Thesis

By

CLIFFORD OBBY ODIMEGWU

THE FACULTY OF SOCIAL SCIENCES, OBAFEMI AWOLOWO UNIVERSITY, ILE-IFE

LACTATION, BIRTH-SPACING AND FERTILITY AMONG THE IGBO OF EASTERN NIGERIA

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BY

CLIFFORD OBBY ODIMEGWU (MR.)

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.....	.....
PROF. ALFRED A. ADEWUYI	DR. JOSHUA A. EBIGBOLA
(PROJECT SUPERVISOR)	(CO - SUPERVISOR)

.....
DR (MRS) ADEKUNBI K. OMIDEYI
(HEAD OF DEPARTMENT, AND CHIEF EXAMINER)

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ABSTRACT

Current interest in breast-feeding practice is a recognition of its role in population growth and child survival. The concern has been about the potential impact of reductions in the proportions of infants ever breast-fed and or the duration of breast-feeding on population growth.The relationship between breast-feeding and fertility interest policy makers because a decline in breast-feeding without a compensatory increase in contraceptive use would result in higher population growth rates. Other things being equal, infant health and maternal fertility are directly affected by the pattern of infant feeding and duration of breast-feeding. Although these mechanisms have been known, certain aspects of the association especially the link between breast-feeding and birth-spacing have not been delineated. This study therefore examines the relationship between breast-feeding and birth-spacing, and their effect on fertility level among the Igbo of Nigeria. The study examines the main factors that affect birth-spacing dynamics in the area. It also estimates the level and proximate determinants of fertility in the area.

Data for this study were collected from a four-month fieldwork in some selected areas in Imo State, Nigeria. On the whole, 819 respondents, who are women of

reproductive age groups 15 - 49 were interviewed. The analysis was done using both descriptive and inferential statistics. The proportional hazards model was the main statistical technique used. The results of the analysis are both interesting and revealing. Fertility level is still high with reported total fertility rate of 7.3, gross reproduction rate (3.5), and general fertility rate (250). Adjusted total fertility rate is 7.4, and completed family size is 6.2 for women aged 45 and above. Family planning method use is low.

The study shows that the initiation and practice of breast-feeding is high, although there is variation among social groups. The durations of post-partum variables are as follows: breast-feeding (10.6), post-partum amenorrhea (6.6) and post-partum sexual abstinence (7.4). The birth interval length is 24.8 months on the average. These variables varied considerably by some socioeconomic factors, while breast-feeding determines the direction of other post-partum variables.

A proportional hazard analysis of the determinants of the birth-spacing variables of breast-feeding, amenorrhea and abstinence and birth interval confirmed our hypotheses. The result showed that breast-feeding is the principal and consistent determinant of all other child-spacing variables. The principal and significant determinants of breast-feeding duration are parity,

education, asset ownership, work status, perception of best infant food and birth attendant. Education and rural-urban residence were found not to be significant when other variables are included. Using Bongaarts' model, a total fertility rate of 5.1 per woman is estimated compared with 7.26 actually observed from the survey. The estimated total fertility rate results from the assumed total fecundity of 15.3 births per woman being inhibited by indexes of the proximate determinants most notably index of post-partum nonsusceptibility as a result of amenorrhea and abstinence (38 %), contraception (mainly traditional methods, 27%) and marriage (26 %).

A decomposition of the post-partum nonsusceptibility shows that postpartum sexual abstinence inhibited 2.7 births while amenorrhea inhibited 1.9. An examination of the percent reduction accounted by each of the proximate variables shows that postpartum infecundability reduces birth by 47 percent, contraception (30%), and non-marriage (23%). Considering the length of birth interval, our result shows that breast-feeding contributes 43 % to birth interval, abstinence (30%), amenorrhea (25%) and contraceptive use (0.4%).

However, on the basis of our findings, this study posited that changes in the duration and patterns of breast-feeding occurring in the society as a result of modernization will lead to higher fertility, unless the

people of the area start practising contraception. It is therefore important to recognise the need for programmes that will encourage the initiation and continuation of breast-feeding practice while simultaneously promoting the use of appropriate contraceptive methods. The current Baby Friendly Initiative programme mounted by UNICEF and WHO has to be encouraged and intensified by the government in every hospital and maternity centres.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Breastfeeding is the focus of rapidly growing interest in developing countries because of its important implications not only for the health of children, who are breatsfed, but also on fertility levels. It is inexpensive and an appropriate source of nutrients. It stimulates strong emotional relationship between mother and child. It reduces infant and child mortality, by the fact that it provides immunological protection against childhood diseases.

Apart from these roles, breastfeeding is equally important in controlling fertility in developing countries where the use of contraceptives is low or absent. It is regarded as a good contraceptive especially in a natural fertility situation. The suckling infant stimulates the flow of natural contraceptive hormones within the mother and this effects a delay in the return of ovulation. Additional months of breastfeeding may therefore extend the period of non-exposure to the risk of conception and lengthen the interval between births. A prolonged breast feeding associated with suckling patterns can influence the duration of amenorrhea (Afaf Babei, 1987). The contraceptive protection of breast feeding which normally depends on the frequency and

intensity of suckling, has been described as incomplete and diminishing rapidly with time. With shorter periods of breast feeding, continuing lactation no longer results in amenorrhea and provides no contraceptive effect (Jain et al.,1970; Orubuloye, 1979).

Breast feeding represents one of the mechanisms through which mortality may influence fertility, since the effect of an infant death before it is weaned may be a reduction in the period of non-susceptibility to conception. In a traditional fertility context, with the absence of modern methods of contraception, birth spacing is largely a function of the norms governing behaviour after birth. Most important of these is the non-susceptible period associated with lactation. Among those groups of women who do not practise any form of contraception, breastfeeding is one of the most important volitional factors that affect birth spacing and hence ultimate family size (Cochrane and Farid, 1989).

Most societies in the sub-saharan Africa have traditionally specified periods of post-natal abstinence and breastfeeding. The belief that an infant should be weaned at the first signs of a new pregnancy is quite common in these societies. This sexual restraint is intended primarily to maximize the duration of breastfeding and hence enhance the likelihood of child survival. This practice tends to keep interbirth

intervals long (Caldwell and Caldwell, 1977; UNO,1987). Although it is generally recognised that postnatal abstinence and breastfeeding reduce levels of natural fertility, few studies of knowledge, attitudes and practice of family planning in these societies have examined these practices and their contraceptive impact (Dow, 1977).

There is evidence that the incidence and duration of breastfeeding and its associated practice of post-partum abstinence are declining in the developing countries (Caldwell and Caldwell, 1981; McCann and others, 1981). This trend tends to shorten the length of birth intervals. Apart from leading to circumstances that affect the health of the mothers and infants, declining breastfeeding interferes with biological child spacing and, on a community basis, increases the rate of population growth. They also have very considerable economic burden to both family and country.

High levels of concern with the effects of declining breastfeeding have been expressed in many international conferences (Jelliffe and Jelliffe, 1978). The present declining situation is the result of many forces that have been in operation in recent years. These include the inappropriate training of health professionals and the development of maternity and pediatric services which make breastfeding difficult to undertake; urbanization

and the changing role of women which is a function of modernization. This observed decline is of considerable importance from both a theoretical and policy points of view. It is therefore an important area of research to examine the level and impact of lactation as well as child spacing on fertility in a society where the use of modern contraceptives is low or absent, in a period of rapid modernization.

1.2 Statement of pproblem

In any society, fertiltiy level is influenced by a series of socio-economic and biological factors. These factors are often called intermediatte fertility variables because they are influenced in turn by various economic, social, cultural and environmental variables (Jain and Bongaarts, 1980). According to Bongaarts (1978, 1983), all variance in the fertility levels of populations is due to differences in just four of these factors namely the proportions married among females; the prevalence of contraceptive use; the incidence of induced abortion, and the fertility-inhibiting effect of breastfeeding. These factors vary in their impact thus producing different birth intervals and different natural marital fertility rates which fall well below known natural fertility levels (Knodel, 1983; Omideyi, 1987).

One of these factors, lactation has been the focus

of growing research in developing societies. Most of the studies have documented the close relation between the duration of breastfeeding and birth spacing (Lee, 1983). In these societies, where contraceptive use is usually low or absent, prolonged breastfeeding has been identified as the major factor in keeping marital fertility level below the biological maximum. Lactation delays the return of ovulation following a birth, thereby contributing to longer birth intervals than would occur in the absence of lactation. The length of birth intervals is thus the strongest determinant of fertility level in such societies (Perez et al.,1971; Chen et al.,1974). Breastfeding in such societies is prolonged. The purpose of such practice of prolonged breastfeeding is to provide newborn baby with nutrition necessary for its survival. And the unintended consequence is that it delays another pregnancy soon after the last birth.

Long intervals between births are the norm in such societies too. They are considered necessary to ensure the health of the mother and her child. The rationale for spacing births is to keep as many children alive as possible in order to achieve a large family. Thus the impetus for birth spacing is pronatalist in nature, the very opposite of contraception to limit family size (Etienne van de Walle and Francine van de Walle, 1988).

In traditional Igbo society, prolonged breastfeeding

of infants was generally between two to three years. The prolonged breastfeeding and its associated practice of post-partum abstinence ensured a reasonable degree of spacing between births. The mother of a newborn baby was expected to abstain from sexual drives. This could be done by the husband's other wives, if he was a polygynist or by a concubine which in most cases is permitted. In other cases, a breastfeeding mother could allow her husband to engage in extramarital relations in order not to disturb her (Uchendu, 1965; Okore, 1987). As in other socities, the institution of prolonged lactation and postpartum abstinence was for the preservation of the health of the child. This allowed the Igbo mother enough time to fully recuperate from one childbearing exercise to another. It also ensured that the care of the already born baby was not sacrificed and its health jeopardised in the event of another birth coming too close to the previous one. Thus, prolonged child spacing practice was embarked upon not necessarily to limit the family size but to safeguard the health of the child.

Weaning of the child could start during the second year after birth or as soon as the child manifested signs of child growth and development such as dentition, crawling, walking etc. Weaning was an extended process of continually modified feeding routines rather than an abrupt event. The child's diet was supplemented with many

other foods especially mashed yam, foofoo, rice and beans, before quitting the breast altogether. The introduction of these other foods took place in the second year of breastfeeding. In an attempt to severe the child from the mother's breast, elder relations of the mother like the grandparents, elderly sisters or other family relations or friends could help to take care of the child. These child spacing practices ensured that reproductive performance of the women was controlled.

However, there is evidence that the incidence and duration of breastfeeding and hence birth interval are declining in various societies (McCan et al.,1981). A decline in the incidence and duration of breastfeeding increases the risk of conception, thereby leading to shorter birth intervals and likely to lead to large completed family size in this society where the use of modern contraception is low or absent. Studies of some population groups have shown that where women are exposed to modernizing influences, fertility may already be increasing mainly becasue of declines in breastfeding without compensatory increases in the use of contraception. Among several reasons given for the decline in breastfeeding durations and child spacing practice is that because of urbanization and industrialization, more women now work in non-agricultural jobs which are frequently in places far

away from home where it is difficult to breastfeed 'on demand'. Several studies have shown that urban women are less likely than rural women to initiate breast feeding and when they do, breast feed shorter than rural women (McCan et al., 1981; UNO, 1987). This decline is of concern as it could lead to shorter birth intervals and higher fertility, particularly among women who already have large family size, in addition to having adverse effects on infant and maternal health. This has an important implication for population growth.

Despite the view that there are important links between lactation, birth spacing and fertility, we do not have a detailed quantitative study of these relationships among the Igbo. In other words, the influence of lactation and birth spacing on Igbo fertility level has not been examined. Thus the contribution of lactation to the reported high fertility level of Igbo is not known. Also, there has not been an examination of the institutional supports developed to sustain the childspacing practices of the Igbo. The role of extended family, elder women, economic activity of the women in influencing their birth spacing patterns need to be examined. Other factors of potential influence on lactation and child spacing such as community factors and contraceptive usage need to be identified and explained. Our understanding of the dynamics of Igbo lactation and

birth spacing will help us to account for the Igbo fertility level.

1.3 Objectives of Study

This study is principally aimed at examining the effect of lactation and birth interval on Igbo fertility level. It intends to investigate the contribution of lactation to fertility level in the area.

The specific objectives are

a) To examine the fertility level and behaviour in the area of study

b) To examine patterns of breast feeding and child spacing in the study area,

c) To identify and evaluate the factors that influence lactation and birth-spacing practices with a view to identifying the effect of modernization on lactation and birth-spacing practices in the area,

d) To examine the impact of lactation and birth-spacing on fertility by identifying the proximate determinants of fertility in the area.

1.4 Rationale for the Study

In recent years, the impact of breast-feeding on birth intervals has received increased attention in fertility research. It is known that lactation delays the return of ovulation following a birth, thereby

contributing to longer birth intervals than would occur in the absence of lactation. There is increasing evidence that the incidence and duration of breastfeeding are declining in some developing countries. This decline is of concern as it could lead to shorter birth intervals and higher fertility, particularly among women who already have high fertility rates in addition to resulting in adverse effects on infant and maternal health.

The link between breast feeding and the delay of the return of ovulation and menstruation is important for population growth. In countries where breast-feeding is universal but where there is little use of modern contraception, breast-feeding provides added protection against pregnancy. A decline in the incidence and duration of breastfeeding in these countries increases the risk of conception because of shorter birth interval and this could lead to higher fertility level. Studies of some population groups have shown that where women are exposed to modernizing influences, fertility may already be increasing largely because of declines in breast-feeding without compensatory increase in the use of contraception. Such increases are usually suggested by a shortening in the length of birth intervals particularly among the educated and urban-based groups. Thus, the present study attempts to investigate breast-feeding

behaviour in Igbo land with a view to estimating the effect of lactation on fertility. Such a study is needed since knowledge of breast-feeding dynamics and their relationship with fertility in the area is lacking.

This study is further called for, especially now that the government is mounting serious campaign to encourage breastfeeding. The study is of theoretical and policy importance.

1.5 Definition of Concepts

Throughout this study, the following words will be used as defined here , to avoid ambiguity and misinterpretation.

1. Natural Fertility: This is fertility in populations or societies where there is no deliberate attempt to restrict fertility through any modern method.

2. Breast feeding or Lactation: This is the feeding of infants with breast milk. It can be full breast feeding when the infant is totally dependent on the breast milk alone. It can be partial when it is supplemented with other foods.

3. Supplemental diets: These are those diets other than breast milk which nursing mothers give to their babies. It can be baby foods or infant formula, mashed food, pap etc.

4. Post-partum Amenorrhea: This is the number of full

calendar months from the date of a pregnancy termination to the date of the onset of the first menstruation.

5. Post-partum Sexual Abstinence: This is the practice of sexual abstinence during the period of breast feeding. It can also be called post-natal abstinence.

6. Birth Interval: This is the interval or gap between the birth of a child and the next child. It can be called interbirth interval. It is achieved through the process of birth spacing.

7. Open Birth Interval: This is the interval between the last birth and the interval that followed it. It is not yet closed by another birth.

8. Last Closed Birth Interval: It is the preceding birth and the interval that followed it. The closure may be a result of another pregnancy or birth.

9. Current Births: This means births during the past twelve months preceding the survey.

10. Retrospective Births: This is the total number of children ever born by a woman upto the time of the survey.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Fertility is directly influenced by a set of social and biological factors which are commonly called intermediate or proximate determinants because they are influenced in turn by various other factors which may be economic, social, cultural or environmental. Studies of the effects of these variables on fertility have demonstrated that nearly all variance in the fertility levels of populations is due to differences in just four factors namely proportions married among females, the prevalence of contraceptive use, the incidence of induced abortion and the effect of lactation (Davis and Blake, 1956; Bongaarts, 1980).

The importance of breast feeding in improving infant and child health and mortality reduction, and in lengthening birth intervals and thus regulating individual fertility behaviour has been a matter of interest for many years. The benefits of lactation are three namely nutritional, economic and the contraceptive values. Lactation is protective to the child, because it contains immunological substances which are anti-infective. The nutrients a child obtains from breast milk are especially needed during the first six months of its life. These protective properties act against certain

bacteria, diseases of the gastro-intestinal tract and viral respiratory infections. Breast-fed babies are also not likely to contract middle ear infections (Cunningham, 1977; 1979; Schaefer, 1977). A number of allergies are less common among breast-fed babies (Mooka, 1986; Murray, 1971). For instance, not only is breast-milk easily digestible, it is safe from contamination and readily available. It does not spoil and can be given at any time without having to prepare it first by boiling water and sterilizing feeding equipment. An adequate supply of human breast milk satisfies virtually all nutritional needs of an infant for the first six months of life (Wray, 1979).

Breast-feeding has also economic value, because it is usually less expensive than bottle-feeding. In his article, Butz (1981) developed a model in which he discussed the economic status of breast-feeding in relation to women's time and cost of substitute goods. He stated that breast-feeding is not a costless activity for many women. It requires time and nutrients, both of which are available only at a cost. Once women's time is more valuable, less and lesser of it will be devoted to breast-feeding while substitute foods are used more and more. McCan et al.,(1981) have demonstrated that breast-feeding is usually less expensive than bottle feeding. On the aggregate, the infant feeding choices made by

individual families can have an economic impact on a nation. For instance, it was reported that in Kenya, feeding a three month old infant on the formula would take up 20 percent of the minimum wage in Kenya and the percentage increases with the child's age (Kent, 1977). This shows that the use of infant formulas may affect national as well as family finances. Many breast milk substitutes or their raw materials are imported and therefore must be bought with scarce foreign exchange.

Studies have indicated that after the delivery of child, the fertility of breast-feeding women is substantially lower than those who are not breast-feeding (Buchanan, 1975). This contraceptive role of breast-feeding is attributable to suppression of ovulation and of menstruation that is associated with lactation. Generally, the longer a woman breast-feeds, the longer she will remain infecund. Although the contraceptive value of breast-feeding has been recognised for long, only recently did demographers and biological scientists focussed attention on the dynamics. The overall conclusion is that breast-feeding makes a substantial contribution to birth spacing and fertility control in many areas, but for an individual woman it is not a reliable family planning method (Rosa, 1974).

Current research has focussed on three aspects of breast-feeding, namely the percent of infants who breast

feed initially, the average duration of breast feeding and the type of breast feeding (scheduled or an on-demand feeding with or without foods) and frequency of suckling or intensity of suckling. The vast majority of women in LDCs breast-feed their infants initially although the percentages are slightly higher in Africa and Asia than in Latin America and Caribbean (McCan et al., 1981). Breast-feeding can also be measured by suckling frequency, amount of time infants spend suckling,and the extent to which they receive other foods. Since the contraceptive protection of lactation is strongly influenced by it, it is important to take account of suckling patterns, influences on them and the ways they change over time. It has been reported that during the first six months, most mothers who breast-fed did so 'on demand' - that is depending on the infants' wants. The proportion of women feeding on a schedule rather than on demand was generally higher among urban residents than among the rural residents(WHO, 1981). The physiological process of breast milk production and output is dependent on the suckling process including its frequency, intensity and duration. Factors that decrease suckling frequency include the supplementation of the child's diet, practice of scheduled feeding, lack of nigh-time feedings and use of feeding bottles and pacifiers. Low milk production can lead to maternal anxiety, inhibition

of oxytocin release and eventually termination of breast feeding (Huffman, 1984).

The association between supplementation of the child's diet and the shortened durations of post-partum amenorrhea has been documented (Chen et al., 1974; Buchanan, 1975; Prema and Ravindranath, 1982). This may be the result of reduced suckling due to increased food supplementation. It should be noted that supplementation varies by the type, amount and caloric content of supplements with corresponding differences in effects on suckling patterns. Within groups of women who fully breast feed or supplement with the same types and amounts of foods, suckling patterns may differ according to certain feeding practices, e.g. whether bottles are used, the frequency of night feeding and whether fed on demand.

A high proportion of the association of duration of breast-feeding with length of amenorrhea is mediated through the length of time the infant is fully breast-fed. This is because the length of full breast-feeding is highly correlated with the duration of total breast-feeding. An introduction of supplements at too early a date is detrimental to amenorrhea duration and to food contamination and use of inappropriate supplements. Populations showing early use of supplementation with substantial contributions in terms of nutrients have shorter durations of amenorrhea (Huntington and

Hostetler, 1986). On the other hand, it has been reported that where supplementation is begun early but only provides a small part of daily nutrient requirements, amenorrhea is extended (Howell, 1979; Vis et al., 1975). In Zaire, where paps are fed at an early age, amenorrhea extends to nearly 18 months . The adequacy of the supplements and the way in which it is fed seem to play major role in determining the eventual effect on reducing amenorrhea. The use of bottles in feeding reduces the length of amenorrhea substantially because of associated reductions in suckling. Maternal activity patterns tend to affect the suckling patterns. Studies in Zaire, Kenya and the Gambia reported that declines in frequency of breast-feeding have been observed during the seasons when agricultural activities increase for women (Vis et al., 1975; Lunn et al., 1981).

2.2 Determinants of breast-feeding and birth spacing

As we have noted above, considerable research has been conducted in developing countries on the potential benefits of breast-feeding, particularly its positive effects on infant health (Popkin et al ., 1983; Knodel, 1977; McCan et al.,1981; and Winikoff, 1978), and on the health, emotional-developmental and demographic consequences of breast-feeding (Simpson-Herbert and Huffman, 1981). A significant body of research has been

developed on the delineation and analysis of factors influencing breast-feeding and child spacing. Most analyses have attributed recent breast-feeding declines in developing countries to infant food industry marketing pressures and to biases towards bottle-feeding of the medical professionals. Some literatures have attributed the decline to the erosion of traditional values and modes of living (such as declines in the extended family system thought to have supported breast-feeding or to increased urbanization and the associated tensions that inhibit the let down reflex (which makes milk available to the suckling infant) and are related to the insufficient milk syndrome (Popkin et al.,1983). Probably these factors have played a role, but changes in infant feeding patterns in developing countries are occurring simultaneously with considerable social and economic changes. Most previous empirical research studies have been univariate, thereby ignoring most socioeconomic forces such as modernization and changes in women's roles that do affect breast-feeding.

Numerous factors appear to affect breast feeding decisions, although their relative importance varies both across and within countries. Since the mother is the ultimate actor and usually the key decision-maker with regard to breast-feeding, behavioural and biological factors related to her are of central concern. Factors

external to the mother and the household such as cultural norms, media exposure and health professionals exert powerful direct and indirect pressures on breast-feeding behaviour.

The decision to breast-feed is affected by the compatibility of the mother's job with child care and breast-feeding. The hours when employment is available, its closeness to the mother's home, and the availability of work breaks that could be used to return home to breast-feed on the one hand or her ability to take the infant with her while she works and periodically nurse it, on the other, clearly influence breast-feeding practice. While many researchers refer to the relationship between maternal work and breast-feeding decisions (see for example, Jelliffe and Jelliffe, 1978; van Esterick and Greiner, 1981), few empirical studies on this topic have been conducted, and this has been mostly in urban areas. In one study, Popkin and Solon (1976) found a significant association between the location of the mother's job and her breast-feeding behaviour. They found in particular that infants of working women were more likely to be mixed fed. Butz and Da Vanzo (1981) found the mother more likely to breast-feed and for a longer time in Malaysia if her job were in agriculture. However, another analysis in Malaysia found that women who were involved in sales or productive activities

including dressmakers, food and beverage makers or weavers were more likely to have children less than ten years of age with them when they worked than those involved in other types of economic activities including professional occupations, management, clerical work and service occupations (Da Vanzo and Lee, 1978). They did not however link these child care compatibility variables with their breast-feeding research.

About a decade ago, Akin et al(1981a) studied 4,308 children in Sri Lanka born within the four years preceding the 1975 WFS survey. Mothers who worked at home had a statistically significant but small increase in the probability of breast-feeding at birth, compared to non-working women. The effect of working at home on the probability of breast feeding increased as the infant grew older. Millman (1981) found work located away from home was associated with a consistently negative effect on breast-feeding extent and duration in Taiwan between 1966 and 1980. In Jordan, where very few women work, Akin et al., (1981b) found work was not a significant factor.

The type of work a woman engages in can influence breast-feeding by affecting both her access to the infant and the time available with the infant. Breast-feeding is more likely to be compatible with part-time work or work that has flexibility in scheduling, as found when a woman works within her household and can easily alternate

between her work and household activities. If women have children at their work setting, for example,, through nearby day care centres, and if the work is flexible and allows nursing breaks, women are more likely to have access to the children. However when work is more highly structured and where such alternatives are not feasible as when women are employed in domestic work, there is less compatibility with child care (Huffman, 1984).

The income received from the woman's employment has a substantial influence on whether she will work or not and it also appears to affect the likelihood of breast-feeding. Women who make higher incomes outside the home in a work setting are less likely to breast-feed. Past studies suggest that in developing countries, higher income families breast-feed less in terms of extent and duration (WHO, 1981). Nevertheless, this finding has been based on cross-sectional data and was not controlled for many other household influences on breast-feeding. The causal relationships remain poorly defined and untested.

Assets can affect breast-feeding in two ways. First, assets which raise productivity will increase the opportunity value of time allocated to household activities by household members. To the extent that relative time costs change with additional productive assets, the whole set of time-allocation decisions will change. The extent and duration of breast-feeding may be

altered. Access to conveniences such as electricity can reduce nonchild care-related home time, and therefore increase time availability for child care as well as assets such as a refrigerator and piped water, reduce the health costs of various methods of infant feeding. If the water mixed with formula is potable, the health cost of formula-feeding will be reduced. The cost of feeding is also lower if a refrigerator allows milk to be kept for several days without spoiling. There is also little research on how income changes affect the overall mix of infant feeding. Johnson (1977) suggested that increased income may have more effect on the type of supplemental foods fed than on breast-feeding per se. She found social and economic changes in rural Trinidad between 1969 and 1976 to be associated with little change in the extent and duration of breast-feeding, but with significant changes in the use of foods to supplement breast-feeding.

Mother's information and knowledge about infant feeding influences the initiation and extent of breast-feeding. Apart from the mother who is the potential breast-feeder, other household members, community norms and social institutions also have important effects on her knowledge and information. A woman's family situation and friends influence both her ability and desire to breast-feed (Akin et al.,1981b). Women who have breast-fed provide the new mother with models to emulate and

advise her on how to breast-feed successfully. Household members may help a woman breast-feed soon after childbirth by doing household chores or by earning an income for the family. Several studies have shown that when older children, adult relatives or servants are present, women are more likely to breast-feed initially and in some cases longer (Pelto, 1981). Such extended families are more prevalent in the rural areas than in urban areas. This in part explains the importance of social support in breast-feeding.

Several knowledge-related factors seem to affect breast-feeding. One is the strength of the mother's desire for a healthy infant combined with her knowledge about the benefits of breast-feeding for its health. If she believes breast-feeding benefits the child and she strongly desires a healthy child, she will be much more likely to breast-feed. A second factor is the mother's understanding about the relationship of breast-feeding to her own health and fertility (Ojofeitimi, 1981). The mother's misinformation about negative physical consequences of breast-feeding and ideas about modernity are often seen as reasons for discontinuing breast-feeding(Popkin et al.,1983). The notion that breast-feeding adversely affects the mother's appearance especially that the child will deform the breasts is such mistaken notions. Also maternal views of the connections

between breast-feeding and conception affect breast-feeding. In a sample of 205 newly delivered Nigerian mothers, Ojofeitimi (1981) found that 88.3 percent of those who abstained from post-partum sexual contact did so because of fear that the infant might suck sperm from the breast which might eventually cause diarrhoea, while only 11.7% abstained to avoid getting pregnant.

It is common to find that women with more formal education breast-feed less (Jelliffe and Jelliffe, 1978; Jain and Bongaarts, 1981). Also the higher her socioeconomic status, the less likely she is to start breast-feeding and where she starts on the average she breast-feeds for a shorter period (Dow, 1977; Mudambi, 1981). The association seen between residence, education and socioeconomic status on one hand and the extent of breast-feeding on the other cannot be proved to be causal from these studies. Nonetheless the associations suggest that as urbanization, education and standard of living increase, the overall practice of breast-feeding will decline unless other changes counteract them. However, in a recent multivariate study in Sri Lanka, more educated women were not only more likely ever to breast-feed five to nine months rather than one to four months (Akin et al.,1981b).

Health care services in most developing countries have been associated with lower rates on initiation of

breast-feeding and shorter durations. Whereas most births in rural areas are delivered at home, births to women in cities occur more often in hospitals where women have to contend with hospital routines and are exposed to the beliefs and practices of trained health professionals. Health professionals who consider infant formula to be as good as, if not better than, breast milk can also influence the mother's view of the adequacy of her breast milk for the child's health (WHO, 1981). Where women receive prenatal care during their pregnancy, the attitudes and beliefs of the health professionals have more of an opportunity to affect the woman's own knowledge and attitude about breast-feeding. The practices and regulations of health institutions, particularly public hospitals, may directly control a mother's breast-feeding choices. These practices may include (1) separating mother and infant after birth and the resulting delay in beginning lactation; (2) administering anesthetics and using drugs or birth through caesarian section which reduce the woman's ability to lactate or the child's alertness, (3) providing supplementary feedings to the newborn in hospitals and give free samples to them when they leave the hospital; and (4) ignorance about the real health contraindications to breast-feeding and the consequent recommendation to cease lactation when it is often

unnecessary (Popkin et al., 1983).

However it has been found that proximity to most types of family planning clinics played a statistically significant positive role in the initiation of breast-feeding in Malaysia (Butz and Da Vanzo, 1981). Also, not only can health professionals and health institutions affect the initiation of lactation but they can also influence its duration. Such results have been reported in Guatemala and the Philippines (Popkin et al.,1983). Related to this is the effect of the availability of infant formula or breast milk substitutes. Butz and Da Vanzo (1981) found a significant negative association between the number of infant foods available in a community in 1978 and the duration of breast-feeding. Greater use of infant milk formula in urban areas may reflect the proximity of store selling these items as well as more extensive exposure to advertising and higher family incomes (Jelliffe and Jelliffe, 1977).

A number of different aspects of breast-feeding have been attributed to family planning size, child-spacing and parity. In some cultures, there are taboos against women breast-feeding once they become pregnant. Some years ago, Henry (1961) hypothesized that the number of children a woman has already had, influences lactation duration if breast-feeding is used as a contraceptive. While some earlier studies found such a positive effect,

the more recent cross-sectional analyses have found no significant effect of parity (Jain and Bongaarts, 1981; Ojofeitimi,1981; Butz and Da Vanzo, 1981). Higher parity may reduce some women's nutritional status. In a study in Colombia, Heller and Drake (1979) found that the higher parity child receives half a month less nursing than the one preceding. However, they also observed that the age at weaning is reduced 1.4 months by the presence of each additional child in the household under age six.

The hypothesized negative effect of other young children on breast-feeding may in many cases be combined with a positive effect of older children (who can substitute for the mother in housework, care for young children and even do market work) to yield an insignificant effect of parity per se. What is more important therefore is household composition (the ages and sex of other children) and other household members as well.

Urban-rural residence seems to have the most consistent effect. In all developing countries, rural women are more likely to breast-feed than urban women (McCan et al.,1981). Certain characteristics of urban city may influence infant-feeding practices. Urban areas are more densely populated, have better transport networks, more social services and more commercial food outlets. In urban areas, the mother's potential income

from market labour is usually greater, and work may be less compatible with child care. Urban areas also offer women a larger variety of employment opportunities. Infant feeding substitutes are more likely to be both advertised and accessible, and there is less social support for breast feeding. The traditional support and control systems in rural areas either may not exist or may perform very different functions in urban areas (Gussler and Briesemeister, 1980).

Not only may social support be less available and infant food substitutes more available, but the urban mother also will probably find greater accessibility to modern health personnel who may influence her either never to breast feed or to reduce the duration of breast feeding (Gussler and Briesemeister, ibid; Pilisuk and Froland, 1978). Greater availability of cash income facilitates the purchase of infant foods. Nevertheless, some factors work in the opposite direction as well. Substitutes for breast milk may be more expensive in urban markets, especially for the poor, who may be forced to work in the large informal labour market which although provides lower wages, poorer working conditions and negative health benefits, may in some cases allow women to keep their children with them while they work (Buvinic and McGreevey, 1983).

In general, women who use modern contraceptives are

less likely to breast-feed than women who do not use them (Lesthaeghe et al.,1981; Akin et al., 1981a). Furthermore when contraceptors do breast-fed, the duration of breast-feeding is likely to be several months shorter. Where different contraceptive methods have been compared, women who use oral contraceptives are less likely to breast-feed for a shorter period than women using other methods (Knodel and Debavalya, 1980; Zurayk, 1981). Because breast-feeding depends on both deliberate choices and physiological reactions; it is often not clear from information from surveys exactly what determines the duration of breast-feeding. The socioeconomic situations of the women may independently influence both breast-feeding and contraception. Another possibility is that women who breast-feed for shorter periods need to adopt effective contraception earlier in order to assure a reasonable interval between pregnancies.

There are exceptions, however. In Thailand, contraceptive users who want no more children breast-feed longer than users who want more children. These women apparently welcome the double protection of breast-feeding and contraceptives. Also, some women may use contraceptives to be sure that breast-feeding is not interrupted by another pregnancy (Knodel and Debavalya, 1980). In Ghana, IUD users have the longest birth intervals and breast-feed the longest and users of

hormonal contraceptives also have longer birth intervals and breast-feed longer than women who use no contraception, although not as long as IUD users (McCan et al.,1981). Overall fertility is lowest where contraceptive usage is highest (Morris et al; 1981). Where fertility is high and contraceptive usage low, however, breast-feeding is the principal factor that determines the birth interval length. In these areas, a major reason for stopping breast-feeding is not the use of contraception but rather another pregnancy (Huffman et al.,1980; WHO,1981).

Differences in fertility levels can logically be attributed to differences in exposure to the risk of pregnancy and differences in the length of time between births when women are exposed (Trussell et al.,1985). Variations in birth interval length can be explained by differences in breast-feeding behaviour, contraceptive use, frequency of intercourse, the incidence of abortion and fecundity. The analysis of determinants of birth interval dynamics has made substantial progress during the past one or two decades, due mainly to the existence of a number of data sets that contain the necessary birth history details (Hobcraft and MacDonald, 1984) and progress in statistical techniques for the analysis (Guilkey and Rindfuss, 1987).

Previous work on this topic has raised interesting

questions. Rodriquez et al (1983) compared results of identical structural models for nine countries and found that a woman's education and age, time period, and length of the previous birth interval all had substantial effects on birth interval length. They found little differences between intervals closed by births of order three, orders 4 - 5, 6 - 8, once these other factors were controlled and concluded that parity is a relatively unimportant variable. Rindfuss et al (1984) analysed the determinants of birth interval for five countries. They found significant and important differences in child spacing for the following variables: country, ethnicity, age at first birth, urban experience and sex of preceding birth. Unlike Rodriquez et al.(1983). they discovered that education had relatively little effect on interval lengths except at the higher birth orders. This may however be as a result of the effect of education operating through the age at first birth.

Women's work status may also affect the length of the birth interval by reducing the demand for children. When women's work is incompatible with childbearing, childbearing working mothers may desire fewer children. On the other hand, women may wait longer to conceive and thus have longer birth intervals. They may reduce the duration of breast feeding which may shorten the birth interval. The use of contraception also have a positive

effect on the birth interval length. Survival status of an infant or child is another variable that is hypothesized to affect the length of a birth interval. The death of an infant may also cause parents to try to replace that child. This may reduce the waiting time to conception. This behavioural effort tends to shorten the length of birth interval.

Actual birth spacing is the result of a combination of factors such as parent's desired spacing as expressed through breast-feeding, mixed feeding and contraceptive use; other biological factors which may cause desired spacing not to be achieved (eg, subfecundity, poor health and nutritional status); periods of abstinence because of separation and other intermediate variables. These proximate determinants are determined by individual, household and community factors and circumstances. Household level factors provide a variety of normative, economic and other influences on the proximate factors, and the community factors are seen as operating through these individual and household factors and the proximate factors to affect spacing (Guilkey et al., 1988).

The community factors are roads, availability of family planning workers and health services. These determine access to fertility regulation methods, breast substitutes and health services that affect child survival. A second set of community factors affects

household income and time allocation. These include electricity and institutions of higher learning, which can affect individual productivity and household income, and schools which can increase the desire for education and change patterns of wealth in the community (Tsui, 1982; Akin et al.,1986 and Cochrane, 1979). The set of community factors affects household social values and their components are often measured as dimensions of modernity. Access to TV and radio and improved road networks are examples such indicators.

Despite these advances in the study of birth interval dynamics, our understanding has been modest (Rindfuss et al., 1987). One important reason is that although excellent details on the dependent variables were collected, little detailed socioeconomic information was obtained. Other reasons have been specification error, poor data quality and omission of such proximate variables as coital frequency and the incidence of sexually transmitted diseases.

2.3 Early theories

Breast-feeding and birth-spacing have been important components in theories of population equilibrium in contemporary hunter-gatherer populations and in discussions of human reproduction in an evolutionary perspective. Long breast-feeding and birth intervals have

been seen as an adaptive mechanism that dictated the prolonged period of dependency of human infants (Rhodes, 1962); the lack of early weaning foods (Lee, 1972) and the economic role of women whose gathering activities require suitable mobility, unimpeded by frequent pregnancies (Sussmann, 1972).

Implicit in many of these studies is biological determinism: selection pressures said to operate against females occur too soon after a birth, and genetically determined longer durations of lactational infecundity thus result (Hull, 1985). Other attempts to place post-partum behaviour in a longer theoretical context have focused on post-partum abstinence, but here too, the emphasis was broadly deterministic. Whittings (1964) cross-cultural comparative study correlated long post-partum abstinence with tropical climates and low protein diets where he hypothesised that its function was to delay a subsequent pregnancy in order to permit longer breast-feeding. This is the oldest hypothesis advanced to account for the child-spacing pattern.

The most important attempt to complement Whitings' thesis with additional explanatory factors and to disentangle some of the circular reasoning behind some causal explanations is offered by Saucier (1972). Although he accepted in part Whittings nutrition theory, he identified a number of social-organizational

correlates of abstinence, including the work of women in extensive agriculture which would either provide a reason for the existence of the practice or conditions for its maintenance. He postulated that long post-partum abstinence might have been imposed on groups which had genetically-determined shorter periods of lactational infecundity.

Further development of these lines of inquiry came with the integration of knowledge on the physiological mechanisms involved in lactational infecundity. Hypotheses have been advanced which contend that the shift from hunter-gathering to sedentary agriculture and then to urban industrialised society reduces mother-infant contact and hence suckling frequency; and make available more nutritious weaning foods which allow for earlier cessation of breast-feeding (Hull, 1985). These studies were wide in scope, focussing on the level on whole societies, and not considering intra-cultural diversity, individual-level attitudes, motivations or decision-making within a particular ecological and societal context.

2.4 Current studies on breast-feeding, birth-spacing and fertility

Whereas the earlier studies provided qualitative descriptions of societal norms of postpartum behaviour,

recent studies that are demographic have yielded a lot of quantitative measures. These have given rise to a lot of models to produce estimates (Lesthaeghe and Page, 1981; Bongaarts, 1982) and attempted simplified methods of obtaining mean values of breast-feeding and other post-partum variables in surveys (Anderson et al.,1983). National and local surveys have been more successful in looking at the dynamics of breast-feeding, if only because their more detailed questions have provided information on many more factors of potential influence (Caldwell and Caldwell, 1981; van Esterik, 1983). The problems inherent in the demographic approach are the inadequacy of data sets to investigate underlying reasons for observed patterns; crudeness of the measurement of the parameter of breast-feeding behaviour itself and the challenge of accurate measurement and by the selection of questions to ask (Hull, 1985).

In the biomedical literature, two main theories have been used to explain the breast feeding-fertility relationships - nutritional hypothesis and suckling patterns hypothesis. In the nutritional explanation, differences in the duration of postpartum infecundity are attributed to fatness levels of the mother during the nutritionally stressful period of lactation. Nutrition may work through reduction in milk volume, and consequent increase in suckling by the infant. If this factor is to

be a determining one, behavioural studies of this sort have to look at dietary intake including food restrictions during pregnancy and lactation. However, studies have found only weak support for nutrition as an explanation for variations in lactation infecundity (Hull, 1985; Huffman et al.,1978; Bongaarts and Delgado, 1979).

The hypothesis that infant suckling patterns are the key to suppression of ovulation is better substantiated. The precise mechanism of operation has not been identified. Suggestions about aspects of suckling patterns which are responsible for the effect include overall frequency of nursing; total nursing time, the time between nursing bouts and intensity of suckling which is assumed to be important but difficult to measure (McNeilly et al.,1980; Prema and Ravindranath, 1982).

Various literatures have provided evidence for a positive association between the duration of breast-feeding and the length of birth interval. There are three components of birth interval namely postpartum amenorrhea, menstruating interval and gestation period. It is an established fact that breast-feeding is the principal determinant of the duration of post-partum amenorrhea. In the absence of breast-feeding, menses return shortly after birth (Perez et al., 1971; Bonte et al.,1974). As the duration of breast-feeding increases so

does the amenorrhea interval. With low lactation, mean amenorrhea intervals from one to two years are observed in both developing and developed countries (Chen et al., 1974; Huffman,ibid; Cantrelle and Leridon, 1971).

Studies from many parts of the world show a positive relationship between the duration of breast-feeding and the length of amenorrhea. For example, urban Nigerian women with primary education breast-feed for an average of about 11 months and experience amenorrhea averaging 5 and 6 months. In rural Senegal where breast feeding averages over 23 months, amenorrhea lasts almost 18 months (Jain et al.,ibid; Jain and Sun, 1972; Lesthaeghe and Page, 1980; Van Ginneken, 1974). A more detailed study in Senegal has shown that in the absence of mortality, the interval between livebirths is lengthened by 9 months when the weaning age is increased by one year within the weaning age of 12 to 36 months. This study showed that the death of an infant, which is equivalent to weaning has an impact on fertility (Cantrelle and Lerridon, 1971). Similar events are described in several studies of historical demography. They all consistently show that the death of an infant leads to a shorter interval between that birth and the next.

On micro-level, the correlation between lactation and amenorrhea intervals is lower while still highly significant (Jain et al.,1981).For example lactation

explained about 215 of Taiwanese women which was 92% of the total variation explained by women's age and parity, education, residence, ownership of modern objects and breast feeding (Jain and Sun, ibid). This lower correlation can be accounted for by the type and pattern of breast feeding (Winnikoff, 1978). Perez et al (ibid) and Huffman (ibid) have reported that women who breast feed fully have a lower probability of resumption of menses than women whose infants receive supplemental food such as fluids by bottles or solids. There is also some empirical evidences that the continuation of breast-feeding beyond the resumption of menstruation suppresses the probability of conception.

Other studies have documented the association between supplementation of the child's diet and shortened durations of amenorrhea (Chen et al., 1974; Prema et al.,1982). This may be as a result of reduced suckling due to increased food supplements. Prema and Ravindranath., ibid) have illustrated that a high proportion of the association between the duration of breast-feeding and the length of amenorrhea is mediated through the length of time the infant is fully breast-fed. This is because the length of full breast-feeding is highly correlated with the duration of total breast-feeding.

There are two basic measures of conception during

lactational amenorrhea namely proportion of women who became pregnant, and the pregnancy rate. The first indicates an individual woman's probability of becoming pregnant during her entire period of lactational amenorrhea. The pregnancy rate measures couple-years of protection. Recent studies indicate that the percentage who become pregnant during lactational amenorrhea ranges from 1 to 13 (Simpson-Herbert and Huffman, 1981; Tieeze, 1961). The percent who conceive is influenced by culturally mediated patterns of breast-feeding, the timing of introduction of supplementary foods and the duration of breast-feeding.

The average duration of lactational amenorrhea varies greatly among world societies, ranging from an average of 5 to 6 months among Western women upto 18 months in rural populations of some developing countries. In any case, it should be noted that breast-feeding lengthens birth interval and consequently reduces fertility, through physiological phenomena exemplified by postpartum amenorrhea. Several authors have investigated whether such temporary sterility of breast-feeding women varied according to certain characteristics. In the United States, Potter (1963) found that apart from breast-feeding, there is a link with the mother's age. In Taiwan, Jain (1969) found no variation according to education or place of residence. It is also observed that

post-partum amenorrhea was longer where per capita income was lower and shorter for those with higher income. This is attributed to a better nutritional level of people with higher incomes. The major factors that influence the duration of amenorrhea are the same factors that affect the frequency and intensity of nursing. They include the length of breast-feeding period; the timing of the addition of supplementary foods; maternal age and demand versus scheduled feeding (Mckeown and Gibeon, 1954; Singarimbun and Manning, 1976). When breast milk is supplemented with other foods, the length of amenorrhea is less than when full breast-feeding is practiced. The earlier such supplementation is initiated, the earlier the resumption of menses. Supplementary foods lessen the infants' dependence on breast milk, and thus frequency of suckling declines (Perez et al.,ibid; Chen et al., ibid).

Because the length of breast-feeding and the length of postpartum infecundity are linked, any substantial shortening of the average duration of breast-feeding will lead to higher fertility unless contraceptive use increases fast enough to counteract this effect. Studies have shown that shorter breast-feeding durations mean shorter birth intervals and thus a larger family size (Cantrelle and Lerridon, ibid; Chen et al, ibid). Changing patterns of postpartum abstinence can also make a difference in fertility. The practice of marital sexual

abstinence in Africa adds to the birth interval when it extends longer than post-partum infecundity (Lesthaeghe et al., 1981). Abstinence prolonged beyond the return of fecundity often is related to extended breast-feeding. Young, educated urban women in these cultures seem generally to be breast-feeding less and abstaining for shorter periods, both of which might be expected to increase fertility (Gaisie, 1981; Hull, 1980).

In some population groups, especially in urban areas where women are exposed to modernizing influences, fertility may already be increasing largely because of declines in breast-feeding without compensating increases in the use of contraception (Olusanya, 1969; Nag, 1979). Such increases usually suggested by decreasing birth intervals over time or shorter birth intervals among women groups have been observed in Senegal, Zaire and Nigeria (Ferry, 1981; Carael, 1981; Caldwell and Caldwell, 1981). However in most studies, increasing contraceptive use has more than compensated for declining breast-feeding, and fertility rates are falling. For example, studies in Taiwan have demonstrated increasing contraceptive use and declining fertility where breast-feeding duration has dropped considerably (Kendall, 1979). Also while shorter birth intervals due to shorter breast-feeding have been most notable in urban areas, on the whole urban women have the lowest fertility rates

because of more extensive contraceptive use, even though they breast feed the least.

Butz (1981) has observed that among Chinese and Malay ethnic groups, women of low parity are breast-feeding less but using contraception more. The result is that birth intervals have changed little. Among high parity women, increasing contraceptive use is more than compensating for declining breast-feeding and birth intervals are growing longer. The declines in the prevalence and duration of breast-feeding in developing countries, especially in urban areas, is expected to affect infant nutrition and health and post-partum fecundability. As the total duration of breast-feeding declines as weaning foods are introduced at earlier infant ages, women in developing societies will be at greater risk of conception in the early post-partum period. In areas where post-partum sexual abstinence accompanies breast-feeding, declines in breast-feeding can lead to even greater increases in fertility (Bongaarts and Delgado, ibid). There is a growing concern about the rapid population growth along with the economic problems mostly in the developing countries.

The impact that breast-feeding has on fertility works through three proximate determinants namely postpartum infecundity (proxied by post-partum amenorrhea, prolonged post-partum sexual abstinence) and

contraceptive use. Three components of breast-feeding behaviour (duration, frequency and use of supplements) impact on the proximate determinants of fertility. The frequency of breast-feeding affects amenorrhea, and the duration of breast-feeding affects amenorrhea and the duration of breast feeding may affect both frequency and duration of breast feeding.

In Igbo context where marriage is almost universal, the extent of use of contraception relatively low or non-existence, abortion not allowed or practised openly, the difference in fertility could be attributed to post-partum non-susceptible periods. As shown above, post-partum amenorrhea is one of the components of variations in fertility. It is the breast feeding practices that determine anovulation and amenorrhea. Moreover, modernization has contributed to the observed reduction in prolonged breast feeding which shortens non-susceptible period which in turn reduces the birth interval (Lesthaeghe and Page, 1981). This study attempts to investigate breast-feeding behaviour in Imo State, Nigeria, with a view to estimating the effect of breast-feeding on fertility in the area. Such a study is needed since there is no knowledge of breast-feeding dynamics in the area.

An associated consequence of extended breast-feeding period which extends the period of post-partum

anovulation and amenorrhea and by prolonged post-partum abstinence is child spacing. As van de Walle and van de Walle (1988) rightly observed that long intervals between births are the norm throughout sub-saharan Africa. They are considered necessary to ensure the health of the child and the mother. Women who do not bear their children far enough apart are viewed negatively by the community, as experience has shown that a new pregnancy can effect the health of the suckling child. The rationale for spacing births is therefore to keep as many children as possible alive in order to achieve a larger family size. This clearly shows that in African society, the main force for child spacing is pronatalistic which is contrary to contraception which tends to limit family size. In this region, the belief is that traditional practices such as abstinence adequately meet the spacing needs of couples. Hence attempts made to introduce family planning programmes have met little or no success.

It was recently that demographers started speculating that in Africa, there might be some spacing of births. In 1977, John and Pat Caldwell published their seminal work on the Yoruba, that highlighted the role of sexual abstinence as a fertility determinant. They reported that the Yoruba almost universally observe taboos on post-partum intercourse which often lasts upto three years after a birth, and that typically the taboo

is maintained for six months after the end of breast-feeding. According to the study, postpartum abstinence enhances the health of the suckling child by ensuring that a new pregnancy will not force the mother to wean the child too soon, and also preserves the mother's health by allowing her time to rest after a birth. The Yoruba also believe that coitus during lactation is harmful because it allows sperm to enter the blood of the nursing mother, thereby poisoning her milk. It is even claimed that early resumption of sex after a birth is associated with various diseases (Gaisie, 1981)

These widely held views have contributed to the survival of the practice of postpartum abstinence. Data from the World Fertility Surveys confirm that taboo against intercourse is still widespread throughout sub-saharan Africa. But durations vary across cultures. Yorubas of Nigeria observe a particularly long period of abstinence compared with the Hausa-Fulani who resume intercourse 40 days after birth, while cultures in East Africa practise abstinence for one year and 40 days while in others the practice extends more than that (Schoenmaeckers et al.,1981). Abstinence lasts from 7 to 31 months in Ghana while it lasted from 11 to 22 months in Cameroon. Post-partum amenorrhea lasts an average of about two months for non-breast-feeding women and increases to roughly 60 - 75% of the average duration of

breast-feeding. This implies that the duration of lactational amenorrhea decreases most markedly when a population reduces its breast-feeding habits in the central range from about two years to just over half a year (Lesthaeghe and Page,1981). It does not usually last as long as breast-feeding. The spacing of births and the protection of the survival chances of the already born infant are enhanced by a post-partum taboo on sexual intercourse. Women who have given birth are supposed to abstain for the whole or for at least a part of the breast-feeding period.

Various studies have been made on child spacing and fertility relationship. Martin et al.,(1964) observed that mean intervals between births in Imesi-ile village, Western Nigeria varied from 17 months following a still birth or death under one year to 35.5 months following the survival of the preceding child. They also observed that the majority of mothers breast-feed for about two years, the mean period being 23.2 months. A study by the then Institute of Population Studies of the Obafemi Awolowo University, Ile-Ife, Nigeria showed that the preferred average period of abstinence varied from 1.42 years to 1.74 years in the Western State (now made up of Lagos, Ondo, Oyo, Ogun and Osun States). The reported average for the then Mid-Western State (now Edo and Delta States) varied from as low as 0.45 years to as high as

1.78 years. The highest average of 2.23 years was recorded for Kwara State. Similarly, the birth interval question yielded averages which varied from 2.09 years to 2.55 years in Mid-Western State, and the highest average of 2.93 years was observed for Kwara State (Orubuloye, 1979).

Also a parity study of Lagos women showed that breast-feeding was on the average 12.4 months, while post-partum abstinence lasted 15.9 months (Adegbola et al.,1977). In Rwanda where the tradition is to resume sexual relations after few days of birth prolonged lactation was found to have delayed conception. Within 9 months after delivery, 74% of non-lactating women became pregnant compared with 7.6 percent recorded among lactating women (Bonte and Balen, 1969). And in Ghana, prolonged amenorrhea due to prolonged lactation was found as the main method of child-spacing (Black, 1976). He posited that child spacing was not the intentional result of birth control or sexual abstinence but rather a coincidental result of long period of post-partum amenorrhea caused by prolonged lactation and other possible biological deficiencies. In that society lactation was generally practised till the child was weaned about 18 months of age.

Jain et al.,(ibid) reported a positive correlation between the length of amenorrhea and breast-feeding in a

study of 500 Taiwanese women. More than nine-tenths of the women had breast-fed their last baby for an average of 16 months, and the mean length of post-partum amenorrhea was about 14 months. Breast-feeding was also found to have delayed menstruation for 7 months. Better educated and urban women were reported as practising shorter period of breast-feeding than the uneducated rural women. Prolonged breast-feeding has also been reported for the majority of Javanese women whose children survive till weaning (Hull and Hull, 1977; Singarimbun and Manning, ibid). In this study, 60% breast-fed their children for 24 months or longer and over 25% for 30 months or longer. The mean duration of breast-feeding was 25.6 months. Among these women, amenorrheic period was about 23 months on the average. They concluded that extended durations of abstinence associated with prolonged breast-feeding were a major factor contributing to low levels of fertility in Mojolama village of Java. Hulls' study in Java showed that prolonged breast-feeding and post-partum abstinence were longer among the older and lower class women. Linking this pattern with fertility, they concluded that the two factors coupled with marital disruption and fecundity impairment due to ill-health were responsible for the positive relationship between class and fertility.

If the earlier reports of the anthropologists are anything to go by, the taboos on sex following a birth are probably shorter now than they were in the past, suggesting an erosion in the tradition. The spread of religion, modernization, urbanization, female unemployment and more widespread education are factors contributing to the erosion of the custom. The practice of abstinence tends to be weak in polygynous homes and where extended family system exists. In any case, the responsibility for observing postpartum behaviour falls on the women, since men do escape this period by extra-marital sexual relations or with other wives (Caldwells, ibid). Urban couples who are increasingly adopting a westernized view of the couple and the nuclear family are rejecting the long abstinence period because it is inimical to happy conjugal relations.

From the above review we can ascertain that the factors determining the length of birth intervals are a complex interaction of a variety of socioeconomic, demographic, cultural and institutional factors. These factors include mother's age, duration of marriage, age at marriage, historical period and marriage cohorts. Analysis of birth interval variations employs controls or adjustments for demographic dimensions. It is postulated that the higher the age at marriage, the shorter birth interval because the increase in age at marriage reduces

the incidence of reproductive impairment associated with early marriage and by inducing women to compensate for the loss of their reproductive life by bearing children at relatively shorter intervals (Ahmed, 1982; Sales, 1988).

Background variables such as place of residence may play a significant role in explaining birth interval variations. Majority of studies has shown that urban women have longer birth intervals than women in the rural areas. The urban-rural differentials may be due to the characteristics of urban life itself such as higher net costs of children, selectivity of urban migrants, being free from traditional pronatalistic values and better access to the means of fertility control. But yet in some cases rural birth intervals exceed that of urban. This could happen in countries where urban growth is a very recent phenomenon, thereby improving the health conditions of urban women, that is improve fecundity of women, and relaxing the impact of traditional practices such as breast-feeding and post-partum abstinence in urban areas (UN, 1984). Living in urban areas and living in a developed region are hypothesized to positively effect the waiting time to conception and negatively affect the duration of post-partum amenorrhea.

2.5 Studies in Nigeria

More than 30 years ago, Matthews observed that breast-feeding was maintained by Yoruba women for variable periods exceeding 12 months. He estimated the average length of breast-feeding at 22 months for mothers following the delivery of their first child, and 18 months for mothers who had delivered their second child. He also observed that amenorrhea tended to persist longer in those women who prolonged lactation, and the average length of amenorrhea was 16 months for women following the birth of their first or second child (Orubuloye, 1979; Matthews, 1955).

Martin et al.,(1964) also confirmed the universal ability of the Yoruba mother to breast-feed her children. In their study of birth intervals in Imesi-ile, they observed that the majority of mothers breast-feed for about two years, the mean period being 23.2 months. Following child survival, the mean interval was 35.5 months compared with 17 months if the child died. They concluded that although the Imesi-ile women did not see breast-feeding as offering any protection against further conception, they however believed that a long period of lactation was needed. Co-habitation during lactation was totally forbidden and a woman who became pregnant while breast-feeding was subjected to a public censure and ridicule.

The traditionally prescribed duration of breast-feeding and abstinence among the Yoruba is about 30 and 36 months respectively. The overall average duration of breast-feeding varied from 12.4 months in metropolitan Lagos through an estimated duration of 16 months in Ibadan city to 20 months in the rural areas. Similarly the average duration of abstinence was estimated at 15.9 months for Lagos; 22 months for Ibadan and 27 months for the rural areas (Adegbola, ibid; Caldwell and Caldwell, ibid).

In another study in Lagos, it is reported that mean age of the child at cessation of lactation is 11.9 months, when compared with similar study in 1975 (Olukoya, 1986; Bamisaiye et al.,1978). Page and Lesthaeghe (1981) reported the median age of the child at cessation of breast feeding to be 16.3 months. The Nigerian segment of the World Fertility Survey found the length of breast-feeding to be 16.6 months and the duration to be inversely related to the level of education of the mother. The DHS reported that nearly all children are breast-fed for at least some time and the large majority are fed breast milk for more than 9 months (92%). Very few babies are given breast milk to the exclusion of anything else. Ninety percent of children aged 3 months or less are given water or other liquids in addition to breast milk. By the time children are 4 to 6

months of age, over one-third will have been introduced to solid food. However many children are not introduced to foods until they are more than six months old; 42% of children 7 - 9 months and 33% of those 10 - 12 months have not been introduced to solid foods (DHS, 1991).

The Nigerian Fertility Survey reported that the mean durations of breast-feeding and of full breast-feeding in the last closed interval in Nigeria were 16.6 and 5.1 months respectively. The practice of breast-feeding and use of supplementary food were found to be universal. Duration of breast-feeding did not vary much by the age of the women but varied considerably by their background characteristics. A high level of education and residence in urban areas were associated with shorter durations of breast-feeding and full breast-feeding. Differentials by region and religion also exist. According to the survey, the mean and median durations of post-partum amenorrhea were 10.4 and 9.0 months respectively and varied positively with the duration of breast-feeding when the latter exceeded 8 moths. Average duration of post-partum sexual abstinence was 14.1 months, and the duration of abstinence varied positively with age and duration of breast-feeding but inversely with education. Type of residence did not exert much influence. Variations by religion and region were also reported (Nigerian Population Bureau,1984). However these studies did not

address the key cultural issues that tend to impact on breast-feeding and child-spacing practices in Nigeria. A good number of variables were not introduced. There is need to probe further the relationship in Nigeria.

2.6 Synthesis of existing studies

The synthesis of ideas from various fields can give insights into behavioral aspects of breast-feeding and its effect on fertility, and the variations observed within and across societies. The three approaches discussed here are useful for future research priorities.

Whereas the ethnographic studies provided qualitative descriptions of postpartum behaviour, demographic sources over the years have yielded a profusion of quantitative measures. Where direct data on the post-partum non-susceptible period were lacking, models have been developed to produce estimates and various analytical approaches developed (Bongaarts, 1978; Page et al.,1981). This impact of breast-feeding and child spacing on total fertility have been provided, and approximate levels of contraceptive use which would be required to compensate for the reductions in post-partum amenorrhea which would accompany breast-feeding declines have all been estimated (Bongaarts, 1981).

The inadequacy of many of the data sets to investigate underlying reasons for observed patterns and

the crudeness of measurement of the parameter of breast-feeding and child or birth spacing behaviour are the limitations of the studies reviewed here. With the increase in large-scale demographic surveys such as World Fertility Survey, Contraceptive Prevalence Survey and Demographic and Health Surveys and local level studies, data on basic parameters in a variety of setting are now available. However, the quantitative analysis has been correlational. There are still large gaps in our knowledge concerning underlying reasons, attitudes and motivations with regard to breast-feeding and related post-partum behaviour. Some important factors were not controlled, hence findings have not been uniform.

Thus, this study will investigate the patterns of breast-feeding and birth spacing behaviour in the area of study. The study will also examine the links between abstinence and breast feeding and birth spacing, attitudes toward sexual abstinence and factors determining the resumption of sexual activity during breast-feeding. The study will also identify the key cultural factors that affect child-spacing practices in the area. The effect of breast-feeding on fertility will be estimated.

2.7 Conceptual framework

Researchers have attempted to develop a general framework for the analysis of fertility determinants. Davis and Blake (1956) were the first to propose such a general framework for the study of fertility. This framework attempted to explain some physiological and cultural variables that affect fertility. These are called intermediate or proximate variables.

The framework divides the variables into three phases of the reproductive process; sexual intercourse, conception and gestation, and parturition. Each of these can operate either to increase or decrease fertility. The factors affecting each of these reproductive processes are called intercourse variables, conception variables, and gestation variables. This scheme has been widely used and modified too.

A major modification of this framework is the work by Bongaarts (1978). He restricted the factors to be considered to only the four of the most important variables namely marriage (one aspect of intercourse variables), contraception (contraception variables), abortion (an aspect of gestational variables), and breast-feeding which is the most important determinant of the duration of infecundity following a birth.

The importance of these four proximate determinants was strongly reinforced by Bongaarts' 1982 aggregate

analysis. Using countries as the units of analysis, he demonstrated that virtually all of the important variation in fertility was captured by differences in these four variables. Using the model developed by him, indexes of these variables were used to relate actual fertility rates to total potential fertility rates. One limitation of the Bongaarts' model is that its indices only consider the effects of each variable ignoring the fact that there may be overlapping.

Following this trend, many authors have suggested implicit or explicit model for the determinants of breast-feeding (and or infant feeding practices) but few have attempted to examine these factors comprehensively. Social class and previous breast-feeding experience were found to be related to duration of breast-feeding (West, 1980). This social support for breast-feeding is important. The role of maternal attitudes was reviewed by Newton and Newton (1967). Clark (1979), reviewed the relationship of women's work to infant nutrition and concluded that studies are needed which can correlate working status of women with feeding patterns rather than limiting the analysis to reasons for weaning. Other model postulations have been made also (Popkin et al.,1979; Butz and Leibowitz, 1980).

Using the foregoing as guideline, a new conceptual framework is developed for this study.

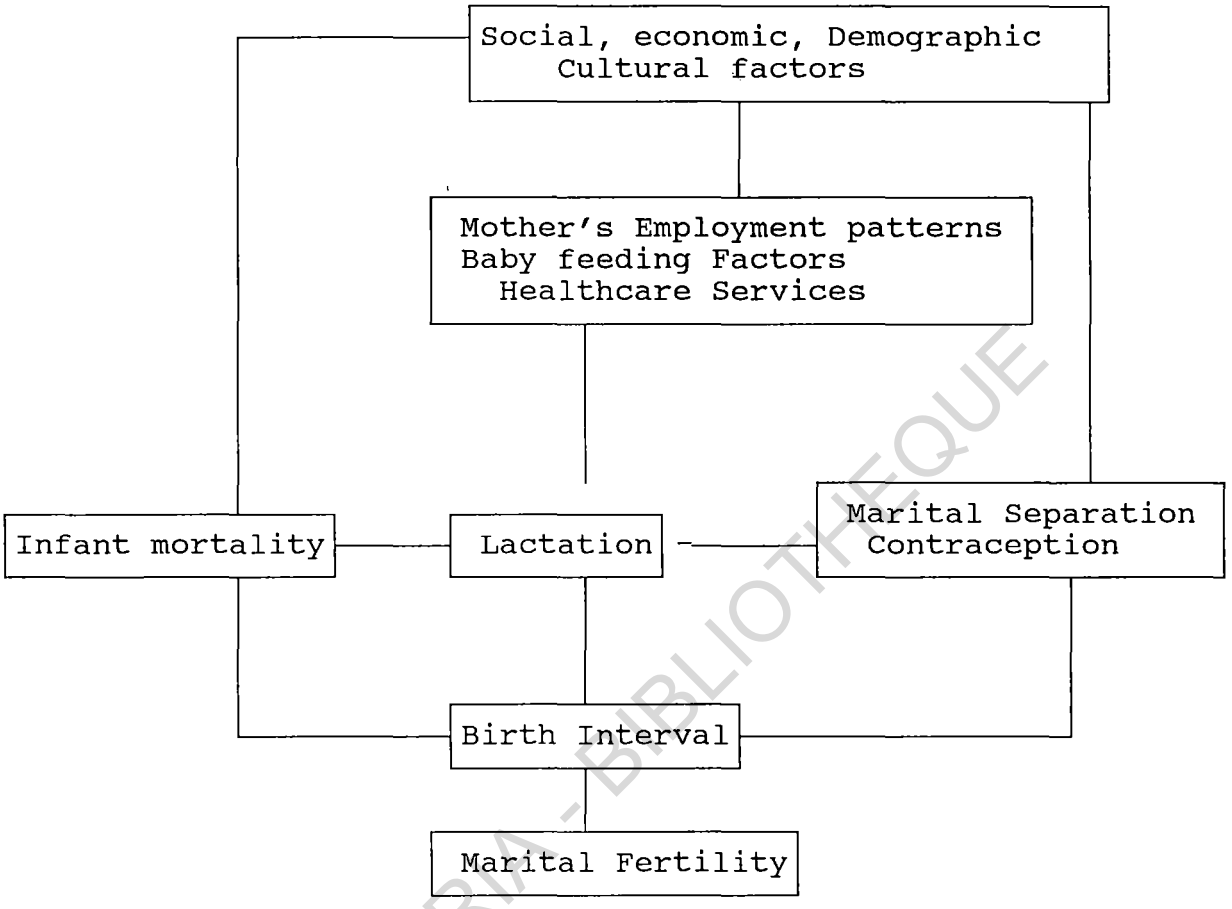


Fig. 1: Adapted Framework showing the linkages between lactation, birth interval and marital fertility (in a natural fertility situation), (Laukaraan, et al., 1981).

This framework is a modification of the one by Winnikoff and her colleagues. It is used here to identify the social, economic, cultural and biomedical factors which influence the mother's breast-feeding practices and hence her child spacing strategy in the study area. Our interest here is to identify those factors which are

thought to be affecting breast-feeding and child spacing strategies but have not been examined or adequately examined. This model includes the underlying biological factors which are typically immutable such as mother's age, parity, sex of the child. The relationships of these factors to the initiation and duration of lactation are difficult to discern. Some studies show no independent influence of parity and others have suggested a decline in lactation performance with increasing maternal age (Wray, ibid). several authors have investigated the role of early physical contact between mother and infant, supplemental feeding and early introduction of other foods as determinants of lactation performance. The importance of early physical contact between mother and infant has been cited as a correlate of successful lactation (Salariya, 1978). Supplemental feeding diminishes the appetite of the infant and therefore leads to decreased intensity of sucking. Several authors have explored the role of health services in diminishing mother-infant contact (Jackson et al.,1956; Huffman, 1984).

A proper understanding of the role of health care sector in determining lactation performance requires the consideration of the relationship of selected health service variables to mother's choices and her decision-making on how to feed the children. Most of the studies

on this role has been done in the developed countries and has also attempted to assess the positive role health services can play in promoting the initiation and continuation of breast-feeding (Winikoff and Baer, 1980). These studies have not dealt with negative effects of health services per se nor have they addressed the full range of problems in breast-feeding practices from failure to initiate breast-feeding through inappropriate supplementation and premature weaning.

This is included in the model because it is an important component of this study. Little is known about it in Nigeria which is in transition from traditional to modern health care delivery. Increasing number of women are coming in contact with the modern health care system. The health care sector is also a major focus of activities for the promotion of breast-feeding and thus a logical focus of this research.

The fuller participation of women in society as a whole, and especially in the paid labour force, has often been alleged to be detrimental to the fulfillment of the maternal responsibilities. Because breast-feeding requires the mother to be in physical contact with the infant on a frequent basis, a conflict has been seen between the promotion of breast-feeding and increasing participation of women in non-traditional work activities outside the home.

Information on the relationship of employment has been derived largely from studies of reasons for weaning as reported by mothers. Several authors have reviewed these studies and concluded that employment is seldom a determinant of early weaning (Van Esterick and Greiner, 1980). Few other studies actually have correlated employment status and feeding pattern. This study will provide new data on the relationship of employment to breast-feeding and child spacing. In this model, women are defined according to participation in the modern sector and traditional labour force. Employment itself is seen as a function of socioeconomic status and social mobility aspirations. These factors interact with others to determine infant feeding practices, which will affect the duration of breast-feeding, birth interval and hence fertility level.

In this adapted framework, we identified those factors that appear to have influence on breast-feeding (and birth spacing). More importantly, we introduced new variables that have not been considered in earlier studies which we believe play significant role in the relationship in the study area. From the proposed model, we have the following variables:

(1) Social, economic, demographic factors which include age, residence, education, occupation, parity, sex preference, birth order. Included in the box is the

community factors which have not been properly identified and measured in the former studies. These community factors include good road networks, big markets, electricity, post=secondary school, availability of family planning clinics.

(2) Mother's working patterns which will include the type of work, place or location of work, income, alternative child care patterns, access to infant, transportation to place of work. (3) The baby feeding factors will be the availability and use of baby foods; perceptions of breast feeding, time of supplementation and types of supplements. (4) The health care factors include medical check-up (both pre- and post-natal), attitude of hospital personnel, place of delivery, type of delivery (normal or caesarian section, gestational period (full term or premature). (5) sociocultural environment proxied by extended family (presence of parent-inlaws or adult relatives), media exposure, sleeping arrangement during parturition, perception of breast-feeding. (6) Infant health and mortality is also another factor that can affect the length of lactation and birth interval and contraception.

The arrows point to the direction of linkages. This model shows that sociocultural environment, health care factors, baby feeding factors, infant health and mortality, mother's working patterns and contraception

are the proximate determinants of lactation performance. The independent variables - social, economic and demographic factors can affect the length of breast-feeding and birth interval through the intermediate variables or directly. From the framework we postulate that the proximate determinants of birth interval are lactation, contraception, infant mortality, fecundity and marital separation.

A set of testable hypotheses are set up based on what we think the model leads us to expect. Testing them will help us to know if our expectations will be true among the Igbo of Eastern Nigeria.

2.9 Hypotheses

1. **Main hypothesis:** As a result of rapid socioeconomic development, the prevalence and duration of breast-feeding will decline and this will affect the level of the fertility in the area because of low use of modern family planning methods. In other words, in a natural fertility area the higher the level of socioeconomic development or modernization, the shorter the duration of breast-feeding and birth interval, and the larger the completed family size.

11. **Specific hypotheses:**

a. The higher the level of education, the shorter the duration of breast-feeding and birth interval.

b. The urban women are more likely to have shorter breast-feeding duration and birth interval than the rural women in the absence of modern contraceptive use.

c. Labour force participation in the formal sector by women increases the probability of early use of breast-milk substitutes, leading to shorter breast-feeding duration and birth interval. Thus women who are employed in formal organizations are more likely to breast-feed for a shorter period and have shorter birth interval, than those in traditional occupations.

d. Women who received antenatal care from modern hospitals and medical personnel are more likely to breast=feed for a shorter period and have shorter birth interval than those who attended traditional birth homes.

e. Women who live in extended family household and or are living with parents-in-law are more likely to breast-feed for a longer period and have longer birth intervals than those who live in nuclear households.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

The main source of data for this study was from a sample survey of some parts of South-Eastern Nigeria. This chapter describes the research design, the sampling procedure, interviewing and statistical analysis techniques employed in this research.

3.1 The Study Area

The main inhabitants of this region of the country are the Igbo. This tribe forms 64.4% of the resident population in Eastern Nigeria. South-Eastern Nigeria was formerly known as Eastern Region comprising the following provinces --- Calabar, Ogoja, Owerri, Onitsha and Rivers. With the creation of states in 1976, 1987 and 1992, the area was divided into seven states, namely Abia, Anambra, Akwa-Ibom, Cross River, Rivers, Enugu and Imo states.

This study was carried out in Imo state which is the researcher's home state. The state was selected for two main reasons. One, there is dearth of demographic information on the area. Two, the state is cosmopolitan and it is seen as the heartland of the Igbo. Thus it attracts people from all areas of the region and hence is more heterogenous. It is broadly representative of the custom and traditions of the Igbo ethnic group.

There were three survey locations deliberately chosen. These were Orsu, Orlu and Owerri. These areas

are at different stages of development. Orsu is a typical rural community, with little or no infrastructural facilities. It was granted a local government status in 1991 during the creation of more local governments in the country. The second area, Orlu, is the Local Government Headquarters of the old Orlu Local Government Area. Orlu has undergone some transformations, although it cannot rank with cities like Lagos in urban status. The inhabitants of Orlu travel from their village to do business or attend to government functions in the town. By 1985, the projected population of Orlu was 12,454 but the provisional census figures released by the Federal government in 1992 put the figure for the local government at 116,776 (NPC, 1992).

Owerri, the capital city of Imo state was the third survey area. Owerri has all the indices of urban centre, good road networks, educational institutions (all levels), administrative structures, banking and financial institutions etc. It is the seat of government of Imo state. The provisional census figure for Owerri town is 284,931 (NPC, 1992). It is a typical urban community .

For these three survey sites, the major ethnic group is the Igbo (Ibo). This group forms about 17 percent of the Nigerian population by ethnicity (Isiugo-Abanihe, 1987) and exclusively occupies four of the 30 states of Nigeria, Imo, Abia, Anambra and Enugu. However, there

are pockets of Igbo in Delta and Rivers states. The states occupy about 6 percent of Nigeria's landmass.

In terms of social structure, the Igbo family is based on a network of mutual obligations. Though people are moving away from the traditional pattern of compound family, yet they do not forget that they have some social obligations to their extended relations.

3.2 Determination of Sample Size

In determining sample size, one usually considers the frequencies of the most pertinent variables in the study as well as the logistic and budgetary variables. The sample size for this study was based on the population size of each of the survey areas. After due considerations of the cost, time and an optimal sample size for reliable estimates on the level like this, we decided to select 1,000 households for the whole sample. We adopted the principle of proportionality to select the number of households in each area.

Accordingly 20% of the maximum target of 1000 was expected to be selected from Orlu; 30% from Orsu and 50% from Owerri.

Owerri - 50% - 500

Orlu - 20% - 200

Orsu - 30% - 300

From the selected households, we attempted to

interview only the eligible respondents who are married women within the reproductive age group 15 - 49 and who have at least a live birth. Since we did not have maps to identify the Enumeration Areas to enable us to select the samples required in each area, we decided to have a random sample of the households.

The method of selection of the households was the probability sampling technique. In the case of the rural segment of the survey, we identified the administrative (political) wards in the area. There were eight of such wards. By using the lottery method, four wards namely Orsu-IhiteUkwa, Umuhu-Okabia, Eziawa and Awo-Idemili, were selected. We selected the households by picking a household out of five households. For Orlu, we randomly picked the 200 households from a randomly selected list of streets. In the third survey site, Owerri, we selected three different residential estates ---- Ikenegbu (a high class area), Aladinma (middle income) and Orji layouts (low income). These areas were supposed to have the expected respondents. We randomly selected the households from these estates (layout).

After the selection of the households, we selected our eligible respondents for the eventual interview. This was selected from the household record form provided for the interview. This form records all that slept in a particular household the previous night. One question

emerged during the oral examination for the defence of the research proposal upon which this study is based. That question is ; what happens in a household where there are more than one eligible respondents? After due considerations of the various aspects and their implications, it was agreed that in such a situation, the lottery method was to be used to select the one to interview. The process is simple , the field workers simply assigns number or alphabets to them and ask them to pick. Whoever picked "1 or A", should be eventually interviewed, out of the number. This was done to avoid the effect of biased responses.

3.3 Data Collection

An important component of any survey is the selection of the appropriate methods for data collection. For this study, we used questionnaire interview technique. There was an initial plan to supplement it with a focus group discussion, but this was later dropped for some logistic problems.

The personal interview technique that was used has many advantages. It can be used with all segments of the population since only verbal responses are required. A high response rate can be obtained with persistent follow-ups since most people are willing to co-operate in the face-to-face situation. The presence of an

interviewer helps to clarify some complex questions. It makes probing possible and easily done by the skilled field worker.

However, the major disadvantages of the technique relate to cost, the time frame for the completion of the survey and the possible negative effects of the presence of an interviewer (Fosu, 1984).

In several surveys in Nigeria, the personal interview or questionnaire method has been used successfully. Since we are interested in the actions people took in response to their breast feeding habit, this method was most relevant. Thus adequate care was taken to use highly qualified interviewers, and a great deal of effort was put into training them for this study.

3.4 Survey Instruments

One of the major tasks undertaken as part of the preparatory activities for this study was the design of the questionnaires and the design of the instrument for the training of the field workers and the execution of the actual fieldwork.

The questionnaire was drawn up after long discussions with the supervisor. The researcher prepared a preliminary list of questions to be included in the survey. The questions were reviewed first by the researcher's supervisor, and then by the Oral examination

panel, suggestions were made on their suitability and relevance of each question.

For an item to be considered necessary to be included, the following questions were raised and considered in the various meetings with the candidate's supervisor and other staff members of the Department:

(1) Is the proposed question related to the major research questions?

(2) Can reliable information about the item be obtained under field conditions?

(3) Can the information be effectively processed?

(4) Are there surveys that have had such questions before?

(5) Will the questions be properly interpreted by the field workers?

What therefore emerged from the various meetings and the Oral examination panel was a compact interview schedule that addressed all the crucial issues in the study. The original questionnaire was prepared in English. As language problems are important sources of non-sampling errors in surveys, effort was made to interview people in their local language which is Igbo. This was the reason why we employed educated ladies who will be able to interprete the questionnaire in Igbo, to carry out the interview.

The questionnaire was divided into two parts -

namely the household and individual questionnaires. The household questionnaire consisted of the household schedule. This was used to record all the members of the household, starting with the head. Such information as relationship of a household member to the head, age, sex ,marital status, educational level, occupation and place of birth were obtained for everybody in the household. We collected information on only the members that slept in the house the previous night - a night before the interview. The information on the household helped to identify eligible women for the interview. The information on the household enabled us also to obtain data on the household events in the past one year. Thus, the use of household schedule provided information on factors which can be used to calculate certain rates It can also provide useful contextual data on factors which may relate to fertility, eg. age-specific birth rates, and children ever born.

The second part of the questionnaire is the individual questionnaire. This was the heart of the survey. It was constructed after consideration of similar studies such as World Fertility Surveys, Nigerian Fertility, Demographic and Health Surveys and other related surveys handled in the Department of Demography and Social Statistics, Obafemi Awolowo University, Ile-Ife, Nigeria. It was designed for each woman identified

as eligible in the household schedule. The individual questionnaire is made up of the following sections:

Section B: Respondents' socioeconomic and demographic characteristics.

Section C: Ownership of Household Assets .

Section D: Employment History.

Section E: Fertility History.

Section F: Breast feeding patterns.

Section G: Child-spacing practices (a list of attitudinal questions).

Section H. Contraception (Knowledge,attitude and practice).

Section I: Community facilities.

In Section B, respondents' background information on age, marital status, education, marriage duration, religion and husband's characteristics were sought. These questions were considered important as part of the explanatory variables to be used in the analysis. Section C contained questions on households ownership of durable items such as TV, radio, stove/cooker etc. The ownership of these items could be used to determine their societal standing or societal status.

Maternal employment is often cited as major reason for the declining rate of breast feeding throughout the world (Cox, 1972; Knodel, 1979). This is because it is argued that employment constrains both the opportunity to

breast feed for many mothers and her ability to engage in other child care activities. To understand this interaction between maternal employment and breast feeding, we should distinguish between work that requires regular sustained separation between mother and infant, and the one that does not. In traditional rural setting, a mother's work is nearly always compatible with breast feeding and other aspects of child care. Series of questions were asked on the employment history of the respondents so that we can examine the relationship between maternal employment and breast feeding.

We also collected information on the lifetime reproductive performance of the respondents. The series of questions for this task were in Section E, together with "Form C - Fertility Form" . Form C involved collecting very detailed information on the maternity history of the woman.Data were collected on the pregnancy order, date of birth, survival status etc. Questions on future reproductive intention and sex preferences were asked too.

Section F was used to obtained data on breast feeding and other post-partum behaviours. Questions were asked on all the children born in the last five years - beginning from 1987. The key questions were on the survival status, birth order, incidence and duration of breast-feeding, supplementary feeding, post-partum

amenorrhea, sexual abstinence and antenatal and postnatal care during and after pregnancy . In all, 32 questions were asked on the current (last) child, while 13 were asked for the next-to-the -last birth and second-to-the last birth.

Section G was used to elicit information on the post-partum attitudes of Igbo women with a view of seeking the cultural context of breast feeding and child spacing practices or behaviour of the respondents.

Questions on contraceptive behaviour were asked too. Section G was designed to determine the knowledge and use of specific family planning methods. We asked questions on knowledge, ever-used, current use and intention to use family planning methods in the future for non-users. Because the reproductive behaviour of individuals is not only affected by their personal demographic and socioeconomic characteristics but also used by their characteristics of the sociocultural milieu in which they live and by the interaction of their personal and group characteristics, we considered it necessary to collect information on some community factors as such information might affect the breast feeding, child-spacing and fertility behaviour of the women.

A copy of the questionnaire used in the survey is contained in Appendix A.

3.5 Recruitment of Interviewers or Field Staff

Female interviewers were appointed from survey location. Female interviewers were used in the interviewing because of the personal and sensitive nature of the questions that relate to the female respondents. However, male field workers were used to select the houses and households before the actual interview. They also acted as supervisors and editors.

Because of the need to interpret the questionnaire in Igbo which is the local language, emphasis was placed on the qualification of the female interviewers. As a result, the General Certificate of Education or its equivalence is the best qualification for the interviewers. Thus some of the field workers were primary school teachers while others were secondary school graduates. Their level of education enabled them to interpret the English version of the questionnaire in Igbo.

In the rural area, a total of six field workers were used for the interview. They were supervised by a male supervisor who was a university undergraduate. At Orlu, the second site, there were five interviewers supported by a male supervisor and a field editor. Each interviewer handled 40 questionnaires. And at Owerri, the urban area, there were six interviewers who were initially employed and trained for the work. One of them later dropped when

she encountered difficulties with the respondents. That left the area with five female interviewers and two supervisors - one male and one female. The field work lasted for three months.

In all, we had a total of 16 interviewers, and four field supervisors. They were subjected to proper training before the fieldwork started.

3.6 Training and Pre-test

We organised joint training programme for each of the three teams at their respective centres close to them. That of the rural area was done in the house of the investigator -- as a more central place. For the Orlu and Owerri segments, we used primary school buildings to serve as our training centres.

During the training, some of the interviewers dropped because of the nature of the work and the type of questions to be asked. New hands had to be sought to replace them. This also necessitated a fresh training programme for the new ones.

The actual training course consisted of discussions and practical and demonstration exercises like role playing. To facilitate the training and field work, the interviewer's manual was distributed during the training phase and used as a text and guide during the actual fieldwork.

An interviewer's or instruction's manual is a detailed manual on all the divisions of the questionnaires. The manual briefly discussed the objectives of the survey, duties and roles of the survey personnel and techniques of interviewing . It describes the types of problems that may arise with a question and how to handle them. The manual was also intended to instil confidence in the interviewers who are handling such work for the first time. The interviewer's manual is contained in Appendix B.

They were briefed on the need to gain rapport and how to establish one with the respondents. The need to obtain permission from household head was emphasised. In situations where the husbands insist on being around while the interview continues, the interviewers were instructed on how to be tactical in asking some sensitive questions in such a situation or may still explain to the man why it is necessary that the wife alone should be around.

The schedule for the training programme was as follows:

(a) A brief description of the survey objectives , survey questionnaires.

(b) Roles of field staff (supervisor vis-a-vis the interviewer and the investigator).

(c) How to conduct interview: principles and practice of

good interview, the do's and don'ts of a successful interview.

(d) Handling problems that arise in the field in the process of the actual interview.

(e) General procedures for questionnaire completion; question arising from above,

(f) Pretest, assignment of teams and fieldwork proper.

At the end of the training sessions, two copies of questionnaires were given to the field workers each for a pretest. The reasons for the pretest were to sensitize them to the intricacies of research; to determine their understanding of the survey concepts, their competence in filling out the questionnaire and the efficacy with which they carried out field instructions; to test the questionnaires with a view to ensuring that the questions are logical and well - coded, and to assess the reaction of the would-be respondents to the survey in general and to some sensitive questions in particular.

3.7 The Field Work and Problems Encountered

During the pretest, mistakes were pointed out and corrected too. After the exercise, all completed questionnaires were checked by the investigator and the supervisors.

There were some field operational problems. The field work suffered from lack of finance to foot the bill

of the field expenses. In the rural and some part of the urban areas, the supervision was weak and poor. The supervisors did not devote time for the supervision. Where there was a need for clarification, the interviewer had to wait for the investigator to return from his base at Ile-Ife to handle the problem at hand. As expected, there were refusals by some women. This is not surprising since research interview and the nature of the study is a recent phenomenon in the area. They opposed the idea of giving the list of children they have born or the numbers of them that died. This particular problem led to a very poor quality of the household schedules. What was returned could not be used for any serious analysis. Some of the respondents that attempted to answer the household questions stopped midway and refused to divulge further information. Thus the responses became incomplete. Other respondents claimed that discussing about family planning is a sin and an evil against God. They linked the survey with 'census' and government secret strategy to enforce family planning.

"I won't allow you to count my children. You see those that allowed themselves to be counted in the last census exercise have all died ....; where are they now ?", a respondent asked. The one that opposed the survey on the ground that it is a secret plan to enforce family planning said, "... how do you think it is possible

...,these people that call for family planning are wicked and are wasting their time . After getting their own children, they want to force me not to have as many children as I want ...".

There was the problem of wrong timing of the visits. Some of the field staff visited some of the households at odd periods (either when the potential respondents were not around or about to go to the farm or market or cook or when they were tired after the day's activities). This contributed to the problem of incomplete questionnaire and non-responses.

The field work also suffered from the effect of the latest fraudulent group in the country known as "419". This is a group that pretends to have some business transactions to do, but after getting some advance payment from their would-be clients would run away with the money. Some of the respondents thought that the interviewers were such people with the intention to steal from them. They vehemently opposed to respond to any question even despite all assurances. This group manifested more in the urban area. While in the rural area, because of the christian belief of the researcher and some of his field workers, the respondents associated the survey with a clandestine attempt to lure them into "American religion". This is the name they call pentecostal religious groups in the area. They reasoned

that their names would be collected and sent abroad so that through some magical wands they would become members of the pentecostal religious group to which the researcher belongs. We tried as much as possible to disabuse their minds of such a fear.

To solve some of these problems in the rural area, we had to contact the local opinion leaders and church leaders in the village to make the announcement in the village church of the essence of the research thereby allaying the fears of the women. A copy of the questionnaire was given to him. And in another locality, the local chief was contacted and duly informed of the mission of the research team. Being an educated man and a retired principal of a secondary school, he understood what the survey was all about and quickly informed his subjects to co-operate with us. These approaches helped to increase the response rate which is 81.9 percent.

3.8 Field Checking of Completed Questionnaire

The supervisors were in charge of all aspects of the survey assigned to them. They were responsible for checking the completed questionnaires of their interviewers and ensured that the interviewers complied with the field instructions. Although they faulted in the assignments, the investigator made sure the interviewers did the work according to instructions.

In the three survey centres - Orsu, Orlu and Owerri, the supervisors collected, at the end of each day, all the completed questionnaires for checking for completeness and consistency. All rejected questionnaires were sent back and corrected in the field by the interviewers through further contacts with the respondents. Such mistakes as missing entries, incorrect adherence to skip instructions and inconsistent entries concerning age, birth order etc were discovered and corrected.

3.9 Data Processing

When the first phase of the survey ended in September, it was discovered that some of the questionnaires were incorrectly filled. There was nothing one could do at this point. For practically, all the field workers were tired and bored with the hazards of the field work and the embarrassment it had caused them. Most of them were singles. None was prepared to go back to the field despite all entreaties.

After editing the returns personally, 819 cases were found to be correct. These were entered into the computer using Epi-Info programme . After the data entry, there was virus error that affected the frequency output from the Epi-Programme. We therefore converted the data to SPSS format and decided to use SPSS package which is

installed in the Department of Demography and Social Statistics, Ile-Ife, Nigeria, to run the preliminary analysis. We also used Stata 2.1 programme for the advanced statistical analysis.

3.10 Statistical Techniques

Several analytical techniques were used in the analysis of the data. These include frequencies, crosstabulations, and means. These are descriptive statistics that determine the composition of the respondents with respect to their socioeconomic and demographic characteristics. We also used graphical representation to reveal frequency and patterns of occurrence.

Another technique for the analysis is the life table approach. Although we used the life table technique for the estimates of breast feeding, amenorrheic and abstinence durations so as to suggest important covariates for further investigation, their application in a truly multivariance examination of data is limited because they are essentially cross-tabulations. The life-table approach suffers the problems of sample size inherent in any crosstabulation analysis, and any variable used in them must be categorical. Another shortcoming of the approach is that it contains too much information which can quickly become difficult to present

in any summary and the number of cases on which each one is based is very small (Trussell et al, 1985; Cornell, 1987). An appropriate approach was discovered to be one which expressed the relationship of variables to each other and how much of the variation among cases they explain.

Hence, we decided to use the proportional hazard model technique (Rodriquez et al., 1983; Richards. 1982). This model is useful in overcoming those problems arising from the use of lifetable method. The model allows the formulation of equation, relating covariates to survivor functions which are similar to the linear regression model.

The proportional hazard model was introduced first by Cox in 1972, and several scholars have improved the models since then (Brewslow, 1974; Kalbfleisch and Prentice, 1980). The application of this method to breast feeding data has been described by Macdonald (1981).

In its simplest form, proportional hazards model is viewed as life tables wherein the risk is dependent on various characteristics of the individual besides time. It deals with two kinds of variables - fixed covariates and time-dependent covariates. The first represents a status which does not change over the course of the observation, and the second, a status which does. Under the time-dependent effect assumption, that is , the

effect of a particular covariate on the hazard may change over time, even though the covariate itself stays the same, the form of the model is

$$\mu(t;Z) = \mu(t) + Z_1X_1 + Z_2X_2 \quad \ldots\ldots\ldots\ldots\ldots\ldots 1$$

where $\mu(t)$ can be any function of time with covariate vector Z_1

When the covariate changes over time, then the ratio of hazards for two individuals will not stay constant. Thus with a time-varying covariate that changes in value over time, the model for the individual is,

$$\mu(t) = \mu(t) + Z_1X_1 + Z_2X_2(t) \quad \ldots\ldots\ldots 2$$

where as before $\mu(t)$ is the function of any time (t) depend on the value of X_2 at the same time t. The technical details of the application of hazards models have been presented elsewhere (Teachman, 1982; Menken et al.,1981; Trussell and Hammerslough, 1983).

From the above models (1 and 2), a general proportional hazard model was specified by the relationship below,

$$\mu(t;Z) = \mu_0(t)\exp(Z\beta)$$

where $\mu(t;Z)$ is the hazard rate at time or duration t for an individual with a vector of covariated Z which may contain both discrete and continuous times (Cox, 1972); $\mu_0(t)$ is an arbitrary unspecified baseline hazard function for continuous T and $Z\beta$ is a vector of coefficients to be estimated. The proportionality factor $\exp(Z\beta)$ represents the relative risk associated with having characteristics Z which is not equal to zero; relative to the baseline group (for whom Z = 0). An alternative form of the model specification is

$$S(t;Z) + (S_0(t))^{\exp(Z\beta)}$$

where S(t;Z) is the survivor function for the individuals with characteristics Z and $S_0(t)$ is the baseline survivor function (Ofosu, 1989).

Like in the ordinary life table, proportional hazards model focuses on two important and related functions as we can observe from the two general model forms - the hazard function (e.g the force of fertility or weaning or being amenorrheic etc) and the survivorship function (Rao and Balakrishnan, 1988).

Thus, the simple logic of hazards model is that at each duration or interval measured from the previous birth, a woman is at the risk of having another birth. This is the risk that a woman who had a baby some months ago (and who has not had a birth since then) will have another in month d. This means that for each individual the hazard (e.g the force of fertility or conceiving) is proportional to a standard hazard which may or may not have a parametric form (Rodriquez et al.,1984)

The model has some attractive properties. It defines the effect of covariates on the hazard function which in turn serves as the fundamental parameter in many models. The covariates act multiplicatively on the baseline hazard function which leads to easily interpreted results. This is an indication of their proportionality. The model also adjust for unequal variances at different durations. The ability of this model to handle censored and noncensored events recommends it for use.

3.11 Variables to be analysed

The dependent variables are duration of breast-feeding, amenorrhea, abstinence and birth interval length.

The variables expected to be affecting the dependent variables which have formed a part of our propositions include the following:

a. Socioeconomic and demographic characteristics of the respondents,

b. Employment history of the women or mothers' working patterns,

c. Health care services factors which include pre- and postnatal care, attitudes of hospital staff to breast feeding, place of delivery, delivery attendant, type of delivery, sex and birth order of the child,

d. Baby feeding factors which include availability of baby food, perceptions of breast feeding, feeding frequency, supplementation and timing,

e. Sociocultural environment proxied by presence of family members, older children and relatives, media exposure and reaction to breast feeding in a public place,

f. Marital separation proxied by whether living with the husband or not and (g) Contraception.

All these variables were dichotomised and considered in the search for explanations in the dependent variables. They were introduced in the first level of analysis and the ones that did not have significant impact on breast feeding and child-spacing in the area were removed. The variables that show some positive concerns were further investigated with a view to determining the main factors that operate in the relationship between lactation, child-spacing and

eight discusses the effects of lactation on Igbo fertility and the estimation of proximate determinants. The last one, chapter nine presents the summary, synthesis of findings and the frontiers for further research and policy implicatins and recommendations.

CHAPTER FOUR

CHARACTERISTICS OF RESPONDENTS.

Information on the background characteristics of our individual survey respondents is very essential for the interpretation of our survey findings. This means that our understanding and the utility of the researcher's major findings would be enhanced by some information on the characteristics of the surveyed women. Information on the background statistics of the households surveyed is not analysed because of the poor quality of data collected in the household schedule. Many respondents refused to provide information about their households. They thought it was a census exercise. Even where some obliged to respond,they abandoned it midway , thereby providing incomplete information. Despite all entreaties and explanations on the importance of the household questionnaire, they refused to provide further information. This is why we shall be concerned with individual and housing characteristics.

Thus, this chapter discusses the socioeconomic characteristics of the eligible respondents in the survey area. The variables analysed include the age, occupation, education, religion, working status before and after marriage, housing characteristics of the respondents.

As mentioned earlier, of the 1,000 households selected for the Igbo survey, 819 were successfully

interviewed. This is 81.9 percent of the total households.

4.1 Age of the Respondents.

Information on age was obtained from the respondents in response to a question on age in completed years. The question was framed thus "what is your age now?'. The five year age distribution is shown in Table 1.

Table 1

Percent distribution of respondents by current age, Imo State, 1993.

Current Age	Number	Percent
15 - 19	3	0.4
20 - 24	51	6.2
25 - 29	159	19.4
30 - 34	204	24.9
35 - 39	140	17.1
40 - 44	57	7.0
45 - 49	31	3.8
Don't know	174	21.2
Total	819	100.0
Mean Age	32.1	

For most respondents, the age data were complete; 78.8 percent were able to give their accurate age.

Table 1 indicates that 26 percent of the respondents are less than 30 years of age, while 68 percent are less than 40 years of age. 7.0 percent is aged 40 - 44 and

3.8 percent aged 45 - 49. 21.2 percent did not indicate their ages. The overall mean age is 32.1 years.

4.2 Level of Education.

Data on the educational attainment of all respondents were collected. To obtain this, we asked the respondents to state their level of education attained. There was no question on the literacy level of the respondents.

Table 2 presents the distribution of respondents by educational level.

TABLE 2

Percent distribution of respondents by educational level attainment, Imo State, 1993.

Educational Level	Number	Percent
No Education	73	8.9
Primary	196	23.9
Secondary	214	26.1
Tertiary	224	27.4
Adult Education	1	0.1
No response	111	13.6
Total	819	100.0

The percent distribution of responndents with no schooling is 8.9 percent. 23.9 percent had primary level of education ; 26.1 percent secondary and 27.4 percent tertiary education. In this survey, tertiary education is taken as any level of education above the secondary

4.3 Place of Residence

The initial plan for the survey was that it should be conducted in three survey sites - rural, semi-urban and urban areas. But when some preliminary results were analysed, it was discovered that there was no difference between our semi-urban sites and rural sites in their behaviour. We therefore decided to record semi-urban and rural as rural. Hence instead of three survey sites we now have two.

Table 4 presents the distribution of these women by their place of residence.

TABLE 4

Percent distribution of respondents by their place of residence Imo State, 1993.

Place of Residence	Number	Percent
Rural	444	54.2
Urban	375	45.8
Total	819	100.0

In spite of the increasing urbanisation, the population is still rural. 54.2 percent of the respondents live in the rural areas, while 45.8 percent live in the urban area.

4.5 Religion

There are three major religious groups in the survey area. These are Roman Catholics, Protestants and the traditionals. The protestants are the religious group that worship in Anglican, Methodist and Presbyterian churches. Usually all other religious groups outside Catholic church are refereed to as Protestants. However, due to the wave of revival sweeping the world, there is another group emerging from both Catholics and the Orthodox Protestants. These are referred to as the Pentecostals who believe in the leadership and guidance of the holy ghost. The Pentecostals are recent outgrowths and have been growing at a faster rate in the area.

Table 5 presents the distribution of the respondents by their religious affiliation. This is divided into four groups -- Roman Catholic, Protestants, Pentecostals and Traditional/Atheists.

TABLE 5

Percent dtribution of respondents by religious affiliation Imo State, 1993.

Religious Affiliation	Number	Percent
Roman Catholics	309	38.0
Protestants	224	27.0
Pentecostals	94	11.5
Traditionalists	4	0.5
No Response	188	23.0
Total	819	100.0

38 percent of the respondents reported being Roman Catholics, 27 percent are Protestants (Anglican, Methodist, Baptists etc), and 11.5 percent are the Pentecostals -- a reflection of the newness of the group in the area or an indication of lack of enthusiasm to embrace the group. That the traditional worshippers are only 4 is not surprising since it is not fashionable in these days of modernity to be an idol worshipper. It is a reflection of the massive assault of Christianity on idolatry in the survey area.

4.6 Work Status

Work status information was obtained by asking all the respondents if they have been employed before their marriage. They were also asked if they have worked for pay, regularly, since their marriage. The distribution of the response is shown below.

TABLE 6
Percentage distribution of respondents by work status before and since marriage, Imo State, 1993.

Work Status prior to marriage	Number	Percent
Worked	250	30.5
Not Worked	418	51.0
No Response	151	18.4
Total	819	100.0
Work Status since marriage		
Working	324	39.6
Not Working	342	41.8
No Response	153	18.7
Total	819	100.0

Table 6 shows that 30.5 percent of the surveyed women did work for regular payment before their marriage; while at marriage, 39.6 percent of them are working for pay (i.e full employment). The possible reason for this may be that some of these women were schooling at the time they got married or were not able to secure any job when they were single. Also, it does not mean that they

were idle, but in the sense of getting salaried job, they were not employed. Although some of them were involved in trading .

The table also shows that 41.8 percent are not working since marriage. This again does not mean that they are not employed, but are not employed for regular pay in government job.

For those reporting working for pay, we asked them their employee status (i.e.if they are working for private organisations or government institutions). Table 7 shows the percentage of women reporting that they were working for private group, government or self-employed.

TABLE 7

Percentage distribution of respondents by employment status Imo State, 1993

Employment Status	Number	Percent
Private Employee	33	10.2
Government Employee	224	69.1
Self-employed	37	11.4
Artisans/Trader	30	9.3
Total	324	100.0

More than half of the respondents are government employees (69.1 percent); 10.2 (private company employee) and 11.4 percent are self-employed. Therefore, higher percentages of the respondents are working for pay (79.3

percent).

Working respondents also were asked about the location of their place of work and the number of hours that they spend at the place of work. The responses are tabulated below in Table 8.

TABLE 8
Percentage distribution of respondents by place of work and hours spent at work place, Imo State, 1993

Place of Work	Number	Percent
Away from Home	142	43.8
Nearer Home	130	40.1
At Home	18	5.6
No Response	30	10.5
Total	324	100.0
Hours at Work Place		
1 - 7 Hours	169	52.2
8 - 10 Hours	138	42.6
11 - 14 ,,	13	4.0
15+	4	1.2
Total	324	100.0

Among those working, 43.8 percent are working at a place away from home; 40.1 percent are nearer home and 5.6 percent are working at home.

It is also observed that among the respondents who reported that they are involved in paid employment, 52.2 percent of them spend less than 8 hours daily at their place of work. 42.6 percent of them spend between 8 to

10 hours daily. 4 percent and 1.2 percent spend 11 - 13 hours and 15 hours daily respectively. Those that spend more hours could be those that work for private companies or are self-employed. The nature of their jobs demand working for a longer time.

4.7 Marital Status

In every civilised society, the practice of childbearing takes place within socially prescribed and stable sexual unions. This is often referred to as marriages. Marriage is defined here as all legally, religiously and traditionally contracted unions of men and women as husbands and wives.

A series of questions relating to marriage or nuptiality were asked of all respondents. These included a question about current marital status.

TABLE 9

Percentage distribution of respondents by marital status, Imo State, 1993.

Marital Status	Number	Percent
Married	653	79.7
Widowed	21	2.6
Divorced/Separated	12	1.5
No response	133	16.2
Total	819	100.0

The table indicates that almost 80 percent of the

respondents are currently in union (marriage) (either married or living together), while 2.6 percent are widowed and 1.5 percent divorced or separated. This shows that 8 out of every ten are married. This supports the universality of marriage in the survey area. Among the Igbo, a lady who is up to the age of marriage and is not married is a source of worry to the family. Some parents can even go to the extent of consulting native doctors to make sure that their daughters are married when due. From the table, the percentage of women who are currently married is high and this is supported by the report of the Nigerian Fertility Survey which reported 80 percent of the respondents as currently married women (NDHS, 1990).

Divorce is low. About one out of every 50 is divorced. Among the Igbo, there is a strong value placed on the payment of bridewealth. It is believed that the practice of bridewealth payment minimises the divorce rate or family disruption, since the parents of the bride are bound to refund the bridewealth if the marriage breaks up. The woman, therefore, remains loyal to her matrimonial home after considering the implications of seeking divorce (Isiugo-Abanihe, 1987, Igwe, 1984).

Thus, we can infer that marriage is universal in this area and divorce rate is low.

4.8 Age at Marriage

The above observation is confirmed by looking at the age at marriage. Information on age at marriage was collected by asking the respondents to state their age at marriage.

TABLE 10

Percent distribution of respondents according to age at marriage, Imo State, 1993.

Age at Marriage	Absolute Number	Percent	Cumulative percent
15	24	4.0	4.0
16	19	3.2	7.2
17	13	2.2	9.4
18	48	7.9	17.3
19	35	5.8	23.1
20	96	15.9	39.0
21	46	7.6	46.6
22	49	8.1	54.7
23	55	9.1	63.8
24	54	8.9	72.7
25	54	8.9	81.6
26	26	4.3	85.9
27	21	3.5	89.4
28	26	4.3	93.9
29	10	1.7	95.4
30	16	2.9	98.1
31	5	0.8	98.9
32	3	0.5	99.4
33	2	0.3	99.7
34	2	0.3	100.0
Total	604	100.0	
Mean age at duration	22.2		

*Excluding missing and Don't know cases.

Table 10 shows that women marry at a relatively early age. More than half of the respondents (82 percent) reported that they married for the first time before their 25th birthday with 4 percent marrying at age 15. 98 percent of the respondents married by their 30th birthday. The above pattern stands when the single age categories were grouped. The mean age at marriage is 22.2 years.

This mean age differs from estimates for the same area by some authors. For instance, Omideyi (1983) reported an estimate of mean age at first marriage of 18.5 years for the area; Ukaegbu (1976) reported an estimate of 16.8 years for rural Eastern Nigeria. The present Igbo mean age at marriage of 22.2 years is higher than that from the Western part of Nigeria which has been reported to be 19.4 years in Ibadan, (Olusanya, 1967) and 19.8 years for Lagos (Ohadike, 1968). The incidence of high bride wealth coupled with schooling tend to contribute to this increase in the mean age at marriage of the Igbo women. This could also be a result of harsh economic condition in the country which has made people to defer marriage.

4.9 Duration of Marriage

Information on the how long the respondents had been in current union was obtained by asking the question,

"How long have you been married to him (your present husband)?. Responses to the question were obtained and tabulated below.

TABLE 11

Percent distribution of respondents by duration of marriage Imo State, 1993

Duration of Marriage	Number	Percent
1 - 5	159	20.6
5 - 10	237	30.7
10 - 15	118	15.3
15+	258	33.4
Total	772	100.0

The table shows that 20.6 percent of the respondents have lived in marriage union with their husbands for less than 5 years, 30.7 percent for less than 10 years and 49 percent have lived for 10 years and more in marriage union.

The more percentage that has lived for more years with their husbands without divorce is an indication of low divorce rate in the area. This pattern is supported by the Igbo view of marriage as a relation between two families bringing two communities together instead of a mere relation between two individuals. As such it is not easily broken. In Igboland, divorce is a slur on the integrity and character of the families involved. The

lady's action is seen as an indication of bad training. This discourages relations and family friends from recommending marriageable lady in that family to any man for marriage. The divorced husband can accuse the woman of any imaginable bad acts to make sure her reputation is damaged and that she has no other chance of getting married. This tends to affect the chances of other ladies in that family. The same goes for the man. His family is regarded as a wicked family; a family that does not care for a wife; a wife-beating family and associated with other evils. It is common in Igboland to hear such comment as "do you want to give your daughter to that wicked family? None of their sons take care of their wives. Their wives don't stay. ... or will you be able to endure them?". Comments like these portray such a family as bad and wicked. No reasonable family will like to be associated with that. Hence, family insists on settlement of cases that will lead to divorce amicably and in Igbo traditional way.

Divorce rate is low in Igboland also because, at the point of divorce, the brideprice will be repaid, whether the money is still available or not, and all that the lady was given when she was married will be forfeited to her divorced husband. Divorce is much more complicated in Igboland when a lady has a male child with the husband. She endures all insults and hardly threatens to go

because of the male child. Because of the position of the male child in the family, when he is matured he can insist on bringing his mother back, and nobody dares refuse him that right . In Igbo it is not uncommon seeing male children of a man going to recall their mother from her divorced state after a long time. They can even settle all that is required to bring peace between their parents.

Therefore the shame of being called a divorcee and the reproach it brings to the families, the problem of refunding an already spent brideprice, the high cost of bridewealth and the position of the male children in the family, all tend to contribute to stable marriage in Igboland.

4.10 Number of Co-Wives

We obtained information on the number of wives the husband has. Table 12 presents the percentage distribution of the respondents by the number of co-wives they have.

TABLE 12

Percentage distribution of respondents according to the number of co-wives they have, Imo State

Number of wives	Number	Percent
One	614	75.0
Two	56	6.8
Three - Five	12	1.5
No Response	137	16.7
Total	819	100.0

The table indicates that 75 percent of the respondents are the only wife to their husabnds. Their husbands have no other legally recognised wives. This tends to show that polygamy is less fancied among the Igbo, with 6.8 percent of them reported that their husbands have two wives while 1.5 percent have more than three other wives in the family. Education, high bride price and high cost of keeping a family are the key reasons why there are more monogamous families in the area than the polygamous area. Time is gone when people prided themselves in the number of wives they have. There is a recognition of the economic effect of more wives.

4.11 Age at First Birth

The respondents were asked their age at first birth. Responses to the question are shown below in Table 13.

TABLE 13

Percentage distribution of respondents by age at first birth, Imo State, 1993.

Age at first birth	Number	Percent
15 - 19	93	15.6
20 - 24	285	47.8
25 - 29	172	28.9
30 - 34	42	7.0
35 - 39	4	0.7
Total	596	100.0

Mean age at first birth = 23.3 years.
Missinng cases and "Don't know" responses excluded.

Table 13 indicates that more than half of the respondents had their first birth before reaching age 25 years; 28.9 percent had their first birth between age 25 and 29, and 8.0 percent at the older ages. The mean age at first birth in the survey area is 23.3 years. On the average, the respondents had their first birth at age 23 or 24. When we relate the mean age at first birth to the mean age at marriage, it shows that the women conceive early as soon as they marry.

4.13 Access to Mass Media.

The surveyed women were asked if they usually listen to a radio or watch television or read newspaper at least once a week.

TABLE 14

Percent distribution of respondents by access to mass media Imo State, 1993.

Media Exposure	Number	Percent
Yes	554	67.6
No	105	12.8
Sometimes	8	1.0
No Response	152	18.5
Total	819	100.0

Table 14 shows that 67.6 percent of the surveyed women have access to the mass media at least once a week, 12.8 percent of them do not listen to the mass media, while 1.0 percent only listen to radio and watch television sometimes.

4.14 **Husband's characteristics: Husband's Level of Education and Occupation**

Some information were collected on the socioeconomic characteristics of the respondents' current husbands. These characteristics are level of education and occupation.

Information on the husband's level of education and occupation was obtained. This is presented in Table 15.

TABLE 15

Percentage distribution of respondents's usbands by level of Education and Occupation, Imo State, 1993.

Level of Education	Number	Percent
None	74	9.0
Primary	245	29.9
Secondary	131	16.0
Tertiary	217	26.5
Adult Education	1	0.1
No Response	151	18.4
Total	819	100.0
Occupation		
Professional/Management/Administrative	124	15.1
Clerical	43	5.3
Sales	195	23.8
Transportation	24	2.9
Artisans	97	11.8
Farming	36	4.4
Teaching	124	15.1
No Response	131	16.0
Total	819	100.0

29.9 percent of the respondents have husbands with basic primary education. 16.0 percent have secondary education, while those whose husbands have tertiary education constitute 26.5 percent. There is low percentage of respondents whose husbands have no education.

The table also indicates 23.8 percent of the respondents husbands are engaged in trading; 15.1 percent, professional, technical, administrative and management); 15.1 percent (teaching). Farming, driving and artisans make up 7.3 percent. The interpretation of the table is that 35.5 percent of the respondents' husbands are engaged in public service job while 48.5 percent are in the private sector.

4.15 Housing Characteristics

To enable us to assess the respondents' environmental conditions and their social standing, we asked some questions about their household environment, and the ownership of particular household goods such as radio, television (to assess access to mass media); refrigerator and stove/cooker (to assess food cooking and storage) and the modes of transportation available to the household. Responses to these questions are analysed in table 16.

provide water to their people. Governments also have helped through deliberate policy of providing hygienic water to their people. 19.2 percent obtain their drinking water from the well or tank, while 16.8 percent obtain theirs from the stream or rain water.

Modern sanitation facility is available to the people. 47.3 percents have the flush toilets, while 44.1 percent have the pit toilet. Only 8.6 percent reported that they make use of the bush, while the pail system is nonexistent in the area.

We decided also to examine the rural-urban differential in the ownership of these household characteristics.

TABLE 17

Percentage distribution of household characteristics according to rural-urban residence, Imo State, 1993

Characteristics	Rural	Urban
Electricity		
Yes	50.8 (190)	88.9 (265)
No	49.2 (184)	11.1 (33)
Source of drinking water		
Well/Tank	32.1 (117)	3.1 (9)
Rain/Stream	26.7 (90)	6.5 (19)
Tap/piped water	43.3 (158)	90.4 (265)
Sanitation Facility		
Bush	14.0 (51)	2.1 (6)
Pit	64.0 (233)	19.8 (58)
Water Cistern	22.0 (80)	78.2 (229)
Pail System	*	*

Note: The numbers in parentheses are the absolute figures.

As expected, electricity supply is more in the urban (88.9 percent) than in the rural (50.8 percent). Urban centre is the seat of the state government and a commercial city where most of the industrial complexes are located. High economic activities and government day-to-day functions make it imperative that the city will be electrified.

Sources of drinking water differ by area of

residence also. While those in the rural area make use of well, tank, rain water and stream (58.8 percent), those in the urban are use pipe-borne water (90.4 percent) and 43.3 percent use piped water in the rural area. This is also an indication of our lopsided sitting of government amenities in the urban centres at the expense of the rural area.

The use of bush and pit is more common in the rural area than in the urban. About 68 percent of the respondents use bush and pit in the rural area. Only 19.8 percent uses pit toilets in the urban. As expected, 78.2 percent of the urban respondents use water cistern as against 22 percent in the rural area. The percentage that uses water cistern in the rural area must be the educated and rich people who have had contact with the urban areas.

4.16 Ownership of Household (durable) Items

Questions were asked about the ownership of such durable household items as refrigerator, stove/cooker, radio, television, bicycle, motorcycle and car.

TABLE 18

Percentage distribution of surveyed women according to ownership of selected household goods, Imo State, 1993.

Ownership of Items	Number	Percent
Refrigerator		
Yes	367	54.1
No	311	45.9
Stove/Cooker		
Yes	550	81.0
No	129	19.0
Bicycle		
Yes	410	60.6
No	267	39.4
Motorcycle		
Yes	297	43.9
No	379	56.1
Car		
Yes	272	40.3
No	403	59.3
Television		
Yes	445	54.3
No	233	28.3
Radio		
Yes	611	90.1
No	66	9.7

people in the rural area depend on fire-wood for their domestic cooking.

53.0 percent owners of radio are in the rural area, while 46.3 percent are in the urban. Those in the urban area own television more than those in the rural area (58.0 percent and 41.0 percent). This is because of the availability of the electricity in the urban centre than in the rural . The rural respondents can afford more radios because of the alternative of using batteries instead of electricity. As can be deduced from above the ownership of refrigerator, cookers and television are restricted to the urban area as a result of lack of electricity in the rural area.

Table 19 shows also that many rural households (68.0 percent) own a bicycle while only 31.0 percent of urban households have a bicycle. Many rural households own motorbike (65.3 percent) than the 34 percent of such in the urban centre. Among the Igbos, especially in the rural areas, the commonest means of transport is the motorcycle. Almost every family has one motorcycle. There are various categories of motorcycle, and women own the type for the ladies, which is the commonest of all the motorbikes in Igboland.

In contrast, 66.2 percent of urban households own a car while 32.4 percent of the rural households own a car. Of course, cars are the commonest means of transport in the

town and their ownership is a status symbol.

4.17 Differentials in socioeconomic characterstics of Respondents.

It was decided to crosstabulate some selected characteristics by rural-urban residence to appreciate the distribution of the respondents by residence.

TABLE 20

Current Age, Age at Marriage and Age at First Birth by rural-urban residence, Imo State, 1993.

	Place of Residence	
Current Age	Rural	Urban
< 24	58.8 (30)	41.2 (21)
25 - 29	52.5 (83)	47.5 (75)
30 - 34	46.6 (95)	53.2 (108)
35 - 39	63.6 (89)	35.7 (50)
40 - 44	57.9 (33)	40.4 (23)
45 - 49	41.9 (13)	51.6 (16)
Overall Mean	31.95	32.3
Age at Marriage		
15 - 19	56.1 (78)	43.9 (61)
20 - 24	50.0 (150)	49.3 (148)
25 - 29	49.9 (68)	50.4 (69)
30 - 34	78.8 (22)	21.4 (6)
Overall Mean	22.3	22.2
Age at First Birth		
15 - 19	52.7 (49)	47.3 (44)
20 - 24	55.1 (157)	44.6 (127)
25 - 29	42.4 (73)	57.0 (98)
30 - 34	71.4 (30)	28.6 (12)
35 - 39	-	-
Overall Mean	23.3	23.3

Table 20 shows that of those currently aged less than 24 years, 58.8 percent are in the rural, 41.2 percent in the urban. Similarly out of the percentages aged 25 -29, 35 -39, 40 -44, more live in the rural areas than in the urban areas. For those aged 30 - 34, and 45 - 49, 52.9 percent and 51.6 percent live in the urban areas. We expected to see a more youthful age structure in the urban area than in the rural as a result of rural-urban migration), but since the reverse is the case, we can attribute this pattern to the number of cases collected from each area. We obtained more respondents from the rural area than in the urban. The mean age for the rural area is 31.95, while the urban is 32.3.

We also observed definite differences in the age at marriage between rural and urban women in Table 20. Of those that reported having married at age less than 20, 56.1 percent married before reaching age 20 in the rural than 43.9 percent in the urban area. This shows that in Igboland, the rural people marry early than their rural counterparts. 50.4 percent of urban respondents married before reaching age 30 compared to 49.9 percent of rural women . The overall mean age at marriage is 22.2 years, while the rural mean age at marriage is 22.3, that of the urban respondents is 22.2 years.

For those who reported having given birth to their first child before age 20, 52.2 percent are in the rural

compared to 47.3 percent urban; for ages 2 -24, 55.1 percent are rural compared to 44.6 percent, and those reporting ages 25 - 29, 42.4 percent rural as against 57.0 percent urban. 71.4 percent gave birth to their first child at ages 30 - 34 in the rural area than 28.6 percent in the urban area. The overall mean age at first birth is 23.3 years for both rural and urban setting. Therefore the expected rural-urban differential does not exist.

4.18 Educational Differentials

Table 21 shows the distribution of the surveyed women by education according to three selected characteristics namely age, residence and occupational status.

TABLE 21

Percentage distibution of surveyed women be educational level according to selected background characteristics, Imo State, 1993

Background Character-istics	Level of Education				
	None	Primary	Secondary	Tertiary	Adult Education
Current Age					
< 24	-	31.4	54.9	11.8	2.0
25 - 29	-	22.0	49.1	22.6	-
30 - 34	1.0	26.5	29.4	40.7	-
35 - 39	6.4	33.6	19.3	38.6	-
40 - 44	7.0	31.6	19.3	42.1	-
45 - 49	3.2	29.0	3.2	51.6	-
Residence					
Rural	4.7	43.2	26.9	17.9	.3
Urban	.7	11.1	36.6	50.0	-
Occupational Status					
Private Company Employee	-	21.1	33.3	45.5	-
Govt Employee	-	.9	17.9	80.4	-
Self-Employee	2.7	16.2	59.5	18.9	-
Farmer/Trader	.9	8.3	5.6	4.6	-

Table 21 shows that it is the older women that have attained tertiary education than the youthful female respondents. For instance, out of the respondents aged 30 - 34, 40.7 percent have attained higher education; those aged 35 - 39, 38.0 percent; 40 - 44 age group, 42.1 percent, 45 - 49 aged, 51.6 percent.

Also, we can observe that the urban women have received more secondary education (36.6 percent versus 26.9 percent) and more tertiary education (50.0 percent versus 17.9 percent). Only a very insignificant proportion of urban respondents that did not go to school. The table shows also that it is the government workers that are more educated than any other group. They make up 80 percent of those with tertiary education, followed by those in the private sector who constituted 45 percent .

4.19 Occupational Status Differential.

TABLE 22
Percentage distribution of respondents' occupational status according to selected background characteristics, Imo State, 1993

Background Characteristics	Occupational Status: Private Employee	Government Employee	Self-Employed	Farmer/Trader/Labourer
Current Age				
< 24	5.9	2.0	11.8	9.8
25 - 29	9.4	21.4	5.0	5.7
30 - 34	4.4	42.6	5.4	3.4
35 - 39	1.4	40.0	3.6	3.6
40 - 44	3.5	43.9	7.0	8.8
45 - 49	3.2	51.6	-	6.5
Education				
None	-	-	1.4	1.4
Primary	3.6	1.0	3.1	6.6
Secondary	5.1	18.7	10.3	7.9
Tertiary	6.7	80.4	3.1	.9
Residence				
Rural	4.8	16.5	5.1	6.9
Urban	4.9	51.6	5.2	2.3

From age 25 upwards, there are more government employees than the occupational group employees. For instance, 51.6 percent out of those that reported age 45 - 49 are government employees compared to 10.0 percent of others.

Moreover, those that have higher education are employed in government service than in other sectors. 80.4 percent of those that received tertiary education have government employment compared to 10.9 percent of others. Similarly, 18.9 percent of those that received secondary education are in the government service when compared to each of other categories.

There is also rural-urban differential in the occupational status distribution. Among the urban respondents, 51.6 percent of them have government employment; 4.9 percent private employment, 5.2 percent self-employment; 2.3 percent farmers, labourers and traders. While in the rural areas, it is 4.8 percent (private employment), 16.3 percent (government employment), 5.1 percent (self-employment); and 6.9 percent (farmers, traders and labourers). This rural-urban differential is still the effect of rural-urban migration. People tend to go to the urban centre for employment purposes. Hence, there are more civil servants than other categories of workers in the town (urban centre).

Summary.

Our discussion here shows that slightly more respondents are from rural areas while 45% lived in the urban areas. 26% of the respondents are less than 30 years, 42% less than 40 years and the overall mean age is 32.6 years. We did not observe any rural-urban differential in the age structure.

With respect to the socioeconomic indicators, we observed that the proportion who attended school is high. There are more educated respondents in the urban areas than in the rural areas.

Government employment is common among the respondents. 51.5% of the surveyed women are government employees, while 23.6% are in other employments. More of those working are working away from home (35.3% versus 32.3% nearer home).

Marriage is universal in the study area. 79.7% of the respondents are legally, religiously and traditionally married and are living with their husbands. Divorce rate is low. Marriage is at relatively early age. 82 percent reported that they married before their 25th birthday. The mean age at marriage is 22.2 years, which showed a higher mean age at marriage than former estimates.

Monogamy is common. 79.4% of the respondents are in monogamous marriages. Polygamy is on the decline. 63.4% of the respondents give birth to their first child before reaching the 25th birthday. The mean age at first birth is 23.3 years. Most of the women have access to the mass media. 67.6% reported either listening to radio, watch television or read newspaper at least once a week

There is rural-urban differential in the housing characteristics and ownership of household durable items. Other residential differentials are less noticeable.

CHAPTER FIVE

FERTILITY LEVEL, ATTITUDES AND BEHAVIOUR IN IGBO.

5.1 Introduction

One of the aims of this survey is to estimate the fertility level in the area of study, and examine the socioeconomic and demographic correlates of these levels. To obtain information necessary for this, we obtained completed maternity history of all the respondents. Each respondent was asked the number of children born alive, the number born alive but later died. We summed up responses to these questions to obtain the total number of children ever born by each respondent.

This chapter therefore examines the fertility level and its differential by socioeconomic and demographic characteristics. Fertiltiy attitudes and attitudes towards contraception were also examined.

5.2 Cumulative Fertility.

Usually information on the number of children ever born provides a measure of the level of cumulative fertility in any society. One major source of problem in data collected in this form is the problem of omitting children born alive but later died, although the series of questions asked helped to minimise underreporting of births which is generally most common among older women and those from the rural area. The percent distribution

of respondents according to children ever born by selected background characteristics is shown below.

TABLE 23

Percentage distribution of respondents according to number of children ever born by selected characteristics, Imo State, 1993.

Selected characteristics	CHILDREN EVER BORN 1	2	3	4	5	6+
Current Age						
< 24	47.2	24.5	13.2	3.8	5.7	5.7
25 - 29	24.2	21.7	21.7	16.6	9.6	6.4
30 - 34	10.3	12.8	14.8	22.7	19.2	20.2
35 - 39	3.6	11.4	12.1	16.4	12.9	43.6
40 - 49	2.3	2.3	6.8	14.8		
Education						
Primary	9.9	9.9	9.0	11.2	15.2	44.8
Secondary	17.1	19.4	20.4	16.6	13.7	12.8
Tertiary	12.9	11.6	13.8	22.3	13.4	25.9
Residence						
Rural	15.6	10.8	13.7	15.1	15.3	29.6
Urban	11.1	17.4	14.1	18.7	12.8	25.9
Occupation						
Government Worker	10.0	9.4	17.5	22.9	14.3	25.1
Others	8.7	7.5	6.4	6.9	5.2	65.3
Age at Marriage						
15 - 19	8.0	8.0	10.1	13.8	13.8	46.4
20 - 24	13.1	12.8	17.4	18.5	16.4	21.8
25 - 29	22.6	18.2	14.6	19.0	9.5	16.1
30 - 34	21.4	39.3	14.3	17.9	-	7.1
Duration of Marriage						
1 - 5 years	45.9	33.1	12.7	3.2	1.3	3.8
5 - 10 ,,	5.5	13.6	25.8	31.4	18.2	5.5
10 - 15 ,,	4.2	4.2	6.8	21.2	26.3	37.3
15+ ,,	0.8	1.9	2.7	3.5	7.8	83.3

Table 23 reveals that more than half (63.6 percent) of the respondents aged 40-49 have had six or more

children. The next group (35 - 39) is 43.6 percent that have had more than six children. For the younger women (aged less than 24 years), 85 percent of them have had upto three children, and among those aged 25- 29, 67.6 percent that have had upto three children.

We excluded childless women, because the survey is meant for women with at least one child. In any case there were few barren respondents.

The table also reveals that those with primary education have had more children than others. About 44.8 percent of those with primary education have more than six children. This is followed by the tertiary education category that have 25.9 percent of them having more than six children. Almost 30 percent of the women in the rural area have had more than six children, while the urban is 25.9 percent.

25.1 percent of government workers, that is those engaged in civil service jobs, have had more than six children, while 65.3 percent of those employed in other sectors such as private companies, farming , trading etc have had more than six children. As would be expected, those married earlier in their lives tend to have more children, all things being equal. About 46.4 percent of those married at younger age group (15-19), have had more than six children. This too is reflected in the duration of marriage. 83.3 percent of those that married for more

than 15 years have had more than six children. This is followed by those who have spent 10 -15 years in union who have 37.3 percent of more than six children. Thus, we observe that the longer the marriage duration, the higher the number of children ever born, all things being equal.

5.3 Age Patterns of Fertility

Table 24 presents the distribution of the respondents by the number of children ever born and age.

TABLE 24

Mean number of Children ever born by Current age of the Respondents, Imo State, 1993.

Current Age	Children Ever Born	Mean Number of CEB
15 - 19	3	1.0
20 - 24	98	2.0
25 - 29	432	2.7
30 - 34	786	3.9
35 - 39	692	5.1
40 - 44	339	5.9
45 - 49	179	6.1
Overall Mean	2,529	4.0

The table indicates that the women aged 45 - 49 have had an average of 6.1 births. The mean number of children ever born for cohort 30-34 is about 4; 5.1 for age group 35 - 39 and 5.9 for those aged 40 - 44. The average number of children ever born increases by age. That the mean number of children ever born for women aged 45 - 49

is 6.1 is an indication of the completed family size, if the assumption is made that these women have virtually reached the end of their reproductive age.

The mean number of children ever born reported here is not far from the results of earlier studies in the survey area. Omideyi (1983) reported a mean children ever born of 6.3 for the oldest cohort 45 - 49, and Odimegwu (1989) reported 6.2 for those aged 45 - 49 and an overall mean of 4.9. The mean for the oldest cohort seems to be higher than the national average of 5.8 reported by the Nigerian Fertility Survey (National Population Bureau, 1984). This tends to indicate that Igbo area is a high fertility zone.

TABLE 25

Comparisons of Mean number of Children ever born from different sources with Imo State mean, 1993

Age Group	Omideyi (1983)	NPB (1984)	Raimi (1986)	UNO (1987)	Odimegw -u (1990)	Odimegw u (1993)
15 - 19	0.181	1.06	0.17	0.3	1.0	0.017
20 - 24	1.330	2.69	1.01	1.4	2.4	0.883
25 - 29	3.024	4.03	3.03	3.0	3.0	2.480
30 - 34	4.713	4.70	4.09	4.6	4.7	4.200
35 - 39	5.712	5.67	5.33	5.7	6.3	5.130
40 - 44	6.136	5.80	5.67	6.3	7.0	5.950
45 - 49	6.252	6.10	6.32	6.5	6.2	6.000
Overall	-	-	4.34	-	4.2	4.100

Note:

1. Omideyi, A.K. (1983): "Age at Marriage and Fertility in Eastern Nigeria", Genus, vol. 39, No 1-4, DeCEMBER, 141-154.
2. National Population Bureau (1984): Nigerian Fertility Survey 1981/84 Report, Imo State Report. (Federal Ministry of Health, Nigeria, 1984).
3. Raimi, M.O. (1986): 'Factors for persistence High Fertility among the Yoruba', Ph.D Thesis, held by the Department of Sociology, University of Lagos, Nigeria.
4. U.N.O (1987) : Fertility Behaviour in the Context of Economic Development, U.N.O. publication.
5. Odimegwu, C.O. (1990): 'The effect of infant-child mortality on fertility level in Igboland', M.Sc Project held by the Dept of Demography and Social Statistics, Obafemi Awolowo University, Ile-Ife, Nigeria.

5.4 Age at Marriage

In societies where there is no practice of contraception or where its use is low, the age at marriage is a key factor that influences fertility

because early marriage means a longer exposure to childbearing. This results to more births. Thus age at marriage is shown to be one of the most important determinants of fertility in a society.

TABLE 26

Mean number of Children ever born by age at marriage and current and current age, Imo State, 1993.

	Current Age					
Age at Marriage	< 24	25 - 29	30 - 34	35 - 39	40 - 49	Total
15 - 19	2.5	4.1	5.3	5.8	5.8	4.5
20 - 24	1.7	2.7	4.2	5.0	5.3	3.8
25 - 29	-	1.7	2.9	4.1	4.8	3.2
30 - 34	-	-	1.0	2.2	4.1	2.8
All	2.1	2.8	3.9	4.5	5.2	4.1

Table 26 shows the mean number of children ever born to the surveyed women, controlling for age at marriage and current age. It shows that the mean number of children ever born declines sharply with increasing age at marriage, from 2.5 births among women married before age 20 to 1.7 births for women married before their 25th birthday. This pattern is evident within every age cohort. The figures for the older cohort (40+) show higher completed family sizes for women married at earlier ages compared with those who married at older age. The table also shows that the earlier the age at

marriage the higher the overall mean number of children ever born. For example women who married at early age of 15-19 have an overall mean of 4.5 children when compared with those who married at age group 30 - 34 who have a mean number of children of 2.6.

When we look at the variation in mean number of children among women aged 40+, the mean among those who were married at ages 24 or 29 is 0.7 or 1.3 births lower than those observed for those that married before age 20. This tends to support the idea that an increase in the average age at first marriage would have a substantial influence on fertility reduction in the area.

5.5 Duration of Marriage

Although we have seen that the age at first marriage has an effect on the cumulative fertility, the result may be biased by the fact that the period of possible exposure to the risk of conception varies with the age at marriage. Thus, women who marry before or at age 15 have virtually 30 years of exposure to childbearing and thus a greater probability of having higher parities than women who marry after age 24 or more. and are as a result exposed to the risk of conception for only about 20 years. To avoid this bias, we have to control for both the age at first marriage and marital duration in looking at the relationship between nuptiality and fertility.

Table 27 considers the effect of both age at marriage and marital duration on cumulative fertility levels. Although marital dissolution and remarriage are less in the society, the number of years since first marriage seems a good proxy since in the area of study, first marriages are relatively stable.

TABLE 27

Mean number of children ever born among the surveyed women by age at marriage and duration, Imo State, 1993.

	DURATION OF MARRIAGE				
Age at Marriage	1 - 5	5 - 10	10 - 15	15+	Total Mean
15 - 19	1.7	3.9	5.4	5.6	4.6
20 - 24	2.0	3.5	4.8	5.4	3.8
25 - 29	1.8	3.8	4.4	5.3	3.2
30 - 34	1.8	2.9	2.4	6.0	2.6

The table confirms that the longer the marriage duration, the higher the average number of children ever born. Women married 5 - 10 years ago have on the average given birth to 3.9 compared to those aged 10 - 15 who have 5.4 births. With increasing age at marriage, the mean number of children ever born falls, while with increasing duration of marriage it increases. This means that those that marry at older age tend to have low number of children than those that married early enough in their youth. The latter group is exposed to more years

of child-bearing before their menopause.

5.6 Age at First Birth

The age at which women initiate childbearing influences a variety of demographic and nondemographic issues. In the absence of active fertility control, the total number of births women bear through the reproductive period is a function of the age at which they begin to bear children. And in societies, where contraception is practised most, ages at first birth are compatible with a wide range of completed fertility levels. In such societies, the age at first birth is nonetheless of interest because of its effect on the timing of childbearing within the reproductive period. With the mean completed family size held constant, young age at childbearing implies higher aggregate rates of fertility and of population growth (Coale and Tye,1961). Young ages at first birth are associated with younger ages at the achievement of desired family size, and possible longer period of exposure to unwanted births if contraception is not practised.

Table 28 shows the percent distribution of women according to the age at first birth. The age at first birth is affected by censoring, that is they are only available for women who have already given birth. Since childless women are excluded, information on age at first

birth for those who have given birth yields a downwardly biased picture of the average age at first birth for the group (ZDHS,1988). Another problem is that age at first birth data depend on the accurate reporting of both the woman's birth date and date of the birth of the child. Misreporting of dates or underreporting of first births who died will affect the result. Such errors are greatest in the case of older women.

TABLE 28

Percent distribution of women according to age at first birth and current age, Imo State, 1993.

	AGE AT FIRST BIRTH				
Current Age	15-19	20-24	25-29	30-34	35+
< 24	35.2	61.1	-	-	3.7
25-29	14.5	55.3	25.2	-	5.0
30 - 34	6.5	46.1	34.8	4.9	7.8
35 - 39	17.9	22.9	27.1	16.4	15.7
40 - 49	13.6	38.6	25.0	8.0	14.8
Total	14.3	43.6	26.5	6.2	9.5

Table 28 shows that there is a decline in the prevalence of early age at birth. Only 14 percent gave birth before their 19th birthday. However, 96.3 percent of women aged less than 25 had their first child before age 25; while 52.2 percent of those aged 40-49 gave their first child birth before age 25. On the whole, 57.9 percent of the women had their first birth before

reaching the age of 25, and 35 percent had theirs before their 35th birthday.

TABLE 29

Mean number of Children ever born according to Duration of marriage by Age at First Marriage, Imo State, 1993

	AGE AT FIRST BIRTH				
Duration of Marriage	15 - 19	20 - 24	25 - 29	30 - 34	35+
1-5 years	1.56	1.78	1.70	1.73	1.85
5 -10	4.11	3.62	3.47	2.95	3.59
10 - 15	6.0	5.12	4.30	2.80	5.80
15+	7.4	6.55	5.89	6.50	6.17
Total	5.7	4.06	3.30	2.70	4.95

Table 29 reveals that those who have their first birth before age 20 have a higher mean number of children ever born than those who have theirs later. The only departure from this pattern is that those who gave their first birth at ages above 35 reported a near higher mean children ever born than the preceding age groups. The two possible reasons for this pattern may be the result of catch-effect, because such women tend to give birth at shorter intervals to make up for the years lost in the unmarried state or barrenness or education (Omideyi,1983).

5.7 . Current Pregnancy

All the respondents were asked if they were currently pregnant. Current pregnancy is a good indicator of current fertility. Thus, the percent currently pregnant provides some indication of current fertility levels. In addition, we obtained information on the number of livebirths occurring in the twelve months preceding the survey. These are used in estimating current fertility in Imo State.

The fertility indicators calculated from these data include the general fertility rate, total fertility rate, sex ratio, child-woman ratio and gross reproduction rate. The general fertility rate is the number of births per 1000 women aged 15 - 49 years in a given year. It is a more refined measure because it relates births more nearly to the age-sex group at risk of giving birth. It is much more indicative of changes in fertility behaviour than crude birth rate. Total fertility rate is a measure of the average number of children that would be born alive to a woman during her lifetime if she were to pass through all her childbearing years confirming to the age-specific rates of a given year. Thus, it answers the questions: how many children are women having these days? It is over 7.0 per woman in developing countries.

The gross reproduction rate is the average number of daughters that would be born to a woman during her

lifetime if she passed through her childbearing years conforming to the age-specific rate of a given year

Information on current fertility is open to sources of error. With regard to the proportion currently pregnant, the problem is that of underreporting by women who are in the first trimester of pregnancy and may not be sure of their status. The major problem with data on births in the twelve months period preceding the survey results from errors in the reporting of dates of birth by the mother. There may be failure to report the births of children who may have died in infancy. Efforts were made to reduce both sources of error during the field work and the use of demographic models to analyse and smoothen the data.

Although subject to some errors as discussed above, the percent currently pregnant provides some indication of the level of fertility. Table 30 shows the distribution of respondents by pregnancy status.

TABLE 30

Percentage distribution of the respondents' pregnancy status by current age, Imo State, 1993.

	PREGNANCY STATUS			
Current Age	Yes	No	Can't be pregnant	Don't know
< 24	20.4	70.4	3.7	5.6
25 - 29	20.1	64.8	1.9	12.5
30 - 34	24.5	66.2	3.4	5.9
35 - 39	11.4	75.0	6.4	7.1
40 - 49	2.3	81.8	9.1	6.8
Total	17.4	70.2	4.5	7.9

The table clearly underestimated somewhat the actual proportion pregnant since some women may be unaware or uncertain about their status. As shown, the proportion currently pregnant declines with age from 20.4 among women under 24 years of age to 20.1 among women 25 - 29. The age group with the highest proportion currently pregnant is the 30 - 34 cohort, followed by those under 24 years. It falls again from 11.4 percent for women in the age group 35 - 39 to 2.3 for women aged 40 - 49 years, demonstrating the fact that these women are approaching their menopause and they might have probably had their required number of children.

That the proportion of women pregnant is highest for women in the age group 30 - 34 instead of the peak years of childbearing (20 - 24 and 25-29) may be as a

result of the age at which the women married, for late marriages will definitely shift the peak period of childbearing.

5.8 Current Fertility level

From the earlier analysis on cumulative fertility, we discover that the area of study is high fertility zone. The average number of children ever born to all the surveyed women is 4.1 and the completed family size indicated by the mean number of children ever born for the oldest cohort (45-49) is 6.1.

However, even though children ever born yields information on lifetime fertility, it does not take into account the rate of the birth of the children. Thus to measure the current fertility, we used age-specific fertility rate for the twelve months preceding interview and current pregnancy rates, which is the proportion of women reporting themselves pregnant at the time of survey. We should note that using age-specific fertility rate for the past year may have the problems of misdating or errors of misstatement of age. Using pregnancy rate is susceptible to underreporting. Some of these women may refuse to indicate that they are pregnant. However, we assumed that any underreporting of early pregnancy over all the ages is equally distributed over all the age groups.

A total of 219 births were reported by currently married women as occurring during the twelve months preceding the survey. Among these, 106 were female births while 113 were male births. This gives a sex ratio at birth of 107. This figure compares well with what is obtained in other developing societies (UN., 1987; Shryock et al, 1971).

Based on the information available, we estimated some indices of current fertility to enable us further examine the level of fertility in the area.

Table 31 presents the estimate of fertility levels based on the current births, that is births in the past 12 months prior to the survey.

TABLE 31

Estimates of Fertility levels from the number of births of the respondents, Imo State, 1993.

	No. of women	Childr en ever born	Births in past year	Female Births	ASFFR*	Mean Childr en ever Born	Age spec- ific ferti lity rate
Age							
15-19	181	3	1	1	0.0055	0.0166	0.005
20-24	111	98	32	15	0.1351	0.8830	0.288
25-29	174	432	81	36	0.2068	2.4630	0.466
30-34	187	786	66	31	0.1658	4.2030	0.353
35-39	135	692	34	21	0.1558	5.1300	0.252
40-44	57	339	5	2	0.0351	5.9500	0.088
45-49	30	179	-	-	-	6.100	-
Total	875	2,529	219	106	0.7039		1.452

* Age-specific female fertility rate

Sex Ratio = Female births/Male births x 100 = 106/113 x 100 = 107

Total Fertility = ASF = 1452.3

Total Fertility Rate = 1.4523 x 5 = 7.26

Gross Reproduction Rate = .7039 x 5 = 3.5

General Fertility Rate = 219/875 x 1000 = 250.

The general fertility rate for the area of survey is calculated to be 250 births per 1,000 women. This means the number of livebirths per 1,000 women 15 - 49 years in a given year. The total fertility is calculated

to be 7.26 births per woman. This rate suggests that a married woman beginning her childbearing at this time may expect to have an average of almost seven children before the end of her reproductive life which is put at 49 years.

Considering the pattern of age-specific fertility rate in this table, we notice the tendency of Igbo women to have their children early in the reproductive period. On the current basis, it implies that the women will have half of their children before age 30. The gross reproduction rate is 3.5, implying that women in the area are more likely to have an average of about four daughters during her lifetime if she passed through her childbearing years conforming to the age-specific fertility rates of a given year.

The total fertility rate from this survey appears to be higher than that calculated by the Nigeria Fertility Survey for the South Eastern region of Nigeria which is 6.02 (NFS, 1984) and other similar surveys. In other words, the Nigerian Fertility Survey result shows a lower age-specific fertility rate and total fertiltiy rate than the present one. This may be a result of differences in age at marriage; while that of the country is generally low, that of the Igbo tends to be higher. Late marriage tends to be associated with continous child-bearing till menopause is reached. Thus high fertility could result

from late marriage which is followed by high reproductive rates (Trussell and Renin, 1989).

We have earlier indicated that there are errors associated with data on births in the year prior to the survey, children ever born and ages of the respondents. Such errors include omission of children ever born. Women tend to omit some of their live-born children especially those living in other households and those who have died, with the result that the proportion omitted tends to increase with the age of mothers. Such omissions can manifest when average number of children ever born fail to increase rapidly enough as age increases and in some cases average number of children ever born for ages 40 - 44 and 45 - 49 may fall below that for women aged 35 - 39 even where there is no reason for that.

These errors may be due to memory lapse especially on the part of older women in reporting the numbers of children ever born or age misstatements in the form of age heaping or age shifting over age boundaries. Another error in the reported number of children ever born arises from the inclusion of stillbirths or late fetal deaths among liveborn children. The possible upward effect of this error on average parity is small (UN, 1983). Therefore, to correct for these possible errors, we decided to use some estimation techniques to improve the quality of our estimation.

5.9 Indirect estimates of Igbo Fertility.

The basic source of information for fertility analysis is the question on children ever born. We have noted earlier that information obtained on this in most cases is erroneous, because of the problem of memory lapse. In most cases, children who died soon after birth are likely to be omitted. Sometimes illegitimate children are omitted, and in others some respondents include their foster children. This leads to overcount. Others could also omit children living outside the house. The accuracy of reporting the number of children ever born tends to vary inversely with the women's age (Shryock, et al 1971).

In relation to African data, Brass and Coale (1968) observed that "the number of children ever born is reported with good accuracy by younger women. The events which the young women are asked to recall have happened recently: the total births to each are typically not more than two or three so that the difficulties of counting large number in an illiterate society do not arise; living children will often be present at the interviews and few will be omitted because they have grown up and left the household. There is also the problem of outright failure to report the number of children". Because of the importance of children ever born, there is always the need to appraise the data carefully. Various techniques have been developed to appraise the consistency of the

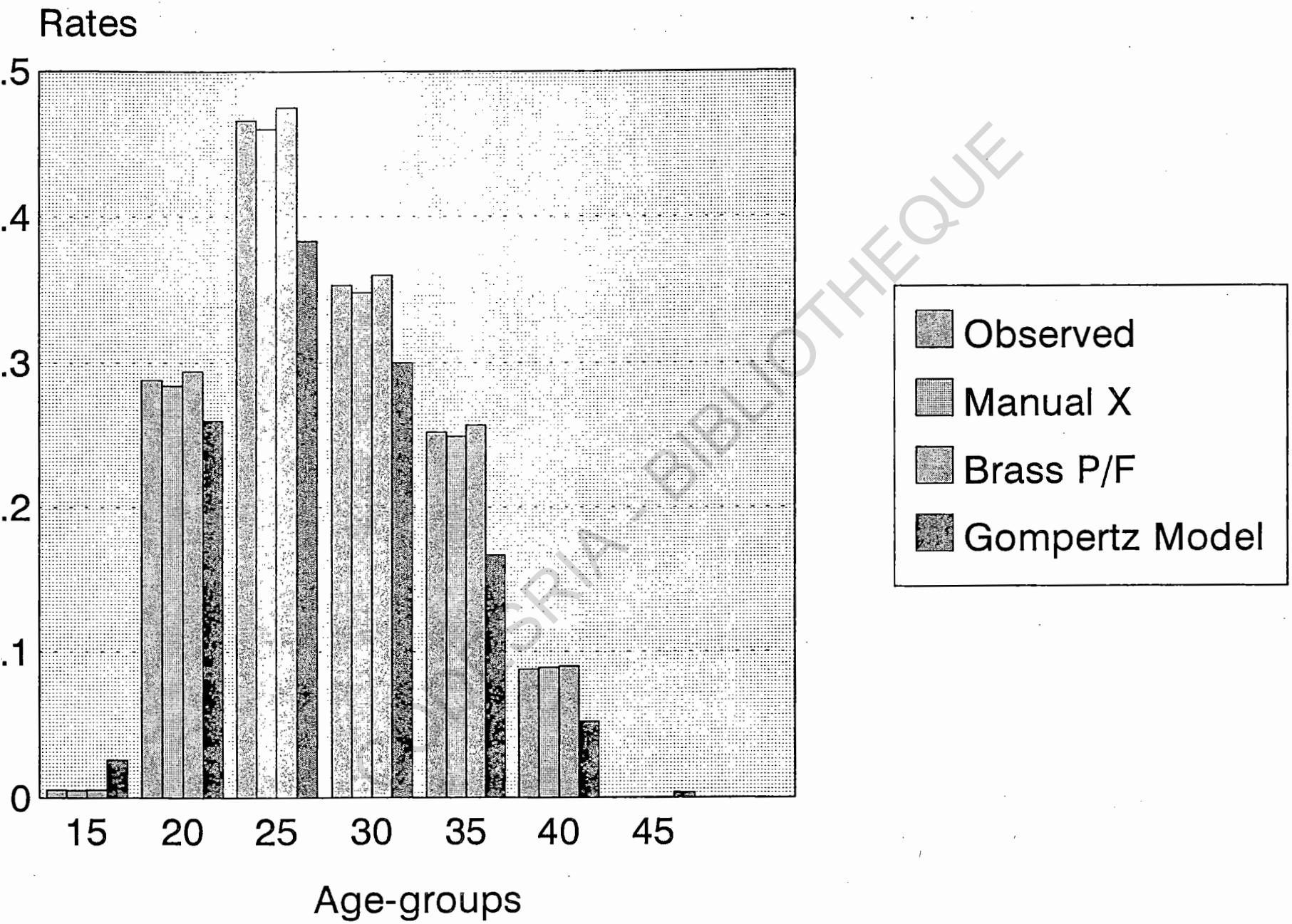
responses to the questions on children ever born.

The purpose of this section therefore is to estimate the fertility levels in the survey area by the use of modern demographic techniques. The techniques used are based on the survey questions concerning information on current and retrospective fertility. While current fertility refers to the number of children born during the twelve-month period prior to the survey; retrospective fertility refers to the total number of children ever born alive by each survey respondent. We employed four well-known techniques namely Brass P/F technique, UN Manual X method and the Brass Relational Gompertz Model and Brass and Rachad techniques. The results of this estimation are shown below. (Details of the Computational techniques can be found in Appendix C).

TABLE 32

Age-specific fertility rates: Observed, Manual X Method, Brass P/F Method and Fitted by the use of the Relational Gompertz Model Imo State, 1993.

Age Group	Observed ASFR	UN Manual X ASFR	Brass P/F ASFR	Gompertz Model ASFR
15 - 19	0.0053	0.005	0.0054	0.0260
20 - 24	0.2880	0.284	0.2940	0.2602
25 - 29	0.4660	0.460	0.4750	0.3834
30 - 34	0.3530	0.348	0.3600	0.3001
35 - 39	0.2520	0.249	0.2570	0.1668
40 - 44	0.0880	0.087	0.0900	0.0520
45 - 49	-	-	-	0.0034
Total	1.4523	1.4332	1.4814	1.1919
TFR	7.26	7.20	7.40	6.0000



Age-specific fertility rates: Observed, Manual X, P/F, Gompertz Model, Imo State, 1993

Table 32 summarises the result of the estimation by the model. Towards the bottom of the table, the estimated total fertility rate based on the fitting of the relational Gompertz model is shown. The reported or calculated total fertility rate is 7.26, the adjusted fertility rates using Brass and Manual X methods are 7.4 and 7.2 respectively and the fitted rate is approximately 6.0. The estimate by Brass P/F appears likely to be overestimated. The true value may be slightly lower than 7.4. The possible reason may be because of our use of f_2/f_3 instead of the original f_i/f_2 values to do the computations. Again we discovered that for the estimated total fertility rate, the relational Gompertz model tends to give values lower than those estimated by the other techniques.

By and large, the estimates of total fertility by the P/F and Manual X methods, and the relational Gompertz model must be enclosing the true estimate of total fertility rate in Imo State. Table 32 and Figure 2 and Figure 6 indicate that all the distributions have their peaks at the age groups 25 - 29. This shows an early peaked-pattern, indicating intensive childbearing at the age group. A consistency check of the result indicated that the estimated total fertiltiy rate in Imo State is 7.05.

Comparing this with the estimates obtained for the

Eastern region from other studies, we discover that our estimate of 7.05 by the consistency check is very close to that of Ukaegbu (1976) for Ngwa-Igbo which was 7.68 and that of Page and Coale (1969) for Owerri Province which was put at 8.10. As a matter of fact, what was then known as Owerri Province of Eastern Nigeria is the present Abia and Imo States, which is the area of survey.

This slight difference in total fertility rate obtained in this study and that of Coale and Page could be due probably to variation in methodology rather than a fertility decline. Over the years there had been a remarkable improvement in estimation techniques.

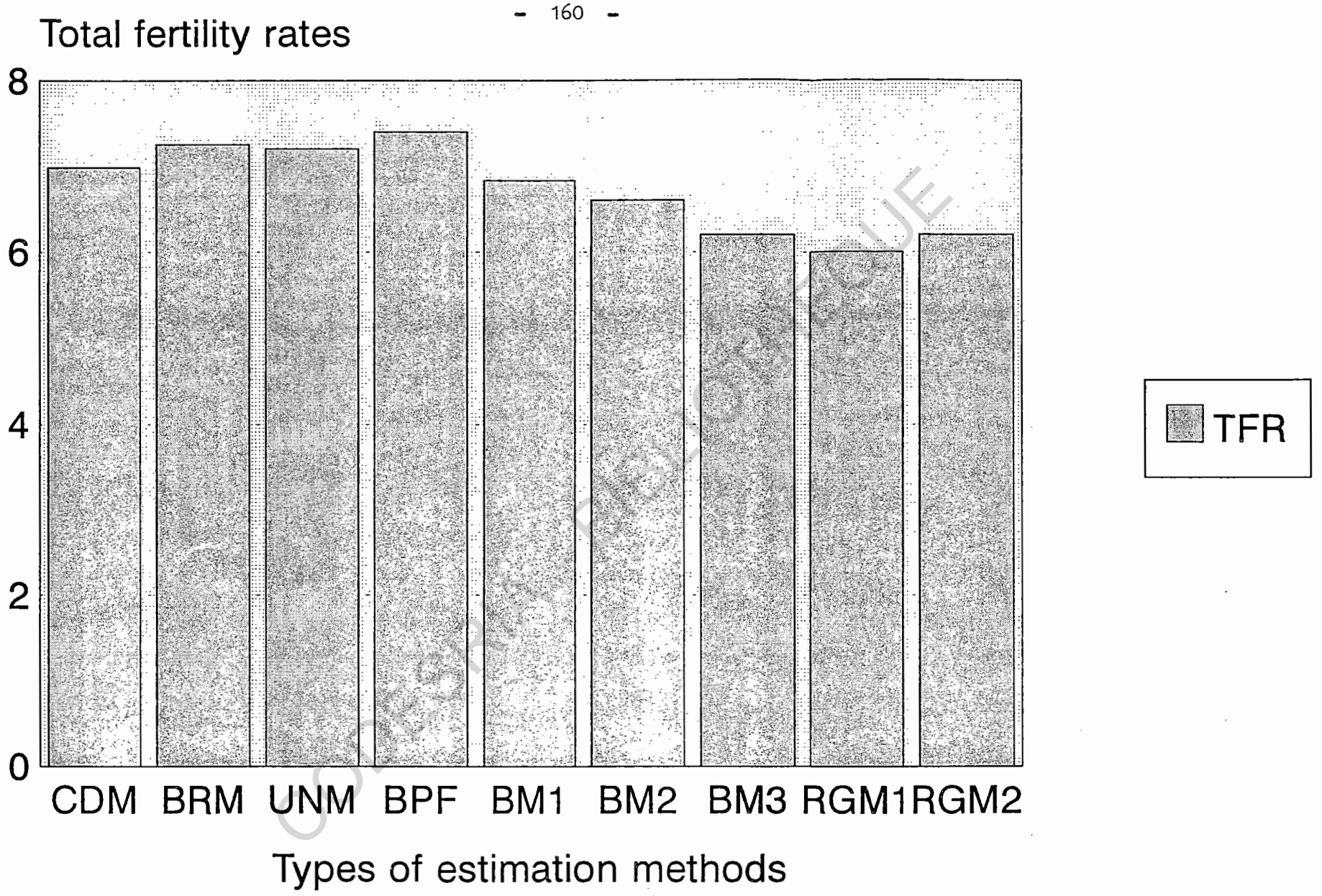
Table 33 presents the summary estimates of fertility level of Imo State, using data on mean parities and births in the twelve months prior to the survey date. The estimates are by various methods.

TABLE 33

Summary estimates of P/F ratio and estimates of TFR by various methods, Imo State, 1993.

	P/F RATIOS	
Age Group	Manual X	Brass Method
15 - 19	0.712	1.18
20 - 24	1.180	1.02
25 - 29	0.863	0.86
30 - 34	0.859	0.86
35 - 39	0.802	0.81
40 - 44	0.829	0.84
45 - 49	0.822	0.82

Method of Estimation	Total Fertility Rate	Gross Reproduction Rate	Crude Birth Rate	General Fertility Rate
Mean CEB (45-49)	6.25	3.5	56.5	0.250
Coale-Demeny Method $([P_3]^2/P_2)$	6.98	4.9	-	-
Brass-Rachad Method $(P_2).\{P_4/P_3\}^4$	7.25	5.1	-	-
UN Manual X	7.20	5.1	54.6	0.242
Brass P/F Method	7.40	5.2	57.7	0.255
Variants of Brass Method:				
1. $(P_2F_2 + P_3F_3)/2$	6.83	4.8	-	-
2. $(P_2F_2 + P_3F_3 . P_4F_4)/3$	6.60	4.6	-	-
3. $(P_3/F_3 + P_4/F_4)/2$	6.20	4.4	-	-
Relational Gompertz Model (Mean Parities)	6.0	4.2}		
Relational Gompertz Model (Current Fertility)	6.2	4.4}	47.7	.211



g.3: Summary Estimates of Total Fertility Rates, Imo State, 1993
DM=COALE-DEMENY METHOD; BRM=BRASS-RACHAD METHOD; UNM=UN MANUAL X, BPF=BRASS P/F
M1=BRASS VARIANT; BM2=BRASS VARIANT; RGM1=GOMPERTZ MEAN; RGM2=GOMPERTZ CURRENT

The P/F ratios for the age-group 15 -19 show erratic fluctuations when compared with those of the middle age groups. This may be as a result of the small number of births in that age group and or due to errors in the data collection itself. The total fertility rate estimated by Coale-Demeny method and Brass-Rachad methods have a difference of 0.27 births between them, but they are higher than the reported parity for the age group 45 - 49.

We also used the four types of adjustment factors based on the P/F ratio for the middle age-groups. The table shows that the estimated total fertility rates decline as we proceed from the first type of adjustment (7.4) to the fourth type (6.2). The difference between each is not much. Below the table, we have the estimated total fertility rate using relational Gompertz model. In the relational Gompertz model fitted to the mean parities (P) we have an estimate of 6.0, while the estimate based on relational Gompertz model fitted to the current fertility (F) gives us 6.2. From these various estimates, it may be correct to say that the total fertility in Igbo area is between 6 and 7 children, and crude birth rate between 48 and 58 per 1,000 women.

It is worth mentioning that as far as these birth rates ar concerned, there may a possible over-estimation of the observed birth rates due to inclusion of the

births of the previous twelve months. Also, there may also be an over-estimation of the number of childbearing women because of errors in age reporting. There may also be under-estimation of the childbearing women because of the inability of some of the respondents to fill out the household schedule.

5.10 Fertility differentials

This chapter has shown us that our area of study is a high fertility area. The pattern of fertility in any society has been explained by various social and economic factors. The relation between these factors and fertility has attracted much attention in the literature. This has led to the coinage of the term "socieconomic". Socioeconomic status is the outcome of a combination of a series of personal characteristics such as educational level, marital status, occupation, employment status, residence and work environment etc.

This section examines the effect of these factors on the reproductive behaviour of the respondents in the survey area.

TABLE 34

Mean Number of Children ever born by selected Socioeconomic Characteristics, Imo State, 1993.

Selected Characteristics	Mean Number of Children Ever Born	Absolute Number
Current Age		
< 24	2.1	53
25 - 29	2.8	157
30 - 34	3.9	203
35 - 39	4.5	140
40 - 49	6.2	88
Education Level		
Primary	4.5	225
Secondary	3.3	211
Tertiary	3.9	224
Duration of Marriage (in Years)		
1 - 5	1.9	157
5 - 10	3.6	236
10 - 15	4.7	118
15+	5.7	257
Place of Residence		
Rural	3.9	372
Urban	3.8	305
Marital Status		
Married	3.9	649
Widowed	4.1	21
Divorced	3.2	12
Marriage Type		
Monogamy	3.9	610
Polygamy	4.0	218
Employment Status before Marriage		
Worked	3.6	248
Did not Work	4.4	521
Working Status		
Working	3.8	322
Not Working	3.9	340
Occupation		
Government Worker	3.9	223
Others	4.9	173
Religion		
Roman Catholics	3.8	307

Protestant	4.1	224
Pentecostals	3.5	94
Traditionals/Atheist	4.0	3
Media Exposure		
Yes	3.8	550
No	4.0	105
Sometimes	4.0	8
Ever Used Family Planning Methods		
Yes	4.0	367
No	3.7	241
Approved Family Planning		
Approved	3.8	480
Disapproved	4.0	119

Table 34 shows that the older women have more children which is expected. The simple reason for this pattern is that the older women have been exposed to more childbearing than the younger ones, who by the time they reach that age may also have the same or higher children ever born.

In the case of education, the relationship is curvilinear. Those with primary education have higher mean followed by those with tertiary education, while the secondary education category is in the middle. This relationship obtains in the case of husband's education level. This relationship is complex. Women who live in the urban centre of our survey have lower past fertility level than the rural women, although the difference is not significant. Women who are working and are in the government service have lower mean parity than the non-working women and those engaged in other sectors of the economy (eg private enterprises). The protestants have higher mean children ever born of 4.1 followed by the atheists and traditional worshippers than the Roman Catholics and the Pentecostals. Those that approved family planning have lower mean parity than those that do not.

Table 34 shows that there exists a curvilinear relationship between education and fertility. Women with primary education have the highest mean number of

children ever born of 4.5 when compared to those with secondary and tertiary qualification who have 3.3 and 3.9 means respectively. In this case, fertility decreases upto secondary level and starts to rise again. The slight increase in the mean number of children ever born of those with tertiary education may be a result of the catch-up effect. Omideyi (1983) claimed that women with higher level of education tend to have higher mean number of children ever born than those of other groups because they want to make up for the years they spent in school.

The pattern whereby the mean number of children ever born of those with primary education is higher than other groups has been reported in some similar studies. Orubuloye (1981) found that women with primary school education had the highest level of fertility, while those with secondary and tertiary education have the lowest. Olusanya (1981) also reported that mean pregnancies and mean livebirths were consistently higher among primary and modern school graduates in Lagos metropolis, Nigeria. The Nigerian Fertility Survey reported the mean number of children ever born for those with primary education to be above 7 and those with secondary education and tertiary education to have 6.6 and 3.9 respectively. Raimi (1986), after collapsing "no education and primary education" found that women with primary education have the highest average and his age-specific fertility rates confirmed

the observation too.

There are possible reasons why women with primary education have been found to exhibit the highest mean children ever born relative to other educational categories. It could be as a result of the duration of primary education in Nigeria which is six years. This does not affect the age at marriage, if the woman is ready and due for marriage. Thus this group tends to marry early and are hence exposed to longer period of childbearing. They also do not have access to family planning methods. On the contrary,those with secondary and tertiary education would have spent longer years in schools - between eleven and twenty-four years, so that they are likely to marry at higher ages than their primary education counterparts.

Thus in the case of the Imo State, there are some cultural forces that tend to encourage high fertility in the rural areas. The extended family system, the emphasis on many children as a sign of wealth,male-child preference, family property distribution among the male children and the influence of parents or older relations etc are some of the factors that tend to encourage high rural fertility. Although, most of these forces are downplayed in Imo State in the urban sector where we have the collection of rural in-migrants with their pronatalist attitude may explain why there is not much

significant difference between rural and urban fertility in Imo State. Because in Igboland, no matter how urbanised one is, his place in the history and development of ones community is often used as a measure of ones success. Hence no Igbo man, will like not to establish his presence in his rural community. Some do this by marrying many wives and having many children, irrespective of their urban experience..

Table 34 shows that those that have worked before marriage or are presently working and are government workers or civil servants have lower mean number of children ever born than their counterparts. The possible reasons for the observed pattern may be that women who work outside the home may find it difficult to combine child-bearing and rearing children with the demands of a job requiring that long periods of time be spent away from home each day. Those employed in modern sectors or government service are more likely to be exposed to modern methods of fertility control and hence have lower family size values. It may also be the result of government policy on maternity leave - an annual leave given to pregnant civil servants. The Imo State government has it as a deliberate policy that no civil servant will be given a maternity leave after the first one except at the interval of two years. This finding on occupation and fertility is supported by other studies

such as Olusanya (1981), Omideyi (1983) and UN (1987). These all reported a lowering effect of employment on fertility of the women.

The table also shows that Catholics who formed 37 percent of our respondents have a reported mean number of children ever born of 3.8, lower than that of the Protestants 4.1 and the traditionalists, 4.0, but higher than the pentecostals. Our finding does not support Ekanem's earlier study in 1974 which found the Catholics to be more fertile than non-Catholics, and Omideyi's 1983 study of Eastern Nigeria. It is not possible to explain why the overall mean number of children ever born of Catholics in Igboland as demonstrated by this analysis is lower than that of the protestants. However, one possible reason could be the paucity of the data for the analysis. Other differentials can be observed from the table.

5.11 FERTILITY PREFERENCES AND CONTRACEPTIVE BEHAVIOUR

Various fertility theories point to the fact that reproductive behaviour is a response to some underlying preferences for children and the constraints on having them imposed by external factors (Easterlin, 1978; Becker, 1960). Fertility decision-making thus becomes a central focus of such theories. Family size desires or preferences are one of the three major attitudinal

elements that constitute the immediate decision content of fertility. The other elements are values and disvalues of children, and the perceptions of and reactions to regulation methods (Asikpata, 1987).

Family size preferences reflect the values which society or individuals in society attach to children. Such preferences actually indicate the demand for children. Lee and Bulatao (1983) has pointed out that the concept of demand for children is intended to capture views on alternate family-building outcomes abstracting from attitudes towards intercourse, abortion, contraception, breastfeeding and other fertility-related behaviour included in the family-building process. Data on fertility preferences are obtained from responses to sample survey questions in which relevant issues are raised.

Empirical studies have shown that family size preferences are strong predictors of future fertility levels. For example, Coombs (1974) found that women with preferences for large families subsequently had more pregnancies and births than those with preferences for smaller families. Studies linking family size preferences to subsequent fertility are limited in developing countries (Coombs, 1979). When we talk of family size preferences, there are two main measures of it. Within the context of a particular number of children desired,

parents may desire at least one child of each sex, a minimum number of children of a particular sex or approximately equal numbers of sons and daughters (Asikpata, 1987). It has generally been hypothesized that preferences for children of a particular sex or combination of sons and daughters may influence family size as well (Williamson, 1976; Arnold, 1986; Feeney, 1986).

Although fertility preference measures have been controversial, the importance of studying family size preferences derives from the fact that these preferences are potentially very important in shaping the fertility of the society. Information on reproductive attitudes and motivation may be helpful in understanding the factors that affect fertility. Data on family size preferences have clear-cut social policy implications. For one, evidence of unwanted fertility (in this study measured by the difference between mean desired family size and actual children ever born) may lead to a strengthening of family planning programmes. Data suggesting a preference for large families or a preference for sons over daughters may lead to a reorientation of development programmes in ways to alter these preferences. Furthermore, data on stated family size preferences are relevant to policy in the sense that they enable planners to assess the relative need of subpopulations for family

planning services.

However, as the NPB (1984) observed "the usefulness of such attitudinal question in a society that is largely uninformed about family planning methods or with a high degree of personal feeling of lack of control towards fertility is however limited. Responses to the questions on family size preferences may be vague or have little relationship to intended actions. The responses may therefore have little intrinsic meaning in themselves and little value in predicting future fertility behaviour".

We should bear these observations in mind while assessing the importance of the information presented here. The stated intentions of the women here will be related to their contraceptive behaviour. Therefore, this section examines information on the fertility desires and contraceptive behaviour among Igbo women.

Respondents in this survey were asked a number of questions regarding their future fertility intentions and their family size ideals. These data provide insights into the number of children women in Igbo expect to have as well as into the family size that they consider desirable for themselves. Knowledge of contraceptive methods, attitudes towards and practice of them will also be explored in this section.

About 69 percent of the respondents expressed desire for more children and less than 10 percent said that they

do not need more children and the rest is undecided.

5.12 Family Size Measures

In order to measure the various family size measures, all the surveyed women were asked relevant questions: "If you would choose exactly the number of children to have in your whole life, how many would that be?"; "What is the ideal number of children for a couple to have? Under the present economic situation in the country, what do you think is the ideal number of children for a couple to have?". The second question was framed to assess the possible effect of the economic situation in the country on the reproductive attitudes of the women. Responses to the above questions are examined while controlling for selected background variables.

We observed that the expressed ideal number of children of Igbo women is low. When this is compared with the expressed ideal number of children in a period of economic depression, we observe that people are indeed feeling the pinch of the economic crunch and would if chance is given, go for a small family size during the period of economic recession.

TABLE 35

Mean Number of Children ever born, Children living, Preferred family size, Ideal number of Children and Ideal number of children in a period of economic depression by selected background characteristics, Imo State, 1993.

Selected Characteristics	Mean Children ever born	Mean Children Living	Mean Desired Family Size	Mean Ideal Number of Children	Mean Ideal Number of Children (SAP)
Age					
<24	2.1	1.9	2.8	3.6	3.1
25 - 29	2.8	2.6	2.4	3.5	2.8
30 - 34	3.9	3.5	2.6	3.5	2.9
35 - 39	4.5	4.1	3.2	3.9	3.4
40 - 49	5.2	4.4	3.1	3.8	3.0
Place of Residence					
Rural	3.9	3.4	3.1	3.9	3.3
Urban	3.8	3.5	2.5	3.5	2.8
Education Level					
Primary	4.5	3.2	3.5	4.3	3.6
Secondary	3.3	3.0	2.4	3.3	2.9
Tertiary	3.9	3.5	2.5	3.5	2.9
Occupation					
Government Worker	3.95	3.6	2.5	3.4	2.9
Others eg traders	4.1	4.1	3.8	4.3	2.9
Working Status					
Currently Working	3.8	3.4	2.5	3.4	2.8
Not Working	3.9	3.4	3.1	4.0	3.3
Religion					

Roman Catholics	3.8	3.4	2.9	3.7	3.1
Protestants	4.1	3.6	2.9	3.7	3.1
Pentecostals	3.5	3.1	2.8	3.6	3.1
Traditionals	4.0	3.3	2.5	4.0	2.8
Total	4.1	3.4	3.1	3.8	3.3

The table examines socioeconomic differentials in the various family size measures. We observed that the expressed desired family size is not translated into action. Whereas the women expressed a desire for small family size of 3.1, they have a mean of 3.4 children living, a difference of 0.3 children more than the expressed desire. This is as a result of lack of conscious fertility limitation - family planning, which if present would have enabled the women to translate the desired family size into reality.

The table also indicates that the children ever born and family size norms tend to be higher among rural women than urban women. The women's educational level is positively related to the measures. The higher the level of education, the smaller the family size norms. Also women who work are likely to have lower family size expectations and norms than those who do not. This obtains also for those in the government service. For example, the stated desired family size of those working is 2.5 compared to that of those not working who have 3.1; the ideal number of children for those working is

3.4 as against 4.0 for those not working. The stated ideal number of children under the structural adjustment programmme is 2.8 and 3.3 for non-government workers. There is also religious differential in the family size measures.

In order to translate family size expectations into actual behaviour, there is a need to introduce family planning methods so that women can achieve their desired family size. This is the only panacea, otherwise we will continue to have a situation where the stated desired family size is far less than the actual number of children living. The excess number of children living over the desired family size indicates that the women would prefer smaller family sizes but have no opportunity to translate that desire into action. It could be as a result of the dominering influence of the husbands or lack of access to family planning methods.

5.13 Sex Preference

A question that is often raised with respect to fertility behaviour is the influence that sex preference may have on a couple's childbearing decisions. Preferences for children of a particular sex reflect differences in role expectations. There is preference for sons because they are expected to provide economic and

social support for their parents. Male children are expected to make financial contributions towards keeping their parent's farm or business going, towards building new houses, paying younger siblings' school fees, taxes, levies etc and they may use paid servants to look after their aged parents. Above all, male children perpetuate the family name by marrying and raising children. They also inherit the family's property after the death of their parents (Orubuloye, 1983, 1987; Odimegwu, 1990).

In order to ascertain the preferences of the women for either boys or girls all the respondents who indicated a desire for additional child or pregnant at the time of the survey were asked whether they would prefer their next child to be a boy or girl. As we have observed earlier in a society where people are fatalistic about individual fertility - a feeling that it is a matter they have no control over, there are many women who either reported "anyone" or "upto God".

TABLE 36

Percentage distribution of surveyed women who prefer their next child to be of a particular sex by selected socio-economic and demographic variables, Imo State, 1993.

	PREFERENCE MEASURES			
Characteristics	Boy	Girl	Anyone	Upto God
Current Age				
<24	30.8	7.7	7.7	53.8
25 - 29	22.0	7.3	24.4	46.3
30 - 34	23.1	7.7	38.5	30.8
35 - 39	35.0	-	25.0	40.0
40 - 49	50.0	-	-	50.0
Education Level				
Primary	13.3	4.4	31.1	51.1
Secondary	31.9	8.5	17.0	42.6
Tertiary	35.9	7.7	30.8	25.6
Place of Residence				
Rural	20.5	4.8	28.9	45.8
Urban	36.0	8.0	24.0	32.0
Number of living sons				
None	46.9	-	9.4	43.8
1	37.8	2.7	24.3	35.1
2	7.5	7.5	47.5	37.5
3	18.8	6.5	31.3	43.3
4+	-	44.4	-	55.6
Number of living daughters				
None	15.6	18.8	25.0	40.6
1	26.2	4.8	26.2	42.9
2	20.0	2.9	45.7	31.4
3	50.0	-	-	50.0

4+	44.4	-	11.1	44.4
Total	26.1	6.7	26.9	40.3

The table indicates there is preference for male child across all the variables. Women of cohort 40 - 49, highly educated and urban respondents would prefer their next child to be a son. We note also from the table that those without any male child would desire moe male children than those with at least a number of male children. It can also be observed that those women with four sons alive would prefer to have at least a daughter (44.4 percent)

On the other hand, more of the women without a daughter left everything to the hand of God to determine (41 percent) while only 16 percent expressed a desire for a male child. Again 44 percent of them with more than four daughters alive would prefer a male child. On the whole, 26 percent of the respondents would prefer a male child while 6.7 would prefer a girl, and about 67.2 percent gave non-numeric answers.

Finally, although the preference for male children is clearly related to the desire for children, we have to stress that the overall family size or the total number of children ever born influences the decision to have more children or cease childbearing than the number of sons alive. Thus the number of children a woman has determines whether she is going to have another or not.

5.14 Knowledge and Approval of Family Planning Methods

For us to be able to examine how widespread the recognition of various family planning methods and how general is the use among the Igbo of Eastern Nigeria, we obtained data on knowledge, attitudes and practice of family planning methods. To determine the level of knowledge of methods of contraception is a precondition for their use. One does not use what she or he does not know that exists. This section considers the level of knowledge and approval and practice of family planning.

To obtain data on the knowledge of contraceptive methods, the women were asked whether they have heard about family planning methods or not. We did not follow the traditional method of asking the respondents to name the methods, rather the interviewers were asked to read out the list of family planning methods to the respondent. Where the respondent is the literate type, she is left alone to tick the ones she knows, has ever used, is currently using and or preferred to use.

In this form we collected information on the ten methods of family planning included in our question. These are seven modern methods namely the pill, intra-uterine devices (IUD), injection, diaphragm, condoms, female sterilization and m,ale sterilization and two traditional methods namely periodic abstinence and withdrawal, and any other method which may include herbs,

rings and breastfeeding. These two categories - modern and traditional, are used in this analysis.

TABLE 37

Percentage distribution of respondents who know, have ever used and are currently using specific contraceptive methods, Imo State 1993.

Contraceptives	Knowledge	Ever Used	Currently using of those who know a method
Any Method	47.6	45	37.7
Modern Methods	58.0		40.9
Pills	50.5	14.2	8.0
Intra-Uterine	33.7	16.0	12.0
Injection	42.2	4.2	3.2
Diaphragm	29.6	3.1	3.0
Condom	47.7	28.2	15.8
Female Sterilization	30.4	3.7	2.9
Male Sterilization	27.2	2.4	3.2
Traditional Method	42.0		59.1
Periodic Abstinence	38.3	31.5	23.5
Withdrawal	46.1	43.3	25.3
Any other Methods e.g. herbs	22.4	13.1	11.3

Table 37 indicateS that less than half (48 percent) of the surveyed women aged 15 - 49 know at least one method of family planning. This means that about 52

percent did not know of any family planning method or that they refused to indicate knowledge of any method. It can also be observed that the most frequently reported known methods are in the following order the pills (51 percent), condom (48 percent), withdrawal method (46.1 percent) and injection (42.2 percent). Such modern methods as male and female sterilization., diaphragm and intra-uterine device are less well-known. As for the traditional methods, 46 percent claimed they know of the withdrawal method or coitus interruptus and 22.4 percent know of any other method like herbs and rings etc.

When we compared the percentage that knows of any method with the national level published by the Nigerian Fertility Survey which was 34 percent, we realised that the Igbo level is higher , although the 47.6 percent is lower than the total level for the South Eastern Nigeria which is 54.4 percent (NPB, 1984).

However, the level of awareness may not be realistic because in the study area and as in all developing countries, discussions on sexual matters and contraception are taken as sensitive issues and personal matters. A woman discussing them is often seen as a prostitute or a woman of easy virtue. Hence, the percentage of those expressing knowledge of any family planning method may be more than this number. They might have refused to indicate knowledge for fear of being seen

as a prostitute.

With the low level of knowledge of family planning methods (at least as expressed in this survey), ever use of any method should be correspondingly low. 45 percent of the women report ever use of any method. It is not clear from the study when they used these methods, whether in marriage, before marriage or for extra-marital sexual relations. Comparing this result with the Nigerian Fertility Survey result for the South Eastern Nigeria from where the present area of study is located, it appears that the level of ever-use increased by about 17 percent - from 28.5 percent in 1982 to 45 percent in 1993). This shows that 55 percent have never used any method.

Of the specific methods, coitus interruptus or withdrawal method is the most commonly used method . 43.3 percent have ever used it. This is followed by the rhythm or periodic abstinence method (31.5 percent). 28.2 percent have ever used condoms. 16.2 percent used IUD, 13 percent used other method like herbs or rings, while the other methods have each been used by less than 5 percent of the women. This showed again that the popular method remains the traditional methods (periodic abstinence and withdrawal).

Currently married women knowing at least a method of contraception were asked whether they are presently using

any method for any reason. Those who answered positively were then asked what method they were using. This findings indicate that 37.7 percent of currently married women are using contraceptive methods. It is not possible for us to decipher why they are using such methods and at what point in their lifetime they do use. This represents 51.5 percent of all currently married ever users.

The methods commonly in use among the surveyed women who are currently using are shown above. The vast majority of current users - 59.1 percent are using the traditional methods. The withdrawal method or coitus interruptus ranks the most currently used method. Among the modern methods, the condom is the most commonly used (15.5 percent) followed by IUD (12 percent), while other methods currently in use account for the rest percent (12.2).

5.15 Attitude toward Family Planning

We asked the respondents a question to ascertain the approval of a couple's using family planning methods, and another question on the wife's views of her husband's attitude toward family planning use. Because the wife's perception of the husband's attitude may be incorrect, we have to take caution in the interpretation of the result . Similarly, the wife's response to her own opinion may be incorrect since she might have given any answer she

felt might satisfy the interviewer. These notwithstanding, the findings may give us an indication of the climate of opinion and may be used as the basis for planning further informational and promotional activities for family planning.

Table 38 shows the percentage distribution of the respondents' and husbands' opinion on family planning by selected background characteristics.

TABLE 38

Percentage distribution of wife's and husband's opinions about family planning by selected variables, Imo State, 1993.

	RESPONDENT'S OPINION		HUSBAND'S OPINION	
Variables	Approved	Disapproved	Approved	Disapproved
Age				
<24	66.7	18.5	55.6	25.9
25 - 29	73.0	17.0	67.3	21.4
30 - 34	77.0	9.8	68.1	16.7
35 - 39	73.6	15.7	67.9	22.1
40 - 49	56.8	23.9	54.5	21.6
Education				
Primary	44.2	24.2	34.9	29.7
Secondary	72.9	14.5	67.3	21.0
Tertiary	83.9	6.3	83.0	6.7
Residence				
Rural	64.3	22.4	54.7	29.3
Urban	76.5	9.8	74.2	12.4
Occupation				
Govt Worker	85.7	6.7	82.1	9.4

Others	35.1	9.2	35.1	10.3
Total	62.4	15.4	56.9	19.7

The table shows that overall, 62.4 percent of the women approve of family planning, while 57 percent indicated that their husbands' approve of family planning. This means that a higher percentage approve of family planning more than their husbands. This perhaps explains the reason why the respondents' desired family size is far less than the total number of children surviving. A husband will refuse family planning because of his doubt over his wife's fidelity. One of the obstacles to reproductive control is gender power relations - often enforced through violence. This tends to shape a woman's sexual and reproductive decision-making. The family planning literature is replete with examples of women who would like to use contraception but who fear their partner's wrath, since men in many cultures link contraception with infidelity and consider having many children a sign of virility. Studies in many developing countries like Mexico and Bangladesh etc have shown that partner approval is the greatest predictor of women's contraceptive use. When partners disapprove, women either forgo contraception, leaving themselves open to all the risks of incessant childbearing or they resort to family planning methods they can use without their

husband's knowledge (Heisie, 1993).

We observe also from the table some differentials in opinion by some background characteristics. Thus the older the women the more they approve of family planning. The highly educated women and their husbands approve of family planning, while the urban respondents approve of family planning more than their rural counterparts. Those involved in government work also approve of family palnning.

5.16 Summary

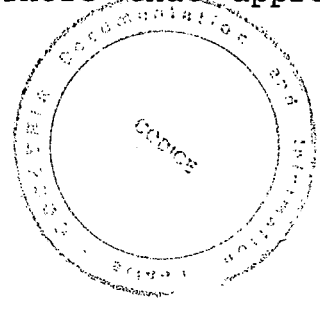
The data presented in this chapter indicate that the area of study is a high fertility region. It shows the comparatively high fertility level that is prevalent in Igbo, relative to other ethnic groups in Nigeria.

Completed family as evidenced by ever married women aged 45-49 (that is those that have virtually reached the end of their reproductive lives) is 6.2. This is higher than the national figure of 5.95 (NPB, 1984). Completed parity among women in the cohort in rural areas averages 6.4 births, while the urban women aged 45-49 have an average of 6.1 births. About 17.4 percent of the women reported themselves as pregnant and only two respondents indicated that they have been barren since marriage.

Cumulative fertility is negatively associated with a woman's age at first marriage and positively associated

with the number of years since marriage. This study shows that the mean parity among ever married women declines sharply with increasing age at marriage, suggesting that an increase in the average age at first marriage would have a substantial influence on reducing fertility level in the society. The result also indicates that those that married early tend to have higher mean number of children ever born.

With respect to socioeconomic status differentials in the mean number of children ever born, we observed substantial differentials in fertility performance. In the case of education, the relationship is curvilinear. Those with primary education have higher mean followed by those with tertiary education, while the secondary education category is in the middle. This relationship obtains in the case of husband's education level. This relationship is complex. Women who live in the urban centre of our survey have lower past fertility level than the rural women, although the difference is not significant. Women who are working and are in the government service have lower mean parity than the non-working women and those engaged in other sectors of the economy (eg private enterprises). The protestants have higher mean children ever born of 4.1 followed by the atheists and traditional worshippers than the Roman Catholics and the Pentecostals. Those that approved



family planning have lower mean parity than those that do not.

When we consider the current fertility level, this too remains high. The total fertility rate is 7.26 and this implies that the average ever married woman was subject to the present schedule of age-specific fertility rate throughout her reproductive period would have 7.26 births before she completed her childbearing. The crude birth rate is 56.5 and the general fertility rate is 250 and total marital fertility rate is 9.8. The schedule of age-specific fertility rate also highlights the tendency for married women to have the majority of their children soon after marriage, hence the peak of childbearing is at ages 25-29. We did not consider the current fertility differential by socioeconomic variables. The results show that more than half of the respondents desired another child (68.8 percent). This includes those that gave non-numeric answers to the question on desire for additional child. Socioeconomic differentials exist in the desire for additional children.

With respect to their family size desires, the respondents indicated that they would like to have 3.1 children. When we compared this with the women's actual family size, the desired family size falls below the actual family size by 0.3. The respondents' ideal family size under normal circumstances is 3.8 but in a period of

economic depression as is experienced in Nigeria, they said that the ideal would be 3.3 children. There are differentials in the various family size measures by selected socioeconomic and demographic characteristics. In the case of sex preference, the result indicates that though the women would prefer to have more male children than females, yet more of them would like to have at least a female child at the end of their reproductive period. The survey shows that Igbo women generally prefer an interval of upto 24 months between births.

This study confirms that knowledge of family planning methods is low: 48 percent of ever married women are reported by this study as knowing at least one method of contraception. A breakdown of this, shows that 58 percent know at least a modern method while 42 percent know at least a traditional method. Among the modern methods, the most widely known method is the pill, followed by the condom, injection, IUD. The withdrawal method is the principal method known among the traditional methods.

Of the percentage knowing at least a method, 45 percent have ever used a method. But we do not know at what period in their life time that they used these methods. Most of the respondents reported ever using traditional methods more than modern methods. In the case of current use, 38 percent are currently using, with

withdrawal and period abstinence methods being the principal methods and followed by the condom and intra-uterine devices. Differentials exist in the knowledge, ever used and current use of contraception by socio-economic and demographic background characteristics.

The vast majority of the respondents approve of family planning: six out of every ten, although their approval is not translated into action. Also more of the respondents' husbands are said to be in support of family planning.

With regard to attitudes concerning the timing of family planning adoption, only 27 percent said women should approve of family planning at any time, while the rest said they support the beginning of family planning at a time when a woman has upto three children living. 50 percent supported that family planning should be adopted at the moment couples have a particular number of children which is about five. While the fertiltiy level is high, with an expressed desire for small family size, there is regretably low modern contraceptive use.

CHAPTER SIX

BREAST-FEEDING AND BIRTH-SPACING BEHAVIOUR

6.1 Collection and Quality of Postpartum Data

There are two sources of data for breast feeding analysis namely current and retrospective data. Both are subject to different errors (Page et al, 1982). Our survey questions apply only to last three births to a woman whether or not they are alive and who breast-fed. These three last births represent births five years preceding the survey. Various questions on postpartum situations were asked (see Appendix A). The interviewers were instructed to identify each child by name to avoid confusion as to the identity of the child being referred to. In cases where twins were involved, questions were asked on one, preferably the first.

The estimation of postpartum patterns in any analysis depends on the nature and object of the survey. If we restrict ourselves to specific births - say births where the number of months breast-fed is known, we will be prone to selection bias that can reach serious proportions. Where women reported the date of their children's births with a reasonable accuracy, it becomes possible to estimate the duration of breast feeding and

its associated variables by using the postpartum status at the time of interview. To circumvent the problem of heaping often noticed in retrospective data, we decided to use the current status data to illustrate the estimation method.

The approach developed by Lesthaeghe and Page (Page et al.,1980) has been detailed by Smith (1981).

The method involves limiting observations only to births which occurred at least in the 24 months before the interview, and constructing an estimate of the proportions of women breast feeding, amenorrheic or abstaining for duration X, by dividing

l_x = number of women currently at any postpartum situation for a child born X month/Number of women with births X months before interview.

Based on the information about whether the child was ever breast-fed, still breast feeding and at what age it was weaned if no longer breast-feeding, we constructed a life table estimating the probability that a woman would still be breast-feeding her last born child at successive months since its birth. The way in which a life table is calculated ensures that the estimated proportion still breast-feeding declines monotonically with months since

last birth. By ordering the proportions of women still breast feeding , amenorrheic or abstaining at progressively longer durations, a complete life table of breast feeding, amenorrheic and abstinence continuation is produced. The life table result is shown in Table 39.

TABLE 39

Conditional monthly probabilities of terminating breast-feeding (B), abstinence (A) and resuming menstruation (M) by months since last birth, Imo State, 1993.

Months	P(B)	T(B)	P(M)	R(M)	P(A)	T(A)
1	0.9796	0.0204	0.7620	0.2300	0.929	0.071
2	0.9771	0.0230	0.6912	0.3088	0.638	0.362
3	0.9567	0.0430	0.5422	0.4578	0.879	0.121
4	0.9412	0.0590	0.5437	0.4963	0.833	0.167
5	0.9065	0.0935	0.4634	0.5376	0.484	0.516
6	0.8846	0.1154	0.4412	0.5588	0.615	0.385
7	0.8347	0.1653	0.4262	0.5738	0.500	0.500
8	0.7896	0.2104	0.4176	0.5824	0.438	0.562
9	0.6772	0.3228	0.3763	0.6237	0.333	0.667
10	0.5660	0.4340	0.3587	0.6413	0.429	0.571
11	0.5363	0.4637	0.3343	0.6657	0.308	0.692
12	0.3407	0.6593	0.2401	0.7599	0.520	0.480
13	*	*	*	*	*	*
14	0.2767	0.7233	0.2239	0.7761	0.414	0.586
15	*	*	*	*	*	*
16	0.2111	0.7424	0.2156	0.7844	0.182	0.828
17	*	*	*	*	*	*
18	0.2111	0.7890	0.2017	0.7983	0.200	0.800
19	*	*	*	*	*	*
20	0.2111	0.7890	0.2017	0.7983	0.143	0.857
21	*	*	*	*	*	*
22	0.2111	0.7890	0.2017	0.7983	0.143	0.857
23	*	*	*	*	*	*
24	0.2028	0.7972	0.2017	0.7983	0.143	0.857

Note:

* Empty cases - no response recorded.

P(B) = Life table proportions still breast feeding at he beginning of each month since last birth.

T(B) = Life table proportions who have terminated breast-feeding at the beginning of each month since last birth.

P(M) = Life table proportions still amenorrheic at the beginning of each month since last birth.

R(M) = Life table proportions that have resumed menstruation at the beginning of each month since last birth.

P(A) = Life table proportions still abstaining from sexual relations at the beginning of each month since last birth.

T(A) = Life table proportions that have terminated abstinence since last birth.

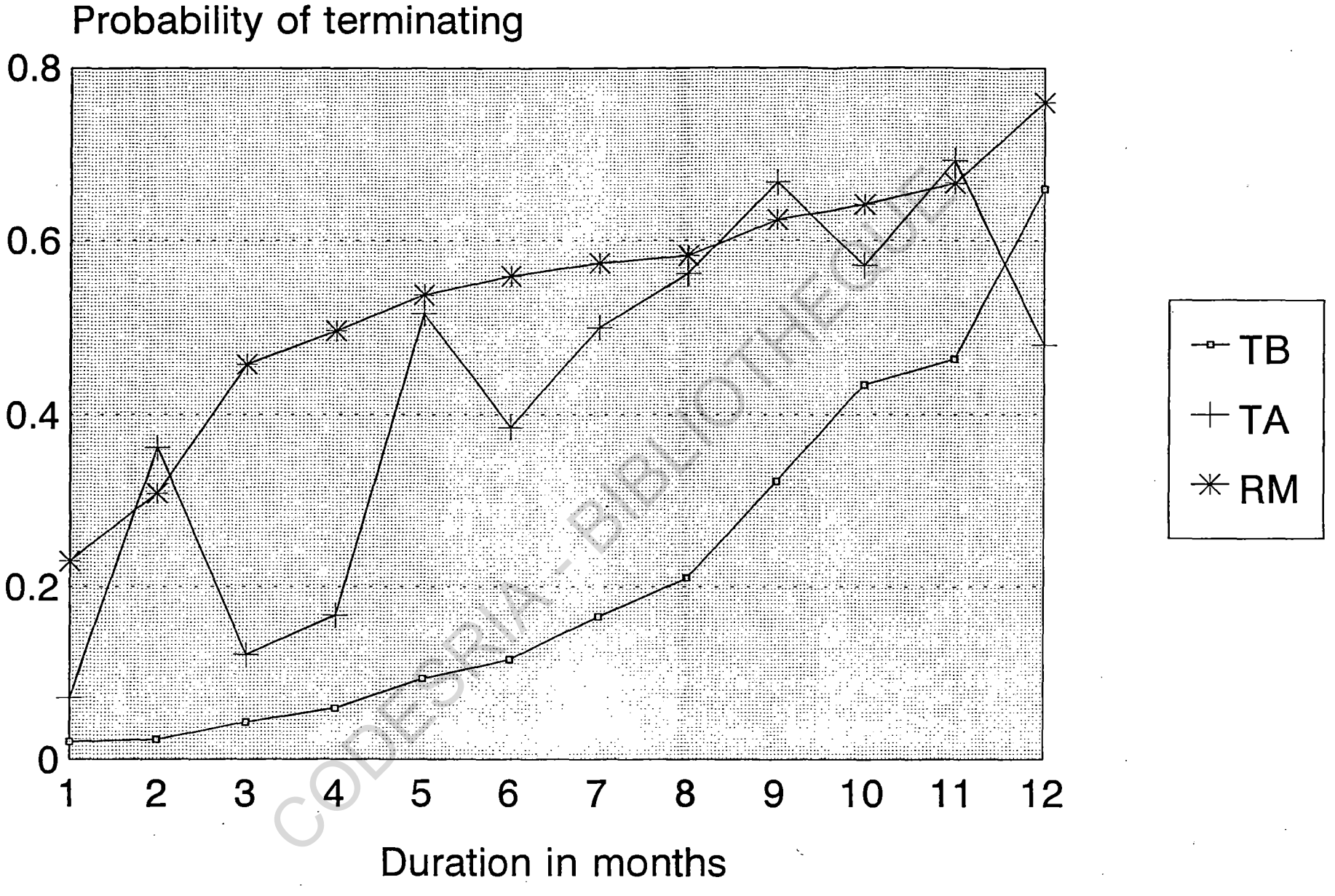


Fig.4: Probabilities of terminating breastfeeding (TB), abstinence (TA), and resuming menstruation (RM), Imo State, 1993

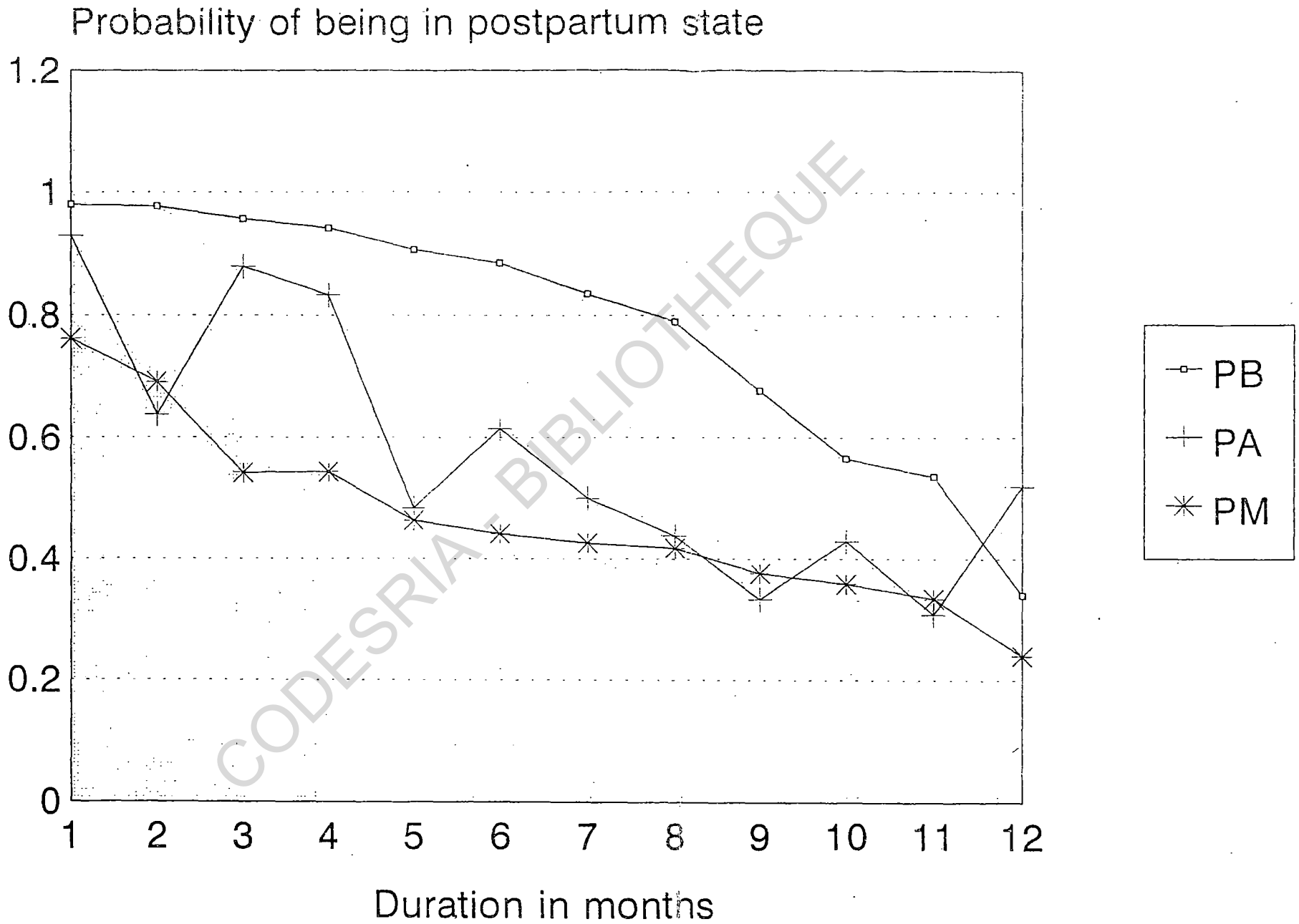


Fig.5: Probability of breastfeeding (PB),amenorrheic and abstaining (PA),Imo State, 1993.

By using a life table technique, estimates were made of the conditional probabilities of terminating breast feeding, abstinence and resuming menstruation for successive periods following a birth. About 2 percent stopped breast-feeding within the first month after pregnancy termination; 12 percent within the sixth months after birth and 32 percent for the 9th month, 67 percent for the 12th month and 79 percent for 18 months. This shows that the probability of terminating breast-feeding increases with increase in months.

Considering the amenorrheic status, we note that about 2.3 percent resumed menstruation within the first month after birth; 56 percent, 62 percent, 75 percent and 80 percent for the 6th month, 9th month, 12th and 18th months respectively. Again this shows that the probability of resuming menstruation increases with increase in duration postpartum, an indication of the relationship between lactation and amenorrhea. We should also note that breast-feeding was terminated much more slowly than amenorrhea. Probability of abstaining or not takes the same pattern, although not consistent. This is an indication of the dependence of these two variables on breast feeding duration. Figures 4 and 5 illustrate further.

6.2 Birth-Spacing Practices: Prevalence and Patterns of Breast-Feeding

This section discusses the pattern and practices of child-spacing in the survey area. Infant feeding practices play a significant and direct role in determining infant health and maternal fertility. The mother is affected by breast feeding through its effects on postpartum infertility which is related to the length of birth intervals and thus fertility levels. These effects are influenced by both the duration and intensity of breast feeding and by the age at which the child receives supplemental foods and liquids (NDHS, 1990).

Despite the view that there are important causal links to be unravelled, detailed quantitative study of these relationships has been neglected. For the area of study nothing is actually known about the practices surrounding infant feeding and the changes in diet and behaviour that may occur in the face of socioeconomic changes. This is the focus of this section, following series of attitudinal questions asked during the survey.

For all the children born in the five years preceding the survey, the question was asked if they ever breast-fed. All the children were breast-fed for some period of time. There is minor differential in the breast-feeding status of the children when some

variables were controlled (see Table 40). We did not ask question on the timing of the initiation of breast feeding.

TABLE 40

Mean Duration of Breast-feeding following all births in the last five years preceding the survey by selected variables, Imo State, 1993.

		MATERNAL AGE		
Variables	% Breastfed	< 30	30+	Total
Education				
Primary	90	11.0	12.7	12.1
Secondary	94	10.0	9.9	10.1
Tertiary	91	9.1	9.4	9.3
Residence				
Rural	82	10.2	10.5	10.4
Urban	78	9.6	9.4	9.5
Working Status				
Working	91	9.4	9.7	9.6
Not Working	96	10.2	11.7	11.2
Work Place				
Away from Home	93	9.3	9.8	9.7
At Home	71	9.6	9.6	9.6
Religion				
RCM	94	10.2	10.5	10.4
Protestant	90	10.0	10.7	10.5

Traditionalists	61	na	na	na
Marital Status				
Married	91	10.2	10.6	10.4
Widowed	88	8.0	11.2	9.9
Divorced	86	na	na	na
Marital Separation				
Living Together	90	10.2	10.4	10.3
Elsewhere	91	9.6	11.6	11.0
Job Compatibility				
Yes	92	9.7	10.5	10.1
No	92	10.2	10.6	10.5
Husband's Education				
Primary	90	10.4	11.5	11.1
Secondary	93	10.2	10.5	10.3
Tertiary	91	9.0	9.8	9.6
Husband's Occupation				
White Collar	92	10.0	9.7	9.8
Others	92	10.0	11.3	10.7
Contraceptive Use				
Yes	98	10.0	9.9	9.9
No	99	10.2	11.0	10.7
Antenatal Care				

Yes	99	10.1	10.6	10.4
No	95	11.4	13.1	12.5
Parity				
1 - 3	99	9.7	9.7	9.7
4 - 6	94	10.8	10.6	10.6
7+	93	12.0	12.2	12.2
Marriage Type				
Monogamy	91	10.1	10.5	10.3
Polygamy	93	10.1	12.2	11.0
Total	80	10.1	10.4	10.6

The table shows that 80 percent of all the children were breast-fed. The mean duration of breast-feeding is 10.6 months. The breast-feeding duration is sensitive to socioeconomic and demographic differences. Considering maternal characteristics, we observe that the mean duration of breastfeeding increases with the age of the respondents. The older women breast feed on the average for 11 months while the younger mothers breast feed for 10 months. This is not surprising because the older mothers are more likely to be traditional in their breast feeding behvaiour than the younger ones who are likely to be highly educated, urbane and working. The younger mothers are more likely to breast feed shorter than their older counterparts and to be working away from home while

the older ones though tend to produce less milk are more traditional and less fecund than younger women so that they may breast feed longer (Chen et al.,1974; Akin et al., 1986). For all women, the mean duration of breast feeding is longer for those with primary education than for the highly educated. The mean duration of breast-feeding decreases as educational level increases. There is also differential by place of residence. The table indicates that rural women on the average breast-feed for 1.5 months longer than their urban counterparts.

We also observe similar differential in breast feeding practice according to the mother's work status. Those currently working breast feed less than those not working, while those engaged in white collar jobs understandably do breast feed for shorter durations than those in other sectors of the economy. Work status may reflect the value of time and the household socioeconomic status. The higher the value of time is in competition with breast feeding, the shorter is likely to be the duration of breast feeding. In all the variables selected, there exists differentials in the mean duration of breast feeding.

The above information shows that breast-feeding initiation is extensive in the area, though its duration varies from one social group to the other. Our data

reveal relationships with socioeconomic status that are consistent with reports in the literature on breast-feeding patterns in the developing society.

The number of breast-feeding in a twenty four hour cycle gives an indication of the cultural norms for breast-feeding practices. With this information, we can ascertain whether supplementation may be providing a substantial proportion of the food the child takes, whether demand feeding is being practised and "what the effect of breast feeding on fertility" might be. Laukaran et al.,(1984) among others have reported that frequent, demand feedings are best suited to maintenace of an adequate milk supply and provision of sufficent intake to maintain breast-feeding as the sole source of nutrition for the first several months of life. Also they report that frequent breast feeding is being associated with a higher probability of continuation of breast-feeding and with lower probability of return to fertility. Women who were currently breast-feeding a child were asked how many times the child was breast-fed during the previous night between sunset and sunrise. The result is summarized below and according to educational and residential categories.

TABLE 41

Percentage currently breast-feeding and the frequency of breast-feeding in the previous 24 hours by education and residence, Imo State, 1993.

		Education Group			Residence	
Number of feeds	Percentage	Primary	Secondary	Tertiary	Rural	Urban
1	1.9	*	1.6	4.4	1.1	3.1
2	5.8	*	6.6	11.1	3.3	9.2
3	12.2	*	16.4	6.7	15.6	7.7
4	10.3	*	8.2	13.3	8.9	12.3
5	39.7	67	36.1	44.4	34.4	47.7
Many Times	30.1	33.3	31.1	31.1	36.7	20.0
Total	100	100	100	100	100	100
Mean	5.3	5.0	4.0	4.0	4.1	4.1

Table 41 shows that Igbo children tend to breast feed frequently. The mean frequency of breast-feeding in the 24 hours preceding the interview is 5.3. There is educational and residential differential in the breast-feeding frequency. Children born to mothers with primary education breast feed more frequently than children in other groups. Those children born to secondary educated mothers breast feed more frequent than those in tertiary education. Also, the children of rural women breast feed more frequent than the urban women. Their mean number of

breast-feeding in the past 24 hours is about the same.

6.3 Breast-feeding and Supplementation by Age

Information obtained on the introduction of supplementary food was analysed. The result forms the basis of this section.

TABLE 42

Percent distribution of breast-feeding children who are receiving other foods and the specific types of food supplementation by age in months, Imo State, 1993.

		TYPES OF OTHER FOOD RECEIVED				
Age in Months	Percent Supplementing	Pap	Infant food	Mashed food	None	Number of children
1 - 2	75.1	38.5	32.6	35.4	7.7	29
3 - 4	94.8	30.9	40.0	26.3	3.4	91
5 - 6	86.5	50.2	23.4	30.4	3.1	38
7 - 8	87.5	52.9	40.0	20.0	20.0	14
9 - 10	75.0	66.7	33.3	33.3	14.3	5
11 - 13	89.0	25.0	27.0	84.2	18.3	9
Total	89.0	29.7	31.7	25.7	13.3	

Most of the children started taking other foods, three months after birth (95 percent). Pap is introduced earlier in the diet of the breast-feeding children. 38.5 percent of those who started supplementing at the first two months were receiving pap. By age 3-4 months they

started receiving infant formula. The table shows that majority of the children were receiving supplements of solid or mushy food (84 percent) by age 11-13 months. This time they must have been weaned or have shown strong desire for solid foods. This result shows that the Igbo women give their children pap at early age compared to baby formula. Overall, the result indicates that 89 percent have started supplementing their food, which is mostly baby food (32 percent), pap (30 percent) and mashed food (36 percent). Only 13 percent did not supplement.

The result was also examined by looking at the educational and residential differences in the introduction of these other foods. Table 43 shows the result.

TABLE 43

Type of supplements by educational level and residence, Imo State, 1993.

		EDUCATIONAL LEVEL			RESIDENCE	
Types of food	Total	Primary	Seconda ry	Tertiar y	Rural	Urban
Pap	29.7	25	32	25.9	33.7	29.5
Baby food	31.7	10	34.8	38.3	33.3	30.0
Mashed food	25.7	50	26.0	27.8	23.2	32.7
None	13.3	15	7.2	8.0	9.8	7.8
Total	100.0	100	100.0	100.0	100.0	100.0

The result from the table is evident that the most given food is the infant formula (32 percent), followed by pap (30 percent) and mashed food such as yam, rice and beans (25 percent). Educational level differences in the type of supplementation are evident. Those with primary education gave more of the mashed food (50 percent), pap (25 percent) and less of the infant formula. This may not be unconnected with the high cost of baby food in the market since the economic depression in the country. It is also very clear from the table of the substantial proportion of mothers in the higher educational group who provide baby food to their children (38.3 percent), compared with mothers with seconary education (35

percent) and those in primary group (10 percent). This may be a reflection of the high income status of the educated women. These women may be gainfully employed in the labour market and the incompatibility of maternal employment with breast-feeding may necessitate their using baby food the more.

From our result the educational differential in the suplementation did not reflect in the residence categories. We expected to see those in the urban area to introduce more of the baby food. But the result shows otherwise. The rural women give baby food and pap more than the urban, while the latter gives more mashed food. This could be attributed to response problem, small urban sample cases compared to the rural (sample variability) or emergence of educated group in the rural area of this survey since it was made a Local Government Headquarters. There are many educated civil servants in the rural area as a result. The most striking feature of Imo State feeding practices with regard to supplemental feedings are very early age at which mothers provide their infants with supplementary food. This happens at the first three to four months. Baby food is the dominant food, followed by pap and the mashed food.

6.4 Nursing Routines.

We asked question on the best food to be given a new child. 74 percent of the women reported breast milk to be the best food for a new baby, citing its nutritional effect on the child as the main reason. When compared with other infant food (manufactured baby foods), the use of pap (locally maize-based food) ranks as the next predominant food given to newly born child.

Sometimes there seems to be divergent views between couples on the type of food to feed an infant. The respondents were asked if they did discuss with their husbands on the type of food to use to feed a new-born child. 50.3 percent said they jointly took a decision on the feeding type. Their attitudes towards breast feeding in a public place such as market place was sought. More than half of the respondents felt unconcerned about where they breast-feed the child. Breast-feeding is always a casual and relaxed behaviour and is common in the public as in the private. Whenever possible, Igbo women sit while breast-feeding or can walk or stand. It all depends on the desire of the women. When the baby is suckling, the mother does little except engage in conversation with people around or be doing menial jobs. For most educated, mothers prefer baby to suckle breast only in secluded place and they prefer baby infant formula in the open.

TABLE 44

Percentage distribution of respondents' attitudes towards breast-feeding in the public by selected variables, Imo State, 1993.

	Attitudes towards breast-feeding in public		
Variables	Shy	Embarrassed	Unconcerned
Residence			
Rural	42.2	36.6	65.2
Urban	57.8	65.2	34.8
Education			
Primary	14.8	20.0	45.8
Secondary	35.8	34.3	29.6
Tertiary	49.4	45.7	24.5
Working Status			
Working	63.2	60.0	39.6
Not Working	36.8	40.0	60.4

The table shows that the educated, urban and working women are more likely to feel embarrassed breast-feeding in the public. This could be one of the reasons why this group breast-feeds less.

Sexual abstinence during breast feeding is a common practice among nursing mothers. To this end we asked some attitudinal questions on the practice. Our finding shows that 53 percent of the respondents do abstain from sex during breast-feeding. The decision to abstain was jointly taken by husband and wife, although some 25

percent of the women claimed that it was their own personal decision not to engage in sex while they were breast-feeding. The women who reported abstaining are mostly the rural women with primary school education and engaged in informal labour. Thus 65.6 percent of women who are in the rural area normally abstain as against those in the urban (34.4 percent). 70.2 percent of the rural women claimed the decision to abstain from sex during breast-feeding is a joint one between the couples. The common reason for sexual abstinence according to the respondents is to avoid unwanted pregnancy and, hence to avoid public reaction to a possible pregnancy that could occur not too long after their last child (53 percent). The other reason given for sexual avoidance is to save the child from sickness that can arise from suckling the breast milk that might be a 'mixture of sperm and milk'. Other reasons are lack of househelps to assist in child care in case she gets pregnant(6.6 percent); high cost of living (1.23 percent); to recover fully from the pains of previous delivery (2.05 percent) and uncleanliness (3.3 percent). To ensure that no mistake occurs from the practice of sexual abstinence, 42 percent of the women claimed that they usually sleep in separate rooms from the husband during nursing to avoid any undue influence that may arise from sleeping with the husband. There is

no known taboo against sexual relations during parturition in this area. The pattern of this behaviour varies when we controlled for residence, education and working status of the women.

Weaning is a process. Mothers first start by introducing food supplements into breast feeding. In the present study, 60.8 percent of the respondents introduce other foods to supplement child's diet in the process of weaning. 32 percent uses other means in the weaning process. For example, some women employ the use of bitter leaves. Usually bitter leaves are rubbed around nipples so that it becomes bitter in the mouth of the baby, thereby discouraging the baby from further desires for breast milk; and others do send their children to their distant relations. In some rare cases the child can stop breast feeding suddenly without attempting to wean.

The major determinant of weaning is the child's physical growth and development. From the study, 66.5 percent gave child's growth and development as the main determinant. This centres around the notion that a child had to reach a certain size and age before weaning. The belief is that premature weaning could endanger the health of the baby. The signs normally observed and seen as indicators of maturity for weaning are teething, ability to eat other foods, and crawling or walking etc.

TABLE 45

Percentage distribution of respondents according to reason for weaning, Imo State, 1993.

Reasons for weaning	Percent
Mother is sick	14.9 (83)
Child's growth and development	66.5 (370)
Pregnancy	1.6 (9)
Age of weaning	13.3 (74)
Bad Breast	3.6 (20)
Total	100.0 (556)

The decision to stop a child from breast feeding is a joint decision between the woman and her husband (49.2 percent) and 24.2 percent said it is the responsibility of the woman .

6.5 DIFFERENTIALS IN POSTPARTUM VARIABLES

It is well-known that child-spacing in sub-saharan Africa is primarily dependent on postpartum abstinence and anovulation - both of which are related to breast feeding (Page, 1981). The latter is usually approximated by its correlate,postpartum amenorrhea. Breast feeding is a well-established determinant of the duration of amenorrhea and thus of fertility variation among societies with natural fertility.

Another postpartum variable is sexual abstinence which confers protection against pregnancy. In some societies, a couple practices abstinence for as long as the woman is amenorrheic. In such a situation, the duration of abstinence and amenorrhea are perfectly related. Some societies have been observed to practice abstinence for the entire breast feeding period; while others observe the postpartum taboos until the child has attained a certain physical development such as walking (Romaniuk, 1967). Abstinence in such cases is expected to have a direct negative (depressing) effect on fertility.

In this section we will discuss each of these postpartum variables and their differentials. We will also discuss briefly the contraceptive behaviour to see the extent it contributes to the birth interval. The net effect of these variables is to lengthen interbirth intervals and cumulatively depress fertility. The mechanisms of operation are both biological and cultural.

A simple cross-tabulation of the postpartum variables would permit the examination of existing socioeconomic and demographic differentials in Imo State. The results are presented and discussed below.

6.6 Postpartum Amenorrhea

One of the ways through which breast feeding influences fertility is through the postpartum amenorrhea. This is the period between birth to the return of the first menstrual period after the last; since ovulation itself is difficult to be identified, the closest possible estimate of the end of amenorrhea is the return of menstruation itself (Ferry et al.,1984). Prolonged lactation tends to protect against pregnancy by delaying return of ovulation and thereby extending the postpartum nonsusceptible period during which the woman is usually amenorrheic. It should be stressed here that reporting on amenorrhea is normally suspect because the termination of the amenorrheic period is non-volitional and more susceptible to memory lapse than breast feeding or abstinence. This is also accentuated by the fact that there is no cultural significance of the variable in any society. The question for this variable was asked for all the births. For those that have resumed menstruation, they were asked how long it took them to menstruate after those births. This result is analyzed below.

TABLE 46

Distribution of ever-married women according to duration of post-partum amenorrhea for all the births in the five year-period, Imo State, 1993.

Duration in months	Number	Percentage	Cumulative percent
1	84	12.4	12.4
2	68	10.0	22.4
3	143	21.1	43.5
4	35	5.2	48.6
5	36	5.3	53.9
6	27	4.0	57.9
7	15	2.2	60.1
8	19	2.8	62.9
9	28	4.1	67.0
10	26	3.8	70.8
11	15	2.2	73.1
12	90	13.3	86.3
13	18	4.7	89.00
14	17	2.5	91.5
15	12	1.8	93.2
16	4	0.6	93.8
17	3	0.4	94.3
18	11	1.6	95.9
19	11	1.6	95.5
20	1	0.2	97.1
21	2	0.3	97.3
22	1	0.2	97.5
23	-	-	-

24	13	1.9	100.0
Total	679	100.0	-
Mean	6.6		

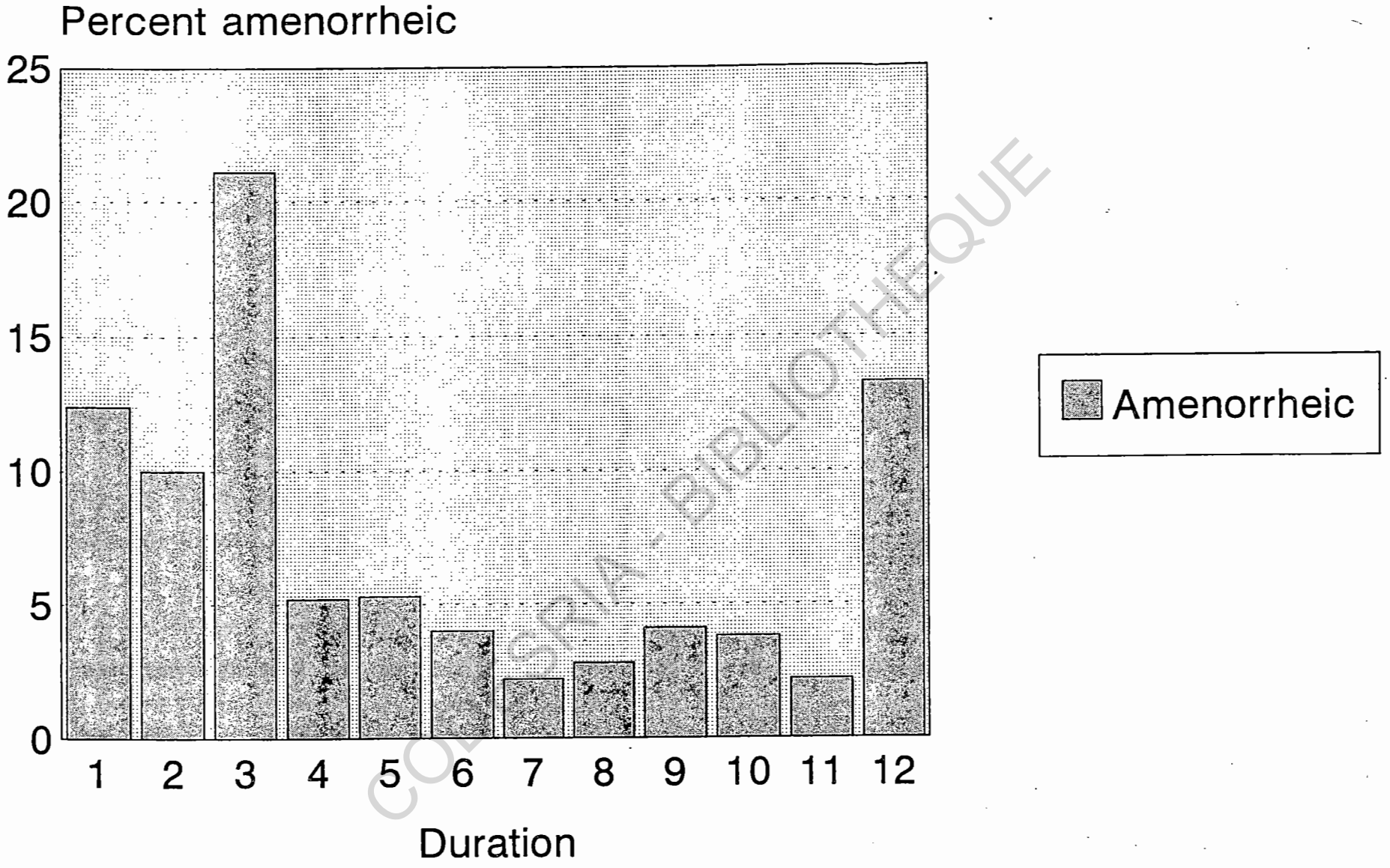


Fig.6: Distribution of ever-married women according to duration of amenorrhea for all the births five years prior to survey, mo State, 1993.

Table 46 and Fig. 6 show the distribution of the ever married women according to duration of amenorrhea. As can be observed from the table and Figure 6 heaping is not much and deviates from the normal patterns. We can observe heaping in durations 1, 2, 3 and 12. The mean duration of postpartum amenorrhea is 6.6 months.

We also examined the effect of different socioeconomic and demographic factors on postpartum amenorrhea. The result is shown below.

TABLE 47

Mean duration of post-partum amenorrhea by selected background characteristics controlling for maternal age, Imo State, 1993.

	MATERNAL AGE		
Variables	< 30	30+	Total
Education			
Primary	7.7	10.0	9.2
Secondary	6.2	5.4	5.8
Tertiary	6.3	5.0	5.2
Residence			
Rural	7.1	7.3	7.2
Urban	6.3	5.6	5.9
Working Status			
Working	7.0	5.6	6.0
Not Working	6.5	7.9	7.3
Occupation Group			
White Collar	7.1	5.2	5.6

Other	7.5	6.5	7.0
Husband's Education			
Primary	7.6	8.3	8.0
Secondary	5.7	5.4	5.5
Tertiary	6.9	5.6	5.9
Husband's Occupation			
White Collar	6.6	6.0	6.2
Others	6.8	7.1	7.0
Contraceptive Use			
Yes	5.1	5.2	5.2
No	7.3	7.4	7.4
Parity			
1 - 3	6.3	5.9	6.2
4 - 6	7.3	6.2	6.5
7+	8.0	8.8	8.8
Age at Supplementation (months)			
1 - 3	7.4	6.3	6.7
4 - 6	6.3	6.7	6.5
7+	6.7	6.6	6.6
Duration of Breastfeeding			
1 - 6	5.4	3.9	4.4
7 - 12	6.9	5.6	6.2
13 - 18	6.3	11.2	10.0
19+	*	*	*

Total	6.7	6.6	6.6

The mean duration of amenorrhea is generally quite consistent with information on breast feeding. Longer duration of amenorrhea periods seem to be associated with longer duration of breast feeding. Women with primary education had higher duration of amenorrhea than those who had been to Secondary and tertiary institutions. Similar variations can be seen in all employment variables,(example, the mother's work status). This group are likely to be educated and urban and have shorter breast-feeding duration and hence the quicker the return of menstruation.

Generally, we observed the mean duration of postpartum amenorrhea decreases with the level of modernization. The relationships between socioeconomic and demographic variables and postpartum amenorrhea are parallel to the observed relationships among those variables with regard to the duration of breast-feeding. Examining the relationship between breast-feeding and amenorrhea, we observed that as the duration of breast-feeding increases, so does the mean duration of amenorrhea.

6.7 Postpartum Sexual Abstinence:

Abstaining from sexual relations immediately after childbirth is a common phenomenon in many societies including the Igbo society. This is chiefly a result of the physiological condition of the women after delivery. However the duration is determined largely by cultural taboos and practices. Whatever the reason for its practice, it has been noted as affecting the reproductive performance of a woman especially when such abstinence extends beyond the period of amenorrhea when the woman is once more fecund. The distribution of abstinence for all the births is shown in Table 48.

TABLE 48

Percentage distribution of respondents according to duration of postpartum sexual abstinence in all the births in the five years before the survey, Imo State, 1993.

Duration	Number	Percent	Cumulative Percent
1	25	4.28	4.28
2	50	8.56	12.84
3	98	16.8	29.62
4	41	7.02	36.64
5	53	9.08	45.72
6	72	12.33	58.05
7	14	2.40	60.45
8	19	3.25	63.70
9	33	5.65	69.35
10	22	3.77	73.12
11	8	1.37	74.49
12	77	13.18	87.67
13	7	1.20	88.87
14	16	2.74	91.61
15	4	0.68	92.30
16	4	0.68	92.98
17	3	0.51	93.49
18	6	1.03	94.52
19	9	1.54	96.06
20	2	0.34	96.40
21	2	0.34	96.75
22	-	-	-
23	1	0.17	96.92

24	18	3.08	100.0
Total	584	100.0	

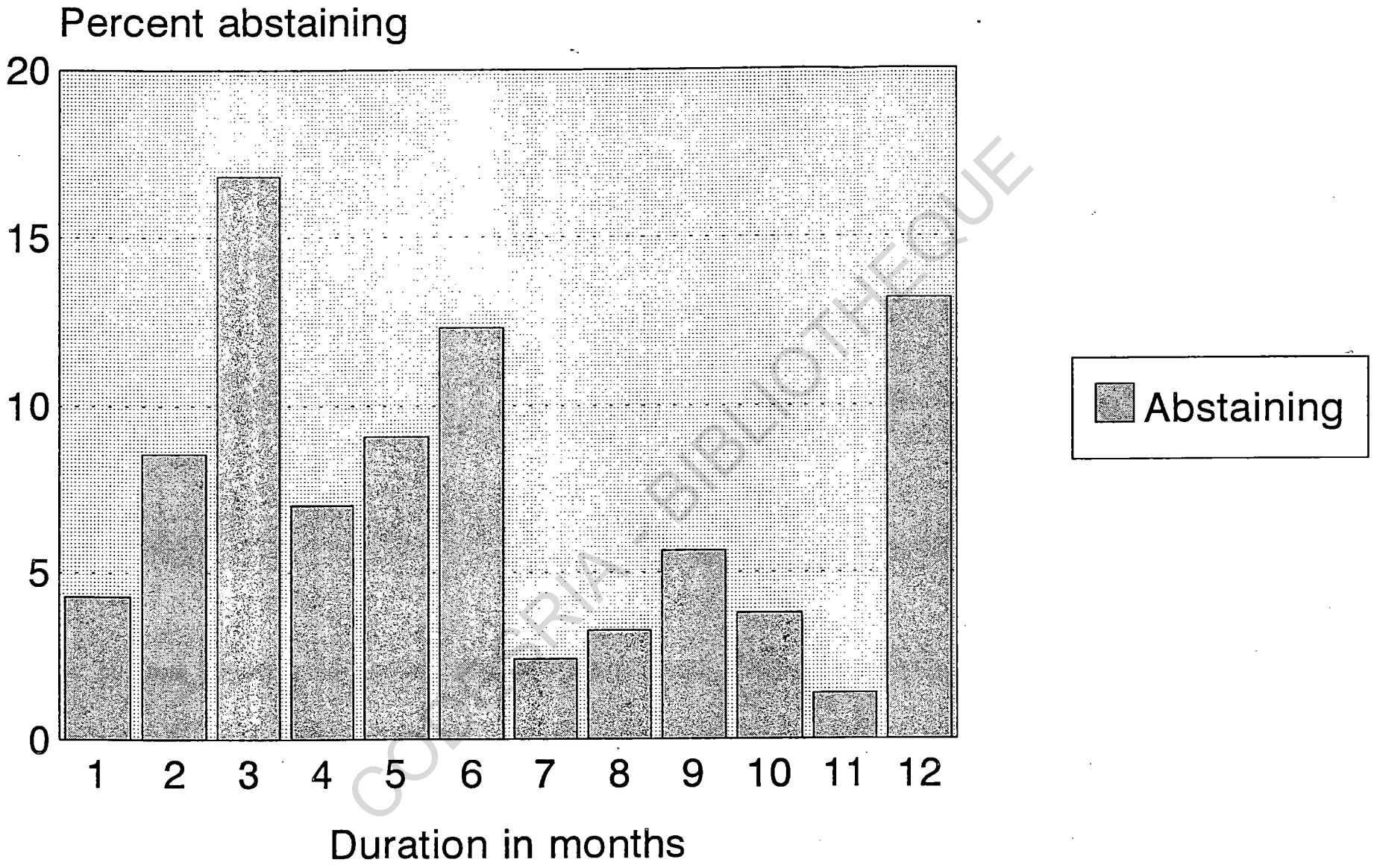


Fig.7: Distribution of ever-married women according to duration of postpartum sexual abstinence for all births five years prior to survey, Imo State, 1993.

The table and Fig. 7 show that heaping is at three-monthly interval up to the twelfth month. We have no information on about 28 percent of the respondents on this variable. The average duration of abstinence is 7.4 months after delivery. This means that on the average most women did not resume sexual relations until after their anovulatory period. About 20 percent resumed sex relations after the third month of child birth, 58.5 percent after the sixth month and 69 percent after the ninth month.

A close relationship exists between duration of abstinence and breast-feeding duration. Beyond the 12th month we observe that women who breast feed longer abstained from sex for a longer period also. The observed mean duration of abstinence by selected socioeconomic characteristics are shown in Table 49.

TABLE 49

Mean duration of post-partum sexual abstinence by selected background characteristics, controlling for maternal age, Imo State, 1993.

	MATERNAL AGE		
Variables	< 30	30+	Total
Education			
Primary	9.3	8.9	9.0
Secondary	7.8	6.4	7.1
Tertiary	4.8	5.6	5.5
Residence			
Rural	8.7	7.3	7.8
Urban	6.6	6.3	6.4
Working Status			
Working	6.6	6.0	6.1
Not Working	8.2	8.0	8.1
Occupation			
White Collar	5.5	5.8	5.7
Others	8.2	6.9	7.4
Religion			
RCM	8.0	6.1	6.9
Protestants	7.6	7.4	7.5
Traditionalist	*	*	*
Marriage Type			
Monogamy	7.6	6.7	7.0
Polygamy	9.1	8.5	8.6
Husband's education			

Primary	9.0	7.9	8.3
Secondary	7.9	7.4	7.7
Tertiary	4.3	5.4	5.2
Occupation			
White Collar	6.5	6.0	6.1
Others	8.3	7.4	7.8
Job compatibility			
Yes	8.7	5.8	7.1
No	7.5	7.0	7.2
Contraceptive use			
Yes	5.6	4.5	4.9
No	8.6	8.3	8.4
Parity			
1 - 3	7.3	6.6	6.9
4 - 6	8.7	6.3	7.0
7+	8.9	8.8	8.7
Duration of breastfeeding			
1 - 6	4.1	4.8	4.6
7 - 12	7.6	6.6	7.0
13 - 18	11.5	9.2	9.8
19+	*	*	*

6.8 Birth Interval

The principal components of birth interval are breast feeding, amenorrhea, abstinence and contraceptive use. We collected data on the birth intervals of all the

births. Table 50 shows the distribution of the birth interval. From the table we can observe that most of the respondents give birth at two year intervals (24 months). The table shows that 65 percent of the children were born at the interval of two years. Those that have children before the two year interval may be as a result of death of the child or sudden pregnancy in the absence of modern contraceptive use.

TABLE 50

Distribution of births by birth interval length, Imo State, 1993.

Duration	Percentage	Cumulative Percentage
10	0.29	0.29
11	1.89	2.18
12	4.06	6.24
13	0.73	6.77
15	0.29	7.26
16	0.15	7.40
17	0.29	7.69
18	7.11	14.80
19	0.15	14.95
20	0.73	15.67
21	0.58	16.26
24	65.17	81.42
25	0.29	81.87
30	1.16	82.87
35	0.29	83.16
36	16.40	99.56
41	0.44	100.0
689	100.0	
Mean	24.8	

We also examined the birth interval differentials among the socioeconomic and demographic variables. The result is shown below in Table 51.

TABLE 51

Mean length of birth interval by selected background characteristics controlling for maternal age, Imo State, 1993.

	MATERNAL AGE		
Variables	< 30	30+	Total
Education			
Primary	25.1	25.5	25.4
Secondary	23.3	24.9	24.1
Tertiary	23.6	25.1	24.9
Residence			
Rural	24.8	26.1	25.6
Urban	22.8	23.9	23.5
Working Status			
Working	23.0	25.3	24.7
Not Working	24.2	24.7	24.6
Occupation Group			
White Collar	24.1	25.3	25.0
Others	23.9	27.3	26.0
Work Environment			
Away from Home	23.8	25.2	24.9
At Home	22.9	24.7	24.2
Marital Separation			

Together	23.9	25.1	24.7
Elsewhere	23.6	25.8	25.0
Religion			
RCM	24.2	25.6	25.0
Protestants	23.4	24.7	24.4
Traditionalist	*	*	*
Husband's education			
Primary	23.6	25.0	24.5
Secondary	23.7	25.2	24.4
Tertiary	24.2	25.3	25.1
Husband Occupation			
White Collar	24.8	25.7	25.4
Others	25.3	24.6	24.1
Duration of breastfeeding			
1 - 6	21.0	24.2	23.2
7 - 12	23.7	25.0	24.5
13 - 18	27.0	26.4	26.5
19+	*	*	*
Amenorrhea duration			
1 - 6	23.7	24.9	24.5
7 - 12	24.2	24.9	24.6
13+	25.8	25.8	25.8
Abstinence duration			
1 - 6	22.7	26.3	25.2
7 - 12	25.2	24.5	24.8

13+	27.0	24.3	25.4
Marriage Type			
Monogamy	23.6	25.1	24.6
Polygamy	26.8	26.2	26.4
Antenatal Care			
Yes	23.7	25.2	24.7
No	27.6	26.7	27.8
No	23.8	25.2	24.8

An examination of the above table shows that there are birth interval differentials by the selected variables. The younger women have shorter birth interval than the older ones (24 and 25 months respectively). There is a curvilinear relationship in the case of respondents' level of education and birth interval. Those with primary education have the highest interval length of 25.2 months; this falls to 24 for those with secondary education and only to rise again to 25 months for the tertiary group.

As expected, the urban women have a shorter birth interval of 23.5 months than the rural women who have birth interval of about 26 months. Similar patterns are obtained in the husband's level of education and occupation group. Those in polygamous unions have longer interval length than those in monogamous unions. In a

polygamous family, the man can allow the nursing wife enough time to rest before the next birth since his sexual desires can be satisfied by the other wife or wives.

The longer the duration of breast feeding, the longer the birth interval. So also the longer the duration of other postpartum variables (amenorrhea and abstinence) the longer the birth interval. It is surprising to observe that those who attended antenatal care have shorter birth interval length than those who did not (25 and 27 months).

6.9 Summary

In this chapter our attention has been focussed on the postpartum variables that could affect fertility and their differentials. These are breast feeding, amenorrhea and postpartum sexual abstinence and birth interval. The pattern of heaping was found to differ a bit from the normal pattern for breast feeding, amenorrhea and abstinence. The mean durations of postpartum variables were 10.6 months for lactation, 6.6 months for amenorrhea and 7.4 months for abstinence and 24.8 months for the birth interval. We also found a general initiation and practice of breast feeding and early introduction of supplementary food. Most women abstain from sexual

relations in the nursing period to protect the health of the baby because of the fear of semen contaminating the breast milk . There was also the fear of early pregnancy soon after the index child. The decision to avoid sex for this period is mostly a joint decision of both husband and wife.

All the postpartum variables varied considerably by selected background characteristics. For instance higher level of education, urban residence, working status and husband's characteristics among others were found to be associated with shorter durations. It was also observed that variation in the breast-feeding duration determine the duration of other variables. This means that the means of amenorrhea and abstinence and birth interval vary directly with the duration of breast feeding.

CHAPTER SEVEN

HYPOTHESES TESTING

7.1 Introduction

In this chapter we want to test our hypotheses. This will prepare us for the examination of the effect of lactation on fertility. Therefore we restate our hypotheses and the assumptions behind each of them. The hypothesis-testing will be done using the cox proportional hazards model.

7.2 Hypotheses

The central hypothesis for this research states that changes in the society brought about by modernization tend to affect the prevalence and duration of breast feeding which in turn affect the level of birth interval, in the absence of contraceptive use. In other words in a natural fertility situation, the higher the level of socioeconomic development or modernization, the shorter the duration of breast-feeding and birth interval, the higher the fertility level. This will happen more so in the area where the use of modern contraception is low or viually non-existent. The various hypotheses to be tested derive from this general one. The following are therefore our specific hypotheses,

(1) The higher the level of education, the shorter the

duration of breast-feeding and birth interval.

(2) The urban women are more likely to have shorter breast-feeding duration and birth interval than the rural women. These two hypotheses can be reframed thus: "the more modernized a woman is, the shorter she breast feeds and the shorter the birth interval in a natural fertility society."

The better educated a woman is, the higher her socioeconomic status, the less likely she is to start breast feeding and if she starts, on average she breast feeds for a shorter period (Akin et al.,1981). The urban women are more likely to breast feed for shorter duration than the rural women. Thus as urbanization, education and standard of living increase, the overall practice of breast-feeding will decline unless other changes counteract them. Because the length of breast-feeding and the length of postpartum infecundity are linked, any substantial shortening of the average duration of breast-feeding will lead to a higher fertility unless contraceptive use increase fast enough to offset the effect. In a society where there is low or no use of modern contraception, shorter breast-feeding duration could lead to shorter birth interval. In such uncontrolled child-bearing the completed family size is bound to be large, other things being equal.

Modernization can affect the practice of postpartum sexual abstinence which will lead to a shortening of the duration through early resumption of sexual relations. The practice of postpartum sexual abstinence adds to the birth interval when it extends longer than postpartum amenorrhea. Young, educated and urban women tend therefore to breast feed less, abstain for a shorter period, both of which will decrease the birth interval length and hence lead to increase in fertility level. The effect of modernization on the breast feeding-fertility relationship in the area of study becomes a matter of concern when we realize that the people of the area are yet aversed to contraceptive use. The variables that are used as proxies for modernization in this analysis are education, residence, husband's education and occupation, ownership of durable asset (e.g, car).

(3) Paid labour force participation in the formal sector by women increases the probability of early use of breast milk substitutes, leading to shorter breast-feeding period and birth intervals. In other words, women who are gainfully employed are more likely to breast feed for shorter period and have shorter birth interval than those involved in other (traditional) economic activities such as trading, weaving etc.

The purpose of this hypothesis is to investigate the

effect of women's working patterns on infant feeding practices. The labour force participation of women has often been alleged to be detrimental to maternal obligation of breast-feeding. Because breast-feeding requires physical contact between mother and child on a regular basis, a conflict has arisen between the promotion of breast feeding and increasing participation of women in modern industrial economic activities outside the home. Logically, the location of place of work and her child care arrangements do affect her opportunities to breast feed. Information on this relationship has been reviewed and found to be inconclusive.

Women in the study area are known for their industry and determination to improve their lot in the labour market. It becomes necessary to examine the employment-lactation relationship in the study area. The following variables were used as proxy for women's working pattern: working status, occupation group, location of work place and hours spent at work place and means of going to work place.

(4) Women who receive prenatal care from doctors and nurses and midwives and or experienced labour and delivery in a government medical center (hospital) are less likely to breast feed for longer period than those who did the same in private hospital and traditional

birth homes. This means that they are more likely to terminate breast feeding early and to use breast milk substitutes than those who did the same in private hospital and traditional birth homes.

A proper understanding of the role of health care sector in determining infant feeding practices requires an examination of the relationship between selected variables of health care and mother's choices and decision-making on how to feed their children. Studies in this direction have been done in the developed countries where modern health care systems have long been established, although these studies have not dealt with negative effects of health service (Winikoff and Baer, 1980). An examination of the role of health care factors is an important component of this study to know the extent our health care systems affect the practice and duration of breast feeding. Because of the declining influence of traditional support systems and increasing contact with modern health care system, the health care sector is a major focus of activities for the promotion of breast feeding. The variables that were selected for this analysis are prenatal care, place of delivery, delivery attendant, doctor's instruction after delivery on the best infant feeding type and type of delivery.

(6) The fifth hypothesis is, "Women who live in an

extended family household and or are living with their parents-in-law are more likely to breast feed for longer durations, have longer birth intervals than those who live in the nuclear households". It is suspected that the sociocultural environment one lives tend to affect her postpartum behaviour. For instance a woman living with her parents-in-law is likely to engage in long breast feeding because of the pressures from the older relations. The older women do provide the new mother with models to emulate and advise her how to breast-feed successfully. They are also very much around to help in family chore thereby lessening the burden of the woman which will incidentally provide enough time for her to breast-feed the child. To investigate this relationship, we asked the respondents whether they have lived with their parents-in-laws, whether it is possible to go to work place with their new baby, their media exposure, child care arrangement and if they are living in extended family households.

There are other factors we selected to test their effect on the overall hypothesis of the study. These include:

Additional children desired: This is a proxy for use of breast feeding to delay pregnancy. Those who do not want any more children are expected to breast feed more than

those who want more children.

Use of Contraceptives during birth interval: In general, women who use contraception are less likely to breast-feed than those who do not. The type of contraceptive used tends to affect the quality of breast milk. This is the reason why those who use hormonal contraceptives e.g. pill, tend to breast feed less. In this survey, we asked a general question if one was using a method to avoid pregnancy during the period of nursing. Most of them who responded gave the traditional methods as the methods they are using to avoid pregnancy. Negative relationship has been found between contraceptive use and breast feeding (Millman, 1985).

Age: Smith and Ferry (1984) have shown that the relationship between maternal age and duration of breast feeding is complex since it affected age-parity interaction. Where age and parity are used, it may lead to unstable regression coefficients. In the following analysis, we shall use the two alternatively.

Sex of Child: A child's sex can influence breast feeding duration in two ways. In societies where there is a strong son preference, women may wish to terminate breast feeding on attaining the desired target sex ratio of births. In such case a woman can avoid pregnancy either through breast feeding her last child longer than the

previous ones. Where children are breast-fed for short time, it is possible that the women may intentionally breast feed male children longer than the female ones. This means that the birth interval for a male child will be longer than that for a female child.

Survival Status: The survival status of a preceding child and that of the index child determine the duration of the breast feeding.

Perception of cost of baby formula: It is assumed here that where women perceive the cost of breast milk substitutes as costly, they tend to breast feed more. Similarly where mothers perceive breast feeding as the best diet for a nursling, they are very likely to breast feed more than otherwise.

7.3 The Proportional Hazard Model

The model used for this analysis has been described fully in Chapter Three of the dissertation. The model is generally specified as:

$$\lambda(t;Z) = \lambda(t)\exp^{\beta x}$$

where

$$\lambda(t;Z)$$

is the instateneous failure probability at time t associated with covariate vector Z; beta is a vector of unknown parameters and

λ_o

is the underlying hazard at time t. The hazards we are looking for are the hazards or risks of weaning, being non-amenorrheic (menstruating) and terminating abstinence. The model means that there is a possibility that the value of the independent variable may change over time. The coefficients are estimated by exponentiation to get the relative risk for individuals with characteristics breast-feeding relative to those without the characteristics. That is, the exponent indicates the risk of weaning or menstruating or resuming sex for an individual with a characteristic of breast-feeding relative to those without that particular characteristic or omitted category. It represents a proportionate decrease or increase in risks associated with the characteristics. We use exponents to keep the rates positive. In the interpretation of hazards model, a negative coefficient implies that the hazrad decreases and therefore a longer survival time. That shows that the event (weaning) is less likely to occur; while positive

coefficient implies increase in hazard and a more likely occurrence of the event.

The dependent variables are the duration of breast feeding, amenorrhea and abstinence and birth interval length measured as continuous variables.

To fully understand the key variables and their effect on breast feeding, we separated the variables into four separate hypotheses. All the variables connected with modernization were grouped together, vis-a-vis those for health care utilization, work patterns of the women and biological factors. A preliminary examination of the variables enables us to identify the important variables which we included in each of the hazard model (A to D).

7.4 Model A: Biological model

TABLE 52

Relative Risk of Weaning by Biological variables, Imo State, 1993.

Variables	Relative Risk	Beta Coefficients	t-statistics
Parity			
1 - 3	R.C	R.C	
4 - 6	0.61	-0.49966	0.000+
7+	0.46	-0.779187	0.000+
Sex of child			
Male	0.98	-0.02572	0.767
Female	R.C		
Contraceptive Use			
Using	1.11	0.106612	0.254
Not Used	R.C		

Log likelihood = -3234.2302
Chi2 (38) = 47.08
Prob > chi2 = 0.0000
Mean = 10.6
+ Significant at 99 percent

As Table 52 shows, parity has significant effect on breast feeding duration. Relative to the children whose mothers have three children, the risk of weaning at any time following a birth for those whose mothers have 4 - 6 and 7 or more children is respectively 0.61 and 0.46. After controlling for other biological variables, the

parity variable results in lower hazard and therefore a longer survival time. This is demonstrated by the negative sign of the beta coefficients which is interpreted to mean that women with higher parities are more likely to breast feed longer than those with fewer children. The reference category is the group that is young, educated, urban and working and many have started childbearing. Those that have more children can afford to breast feed longer either as a contraceptive device to delay further pregnancy or as strategy to regain strength. It could equally be a sign of termination of child bearing.

The effect of sex preference is in the hypothesized diirection, although the result is not significant. The result shows that those whose sex is male have 0.98 relative risk of weaning relative to the reference category. It implies that the male children are breast fed longer than the female children going by the negative sign of the beta coefficient. This supports the notion of sex preference in breast feeding behaviour. A woman with a female child will likely breast feed for shorter duration. This will enable her to stop breast-feeding and be pregnant again. The effect of contraceptive use on breast-feeding duration is in the expected direction, though not significant, when other variables are

controlled. The result supports the view that those that use contraceptive methods during their breast-feeding period do wean early or when contraceptive users do breast feed, the duration is several months shorter.

7.5 Model B: Sociocultural model.

This model measures the effect of socioeconomic and cultural variables on the duration of breast-feeding. We adopt this same method of using either the stepwise regression or correlation matrix to identify the important variables. Having identified them, they were introduced into the hazard model to measure the risk of weaning. The result is shown below.

TABLE 53

Relative Risk of Weaning by socio-economic and culural variables, Imo State, 1993.

Variables	Relative Risk	Beta Coefficient	t-statistics
Ever lived with husband's parents*	0.88	- 0.133	0.150
Best food for Infants			
Baby Formula	RC	RC	
Breast Milk	0.83	- 0.184	0.139
Education			
Primary	RC	RC	
Secondary	1.37	0.318	0.006+
Tertiary	1.52	0.420	0.002**
Residence			
Urban	RC	RC	
Rural	0.89	- 0.113	0.270
Car Ownership*	1.27	0.237	0.022+
Couple's Relation			
Cordial	1.21	0.191	0.088***
Not Cordial	RC	RC	
Abstains *	0.87	- 0.134	0.146

Log likelihood = -3227.4142
Chi2 (8) = 60.72
Prob > Chi2 = 0.0000
* See Chapter Three for the Dummies
+ Significant at 95 percent
** Significant at 99 percent
*** Significant at 90 percent

In this model, the significant variables are education, car ownership and couple's relation. Children whose mothers have tertiary education have 52 percent greater risk of being weaned than those whose mothers have primary education. The same thing applies to those with secondary education. Car ownership taken as a proxy for social status in the area has the expected significant effect. Children born to mothers in high social status (that is those that own private cars) have higher risk of being weaned than those in the relative category (that do not have). The result of this model indicates the effect of residence on risk of weaning is insignificant, when other socioeconomic variables were controlled. But this we suspected to be the result of the confounding effect of education. So when we tested for the significance of residence separately as a variable of influence, we found it to be significant. This means that residence alone as a modernization element could affect the duration of breast feeding in the area.

Where the husband-wife relationship is cordial, there tends to be shorter breast feeding duration. This is shown in the result too, relative to those in reference category. In a situation where the husband-wife relationship is not cordial, the wife may decide to embark on prolonged breast-feeding with the purpose of

denying the husband access to sexual pleasure. This could be a reason for this result.

7.6 Model C: Women's working patterns or employment model

This model is used to test the effect of employment variables on the duration of breast-feeding. The variables finally introduced are work status, work place, occupation group, child care arrangements and job compatibility. The result of the model indicates that work status and job compatibility are the significant variables. When we tested for the significance of other insignificant employment variables separately each of them became significant. This calls for further and more detailed examination of the effect of employment on breast-feeding in the area. All the variables related to women's employment have to be considered in such a study. The absence of significant effect of these variables in the model is seen as a result of the confounding effect of work status. The results of the variables after the testing are in parentheses.

TABLE 54

Relative Risk of Weaning Controlling for women's employment variables, Imo State, 1993.

Variables	Relative Risk	Beta Coefficient	t-statistics
Work Status			
Working	1.80	0.586	0.0000+
Not Working	RC	RC	
Work Place			
Away from Home	0.88 (1.49)	- 0.129 (0.395)	0.328 (0.000)
Nearer/At Home	RC	RC	
Occupation Group			
White Collar	1.22 (1.77)	0.201 (0.569)	0.157 (0.000)+
Others	RC	RC	
Child Care			
Househelps	0.83 (1.33)	- 0.183 (0.288)	0.231 (0.034)*
Relations	RC	RC	
Job Compatibility			
Yes	0.70	- 0.352	0.043*
No	RC	RC	

Log likelihood = -3233.0645
Chi2 (5) = 49.41
Prob > Chi2 = 0.0000
+ Significant at 99 percent
* Significant at 95 percent.

7.7 Model D: Health care Utilization Model

This model attempts to measure the effect of health-related variables on the duration of breast-feeding. This is based on the assumption that health factors affect the duration of breast-feeding as specified in our hypothesis. A preliminary examination of the variables with a stepwise regression identified the important variables that were estimated in the hazard model to measure their effect on breast-feeding duration.

TABLE 55

Relative Risks of Weaning controlling for Health care Utilization variables, Imo State, 1993.

Variables	Relative Risk	Beta Coefficient	T-statistic
Antenatal Care*	0.55	- 0.606	0.053+
Delivery Place			
Govt Hospital	RC	RC	
Priv.Hospital	0.76	- 0.270	0.769
Trad.Homes	0.64	- 0.454	0.207
Birth Attendants			
Doctors	1.92	0.652	0.056+
Nurses	1.36	0.305	0.337
TBA	RC	RC	
Perception of public breast-feeding			
Shy	1.72	0.540	0.000***
Uncorncerned	RC	RC	
Perception of Best food			
Baby Milk	RC	RC	
Breast Milk	0.72	- 0.323	0.007**
Survival Status			
Alive	0.92	- 0.085	0.543
Dead	RC	RC	

Loglikelihood = -3218.4883 Chi2(8) = 78.57
Prob > Chi2 = 0.0000 + Significant at 90 percent
** Significant at 95 percent *** Significant at 99 percent

The result indicates that only antenatal care or visit, delivery by medical doctors, perception of breast-feeding in the public place and the perception of best infant food are the significant variables. The model shows that children whose mothers attended prenatal clinical services have the highest risk of being weaned relative to those whose mothers did not attend. This is also supported by the birth attendant variable, whereby children whose mothers were attended to by medical doctors have 92 percent greater risk of weaning relative to those delivered by traditional birth attendants. This raises the suspicion that modern health sectors may be a factor in the decline in breast-feeding duration. There is an important need to investigate fully the role of health sectors in breast-feeding pattern and duration.

As expected, children whose mothers are shy of breast-feeding in the public or in the open , have 72 percent risk of weaning relative to those whose mothers can breast-feed anywhere. Also, those whose mothers perceive breast milk as the best infant food have 38 percent greater risk of weaning relative to those whose mother prefer infant formula.

7.8 The Composite Model

The composite model brings all the variables discussed in Models A to D together to assess the important variables that determine the duration of breast feeding in the area of study. The strategy adopted is that we selected only those variables that have significant independent effects. Ten variables were finally selected, and these include parity, education, car ownership, work status, job compatibility, ever lived with husband's parents, antenatal care, birth attendant, perception of breast-feeding in the public, perception of best infant food. These variables were introduced in our hazard model with a view to testing our hypotheses. The result of the analysis is shown in Table 56.

TABLE 56

Relative Risk of Weaning by selected significant variables from Models A - B, Imo State, 1993.

Variables	Relative Risks	Beta Coefficient	t-statistics
Parity			
1 - 3	RC	RC	
4 - 6	0.62	- 0.476	0.000+
7+	0.62	- 0.481	0.002+
Education			
Primary	RC	RC	
Secondary	1.18 (1.29)	0.162 (0.251)	0.151 (0.028)**
Tertiary	1.05 (1.42)	0.052 (0.348)	0.742 (0.009)**
Ever lived with husband's parents*	0.90	- 0.105	0.244
Car Ownership*	1.22	0.198	0.058***
Work Status			
Working	1.51	0.409	0.001+
Not Working	RC	RC	
Job Compatibility*	1.18	0.164	0.342
Antenatal Care*	1.46	0.379	0.232
Birth Attendant			
Doctors	1.78	0.575	0.024**
Midwives	1.51	0.412	0.090**
Trad. Birth Attendants	RC	RC	

Perception of breast-feeding in the open			
Shy	1.63	0.491	0.000+
Unconcerned	RC	RC	
Perception of best infant food			
Infant formula	RC	RC	
Breast milk	0.75	- 0.293	0.017**

Log Likelihood = - 3186.3125
Chi2 (13) = 142.92
Prob > Chi2 = 0.0000
+ Significant at 99 percent
** Significant at 95 percent
*** Significant at 90 percent

The model shows that seven of the variables are significant in the explanation of breast-feeding duration in Imo State, Nigeria. These are parity, education, car ownership, working status, birth attendant, perception of breast-feeding in a public place and perception of best food for an infant. Relative to children whose mothers have one to three children, the risk of terminating breast feeding for those whose mothers have 4 - 6 and more than seven children is 0.62 and 0.62. After controlling for other facotrs, parity results in lower hazard and therefore a longer survival time (or period of weaning). The beta coefficients are negative implying

that children whose mothers have higher parities are more likely to breast feed longer than those with fewer children. In other words the women with fewer children will breast feed shorter than those with larger number of children. The women with higher parities can afford to breast feed longer either as a contraceptive device to delay further pregnancy or as strategy to rest for a long while before another pregnancy so that they can regain enough strength. It could equally be a way of stopping further child bearing.

The effect of education in the composite model is interesting. The result shows that relative to those whose mothers have primary education, children whose mothers have secondary education have 18 percent greater risk of weaning. The result shows that both the secondary and tertiary education categories do influence the duration of breast-feeding, although the result is insignificant in this model. On the face value we could conclude that this is an indication that education is not an important factor in determining the duration of breast-feeding. When we tested the significance of education with working status variable, education variables became significant. Similarly when we removed the employment variable from the model and examined the effect of education, we observed it was

significant.(result in the parentheses). We thus conclude that work variable acted as a confounding variable, obscuring the effect of education.

The result reveals also that those who are working currently are more likely to breast feed for a shorter period than those not working in the public service. The result shows that children whose mothers are currently working have 51 percent greater risk of weaning relative to those whose mothers are involved in other activities or not employed. This result is highly statistically significant. The reason for this is not far fetched. It is not possible for those that are employed to go to place of work with their babies because of the bureaucratic structures in the place of employment. The employment-lactation relationship is manifested also in other work variables considered in Model C. When we considered the job compatibility variable (whether it is possible to go to work place with baby or not), we found that those who said it is compatible have 18 percent greater risks of weaning relative to those mothers who cannot go to work place with the baby. In the composite model, the result was not significant but significant in Model C.

The effect of antenatal care shows that children whose mothers attended prenatal clinic have 46 percent

greater risk of weaning relative to those whose mothers did not attend. The result is not significant. But another health services variable showed a significant effect on the risk of weaning. The model shows that children whose mothers were delivered by medical doctors have 78 percent greater risk of weaning relative to those delivered by traditional birth attendants. Also those whose mothers were helped during delivery by nurses and midwives have 51 percent greater risk of weaning relative to the reference category. Though this supports our hypothesis, it is not clear from this study why women who were delivered by modern medical personnel should breast-feed for a shorter period than those who were helped by traditional birth attendants. One possible reason that we can adduce for this finding may be that those who attend modern hospitals and hence are attended to by medical personnel are likely to be the educated, working and urban-based class. However, there is need for a thorough examination of the effect of health sector on breast-feeding duration with a view to explaining this relationship.

Another significant variable in this relationship is the perception of breast-feeding in a public place. The result shows that children whose mothers feel shy or embarrassed breast-feeding in the public have 63 percent

greater risk of weaning relative to those in the reference category. This is interpreted to mean that these women are very likely to breast-feed for a shorter time than those who feel unconcerned about where they breast-feed their babies. The significance level is high. Similarly, children whose mothers perceive breast-milk as the best food for the babies have 0.75 percent risk of weaning relative to the reference category. The beta coefficient is negative, indicating that these women are likely to breast-feed for a longer time that those perceive infant formula or baby food as the best food.

Examining the effect of the presence of elder relations on the duration of breast-feeding, the result shows that children whose mothers have ever lived with their husband's parents have 0.90 greater risk of weaning relative to those that have not. The coefficient is negative, an indication that those who have lived or are living with husband's parents are more likely to breast-feed for a longer time than otherwise. The relationship, however is not significant.

From the model, we make the following deductions about the hypotheses:

1. The first hypothesis is stated thus "The more modernized a woman is, the more likely she breast-feeds for shorter duration".

Similarly, "Women who are working or participate in the paid labour force are likely to breast-feed for a shorter duration than those not working". These two hypotheses are supported by the result of our analysis.

2. The third proposition is that "women who receive prenatal care from doctors, nurses and midwives are less likely to initiate breast feeding and more likely to terminate early than those who did the same in private hospital and traditional birth homes. The components of this hypothesis are:

- Those who receive prenatal care breast feed less. This is true from the model but the relationship is not significant.

-Those who were attended to by doctors and nurses are likely to breast feed less than those attended to by traditional birth attendants. The hypothesis is supported and statistically insignificant.

3. Women living in an extended family household and or with their parents-in-law are likely to breast feed longer and have longer birth interval. This hypothesis is based on the assumption that a woman's social and cultural milieu tend to influence her behavioural pattern. This means that the environment one lives influences her reproductive behaviour. In a society where the influence of extended family is pervasive, it is

expected that the older relations, parents,, siblings etc will influence a woman's breast feeding duration. The hypothesis is supported by the model, but the result is not significant.

Another deduction from the model is that those in the high social economic status do breast feed for a shorter duration than those in the lower social position. Those that own a car behave thus.

7.9 Lactation and Postpartum Amenorrhea

This section focuses on another postpartum variable called amenorrhea. The effect of breast feeding on amenorrhea is always taken as an indicator of the fertility-inhibiting effect of breast feeding.

The period of postpartum amenorrhea following a birth in which most women do not ovulate and hence are not at risk of pregnancy is a function of the duration and nature of breast feeding. Generally, the longer a woman breast-feeds a baby, the longer she waits before introducing supplements, the longer will be the period of amenorrhea (ZDHS, 1988). Thus the duration of breast feeding is associated with the period of amenorrhea. However this association is cut short if there is an early introduction of supplements. The effect of early supplementation is that it reduces the intensity and

duration of breast-feeding which will invariably lead to the resumption of menstruation. The relationship between breast-feeding and amenorrhea has earlier been examined in Chapter Six (Table 47).

To examine the factors that determine the duration of amenorrhea, our preliminary examination yielded six important variables. The variables selected are age, education, feeding frequency, type of supplements, age at supplementation, type of supplementary foods and duration of breast-feeding. Breast-feeding frequency as used here refers to the number of times the woman breast fed her child in the 24 hours preceding the date of the survey. This frequency as used here is a measure of the regularity of feeding pattern. We categorized the frequency into three categories 1 - 3, 4 - 6 and 7+ feeds. Types of food was categorized as follows pap, baby food (manufactured foods), solids (mushy beans, rice, yam etc). We used the hazards model to predict the relative risk of resumption of menses. We first considered the socioeconomic variables which indicated that education has a highly significant effect. When we examined the proximate factors such as types of supplements, breast-feeding duration, they were all significant. Their significance did not change when we examined all the variables together.

TABLE 57

Proportional Hazard model of determinants of post-partum amenorrheic duration or Relative Risk of resuming menses by selected variables, Imo State, 1993.

Variables	Relative Risk	Beta Coefficient	t-statistics
Maternal Age			
< 30	0.81	- 0.206	0.074+
30+	RC	RC	
Education			
Primary	RC	RC	
Secondary	1.80	0.5878	0.000++
Tertiary	1.86	0.61839	0.000++
Feeding Frequency			
1 - 3	RC	RC	
4 - 6	0.03	- 3.6835	0.621
7+	0.004	- 5.6101	0.351
Type of Supplements			
Pap	RC	RC	
Baby Food	0.004	- 5.474	0.020*+
Solid Foods	0.004	- 5.476	0.001++
Age at Supplementation			
1 - 3 months	RC	RC	
4 - 6	0.71	- 0.3437	0.001++
7+	*	*	*
Duration of Breast-feeding			

1 - 6	RC	RC	
7 - 12	1.04	0.04204	0.825
13 - 18	0.69	- 0.3677	0.095+
19+	0.87	- 1.4273	0.020*+

Log likelihood = - 2045.239
Chi2(11) = 314.46
Prob > chi2 = 0.0000
+ Significant at 90 percent
*+ Significant at 95 percent
++ Significant at 99 percent

The significant variables are age, education, age of introducing supplementation, type of food introduced, duration of breast feeding. The children whose mothers are young have about 0.81 times the risk of being non-amenorrheic relative to the older group. The time to terminate amenorrhea is longer in this age group than in the older age group.

Education effect on amenorrhea is not unexpected. This is because since it has earlier had effect on the duration of breast feeding it will definitely play a significant role in the duration of amenorrhea. Thus, both those with secondary and tertiary education have greater risk of resuming menstruation relative to those with primary education. Those with these categories of education breast feed at shorter period and the shorter the breast-feeding period, the earlier the resumption of menstruation. This is what this model is illustrating.

We expected that feeding frequency will affect the duration of amenorrhea, but our result is to the contrary. Although the result indicates that feeding frequency has greater effect on amenorrhea duration, the effect is not statistically significant. When we separated all the postpartum-related variables and re-estimated the model, the effect still remains insignificant.

Age at supplementation is expected to have an important effect on amenorrhea outcome. For instance, it is expected that the earlier the introduction of supplementary food the earlier the return of menstruation which indicates a termination of amenorrhea. Thus the table shows that those who started giving the child other foods at the category 4 - 6 months have 0.71 times risk of resuming menstruation relative to the reference group. The earlier the introduction of supplementary foods, the earlier the termination of breast-feeding or reduced suckling frequency and hence the earlier the resumption of menstruation.

Related to the effect of age at supplementation is the type of supplementary food given to the child. This too has serious impact on the duration of amenorrhea. Early supplementation with baby food and mashy (solid) foods have significant effects on amenorrhea duration relative

to those who use pap.

As expected breast-feeding duration is one of the factors that determine the extent of amenorrhea after any birth. The longer the lactation duration, the longer the duration of amenorrhea. From the result, those that breast feed for 7 - 12 months have 1.04 times the risk for those who breast feed 1 - 6 months. Those that do breast feed for a longer period of 19 months or more have greater risks of being amenorrheic relative to the reference group. To decide on the robustness of the result, we selected only those lactation-related variables and re-estimated the regression. The result remained the same thereby confirming our earlier result. The finding here is not different from the ones from other sources (Rutstein, 1991). The result of this section of the analysis shows that age and education are the exogenous variables, while age at supplementation, supplementary food type and breast-feeding duration are the proximate determinants of post-partum amenorrhea.

7.10 Lactation and post-partum sexual abstinence

The practice of postpartum abstinence in some societies especially sub-saharan Africa adds to the birth interval when it extends beyond the return of fecundity (Lesthaeghe et al.,1981). Prolonged abstinence beyond the

return of fecundity is often related to prolonged breast-feeding, especially in a society where it is believed that sexual relations at such a time leads to the contamination of the milk which jeopardizes the health of the child. We have earlier examined the abstinence differential.

In this section, we examined the impact of lactation on this cultural practice. We selected some variables that are of theoretical relevance through the stepwise regression. The variables are marital separation, education, contraceptive use at the time of birth, survival status and breast-feeding durations. The dependent variable is the duration of abstinence before the resumption of sex, collected for all the births. The same hazard model was used and the model was significant. Table 58 shows the result.

TABLE 58

Proportional Hazard model of the social determinants of post-partum sexual abstinence, Imo State, 1993.

Variables	Relative Risk	Beta Coefficient	t-statistics
Education			
Primary	RC	RC	
Secondary	1.25 (1.40)	0.222 (0.337)	0.123 (0.015)**
Tertiary	1.42 (1.50)	0.349 (0.405)	0.032** (0.012)**
Marital Separation			
Elsewhere	0.89	- 0.1150	0.430
Living Together	RC	RC	
Contraceptive Use*	2.35	0.853	0.000++
Survival Status			
Alive	0.55	- 0.590	0.000++
Dead	RC	RC	
Duration of Breast-feeding			
1 - 6	RC	RC	
7 - 12	0.88 (0.79)	- 0.126 (- 0.235)	0.525 (0.232)
13 - 18	0.79 (0.67)	- 0.236 (- 0.398)	0.307 (0.084)*+
19+	0.44 (0.52)	- 0.810 (- 0.648)	0.188 (0.289)

Log likelihood = - 1813.2184 Chi2 (8) = 88.52
Prob > Chi2 = 0.0000 *+ Significant at 90 percent
** Significant at 95 percent ++ Significant at 99 percent
Note: Figures in parentheses refer to result obtained when the effect of that variable is measured separately.

The following variables have significant effects on the duration of postpartum sexual abstinence: education, contraceptive use following a child birth, survival status of the child and duration of breast-feeding. Education is a single most important factor determining the duration of sexual abstinence. In the general model, only the tertiary category is significant. The result shows that women who are highly educated have 42 percent greater risk of resuming sex so soon after a child birth relative to the omitted category. That of the secondary category is in the expected direction, though not significant. The two education groups were significant at 99 percent when modelled alone. Also when we considered the operation of education on post-partum sexual abstinence alone without other intermediate variables, education still remained significant (result in parentheses). The educated women are not controlled by cultural imperatives, hence they can easily abandon the traditional practice of sexual abstinence. This same group sees sex in marriage as an expression of love and should be enjoyed irrespective of the condition. Many studies have supported this view (Lesthaeghe et al.,1981).

Contraceptive use following a birth is a major

determinant of postpartum sexual abstinence period in the area. The risk of terminating sexual abstinence following the births of children whose mothers use contraception is 2.35 times the risk for those in the reference category. The result is significant. The women who use a method to avoid another pregnancy too close to the previous one are very much likely to begin sexual abstinence since the use of the method confers protection against any unwanted pregnancy. As expected, survival status of a child is a strong determinant of the practice and duration of abstinence. Where a child survives, the duration of abstinence is likely to be longer than when the child is dead. The risk of terminating abstinence when a child is alive is 0.55 times the risk when the child is not dead. The sign of the coefficient is negative and this gives indication that in such a situation, the woman abstains for a longer time. Another variable with a powerful effect on the duration of abstinence is the duration of breast-feeding. The result shows that the longer the breast-feeding duration the longer the duration for abstinence. The significance of the variable disappeared once contraceptive and survival status variables were added. This suggested a confounding effect of these variables. When education and breast-feeding duration were examined alone, breast-feeding duration became

significant. One variable that is expected to have effect on abstinence durations is amenorrhea duration because lactation affects amenorrhea status which in turn affects abstinence, especially in a situation where the woman decides to wait for her menstrual cycle before resuming sexual activity. This led us to introduce amenorrhea duration as an intervening variable in the model. The result shows that the duration of amenorrhea affects the duration of abstinence, implying that actually some women will like to start sex relations the moment their menstruation starts. This indicates that most Igbo women do not resume sexual activity until the resumption of their menstrual period. This waiting enables them to monitor their ovulatory cycle to avoid resuming sexual relations at a time she is ovulatory. The result is not significant, however. We suspected the confounding influence of breast-feeding duration. When therefore we removed breast-feeding duration as a variable from the model and replaced it with amenorrhea duration, the effect of amenorrhea duration became significant at the longest duration (result not shown). It should also be observed in this model that marital separation indeed determines how long a woman stays before resuming sexual relations after birth, although it is not significant.

In summary we have been able to identify the

variables that have impact on abstinence, but more important variables are breast-feeding duration, (amenorrhea duration alone), survival status, birth order and contraceptive use following a birth, and education. The first four significant variables are the proximate determinants while education represents the socioeconomic factors. All the models used in this section are significant, and the direction of the effect of all the variables is as expected though some of the variables are insignificant statistically. This could be the problem of model specification, data sampling variability or the smallness of the cases.

7.11 Lactation and Birth Interval Length

The operation of the postpartum variables and the use of contraception tend to add to the interval between births on these women. In other words, birth interval in any society is a function of the duration of postpartum variable and or contraception where they are in use. We have noted that the durations of breast-feeding, amenorrhea and abstinence in this area are 10.6, 6.6 and 7.4 months respectively.

Before looking at the contribution of the postpartum variables to the birth interval, we examined the factors that affect the birth interval length. We selected the

variables that are of theoretical importance which have earlier been used in the model for risk of weaning. The dependent variable is the birth interval length for all the births in the five years preceding the study. The dependent variable is treated as a continuous variable.

TABLE 59

Relative Risks of Weaning and pregnancy by selected socio-economic and biological variables, Imo State,1993

	Risk of Weaning		Risk of Pregnancy (birth interval length)	
Variables	Relative Risk	Confidence Interval	Relative Risk	Confidence Interval
Parity				
1 - 3	RC		RC	
4 - 6	0.62	99 %	0.99	NS
7+	0.62	99 %	1.18	NS
Education				
Primary	RC		RC	
Secondary	1.15 (1.26)	NS (95 %)	1.10	NS
Tertiary	1.01 (1.38)	NS (95 %)	1.02	NS
Car Ownership*	1.22	90 %	0.96	NS
Everlived with husband's parents*	0.90	NS	0.89	NS
Work Status				
Working	1.54	99 %	1.03	NS

Not Working	RC		RC	
Job Compatibility*	1.20	NS	0.99	NS
Contraceptive Use*	1.06	NS	1.05	NS
Antenatal Care*	1.64	NS	1.17	NS
Birth Attendant				
Doctors	1.87	95 %	1.06	NS
Nurses	1.54	90 %	0.99	NS
T. B. A	RC		RC	
Duration of Breast-feeding				
1 - 6	RC		RC	
7 - 12	NA	NA	0.88	NS
13 - 18	NA	NA	0.75	95 %
19+	NA	NA	0.25	95 %
Abstinence Status*	1.18	90 %	1.18	90 %

NA - Not Applicable
NS - Not Significant
RC - Reference Category

The independent variables used in this model were selected after a preliminary exploratory analysis of the data with particular reference to the duration of breast-feeding. Th result of the hazard shows that the respondents' socioeconomic and demographic

characteristics have no significant effect on the length of birth interval. This means that as a group these variables did not add much to our understanding of the birth interval length in Igboland. Even contraceptive use variable has no effect. Two variables are significant in this model, namely breast-feeding duration and abstinence status. We tested for interaction between these independent variables and breast-feeding variable. The result (not shown here) showed that these independent variables interacted with breast-feeding to effect birth interval length or the risk of another pregnancy. This led us to conclude that the independent variables alone could not determine the risk of pregnancy in the area. The test of significance of interaction and of each of the variables demonstrates that these variables act through breast-feeding to effect birth interval length. That is , for the Igbo women, one could argue that whatever effects socioeconomic variables have on birth interval, these effects are manifested through the principal determinant of birth interval length which is breast-feeding duration.

The result shows that the longer the duration of breast-feeding, the longer the birth interval length. Thus the hazard of pregnancy decreases with increase in the duration of breast-feeding. Abstinence status is in

the same direction. The effect of contraceptive use is not significant, possibly because of its low use or its interaction with abstinence status and breast-feeding. For breast-feeding, by causing a delay in the resumption of ovulation in post-partum period, it postpones the next pregnancy and lengthens the subsequent interval. It could also do this by encouraging the practice of sexual abstinence.

Further examination of theoretical variables shows that the maternal age is a strong predictor of birth interval length with the younger women more likely to have a shorter birth interval than the older women. This is associated with changes in fecundability due to age. The older women are less fecund and hence are liable to have longer birth interval. Despite this biological explanation, there is a socially-mediated component in that as the woman's oldest child reaches childbearing age, she is likely to want to cease childbearing and begin to assume the role of grandmother. The result supports the view that the traditional religious group tend to have longer birth interval than the other groups. The traditional group have the strongest significant effect on the birth interval length.

Generally the effect of education on birth interval is negative, the sign of the coefficient does vary from

country to country and according to model specification and often is not statistically insignificant (Guilkey et al.,1988). Our result shows that education has a positive effect - indicating that those with secondary and tertiary education are very likely to have shorter birth interval relative to those in the omitted category in a natural fertility setting. The effect though is weak. Though this model may be imperfect in its specification, yet it points to breast-feeding as the main determinant of birth interval length.

7.12 Summary

The examination of the theoretical variables show vividly the ones that are important determinants of child-spacing variables. The preliminary examination of these variables was to help select the key variables that would be used for the final testing of our hypotheses.

At the first level, the biological model showed that parity is the only biological determinant of duration of breast-feeding, while sex preference has no significant effect, although the relationship is in the expected direction. The socio-cultural model indicated that such variables as education, car ownership and couples' relationship are the determinants. Only work status and job compatibility (measured by the ability of a woman to

go to place of work with the new baby) are the employment variables that are significant independent variables. The health care model demonstrated that antenatal care, delivery by medical doctors, perception of breast-feeding in the public place and perception of best infant food are the significant variables.

The composite model was used to test our hypotheses. The analysis showed that out of ten selected variables entered into the model, seven of them were found to be significant determinants of duration of breast-feeding in Igbo. These are parity, education, car ownership, working status, birth attendant, perception of breast-feeding in a public place, perception of best food for an infant. Our analysis showed also that education and rural-urban residence are no longer necessary variables when other variables are brought in. All the hypotheses were confirmed and are in the expected direction, except that the last hypothesis based on cultural variable though in the expected direction but not statistically significant.

Examining the factors affecting the risk of resuming menses, our result showed that age, education, age of introducing supplementation, type of food introduced and breast-feeding duration are all significant variables. The determinants of risk of terminating sexual abstinence after birth are education,

contraceptive use following a child birth, survival status of the child and duration of breast-feeding. In these post-partum variables, breast-feeding duration is highly significant.

The analysis also confirmed that breast-feeding is the principipal determinant of birth interval length. All other variables interact with breast-feeding to affect birth interval length. The key role of breast-feeding in determining the direction of other post-partum variables is quite appreciated in this analysis.

CHAPTER EIGHT

THE EFFECT OF LACTATION ON FERTILITY IN IMO STATE

In this chapter, we attempt to investigate the effect of breast-feeding on fertility in the area of study. The evaluation of the impact of breast-feeding on fertility is complex mainly because of the problem of reciprocal causality. Breast-feeding practices influence the time that will elapse before a woman becomes susceptible again to conception. But the advent of a new pregnancy can in turn force her to stop the baby from breast-feeding (Page, et al, 1982).

8.1 Social and Biological Mechanisms of Breast-feeding Effect on Fertility.

The fertility-inhibiting effect of breast-feeding arises from its role in lengthening the period of post-partum amenorrhea and the accompanying inhibition of anovulation. The post-partum period of non-susceptibility is determined by the duration of either post-partum amenorrhea and post-partum sexual abstinence whichever is longer. In this study, as the post-partum amenorrhea averages only 6.6 months, abstinence which averages 7.4 months is mainly responsible for preventing conception.

To understand this mechanism properly, we decided to examine the effect of all the post-partum variables on

fertility. The conventional method of measuring this impact has been to use amenorrhea duration and birth interval length as proxies for fertility. We deviate from this method by including abstinence duration, since its duration is longer than that of amenorrhea.

Because of the fact that the duration of abstinence is longer than amenorrhea, the logical starting point is to examine the relationship between breast-feeding and abstinence. To investigate such relationship, we decided to take into account such socioeconomic and demographic variables as age, education, residence and parity. The analysis is focussed on the duration of abstinence following the births in the five years preceding the survey.

TABLE 60

Estimated Mean Duration of Post-partum Abstinence following births in the five years preceding the survey by Breast-feeding Duration and Selected Variables, Imo State, 1993.

Panel A	EDUCATIONAL STATUS			
Breast-feeding Duration	Primary	Secondary	Tertiary	Total
1 - 6	6.0	4.1	4.4	4.6
7 - 12	8.6	7.3	5.7	7.0
13 - 18	11.5	8.7	7.0	10.6
19+	9.0	15.3	*	12.0
Overall	9.6	7.2	5.5	7.4
Panel B	PARITY			
Duration	1 - 3	4 - 6	7+	Total
1 - 6	4.9	4.4	4.4	4.6
7 - 12	7.2	6.8	7.9	7.1
13 - 18	8.5	11.5	10.5	10.6
19+	*	6.7	17.3	12.0
Overall	7.0	7.5	9.1	7.5

The table shows the mean duration of abstinence by breast-feeding durations and parity in Imo State. It shows that generally there is a positive relationship between breast-feeding and post-partum abstinence. An increase in the duration of breast-feeding tends to prolong the length of abstinence. This pattern is observed in the different categories of education and parity. For instance, for those with primary education

qualification, the more they breast-feed, the longer they abstain from sexual relations.

The mean duration of abstinence tends to increase as the number of children ever born increases. For instance, those that have seven or more children and breast-feed for more than nineteen months have longer period of abstinence. These differences also exist when we consider the duration by residence and age.

Breast-feeding does also affect fertility through amenorrhea or temporary cessation of ovulation. This lasts on average about two months between non-breast-feeding women and increases to roughly about 60 percent to 70 percent of the average duration of breast-feeding in a population practising such phenomenon (Afaf Babie, 1986). An examination of the relationship between breast-feeding and amenorrhea controlling for education, residence and parity shows that an increase in breast-feeding durations will and do prolong the length of amenorrhea. Longer durations of breast-feeding among those with primary education lead to longer period for the return of menstruation especially when compared with highly educated women. The mean duration of amenorrhea tends to increase as the number of children ever born increased (See Table 61). In general, this investigation of the relationship shows the role that breast-feeding

plays in prolonging the average duration of amenorrhea following birth among Igbo women.

TABLE 61

Mean duration of Post-partum amenorrhea by Breast-feeding Durations and Demographic variables, Imo State, 1993.

	EDUCATIONAL STATUS			
Breast-feeding Duration	Primary	Secondary	Tertiary	Total
1 - 6	5.6	5.1	3.1	4.4
7 - 12	8.3	5.6	5.6	6.2
13 - 18	11.8	8.1	7.1	10.5
19+	15.7	15.7	*	12.5
Overall Mean	9.7	5.9	5.3	6.9
PANEL B	PARITY			
Duration	1 - 3	4 - 6	7+	Total
1 - 6	5.2	3.6	3.2	4.4
7 - 12	6.3	6.0	6.9	6.2
13 - 18	5.7	11.9	12.0	10.5
19 +	*	*	21.8	12.5
Overall Mean	6.1	7.0	9.4	6.9
Panel C	RESIDENCE			
Duration	Rural	Urban	Total	
1 - 6	5.9	3.6	4.4	
7 - 12	6.3	6.3	6.3	
13 - 18	11.5	7.2	10.5	
19+	15.7	3.3	9.5	

Overall Mean	7.7	5.9	7.0	

8.2 Lactation, Amenorrhea and Contraceptive use.

The relationship between lactation, amenorrhea and contraceptive use is complex and various studies have tried to disentangle the effect (McCan et al.,1981; Rutstein, 1991). The need for understanding the relationship is clear because after the few months of breast-feeding, nursing women run an increasing risk of being pregnant, and they have strong reason to avoid pregnancy. Some contraceptives are known to have effect on the production of breast milk and do contaminate the milk. Some also affect the production of milk.

TABLE 62

Contraceptive method used by post-partum status, Imo State, 1993.

	Lactation Status		Amenorrheic Status	
Method Types	Yes	No	Yes	No
Pill	2.2	4.1	4.3	1.7
IUD	1.6	2.0	2.0	0.8
Injection	-	0.3	0.3	-
Condom	4.4	6.4	8.6	-
Rythm (Abstinence)	6.0	3.8	4.5	4.2
Withdrawal	2.7	3.5	3.5	2.5
Others	-	-	-	0.8

Total	22.3	42.0	14.7	48.4

Where a nursing mother decides to use such method, she may decide to quit breast-feeding, and others may decide not to use because they know that they will not be pregnant as far as they are breast-feeding. Table 62 shows the use of family planning method following the birth of current child according to method used by breast-feeding women.

The table shows that 2.2 percent use the hormonal method (pill) among those currently breast-feeding and 4.1 percent for those not breast-feeding. We also note that those breast-feeding mostly use the abstinence method (6.0 percent) while those not breast-feeding, principally use condom (6.4 percent) and the pill (4.1). Considering the amenorrheic status, respondents who are amenorrheic use mostly the condom (8.6 percent), postpartum abstinence (4.5 percent) and pill (4.3).

Generally 22.3 percent of mothers who are breast-feeding contracept and 14.7 percent who are amenorrheic are using family planning method. It should be observed that the use of contraception varies between breast feeding and non-breast-feeding women. The percent using modern method (pill, condom) is more in the non-lactating

group, while those breast feeding practice sexual abstinence (6.0 percent). This may be an indication that women are aware of the likely effect of the modern methods on breast milk production and quality or a general lack of knowledge. But it is more likely an expression of the aversions of the people of the area to the use of modern contraceptives.

Though the postpartum amenorrhea is a period when a woman is not susceptible to pregnancy, protection against pregnancy during this period is not complete since ovulation usually precedes menstruation by two weeks and hence nonsusceptibility typically ends two weeks before the end of amenorrhea (Knodel et al.,1985). This indicates that it is possible for a woman to become pregnant prior to the return of menses if contraception takes place immediately following the first ovulation. The risk is reduced by the fact that the first or two menstrual cycles for some women are anovulatory (see McCan et al.,1981 for detailed discussion).

Ideally therefore, if complete protection against pregnancy is desired, a woman would need to initiate contraception before the end of her period of amenorrhea. But where contraception is initiated for more than a few weeks before the return of menses, the protection from pregnancy through family planning will be of no effect

since pregnancy hardly occurs in an amenorrheic status.

We look at this relationship because it is of interest to family planning programme since delay of family planning use until the return of menstruation subjects would-be clients to the risk of unwanted pregnancy. The extent of overlap between contraceptive use and amenorrhea is also of demographic interest since it has strong implications for assessment of the fertility-inhibiting effect of contraceptive use within a population (Millman, 1984).

TABLE 63

Contraceptive use by amenorrheic status, months since last birth and rural-urban residence for the surveyed women aged 15 - 49 Imo State, 1993.*

	Percent Contracepting by duration since birth		
Rural	1 - 6	7 - 12	13+
Amenorrheic	12.5	6.1	13.6
NonAmenorrheic	87.5+	90.9+	81.8+
Urban			
Amenorrheic	-	3.7	-
NonAmenorrheic	100.0	92.6	80.0

* Calculation is based on the number of women currently breast-feeding to capture the current position. Result excluded nonresponses.
+ Not necessarily the modern methods but traditional methods which are common in the area.

Table 63 shows that for both rural and urban women, use of contraceptive method following birth is far more likely if menstruation has started than if not. For instance among the rural women who are amenorrheic for 1 - 6, 7 - 12 and 13 or more months, 13 percent, 6.1 and 14 percent of the women respectively contracept while for those nonamenorrheic, 88, 91 and 82 percent are doing something to prevent or avoid another pregnancy so soon. Similar scenario is observed in the case of urban women. The result indicates that among these women who are contracepting, the most important stimulus for the practice of family planning is the return of menses. Though the result gave a high percentage of contraceptive use, it does not indicate that there is a high contraceptive prevalent rate in this area.

TABLE 64

Contraceptive use by amenorrhea status duration post-partum and method of use for surveyed women, Imo State, 1993.

	Percent currently contracepting months postpartum		
Amenorrheic Status and Method	1 - 6	7 - 12	13+
Amenorrheic			
Pill	-	4.3	-
IUD	-	-	-
Injection	-	-	-
Condom	-	-	-
Abstinence	16.7	4.3	4.3
Withdrawal	-	-	4.3
Others	-	-	-
NonAmenorrheic			
Pill	2.0	3.9	5.7
IUD	-	2.9	1.1
Injection	2.0	-	-
Condom	26.5	6.8	2.3
Abstinence	2.0	6.3	2.3
Withdrawal	4.1	3.4	3.4
Others	-	-	-

This then means that the type of method in use may differ or even be the traditional methods which are common in the area. To find out this, we sought to know from the respondents the type of method they use during this

period.

The table shows that for the amenorrheic women, 4.3 percent of them use the pill for the 7 - 12 months postpartum. For those who have births six months prior to the survey, they use abstinence and withdrawal methods.

In the case of nonamenorrheic women, 26.5 percent are using the condom for the sixth month and 4.1 percent at the same period used withdrawal method and injectable (2.0). This result also shows that the women mostly contracept the moment they begin to menstruate, confirming that the resumption of menses is a stimulus for the use of contraception (modern and traditional).

Finally, to estimate the extent of protection against pregnancy by contraception, amenorrhea or both, the percent contracepting and amenorrheic but not using has been calculated and on that basis we were able to determine the percent of protection against pregnancy conferred by amenorrhea. That a woman is protected by lactational amenorrhea means that the woman is not using contraceptive method, and is breast-feeding and amenorrheic. The result is shown in Table 65.

TABLE 65

Percentage of surveyed women protected from pregnancy by contraceptive use*, Amenorrhea and percent of protection from amenorrhea, Imo State, 1993.

	Percent Contracept-ing a	Percent not using but amenorrheic b	Percent protected from pregnancy c = a + b	Percent protected from amenorrhea d = b/a+b*100
Age				
15 - 24	7.8	10.0	17.8	56.2
25 - 29	31.8	31.0	62.8	49.4
30 - 34	35.7	34.0	69.7	48.8
35 - 39	18.6	14.0	32.6	42.9
40 - 49	6.2	11.0	17.2	64.0

* Predominantly traditional methods

Going by our definition of protection against pregnancy, low use of contraception is associated with low protection from contraception and amenorrhea. For instance about 18 percent were protected from pregnancy among 7.8 percent contracepting. When compared to those of age 35 - 39 and 40 - 49, we observe that the higher the percentage contracepting and amenoerrheic, the higher the percentage of protection. We can also observe the compensatory role of lactational amenorrhea. For those who have low percentage of protection from pregnancy due

to contraception, they are compensated by increased protection from lactational amenorrhea. For example considering both sources of protection, 17 and 18 percent are protected from pregnancy on the low end of contraceptive use while 64.0 and 56 percent are from amenorrhea. In order words, whereas 18 percent were protected from pregnancy by contraception at age 15 - 24, 50 percent were protected by amenorrhea at the same age group; and for those who got 17 percent protection (age 40 - 49), 64 percent were protected from pregnancy by amenorrhea. The result shows that both contraceptive use and amenorrheic status do protect the women from pregnancy, though in comparison amenorrhea confers the greater protection than contraception in this area. What is called contraception here is not much of the modern method, but the traditional practice of abstinence and withdrawal.

8.3 The Impact of post-partum variables on fertility among the Igbo of Eastern Nigeria.

A systematic examination of the practice and pattern of breast-feeding in this area shows that breast feeding affects fertility through principally the practice of sexual abstinence which lasts for 7.4 months and amenorrhea (6.6 months). There is a decline in the

duration of these postpartum variables. This decline is brought about by rapid modernization. Further shortening of the duration of these practices will lead to a substantial increase in the fertility level in the area because of low use of modern family planning methods.

In order to assess the effect of breast-feeding on fertility relative to other proximate determinants, we employed the Bongaarts (1978) model for analysing the proximate determinants of Igbo fertility. Bongaarts expressed the impact of each of the four intermediate fertility variables in terms of the extent to which each inhibits overall fertility. The model has four indices namely index of proportion married (C_m), index of contraception, C_c; index of induced abortion, C_a; and index of postpartum infecundability, defined for each woman as whichever is longer, amenorrhea or abstinence.

The four relevant measures of fertility employed in the model are total fertility rate (TFR), total marital fertility rate (TMFR), total natural marital fertility (TNMFR), and total fecundity rate (TF). These are all expressed in births per woman at the end of the reproductive period. The fertility-inhibiting effects of these determinants are estimated by comparing levels of

fertility in the presence and or absence of the inhibition caused by each factor. For instance, with the inhibitory effects of all intermediate variables present, a population's actual level of fertility is given by the total fertility rate. If the fertility-inhibiting effect of celibacy or non-marriage is removed, fertility would increase to a level of total marital fertility rate, and if all contraception and abortion were eliminated, fertility would rise to a level of total natural marital fertility. When we remove the practice of lactation and postpartum sexual abstinence, fertility would further increase to total fecundity rate (total fertility rate). All these indices fall between 1.0 and 0.0. Where there is no fertility-inhibiting effect of a given variable, the corresponding index equals 1, and where it is complete, the index equals 0.

He provided equations for the calculation of the indices.

The equation for the calculation of the index of proportion married is,

$$C_m = TFR/TM , \quad \ldots\ldots\ldots\ldots\ldots\ldots 1$$

This index gives the proportion by which total fertility rate is smaller than the total marital fertility rate as a result of nonmarriage. If all the women were married

throughout their reproductive years then C_m = 1 and 0 if nobody is married.

To estimate the effect of contraception on marital fertility, the following equation expresses marital fertility as the interaction of contraceptive practice and natural fertility:

$$TM = C_c \times TNM, \quad \ldots\ldots\ldots\ldots\ldots\ldots 2$$

where

TM = total marital fertility rate,

TNM = total natural marital fertility rate

C_c = index of noncontraception

The simple meaning of equation 2 is that total marital fertility rate is smaller than natural marital fertility by a proportion C_c with the value of C_c depending on the contraceptive prevalence (i.e the extent of use and effectiveness of contraception). The index, C_c can be estimated thus,

$$C_c = 1 - 1.08 \times u \times e \quad \ldots\ldots\ldots\ldots\ldots\ldots 3$$

where

u = average proportion of married women currently using contraception

e = average contraceptive effectiveness. The proportion of all married women of reproductive age that currently uses contraception can be employed as an estimate of u.

An average contraceptive effectiveness of 0.85 is used, as suggested (Bongaarts, 1978; Watson and Laphan, 1975).

In the case of abortion index, we did not make any attempt to get any information on it because the practice of abortion is illegal in the country. This index equals 1.0 where there is no legal practice of abortion. In this study we set the index of abortion to 1.0 since there is no induced abortion which is not legalised in Nigeria. Lactation or breast-feeding has an inhibitory effect on ovulation and thus increases the birth interval and leads to a decline in natural fertility. The ratio of the average birth intervals without and with lactation is referred to as the index of lactational infecundability, C_i.

$$C_i = \frac{20}{18.5+i} \qquad \ldots\ldots\ldots\ldots\ldots 4$$

where

i = average duration of the post-partum non-susceptible period, which is defined for each woman as whichever is longer - amenorrhea or abstinence. There are three ways we can estimate i for calculating post-partum infecundability. It can be estimated from the mean duration of lactation in months (L) with the following

equation, i = 1.5 + 0.56L. This statistical expression means that all women breast-feeding or not experience a constant period of amenorrhea equal to one and half months, and for each month of breast-feeding, L, an extra 0.56 months are added to the duration of amenorrhea i (Corsini, 1977; Hill, 1985). Also, it can be estimated from the mean duration in months of post-partum amenorrhea or abstinence. If the proportion of women still amenorrheic or abstaining in the t months after birth equals R (t), then i = R(t). The other way is to use Bongaarts formula when we know the mean duration of breast-feeding, i = 1.753 exp (0.1396L - 0.001872L2). The relationship between breast-feeding and the total natural marital fertility rate, TNM, is given as

$$TNM = C_i \times TF \quad \ldots\ldots\ldots\ldots\ldots\ldots 5$$

where

TF = total fecundity rate which is equal to the natural marital fertility rate. In the absence of breast-feeding, C_i equals 1 and with lactation, i increases and C_i declines. To relate this index to the total fertility rate , his formulation is as follows;

$$TFR = C_m \times C_c \times C_i \times TF \quad \ldots\ldots\ldots\ldots\ldots\ldots 6$$

This equation summarizes the entire model for the relationships between the four proximate determinants

and fertility.

It should be noted that total fecundity rate which is the highest measure of fertility is the level which obtains if all the intermediate variables were not operating. TFR is lower than TF because of the influence of the proximate variables. Thus,

$$TF = \frac{TFR}{C_m X C_c X C_a X C_i} \qquad \ldots\ldots\ldots\ldots\ldots\ldots 7$$

8.4 Application of Bongaarts Model to Imo State Data

Now, applying the model to the Imo State data, we fulfilled the data requirements thus,

Index of Marriage, C_m: We calculated the proportion married from the response to the question on marital status. The number of women in union is 645, and this as a proportion of the total sample is 0.79.

Index of contraception, C_c: In the absence of age-specific and method-specific proportions currently contracepting among married women, and age-specific and method-specific effectiveness levels of contraception, we decided to use the proportion of respondents currently practicing modern contraception, 0.22 as "u" and the overall use-effectiveness taken to be 0.85 as "e" which

is the standard value recommended by Bongaarts for the developing societies in the absence of any other one from the data. The index of contraception is calculated as follows using equation 3,

$$C_c = 1 - 1.08 \times u \times e$$

$$= 1 - 1.08 \times 0.299 \times 0.85 = 0.73$$

Index of Lactational Infecundability, C_i :

In our survey, we asked all women who had live births in the preceding year about their post-partum status - that is whether they are still breast-feeding, amenorrheic or abstaining. Those indicating they were lactating were asked if they were amenorrheic or abstaining. Out of a total of 219 respondents who had their last live births in the 12-month period before interview, 194 said they were still breast feeding. I51 were still amenorrheic while 146 were still abstaining. The mean duration of lactation was estimated using the prevalence-incidence method of Mosley et al.,1982. This method is defined thus,

$$\overline{X} = \frac{P}{I} \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad 8$$

where

P = the number of births for which the mother is still in

the post-partum condition,

I = the average number of births per month.

We did this estimation using births in the last twelve months, and this is based on assumption of constant flow of births in the recent past. Thus from the information we have,

$$L = \frac{194}{219} x \frac{12}{1} = 10.6$$

Similarly the mean durations of amenorrhea and abstinence are 6.6 and 7.4 respectively.

To effectively examine the impact of abstinence and amenorrhea on fertility, we divided the index of post-partum non-susceptibility into two sub-indices as suggested by Adegbola and Page (1979). These indices are (C_{am}), representing the fertility impact of lactational amenorrhea and the other (C_{abst}) indicating the additional impact of sexual abstinence, prolonged beyond the period of anovulation. The index of lactational amenorrhea is estimated as 20/(18.5 + amen), where "amen" is the mean duration of amenorrhea, and the index of abstinence is (18.5 + amen)/(18.5 + amen + abst), where "abst" stands for the duration of abstinence. This means that $C_i = C_{am} * C_{abst}$. (Bongaarts, 1981). Thus the

index of post-partum infecundability, C_i due to amenorrhea is 0.80 while that due to abstinence is 0.77

Using the various indexes thus computed above, we calculated the fertility measures using the equations appropriate for each.

The indices for the four key proximate determinants - marriage, post-partum nonsusceptibility (lactational amenorrhea and abstinence) and contraception are estimated from the appropriate equations. As can be seen from the table, the index of proportion married is high being an indication of universal marriage, with little or no divorce. With a prevalence of current contraceptive use near 30 percent among the married women in the survey, the index of non-contraception equals 0.73. And in the absence of induced abortion, the index of induced abortion equals 1.0. The index of amenorrhea is high, 0.80 and that of abstinence is 0.77. The combined index of nonsusceptible infecundability is 0.62 (0.80*0.77).

TABLE 66

Estimates of the Indices of the Intermediate Fertility variables and of Fertility Rates for the Igbo, Imo State, 1993.

a. **Index Estimates**	**Igbo Sample**
Index of proportion married, C_m	0.74
Index of induced abortion, C_a	1.00
Index of Contraception, C_c	0.73
Index of postpartum infecundability	
due to amenorrhea, C_{am}	0.80
due to abstinence, C_{abst}	0.77
Combined $C_i = C_{am} \times C_{abst}$	0.62
Combined Indices, $C_m \times C_c \times C_a \times C_i$	0.33

b. **Estimates of Fertility Measures**	
Total Fecundity Rate (Bongaarts Standard)	15.3
Total Fertility Rate, ($C_m.C_c.C_i \times 15.3$)	5.1
Total Marital Fertility Rate, ($C_c.C_i \times 15.3$)	6.9
Total Natural Marital Fertility Rate, ($C_i \times 15.3$)	9.5

The Bongaarts model in its simplified form assumes fertility levels to be lower than the maximum biological level given the inhibiting effects of marriage delay and disruption, contraception, abortion (where it exists), and post-partum infecundability due to amenorrhea and sexual abstinence. These factors operate sequentially to reduce maximum fertility, and the total fecundity rate to the observed value of the Total fertility Rate. This varies within the range of 13 to 17 children per woman and around an average of 15.3 children (Bongaarts, 1982; Bongaarts and Potter, 1983).

Due to several cultural and social factors which include lactation and associated postpartum variables, it tends to reduce fecundity to the level of total natural marital fertility rate (TN). Contraception and abortion further reduce fecundity to the total marital fertility rate (TM), and marriage delay and disruption reduce fecundity to the observed total fertility rate.

In the interpretation of index values, the complement of each observed value represents the proportional reduction in fertility which may be attributed to the determinant under observation. This means that index of marriage, C_m, of value 0.74, implies that marriage delay (and disruption) reduces marital fertility by 0.26 or 26 percent (1 - 0.74), for an observed total fertility rate of 7.26 children per woman. This could also mean that as a result of non-marriage, total fertility is only 74 percent of marital fertility. Similarly, total marital fertility is 73 percent of total natural fertility as a result of contraception. The index of contraception (mainly traditional methods) is 0.73, reducing marital fertility by 27 percent; postpartum infecundability due to amenorrhea is 20 percent (1 - 0.80) while that due to abstinence is 23 percent. The combined index of post-partum non-susceptibility is 0.62,

reducing fertility by 38 percent. This means that total natural fertility is 62 percent of total fecundity as a result of post-partum, mainly as a result of the practice of sexual abstinence.

The combined effect of all the proximate variables on fertility is 0.33. This gives a reduction value of 67 percent. This means that the joint effect of these factors on Igbo fertility was to reduce the total fertility by about 67 percent (1 - 0.33) from its theoretical maximum of around 15.3 births per woman. The observed total fertility rate is the outcome of the inhibiting effects of the proximate fertility determinants under study.

The three principal intermediate fertility variables explain 67 percent of the variation in the observed fertility rate. This clearly shows these three as the most important variables affecting fertility level in the area.

Generally applying the above ideas to our model we have

$TFR = TF \times Cm \times C_c \times C_a \times C_i$ (from equations 6 and 7)

6.6 = 15.3 x 0.74 x 0.73 x 1.0 x 0.80, Ci due to amenorrhea

6.4 = 15.3 x 0.74 x 0.73 x 1.0 x 0.77, C_i due to

abstinence

5.1 = 15.3 x 0.74 x 0.73 x 1.0 x 0.62, Combined C_i

The difference between the estimated and observed fertility rates is seen as error of estimation. It may also be the problem of model specification and or due to errors in the measurements of the proximate determinants.

8.5 The Impact of post-partum abstinence on Igbo fertility

Based on the values of the indices in the model, postpartum infecundability has 38 percent fertility-reducing effect, followed by contraception (27 percent), marriage (26 percent). For the post-partum sexual abstinence, it has 23 percent fertility reducing effect. The model shows that the difference between total fecundity rate and total fertility rate is the result of the inhibiting effect of the proximate determinants, with lactational infecundability playing a significant role.

Another way of measuring the magnitude of the total inhibiting effect being accounted for by each proximate determinants of fertility is by simple decomposition of the difference between estimated and potential fertility. To obtain the inhibiting effect of each determinant, the total inhibiting effect of 10.2 (15.3 - 5.1) is prorated

by the proportion of the logarithm of each index to the sum of logarithms of all indices.

$$\frac{10.4\log C_i}{\log C_i+\log C_m+\log C_c} \quad \ldots\ldots\ldots\ldots\ldots\ldots 9$$

Note that the value 10.2 could be any number depending on what is the difference between total fecundity and the estimated total fertility rate. The contributions of each determinant to the reduction of fertility from the total fecundity (TF) to the total fertility rate (TFR) can be calculated as

$$\frac{100\ln(C_i)}{\ln(C_i)+\ln(C_m)+(\ln(C_c)} \quad \ldots\ldots\ldots\ldots\ldots 10$$

where this equation yields the percentage contribution of C_i. It can be applied to other indices in the same form. The percentage contributions will sum up to 100, the relative size of each directly reflecting the relative size of each index. Thus this decomposition essentially produces a comparison of the relative magnitudes of the fertility-reducing impacts of the three proximate determinants (Casterline et al., 1984).

TABLE 67

Model of Proximate determinants of Fertility and portioning fertility-inhbiting effect,Imo State, 1993. (measuring the effect of sexual abstinence).

Model of Proximate Determinants TFR = TF x C_m x C_c x C_i 6.4 = 15.3 x 0.74 x 0.73 x 0.77		
Proximate Determinants (Index)	Fertility-inhibiting Effect[b] Births per woman	Fertility-inhibiting Effect[b] Percent Reduction
Marriage Index	3.0	34.3 percent
Contraception Index	3.2	35.9 percent
Postpartum Infecundability Index due to abstinence	2.7	29.8 percent
Total (15.3 - 6.4)	8.9	100.0

a: The total fertility rate estimated from the model
b: The total fertility-inhibiting effect is prorated by the logarithm of each index (equation 9) and for the percent reduction, equation 10.

The result indicates that of a total of 8.9 births being inhibited, 2.7 births or 29.8 percent are due to the effect of lactational abstinence; 3.2 births or 35.9 percent are inhibited by the effect of contraceptive use (mainly traditional methods), and 3.0 births or 34.3 percent are due to marriage effect.

From the above result the impact of abstinence on fertility level is the last of the three. Postpartum

abstinence averted 2.7 births, about 30 percent reduction. In this case the principal proximate determinant is contraceptive accounting for 35.9 percent of fertility inhibition. This contraceptive use is not necessarily modern methods, but as our earlier analysis has shown, it is mainly the traditional methods of withdrawal and periodic abstinence. A combination of the postpartum abstinence and contraceptive use would avert more than six births accounting for about 70.2 percent of fertility inhibition. Marriage delays and disruption as a result of death or separation is the second important variable that inhibits fertility when we are considering the effect of abstinence.

8.6 The Impact of post-partum amenorrhea on Igbo fertility.

We examined the contribution of post-partum amenorrhea on the fertility level. The result is analysed in Table 68.

TABLE 68

Model of Proximate determinants of Fertility and portioning Fertility-inhibiting effect, Imo State, 1993. (measuring the effect of postoartum amenorrhea)

Model of Proximate Determinants TFR = TF x C_m x C_c x C_i 6.6 = 15.3 x 0.74 x 0.73 x 0.80		
Proximate Determinants (Index)	Fertility-inhibiting Effect[b] Births per woman	Fertility-inhibiting Effect[b] Percent Reduction
Marriage Index	2.6	35.9 percent
Contraception Index	4.2	37.5 percent
Postpartum Infecundability Index due to amenorrhea	1.9	26.6 percent
Total (15.3 - 6.6)	8.7	100.0

a: The total fertility rate estimated from the model
b: The total fertility-inhibiting effect is prorated by the logarithm of each index (equation 9) and for the percent reduction, equation 10.

The impact of post-partum amenorrhea on fertility in the area is also clear from the above table. It has a 20 percent fertility-inhibiting effect. It averted 1.9 births which is about 27 percent reduction in fertility. The model above indicates that the role of amenorrhea is negligible; it ranks the third variable after marriage. This is quite the opposite to that of abstinence which ranked second - a confirmation of the fact that breast-feeding affects fertility in Igboland through the

socially mediated path of postpartum abstinence more than through the post-partum amenorrhea.

8.7 The Combined Impact of post-partum nonsusceptibility on Igbo fertility.

We also examined the combined effect of all post-partum variables. This is to enable us measure the effect of postpartum nonsusceptible period.

TABLE 69

Model of Proximate Determinants of Fertility and portioning Fertility-inhibiting effect, Imo State, 1993. (measuring the combined effects of abstinence and amenorrhea).

Model of Proximate Determinants TFR = TF x C_m x C_c x C_i 5.1 = 15.3 x 0.79 x 0.73 x 0.62		
Proximate Determinants (Index)	Fertility-inhibiting Effect[b] Births per woman	Fertility-inhibiting Effect[b] Percent Reduction
Marriage Index	2.8	27.5 percent
Contraception Index	2.9	28.8 percent
Postpartum Infecundability Index	4.5	43.7 percent
Total (15.3 - 5.1)	10.2	100.0

a: The total fertility rate estimated from the model
b: The total fertility-inhibiting effect is prorated by the logarithm of each index (equation 9) and for the percent reduction, equation 10.

Considering the influence of all the proximate determinants of fertility, the result of our analysis indicates that of a total of 10.2 births being inhibited, 4.5 births, about 44 percent are due to the effect of lactational infecundability or post partum nonsusceptibility. Almost three births are averted as a result of the use of contraceptive devices which in this case are mainly the traditional methods. This is 29 percent of the fertility reduction. Also 2.8 births were averted by delayed marriage, separation or divorce. This is about 28 percent of fertility reduction. This shows that in rank order the fertility level of women in Imo State is very much inhibited by the combined effect of amenorrhea and abstinence which constitute the postpartum nonsusceptibility period, followed by traditional contraceptive use and delayed marriage or other marriage effects. The effects of marriage and contraception are almost the same. A combination of the breast-feeding and contraceptive effects avert about 7.3 births or 70.2 percent fertility reduction.

Although breast-feeding seems to be the major factor influencing fertility level among the Igbos, it can only be relied upon to postpone child-bearing and not to prevent it altogether. This effect can only be felt at the aggregate level. The implication of this is that if

the demands made on the mothers as a result of modernization pressures (example employment and working away from home), and the perception of breast-feeding as an old fashioned practice by urban and educated women continues, the likelihood is that breast-feeding durations will decline further in the area. There is no indication that modern contraception is going to be compensating for the decline in breast-feeding duration, because of its low use. Traditional methods of contraception cannot be relied upon. We observed that in the absence of breast feeding and its attendant variables, the estimated fertility rate are much higher than that estimated by the four indices. Both the total marital fertility rate and total fertility rates were higher. The total marital fertility rate in the absence of lactation was calculated to be 11.2, while that of total fertility rate would be 8.3. We conclude that among the Igbo, breast-feeding is a major determinant of fertility level. Its effect operates mainly through the social practice of post-partum sexual abstinence.

8.8 The Effect of Breast-feeding on fertility through birth interval.

Another attractive and direct way to evaluate the relationship between breast-feeding and fertility is

often by the analysis of birth intervals, although a number of difficulties exist (Page et al, 1982). Thus birth interval is a significant index reflecting the level of fertility and its changes. We briefly examine the relationship considering selected variables.

TABLE 70

Mean Length of breast-feeding and Birth interval by maternal age, education, residence and parity, Imo State, 1993.

	Mean Length of Birth Interval			Mean Duration of Breast-feeding		
Residence	< 30	30+	Total	< 30	30 +	Total
Rural	24.8	26.1	25.6	10.3	11.4	11.0
Urban	22.8	23.9	23.5	9.9	9.5	9.7
Education						
Primary	25.1	25.5	25.4	11.0	12.3	12.1
Secondary	23.3	24.9	24.1	10.0	9.9	10.0
Tertiary	23.6	25.1	24.9	9.1	9.4	9.3
Parity						
1 - 3	23.7	25.4	24.5	9.7	9.7	9.7
4 - 6	24.3	25.7	25.3	10.8	10.6	10.6
7+	*	23.8	23.4	12.0	12.2	12.2
Total	23.8	25.2	24.7	10.1	10.6	10.4

The table shows evidently that both breast-feeding and birth interval vary in the same direction with the age of the mothers. The mean length of birth interval was increasing as the duration of breast-feeding was prolonged. Such pattern is clear in all the groups

considered. The pattern of birth intervals by parity showed that its mean length increases with increasing parity up to parity group (4 - 6) and then it declined for the last group (7+). This may be due to the fact that higher parity are usually related to the less educated and more traditional women whose birth intervals are relatively short. The close relationship between breast-feeding and birth interval is noted here, and this gives an indication that a shortening of the breast-feeding duration will affect birth interval length especially in this society where the use of modern family planning methods is lacking or at best low or poor.

Further examination of this relationship is done by looking at the contributions of the various variables to birth interval length as discussed below.

8.7 Relative contributions of post-partum variables to birth interval length in Imo State .

Logically the length of birth interval in any society is a function of breast-feeding behaviour, contraceptive use and fecundity . The average birth interval in the area of study is 24.8 months. The extent these variables contribute to this interval is our interest here. The necessity of considering the relative contributions of each of the variables is more compelling

because in the absence of or low use of modern contraceptives, it is surprising that the women still maintain a two-year birth interval on the average. The understanding of the relative contribution of each of the variables will help us to determine the factor(s) that contributes to this length and what is the likely effect if breast-feeding declines further. The relative contribution of each of the variables is shown in Table 71.

TABLE 71

Contribution of Lactation, amenorrhea, abstinence and contraception to Birth Interval length, Imo State, 1993.

Age	M. Lac 1	M. Amen. 2	M. Abst 3	Prop Contr 4	M. B Int. 5	% Con by BF* 6	% Con tby Amen* 7	% Cont by Abst * 8	% Con by Con * 9
15-19	-	-	-	-	-	-	-	-	-
20-24	8.0	2.3	4.7	0.004	22.0	36	11	21.4	.02
25-29	9.5	8.4	11.0	0.046	25.1	38	34	44	.18
30-34	11	5.5	8.5	0.16	26.4	41	21	41	.61
35-39	11	6.3	8.6	0.09	24.6	48	27	36.4	.38
40-44	11	7.4	6.9	0.04	24.0	46	31	28.8	.17
45-49	7.8	1.0	7.0	0.004	21.4	36	5	32.7	.02
Total	11	6.3	7.4	0.1	24.8	43	25	30.0	0.4

*Calculation of the Percentages : Mean of each variable at each age group/Mean birth interval at that age group * 100

Note:

1 = Mean duration of lactation; 2 = Mean duration of amenorrhea

3 - mean duration of sexual abstinence; 4 = proportion contracepting; 5 = mean length of birth interval ; 6 = % contribution by breastfeeding; 7 = % contribution by amenorrhea;

8 = % contribution by abstinence; 9= % contribution by contraception.

The postpartum variables vary with age positively, except in the oldest age group 45 - 49 where the mean is lower than expected. This may be the result of smallness of the cases in that age group or problem of memory

lapse. The mean duration of breast-feeding is 10.6 months and range from 8 months for women under age 25 to 11 months for those under age 45. Lactational amenorrhea - a biological consequence of breast-feeding, averages 6.6 months for all women. It has the same pattern of relationship with age. For women under age 25, it is 2.3 months while it is 7.4 months for those under age 45. Postpartum sexual abstinence averages 7.4 months, much more than the amenorrhea. Only about 10 percent reported contraceptive use following their births.

Examining the percentage contribution of each variable to the length of birth interval, breast-feeding contributed the highest percentage of 43 percent followed by abstinence (30 percent) and amenorrhea (25 percent) and weakly by contraception (0.4 percent). The contribution of contraceptive use is weak possibly because of low level of use. The observation that breast-feeding contributes more to the birth interval length is a good confirmation of the quality of our hazard model of birth interval determinants which indicated that out of all variables in the model, breast-feeding duration is the greatest and only significant effect over all other variables. The contributions of these variables to the birth interval length while controlling for education and contraceptive status were examined. The result shows

similar pattern as the above one.

Summary

This chapter examined the relationship between lactation, birth spacing and fertility in the area of study. Estimates of proximate determinants were obtained. The determinants of lactation and lactation-related variables were examined too. The results show the dominant effect of breast-feeding on each of the postpartum variables such as amenorrhea, abstinence and birth interval. That breast-feeding consistently remains the significant factor in all the models relating to these variables is an indication that any change in the duration of breast-feeding without compensating in contraceptive use is bound to have a serious impact on the fertility level of the area.

Though fertility level is high among the Igbo, this level is about 8.0 births below the theoretical total fecundity level. The proportion of births averted through postpartum infecundability as a result of shortened duration of breast-feeding is 4.6, contraception (3.0 births). This is followed by the effect of delayed marriage or disruption through death and divorce which averts 2.2 births.

The main fertility-inhibiting variable in this area

is seen therefore to be the postpartum infecundability (38 percent), contraception (27 percent) and then marriage (26 percent). The combined effect of post-partum infecundability and contraception, C_i x C_c, on fertility in Igbo is 55 percent; postpartum abstinence and contraception is 44 percent. This order is also reflected in the percent of reduction accounted by each variable as shown in Tables 67 - 69. Thus the three major proximate determinants of fertility in their order of magnitude of effect on fertility is postpartum infecundability (47 percent), contraception which is mainly the use of traditional methods (30 percent) and marriage (delayed mainly because of high bride wealth,23 percent).

While similar studies in other Africa societies ranked marriage as the second variable before contraception (UN,1987), this result indicates that contraception ranks second before marriage. This study finds support also in another study in Eastern Nigeria where the result showed that period of post-partum infecundability, contraception and delayed marriage are the main proximate determinants in that order (Omideyi, 1983). The effect of contraception here should not be interpreted as a sign of massive use of modern contraceptive methods but a widespread use of the

traditional methods (periodic abstinence and withdrawal). This therefore means that the reported effect of contraception should be attributable to the rampant use of traditional methods of contraception and not to modern contraceptive use, although some reported using them.

Examination of the relationship between breast-feeding and birth interval shows that both vary positively. The result shows that the longer the duration of breast-feeding the longer the birth interval length. Our analysis is further confirmed when we looked at the contributions of four main factors that do determine the length of birth interval. Our result shows that breast-feeding contributes the highest percentage to Igbo birth interval of 24.8 months by 43 percent, followed by abstinence (30 percent), amenorrhea (25 percent) and contraceptive use (0.4 percent). The remaining 1.6 percent may be a result of some physiological matters that are not open to any human manipulation. The role of breast-feeding is obvious, pointing to the fact that any further reduction in the duration of breast-feeding not accompanied by similar increase in contraceptive use will have a serious effect on the fertility level in Imo State.

The decline in the mean duration of breast-feeding not accompanied by large increase in the use of modern

contraceptives tends to contribute to the high fertility level observed in the area. With a breast-feeding duration above World Health Standard, and average birth interval of 24.8 months, the fertility level of the area remains surprisingly high. The reasons for the persistent high fertility level could therefore be found within the cultural milieu of the area.

CHAPTER NINE

SUMMARY, SYNTHESIS OF FINDINGS AND POLICY IMPLICATIONS

9.1. Summary of Findings

The purpose of this study is to investigate the relationship between breast-feeding, birth-spacing and fertility. This is aimed at examining the impact of lactation and birth spacing on fertility in the area. Although the findings are revealing, there are still areas for further investigation.

The area of study is still a high fertility zone with fertility level as high as 7.26 by all estimation techniques. The completed family size is about 6.3 births. There is differential fertility behaviour in terms of such socioeconomic elements as education, urbanization, occupation, religion and husband's characteristics such as occupation and education among others. The relationship between education and fertility is curvilinear, with those with primary education and tertiary education having a higher mean parity than those with secondary education. The respondents from polygamous families have higher mean number of children ever born than those in monogamous. While the Catholics known for their pronatalist doctrine have lower mean children ever born (3.8) than the protestants (4.1). Other differentials also exist in all the variables considered.

On fertility preferences, about 69 percent still expressed the desire for additional children. The women would prefer a smaller family size than otherwise. The desired family size is 3.1 while the mean number of children ever born is 5.2. We suspected a recognition of the effect of economic difficulty in the country in the response given in the case of desired family size. This is shown by the expressed desired family size in a depressed economic situation which is 3.0 while under normal situation they would prefer 3.8 children. This is an indication that the Igbo women may appreciate small family size (especially in these hard times) but in a society where a married woman has no control over her sexual life and with low or no contraceptive use, more children are bound to be born. The average ideal family size increases with a woman's increasing age and parity.

Knowledge of contraceptive methods is fairly moderate in Igboland. Forty-eight percent of women know of at least one method of birth control, and fifty eight percent know of at least one modern method. The best known method is the pill (51 percent), followed by condom (48 percent), withdrawal (46 percent). In terms of use, 45 percent of the women report ever using birth control. The ever use of contraceptive methods is relatively related to education and other socioeconomic variables.

The result shows that the most commonly used method is withdrawal (43.3), periodic abstinence (31.5 percent); and condom (28.2 percent). This shows that traditional methods and condom are the main methods ever used. This pattern is also observed in the current use status. For those that are currently using, 59 percent are using the traditional methods, with the withdrawal method ranking as the most important. We observed also that it is the young, educated and working class women who are using the methods currently. Those who want no more children use family planning methods more than those desiring more children. Thirty four percent of those who have never used a method intend to do so in the future. The preferred methods again are the traditional methods of periodic abstinence and withdrawal, and condoms . With regard to attitudes to family planning, only 27 percent approve of family planning at any time, while the rest said they support the beginning of family planning when a woman must have had upto three living children. Generally the knowledge and use of contraceptive method is low in the study area.

The importance of breast-feeding and associated variables to the understanding of fertility dynamics in the area of study is of prime importance. In Imo State, women breast feed for an average of 10.6 months, with

average amenorrheic duration of 6.6 months, abstinence (7.4), and birth interval of 24.8 months. The principal determinant of other lactation-associated variables is breast-feeding, and its variation with selected variables runs parallel with the differentials of other postpartum variables. For instance as the duration of breast-feeding varies with age, education, residence etc so the durations of amenorrhea and abstinence vary with the same variables. The duration of breast-feeding varies with education. Better educated women tend to breast feed for shorter durations (9.3 months); the women with secondary school education breast feed for 10 months and primary for 12 months. This pattern of variation is reflected in the amenorrhea and abstinence durations also. There is differential in the birth interval too. Our analysis shows that the average birth interval varies from 24.3 and 25.0 months among women with secondary and tertiary education to 25.2 months among those with primary education. Younger women exhibit a relatively shorter birth interval of 23.8 months while the older cohorts (30+) experience a birth interval of 25.2 months. The highly educated, urban and working class women are associated with longer birth interval than their respective averages. This may be a reflection of the use of contraception or as a result of the State government

policy that every nursing mother who is a civil servant cannot be given a maternity leave unless the index child is two years. It could also be a result of the incompatibility of job and motherhood. These women too are shortening the durations of postpartum variables and hence they are likely to employ contraceptive technology to offset the effect of reduced post-partum abstinence. With a birth interval of 24.8 or approximately 25 months, it becomes evident that the duration of post-partum amenorrhea is less and even the birth interval is less than what it should be . Nine months of gestation, three months added by pregnancy wastage, two months of anovulatory cycles, and a minimum of five months for ovulatory exposure add up to 19 months and a post-partum amenorrhea duration of 6.6, gives a birth interval of 25.6. This shows that these women even shortened their birth interval by 0.8 months. They conceive earlier thereby shortening the birth interval. The normal birth interval may have been maintained if there is high level of contraceptive use.

A multivariate analysis of the determinants of the child-spacing variables indicated, for lactation, that parity, education, asset ownership, work status, perception of breast-feeding in a public place and perception of best infant food and birth attendant are

significant. In the case of parity, the analysis shows that the higher the number of children, the greater the risk of breast-feeding longer in order to delay or avoid another conception. We observed that there is an interaction effect when age and parity were considered together. The negative effect of parity disappeared the moment age of woman was introduced into the model.

The expected health care effect on the duration of breast-feeding is significant at the level of birth attendant. Health care services in some countries have been associated with lower rates of initiation and duration of breast-feeding. This is because some hospital routines do expose women to beliefs and practices that are against breast-feeding. It is therefore posited that women who go for antenatal care, are delivered in government hospital and attended to by trained medical professionals are very likely to breast feed shorter than otherwise. Also health professionals who consider baby food to be good and even better than breast milk can also influence the mother's view of the adequacy of breast milk for the child's health (WHO, 1981). About 50 percent of the respondents said that the medical personnel did not instruct them on what to use to feed their babies. The expected pattern of influence is not clear, besides it is insignificant.

Considering the employment patterns of women, its effect on breast feeding duration in various studies have not been clear (Van Esterik and Greiner, 1981). The differences in result have led to separate consideration of the effect of factors associated with working patterns such as type of work, place of work, availability of alternative child care facility. All these variables show significant relationship with breast-feeding duration. Those that work outside the home and or who are government employees have higher risk of weaning the children earlier than the opposite group. These people are likely to breast feed for shorter duration than those women who are not working. Though most of the work variables have significant effect on the dependent variables, few have are insignificant, and this may be the problem of model specification or that outrightly they have no effect.

The effect of cultural variables on the duration of breast-feeding is also mixed. It is posited that the environment a woman lives and her interaction with that environment will affect her breast-feeding practice. Thus it is expected that those living with their parents-in-law or elderly relations are very likely to breast-feed longer than otherwise. The analysis supports this position, although the effect of living in an extended

family household on the duration is insignificant. The relationship between a husband and wife does influence the duration of breast-feeding. When this relationship is cordial, it is always reflected in the level of attention and care given to the woman during her confinement. Hence such cordiality determines whether a woman should terminate breast-feed early enough to satisfy the husband's sexual urge. The point being made here is that some women can use breast-feeding as an excuse to deny their husband's sex and avoid subsequent pregnancy. The result supports this view that when couple relationship is cordial, the woman breast-feeds shorter. When we examined these variables individually in separate models they all became significant and relevant - an indication that they have impact on the duration separately.

The effect of lactation on fertility operates through the mechanisms of amenorrhea and abstinence. They operate to increase the length of birth interval. The length of breast feeding determines the duration of amenorrhea; the longer the breast-feeding duration, the longer the duration of amenorrhea also. Other variables that affect the duration of amenorrhea include the maternal age, age at food supplementation and type of supplements given to a child. Breast-feeding also remains the most significant factor that affects the duration of

abstinence, followed by education , contraceptive use, and survival status. This study shows that the socio-economic variables have no significant effect on birth interval length except breast-feeding duration and abstinence status. Of the three postpartum variables, breast-feeding contributes 43 percent, abstinence (30 percent), amenorrhea (25.4 percent) to the length of birth interval. The contribution of contraceptive use to the birth interval length is small or even non-existent because of the low use of the technology in the area. Amenorrhea confers greater protection against pregnancy than contraceptive use. Resumption of menses is a stimulus for the practice of contraception.

By using the Bongaarts model for analyzing the effects of the proximate determinants, we note that delayed marriage or its disruption reduces the level of marital fertility by 23 percent and averted 2.2 births. The combined effects of postpartum amenorrhea and abstinence, in contrast, reduce fertility by 47 percent, most of this can be traced to the impact of postpartum abstinence which reduces fertility by 23 percent. Contraceptive use reduces fertility by 31 percent and averted 3.0 births. We have observed earlier that the contraceptive effect here must be credited to the traditional methods which are methods mostly used in the

area. A combination of lactational infecundability and contraceptive use reduces fertility by 53 percent. The effect of breast-feeding in Imo State operates mainly through its social path of postpartum sexual abstinence.

Finally, based on our findings we conclude that lactation is still the principal determinant of fertility level in the area.

9.2. Synthesis of Findings

This study has shown that fertility level is still high. Although the level is high the birth interval is 24.8 months. The surveyed women have also very clear ideas on the importance of good spacing of births and what a normal spacing should be. When a woman gives birth so soon after the first one she is often ridiculed. This tends to make the women avoid early resumption of sex and even where they start, care is taken to avoid pregnancy. One of the respondents put it this way ".....to avoid getting pregnant my husband carefully removes his penis when he wants to release the 'juice' (semen)..." (reference to the withdrawal method).

The contribution of postpartum variables to the level of fertility in this area is observed. Since the mean duration of breast-feeding is 10.6, amenorrhea 6.6 and abstinence 7.4, the implication is that child-spacing

is achieved by postpartum sexual abstinence with postpartum amenorrhea playing a supportive role. Abstinence duration of 7.4 months is a sign of the effect of modernization. It is lower than what was associated with traditional African societies where sexual relation during breast-feeding period is suspended till the child shows signs of physical development and growth like walking and teething etc.

Various social changes are taken place in the study area. Education happens to be the main industry of the people of the area and urbanization and diversified economic activity do undermine the traditional network of social support and regulation. Hence traditional authority has shifted from the elders to the youths who with their new found wealth do determine the trend of things in the society. There were times when an Igbo young man would wait for the parents to get enough money and get a wife for him. Given the monetization of the economy, an Igbo young man may marry the moment he has the wherewithal. Social changes also led to the breakdown in sexual moral codes. Chastity is no longer a virtue. Ability of a young lady to demonstrate that she can be fecund is an important factor in the marriage market in Igboland. The lady must prove her womanhood. The practice is so rampant that many young men are not ready to wed in

the Church unless their wives show sign of pregnancy. No average Igbo man is prepared to take the wife to the alter except the wife is pregnant at least in the first trimester. This is an indication of the extent of erosion in the sexual moral codes in the society.

In spite of the fact that duration of breast-feeding has not witnessed drastic decline and the birth interval of 24.8 months, fertility remains high. Large family is still seen as necessary for the maintenance and continuation of the lineage. The real support of the extended family system is a factor that encourages high fertility among the Igbos. Children are seen as valuable investment among the Igbo. Various Igbo names tend to portray the importance the Igbo place on children. Such names as "Nwakaego", children are better than wealth or money; "Nwabugwu", children are the source of prestige (that is the number of children you have determines how prestigious you are in the society); "Nwaebuka", children are great; "Nwaamaka", children are sweet or good; "Nwabueze", children are king or children make one a king - depict the importance the Igbo attach on the number of children one has. It is not uncommon to hear in Igbo such statement as "onye nwere mmadu ka onye nwere ego", meaning that 'a person who has children is far better than a wealthy man'. It is not surprising why an Igbo man

is prepared to take the second wife if the first does not give birth to any child. To the mother, the expected economic gains from her children when they are working is of paramount importance. In some parts of Igboland there is a celebration to honour any woman who has successfully given birth to ten or more children. This is a big time celebration and gifts are sent to the woman by friends and relations, both within and without . Number of children one has in this area thus becomes a status symbol. Various cultural reasons that maintain high fertility in this area have been given by Omideyi (1983).

From this study, it is clear that significant changes are occurring in the social system which impinge on the reproductive behaviour. The following conclusions are derived from the study:

1. Fertility level is still high despite the socio-economic changes taking place world-wide. The women would prefer smaller family size especially in this period of economic depression. The inability to achieve that is suspected to be the effect of low use of modern contraceptive methods. The use of modern methods of family planning is low, while the use of traditional methods is still dominant.

The duration of postpartum variables is determined by the duration of breast-feeding. Postpartum abstinence

duration is longer than amenorrhea. While breast-feeding duration contributes more to the duration of birth interval it is followed by abstinence duration. The younger, educated and urbanized and working women have shorter durations of breast-feeding, amenorrhea and abstinence. However, our analysis clearly demonstrated that education, occupation and rural-urban residence cannot affect the duration of breast-feeding outside the effect of other theoretical variables. Postpartum infecundability is the principal fertility-inhibitor in the area. For the area as a whole, the computed mean duration of breast-feeding is 10.6.

Though this duration is shorter than what used to be, it is not clear the type of breast-feeding (full or partial) which these women give to their babies. It is not possible to discover in this study how long the respondents breast-feed their children exclusively.

The fact that a shortening of the non-susceptible period is present and may fall further if appropriate measure is not taken have serious demographic implications. A further reduction in the breast-feeding duration especially in this period of economic hardship could lead to serious maternal and child malnutrition. This will affect the health of the mother and child. With increase in child death women are prone to replace the

death ones either by themselves or their husbands marry another wife thereby increasing the fertility level in the area. An increase in fertility in the area would exacerbate the population growth. This is based on the fact that the people of the area have not yet embraced contraceptive technology.

9.3. Policy Implications and Recommendations

In as much as breast-feeding confers a measure of protection against pregnancy especially before the return of the menstrual cycles, the effect of lactation on fertility seems to be substantial. Pregnancy rate during the period of lactational amenorrhea is as low as that for modern contraceptive methods. Every effort should be made therefore to encourage the contraceptive effect of postpartum amenorrhea. This can only be achieved by enhancing the duration of breast-feeding which can play significant role in regulating fertility because of the association between lactation and postpartum amenorrhea.

We understand from this study that the duration of breast-feeding and its associated variables are declining especially as education level increases. This means the more educated women are likely to breast feed for shorter period and abstain for a shorter period. These changes would be attributed to the availability of

breast milk alternatives through manufactured baby food products and other substitute baby food like pap. The decrease in the duration of postpartum sexual abstinence is a reflection of the new perceptions of women's sexuality in marital relations. Women, especially the educated ones, no longer take sexual relations as a means of procreation but an important element in expression of love for a successful marriage. With the rising level of education and associated socioeconomic development, breast-feeding length may be reduced and unless contraception substitutes for this trend to maintain the length of birth interval length, fertility might continue to rise in the area. Government should therefore adopt policies to increase the use of modern contraceptives and also promote breast-feeding practice. It should intensify efforts together with international health agencies to promote the Baby Friendly Initiative. This programme is geared towards encouraging mothers to breast-feed without any mixture for six months. It is a joint programme by UNICEF/WHO.

The study indicates that though there is decline in postpartum practices, yet there is low use of contraceptive methods especially the modern methods. The low contraceptive prevalence rate is one of the reasons for a high fertility level in the area. Most of the women

preferred smaller family size, yet they do not have the means to effect their desires. This lack of means of having the preferred family size raises the question of who holds power in the house. In society where women can be seen, used and not heard, it is not unlikely that the husband's will always prevail. This calls for the need to understand the place of husbands in fertility decision-making vis-a-vis that of the wives.

Despite the level of education, fertility remains high. A lot of sociocultural factors exist that support high fertility. The case of extended family system makes it possible for a woman educated or not to have a close relation (mother or mother-in-law or junior relations) to look after her child while she goes to work or trade. Househelps or maids can also be employed to help in the domestic work. In some cases the parents send their older children to their well-to-do relations either to learn a trade or for schooling. The hope is that at the end of their graduation they will be able to take care of their siblings and help their ageing parents. Lack of husband-wife communication over their fertility desires is a contributory factor.

Some government policies have unintentionally helped to encourage high fertility. For instance granting of maternity leave to nursing mothers with pay tends also to

reduce the cost of rearing children and increases demand for more children. Though the present economic crisis in the country seems to be discouraging women from unbridled child births, it is not expected to have a long term effect. This is crisis-led fertility decline which will soon be reversed to the old pattern the moment the economy improves.

Several policy recommendations are hereby presented thus:

1. To enhance the practice and longer duration of breast-feeding, massive promotion of breast-feeding through the mass media, support groups for breast-feeding women, better life programmes, village groups and education in schools should be embarked upon. The health benefits of breast milk should be emphasized in the hospitals, maternity centers, churches, markets and at village meetings. As much as possible whenever and wherever women are holding meetings, opportunity should be sought to instruct them on the benefits of breast-feeding.

2. Health professionals - doctors, nurses, midwives and even traditional birth attendants should be trained to encourage and support practices that will be conducive to breast-feeding like immediate postnatal contact between mother and child after delivery, limited use of bottle

feeds or supplemented foods, appropriate information during antenatal care stressing the importance of longer periods of lactation especially for the health of the baby.

3. The government should review all policies in education, taxation, maternity leave etc that directly or indirectly encourage large families. This will eliminate all implicit subsidies for large families.

4. Family planning facilities and services should be expanded and contraceptive devices made more available to the people at the grassroot level. Serious mass media campaign especially through the state radio and television stations should be mounted to educate the people on the health benefits of family planning. Emphasis should be placed on the health benefits of the family planning instead of the fertility-reducing benefits, because of the people's poor understanding of what family planning entails. By so doing public awareness of the importance of family planning should be intensified. The current efforts by the Federal Ministry of Health in this regard are encouraging.

5. There exists the need for the expansion of educational opportunities especially for the women at least upto the secondary school level. This will not only help to increase the age at marriage for females and promote more

accurate perceptions concerning their fertility, but will also enhance women's capacity for a more lucrative and useful life. Population education should be introduced to secondary school curriculum.

6. Finally we call for the implementation of such policy programmes that will include antenatal education; provision of supplementary food programme for lactating women; breast-feeding education in schools and universities; establishment of creches at work places with lactating women granted at least one hour daily to breast feed their babies.

To increase a woman's motivation to breast-feeding and to do it successfully, health personnel will help eliminate artificial feeding from maternity wards, except purely on medical reasons like unhygienic breast or when delivery is through caesarian section or to solve any breast-feeding problems.

9.4. Frontiers for further Research

One clear limitation of this survey is our inability to define breast-feeding duration properly. By the mean duration of breast feeding used here it is not clear if the duration refers to full or partial breast-feeding. This is because if the duration is for full breast feeding, then there is no need to express concern since

it is still higher than the six month duration being advocated by medical experts. A clear definition of the duration would have been better and would make our understanding clearer.

The question on contraceptive does not give us a clearer understanding of the place of contraceptive method in the breast=feeding-fertility relationship. It is not possible to explain the extent of the influence of family planning methods in this study. Most research questions put the question "have you ever used anything to delay or prevent pregnancy?". This question used here seems to be ambiguous, because it does not take into consideration that the respondents may have used the methods in their youths before marriage. A better question would have fixed the time of use: premarital or at marriage and this would help us to know the actual number using any method at and since marriage.

The survey suffers from lack of large sample sizes. This would make comparability difficult and this hampers the extent of our deductions. There are variables not considered here that would have enriched our survey. Those variables need to be identified in further study. One of such variables is maternal and child nutrition.

One incontrovertible conclusion drawn from this study therefore, is the necessity for more thorough

investigations. Research on several levels involving a number of different approaches is needed to expand " our empirical, theoretical and policy-relevant knowledge of lactation and fertility" (Hull, 1987).

Hence studies that combine observation, survey methods, focus group discussions to gather retrospective and prospective data and employ quantitative analysis of sufficiently large samples are necessary for us to understand and manage the complex relationships between lactation,fertility and maternal-child health.

There is of course the need for large-scale comparative studies in order to provide us with measures of such parameters as the extent and duration of breast-feeding and patterns of birth intervals and contraceptive use. We should obtain information on full or partial breast-feeding, the use of traditional and modern contraception. Longitudinal studies to monitor change in the extent and duration of breast-feeding at the national level is suggested.

Future survey should involve better specification of dependent, independent and intermediate variables to be able to trace the directions of causality in recorded associations between variables. For instance the association between women's work and breast-feeding duration could be broken into examining the conditions of

work and other related aspects; breast-feeding variables such as suckling frequency, night feeding, child development and growth. Future investigation should involve women's attitudes and direct observation of behaviour as it occurs in the community and in the context of individual decision-making. In the expected comparative studies, it is necessary to compare causes of declines in breast-feeding duration. Research should also focus on how long separation of infants from their working mothers presents obstacles to breast-feeding and to determine to what extent declines in breast-feeding are inevitable results of modernization.

From the forgoing, we call for a more thorough and indepth investigation into breast-feeding dynamics in Nigeria, a study whose components would include,(a) investigating traditional and modern patterns of breast-feeding and child-spacing; (b) reasons for continuation and discontinuation of breast-feeding; (c) health and economic impact of breast-feeding and bottle feeding under different conditions; (d) contraceptive practice of breast-feeding women and beliefs about fertility and sexual behaviour during lactation or determinants of contraceptive acceptance patterns during postpartum months. Indeed further comprehensive research is needed to unravel the intricate relationship between breast-

feeding and fertility, especially to examine the proximate determinants of lactation and factors that influence decision to adopt a particular feeding pattern for infants in the study area.

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APPENDIX A:

DEPARTMENT OF DEMOGRAPHY AND SOCIAL STATISTICS
FACULTY OF SOCIAL SCIENCES
OBAFEMI AWOLOWO UNIVERSITY
ILE-IFE

QUESTIONNAIRE SCHEDULE
FOR THE STUDY
"LACTATION, BIRTHSPACING AND FERTILITY AMONG THE IGBO OF EASTERN NIGERIA".

TO WHOM IT MAY CONCERN

Dear Madam,

This is a student's research project aimed at studying the breastfeeding and childspacing patterns of the Igbo women. It is purely an academic exercise for the award of a degree, and it has nothing to do with you as a person. As such every information given by you will be treated confidentially.

I plead that you respond to these questions honestly as much as you can. Your co-operation is highly needed.

The Research Student.

Serial Number.....
Place of Interview.....
Family name.....
Date of interview.....
Time started.....
Time ended.....
Interview Outcome: Completed.....(11) Refused.....
(111) Not completed.....

FORM A: HOUSEHOLD RECORD FORM

S/N	NAME	R/SHIP	AGE	SEX	MARIT	EDUC.LEVEL	OCCUPA	PLACE

	TO HH			AL STAT		TION	OFBIRTH

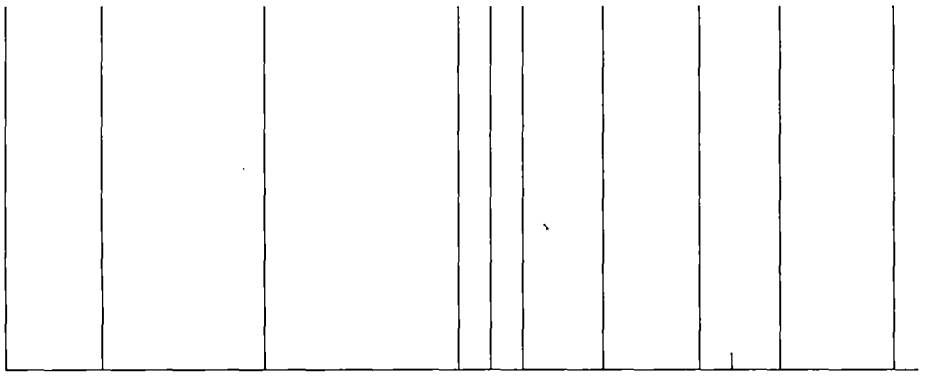
HOUSEHOLD EVENTS IN THE PAST 12 MONTHS

Name of mother	age of mother	sex of child	living or dead	If dead, age date	cause of death

FORM C: FERTILITY FORM

Year of marriage.....

Preg. Order	Birth end /birth date	Livebirths								
		Name	Sex		Living			Deceased		
			M	F	Home	Else where	Died /S-birth	Age at dead	Miscarria	



SECTION B: SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS

01). What is your age now?.....
(b) at marriage.....
(c) at first birth.....
02). What is your level of education? .....
03) How many years did you complete at school?.....
04) Where are you living now? .....
05) What is your marital status?
Married 1
Widowed 2
Divorced/separated 3
05b) Does your husband live with you or is he staying elsewhere?
Living with me 1
Elsewhere 2
06) How many wives has your husband?.....
07) How long have you been married to him?....
08) What is your religion or which church do you attend?....
09) What is your husband's highest level of education?
10) What is his occupation? .....
11) Is he.....
an employee of a private company.....1
a government employee.....2
self-employed in his own business.....3
farmer,and or labourer/trader 4
12) (If salaried),What is his income level and number of years at that level? Level.....; No. of Years.....
13) (If non-salaried), How much income does he earn per month?
Less than N100.....1; N100 - N199 2
N200 - N399.....3; N400 - N599 4
N600 - N799.....5; N800 and above 6
Don't Know.....7

C: HOUSEHOLD

1) Does any member of your house have	YES	NO
Refrigerator	1	2
Stove/cooker	1	2
Radio	1	2
TV	1	2
Electricity	1	2

2) Does any member of your house have	YES	NO
A bicycle	1	2
A motorcycle	1	2
A car	1	2

3) Do you listen to radio, watch TV or read newspapers once a week?.....

4) What type of toilet facility do you have ? .....

5) What is the source of drinking water to this family? ...

SECTION D: EMPLOYMENT HISTORY

01) Have you ever been employed or worked for pay before marriage?

2) Since you got married, have you ever worked regularly to earn money other than your trade or farm? Yes ...1 (ask q.3); No ...2

3) In your present occupation, are you...

an employee of a private company ....1}(ask q.4)

a government employee.....2}(ask q.4)

Self-employed in your own business.....3}(ask q.4)

Farmer/Trader/Labourer 4

4) Where is the location of your place of work?

Away from home.....1 (GO TO Q5-12)

Nearer home.....2 (, , , , ,,)

At home.....3

5) How many hours do you spend at the place of your w o r k daily? .....

6) By what means do you go to your place of work?

Trek .... 1 Bicycle.....2, Motorcycle.....3; Taxi.....4

7) What is the distance from your home to your working place? (Record in KM) .....

8) How long does it take you to reach your place of work? ..... minutes; Don't know.....

9) (If uses Taxi), What is the total cost of your travel to and from your work each day?.....

10) While you are away at your place of work or business, do you have your youngest child with you? Always .....1 Sometimes

.....2 } (ask q.11)
Never .....3} (ask q.11)
11) How do you take care of the baby at home while you are working or trading? Older Children ..... 1; Maids ..... 2 Neighbours.....3; Grandparents/Relations .... 4 Daycare centres 5
12) While at your place of work or trading, is it possible for you to go home to feed your nursing child? Yes.....1; No.....2 (GO TO Q13)
13) How then do you make sure that the child is well-fed in your absence?.....

E: FERTILITY HISTORY/PREFERENCES

1) Have you been pregnant before? Yes ... 1 (ask q.2); No ... 2
2) How many living children of your own do you have now?
2b) How many sons.....; daughters.....
3) How many babies did you have born alive that later died? ....
4) How many live births have you had? .....
(INTERVIEWER: THIS IS BOTH THE ONES BORN ALIVE BUT LATER DIED AND THE ONES PRESENTLY ALIVE)
5) Are you pregnant now? Yes.....1 ; No 2
Can't be pregnant .....3 (ask from q.9)
Don't know .....9 (ask from q.9) 6) Would you prefer to have a boy or a girl? Boy.....1; Girl..2
Anyone....3; Upto God.....4
7) After the child you are expecting, would you like to have another child or more children? Have another child.....1;
No more 2;
Undecided.....3;
Upto God/Don't know.....4
8) How long will you like to wait before you have another child? .....
9) What is the ideal number of children for a couple to have? .....
10) Under the present economic situation,what do you think is the ideal number of children for a couple to have? .....
11) If you could choose exactly the number of children to have in your whole life, how many would that be?
b) How many boys.....; girls.....

(IF THERE IS NO LIVE BIRTH SINCE 1987, SKIP TO SECTION G)

SECTION F: BREASTFEEDING AND CHILDSPACING PRACTICES

(Madam, I would like to ask you specific questions about all the children you have born in the last five years, ie since 1987)

We will begin with your last birth.

Last child ...(NAME)..... Alive .....1; Dead 2

His birth position? .....

1) How old were you at the birth (....)? --------

2) Did you receive any antenatal care during the pregnancy? -----

3) Whom did you see during the antenatal care?

Doctors .. 1 Nurse/Midwife ..2 TBA 3

4) How many months did you carry the child in the womb? .....

5) Where did you deliver (-)?

Government Hospital/Maternity/Clinic 1

Private Hospital/Maternity/Clinic 2

Traditional Nursing Home 3

At Home 4

6) Who assisted with the delivery? Doctor 1

Nurse/Midwife 2

Traditional Birth Attendant/Doctor 3

Others 4

7) Was the delivery normal or by operation?

Normal delivery ...1 Caesarian section ... 2

8) When you gave birth to (.....), did the doctors instruct you to breastfeed or bottlefeed? Breastfeed.....1

; Bottlefeed.....2

No instruction.....3

Don't know 9

9) Did you ever breastfeed this child? Yes 1

No .....2 (ask q.16-16b)

10) Are you still breastfeeding (....)? Yes....1;

No.....2 (ask q.14)

Child died ..... 3 (ask q.14)

11) How many times did you breastfeed last night between sundown and sunrise? ---------

12) Have you started giving him anything other than breastmilk?..

13) How old was (--) when you started giving him

solid food ..... Months ; Don,t know 9

liquid food? .....Months; Don't know 9

14) How many months did you breastfeed (...)?

----Months; Till Death .....8; Don't know 9

15) Why did you stop breastfeeding (...)? ----------

16) Why did you not give him breastmilk? .....

16b) What kind of other foods did/do you give to (...)? Pap ....1 Baby food .....2; Mashed beans, rice/yam 3

None 8

17) From where do you obtain these other foods which you give to (...)? Markets/Stores/Gifts (UNDERLINE THE ONE APPLICABLE).

18) What do you think about the cost of baby foods these days?

19) Did (--) receive any postnatal care? .....

20) Did you practise contraception or use any contraceptive method while you are breastfeeding this child?

Yes ..... 1 (ask q.21 - 22)

No ..... 2 (ask q.23)

21) What method did you use? .....

22) How old was the baby when you started using this method? --

23) Why not? It reduces milk Supply.....1

Makes milk bad.....2

No need since breastfeeding 3

Immoral/Bad 4

No response 8

Don't know 9

24) What season of the year did you give birth to (-)?

Rainy ...1 Dry/Harmattan 2

25) Since the birth of this child, have your periods come back? Yes ..... 1 No ..... 2 (ask q.27)

26) How many months after the birth of (...) did your periods come back? ..... Months

Became pregnant before menstruation ...99

27) Since the birth of (...), have you started sexual relations? Yes ... 1 (ask q.28) No .... 2 (ask q.29)

28) How many months after the birth of (--) did you resume sexual relations? .....Months; Don't Know ...9

29) How many months do you expect to stay before resuming sex relations? ..... Months

Never ..... (WHY? .....

30) Did the child suffer any diarrhea in the past two weeks? ....

31) How often do you feed (...)? On Demand 1;

At Fixed intervals 2

32) When is it convenient to leave (....) at home and go to the farm or market or working place?..... (Ask for the age.....)

NOW. I will ask you questions about the next-to-last birth

INTERVIEWER::(IF ONLY ONE LIVE BIRTH SINCE 1987, SKIP TO SECTION G).

Obtain the name of the child.....

Alive?.....1; Dead 2

Birth position .....

01) Did you have any antenatal visit during this pregnancy?

2) Was (--) delivered at Government Hospital; Private Hospital; Traditional nursing Homes or At Home? .....

3) Who attended to you during the delivery?

4) Did you ever breastfeed (NAME)? Yes.....1;

No .....2 (ASK WHY? .....

5) How many months did you breastfeed him before stopping?.....

6) Were you still brastfeeding him or her when you became pregnant? Yes ..... 1; Had stopped 2

7) How many months old was (...) when you began giving him bottle milk, pap or any solid food? ..... Months ; Child died before supplementary food 99

8) How many months after the birth of (...), did your periods come back? .....months ; Become pregnant before menstruation ...8

Don't know 9

9) How many months after the birth of (....) did you resume sexual relations? ..... Months ; No Response ..... 8; Don't know ...9

10) How many months was the child in the womb? .....

11) What kind of delivery? Normal delivery 1;

Caesarian Section 2

12) How old was he when you started leaving him at home to go to market or farm or working place?.....

13) Think back before you became pregnant with (---), Was there any time when you were using any method to keep you from getting pregnant? Yes .... 1 (Name of method.....; No..... 2

(INTERVIEWER: REPEAT 1 - 13 FOR THE SECOND TO THE LAST CHILD THAT IS THE ONE BORN IN 1987. RECORD RESPONSES ON A SEPARATE SHEET).

SECTION G:CHILDSPACING PRACTICES

01) When you gave birth to any of your children, did the doctors or nurses tell you to breastfeed or bottlefeed? Breastfeed....1 Bottlefeed....2; No instruction....3

02) What is the best food for a new baby? Infant formula....1 Breast....2; Both ....3; Don't Know....4

(Reason for your answer.....

3) Which is the best/easiest food for a mother to give her new child?..... Why?.....

b) How often do you use baby food these days to feed your infants?

(1) Quite often .. 1; Uses pap more ...2; Don't use ... 3

4) Do you discuss with your husband on the choice of infant feeding methods whenever you give birth? Yes.....1; No.....2

5) How do you feel breastfeeding a child in a public place? Shy...1; Embarrassed....2; Unconcerned 3

6) Do you normally abstain from sex while breastfeeding? Yes....1 (GO TO Q.7); No 2

7) Is it a personal decision of yours to abstain while breastfeeding? Personal....1; Husband's.....2; Both...3

8) Why do you abstain from sexual relations while breastfeeding?.....

9) Do you sleep on a separate bed from that of your child while nursing? Yes.....1; No.....2; sleeps with the husband.....3

10) Do you think that a woman ought to live apart from the husband for a period after she has given birth so that there will not be any sex relations? Yes ..1 No. 2

11) What do you do if your husband approaches you while you are still breastfeeding? Shun him.....1 (ASK Q12)

Agree.....2; Deny him for few months.....3

12) Do you think your refusal, will cause him to deny you of some of your rights? Yes.....1; No....2

13) What do you think will be the effect on the baby if sexual intercourse during breastfeeding leads to pregnancy? .....

14) What is the effect if it does not lead to pregnancy? .....

15) Will you continue breastfeeding a baby if you discover that you are pregnant but the baby is less than six months?.....

16) Is there any taboo (Nso Ala) in this area that forbids sexual intercourse once the woman is breastfeeding or becomes pregnant? Yes...1(ASK Q.17); No.....2

17) What is that taboo?.....

18) Are there occasions when both husband and wife think a child is not old enough but would like to have relationship and not have it result in pregnancy? Yes.....1 (GO TO Q19); No 2

19) How can this be done?.....

20) How will you feel if you discover you are pregnant while you are still breastfeeding?.....

21) How do the people of this area react when a nursing mother becomes pregnant again?.....

22) What do you do if you discover that you are pregnant again when the child is not upto six months? 23) On average how long do you breastfeed your children .....

24) How do you wean your child? Use bitter leaf.....1

Use other foods.....2; Send the child to my mum.....3 Others (Specify) 4

25) What do you see that makes you decide that a child should be stopped from breastfeeding?.....

26) What important reason do you have that makes you decide that a child should be stopped from breastfeeding? .....

27) Who decides that a child should be weaned? Mother.....1; Husband.....2; both.....3

28) How long shall a child normally breastfeed?....

29) For how long should a couple wait before having sexual intercourse after the birth of a baby? ..Months; Don't know ..9 Others (specify) 8

29b) Should a woman wait until she has completely stopped breastfeeding before starting sexual relations again or doesn't it matter? Should wait .... 1; Doesn't matter 2

30) In most of your childbearing experiences, do you seek for advice on infant feeding from Elderly Relations...1 ;Doctors/Nurses.....2

31) What kind of assistance do your relations render to you while you are breastfeeding a child?.....

32) What is the normal length of time between one birth and another?.....: Why?.....

33) How can you assess your last confinement (Omu Ngwo)? Fair.....1; Not fair.....2; Don't know 9

34) Do you think you are still able to become pregnant?

Yes.. 1; No... 2 (Reason .....

35) Are your parent(s) still alive? Yes .. 1;No.. 2

35b) Are your husband's parent(s) still alive?

Yes ... 1; No ... 2

35c) Have you lived with your husband's parents before? Yes .....1; No 2

SECTION H: CONTRACEPTION

01) There are various ways or methods that couple can use to delay or avoid pregnancy. Which of these methods have you heard?

Methods Heard	*YES*	*NO*
Pill or Tablets	*1*	*2*
I.U. D	*1*	*2*
injections(loop)	*1*	*2*
Diaphragm/Jelly/Cream	*1*	*2*
Condom/Durex	*1*	*2*
Female Sterilization	*1*	*2*
Male sterilization	*1*	*2*
Rhythm/Periodic abstinence	*1*	*2*
Withdrawal	*1*	*2*

Any others? 1 2
(LIST .....)
2). Have you ever used any of the methods to delay or avoid getting pregnant? Yes .....1 (ask q.2b); No.....2 (ASK Q3)

2b).Which method have you used?.....

3) Why have you not been using a method?.....

4) Are you currently using any method ? Yes...1 (ask q.5) No,.... 2 (ask q.6)

5) If yes, which method(s) are you using? .....

6) Do you intend to use a method to delay or avoid pregnancy at any time in future? Yes.....1 (ask q.7) No.....2 (ASK Q.8)
Don't Know.....9

7) What method would you prefer to use? .....

8) What are your reason (s) .....

9) Do you think a woman would have a particular number of children before using family planning method? Yes .... 1 (ask q.10); No 2

10) How many children should a woman have before she can use that? .....

11) Do you approve or disapprove of a couple using family planning method? Approve.....1; Disapprove....2

12) Do you think that your husband approves or disapproves of couples using a method to avoid pregnancy? Approves ..... 1; Disapproves 2

** BEFORE I ROUND UP, MADAM, I WANT TO ASK YOU A MORE PERSONAL QUESTION TO BE ABLE TO UNDERSTAND MORE ABOUT YOUR ATTITUDE TO CONTRACEPTION. I HOPE YOU WON'T MIND COOPERATING AS USUAL**

13) Have you had sexual intercourse in the past four weeks? YES ..... 1 (ask q.14); No..... 2(ask q.15).

14) How many times? Number of times....; Don't know ..9

15) When was the last time you had sexual intercourse?

Days ago .....; Weeks ago .....

Months ago ......; Years ago .....

Before last birth .....; No response 8;

Dk...9

SECTION I:COMMUNITY FACILITIES

01) Do you have any health facility/family planning clinic in this area? Yes.....1; No.....2

02) Do you have post-primary institutions in this community? Yes ... 1; No 2

03) Is there a major (big) market in this area? Yes...1; No....2

03b) How long does it take you to go to the market? .....Minutes; Don't Know 9

04) Any tarred/good road in this town/village? Yes.....1; No....2.

05) How would you describe the relationship between you and your husband? Cordial.....1; Not so cordial...2

06) How many brothers of the same mother does your husband have, that are alive?.....

APPENDIX B

INTERVIEWERS' MANUAL

FOR THE STUDY

'LACTATION, BIRTH SPACING AND FERTILITY AMONG

THE IGBO OF EASTERN NIGERIA'.

GENERAL INTRODUCTION AND INFORMATION

This study is aimed at investigating the impact of lactation, birth spacing on fertility of the Igbo. The purpose is to investigate how far these practices can explain the fertility level of the Igbo. It is intended to examine the traditional and modern child spacing practices of the Igbos.

The survey will involve interviewing a randomly selected group of Igbo women who are between 15 - 49 years of age. It is hoped that by interviewing a representative sample of Igbo women, we will be able to know more about the underlying currents in Igbo birth spacing practices and their fertility level. These women will be asked a series of questions about their background and their breastfeeding and child spacing practices . Other information which will be helpful to our understanding of the cultural factors influencing these practices will be asked.

CONFIDENTIALITY OF INTERVIEWS.

Because of the private nature of the interviews, it is strictly forbidden to show the completed questionnaires to any person not participating in the conduct of the survey or discussing the outcome of your interview with any body outside this group. The completed questionnaires constitute official secrets and the information in them is only for statistical processing and demographic analysis. It is strictly forbidden to reveal any of the obtained information to any individual.

THE SURVEY QUESTIONNAIRES.

Basically, there are two kinds of questionnaires we have viz: household questionnaire and the individual questionnaire (Section B - Section I). Both questionnaires have been carefully designed to provide the expected information. The households have earlier been selected. Each household will be visited and enumerated. Information will be collected about each person such as name, age, sex and education etc. Thus, the household questionnaire will be used to identify the eligible respondents to be interviewed in each household.

After listing all the members and visitors that slept in that house the night before, i.e. the previous night, you will identify only women aged 15 - 49 years, who are either ever married or

currently married, whether living with the husband or not, divorced or widowed. Where there are more than one eligible respondent, you should pick one for the interview by a lottery method. Number them on pieces of paper; mix the pieces up and pick one. The one with the number picked will be interviewed.

The individual questionnaire (Sections B - I) will now be used to interview the identified respondents. Information will be collected on the socioeconomic characteristics, fertility history, employment history, breastfeeding and child spacing practices of the respondents and their contraceptive knowledge and use and attitudes to family planning methods. For non-use women, questions are included about reasons for non-use and intentions for use and preferred method. Questions will also be asked on community facilities.

SURVEY PERSONNEL.

About 10 interviewers - all females, will be employed - five in each of the location. There will be two survey co-ordinators /supervisors who will be employed to direct and supervise the work of the interviewers. The interviewers should visit the selected household and after introducing themselves, should list all the eligible respondents on the space provided and also select the person to be interviewed. They have to check completed questionnaires, and will also return to households if the respondents were not met initially.

Research co-ordinators/supervisors are to tell the interviewers where to go and whom to interview. They are to check questionnaires daily to ensure effective interviewing, honest, factual and legible recording. He /she can help to solve any problems that may arise (e.g., understanding the questionnaire concepts or difficulty with respondents). Generally, the supervisor supervises the interview.

INTERVIEW STRATEGIES.

Because the interviewer(s) and the respondents are strangers to each other, one of the main tasks of an interviewer is to establish rapport. The respondents first impression of you will influence her willingness to co-operate with you. As such:

- Introduce yourself smartly. Be cordial, courteous and respectful. Explain the purpose of the visit and the survey. Cheerfulness matters a lot.

- Always have a positive approach. Don't be apologetic. Politeness and alertness are the keys to effective and successful interviewing. The question why interviewers chose the selected household as well as the particular individual to be interviewed also may emerge. In such cases, they may answer that 'in order to know more about the mentioned questions, they have to find the representatives of our people. This is why we took a representative sample of Igbo women and by chance, yours happen to be selected. Your responses will help us to obtain correct information about the research topic in this area, and suggestions can be made to the government for policy making'.

- Stress the confidentiality of responses where necessary.

- Interview the respondent alone. Interviews should be conducted privately. If people are around, explain to her that most of the questions are private and ask where is the best place you can talk with her alone. If not possible to separate yourself and the respondents from others, carry out the interview any way but lower your voice.

- Be neutral throughout the interview. Do not behave as if you have an interest in the survey.

- Never suggest answers. Do not change the wording or sequence of questions. Interviewers should ask the questions precisely as they are worded in the questionnaires. The interviewer must not influence

the respondent's answer in any way. Do not pose leading question that is , do not ask the question in such a way as to suggest the answer. Be tactful, but be not in a hurry.

- The survey must be carried out with complete discretion. It is expedient to conduct the interview in the absence of 'other persons' even family members, and to base it exclusively on the conversation between the interviewer and the respondent concerned. Effort must be made to create conditions in which the interview cannot be disturbed or influenced by anybody.

PROBLEMS IN THE IDENTIFICATION OF ELIGIBLE RESPONDENTS.

You already know how you can identify the eligible respondents. However you may have problems in this wise viz:

- No eligible respondents: In which case, the individual questionnaire will be blank.

- Eligible respondents not available: In this case find out when she will be around. Plan to contact her at four different times, trying to make each visit at a different time of the day. Don't make all the visits on the same day.

- Refusal to respond: This may be as a result of the initial impression created by you. If after doing everything to establish rapport, she is unco-operative, mark 'REFUSED' in the space provided in the questionnaire. Decision will be taken on what action to be taken later.

- Interview not completed: If you happen to encounter this problem, it may be because of a distraction or that the respondent's attention is needed elsewhere urgently. Try to arrange for a revisit at the convenience of the respondent.

GENERAL RULES FOR QUESTIONNAIRE COMPLETION.

1. Use a biro and/or a well-sharpened pencil to complete the questionnaires. No abbreviations. Never leave a question unanswered. If there is a question that she refuses to answer, write 'NO

RESPONSE'

2. For close questions, tick the appropriate answer only; for multiple choice questions, tick the responses of the women. In the case of open questions, for which the interviewer must reproduce in English the respondents answer in the appropriate space provided in the questionnaire. Express the answers in short sentences or phrases. Check all completed questionnaires.

DETAILED INFORMATION ON SOME QUESTIONS.

1 ON BREASTFEEDING

Breastfeeding is important for fertility and child health. This is the main focus of this study and great care is demanded in asking the questions. The questions on breastfeeding are for the births since 1987, i.e., five years before the survey. It is in SECTION F.

2. ON CHILD SPACING PRACTICES.

This area is very crucial for the survey, for here we want to identify the cultural and institutional supports for birth spacing strategy in Igboland. Most of the questions are open ended. You will elicit their opinions on child spacing practices and their attitudes towards some child spacing practices.

3. ON CONTRACEPTION.

This section collects information on the knowledge and use of various family planning methods. Respondents may consider the knowledge or use of family method a personal matter and may feel embarrassed to talk about it. To overcome this, behave as if it is nothing new, fantastic or evil to use family planning methods. Ask the questions as if they are no different from any other questions in the questionnaire. If she is hesitant, reassure her of the confidentiality of the interview and that the same questions are being asked of women in other places.

For a common understanding, the meanings of various methods

are as follows:

IUD/IUCD/LOOP - Women can use a loop or coil placed inside them by a doctor or nurse.

INJECTIONS - Women can have an injection by a doctor/nurse which stops them from becoming pregnant for several months.

DIAPHRAGM/FOAM/JELLY - They can place a sponge, suppository, jelly or cream inside them before intercourse.

CONDOM/DUREX - Men can use a rubber sheath during intercourse.

FEMALE STERILIZATION - Operation to remove the womb, uterus or tie the tube so that a woman cannot be pregnant again.

MALE STERILIZATION/VASECTOMY - Operation on men to stop them from being reproductive.

RHYTHM/PERIODIC ABSTINENCE - Couples can avoid having sexual intercourse on certain days of the month when the woman is more likely to become pregnant.

WITHDRAWAL - Men can be careful or pull out before climax/release.

ANY OTHER METHODS? - If yes, list the ones she mentions such as abortion, breastfeeding or herbs.

Don't be embarrassed asking these questions. They do not make you a sinner . It is purely an academic exercise. Keep from smiling when asking them so that you will encourage her to be direct and feel more comfortable.

4. ON SEXUAL INTERCOURSE

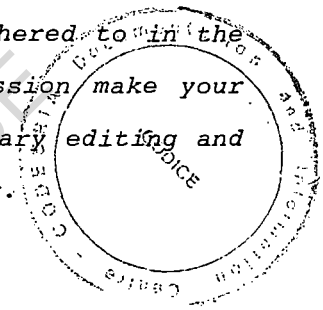
Here we want to determine the respondent's exposure to pregnancy, since fertility levels are directly related to the frequency of intercourse. These questions may be embarrassing for some respondents (even you the interviewer). Therefore ask respondents the questions in a matter-of-fact voice and do not make her feel embarrassed by your own behaviour. It may be the most difficult set of questions in the interview. A common reaction for

people who are embarrassed is to giggle or laugh uncontrollably. If you laugh in turn, or act as if you are embarrassed too, it will make her think that you and the questions are not serious. Therefore keep a serious attitude or adopt a serious posture.

5. ON COMMUNITY FACILITIES

Although you can fill this out without asking questions, all the same, ask them to be able to ascertain their knowledge of the existence of such facilities.

All these rules must be observed/strictly adhered to in the conduct of the interview. At the end of each session make your returns to the Co-ordinator /Supervisor for necessary editing and for onward submission to the principal investigator. PLEASE ADHERE STRICTLY TO THESE RULES. THANK YOU.



APPENDIX C:

STEPS OF USING UN MANUAL X TECHNIQUE FOR ADJUSTING FERTILITY DATA

Coale-Trussell developed a method for adjusting fertiltiy data, to estimate fertiltiy rates. The essence of the technique is the adjustnment of the age apttern of fertiltiy derived from information on recent births (births in the past year preceding the survey) by the level of fertitliy implied by the average parity of women in age groups 20 - 24, 25 - 29 and 30 - 34.

The data requirement for the method include:

1. the number of children ever born

2. the number of children born in the past twelve months prior to the survey (current births),

3. total number of women in each 5-year age groups, irrespective of the marital status,

4. total population.

The procedure for the computation is as follows:

a. Calculation of the reported mean children ever born. This is obtained by dividing the total number of children ever born to women in a particular age group by the total number of women in that age-group.

b. Calculation of a preliminary fertility schedule from information on births in the past year. This is obtained by dividing the number

of births occuring to women in the year or twelve months preceding the survey by the total number of women in that age-group.

c. Calculation of cumulated fertiltiy schedule for a period. The fertiltiy rates computed in step B are cummulated. The value of this sum multiplied by five is the estimate of cumulated fertilty,

$$\Phi_1 = 5\sum f(i)$$

d. Estimation of average parity equivalents for a period. Average parity equivalents F(i) are estimated by interpolation using the period fertilty rate f(i) and the cumulated fertility values calculated previously. F(i) is obtained thus,

$$\Phi(i-1) + af(i) + bf(i+1)$$

where a and b are constants. The interpolation equation used is

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

(e) Adjustment of period fertility schedule: With steps a - d we can calculate the ratios P_1/F_1. Ideally, the P_2/F_2 and P_3/F_3 are consistent, we can use one of them as an adjustment factor for the period fertility rates. And if they are not similar, a weighted average of the two can be used (the weights being the number of women in each age group as a proportion of the women in both age-groups). Where there is evidence of fertility decline affecting the older women mainly, the value of P_2/F_2 should be used. In our case, we utilised the first two ratios.

Once an adjustment factor has been chosen and denoted by K, an adjusted fertiltiy schedule is computed by multiplying the fertility rates for conventional age groups. In the computation shown here, we chose two adjustment factors (deliberately) . The first is the average of the first three ratios (P/F) for women in the age range 20 - 34 thus,

$$K = \frac{1.180+0.963+0.959}{3} = 0.967$$

The second adjustment factor is based on the assumption that the ratios had not been so consistent. This is calculated as a weighted average of P_2/F_2 and P_3/F_3, the weights being the number of women in each age group as a proportion of the women in both age groups. Thus, another K is given as

$$K = \frac{(1.100)(174)}{111+174} + \frac{(0.863)(174)}{111+174} = 0.987$$

The adjusted age-specific fertiltiy rates for the age groups are obtained by multiplying the $f_{(i)}$ - period fertiltiy rates, by the adjustment factor(s) K.

Total fertility is estimated by multiplying the sum of the adjusted age-specific fertiltiy rates thus:

$$TFR = 5\sum ASFR.$$

(F) To obtain an adjusted birth rate, we calculate the number of births that would occur to the population being considered if it were subject to the adjusted fertitliy rate and by the dividing the total number of births by the total population (UN, 1983).

APPENDIX D:
BRASS CONSISTENCY CHECK

The Brass consistency check of the TFR estimate is given as

$$\frac{CT}{W} = F\left(\frac{n-m}{n} + \frac{P}{2n}\left(m(n-m)-40\right)\right)$$

where

W = total number of women aged 15 - 44 = 845

CT = number of children ever born to women 15 - 44 = 2350

M = mean age of period fertility distribution minus 15 years, and

$$\bar{m} = 17 \times 0.0053 + 22 \times 0.288 + 27 \times 0.466 + 32 \times 0.353 + 37 \times$$

0.252 + 42 x0.088

$$= \frac{43.3241}{\sum f_i} = \frac{43.3241}{1.452} = 29.8$$

$\overline{m} = 29.8 - 15 = 14.8$

P = average proportional change in the year in the number of womemn aged 15 - 44,

$$2(W_{30-45} - W_{15-30})/15W = 0.036$$

F = Total fertility rate

n = 30 year age range.

Substituting, we have

$$\frac{2350}{845} = F\left(\frac{30-14.8}{30} + \frac{0.036}{60}(14.8(30-14.8)-40)\right)$$

$$= F\left(\frac{15.16}{30} + \frac{-0.036}{60}(224.97-40)\right)$$

$$= F\,(0.5054 + -0.110982)$$

$$2.8902 = 0.394418F$$

$$F = 2.8902/0.394418 = 7.05$$

ABSTRACT

Current interest in breast-feeding practice is a recognition of its role in population growth and child survival. The concern has been about the potential impact of reductions in the proportions of infants ever breast-fed and or the duration of breast-feeding on population growth. The relationship between breast-feeding and fertility interest policy makers because a decline in breast-feeding without a compensatory increase in contraceptive use would result in higher population growth rates. This relationship has long been recognised, yet certain aspects of the association especially the link between breast-feeding and birth-spacing have not been delineated. This study therefore examines the relationship between breast-feeding and birth-spacing, and their effect on fertility level among the Igbo of Nigeria. The study examines the main factors that affect birth-spacing dynamics in the area. It also estimates the level and proximate determinants of fertility in the area.

Data for this study were collected from a four-month fieldwork in some selected areas in Imo State, Nigeria. On the whole, 819 respondents, who are women of reproductive age groups 15 - 49 were interviewed. The proportional hazards model was the main statistical technique used. The analysis shows that Igbo fertility level is high with reported total fertility rate of 7.3, gross reproduction rate (3.5), and general fertility rate (250). Adjusted total fertility rate is 7.4, and completed family size is 6.1 for women aged 45 and above. The initiation and practice of breast-feeding is high, although there is variation among social groups. The durations of post-partum variables are as follows: breast-

feeding (10.6), post-partum amenorrhea (6.6) and post-partum sexual abstinence (7.4). The average birth interval is 24.8 months.

A proportional hazard analysis of the determinants of the birth-spacing variables of breast-feeding, amenorrhea, sexual abstinence and birth interval confirmed our hypotheses. The results showed that breast-feeding is the principal and consistent determinant of all other child-spacing variables. The significant determinants of breast-feeding duration in Igbo are parity, education, asset ownership, work status, perception of best infant food and birth attendant. Education and rural-urban residence were found not to be significant when other variables are included. Using Bongaarts' model, a total fertility rate of 5.1 per woman is estimated compared with 7.26 actually observed from the survey. The estimated total fertility rate results from the assumed total fecundity of 15.3 births per woman being inhibited by indexes of the proximate determinants most notably index of post-partum nonsusceptibility as a result of amenorrhea and abstinence (38 %), contraception (mainly traditional methods, 27%) and marriage (26%). The postpartum sexual abstinence inhibited 2.7 births while amenorrhea inhibited 1.9. Our result also shows that breast-feeding contributes 43 % to birth interval, abstinence (30%), amenorrhea (25%) and contraceptive use (0.4%).

However, on the basis of our findings, this study posits that changes in the patterns and durations of breast-feeding occurring in Igbo society beacause of modernization will lead to higher fertility, unless the use of modern contraceptives is increased. There is therefore the need for programmes that will encourage the

continuation of breast-feeding practice while simultaneously promoting the use of appropriate contraceptive methods. The current Hospital Baby Friendly Initiative programme to promote exclusive breastfeeding needs to be intensified.