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BREASTFEEDING THE PRETERM INFANT:
A STATISTICAL ANALYSIS OF THE FACTORS AFFECTING
CHOICE AND ULTIMATE SUCCESS

LYNN ELIZABETH SULLIVAN

Yale University

1996

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**Breastfeeding the Preterm Infant:
A Statistical Analysis of the Factors Affecting
Choice and Ultimate Success**

A Thesis Submitted to the
Yale University School of Medicine
in Partial Fulfillment of the Requirements for the
Degree of Doctor of Medicine

by
Lynn Elizabeth Sullivan

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BREASTFEEDING THE PRETERM INFANT: A STATISTICAL ANALYSIS OF THE FACTORS AFFECTING CHOICE AND ULTIMATE SUCCESS. Lynn E. Sullivan, Richard A. Ehrenkranz, Barbara A. Ackerman, Jo Anne Metzger, Carol Bryce-Buchanan, Michael B. Bracken. Department of Pediatrics, Yale University School of Medicine, New Haven, CT.

There is limited information about the factors that affect the mothers of preterm infants with respect to their choice to breastfeed and their success at breastfeeding. The purpose of this project was to interview women who delivered prematurely and examine the variables that influenced their decision of whether to breastfeed, and to define the factors related to their ultimate success. A feeding survey was administered by structured interview to 199 mothers of preterm infants cared for in the Yale-New Haven Hospital Newborn Special Care Unit, shortly after delivery; 109 women had selected breastfeeding, 85 had selected formula feeding, and five were undecided. A follow-up interview was administered to 73 women who were breastfeeding at the time of their infant's hospital discharge. The data were entered into a SAS database and were evaluated with a chi-square analysis and a stepwise logistic regression to determine which variables might affect feeding choice and successful lactation, and to estimate the effect that each of the significant variables independently had on the choice of feeding method. Eighty-three percent of women had chosen their feeding method prior to or during the first trimester; this finding is similar to the timing of feeding choice in the full-term population. The four variables having the greatest positive impact on a mother's final choice to breastfeed her preterm infant included the influence of friends and family who had previously breastfed an infant, if the mother did not smoke during her pregnancy, if the infant's father was the head of the household, and if breastfeeding was recommended by certain individuals. The analysis of the

follow-up data revealed that the mean duration of lactation was 14.4 ± 1.0 weeks. The majority of women were successful as evidenced by the fact that 83% stated that they enjoyed breastfeeding and an overwhelming 94% stated that they would breastfeed another preterm infant.

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INTRODUCTION

Zeng Shirong (12) , the 13th century Chinese physician reflected on the concerns that have been expressed for many years that substitutes for human milk are being used too often or too early in an infant's life:

If breastfeeding misses the time, the child without illness weakens on its own.

If food is unregulated, the child without disease becomes timid on its own.

Milk strengthens tissue and flesh.

Food makes substantial intestines and stomach.

As it is said: "breastfeeding and other feeding for two or three years, then the body will benefit."

People today do not use it.

Take away milk,

*a month of unregulated fatty or sweet food,
how could it not result in disease and harm,
resulting in profound sighs?*

HISTORICAL TRENDS IN BREASTFEEDING INFANTS

The U.S. Department of Health, Education and Welfare and subsequently the Department of Health and Human Services outlined a series of national health objectives to be accomplished by 1990. These goals were published in *Healthy People and Promoting Health/Preventing Disease: Objectives for the Nation*. Nutrition was designated as one of the principal target areas and included the following goals for breastfeeding: "By 1990, the proportion of women who breastfeed their babies at hospital discharge should be increased to **75%** and **35%** at six months of age" (49,50). The DHHS *Healthy People 2000: National Health Promotion and Disease Prevention Objectives* included the revised breastfeeding objective, updated for the 1990s: "To increase to at least **75%** the proportion of mothers who breastfeed their babies in the early postpartum period and to at least **50%** the proportion who continue breastfeeding until their babies are five to six months old" (52).

Historically, the number of breastfeeding infants has risen and fallen since the beginning of this century. Breastfeeding rates declined in the 1950s and 1960s (1955--29.2%, 1960--28.4%, 1965--26.5%) (31). This fluctuation is thought to be due in part to the introduction of commercial infant formulas as they were not available to large numbers of infants until after World War II (1). Breastfeeding reached its lowest incidence at 24.9% in 1970, started to rise in the 1970s (1971--25%, 1975--33.4%, 1978--45.1%) (31) and reached a peak in 1982 with 62% of mothers initiating breastfeeding. Between 1978 and 1983 breastfeeding increased from 47% to 61.4% nationally with significant variation between sociodemographic groups. The greatest proportion of breastfeeders were well-educated, more affluent, older women living in the Western U.S. versus those less likely to breastfeed being black women, under 20 years of age, less educated with less income, living in the Southeast Central part of the U.S. Since that time, there was a decline in mothers initiating breastfeeding with 59.7% in 1984 falling to 58% in 1985 to 52.2% in 1989 (170). In addition, between 1984 and 1989 the group of mothers that experienced the sharpest decline were women who were black, younger, less educated, primiparous, living in the East North Central region of the United States, enrolled in the WIC program, not working outside the home, and had delivered a low-birth-weight infant.

BENEFITS OF BREAST MILK IN TERM INFANTS

It has been shown that breastfeeding full-term infants is beneficial for nutritional and immunological reasons and for the emotional bonding it creates between mother and infant, and it is widely recommended for full-term infants for the first three to six months of life. Human milk meets the nutritional needs of

the healthy full-term infant, providing a sufficient amount of energy, fat, protein and minerals to support post-natal growth.

Human milk is thought to possess factors that complement the infant's developing immune system (51). Secretory IgA, the predominant immunoglobulin in human milk, is directed against gastrointestinal and respiratory pathogens. In addition to IgA, IgM, IgD, and IgE, lymphocytes and macrophages, lactoferrin, and more than 20 enzymes have been found to exist in human milk. In less developed countries with poor sanitation and contaminated water the benefits of breastfeeding infants have been well-documented in terms of decreasing the morbidity and mortality secondary to infectious causes. In developed nations, however, while there is evidence to support the anti-infective properties of human milk, there still remains controversy over whether breast milk definitively protects against gastrointestinal disease and respiratory infections (17,38).

The beneficial effects of breastfeeding on subsequent intellectual development of the full-term infant have also been investigated. One study by Tembory et al (47) found that breastfeeding itself strengthens the maternal-infant interaction and provides optimal nutrition at a particularly vulnerable period in the infant's intellectual development, thus exerting a positive effect on the ultimate cognitive development of the infant.

A study from Hawaii (5) found that the duration of breastfeeding was significantly correlated with cognitive development assessed on the subjects' third birthday. The mechanism for this relationship was unknown and was speculated to involve immunologic or nutritional factors in the breast milk itself and environmental factors such as the maternal-infant interaction. However, when other factors such as gender and socioeconomic status were controlled for, the relationship was found to remain significant.

There are certain situations in which it is disadvantageous for the infant to be provided breast milk (22). Any substance in the mother's circulation such as toxic medications or recreational drugs will pass through the breast milk to the infant. In addition, infections can be transmitted via breast milk, including rubella, cytomegalovirus, herpes, hepatitis B, and most significantly the HIV virus. Certain metabolic disorders such as galactosemia and phenylketonuria may necessitate that a mother not breastfeed her infant because of the lactose and phenylalanine in breast milk.

FACTORS AFFECTING CHOICE AND SUCCESS OF BREASTFEEDING IN TERM INFANTS

The decision to breastfeed is made very early; in over half the women it is made prior to pregnancy. In 1981, 55% of mothers breastfeeding their full-term infants had made their decision before becoming pregnant, while in 1984 that number climbed to 63%. An additional 14% of those breastfeeders made their decision during the first trimester and all in all, 98% of the breastfeeding mothers had made their decision by the time of delivery (51). Interestingly, in one study (9) the decision to breastfeed was made significantly earlier in primiparous mothers as opposed to multiparous mother who were more likely to make their decision just prior to pregnancy.

Because many women are unaware that they will ultimately deliver a preterm infant, the elements that affect the choice of feeding method in full-term infants are likely to be the same as those affecting feeding choice in mothers of preterm infants. Therefore it is important to examine those factors in the full-term population, be they demographic, environmental, or perinatal, and assess if they have a similar influence on the preterm population.

Many studies have examined the variables that influence a mother's choice of feeding method. They have shown that certain demographic characteristics such as increased maternal age and education, and Caucasian ethnic background have a positive influence on the choice to breastfeed (46). Prenatal factors that have an impact on the choice to initiate breastfeeding include the influence of family, friends, and health care providers; experiences in the hospital related to complications during the delivery; the baby's condition, mother's need to take medication, and a cesarean section which can limit mother-infant interaction; the interactions with both maternity and pediatric nurses; and the support of the baby's father and the mother's family and friends. In addition, factors related to post-hospitalization such as mother's support systems at home and her need to return to work have an impact on the mother's choice of feeding method.

There is an obvious difference in the frequency of breastfeeding based on different demographic data. Certain characteristics that have been shown to have a bearing on the choice of feeding method are not modifiable such as age, ethnicity, education, income, geographic location, or parity. Other factors that influence the choice can be modified and include employment practices, support from friends and family, the health care system, and lactation education through groups such as La Leche League and other child care education programs (24).

In 1987 the incidence of breastfeeding was high among college-educated, older white women living in urban areas or in the Western U.S. who delivered normal birthweight infants versus the lowest rates in younger black women living in rural areas or southern regions, who were less than college-educated and had lower birthweight babies (39). In contrast, the population of women who were younger, black, uneducated, of lower income and who delivered preterm infants

were less likely to be breastfeeders. This population in fact may be the one whose infants might benefit most from breastfeeding (24).

In summary, it has been found that women who are white, older, have some college education, have a higher total family income, are primiparous, live in the western part of the U.S., are not enrolled in the WIC program, have delivered a normal birthweight infant, and are not working outside the home have a greater likelihood of initiating breastfeeding and have a longer duration of exclusive breastfeeding (40,41).

A state-wide breastfeeding program initiated in Rhode Island found that the most important reason given for breastfeeding a full-term infant was related to the health of the infant. Other important reasons included maternal-child bonding, encouragement by family, friends and physicians, convenience, and reduced expense. In addition, the Rhode Island study found that the major reason women discontinued breastfeeding was because of their concern that their infant was not getting enough to eat with breastfeeding and not that they had to return to work (51).

Health of the infant is a commonly cited reason for a woman's choice to breastfeed and raises the issue of the dichotomy of infant-centered versus mother-centered reasons for choice of feeding. It has been described that women who choose to breastfeed are "infant-centered" stating reasons such as that it is healthiest for the infant and that the infant enjoys it. On the contrary, women who choose to feed their infants formula have been described as citing "mother-centered" reasons such as that breastfeeding is embarrassing and messy (21).

In terms of environmental influences it appears that the feeding practices of the mother's friends and family have a greater impact on the mother's choice than the suggestions or advice of health care professionals. Ekwo's study (9)

noted that the mother's friends who had successfully breastfed, the mother's mother-in-law, other relatives, and women at work had an influence of the choice to breastfeed while physicians and other health workers played a lesser role.

In a study by Lawrence (23) surveying health professionals, it was revealed that 72% of obstetricians, 92% of pediatricians, and 68% of nurses advocated breastfeeding if a woman was still undecided in her choice of feeding method. However, only 34% of these health professionals introduced the discussion about breastfeeding with the mother. Of the obstetricians surveyed, 65% initiated the discussion during the pregnancy compared with only 30% of pediatricians. Although these groups of professionals were reported to feel that they were an important influence on a mother's decision to breastfeed, as a whole they failed to initiate the discussion of breastfeeding, and because the choice in most mothers was made so early, the discussion needed to take place earlier in the pregnancy.

In a another study looking at factors important in breastfeeding success (6), mothers were reported as stating that their infant and the infant's father were the main source of encouragement for breastfeeding. This study found that not only were the mother's physician, the baby's physician, and the nurses sources of discouragement for the mother, but in contrast to the findings of other studies, the mother's friends and family were as well.

While in the Rhode Island program cited earlier, the infant's health played a significant role in terminating breastfeeding, other studies have shown that environmental factors such as maternal employment appeared to have a significant effect on exclusivity and duration of breastfeeding. In a study analyzing responses from a survey of new mothers (41), they found that the mother's employment status significantly and adversely affected exclusivity and duration of breastfeeding. Similarly, in a study by Sarett (42), they found that

when asked, many women who chose to formula feed stated that they made their choice because they wanted to return to school or work. However, in a study by Loughlin et al (25), they found that anticipated duration was not related to anticipated return to work but to the mother's level of confidence in breastfeeding.

There have been conflicting results from studies examining the effects of perinatal events on the choice of feeding method. In a survey by Lyon it was found that assisted delivery or cesarean section appeared to have little effect on breastfeeding (30). On the other hand, Houston cited the events of the perinatal and post-partum periods as having a significant influence on the initiation of breastfeeding (18).

TRENDS IN BREASTFEEDING PRETERM INFANTS

Many studies have been conducted looking at the rate of breastfeeding in the full-term population and at the factors affecting feeding choice and success. Few studies have examined which factors affect the frequency and success of breastfeeding in the preterm population. Interestingly, while there was a 12.3% decline (61% to 53.5%) in the rate of breastfeeding from 1984 to 1989 in normal weight infants, there was an even greater decline, 17.9% (44.1% to 36.2%), during that time period in the rate of breastfeeding low-birth-weight infants of less than or equal to 2500 gm (40).

A study by Verronen revealed how the preterm population appears to reflect the trends of the general infant population (53). This study found that in their hospital 98% of all mothers initiated breastfeeding, 77% continued breastfeeding for three months, and 49% were still breastfeeding at six months. Among the mothers of low-birth-weight infants (less than 2,500 gm) 78% initiated breastfeeding, 54% continued for three months, and 40% for six months (46% of

these infants weighed less than 2,000 gm and 86% were less than 37 weeks gestation). In addition, this study revealed that the increase in breastfeeding overall was also seen in the low-birth-weight population with an increase from 78% in 1979 to 91% in 1983.

BENEFITS OF BREASTFEEDING PRETERM INFANTS

In assessing the incidence and success of breastfeeding in the preterm population it is first important to outline the benefits and risks of this practice in this special group of infants. In other words, it is not only important to look at how many mothers of preterm infants breastfeed, why they make this choice and how successful they are, but also to decide whether it provides any advantages to the preterm infant.

Nutritional Benefits and the Need for Fortification

As the medical problems of preterm infants have been more successfully managed over the past 20 years, more effort has been expended to understand and meet the nutritional needs of very low-birth-weight infants.

While it has been well-established that human milk is the best source of nutrition for the young full-term infant, there has been a long history of debate over whether human milk is sufficient nutrition for the preterm infant. In his 1948 article looking at feeding practices of preterm infants during 20 years at the New Haven Hospital, Powers reported that in a group of preterm infants weighing 1800-2199 gm, those infants fed one-half skimmed milk gained 11.9 gm/kg/day versus those fed human milk who gained only 8.4 gm/kg/day and found this difference to be significant. He also stated that while in the 1920s they believed that all preterm infants should receive human milk, that they ultimately discovered that preterm infants grew better and had less gastrointestinal

disturbances on cow's milk with supplements than on human milk with the same supplements. He therefore concluded that a cow's milk mixture, not human milk, was the ideal food for the preterm infant, that one can not consider fortified human milk as breast milk feeding, and that once the preterm infant is healthy and mature enough to breastfeed they should be allowed to do so (35).

More recently, a study by Atkinson assessed the protein, fat, and carbohydrate balances in preterm infants receiving their mother's preterm milk, pooled breast milk, or an infant formula (SMA, 20 and 24 kcal/ounce) (3). They found that infants receiving preterm human milk demonstrated nitrogen retention similar to normal intrauterine accretion rates, a finding also seen in the formula group but not in the pooled breast milk group. In general, the infants fed preterm human milk also had the most favorable protein and amino acid status. In addition, fat absorption was found to be highest in the preterm human milk group and although the gross and net lactose intakes in this group were less, all feeding methods provided adequate absorption of lactose. In terms of growth measurements, all three groups had similar rates of growth in length and head circumference, but the infants from the preterm human milk group and the formula group regained and exceeded their initial weights while the pooled milk group only reached 94% of their initial weight.

Gross (15) demonstrated similar findings in his study comparing preterm human milk, term human milk, and a preterm infant formula in regards to their effects on rates of growth and retention in preterm infants. This study revealed that infants fed preterm milk or the preterm formula exhibited faster rates of regaining birthweight and overall weight gain than preterm infants fed the milk of mothers delivering full-term infants. They also showed that while the electrolyte, protein, and energy content of preterm milk may be adequate, it is consistently lacking in its supply of calcium, and phosphorus, and magnesium.

Another study by Atkinson (4) compared the macromineral balances in preterm infants fed their mothers milk versus infants being fed a modified formula (SMA, 20 and 24 kcal/ounce). This study concluded that preterm human milk provided for adequate retention of sodium and chloride while the formula did not. Both feeding methods provided sufficient retention of potassium equivalent to intrauterine rates. In addition, both the preterm milk and the modified formula provided insufficient calcium, phosphorus, and magnesium in terms of meeting the estimated growth requirements for the preterm infant. Although length and head circumference in the infants fed their mother's preterm milk approximated intrauterine growth, some of the infants exhibited deficient bone mineralization when assessed radiographically.

In order to assess the nutritional adequacy of preterm human milk for preterm infants, Anderson et al (2) looked at the nutritional composition of preterm milk, specifically at the total energy content as compared to full-term milk. They reported that preterm human milk was similar in composition to full-term human milk in regards to the concentrations of sodium, potassium, chloride, calcium, phosphorus, and magnesium, but that the protein concentration was 10-20% higher in preterm human milk. They also described that the lipid and lactose concentrations of both preterm and full-term human milk increased during the first month of lactation and that the nitrogen and protein content decreased over time. In addition, while the lactose concentration of preterm human milk was lower than in term human milk at the beginning of lactation, its concentration rose during the first two weeks of lactation in term milk and during the first four weeks of lactation in preterm human milk. This study also specifically focused on the energy content of both types of human milk and found that preterm milk was actually more energy dense during the first month of lactation, mostly attributable to its higher lipid concentration. Since the total

daily intake of preterm infants may be restricted, the ability of preterm human milk to meet nutritional needs may be limited. However, Anderson's study provides evidence that because of its higher energy density and increased protein content, preterm milk may not only be adequate for preterm infants, but may be the optimal form of nutrition.

Davies (7) compared the growth of preterm infants divided into two groups of gestational ages, 28-32 weeks and 33-36 weeks. The infants were randomly fed either a cow's milk formula or expressed mature breast milk. Weight gain, linear growth, and head circumference growth were assessed. This study found that in the group of younger infants (28-32 weeks) the rate of growth was slower in the breast milk group than in the formula group during the first month of life. During the second month of life the breast milk infants gained weight slower than the formula fed infants while the linear and head growth was not significantly different between these two groups. Interestingly, in the group of older infants (33-36 weeks) there were no significant differences in any of the growth indices during the first or second month. They concluded that term breast milk was not suitable for adequate growth of very immature preterm infants during the first month of life but raised questions as to whether it might be appropriate for older preterm infants. This study further emphasized that it is specifically preterm milk, not any breast milk, that may be uniquely beneficial to the preterm infant.

In order to eliminate any influence on milk composition that daily mechanical expression might have, Gross et al (16) compared the composition of milk expressed from women who had delivered preterm, with the milk expressed from women who had delivered sick full-term infants, with the milk of mothers who were nursing their full-term infants but were intermittently expressing milk. This study revealed higher concentrations of protein, sodium, and chloride in the preterm milk than in either of the full-term milks, and

comparable fat, potassium, energy, and volume in all three types of milk. Lactose was found in significantly lower concentrations in the preterm milk. The lack of any difference between the exclusively expressed full-term milk and the intermittently expressed full-term milk demonstrated that the difference in milk composition is not attributable to mechanical expression. Interestingly, the greatest degree of variability was seen in the preterm milk and this was shown to exist within individual mothers. Therefore, although mechanical expression does not appear to affect composition, it is important to consider that expressed milk may vary in its nutritional content from one feeding to the next.

While many studies discuss the unique nutritional benefits of providing preterm human milk to preterm infants, there are certain nutritional deficiencies produced in infants fed preterm milk (10,45). As previously discussed, there has been a demonstrated variability in the content of preterm human milk, and the most variable component is fat which contributes nearly 50% of the calories in human milk. In addition, although the levels of protein and sodium are found to be higher in preterm milk in early lactation, they decrease with time, and these deficits may lead to protein deficiency and poor growth, and hyponatremia. As many of these studies have revealed, the calcium and phosphorus levels in preterm milk are at no time adequate for bone growth in preterm infants and can lead to poor bone mineralization (osteopenia of prematurity). Therefore, although there are many compelling reasons to feed the preterm infant preterm human milk, they must be carefully monitored and the issue of fortification must be addressed.

If preterm human milk is thought to provide unique nutritional and immunological benefits to the preterm infant but also possesses some obvious deficiencies, then perhaps instead of deserting the notion of providing preterm infants with their mother's milk, it is necessary to explore the benefits of protein

and mineral fortification. Raupp et al (36) demonstrated that preterm infants who were exclusively fed their mother's milk, developed by two to three weeks of age an elevated alkaline phosphatase, hypophosphatemia, and hypophosphaturia, even though they maintained a normal serum calcium. When a mineral supplement or fortifier was introduced, the alkaline phosphatase fell, the serum phosphorus level and the amount of urinary phosphorus excretion rose even though there was a concurrent rapid weight gain which would imply a large mineral requirement. This study promoted the idea of human milk fortification instead of simply mixing preterm human milk with formula.

Ehrenkranz et al (8) compared preterm infants fed a preterm formula or their own mother's preterm milk fortified with a protein-mineral supplement and found that both diets supported rates of growth approximating the third trimester of pregnancy. With the fortification, however, the preterm milk not only allowed for better zinc and copper retention, but produced levels of calcium and phosphorus retention nearing the low end of the range of that expected in utero. This study emphasized that although preterm human milk may need fortification to adequately provide for growth, it is in fact still better suited for preterm infants than full-term milk or a preterm formula.

Immunological Benefits

There are also nonnutrient factors that are important in evaluating the benefits of breastfeeding the preterm infant. The immune components in human milk may play an important role in preventing infection and death especially in high-risk hospitalized infants such as those born prematurely or with intrauterine growth restriction (19). The immune system of all newborns is immature at birth but the preterm infant is born with a significantly underdeveloped system as seen by the decreased function of neutrophils, decreased levels of sIgA and

lysozyme, the decreased expression of antibodies, and a decreased production of cytokines. In addition, because of the shortening of the intrauterine period, the time for placental transfer of IgG to the fetus is decreased thus exposing the preterm infant to a greater likelihood of infection with opportunistic pathogens (13).

Since preterm infants have more medical problems and are at a significantly higher risk of death secondary to sepsis, the issue of the anti-infective properties of preterm human milk is critical. The antimicrobial components of human milk include antibodies, lysozyme, lactoferrin, lactoperoxidase, fatty acids, components of the complement system, and cellular components such as leukocytes and macrophages. Lactoferrin is found in higher concentrations in preterm milk than in term milk and exhibits both bacteriostatic and bactericidal activity, as well as possessing anti-inflammatory properties. Both lysozyme and total IgA and sIgA are present in higher concentrations in preterm than full-term human milk. *Lactobacillus bifidus*, the predominant colonic flora in breastfed infants, may also serve some anti-infective function.

In addition to providing other immunological advantages, there is evidence that breast milk may possess anti-inflammatory factors that may specifically protect against necrotizing enterocolitis for which the very low-birth-weight preterm population is at a higher risk for developing. In addition, preterm milk may help to prevent necrotizing enterocolitis because of the antibodies and other cellular components it possesses and because of its lower osmolarity. It may also stimulate maturation of the immature intestinal mucosa. A study by Lucas looked at 926 low-birth-weight infants (<1850 gm) and found that the infants fed formula had a six times greater likelihood of developing necrotizing enterocolitis than the breastfed infants (26).

Impact on the Maternal-Infant Relationship

Skin-to-skin contact, also described as "kangaroo baby care" involves the practice of holding the preterm infant naked between the mother's breasts. Studies have speculated about the possible immunological benefits of this practice in that a mother who is exposed to her preterm infant's nursery environment during kangaroo baby care may produce sIgA antibodies in her breast milk specific for pathogens in that environment. This theory remains unproven but a study by Whitelaw (54) revealed the psychological advantages of kangaroo care including an increased confidence in breastfeeding on the part of the mothers, feelings of confidence in monitoring the infant, and eagerness for discharge. Therefore, skin-to-skin contact not only helps to increase the maternal-child bond but also provides lactation reinforcement.

Impact on Cognitive Development

A number of important studies have been conducted by a British group of researchers investigating the effects of preterm milk on subsequent cognitive development of preterm infants, a population at an increased risk for cognitive deficits (33,28,29,44). In their original study (33) the infant's developmental status at 18 months of age was correlated with a mother's choice to breastfeed. After controlling for demographic and perinatal factors, they found that the infants who had received breast milk scored 4.3 points higher on the Bayley mental scale and scored 4.4 points higher on IQ tests. This finding raised the question of whether there is a factor in breast milk that increases brain growth and maturation. On the other hand, this difference in cognitive development might be more a function of the mother's choice to provide milk as reflecting a

parenting issue that is influencing both the choice to breastfeed and her infant's development.

In order to further assess the effects of diet in the early post-natal period on long-term developmental outcome, this same group examined four groups of preterm infants (28). Prior to randomization into one of the groups the mothers were asked if they wished to provide breast milk for their infants. One group of infants was fed a nutrient-enriched preterm formula alone, one was fed the preterm formula as a supplement to their own mother's expressed preterm milk, a third group received a standard term formula, and the fourth group received the standard formula as a supplement to their own mother's expressed preterm milk. If the mother chose to provide breast milk she was randomized to one of the groups that used expressed preterm milk along with the formula supplement. They subsequently evaluated the infant's development at 18 months of age and found that not only did the infants fed the preterm formula (+/- preterm human milk) gain weight significantly faster and have an increased rate of head growth, but they had consistently higher mental, psychomotor, and motor development indices. The largest difference between the groups was seen in the motor development with a 14.7 point advantage in the preterm formula group. Of importance is the fact that the median period from birth to end of feeding trial was four weeks indicating that nutrition during the very early post-natal period when there is rapid brain growth may play a significant role in long-term development.

These same groups of children were subsequently re-evaluated at seven and a half to eight years of age to assess if the neurodevelopmental advantages related to their being fed their mother's preterm milk had persisted into childhood (29). They found an 8.3 point advantage in IQ for children who had received breast milk during the early post-natal period. In this study they adjusted for

confounding variables such as demographic factors and ultimately found that of the five factors related to IQ, receiving mother's milk was the most significant. Of note, there was a dose-response relationship between the proportion of preterm milk received and subsequent IQ. In addition, the process of being breastfed was not associated with this advantage as most of the infants were fed via nasogastric tubes thus lessening the likelihood that the increase in IQ was secondary to the maternal-child relationship that is fostered in the practice of breastfeeding. It is intuitive to assume that the association between being fed breast milk and an increase in IQ is rooted in the fact that mothers who choose to provide their infants with breast milk may themselves be better educated or may possess specific parenting skills thus leading to an increased IQ in their offspring. This study revealed that the children whose mothers chose to provide them with breast milk but failed to do so had the same IQ as those children whose mothers chose not to breastfeed, thus supporting the idea that it may be the actual consumption of the breast milk and not the choice to provide it that results in the higher IQ. Although this study controlled for certain demographic variables, it is impossible to completely rule out the effects of parenting or genetics on the infant's later developmental status, but this study provides important evidence of the benefits of breast milk on long-term neurodevelopment.

FACTORS AFFECTING CHOICE/SUCCESS OF BREASTFEEDING IN PRETERM INFANTS

There is compelling evidence that human milk does provide certain advantages to the preterm infant in terms of its unique nutritional components, its anti-infective properties, and its potential impact on later cognitive development. Therefore, an important area of interest and the focus of this

study, is to evaluate which factors may predict or influence a woman's decision to breastfeed her preterm infant. It is also important to evaluate these factors to see how they differ from those influencing feeding practices of mothers of full-term infants. If mothers of preterm infants choose to breastfeed for the same reasons as the mothers of full-term infants, it can be theorized that preterm delivery may in fact have little bearing on the ultimate choice of feeding method. This finding would be important as it would provide evidence for health professionals that they should encourage mothers of preterm infants to at least attempt to breastfeed their infants.

In a study from Finland the factors that correlated with the choice of breastfeeding in low-birth-weight infants were found to include the mother's social class. Women from higher socioeconomic classes not only had a higher rate of breastfeeding but they breastfed for a longer period of time. Infant characteristics such as gestational age and birthweight were only slightly positively correlated with length of breastfeeding. The only group of infants who showed a marked reduction in the incidence of breastfeeding were those with respiratory distress syndrome with 26% of these infant's mothers never initiating breastfeeding (53).

A study by Lucas et al (27) examined the factors associated with a mother's choice to provide breast milk for her preterm infant. They found that a married, well-educated, primiparous mother 20 years or older who delivered a male infant by cesarean section was 1,000 times more likely to choose to provide breast milk than a mother who was single, less educated, multiparous, less than 20 years of age, and had vaginally delivered a female infant. This study revealed that maternal education had a significant influence with 98% of mothers with college degrees or higher choosing to provide milk as compared to 54% with less education. In addition, parity had a significant effect as

primiparous mothers were twice as likely to provide milk than multiparous mothers. Factors related to the infant and to perinatal events such as gestational age, multiple births, birth weight, size for gestational age, complications associated with the pregnancy, and mother's transfer from another hospital were found not to be associated with intention to provide milk. This study also suggested that hospital staff had little influence over maternal choice of feeding method. In addition, they found that cigarette smoking by the mother, particularly during the second trimester, was negatively correlated with the choice to provide breast milk.

It is also important to identify those factors associated with successful maintenance of lactation in women who have delivered prematurely. If these mothers are found to be able to successfully breastfeed their infants, then health professionals and families can assist in providing an environment in which the woman is more likely to continue providing milk for her preterm infant once breastfeeding is established.

A number of programs emerged during the 1970s and 1980s focusing on the promotion of breastfeeding in preterm infants. In the late 1970s a lactation program was established in San Diego using two teaching hospitals as a resource for promoting breastfeeding. At the hospitals used for this program, human milk was viewed as the preferred nutrient for most of the preterm and critically ill infants admitted to the NICUs. In these units the nursing staff were trained to assist mothers in initiating and maintaining lactation, helping them with the pumping and expression of milk, and the safe storage of their milk. In addition, they advised on issues of maternal nutrition and breast care and once the infant was ready to begin nursing, the nursing staff assisted the women in retraining the infant to breastfeed directly from the breast (51).

One of the recommendations outlined in the 1984 Surgeon General's Workshop on Breastfeeding and Human Lactation addressed the issue of support services in the community which promote breastfeeding. Similar to the program in San Diego, The Texas Children's Hospital Lactation Support Program encouraged feeding hospitalized infants their own mother's milk. This program was staffed by nurses who acted as lactation counselors, a neonatologist, and a lactation physiologist. They provided the mothers with the equipment and instructions for expressing breast milk as well as facilities for storage of the milk. They provided assistance for establishing suckling and fortification of maternal milk for preterm infants. This program also included home visits and an outpatient lactation clinic in order to promote the continuation of breastfeeding following discharge (46).

In a study by Meberg et al, the rate of breastfeeding in full-term and preterm populations was compared. Although overall a greater percentage of mothers of full-term infants were successful in breastfeeding, there was still a high percentage of preterm mothers who were successful (61% at three months, 45% at six months, and 21% at nine months). This study emphasized the importance of the attitudes and practices of the nursery and unit staffs in supporting efforts by mothers of preterm infants in order to sustain lactation, especially in the setting of the neonatal intensive care unit where interaction between mother and infant is more limited (32).

The factors affecting a mother's choice to and her success at breastfeeding her preterm infant have not been extensively explored. While mothers of full-term population have been studied at length in regards to the forces that influence their feeding practices, there is minimal information about what motivates the feeding choices of mothers of preterm infants. Since there are established benefits to providing human milk to the preterm infant, this

project interviewed women who delivered prematurely to assess the timing of their choice of feeding method, to examine the variables that influenced their decision of whether to breastfeed, and to define the factors related to their ultimate success.

METHODS AND MATERIALS

Identification of Subjects/Questionnaire Design

Initial Questionnaire

A feeding survey questionnaire composed of 130 items was administered by a trained interviewer (J.A.M.) to 199 of 260 consecutive eligible women who had delivered preterm infants at Yale-New Haven Hospital (Appendix I). Written informed consent was obtained from each woman and a structured interview was carried out. The goal of the questionnaire was to address the choice of feeding method made prior to and following delivery. The questionnaire examined certain maternal demographic factors such as age, race, religion, marital status, level of education, head of household, occupation, and household income. Other information obtained included environmental factors such as substance use/abuse; the influences of family, friends, health care professionals, and childbirth education classes; constitutional aspects of the infant such as gestational age (determined using standard obstetrical methods) and birthweight; mother's feeding choices during other pregnancies; mother's experience with the present pregnancy and labor and delivery and her perception of the infant's vulnerability; and initial (prior to delivery) and final (following delivery/at time of interview) choice of feeding method (breastfeeding vs. formula feeding).

Of the total 199 subjects interviewed, five were excluded from the statistical analysis because they were undecided in their choice of feeding method following delivery, therefore the final analysis included a total of 194 women. In the study population there were 20 sets of twins born, therefore there was a total infant sample size of 214. However, because of incomplete data, some of the variables have lower sample sizes. Eight of the 214 infants died

prior to discharge from the hospital, but because their mothers had completed the structured interview, they were included in the analysis.

Respondents were divided into two groups according to initial and final choice of feeding method. The formula group consisted of all subjects who chose to formula feed exclusively. The breastfeeding group consisted of all subjects who chose to breastfeed exclusively or breastfeed with formula supplementation. The women who chose to provide milk to their preterm infants donated their milk to a human milk bank that was established in the Newborn Special Care Unit at Yale-New Haven Hospital. These mothers were instructed by a trained lactation nurse (B.A.A.) how to hygienically express their milk, either manually or by pump, collect, and store it. This bank provided each infant with its own mother's milk when he/she was ready to be given enteral feedings.

Follow-Up Questionnaire

Of the 194 women a total of 109 were supposedly still breastfeeding their infants when the infants were discharged from the hospital. Oral consent was obtained and follow-up interviews of 82 (75%) of those 109 women who were breastfeeding were conducted by telephone (J.A.M.) following the infant's hospital discharge (Appendix II). However, one respondent was excluded because, by her report, her milk never came in, and eight were excluded because they stated that they never started nursing. Therefore the final sample size for the follow-up questionnaire was 73 women. There were six sets of twins in this sample resulting in a total infant sample size of 79 infants.

The follow-up questionnaire consisted of 62 questions and ascertained if the mother was still breastfeeding and if she was not, at what point she had stopped. Other questions addressed factors that supported or interfered with

the mother's interest in or ability to continue breastfeeding, if and when formula supplementation was introduced, and recommendations the mother had received from outside sources.

Statistical Analysis

The data from both the initial and follow-up questionnaires was entered into a SAS database (Perinatal Epidemiology Unit staff, L.E.S.) and was analyzed (L.E.S.) using SAS/STAT 6.03 (SAS Institute Inc., Cary, N.C.). All mean values were presented as the mean \pm the standard error (SE). A chi-square analysis (PROC FREQ/chi-square option) was performed on the data from the initial questionnaire to compare the characteristics of mothers who chose to breastfeed and formula-feed their preterm infants to determine if there was a significant relationship between these variables and the initial and final choice of feeding method. A p-value of less than 0.05 was considered to indicate statistical significance.

It should be noted that for the variables "discussed feeding method with someone" (initial questionnaire questions 26A-26G) and "recommended feeding method" (initial questionnaire questions 27A-27G) a grouping of people was made (includes infant's father, subject's mother, other family members, friends, subject's obstetrician, and infant's future pediatrician) using an equation that is provided in Appendix III.

The characteristics that were found to be significant were made dichotomous with 1 favoring breastfeeding and 0 favoring formula feeding. If those variables were no longer significant once they were made into binary variables, they were excluded from the analysis. In addition, any variable whose

adjusted sample size fell below 50% of the total sample size, was excluded from the analysis.

The odds ratio and 95% confidence intervals were obtained and were used to measure the relationship between each of the characteristics and the choice of feeding method. PROC LOGIST/stepwise option was used to perform a stepwise logistic regression analysis in order to estimate the effect that each of the significant variables independently had on the choice to breastfeed or formula feed and to adjust for confounding factors. The SAS/STAT program deletes observations with missing values. Therefore, in order to obtain the greatest number of observations, those variables that did not enter into the model and did not have a level of significance of $p < 0.05$ from the initial logistic regression analysis were removed from further analysis. The variables that remained from the initial regression analysis were re-analyzed using PROC LOGIST yielding a greater total number of complete cases.

In examining the follow-up data, a frequency procedure (PROC FREQ) was performed (L.E.S.) on the data to look at the demographic profiles of the mothers and infants in the follow-up sample and to investigate the factors that might be associated with the mother's ultimate success with breastfeeding.

RESULTS

Initial Questionnaire

Maternal and Infant Demographics, All Subjects

A questionnaire consisting of 130 items was administered to 199 (77%) of 260 consecutive mothers of preterm infants weighing less than or equal to 2,000 gm, less than or equal to 37 weeks gestational age, and cared for in the Yale-New Haven Hospital Newborn Special Care Unit between 4/18/83 and 10/29/84. Written informed consent was obtained from and structured interviews were conducted with 94% of the women within seven days after delivery and 6% within 34 days after delivery. A database was constructed containing data from this questionnaire and from additional data compiled prior to the infant's hospital discharge. The demographic profiles of the original 199 women and their 219 infants (includes twin deliveries) are shown in Tables 1 and 2, respectively. As shown in Table 1, the maternal sample was largely white and married. The majority were in their mid-twenties or older and had obtained a ninth-grade education or higher. The religion with the greatest representation was Protestant and in over half of the sample the infant's father was the head of the household. The main provider's occupation ranged from unemployed to being a professional and in the majority of the women, the main provider's income was less than \$6,000 per year (based on the Consumer Price Index, \$6,000 in December 1984 would translate to \$8750 in November 1995 dollars).

Table 2 reveals the characteristics of the preterm infants born to the total population. In this population there were 20 twin deliveries, therefore there was a total infant sample size of 219. However, because of some incomplete data, variables may have lower sample sizes. The overall mean birthweight was 1492.09 ± 26.71 gm, the overall mean gestational age was 29.68 ± 0.24 weeks, and 52% of the infants were female.

Study Population

Of the 199 women interviewed, five were excluded from the analysis because they were undecided in their choice of feeding following delivery, thus leaving a sample size of 194. Of note, of the seven women who were undecided in their choice prior to delivery, following delivery three had decided to breastfeed, three had decided to formula feed, and one was still undecided. Of the 194 women who were interviewed and included in the statistical analysis, 189 were found to be alert and oriented while three were found to have poor memory and attention span, one woman's mental status was found to fluctuate, and one was slightly confused. All but one was fully able to speak and understand English and the exception was only somewhat limited in her abilities. One hundred and eighty-two of the 194 (94%) were found to be frank and accurate while nine (4%) were probably accurate, two (1%) were not always accurate, and one (1%) was found to be seldom accurate. While 179 women were cooperative and interested during the interview, six were found to be cooperative, seven were found to be ambivalent, and only two were found to be uncooperative.

One hundred and eighty-two (94%) of the mothers were interviewed within the first seven days following delivery while nine (4%) were interviewed within the first 12 days following delivery, and only three (2%) were interviewed slightly over a month following delivery. Having these three mothers interviewed so long after delivery is of concern as the study was designed so that results would not be affected by post-partum input. However, since each of these three mothers had chosen their method of feeding prior to delivery and did not change that method following delivery, these late interviews are of less concern.

Maternal and Infant Characteristics and Final Choice of Feeding Method

Table 3 separates the sample into a breastfeeding group and a formula group. Interestingly, all of the maternal characteristics except religion are statistically significant. Of the significant variables, it appears that women who are older, who are of Caucasian ethnic background, who are married, have a higher level of education and greater family income, and who are in a household headed by the infant's father, have a greater frequency of breastfeeding their preterm infants.

This sample was divided into ethnic groups and the choice of feeding was examined, revealing clear differences in the incidence of breastfeeding. In white women the rate of breastfeeding is 66% and formula feeding is 34%, while in African-American women it is exactly the opposite with 34% of women choosing to breastfeed and 66% choosing to formula-feed. The frequency of breastfeeding in Hispanic women is 80% and formula feeding is 20%. Marital status, education, head of household, and employment are factors found to be correlated with breastfeeding. The effect of these factors within ethnic groups was examined. In white women, 98% of breastfeeders were married and 2% were unmarried, while in African-American women 43% were married and 57% were unmarried (sample size in Hispanic women was too small for analysis).

With regards to educational attainment, 68% of white women who breastfed had a college degree or higher while 45% of African-American women who breastfed had a comparable education. Seventy-nine percent of white women who breastfed lived in households where the infant's father was head of the household while 33% of African-American women who breastfed lived in households where the infant's father was head of household. While 51% of white women who breastfed their infants were not planning on working outside the home, only 25% of African-American breastfeeding women were not

planning on working outside the home. In both populations of women the infant's father was overwhelmingly supportive (greater than 98%) of their choice to breastfeed, and both groups stated that the person they would seek advice from regarding breastfeeding was a health professional (e.g. pediatrician, obstetrician, Lactation Nurse Specialist).

Table 4 outlines the demographic features of the 214 infants born to the 194 mothers (includes 20 twin deliveries). While many of the maternal characteristics appeared to significantly influence the final choice of feeding method, infant characteristics seemed to have little bearing on whether the mothers provided human milk or formula to their preterm infants.

History of Substance Use/Abuse and Final Choice of Feeding Method

The majority of both groups of mothers did not drink any caffeinated coffee during their pregnancy while at least 60% of both groups did drink alcoholic beverages during the prenatal period (Table 5). Of significance, twice as many breastfeeding mothers than formula feeding mothers never smoked cigarettes, and of those who did, nearly three times as many of the breastfeeding group stopped smoking during their pregnancy. In addition, twice as many of the formula group mothers continued to smoke during their pregnancy. Also of significance, although most of the women in both groups did not use marijuana during pregnancy, twice as many in the formula group used marijuana than in the breastfeeding group. On the other hand, a greater percentage of women in the breastfeeding group used prescription or over-the-counter drugs during the last four weeks of pregnancy than did the formula group.

Family/Friends/Health Care Professionals and Final Choice of Feeding Method

Table 6 reveals other potential influences on the mother's choice of feeding method. The women in the breastfeeding group were much more likely to have discussed prior to delivery their plans of feeding method with the infant's father, family members, and friends than the women in the formula group. In addition, more of the women in the breastfeeding group had read materials on feeding methods and were more influenced by these materials than the women in the formula group. Friends and family who either had breastfed an infant or who were planning on breastfeeding future children had a significant positive effect on a mother's choice to breastfeed. The rate of breastfeeding was greater in the cases where the infant's father was included in the choice of feeding method and provided a higher level of support for the final choice.

Across both groups, most of the mothers did discuss their plans with their obstetrician, but did not discuss their plans with their own mother or their infant's pediatrician. Interestingly, very few mothers attended any kind of childbirth education (18%) or La Leche League classes and of those who did, breastfeeding was rarely discussed (37% in childbirth education classes).

Experience of Pregnancy and Newborn and Final Choice of Feeding Method

A mother's pregnancy experience and her sense of her infant's vulnerability were expected to be important with respect to their effect on her choice of feeding method. Mothers were queried about their feelings about their pregnancy and labor and delivery, their interaction with their newborn, and their perception of their infant's condition and their level of concern (Table 7). The only variable that was found to be statistically significant was the mother's

description of her pregnancy. Women who described their experience as negative were more likely to breastfeed than to give their preterm infants formula. While other variables such as the type of delivery, mother's description of the newborn at birth, and whether the mother had held the infant since birth all neared significance, none of them met the criteria of a p-value < 0.05 for statistical significance.

Of the 192 mothers who responded, 86 of their infants were described as having no medical conditions while other infants suffered from conditions such as respiratory distress (69), hyperbilirubinemia (25), hyperthermia (7), or Grade II-III intraventricular hemorrhages (7). According to one investigator's (R.A.E.) assessment, 37 mothers thoroughly understood their infant's medical condition, while 100 had a partial understanding, 54 only understood that their infant was preterm or too little, and two had no appreciation of their infant's condition or their responses were too vague to discern their level of understanding. When asked to rate the clarity of the explanations they were given in terms of their infant's medical condition, 143 mothers rated it as very clear, 42 rated it as clear or moderately clear, and six rated it as unclear or very unclear.

As seen in Table 7, of the mothers who responded, close to two-thirds of their infants had been fed orally by the time of interview. Of the 206 infants from which this data had been collected, 168 (82%) had not been fed by their mother's chosen method, while the remaining 38 (18%) had been fed by their mother's chosen method. Specifically, of those mothers who had decided to breastfeed, only 17% of mothers had put their infants to the breast by the time of interview and of the mothers who had chosen to feed their infants formula, close to the same percentage, only 20%, had bottle-fed their infants formula by the time of interview. Of the 109 breastfeeders who responded, 63% had not yet produced breast milk since their infant's birth while 37% had.

Past Experiences and Final Choice of Feeding Method

Other important factors examined included mother's past experiences including parity (defined as infants born at 500+ gm or 20+ weeks gestation despite outcome), and how the mothers themselves were fed as infants (Table 8). Although the sample size was small (n=90), the primary method of feeding of their first infant for multiparous mothers had a significant effect on choice of feeding method. Sixty-four percent of mothers who had breastfed their first infant chose to breastfeed while 91% of mothers who formula fed their first infant chose to formula feed their present infant ($p < 0.001$). Parity influenced choice to breastfeed as nulliparous women were more likely to breastfeed their infants than to give them formula. In addition, the primary feeding method of the mother when she was an infant significantly affected her choice. Although the majority of both groups of women received formula as infants, most likely reflecting the trends at that time, a greater percentage of women who were breastfed as infants chose to breastfeed their infants than provide them with formula.

External Influences and Final Choice of Feeding Method

External influences such as a mother's leaving the home to return to work or school can have an effect on the choice to breastfeed. None of the variables related to the mother's choice to return to work or school had any impact on feeding choices in this study (Table 9). The majority (80%) of the respondents who planned to breastfeed did not expect that working outside the home would affect their efforts to breastfeed. Mothers who felt that working or studying outside the home would affect their plans to breastfeed expressed the following concerns: working would create the inconvenience of pumping and bottle-feeding breast milk; concern over whether the infant was getting enough;

because of work the infant would be forced to wean earlier; and if the infant received formula while the mother was at work, concerned that her milk supply would be affected.

Choice of Feeding Method

The majority of mothers in this study made their choice of feeding method during or before the first trimester (39% prior to conception and 44% during the first trimester) while 13% made their choice during the second trimester and only 4% made their choice during the third trimester. There were no significant differences in when the decision was made between the breastfeeding and formula groups. When asked what their original plan had been, 117 mothers (60%) planned to breastfeed their infants, 71 (37%) planned to formula feed them and six (3%) were undecided. For the purposes of the analysis, breastfeeding included breastfeed until weaned, breastfeed and supplement with formula later, and breastfeed and supplement with formula from the time feeding was initiated. Formula feeding was simply exclusively formula feeding.

When questioned as to the reason for their choice of feeding method, the primary reasons for breastfeeding included nutrition (11.2%), breastfeeding being healthier for the infant (10.2%), breastfeeding providing immunities (8%), and breastfeeding providing bonding between mother and infant (7%). Other reasons cited included protection against allergies, breastfeeding seen as more natural, easier and less expensive, seen as a special experience, and following the advice of NBSCU nurses who said breastfeeding was better. In terms of the choice to formula feed, the primary reasons included convenience (8%), mother's comfort (3.7%), and mother's working schedule (3.7%). Additional reasons were that it was easier because of twins, it gave infant's father a role,

mother was unwilling to stop smoking, embarrassed to expose breasts, and mother not wanting to be concerned with her diet.

When the subjects were surveyed as to why they had not chosen the alternative method, most (60.3%) stated no specific reason. Of mothers who had chosen to breastfeed, their reasons not to formula feed included to avoid allergies (9.6%), formula seen as artificial (5.8%), inconvenience (4.8%), because formula was expensive (3.8%), and because formula feeding viewed as impersonal (1.9%). Of those who had chosen not to breastfeed, they had done so because formula was more convenient (6.2%), to avoid exposing breasts in public (6.2%), did not view breastfeeding as that important (6.2%), and because of the fear of discomfort of breastfeeding (5%).

Change in Feeding Method

When asked about their final choice of feeding method, the number of mothers choosing to breastfeed had decreased and those choosing to formula-feed had increased. Breastfeeding was the final choice of feeding method for 109 mothers (56%) and formula feeding was the final choice of feeding method for 85 mothers (44%). Because the infant's condition and the mother's perception of her infant's vulnerability may have an impact on the mother's changing her choice of feeding method, the infant's overall condition at time of birth was examined. Twenty-three mothers changed their choice of feeding method. Of the 27 infants of these 23 mothers, 14 (56%) infants' condition were described by their mothers as being good to very good. Nineteen (70%) of the infants were described as having a diagnosed medical condition. Although 85% of these infants were described as having an improved condition at the time of interview, all of the mothers expressed some degree of concern for their infant's condition.

It is also important to examine whether the mothers switched from breastfeeding to formula feeding or formula feeding to breastfeeding and the reasons they gave for their change in decision. Of the 23 mothers whose choice of feeding method changed, 14 switched from breast to formula, three switched from formula to breast, and of the six who were initially undecided, three chose to breastfeed and three chose to formula feed. Of the 14 who ultimately chose to formula feed instead of breastfeed, seven indicated that they changed their choice due to the preterm delivery, citing reasons such as the inconvenience of traveling to the hospital, the long hospitalization, impatience, not wanting to use a breast pump, and their feeling that their infant was too small to breastfeed.

Of the other seven who switched to formula feeding for reasons other than the preterm delivery, they stated their reasons included that they were taking medications, that they had delivered twins, that they had developed toxemia, that they were impatient, and because of a lack of supply of breast milk. Of the three women who switched from formula to breastfeeding, two did so because of the early delivery, stating that breastfeeding would help their preterm infant to grow and that they had been told that breastfeeding was better, while the other mother whose choice was unaffected by delivery stated that breastfeeding was what her partner wanted her to do. Of the six who were initially undecided, the three who chose to breastfeed all stated that they made the choice because of the preterm birth citing reasons such as it would help the infant to grow and that the NBSCU nurses had advised it. Of the three that ultimately chose to formula feed, one woman stated that she had to take medication because of the preterm delivery and therefore the early delivery had affected her choice and had precluded her from being able to breastfeed. The remaining two women chose to formula feed for reasons unrelated to the preterm

delivery (a physical condition interfering with breastfeeding (1) and no interest in learning about breastfeeding (1)).

Therefore, of the 188 women who initially made a decision regarding their choice of feeding method, 103 of the 117 women (88%) who initially intended to breastfeed, chose to breastfeed following delivery, while of the 71 women who initially planned to formula feed their infants, 68 (96%) stuck to their original plan. As previously stated, 17 (8.8%) of the 194 women switched from one choice of feeding method to another.

When asked how long they initially planned to breastfeed their infants, the greatest percentage of women (38.2%) responded four to six months; a similar response was given following delivery. Of those mothers who changed their planned duration of breastfeeding, all 27 increased the amount of time they planned to breastfeed. Of these 27, 22 changed the amount of time they planned to breastfeed because of their infant's preterm birth stating the following reasons: infant was early, would improve chances (7), because infant was so tiny (5), infant would gain weight better (5), infant was small and needed immunities (3), preterm delivery gave mother longer maternity leave and therefore longer time to breastfeed (1), and because infant was in the Newborn Special Care Nursery the mother felt she wanted to nurse for a longer period of time (1). Of the women who changed the time they planned to breastfeed for reasons other than the preterm delivery, their reasons included breastfeeding longer because it was less expensive, and the death of one twin allowed the mother to breastfeed longer.

Advice/Information Given to Women who Chose to Breastfeed

Most of the mothers (67%) who planned to breastfeed did receive information from medical and nursing personnel (including the NBSCU lactation

nurse) regarding pumping and supplying breast milk by the time the interview was conducted (Table 10). When asked what factors helped their plans to breastfeed, 44 (40%) of the mothers responded that there were no specific factors. Some of the factors that did positively contribute to their plans to breastfeed included in-depth help from the lactation nurse, help from the neonatal nurse and nursing staff, the accessibility of an electric pump on their maternity floor, and because of the preterm delivery and the infant being so small some mothers were more concerned about the infant getting enough breast milk. When queried about what factors interfered with their plans to breastfeed, the majority (54%) stated that there were none, while 21% stated that having a preterm infant in the unit made it difficult to breastfeed. Other responses included that the hospital was far away, and that a cesarean section, the need to take certain medications, and their medical condition interfered with plans.

Twenty-four percent of mothers in this study had no specific concerns about breastfeeding. Of those with concerns, major issues included concerns about having enough milk, about infant's ability to suckle, worries about getting through the pumping period successfully, about their nutritional status, about the amount the infant was getting, the discomfort of sore nipples, and concerns that the infant would become accustomed to the bottle and would not breastfeed.

Importantly, when asked what additional assistance the hospital could provide for women who wished to breastfeed their preterm infants, the vast majority (78%) stated that there was none. Several women stated that more education before the preterm delivery would be helpful as would bringing the infant to her as soon as possible following delivery, and having someone explain pumping and breastfeeding.

Multivariate Statistical Analysis Assessing Variables Influencing Final Choice to Breastfeed

Table 11 reveals the dichotomous variables that were found to be significant ($p < 0.05$). Of interest is that none of the variables related to factors following the preterm delivery such as the infant's gestational age, birthweight, type of delivery, or description of infant's condition at birth were statistically significant. The factors having the greatest impact on a woman's choice to breastfeed were those related to her demographic profile, her substance use, the input of her family and friends, and her pregnancy experience. Variables such as "friends/family feeding method", "marital status", and breastfeeding as "someone's recommended feeding method" had particularly high odds ratios favoring breastfeeding.

Stepwise Logistic Regression Analysis

The association between each independent variable and the outcome variable was examined in a logistic regression. A stepwise logistic regression was performed and included all of the variables listed in Table 11, all of which were found to be significant ($p < 0.05$) in the analysis of the final choice of feeding method. This procedure yielded 136 observations and produced four variables that met the significance level for entry into the model (Table 12). When the stepwise logistic regression was performed a second time including only those same four variables, the procedure yielded 177 observations and the same four variables (Table 13). Therefore, the following variables were found to have the greatest positive impact on a mother's final choice to breastfeed her preterm infant:

- 1) Influences of friends/family who had previously breastfed an infant

- 2) If mother did not smoke during pregnancy
- 3) Infant's father being head of the household
- 4) If breastfeeding was recommended by certain individuals
(infant's father/subject's husband, subject's mother,
obstetrician, pediatrician)

Follow-up Data

Maternal and Infant Demographics

Of the 109 mothers who were planning to breastfeed their infants at the time of discharge, 82 (75%) completed follow-up interviews by telephone conducted from 1/29/83 to 3/23/85. One respondent was excluded because, by her report, her milk never came in, and eight were excluded because they stated that they never started nursing. Therefore the final sample size was 73 mothers. There were six sets of twins in the sample, therefore producing a total infant sample size of 79 infants. All of the mothers were assessed to be alert and fully oriented, frank and accurate, cooperative, and able to speak and understand English.

Table 14 shows the demographic data for the 73 mothers included in the review of the follow-up data. In general, this sample population was in their mid-thirties, white, married, Protestant, and had a college level education. In the majority of the women's households the infant's father was the head of the household, the income of the household's main provider was greater than \$6,000 per year, and the percentage of professionals in this study sample was approximately 18% versus 10% seen in the original study sample.

Table 15 reveals the profile of the 79 infants who were breastfed and whose mothers were included in the follow-up telephone interview. The mean birthweight of these infants was 1588.94±39.40 gm and the mean gestational

age at birth was 30.23 ± 0.39 weeks. At the time of follow-up interview, the infants ranged from 17-35 weeks old with a mean age of 22.8 weeks (SE=0.5). The mean age when discharged home was 5.0 weeks (SE=0.4). The infant's age when their mother's milk came in ranged from one to seven days old with a mean age of 3.6 days (SE=0.2). The infants ranged in age from one to 13 days old when they were put to the breast with a mean age of 4.9 days (SE=0.3).

Factors Influencing Success and Duration of Breastfeeding

Table 16 lists the variables examined in terms of their possible influence on the mother's successful lactation. The majority of mothers (84%) were given literature on breastfeeding by the Lactation Nurse Specialist while they were in the hospital and found this literature to be helpful. Most of the mothers were provided assistance by a lactation nurse before their infant was discharged from the hospital. They found the lactation nurse helpful in that she assisted them in initiating nursing and helped them use the breast pump. In addition, the majority of the mothers (74%) found the Lactation Nurse Specialist to be the person who provided the most helpful information. Although the Lactation Nurse Specialist played an integral role in assisting women with breastfeeding while they were in the hospital, following their infant's hospital discharge, their contact with the Lactation Nurse Specialist was limited. When asked who gave them the most encouragement to continue breastfeeding once they had returned home, 25% stated that it was the infant's father, while 13% found themselves most encouraging, and 10% found the Lactation Nurse Specialist to be most encouraging. The majority (66%) of mothers who responded stated that it was closeness to the infant that they most enjoyed about breastfeeding.

The mean age of the infants when they stopped breastfeeding was 14.4 weeks (SE=1.0). Of the 79 infants, five stopped breastfeeding prior to discharge

home, one stopped breastfeeding on the day of discharge, and the remaining 73 continued breastfeeding following discharge. Of the six who stopped breastfeeding prior to or on the day of discharge home, their mean age at time the time they stopped breastfeeding was 4.2 weeks (SE=0.8) and of the 73 who discontinued breastfeeding following their return home, their mean age at time of discontinuation was 15.3 weeks (SE=1.0). Of the 73 mothers, 27 (37%) were still nursing at the time of the follow-up interview, while 46 (63%) had discontinued breastfeeding. Of the 64 mothers that responded, 59 (92.2%) breastfed their infants for a shorter period of time than they had originally planned, while five (7.8%) breastfed them for a longer period than they had planned.

Interestingly, when the mother made her decision to breastfeed appears to have an impact on ultimate duration of breastfeeding. Of those mothers who made the decision prior to conception, 65.6% breastfed for greater than 15 weeks, while those mothers who made the decision to breastfeed during or after the first trimester of pregnancy, only 35.9% breastfed longer than 15 weeks (p -value=0.013). These data indicate that the earlier the decision to breastfeed was made, the longer the duration of breastfeeding.

Forty-six of the 73 mothers had discontinued breastfeeding by the time of the follow-up interview and gave the following reasons for their ceasing lactation: decreased milk supply (19%), their health (illness, needs to take medication) (12%), return to work or school (10%), mother frustrated or unhappy (10%), infant's health (illness, refused breast) (7%), and the needs of other children in the family (5%). It is known that the introduction of solid foods can also have an impact on the duration of breastfeeding. In this study population, of the 49 mothers who had introduced solid foods by the time of the follow-up interview, 23 had introduced solid foods after discontinuing breastfeeding, 22 had

introduced solid foods while still breastfeeding, and four had started feeding their infants solid food at the same time as ceasing breastfeeding.

When asked what advice the mother would give to a mother who wished to breastfeed a preterm infant the subjects stated that they would advise mothers to try to breastfeed, be patient, and "hang in there." Although 50% of mothers experienced some kind of difficulty with breastfeeding such as feeling that their milk was insufficient, overall, a large percentage enjoyed breastfeeding (83%). A good measure of success may be the fact that an overwhelming 94% stated that they would breastfeed another preterm infant.

DISCUSSION

Although the popularity of breastfeeding has fluctuated over the past 50 years, the benefits of this practice for full-term infants have been well-established. Recently, the benefits of providing human milk to preterm infants have been investigated and it is clear that there are significant advantages to feeding preterm infants their own mother's milk alone or with fortification. Therefore, it is important to explore the factors that play a role in a woman's choice of feeding method for her preterm infant, to compare these factors to those influencing mothers of full-term infants, and to examine if a preterm delivery has a necessarily adverse impact on the desire and ability of mothers of preterm infants to breastfeed.

With respect to incidence, the rates seen in the full-term population and in our study were similar. In 1984, 59.7% of full-term infants were breastfed, similar to the rate of 56.0% for the preterm infants found in our study in the same year. It follows that if the rates are equivalent and if the factors influencing the decision to breastfeed are similar in women delivering at term and prematurely, then perhaps it is those demographic and environmental factors that influence feeding choice while preterm delivery has a minimal negative effect.

The focus of our study was to delineate the factors that might predict or influence a woman's decision to breastfeed or formula feed her preterm infant and the factors that might ultimately affect successful breastfeeding. Studies have shown that the choice of feeding method is made either before or very early in pregnancy in most women. One study of full-term infants indicated that 49% to 61% of mothers had decided upon their method of feeding prior to pregnancy, and that 85% to 92% of mothers had made their decision before the end of the second trimester (42). Similarly, our study showed that 83% of

mothers of preterm infants made their decision before or during the first trimester, 13% during the second trimester, and 4% during the third trimester.

Our study also revealed that in addition to the decision being made early, very few women wavered from their original choice of feeding method. This adherence to the original choice of feeding method is also seen in the population of women delivering at term. For example, in one study 96-97% of mothers fed their infants as they had previously planned (42). In our study the majority of both groups of women adhered to their original feeding plan, with 88% of women who chose to breastfeed and 96% of women who chose to formula-feed sticking to their decision. Therefore, since the choice of feeding is usually made prior to delivery and since most women adhere to their original decision, a preterm delivery appears to have little impact on the choice of feeding method.

However, although the number of women who changed their feeding choice was small, our study suggests that for those women, the preterm delivery did play a role. Of the six women who were undecided in their choice of feeding method prior to delivery, three chose to breastfeed and three chose to formula feed. Of those who chose to breastfeed, each woman stated that the preterm delivery influenced her choice, while those choosing to give their infants formula stated that the preterm delivery had no impact on their decision. Of the 117 women who had decided before delivery that they would breastfeed, 14 (12%) switched to formula feeding, and seven of them stated that the preterm delivery influenced their decision. Similarly, of the 71 women who had decided to formula feed prior to delivery, three (4%) switched to breastfeeding. Of those who switched, two out of the three changed their decision due to a preterm delivery. Therefore, although the vast majority of mothers did not change their decision, of the 17 women who did change their decision, nine (53%) indicated that the occurrence of a preterm delivery had an effect.

All the demographic variables examined in our study were statistically significant with regards to choice of feeding method except for the mother's religion (Table 3). Both level of income and the person who was considered the head of the household were found to be important variables; a higher income and the infant's father being the head of the household were associated with a greater likelihood of the mother choosing to breastfeed. A mother in our study was more likely to breastfeed if she were older, white, married, better educated, primiparous, and had delivered by cesarean section. In fact, 95% of the mothers with those features chose to breastfeed compared to 42% in the group comprised of younger, non-white, less-educated, multiparous women who had delivered vaginally. A study by Lucas et al revealed that mothers of low-birth-weight infants who were breastfed had a profile similar to that found in our study (27). Another study (40) found that similar demographic features in the full-term population such as white ethnicity, some college education, increased family income, increased maternal age, primiparity, and an infant of normal birth weight were positively correlated with the choice to breastfeed. Therefore, except for the infant's condition, many of the variables that have a positive influence on the full-term mother to breastfeed have a positive influence on the mother of the preterm infant.

Sauls (43) profiled the American woman of the late 1970s in terms of their choice of feeding method:

"Who is most likely to choose breast-feeding and to lactate for a prolonged period of time is one who was breast-fed as an infant, has successfully breastfed an infant before, has friends who breast-feed their infants, receives support from health care personnel, receives support from her husband, strongly believes breastfeeding is 'healthy', believes her infants enjoy breast-feeding more than bottle feeding, has an educational level beyond high school, does not work out of the home, lives in a cultural environment that is supportive of breast-feeding, is socioeconomically advantaged, and does not belong to a racial minority."

On the other hand, Sauls described the mother most likely to bottle feed as one:

"Who belongs to a lower socioeconomic group, has a lower educational level, is more likely to be receiving governmental support, and is younger, single, and a smoker. She is also more likely to be gainfully employed outside the home and to have physical or emotional prenatal or postnatal illness; she also has a greater propensity to deliver a low-birth-weight infant."

Our study confirmed Sauls' observation that women who formula feed were more likely to be cigarette smokers. Women who did not smoke cigarettes during their pregnancy were greater than four and a half times more likely to breastfeed than to feed their infants formula. Similarly, women who did not use marijuana during their pregnancy were three times more likely to breastfeed their infants. Alcohol intake however did not seem to have any significant bearing on a mother's choice of feeding method with the majority of both feeding groups drinking some form of alcoholic beverage during their pregnancy. Therefore, our study found that women who chose to breastfeed were more likely to choose to abstain from cigarette and marijuana smoking but not from alcohol use (Table 5).

Studies examining the influence of perinatal events and the infant's condition on the mother's choice of feeding method have reported conflicting results. We found that infant variables such as gestational age, birthweight, and gender did not have a significant effect on the mother's choice of feeding method (Table 4). Perinatal events such as complications during the pregnancy or during labor and delivery also had little influence on a woman's feeding choice (Table 7). However, the type of delivery and the description of the baby's condition at birth nearly reached statistical significance ($p=0.071$ and 0.075 respectively), while only the mother's description of her pregnancy was statistically significant ($p=0.011$); mothers who felt negatively about their pregnancy were 2.81 times more likely to breastfeed. This finding suggests that

women who view their pregnancy as a negative experience are more likely to breastfeed in order to possibly compensate for these negative feelings and to increase their connection with their infant. However, since we found that over 80% of the women had made their decision regarding feeding choice before conception or during early pregnancy, feelings toward their pregnancy may actually have had little impact on their final choice, and other unknown factors might be at play.

Environmental influences such as friends and family had a greater impact on a our study subject's choice to breastfeed their preterm infants than physicians or nurses (Table 6). Variables such as how friends and family had fed their infants, discussions of feeding method with friends, baby's father and other family members, infant's father being included in the decision and being supportive of the chosen feeding method were all statistically significant and all favored the choice of breastfeeding. Of all the factors found to be statistically significant, if the mother's family or friends had previously breastfed an infant, she was almost eight times more likely to breastfeed her preterm infant. This finding emphasizes the critical impact family members or friends can have on a woman's choice of feeding method. As reported in other studies (6, 11), our study also showed that the infant's father and the woman herself were important sources of encouragement for successful lactation.

Studies of full-term infants have similarly revealed that health care professionals play a significantly smaller role in providing information and influencing feeding choice than the family and friends of the woman. In addition, because few mothers changed their intended method of feeding it can be concluded that the hospital course and staff have little bearing on the ultimate choice. Ekwo et al (9), in examining the full-term population, found that close friends and family who had successfully breastfed were key to influencing study

subjects to breastfeed and that prenatal counseling, though important, may be less influential as it takes place during a less optimal time for motivating mothers.

Analysis of our data with logistic regression revealed four variables (Tables 12 and 13) that were found to have the greatest influence on a mother's choice of feeding method after controlling for other confounding factors. As previously stated the influence of friends and family was the most powerful in terms of its effect on feeding choice. In addition, a mother's choice not to smoke during her pregnancy, the presence of the infant's father as the head of the household, and breastfeeding as the recommended method of feeding by friends, family, and health care providers all were significantly associated with the dependent variable of the mother's final choice to breastfeed her infant.

In general, although family members and friends may have a more significant impact on final choice of feeding method than health care professionals, it is clear from our study that mothers of preterm infants are also profoundly influenced by the individuals around them in terms of who they discuss their decision with and the recommendations of those individuals. Although it is indisputable that maternal demographic factors greatly affect a mother's choice, these factors are not easily altered. Therefore, the factors that are modifiable such as the influence of a mother's family, friends, and her health care professionals can affect a change in maternal attitude and, if done at an appropriately early time, can encourage a mother to attempt to breastfeed her preterm infant.

The follow-up population consisted of those women who had been discharged from the hospital breastfeeding their infants. In comparison with the original study population (Table 1), this sample was older, had a higher level of education and income, and had a greater percentage of professionals (Table

14). The infant population in the follow-up group (Table 15), however, had an only slightly higher gestational age and was on average 5% greater in birthweight than the original group (Table 2). Therefore, this population again reflects the fact that the women in this study who breastfed tended to be older and came from a higher socioeconomic background than the general study population, while the infants in this population were relatively the same in their profile as the original study group.

Although we found that health care providers had very little influence over a mother's choice of feeding method in the total study population, in the group of breastfeeders health care professionals appeared to play a much greater role. Over 60% of the breastfeeding women stated that a health care provider would be the first person who they would consult with for advice regarding breastfeeding. In addition, the majority of women had been spoken to by health care personnel while in the hospital about supplying breast milk and had been given information on pumping breast milk (Table 16). There appears, however, to be a discrepancy between the responses given by mothers during the initial interview and those given during the follow-up interview regarding the information and assistance provided by the NBSCU lactation nurse. While the majority of women reported that they did not receive information or assistance from the Lactation Nurse Specialist when questioned during the initial interview (Table 10), the vast majority reported otherwise at the time of the follow-up interview (Table 16). The fact that the mean time between the initial interview and the time of the infant's discharge home was approximately one month may explain these contradictory statements. Presumably during the month following the initial interview and prior to the infant's discharge the mother received information and guidance from the Lactation Nurse Specialist. Therefore, since 94% of the interviews were conducted within seven days after delivery, it

appears likely that the mothers received the information and assistance, but not during the period prior to the initial interview. Interestingly, while the Lactation Nurse Specialist played a significant role in providing support during the infant's hospitalization, the majority of the women reported limited contact with the Lactation Nurse Specialist following the infant's discharge. In view of the fact that the current trend is to discharge women from the hospital earlier in the postpartum period, this information suggests that better follow-up for women who have chosen to breastfeed a term or a preterm infant may help more women to successfully sustain lactation. It would be of significant value if a Lactation Nurse Specialist or a visiting nurse who is experienced with instructing women about breastfeeding could visit the mother at home following her infant's discharge and continue to provide the support that was initiated in the hospital. In order for health professionals to fully promote breastfeeding, they must not only provide information, but must also focus on developing techniques for initiating and sustaining lactation, provide instruction for pumping and expressing breast milk, as was described by women in our study, and educate women about maternal nutrition and breast care. It is also crucial that they educate parents about ensuring the safe and careful storage and transport of human milk in order to avoid contamination and to supervise women when they are training their baby to nurse from the breast once the infant is healthy enough to do so (51).

There is a tendency to equate successful lactation with the duration of lactation. One of the objectives outlined in the Department of Health, Education and Welfare and the Department of Health and Human Services publications *Healthy People* and *Promoting Health/Preventing Disease: Objectives for the Nation* (49,50) was that by 1990 35% of women should be still breastfeeding their infants at six months of age. Similar to the decline in the rate of initiation of

breastfeeding from 1985 to 1989 there was also a decline in the rate of breastfeeding at age of six months from 22.1% in 1985 to 19.6% in 1989 (46). In our study only 16.5% of women were still breastfeeding when their infants were six months of age. Although it is difficult to quantitate the influence a preterm delivery had on duration of breastfeeding, in the 46 women who had discontinued breastfeeding by the time of the follow-up interview, 19% cited decreased milk supply and 7% cited infant's health as the reasons for ceasing breastfeeding. While both of these factors could be related to the delivery of a preterm infant, it appears that the impact of a preterm delivery on the length of time of breastfeeding is small.

Our study demonstrated a correlation between when the decision to breastfeed was made and the ultimate duration of breastfeeding. The earlier the decision was made, the longer the duration of breastfeeding; an association that has been described in other studies examining full-term populations (14,20). This finding suggests that a longer standing decision may accompany a greater conviction to breastfeed which may translate into an increased duration of breastfeeding.

Loughlin et al (25) found that the following factors in a full-term population predicted mothers and infants at risk for early termination of breastfeeding (discontinuation of breastfeeding before eight weeks of age): 1) maternal lack of confidence in breastfeeding, 2) anticipated duration of breastfeeding of less than six months, 3) infant's demanding personality, and 4) trouble with feeding. In our study the majority of women breastfed for a shorter period than they had originally planned. In comparing our data with one of the criteria Loughlin found to be significant, anticipated duration of breastfeeding of less than six months, we found that those women who planned to breastfeed for less than 24 weeks stopped breastfeeding at an average of 11.5 ± 1.1 weeks, while those women

who planned to breastfeed for more than 24 weeks stopped breastfeeding at an average of 18.8 ± 1.6 weeks. Therefore, our study also demonstrated the significant impact ($p < 0.002$) that planned feeding duration had on actual feeding duration.

A study of full-term infants by Beske and Garvis (6) defined success of breastfeeding by two criteria: 1) the mother's subjective feeling of success at breastfeeding and 2) if the mother would breastfeed again. They did not include duration of breastfeeding as an indicator of successful or unsuccessful breastfeeding. In our study two factors that were used to measure success of breastfeeding were whether a mother enjoyed breastfeeding and if she would breastfeed another preterm infant. In the follow-up group although 50% stated that they experienced some kind of difficulty with breastfeeding, 83% of mothers stated that they enjoyed breastfeeding, a sentiment that could probably be translated into a feeling of success at breastfeeding. In addition, 94% of women reported that they would breastfeed another preterm infant, an indication that they viewed their own breastfeeding experience as a successful one and that they did not feel that delivery of a preterm infant excluded a mother from the opportunity to breastfeed.

Interestingly, our study revealed, as have others examining the full-term population, that the choice of feeding method is made very early, often prior to the pregnancy. This finding is an important public health issue. If breastfeeding is significantly beneficial for both preterm and full-term infants and the choice to breastfeed is made pre-conception or during early pregnancy, then it is crucial that education and intervention take place prior to the prenatal and perinatal periods. Furthermore, because the decision is made early and it is ultimately adhered to, it is clear that the choice of feeding method is the consequence of very early experiences that exert their influence well in advance of pregnancy.

Therefore it is not appropriate to begin lactation education during the third trimester. It must begin much earlier, for example during the elementary or junior high school years when both girls as well as boys can benefit from learning about the nutritional, immunologic, and psychological advantages of breastfeeding. In addition, health care professionals must recognize that in order to have an influence on choice of infant feeding methods, they must provide education and information at an early stage of development and not after the decision has already been made.

In conclusion, we found that the proportion of mothers of preterm infants that do decide to breastfeed is similar to the proportion of mothers in the full-term population, and that similar factors in each population have an impact on that decision. Since our study had the benefit of a diverse population, we believe that our data provide an excellent representation of the possible effects of different demographic and environmental factors. In addition, our data demonstrate that a preterm delivery does not exclude a woman from breastfeeding and that once a mother of a preterm infant has initiated breastfeeding she can successfully sustain lactation and view the experience as a satisfying one.

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Table 1. *Demographic profile of mothers*

Characteristic		n	%
Age (n=199) (Range=15-41) (Mean + SE=27.0±0.41)	<=25	77	38.7
	26-29	54	27.1
	30-34	51	25.6
	>=35	17	8.5
Ethnic background (n=198)	white	126	63.6
	black	62	31.3
	hispanic	5	2.5
	asian	5	2.5
Marital status (n=199)	married	135	67.8
	never married	54	27.1
	separated	5	2.5
	divorced	5	2.5
Religious background(n=195)	protestant	98	50.3
	catholic	67	34.4
	jewish	9	4.6
	none	17	8.7
	other	4	2.1
Level of education (n=198)	1-8 grade	5	2.5
	9-12 (high school)	100	50.5
	college	75	37.9
	graduate	17	8.6
	>graduate	1	0.5
Head of household (n=199)	infant's father	109	54.8
	self/parent	90	45.2
Occupation of main provider (n=188)	professional	19	9.5
	business manager	11	5.5
	own med business	2	1.0
	lesser professional	21	10.6
	admin personnel	12	6.0
	own sml business	7	3.5
	semi-professional	6	3.0
	cler/sales worker	14	7.0
	technician	4	2.0
	skilled manual	24	12.1
	mach op/semi-skilled	33	16.6
unskilled	3	1.5	

Table 1. *Demographic profile of mothers*
(continued)

Characteristic		n	%
Occupation of main provider	unemployed	39	19.6
	trust fund/savings	4	2.0
Income (\$) (n=195)	<6,000	117	60.0
	6,000-35,000	25	12.8
	35,000-100,000	34	17.4
	>100,000	19	9.7

Table 2. Profile of infants

Characteristic		n	%
Birthweight (gm) (n=212) (Range=620-2000)	<=750	10	4.7
	751-1000	25	11.8
	1001-1250	26	12.3
	1251-1500	28	13.2
	1501-1750	50	23.6
	1751-2000	73	34.4
Gestational age (wks) (n=219) (Range=21-37)	<28	58	26.5
	28-31	91	41.6
	32-34	57	26.0
	>34	13	5.9
One minute Apgar score (n=203)	0-3	46	22.7
	4-6	64	31.5
	7-10	93	45.8
Five minute Apgar score (n=191)	0-3	14	7.3
	4-6	54	28.3
	7-10	123	64.4
Sex (n=214)	boy	102	47.7
	girl	112	52.3

Table 3. Association between maternal characteristics and mother's final choice of feeding method

Variable		Breast		Formula		p
		n	%	n	%	
Maternal age (yrs)	<=25	30	27.5	46	54.1	<0.001
	26-29	31	28.5	23	27.1	
	30-34	41	37.6	9	10.6	
	>=35	7	6.4	7	8.2	
Ethnic background	white	80	73.4	42	50.0	<0.001
	black	21	19.3	40	47.6	
	other	8	7.3	2	2.4	
Marital status	married	92	84.4	39	45.9	<0.001
	single/divorced/ separated	17	15.6	46	54.1	
Religious background	catholic	42	39.2	22	26.5	0.152
	protestant	48	44.9	48	57.8	
	other	9	8.4	4	4.8	
	none	8	7.5	9	10.9	
Level of education	<college	43	40.4	60	70.6	<0.001
	>=college	65	59.6	25	29.4	
Head of household	infant's father	75	68.8	30	35.3	<0.001
	self/parent	34	31.2	55	64.7	
Income (\$)	<6,000	50	46.3	65	79.3	<0.001
	6,000-35,000	20	18.5	4	4.9	
	35,000-100,000	22	20.4	10	12.2	
	>100,000	16	14.8	3	3.6	

Table 4. Association between infant characteristics and mother's final choice of feeding method

Variable		Breast		Formula		p
		n	%	n	%	
Birthweight (gm) (n=207)	<=750	8	7.0	2	2.2	0.407
	751-1000	12	10.4	11	12.0	
	1001-1250	13	11.3	12	13.0	
	1251-1500	15	13.0	13	14.1	
	1501-1750	23	20.0	26	28.3	
	1751-2000	44	38.3	28	30.4	
Gestational age (wks) (n=214)	<28	30	25.6	27	27.8	0.259
	28-31	50	42.8	40	41.2	
	32-34	33	28.2	21	21.7	
	>34	4	3.4	9	9.3	
One minute Apgar score (n=198)	0-3	26	23.6	19	21.6	0.179
	4-6	28	25.5	33	37.5	
	7-10	56	50.9	36	40.9	
Five minute Apgar score (n=186)	0-3	5	4.9	8	9.5	0.270
	4-6	26	25.5	26	31.0	
	7-10	71	69.6	50	59.5	
Sex of infant (n=209)	boy	55	48.2	46	48.4	0.980
	girl	59	51.8	49	51.6	

Table 5. Association between history of substance use/abuse and mother's final choice of feeding method

Variable		Breast		Formula		p
		n	%	n	%	
Prenatal caffeinated coffee use (n=194)	yes	42	38.5	31	36.5	0.769
	no	67	61.5	54	63.5	
Prenatal alcohol (n=194)	yes	65	59.6	55	64.7	0.470
	no	44	40.4	30	35.3	
Smoking history (n=194)	never smoked	54	49.5	27	31.8	<0.001
	smoked/stopped during pregnancy	33	30.3	12	14.1	
	smoked/continued during pregnancy	22	20.2	46	54.1	
Prenatal marijuana use (n=194)	yes	8	7.3	16	18.8	0.016
	no	101	92.7	69	81.2	
Prenatal prescription or over-the-counter drug use (n=192)	yes	69	63.9	39	46.4	0.016
	no	39	36.1	45	53.6	

Table 6. *Influence of family, friends and health care professionals and mother's final choice of feeding method*

Variable		Breast		Formula		p
		n	%	n	%	
Discussed plans of feeding method with:						
Infant's father (n=193)	yes	90	83.3	49	57.6	<0.001
	no	18	16.7	36	42.4	
Mother (n=190)	yes	51	48.1	33	39.3	0.224
	no	55	51.9	51	60.7	
Family members (n=192)	yes	64	59.8	32	37.6	0.002
	no	43	40.2	53	62.4	
Friends (n=193)	yes	76	70.4	29	34.1	<0.001
	no	32	29.6	56	65.9	
Obstetrician (n=194)	yes	63	57.8	48	56.5	0.853
	no	46	42.2	37	43.5	
Pediatrician (n=188)	yes	15	14.3	18	21.7	0.185
	no	90	85.7	65	78.3	
Read materials on feeding method (n=193)	yes	66	60.6	38	45.2	0.034
	no	43	39.4	46	54.8	
Influenced by these materials (n=105)	yes	28	42.4	8	20.5	0.022
	no	38	57.6	31	79.5	
Friends/family feeding method to breastfeed (n=177)	yes	71	71.7	19	24.4	<0.001
	no	28	28.3	59	75.6	
Friends/family planned feeding method to breastfeed (n=93)	yes	43	82.7	9	22.0	<0.001
	no	9	17.3	32	78.0	
Infant's father included in choice of feeding method (n=175)	yes	93	89.4	48	67.6	<0.001
	no	11	10.6	23	32.4	

Table 6. *Influence of family, friends and health care professionals and mother's final choice of feeding method (continued)*

Variable	<u>Breast</u>		<u>Formula</u>		p	
	n	%	n	%		
Infant's father's level of support for final choice of feeding method (n=172)	v supp/supp	99	94.3	51	76.1	<0.001
	mod supp/	6	5.7	16	23.9	
	unsupp/v unupp					

Table 7. Pregnancy experience and mother's initial understanding of infant's medical condition and mother's final choice of feeding method

Variable		<u>Breast</u>		<u>Formula</u>		p
		n	%	n	%	
Description of pregnancy (n=187)	positive	77	74.8	75	89.3	0.011
	negative	26	25.2	9	10.7	
Complications during pregnancy (n=193)	no	33	30.3	29	34.5	0.531
	yes	76	69.7	55	65.5	
Description of labor/delivery (n=184)	positive	64	62.7	59	71.9	0.187
	negative	38	37.3	23	28.1	
Complications during labor/del (n=194)	no	19	17.4	21	24.7	0.214
	yes	90	82.6	64	75.3	
Type of delivery (n=203)	vaginal	56	49.6	56	62.2	0.071
	cesarian	57	50.4	34	37.8	
Description of infant's condition at birth (n=206)	very good	24	21.2	28	30.1	0.075
	good	25	22.1	11	11.8	
	mod good	36	31.9	27	29.0	
	poor	22	19.5	15	16.1	
	very poor	6	5.3	12	12.9	
Mother's perception of infant's condition at time of interview as compared to at time of birth (n=206)	worse/same	34	30.4	20	21.3	0.140
	better	78	69.6	74	78.7	
Mother's concern about infant (n=208)	very worried	35	30.7	34	36.8	0.648
	worried	16	14.0	13	13.2	
	mod worried	41	36.0	29	30.8	
	slightly worried	13	11.4	7	7.5	
	not worried	9	7.9	11	11.7	
Infant's age when first touched (n=204)	<1 hr	30	26.8	19	20.7	0.549
	1-24 hrs	64	57.1	55	59.8	
	24 hrs-7 days	18	16.1	18	19.6	

Table 7. Pregnancy experience and mother's initial understanding of infant's medical condition and mother's final choice of feeding method (continued)

Variable		<u>Breast</u>		<u>Formula</u>		p
		n	%	n	%	
Mother held infant since birth (n=204)	no	36	32.4	41	44.1	0.087
	yes	75	67.6	50	55.9	
Infant fed oral/gastric feeding (n=194)	yes	73	64.6	50	61.7	0.682
	no	40	35.4	31	38.3	

Table 8. Past experiences influencing mother's choice of feeding method

Variable	<u>Breast</u>			<u>Formula</u>		p
		n	%	n	%	
Total number of pregnancies (includes current pregnancy) (n=194)	1	33	30.3	31	36.5	0.082
	2	38	34.8	15	17.6	
	3	20	18.3	16	18.9	
	4	9	8.3	11	12.9	
	5+	9	8.3	12	14.1	
Total number of livebirths (excludes current pregnancy) (n=194)	0	63	57.8	39	45.9	0.264
	1	31	28.4	26	30.6	
	2	9	8.3	11	12.9	
	>=3	6	5.5	9	10.6	
Parity (excludes current pregnancy) (n=194)	0	57	52.3	37	43.5	0.017
	1	35	32.1	20	23.5	
	>=2	17	15.6	28	32.9	
Primary feeding method of first infant=breastfeeding (n=90)	yes	29	64.4	4	8.9	<0.001
	no	16	35.6	41	91.1	
Primary feeding method of mother as an infant, includes breastfeeding (n=181)	yes	35	34.0	12	15.4	0.005
	no	68	66.0	66	84.6	

Table 9. External influences and mother's final choice of feeding method

Variable		<u>Breast</u>		<u>Formula</u>		p
		n	%	n	%	
Plan to work outside home after discharge (n=190)	yes, work	45	42.1	40	48.2	0.382
	yes, school	8	7.5	9	10.8	
	yes, both	4	3.7	5	6.0	
	no	50	46.7	29	34.9	
How many hrs/wk outside home (n=93)	<=20	20	40.8	18	40.9	0.993
	>20	29	59.2	26	59.1	
How old infant will be when start working outside home (wks) (n=103)	<=6	2	4.1	7	13.0	0.089
	7-12	11	22.5	18	33.3	
	12-24	25	51.0	16	29.6	
	24-52	10	20.4	9	16.7	
	>52	1	2.0	4	7.4	

Table 10. Advice/information given to breastfeeders prior to the initial interview

Variable		n	%
Spoken to by medical/nursing personnel regarding supplying breast milk	yes	73	67
	no	36	33
Clarity of information given on supplying breast milk	v clear	33	46
	clear	19	27
	mod clear	14	20
	unclear	3	4
	v unclear	2	3
Information given on pumping breast milk	yes	47	64
	no	26	36
NBSCU lactation nurse provide information about breastfeeding	yes	34	32
	no	73	68
If information was provided, read materials	yes	27	90
	no	3	10
Extra assistance with breastfeeding provided by NBSCU lactation nurse	yes	29	28
	no	75	72
First person mother would seek advice from regarding breastfeeding	pediatrician	35	32
	lactation specialist	17	16
	other unspec	13	12
	la leche member	10	9
	mother	9	8
	obstetrician	10	9
	other fam member	7	6
	pediatrician (NBSCU)	4	4
	friends	3	3
	midwife	1	1
Second person mother would seek advice from regarding breastfeeding	friends	17	19
	pediatrician (NBSCU)	10	11
	pediatrician	11	12
	obstetrician	10	11
	lactation specialist	8	9
	other fam member	8	9
	mother	8	9
	other unspec	7	8

*Table 10. Advice/information given to breastfeeders
prior to initial interview
(continued)*

Variable	n	%
Second person mother would seek advice from regarding breastfeeding	6 4	7 5
la leche member midwife		

Table 11. *Data influencing final choice to breastfeed, as assessed by multivariate statistical analysis*

Variable	Comparison	Odds ratio in favor of breastfeeding	95% CI	p
Maternal age (yrs)	>25 vs <=25	3.11	1.64-5.92	<0.001
Race	white vs non-white	2.76	1.45-5.28	0.001
Marital status	married vs unmarried	6.38	3.11-13.24	<0.001
Education	college+ vs <college	3.63	1.90-6.97	<0.001
Income (\$)	>=6,000 vs <6,000	4.94	2.20-9.02	<0.001
Head of house	infant's father vs. self/parent	4.04	2.12-7.74	<0.001
Smoked during pregnancy	no vs yes	4.66	2.37-9.25	<0.001
Prenatal marijuana use	no vs yes	2.93	1.10-7.95	0.016
Prescription drugs during pregnancy	yes vs no	2.04	1.10-3.81	0.016
Friends/fam feeding method	breast vs formula	7.87	3.80-16.48	<0.001
Discussed feeding method w/ infant's father	yes vs no	3.67	1.80-7.55	<0.001
Choice of method included infant's father	yes vs no	4.05	1.71-9.74	0.001
Infant's father supportive of feeding method	yes vs no	5.18	1.76-inexact	0.001

Table 11. *Data influencing final choice to breastfeed, as assessed by multivariate statistical analysis (continued)*

Variable	Comparison	Odds ratio in favor of breastfeeding	95% CI	p
Read materials on feeding methods	yes vs no	1.86	1.00-3.45	0.034
Discussed feeding method w/ family	yes vs no	2.47	1.32-4.62	0.002
Discussed feeding method w/ friend	yes vs no	4.59	2.39-8.86	<0.001
Discussed feeding method w/ someone	yes vs no	2.78	1.09-7.21	0.017
Someone recomm feeding method	breast vs formula	5.35	2.74-10.52	<0.001
How mother was fed as infant	breast vs formula	2.83	1.28-6.34	0.005
Description of pregnancy	negative vs positive	2.81	1.16-6.97	0.011

*Table 12. Primary stepwise logistic regression
(observations=136)*

Step	Variable entered	Chi-Square	p-value
1	Influence of friends/family	29.0	0.0001
2	Recommended feeding method	12.7	0.0004
3	Head of household	5.6	0.0176
4	Prenatal smoking	4.9	0.0268

*Table 13. Secondary stepwise logistic regression
(observations=177)*

Step	Variable entered	Chi-Square	p-value
1	Influence of friends/family	39.2	0.0001
2	Prenatal smoking	15.4	0.0001
3	Head of household	12.0	0.0005
4	Recommended feeding method	10.8	0.0010

Table 14. Follow-up data: Demographic profile of mothers who chose to breastfeed

Characteristic		n	%
Age (n=73) (Range=17-40)	<=25	13	17.8
	26-29	23	31.5
	30-34	32	43.8
	>=35	5	6.8
Ethnic background (n=73)	white	62	84.9
	black	10	13.7
	asian	1	1.4
Marital status (n=73)	married	67	91.8
	never married	4	5.5
	divorced	2	2.7
Religious background (n=72)	protestant	33	45.8
	catholic	28	38.9
	jewish	6	8.3
	none	3	4.2
	other	2	2.8
Level of education (n=73)	9-12 (high school)	22	30.1
	college	41	56.2
	graduate	9	12.3
	>graduate	1	1.4
Head of household (n=73)	infant's father	54	74.0
	self/parent	19	26.0
Occupation of main provider (n=73)	professional	13	17.8
	business manager	6	8.2
	own med business	2	2.7
	lesser professional	7	9.6
	admin personnel	6	8.2
	own sml business	5	6.8
	semi-professional	5	6.8
	cler/sales worker	4	5.5
	technician	4	5.5
	skilled manual	9	12.3
	mach op/semi-skilled	10	13.7
unemployed	2	2.7	

*Table 14. Follow-up data: Demographic profile of mothers who chose to breastfeed
(continued)*

Characteristic	n	%
Income (\$)		
<6,000	29	39.7
6,000-35,000	16	21.9
35,000-100,000	15	20.5
>100,000	13	17.8

Table 15. Follow-up data: Profile of infants who were breastfed

Characteristic		n	%
Birthweight (gm) (n=79) (Range=700-2000)	<=750	3	3.8
	751-1000	5	6.3
	1001-1250	6	7.6
	1251-1500	10	12.7
	1501-1750	19	24.1
	1751-2000	36	45.6
Gestational age (wks) (n=79) (Range=23-36)	<28	14	17.7
	28-31	38	48.1
	32-34	24	30.4
	>34	3	3.8
One minute Apgar score (n=79)	0-3	17	21.5
	4-6	18	22.8
	7-10	44	55.7
Five minute Apgar score (n=73)	0-3	3	4.1
	4-6	16	21.9
	7-10	54	74.0
Sex (n=79)	boy	42	53.2
	girl	37	46.8

Table 16. Follow-up data: Factors influencing success of breastfeeding

Factor		n	%
Given literature on breastfeeding (n=73)	yes	69	94.5
	no	4	5.5
Literature was helpful (n=68)	yes	56	82.4
	no	12	17.6
Lactation nurse provided assistance (n=73)	yes	64	87.7
	no	9	12.3
Lactation nurse was helpful (n=61)	yes	60	98.4
	no	1	1.6
Frequency of contact with lactation nurse (n=71)	never	46	64.8
	1-2X	14	19.7
	3-5X	9	12.7
	6-10X	2	2.8
Felt milk was insufficient after discharge (n=71)	yes	38	53.5
	no	33	46.5
Experienced other difficulties (n=72)	yes	36	50.0
	no	36	50.0
Worked since discharge (n=69)	yes	30	43.5
	no	39	56.5
Work interfered with breastfeeding (n=28)	yes	10	35.7
	no	18	64.3
Overall experience of breastfeeding (n=71)	enjoyed	59	83.1
	disliked	8	11.3
	neither	4	5.6
Would breastfeed again (n=72)	yes	68	94.4
	no	4	5.6

Now, I would like to start by asking you some general background questions.

1. What is your date of birth? *mombirth*

month		day		year	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
25				30	

2. Are you currently married, divorced, separated, widowed, or have you never been married?

1	Currently married
2	Divorced
3	Separated
4	Widowed
5	Never married
6	NR

Marstat 31

3. How old were you when you first married? *Marage*

years	
<input type="text"/>	<input type="text"/>
32	33

4. How many times have you been married? *Marnum* 34

5. What is your religion? _____

1	Catholic
2	Protestant
3	Jewish
4	None
5	Other
6	NR

Religion 35

6. What is your ethnic background? (BY OBSERVATION IF POSSIBLE)

1	White, not of Hispanic origin
2	Black, not of Hispanic origin
3	Hispanic
4	Asian/Pacific Islander
5	American Indian/Alaskan Native
6	NR

Race 36

7. What was the highest year of school or college that you completed? (ROUND DOWN) (FOR YEARS ABOVE 20, CODE YEAR)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Grade School								High School				College, Vocational				Professional, Graduate School			

Educ

years	
<input type="text"/>	<input type="text"/>
37	38

8. Next I would like to ask you some questions about your most recent pregnancy and any past pregnancies.

How many times have you been pregnant?
I would like you to include your most recent pregnancy, any previous births, stillbirths, abortions and miscarriages.

We would also like you to include any menstrual extractions or regulations you may have had for a confirmed pregnancy.

TOTAL
NUMBER OF
PREGNANCIES

39	40

Totpreg

D	1
79	80

CODE NUMBER

1	2	3

9. I would like to ask you some questions about each previous pregnancy now. (ASK QUESTIONS A TO C FOR EACH PREGNANCY EXCEPT THE MOST RECENT ONE)

A

B

C

Did your first (etc.) pregnancy result in a livebirth (L), stillbirth (S), induced abortion (A), miscarriage (M), or ectopic pregnancy (E)? (CODE BELOW)

(How many weeks pregnant were you when you gave birth?)

(How many weeks pregnant were you when this occurred?)

What was the child's birthdate?

Could you tell me the month and year this occurred?

PREGNANCY NUMBER FOR EACH FETUS

pregnol - pregno9

pregout1 - pregout9

pregdur1 - pregdur9

	L	S	A	M	E	NR	weeks	month	year
<input type="checkbox"/> 4	1	2	3	4	5	6	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> 8 9 10 11
<input type="checkbox"/> 12	1	2	3	4	5	6	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> 14 15 16 17 18 19
<input type="checkbox"/> 20	1	2	3	4	5	6	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> 22 23 24 25 26 27
<input type="checkbox"/> 28	1	2	3	4	5	6	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> 30 31 32 33 34 35
<input type="checkbox"/> 36	1	2	3	4	5	6	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> 38 39 40 41 42 43
<input type="checkbox"/> 44	1	2	3	4	5	6	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> 46 47 48 49 50 51
<input type="checkbox"/> 52	1	2	3	4	5	6	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> 54 55 56 57 58 59
<input type="checkbox"/> 60	1	2	3	4	5	6	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> 62 63 64 65 66 67
<input type="checkbox"/> 68	1	2	3	4	5	6	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/>	<input type="text"/> <input type="text"/> 70 71 72 73 74 75



IF LIVEBIRTHS - ASK QUESTION 10 for EACH LIVEBIRTH
IF NO LIVEBIRTHS - SKIP TO QUESTION 11, PAGE 7

LIVEBIRTH SECTION

CODE NUMBER

1 [] [] [] 3

10. And now I would like to ask you some questions about your pregnancy, labor, and delivery for your first, (etc.) child. (LAST FOUR LIVEBIRTHS ONLY) (ASK A TO O IN SEQUENCE)

PREGNANCY NO.

pregnum [] 4

A Did any complications arise during the pregnancy? (IF YES) What were they? (LIST)

B Did any problems or complications arise during the labor or delivery? (IF YES) What were they?

C Were you given analgesia and/or anesthesia at any point during the labor and delivery? (IF YES) What sort? (CODE MOST EXTREME)

Q10A1
Q10A2

Q10B1
Q10B2

Q10C

Yes = CODE
No = .0
NR = Ø

Yes = CODE
No = .0
NR = Ø

No = 0
Sedative = 1
Local = 2
Regional = 3
General = 4
NR = Ø

5 [] [] [] [] 8 9 [] [] [] [] 12

13 [] [] [] [] 16 17 [] [] [] [] 20

[] 21

D Did you have one baby or was it a multiple birth? (IF MULTIPLE) How many babies did you have?

E (IF ONE BABY) Did you have a boy or a girl?

(IF TWINS) Was the first (etc.) baby that you delivered a boy or a girl?

SKIP REMAINDER OF LIVEBIRTH QUESTIONS FOR THIS PREGNANCY

F What was/were the baby/ies birth weight/s? (ROUND DOWN)

Yes - One baby = 1
No - Twins = 2
No - Triplets = 3
Quadruplets = 4
More = 5
NR = Ø

Boy = 1
Girl = 2
NR = Ø

A.
B.

Q10D [] 22

Baby A. [] Q10EA 23
B. [] Q10EB 24

Baby lbs. oz. A. [] [] 25 28
B. [] [] 29 32

Q10FALBS Q10FAOZ Q10FBLBS Q10FB0

G

Was/were the baby/ies placed in a special care nursery?

Q 109A
Q 109B

Yes = 1
No = 0
NR = b

Baby

A.

33

B.

34

H

Did the baby/ies have any medical problems? (IF YES) What sort? (LIST MEDICAL PROBLEMS) (PROBE IF BABY PLACED IN SPECIAL CARE)

Baby

A. Q 10HA1

Q 10HA2

B. Q 10HB1

Q 10HB2

Yes = CODE
Yes-(Unknown type) = 779.8
No = .0
NR = .b

Baby

A. |

35 38 39 42

B. |

43 46 47 50

Baby

A. |

51 54 55 58

B. |

59 62 63 66

J

How many days did the baby/ies stay in the hospital of birth?

No. of days = 1-
Never in hosp. = 0
Never left, died = 999
NR = b

Q 10JA
Q 10JB

A.

67 69

B.

70 72

K

What was the feeding method that you used with the baby/ies?

Q 10KA
Q 10KB

Solely breastfed = 1
Solely formula fed = 2
Mainly breastfed = 3
Mainly formula fed = 4
Combination (no main) = 5
NR = b

IF 'SOLELY FORMULA' OR NR SKIP TO Q. 10 N

Baby A.

73

B.

74

L

(IF BREASTFED) How old was/were your baby/ies when you weaned him/her/ them, that is, when you ceased breastfeeding entirely?

Q 10LA
Q 10LB

B. _____

Baby A.

Months

75 76

B.

77 78

79 8

(Beginning of card L2)

CODE NUMBER
1 3

PREGNANCY NO.
4

M

N

(IF BREASTFED) What were the main reasons you stopped breast-feeding the baby/ies?

Did the baby/ies survive the first 28 days of life?
(IF NO) How many days old was/were the baby/ies at the time of death?

Baby A Q10MA1
Q10MA2
B Q10MB1
Q10MB2

Yes = 0
No - Age at death = 1-
(ROUND HOURS UP TO NEAREST DAY)
NR = B

Q10NA
Q10NB

Baby A.
5 6 7 8

Baby A.
13 14

B.
9 10 11 12

B.
15 16

79 80

(Beginning of card D3)

CODE
NUMBER

1		3

11. Next I would like to ask you some questions about your most recent pregnancy.

What was the date that your last menstrual period started before the pregnancy?

month	day	year	
			LMP
4		9	
LMPmo	LMPDA	LMPYE	

12. What did the doctor say your "due date" would be?

month	day	year	
			EDC
10		12	
EDCmo	EDCDA	EDCYE	

13. What did you think your "due date" would be?

month	day	year	
			EDC
16		21	
EDCZmo	EDCZDA	EDCZYR	

14. Now I am going to calculate the date that your pregnancy probably started.

Using the gestational wheel (for reasons of standardization), the date we think your pregnancy started is:
(IF LMP NOT USED NOTE REASON)

month	day	year	
			DC
22		27	
DOFCmo	DOFCDA	DOFCYE	

15. What date did you deliver your baby on?
(VERIFY AGAINST ENUMERATION SHEET BIRTHDATE)

month	day	year	
			DEL
28		33	
DELmo	DELDA	DELYR	

16. Did any complications arise during your most recent pregnancy? (IF YES) What were they?
(LIST)

1.

--	--	--	--

 Q16A

2.

--	--	--	--

 Q16B

3.

--	--	--	--

 Q16C

				Yes - CODE
0				No
1				NR

17. Did you deliver vaginally or by Caesarian section?
(IF VAGINALLY) What part of the first (etc.) baby was delivered first?

- Vaginal
- 1 -presenting part unknown
 - 2 -head (Vertex)
 - 3 -feet, knees, or buttocks (Breech)
 - 4 -arm, shoulder, or trunk (Transverse)
 - 5 Caesarian (CODE INDICATION BELOW)
 - NR

Q17A A. 46

Q17B B. 47

Q17C C. 48

18. Did any problems or complications arise during your labor or delivery of the first (etc.) baby? (IF YES) What were they? (LIST)

Baby A

1. _____ Q18A1

2. _____ Q18A2

Baby B

1. _____ Q18B1

2. _____ Q18B2

Baby C

1. _____ Q18C1

2. _____ Q18C2

1. A. 49 52

2. 53 56

1. B. 57 60

2. 61 64

1. C. 65 68

2. 69 72

Yes - CODE

0 No

NR

19. Were you given analgesia and/or anaesthesia at any point during your labor and delivery of the first (etc.) baby? (IF YES) What sort? (CODE MOST EXTREME FOR EACH BABY)

- 0 No
- 1 Sedative
- 2 Local
- 3 Regional
- 4 General
- NR

Q19A A. 73

Q19B B. 74

Q19C C. 75

(Beginning of card D4)

CODE
NUMBER

1		3

20. Overall, how would you describe your pregnancy? Was it a positive experience or a negative experience?

- 1 Positive
- 2 Negative
- b NR

Q20

4

21. Overall, how would you describe your labor and delivery? Was it a positive experience or a negative experience?

- 1 Positive
- 2 Negative
- b NR

Q21

5

22. What date were you last weighed before you delivered your new baby/ies?

month	day	year
6	7	11

Q22mo Q22DA Q22YR

23. How much did you weigh at that time?

lbs.

12		14

Q23

24. How much did you weigh before your pregnancy started?

lbs.

15		17

Q24

25. How tall are you?

ft.	in.
18	20

Q25FT Q25IN

Next I would like to ask you some questions about your choice of feeding method for your new baby.

26. Did you discuss how you would feed your new baby with the following people? (READ CHOICES)



- A. The baby's father
- B. Your mother
- C. Other family members
- D. Friends
- E. Your obstetrician
- F. Your pediatrician
- G. Others, _____
(specify)

Q26A - Q26G
(CIRCLE CODE)

Q27A - Q27G

	Y	N	NR	Breast	Formula	Mixed/ Neither	NR
A. The baby's father	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B. Your mother	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C. Other family members	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D. Friends	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E. Your obstetrician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F. Your pediatrician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G. Others, _____ (specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IF DISCUSSED WITH ANY OF THE ABOVE



27. For the people you discussed feeding methods with, could you please tell me which method each person recommended. (CIRCLE APPROPRIATE CODES ABOVE)

28. Did you read any printed materials about feeding methods during your most recent pregnancy?

READ?			INFLUENCED?		
Y	N	NR	Y	N	NR

Q28

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35		

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36		

Q29

IF READ ANY PRINTED MATERIALS



29. Did these readings influence your choice of feeding method? (CIRCLE APPROPRIATE CODE ABOVE)

30. Did you attend any of the following classes during your most recent pregnancy? (READ CHOICES)

(CIRCLE CODES)

	Q30A - Q30C	Q31A - Q31C	Q32A - Q32C	Q33A - Q33C	Q34A - Q34C	Q35A - Q35C	Q36A - Q36C	
	Attended Classes	Discussed Breast Feeding	Influenced Feeding Choice	Discussed Diet	Influenced Feeding Choice	Discussed Formula Feeding	Influenced Feeding Choice	
A. CHILDBIRTH EDUCATION CLASSES	1 0 B	1 0 B	1 0 B leave blank	1 0 B	1 0 B leave blank	1 0 B	1 0 B leave blank	Yes No NR NA
B. CHILDCARE CLASSES	37 1 0 B	38 1 0 B	39 1 0 B leave blank	40 1 0 B	41 1 0 B leave blank	42 1 0 B	43 1 0 B leave blank	Yes No NR NA
C. LA LECHE LEAGUE SESSIONS	44 1 0 B	45 1 0 B	46 1 0 B leave blank	47 1 0 B	48 1 0 B leave blank	49 1 0 B	50 1 0 B leave blank	Yes No NR NA
	51	52	53	54	55	56	57	

FOR EACH TYPE OF CLASS ATTENDED
ASK QUESTIONS 31-36 BELOW

31-32. Was breast feeding discussed? (CODE ABOVE) (IF YES) Did this discussion influence your choice of feeding method? (CODE ABOVE)

33-34. Was the proper diet to support lactation discussed? (CODE ABOVE) (IF YES) Did this discussion influence your choice of feeding method? (CODE ABOVE)

35-36. Was formula feeding discussed? (CODE ABOVE) (IF YES) Did this discussion influence your choice of feeding method? (CODE ABOVE)

37. Do you have friends or family with babies? (IF YES) Do the majority breast or formula feed?

- 0 No friends or family with babies
- 1 Breastfeeding majority
- 2 Formula feeding majority
- 3 Mixed feeding method majority
- 4 No majority
- m DK
- h NR

Q37

58

38. Do you have friends or family who are planning to have children? (IF YES) Do the majority plan to breast or formula feed?

- 0 No friends or family planning to have babies
- 1 Breastfeeding majority
- 2 Formula feeding majority
- 3 Mixed feeding method majority
- 4 No Majority
- m DK
- h NR

Q38

59

39. How were you fed as an infant?

- 1 Mainly breast fed
- 2 Mainly formula fed
- 3 Mixed feeding method
- m DK
- h NR

Q39

60

Now I would like to ask you some questions about medications or drugs you may have taken in the last 4 weeks of your most recent pregnancy, that is between ___/___/___ and ___/___/___ . Please include over the counter medications, which are sold without a prescription, as well as prescription medications.

A. (SHOW RESPONDENT LIST ON CARD.) I am going to read through this list. Please tell me if you have taken medications for any of these reasons.

Did you use medications or drugs.....

IF MEDICATIONS OR DRUGS WERE USED FOR ANY OF THESE REASONS ASK 'B' TO 'E' IN SEQUENCE FOR EACH DRUG:

To help control nausea
For fluid retention (swelling/bloating)
For diet or weight loss
To help you sleep
To help you stay awake
Relieve nervousness and anxiety
To relieve depression
To relieve pain or headaches
For illness or infection
For acne and skin problems
For constipation
For upset stomach, gas, or ulcer
For high blood pressure
For a blood disorder (anemia, clotting, thrombotic disorder)
For cancer
For a metabolic problem
For a hormone problem
For arthritis
For a convulsive disorder (e.g., epilepsy)
For diabetes
For allergy
For a cold or cough
For any other reason

- B. What is the name of the drug or medication that you used?
- C. When did you use this medication during the last 4 weeks of this pregnancy?
- D. How many days per week did you take this medication?
- E. How many times per day did you take this medication?

TOTAL NUMBER OF DRUGS USED IN LAST FOUR WEEKS OF PREGNANCY

61	62

TOT DRUG

D	4
79	80

CODE NUMBER

As we said earlier, your date of conception was ___/___/___/. The second trimester of your pregnancy began on ___/___/___/, and you delivered on ___/___/___/.

41. Did you have a drink of wine, beer, or liquor between ___/___/___/ and ___/___/___/? (2nd trimester) (delivery date)

- 1 Yes
- 0 No
- B NR

Q41

42. Between ___/___/___/ and ___/___/___/, how often did you usually have wine? (beer?) (liquor including such things as whiskey, vodka, and mixed drinks). (SHOW CARD WITH ANSWER CHOICES).

- 1 Four or more times per day
- 2 Three times per day
- 3 Two times per day
- 4 About once per day
- 5 Three or four times a week
- 6 Once or twice a week
- 7 Two or three times a month
- 8 About once a month
- 9 Less than once a month but at least once
- 0 Never (SKIP Q43 FOR ANY ALCOHOLIC BEVERAGE CODED "0" IN Q42)

Q42W

W

Q42B

B

Q42L

L

43. Think of all the times you had wine, (beer), (liquor), between ___/___/___/ and ___/___/___/.

When you drank wine, (beer), (liquor), how much did you usually have at one time, on the average? (SHOW CARD WITH ANSWER CHOICES)

- 1 Twelve or more wine glasses, (cans of beer), (drinks)
- 2 Nine to eleven
- 3 Seven or eight
- 4 Six
- 5 Five
- 6 Four
- 7 Three
- 8 Two
- 9 One
- None (LEAVE BLANK) (IF LESS THAN A FULL GLASS, ETC. ROUND UP)

Q43W

W

Q43B

B

Q43L

L

10

INTERVIEWER: FILL IN DATES
___/___/___/ and ___/___/___/
2nd TRIMESTER DELIVERY DATE

44. Between ___/___/___/ and ___/___/___/, did you drink one or more cups of non-decaffeinated coffee, that is regular coffee, a week?

- 1 Yes
- 0 No
- NR NR

Q44

11

45. How many cups of non-decaffeinated coffee did you drink on average between ___/___/___/ and ___/___/___/? (SHOW CARD)

- 1 More than 10 cups daily
- 2 5 to 10 cups daily
- 3 3 or 4 cups daily
- 4 1 or 2 cups daily
- 5 4 to 6 cups a week
- 6 1 to 3 cups a week

Q45

12

46. Between ___/___/___/ and ___/___/___/, did you drink one or more cups of non-herbal tea a week?

- 1 Yes
- 0 No
- NR NR

Q46

13

47. How many cups of non-herbal tea did you drink on average between ___/___/___/ and ___/___/___/? (SHOW CARD)

- 1 More than 10 cups daily
- 2 5 to 10 cups daily
- 3 3 or 4 cups daily
- 4 1 or 2 cups daily
- 5 4 to 6 cups a week
- 6 1 to 3 cups a week

Q47

14

48. Between ___/___/___/ and ___/___/___/, did you drink one or more glasses of caffeinated cola a week? (PAUSE) We would also like to know if you drank one or more glasses of Mountain Dew, Mello Yello, or Sunkist Orange (non-diet) soda a week?

- 1 Yes
- 0 No
- b NR

Q48

15

49. How many glasses of caffeinated cola, Mello Yello, or Sunkist Orange (non-diet) did you drink on average between ___/___/___/ and ___/___/___/? (SHOW CARD)

- 1 More than 10 glasses daily
- 2 5 to 10 glasses daily
- 3 3 or 4 glasses daily
- 4 1 or 2 glasses daily
- 5 4 to 6 glasses a week
- 6 1 to 3 glasses a week

Q49

16

50. What is the name of the caffeinated cola or soda that you drank most often between ___/___/___/ and ___/___/___/?

Q50

17 18

51. Have you ever smoked cigarettes?

- 1 Yes
- 0 No
- b NR

Q51

19

52. Between ___/___/___/ and ___/___/___/, did you usually smoke one cigarette or more per day?

- 1 Yes
- 0 No
- b NR

Q52

20

53. How many cigarettes a day did you smoke on average between

___/___/___/ and ___/___/___/?

Q53

21 22

54. Did you smoke marijuana or hashish at any time during your most recent pregnancy?

- 1 Yes
- 0 No
- b NR



Q54

23

55. How often did you use marijuana or hashish during your most recent pregnancy?

- 1 Five or more times daily
- 2 Three or four times daily
- 3 Twice daily
- 4 Once daily
- 5 4 to 6 times a week
- 6 1 to 3 times a week
- 7 2 or 3 times a month
- 8 About once a month
- 9 Less than once a month but at least once during that period

Q55

24

Now I would like to ask you some questions about your choice of feeding method for your new baby.

56. Before your new baby/ies was/were born how had you planned to feed him/her/them? (IF BREASTFEED, READ CHOICES 1-3)

- 1 Breastfeed solely until weaned
- 2 Breastfeed solely for awhile then introduce some supplements
- 3 Breastfeed with supplements throughout
- 4 Formula feed exclusively
- 5 Other
- 6 Had not decided
- b NR

→ PAGE 22, 0.67

Q56
25

57. Before your new baby/ies was/were born, how long did you plan to breastfeed him/her/them?

- Months (IF < 1 MONTH, ROUND WEEKS UP)
- 9 8 As long as the baby/ies want/s to nurse
 - 9 9 As long as my milk lasts
 - m DK
 - b NR

Q57
26 27

58. When did you make this initial decision about feeding method?

- 1 3rd trimester
- 2 2nd trimester
- 3 1st trimester
- 4 The year prior to conception
- 5 Previous to all of the above
- b NR

Q58
28

59. We know that people give a lot of thought to their choice of feeding method. We also know there are advantages and disadvantages with each method. Could you please tell me all of your reasons for deciding to breast/formula feed?

_____	Q59A	<table border="1"><tr><td> </td><td> </td></tr><tr><td>29</td><td>30</td></tr></table>			29	30
29	30					
_____	Q59B	<table border="1"><tr><td> </td><td> </td></tr><tr><td>31</td><td>32</td></tr></table>			31	32
31	32					
_____	Q59C	<table border="1"><tr><td> </td><td> </td></tr><tr><td>33</td><td>34</td></tr></table>			33	34
33	34					

60. What were your reasons for choosing not to breast/formula feed?

_____	Q60A	<table border="1"><tr><td> </td><td> </td></tr><tr><td>35</td><td>36</td></tr></table>			35	36
35	36					
_____	Q60B	<table border="1"><tr><td> </td><td> </td></tr><tr><td>37</td><td>38</td></tr></table>			37	38
37	38					

(CIRCLE)
INITIAL FEEDING METHOD WAS.....BREAST or UNDECIDED/FORMULA → NEXT PAGE

61. Did you prepare your breasts prior to the delivery of your baby/ies? (IF YES) Did you do so: (READ CHOICES)

- 0 Never
- 1 Daily
- 2 A few times a week
- 3 Once a week
- 4 Less than once a week
- NR

Q61

39

62. How many weeks pregnant were you when you began preparing your breasts prior to the delivery of your baby/ies?

Q62

gestational age (weeks)

40	41

63. Did you express colostrum prior to the delivery of your baby/ies?

- 1 Yes
- 0 No
- NR

Q63

42

64. How many weeks pregnant were you when you began expressing colostrum prior to the delivery of your baby/ies?

Q64

gestational age (weeks)

43	44

65. How did you know to begin preparing your breasts and/or expressing colostrum prior to the delivery of your baby/ies?

Q65A

45	46

Q65B

47	48

Q65C

49	50

66. Did you experience any uterine contractions when you prepared your breasts and/or expressed colostrum prior to the delivery of your baby/ies?

- 1 Yes, with breast preparation
- 2 Yes, with expression of colostrum
- 3 Both of the above
- 0 No
- m DK
- NR

Q66

51

67. What is your final choice of feeding method?
(IF BREASTFEED, READ CHOICES 1-3)

- 1 Breastfeed solely until weaned
- 2 Breastfeed solely for awhile then introduce some supplements
- 3 Breastfeed with supplements throughout
- 4 Formula feed exclusively
- 5 Other
- 6 Have not decided
- 7 NR

Q67
52

INTERVIEWER: COMPARE
RESPONSES TO Q56 and Q67

(CIRCLE)
FINAL CHOICE IS.....CHANGED or JUST DECIDED///UNCHANGED → NEXT PAGE

68. (IF CHANGED) Did you change your choice of feeding method because your baby/ies was/were born prematurely?

(IF JUST DECIDED) Did your baby/ies' premature birth influence your final choice of feeding method?

- 1 Yes
- 0 No
- 7 NR

Q68
53

69 A. (IF CHANGED) Why did you change your choice of feeding method? (LIST)

69 B. (IF CHANGED) In what ways did your baby/ies' premature birth cause you to change your final choice of feeding method? (LIST)

(IF JUST DECIDED) Why did you choose to breast/formula feed your premature baby/ies'? (LIST)

(IF JUST DECIDED) In what ways did your baby/ies' premature birth influence your final choice of feeding method? (LIST)

Q69A

Q69B

54 55

56 57

FINAL CHOICE IS.....(CIRCLE) BREAST/FORMULA or UNDECIDED → NEXT PAGE

70. Now that your baby/ies has/have been born, how long do you plan to breastfeed him/her/them?

- Months (IF < 1 MONTH, ROUND WEEKS UP)
- 98 As long as the baby/ies want/s to nurse
- 99 As long as my milk lasts
- m DK
- b NR

Q70 [] []
58 59

INTERVIEWER: COMPARE RESPONSES TO Q57 and Q70

DURATION IS.....(CIRCLE) CHANGED/UNCHANGED → NEXT PAGE

71. Did you change how long you plan to breastfeed the baby/ies because he/she/they were born prematurely?

- 1 Yes
- 0 No
- b NR

Q71 []
60

72 A. Why did you change how long you plan to breastfeed your baby/ies? (LIST) (CODE 1-50)

B. In what ways did your baby's/babies' premature birth cause you to change how long you plan to breastfeed? (LIST) (CODE 51-99)

Q72A [] []
61 62

Q72B [] []
63 64

CODE
NUMBER

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1		3

(CIRCLE)

FINAL CHOICE IS.....BREAST OR UNDECIDED/FORMULA → NEXT PAGE

Several of the questions that follow will use a five-point answer scale. (HAND RESPONDENT CARD) The answers to my next question, for example, range from very clear to very unclear, and from 1 to 5. Please choose the number which goes with your answer to each question.

75. Have any of the medical or nursing personnel spoken with you about supplying breastmilk for your baby/ies since his/her/their birth?

- 1 Yes
- 0 No
- b NR

Q75

10

76. How would you rate the clarity of the information you have received about supplying breastmilk for your baby/ies since his/her/their birth?

1 2 3 4 5

Very clear Moderate Very unclear

Q76

11

77. Have any of the medical or nursing personnel spoken with you about the timing and duration of breast-pumping since you delivered your new baby/ies?

- 1 Yes
- 0 No
- b NR

Q77

12

78. How would you rate the clarity of the information you've received about the timing and duration of breast-pumping since you delivered your new baby/ies?

1 2 3 4 5

Very clear Moderate Very unclear

Q78

13

84. How concerned are you about the baby's/ies' father's ability to cope with the baby's/babies' condition? (SHOW CARD)

n NA 1 2 3 4 5
 Very Moderate Not at
 Concerned all
 Concerned

Q84A A. 23
 Q84B B. 24
 Q84C C. 25

85. What medical conditions do/es your baby/ies have? (PROBE: "AS YOU UNDERSTAND THEM")

Baby A	1.	Q85A1	1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	A
	2.	Q85A2	2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	3.	Q85A3	3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Baby B	1.	Q85B1	1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	B
	2.	Q85B2	2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	3.	Q85B3	3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Baby C	1.	Q85C1	1.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	C
	2.	Q85C2	2.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	3.	Q85C3	3.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

86. Could you please rate the clarity of the explanations you have received from medical or nursing personnel about your baby/ies condition/s? (SHOW CARD)

1 2 3 4 5
 Very Moderate Very
 Clear Unclear

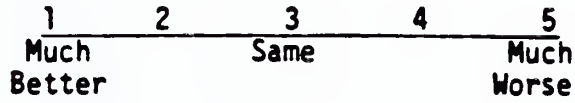
Q86A A. 62
 Q86B B. 63
 Q86C C. 64

87. How would you describe your baby/ies medical condition at birth?

1 2 3 4 5
 Very Moderate Very
 Good Medical Cond. Poor
 Medical Cond. Medical Cond.

Q87A A. 65
 Q87B B. 66
 Q87C C. 67

88. How do you think your baby/ies is/are doing today compared to his/her/their condition/s at birth? (SHOW CARD)

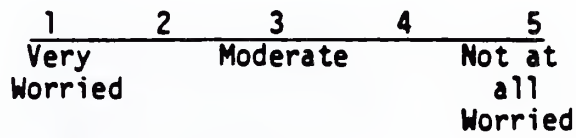


Q88A A. 68

Q88B B. 69

Q88C C. 70

89. How worried are you about your baby's/ies' condition? (SHOW CARD)



Q89A A. 71

Q89B B. 72

Q89C C. 73

CODE NUMBER

1		3

90. Have you touched your baby/ies since his/her their/birth?

- 1 Yes
- 0 No
- b NR

Q90A

A.

Q90B

B.

Q90C

C.

91. How old was/were your baby/ies when you first touched him/her/them?

- 1 Less than 1 hour old
- 2 1 to 3 hours old
- 3 4 to 11 hours old
- 4 12 to 24 hours old
- 5 2 to 3 days old
- 6 4 to 5 days old
- 7 6 to 7 days old
- 8 8 or more days old
- m DK
- NR

Q91A

A.

Q91B

B.

Q91C

C.

92. Have you held your baby/ies since his/her/their birth?

- 1 Yes
- 0 No
- b NR

Q92A

A.

Q92B

B.

Q92C

C.

93. Have you been allowed to hold your baby/ies since his/her/their birth?

- 1 Yes
- 0 No
- m DK
- b NR

Q93A

A.

Q93B

B.

Q93C

C.

94. Why have you delayed holding the baby/ies?

Q94A1

A.

16			17
----	--	--	----

Q94A2

18			19
----	--	--	----

Q94B1

B.

20			21
----	--	--	----

Q94B2

22			23
----	--	--	----

Q94C1

C.

24			25
----	--	--	----

Q94C2

26			27
----	--	--	----

95. Has/have your baby/ies been fed orally or with a tube into the stomach since his/her/their birth?

- 1 Yes
- 0 No
- m DK
- b NR

Q95A A.

Q95B B.

Q95C C.

30

96. How old was/were your baby/ies when he/she/they was/were first fed orally or with a tube?

- 1 Less than 12 hours old
- 2 12 to 24 hours old
- 3 2 days old
- 4 3 days old
- 5 4 or more days old
- m DK
- b NR

Q96A A.

Q96B B.

Q96C C.

33

(CIRCLE) BREAST/FORMULA or UNDECIDED → PAGE 32

97. Have you produced colostrum since your new baby/ies was/were born?

- 1 Yes
- 0 No
- b NR

Q97

34

98. How many days following delivery did you first produce colostrum?

Q98

35

36

99. What method did you use to produce colostrum? (READ CHOICES)

- 1 Hand
- 2 Hand pump
- 4 Electric pump
- 8 Unstimulated leaking
- 16 Breastfed
- b NR

Q99

sum	
<input type="text"/>	<input type="text"/>

37

38

100. Have you produced breast milk since your baby/ies was/were born?

- 1 Yes
- 0 No
- NR

Q100

--

39

101. How many days following delivery did you first produce your milk?

Q101

days	

40 41

102. What method did you use to produce your milk?
(READ CHOICES)

- 1 Hand
- 2 Hand pump
- 4 Electric pump
- 8 Unstimulated leaking
- 6 Breastfed
- NR

Q102

sum	

42 43

103. Have you used an oxytocic nasal spray to aid your milk-flow since your baby/ies was/were born?

- 1 Yes
- 0 No
- NR

Q103

--

44

104. How many days after your baby's birth did you start using an oxytocic nasal spray?

Q104

days	

45 46

(CIRCLE)

BREAST/FORMULA OR UNDECIDED

105 A. Has/have your baby/ies been put to the breast yet?

- 1 Yes.....
- 0 No
- b NR

106 A. How old was/were your baby/ies when you first put him/her/them to the breast?

- 1 Less than 12 hours old
- 2 12 to 24 hours old
- 3 2 days old
- 4 3 days old
- 5 4 or more days old
- m DK
- b NR

B. Have you given your baby/ies a bottle of formula yet?

- 1 Yes.....
- 0 No
- b NR

B. How old was/were your baby/ies when you first gave him/her/them a bottle of formula?

Q105A A.

47

Q105B B.

48

Q105C C.

49

Q106A A.

50

Q106B B.

51

Q106C C.

52

(CIRCLE)
FINAL CHOICE IS.....BREAST OR UNDECIDED/FORMULA ➡ NEXT PAGE
 ↓

The hospital is interested in providing further assistance to women who deliver premature infants and plan to breastfeed.

107. Could you please tell me about anything that has occurred up to now that has helped with your plans to breastfeed your new baby?

_____ Q107A

53	54

_____ Q107B

55	56

_____ Q107C

57	58

108. Could you also tell me about anything that has occurred up to now that has interfered with your plans to breastfeed your new baby?

_____ Q108A

59	60

_____ Q108B

61	62

_____ Q108C

63	64

109. What additional assistance could the hospital provide for women who wish to breastfeed their premature infants?

_____ Q109A

65	66

_____ Q109B

67	68

_____ Q109C

69	70

Next I would like to ask you about any plans you may have to work or go to school after you bring your new baby home from the hospital.

110. Do you plan to work or study outside your home after you bring your new baby/ies home from the hospital?

- 1 Yes, work
- 2 Yes, school
- 3 Yes, both
- 0 No
- m DK
- n NR

Q110

71

111. When you start to work/study how many days per week do you expect to be outside the home?

Q111

72 days

112. How many hours per day do you expect to be outside the home?

Q112

73 hours 74

113. How old do you expect your new baby/ies will be when you start to work/study outside your home?

Age _____ (LESS THAN ONE WEEK ROUND DOWN TO NEAREST WEEK) Q113

75 weeks 76

(CIRCLE) BREAST/FORMULA OR UNDECIDED → NEXT PAGE

114. Do you expect that working/studying outside your home will affect your plans to breast-feed?

D 7

79 80

(Beginning of card D8)

CODE NUMBER

1 3

- 1 Yes
- 0 No
- m DK
- n NR

Q114

4

115. In what ways do you think working/studying outside your home will affect your plans to breastfeed?

_____ Q115A

3 4

_____ Q115B

5 6

116. Who is the head of your household, that is the person who provides the major financial support for your household (TWO HEADS OF HOUSEHOLD POSSIBLE) (READ CHOICES)

You	= 1] _____]	Q116A			
Father of the baby	= 2] _____]	H of H 1.	<input type="text"/>	<input type="text"/>
Someone else	= CODE			9	10	
(SPECIFY RELATION TO WOMAN)			Q116B			
NR	= 0	_____]	H of H 2.	<input type="text"/>	<input type="text"/>	
				11	12	

117. What is your/his/her/their present occupation/s of source of income? (ONE MAJOR OCCUPATION PER HEAD OF HOUSEHOLD)

1.	_____]	H of H 1.	<input type="text"/>	<input type="text"/>
	(INCLUDE WELFARE, UNEMPLOYED, ETC.)	Q117A	13	14
	(BE SPECIFIC) (GET JOB LEVEL)			
2.	_____]	H of H 2.	<input type="text"/>	<input type="text"/>
	(INCLUDE WELFARE, UNEMPLOYED, ETC.)	Q117B	15	16
	(BE SPECIFIC) (GET JOB LEVEL)			

The last set of questions deals with a number of different topics.

118. How old were you when you first started having menstrual periods?
(ROUND DOWN TO NEAREST YEAR) Q118

years
[] []
17 18

119. Thinking about this most recent pregnancy, has anything else occurred that you feel would be useful or important for us to know about? Please include anything that occurred in the year before you became pregnant, during your pregnancy, or in the time since the delivery of your baby/ies.

[] Yes - CODE
[0] No
[] NR

1. _____ Q119A

[] []
19 20

2. _____ Q119B
2.

[] []
21 22

120. Did this occur in the year before your pregnancy started, during your pregnancy, or since the delivery?

[1] Year before pregnancy
[2] During pregnancy
[4] Since delivery
[] NR

Q120A 1. [] sum
23
Q120B 2. [] sum
24

121. Have you ever been interviewed for this survey before?

[1] Yes
[0] No
[] NR

Q121 []
25

122. When did the previous interview take place?

month day year
[] [] [] [] [] []
25 31

Were you using the same name at that time?

Q122AMO Q122ADA Q122AY

Yes →
No → What name were you using then?

(SPECIFY OTHER NAME-FIRST AND LAST)

previous code number
[] [] []
32 34
Q122B

(CIRCLE)
FINAL CHOICE IS.....BREAST OR UNDECIDED///FORMULA **➔** NEXT PAGE

123. Has the Lactation Nurse Specialist from the Newborn Special Care Unit, _____, given you any printed materials about breastfeeding?

<input checked="" type="radio"/>	Yes
<input type="radio"/>	No
<input type="radio"/>	NR

Q123

35

124. Did you read these materials about breastfeeding?

<input checked="" type="radio"/>	Yes
<input type="radio"/>	No
<input type="radio"/>	NR

Q124

36

125. Has the Lactation Nurse Specialist from NBSCU, _____, given you any further information or assistance with breastfeeding?

<input checked="" type="radio"/>	Yes
<input type="radio"/>	No
<input type="radio"/>	NR

Q125

37

This section is to be completed by the interviewer immediately following the interview.

126. Please select the phrase which best describes the respondent's present mental alertness (status).

- Alert and fully oriented.....1
- Poor memory and attention span.....2
- Mental status fluctuates.....3
- Slightly confused most of the time.....4
- Confused and disoriented.....5

Q126

38

127. Please select the phrase which best describes the respondent's ability to speak and understand English.

- Fully able to speak and understand English.....1
 - Limited ability to speak and understand English.....2
 - Poor understanding of English.....3
- (LANGUAGE SPOKEN)

Q127

39

128. Please select the phrase which best describes how you would rate the respondent's frankness and accuracy during the interview.

- Absolutely frank and accurate.....1
- Probably frank and accurate.....2
- Not always frank and accurate.....3
- Seldom frank and accurate.....4
- Never frank and accurate.....5

Q128

40

129. Please select the phrase which best describes how you would rate the respondent's attitude during the interview.

- Cooperative and interested.....1
- Cooperative.....2
- Ambivalent.....3
- Uncooperative.....4
- Uncooperative and hostile.....5

Q129

41

This section is to be completed by Dr. Ehrenkranz immediately following the interview.

130. Please rate the respondent's overall understanding of her baby's/ies' medical condition/s. (Question 85)

Thorough understanding of baby's/ies' medical condition/s.....1

Partial understanding of baby's/ies' medical condition/s.....2

Understands only that the baby/ies is/are premature or too little.....3

No appreciation of the baby's/ies' medical condition/s including prematurity or low birth weight.....4

Not able to determine understanding of medical conditions due to vague or non-existent response...5



ENUMERATION CARD

(last name) _____, (sex) 63 ²⁴(baby's unit no.) 30

Assign. No. 1 - - - - - 8

Enum. date 7 / - / - 12

Birthweight 64 - - 67 gms. Birthdate 31 / - / - 36

Outcome _____ 13-14

Head Circ. 68 - 69 cms. Birth time 37 - : - - 41

Outc. date 13 / - / - 20

Length 70 - 71 cms. Adm. date 42 / - / - 47

Interviewer _____ 21

Apgars 1m 72 - 73 5m 74 - 75 Adm. time 48 - : - - 52

Delivery hospital _____

Gest. age 76 - 77 wks. Mother's unit no. _____

_____ 22-23

A
80

53 - - - - - 62

Mother's Name: _____

Diagnosis: _____

Address: _____

Phone No. _____ (H) _____ (W) _____

Comments: _____

DISCHARGE CARD

Assign. No. 1 - - - - - 8

Discharged To _____ 78

Discharge Date 9 / - / - 14

Time Discharged 15 - : - - 19

Feeding method at D/C 20

Attempt to breastfeed 21

Drugs _____ 22 23 _____ 24 25

B
80

A-II.

FOLLOW-UP QUESTIONNAIRE
 INFANT FEEDING SURVEY
 DEPARTMENTS OF PEDIATRICS and
 EPIDEMIOLOGY AND PUBLIC HEALTH
 YALE MEDICAL SCHOOL

for respondent eligibility only

(Beginning of Card F1)

Planned to breastfeed	Y	N	U	CODE NUMBER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	3
Working with L.N.S.	Y	N	lost track of	RESPONDENT NUMBER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9
If avail., Date weaned	____/____/____			Interviewer	_____						
If not avail., Date discharged (infant/s)	[____/____/____] [____/____/____] [____/____/____]			Interview Date -	month		day		year		10
Medical chart shows breastfeeding attempt	Y	N		Follow-up	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16
3 mos. _____ 6 mos. _____ 9 mos. _____				Length of Interview					<input type="checkbox"/>	<input type="checkbox"/>	17 18

INTRODUCTION TO RESPONDENT

You may recall that we interviewed you for an infant feeding survey while you were in the hospital for your delivery of _____, _____, and _____. I would like to ask you some additional questions in a short telephone interview. These questions also relate to infant feeding methods and the interview should only take about 10 minutes of your time. The information you give us will be kept strictly confidential. While we would very much appreciate your cooperation, participation is voluntary and you may withdraw at any time and are free to omit any questions you do not want to answer. Your refusal will not in any way affect your treatment or that of your infant/s at the hospital now or in the future.

Oral consent

Obtained
 Refused →

19

A. Did your milk come in?

Yes
 No
 NR

20

B. Did you put your baby /ies to the breast at some point?

Yes.....Continue with interview NEXT PAGE, Q. 1.
 No
 NR

21

22

23

THANK YOU VERY MUCH FOR YOUR PARTICIPATION IN THIS SURVEY OF FACTORS RELATED TO INFANT FEEDING METHODS.

- 1. How many days old was/were your new baby/ies when your milk came in? DAYS
()
34
- 2. How many days old was/were your baby/ies when you first put him/her/them to the breast? DAYS
() A
26
() B
28
() C
30
DAYS
()
32
- 3. How many days did you stay in the hospital you delivered your baby/ies in? () A
34
() B
36
() C
38
- 4. How many days old was/were the baby/ies when you brought him/her/them home from the hospital to stay? ()
40
- 5. While you were in the hospital for your delivery you may have received information about breast-pumping or breastfeeding from a number of people including family members, friends and hospital staff. Could you please tell me who gave you the most useful information? List as many people as you'd like. 1. ()
41
2. ()
42
3. ()
44

- 6. While you were in the hospital for your delivery, were you given any readings about breast-pumping or breastfeeding? ()
46

Yes
 No
 NR

- 7. Who gave you these readings? ()
47
 - 8. Were the readings helpful? (IF YES) In what way? (IF NO) Why not? ()
49
()
51
()
53
- CODE 1-50 (no) CODE 51-99 (yes)

(Beginning of Card F2)

CODE NUMBER

1	3	4

9. Did the Lactation Nurse Specialist, _____, assist you with breast-pumping or breastfeeding while your baby/ies was/were in the NBSCU?

- 1 Yes
- 0 No
- NR

()
4

10. Was this helpful? (IF YES) In what way? (IF NO) Why not?

CODE 1-50 (no) CODE 51-99 (yes)

- 1. ()
5
- 2. ()
7
- 3. ()
9

11. When you first brought your new baby/ies home from the hospital, that is at the end of his/her/their first week home, were you: (READ CHOICES)

- 1 Feeding with breast milk only - SKIP TO Q.19.
- 2 Feeding with breast milk and feedings of formula
- 3 Feeding with formula only - SKIP TO Q. 17.

- () A
11
- () B
12
- () C
13

12. At the end of your baby/ies first week home, how many feedings per day were you giving your baby/ies?

()
14

() B
16

() C
18

13. At the end of your baby/ies first week home, how many of the ___ feedings per day consisted of some formula?

() A
20

() E
22

() C
24

14. At the end of your baby/ies first week home, how did you usually give the feedings of formula? (READ CHOICES)

- 1 After the baby/ies had fed at the breast for awhile
- 2 In place of a breastfeeding
- 3 Before a breastfeeding
- 4 Using a Lact-aid
- 5 Various ways, no main one
- NR

() A
26

() B
27

() C
28

15. At the end of your baby/ies first week home, did you give the feedings of formula mainly during the day or at night?

- 1 Day
- 2 Night
- 3 Both
- 4 NR

() A
39

() B
30

() C
31

16. At the end of your baby/ies first week home, how many ounces of formula, on the average, did the baby/ies receive per feeding?

OUNCES
() A
32

() B
34

() C
36

17. At any time after your baby/ies discharge from the hospital, did you feed your baby/ies solely breast milk for one week or more?

() A
38

() B
39

() C
40

- 1 Yes
- 0 No } SKIP TO Q22
- 2 NR }

18. How many weeks old was/were the baby/ies the first time that you got to the point that you were solely breastfeeding?

WEEKS
() A
41

() B
43

() C
45

19. Did you reintroduce regular feedings of formula at any time after you got to the point that you were solely breastfeeding?

() A
47

() B
48

() C
49

- 1 Yes
- 0 No } SKIP TO Q22
- 2 NR }

20. How many weeks old was/were the baby/ies when you re/introduced these regular feedings of formula?

WEEKS
() A
50

() B
51

() C
52

21. Why did you re/introduce regular feedings of formula at that particular time?

() A
53

() B
54

() C
55

CODE NUMBER

--	--	--

22. At any time after your baby's/babies' discharge from the hospital, did you feel that you had an insufficient supply of breast milk? (DO NOT INCLUDE MOTHER-INITIATED WEANING PERIOD)

<input type="checkbox"/> 1 Yes	SKIP TO Q32
<input type="checkbox"/> 0 No	
<input type="checkbox"/> NR	

()
4

23. How often did this occur?

()
5

(IF MORE THAN ONCE) For the remaining five questions I will ask you about your first and last occurrences of insufficient milk.

24. What was it that made you feel you had an insufficient supply of breast milk the first time this occurred? (REPEAT QUESTION...the last time this occurred...IF NEEDED)

FIRST
1. ()
7

(FIRST) 1. _____

2. ()
9

2. _____

LAST

(LAST) 1. _____

1. ()
11

2. _____

2. ()
13

25. Did anyone else confirm that you had an insufficient supply of breast milk? (IF YES) Who? (FIRST AND LAST OCCURRENCE)

FIRST
1. ()
15

0 No - SKIP TO Q27

Yes-

2. ()
16

1 Baby's/ies' pediatrician

2 Obstetrician

LAST

3 Midwife

1. ()
17

4 Baby's/ies/ father

Other - CODE

NR

2. ()
18

26. What made him/her say you had an insufficient supply of breast milk? (FIRST AND LAST OCCURRENCE)

FIRST
1. ()
19

(FIRST) 1. _____

2. ()
21

2. _____

LAST

(LAST) 1. _____

1. ()
23

2. _____

2. ()
25

27. How many weeks old was/were the baby/ies when you had an insufficient supply of breast milk? (FIRST AND LAST OCCURRENCE)

FIRST
1. ()
27

LAST
2. ()
29

(CIRCLE)
INSUFFICIENT MILK.....YES/NO → Q. 32

28. How many days did this occurrence of insufficient milk last? (FIRST AND LAST OCCURRENCE)

FIRST	DAYS
()	(<u> </u>)
	31
LAST	(<u> </u>)
	33

29. Did you build up your supply of breast milk again?

<input type="checkbox"/> Yes	} SKIP TO Q32	(<u> </u>)	
<input type="checkbox"/> No			35
<input type="checkbox"/> NR			

30. How did you build up your supply of breast milk again?

	FIRST
1. (FIRST)	1. (<u> </u>)
	36

2. _____	2. (<u> </u>)
	38

	LAST
1. (LAST)	1. (<u> </u>)
	40

2. _____	2. (<u> </u>)
	42

31. How did you know to do that to build up your supply of breast milk? (PROBE: Who told you / Where did you read about it?)

	FIRST
1. (FIRST)	1. (<u> </u>)
	44

2. _____	2. (<u> </u>)
	46

	LAST
1. (LAST)	1. (<u> </u>)
	48

2. _____	2. (<u> </u>)
	50

(Beginning of card F4)

CODE
NUMBER

1	2	3

32. Did you have any other difficulties with breastfeeding?

1	Yes
0	No
B	NR

()
4

33. Could you please tell me about all of the difficulties that you had with breastfeeding?

Diff. 1. _____

1. ()
5

Diff. 2. _____

2. ()
7

Diff. 3. _____

3. ()
9

34. For each difficulty, did you seek help from other people, did you read materials in order to decide what to do, or did you yourself know what to do? (IF SOUGHT HELP FROM OTHER PEOPLE OR READINGS) Who/what were the main people/reading materials you sought help from ?

DIFF.	HELP SOURCE	RECOMMENDATION OF EACH	HELP SOURCE	MAIN RECOM.	HELPED
1.	a. _____	a. _____	1. () ()	()	()
	b. _____	b. _____	11 () ()	()	15 ()
2.	a. _____	a. _____	16 () ()	()	20 ()
	b. _____	b. _____	21 () ()	()	25 ()
3.	a. _____	a. _____	26 () ()	()	30 ()
	b. _____	b. _____	31 () ()	()	35 ()
			36 () ()	()	40 ()

35. (DEPENDING ON HELP SOURCE/S) What was the main recommendation of each person you sought help from? (OR) What was the main recommendation in the material you read? (OR) What did you yourself know to do? (CODE ABOVE)

36. (DEPENDING ON RECOMMENDATION) Did you follow/use this recommendation/approach in order to solve your difficulty with breastfeeding? (IF NOT USED CODE N.A.) (IF USED) Was this recommendation/approach very helpful, a little helpful, or not at all helpful in solving your difficulty with breastfeeding? (CODE ABOVE)

n	N.A.
1	Very helpful
2	A little helpful
3	Not at all helpful
B	NR

37. At any time since your baby/ies were born, did you take any medications, other than an oxytocic nasal spray, to increase/re-establish you milk supply?

Yes
 No
 NR

()
41

38. Which medications did you take to increase/re-establish your supply of breast milk after your discharge from the hospital? (CODE BELOW)

DRUG	CODE	BEGAN	(CIRCLE)			
			Y	N	DK	NR
1. _____	() 42	() 43	1	0	m	0
2. _____	() 46	() 47	1	0	m	0

39. How many weeks after delivery did you begin taking this medication to increase/re-establish your supply of breast milk? (CODE ABOVE)

40. Did this medication help to increase/re-establish your supply of breast milk? (CODE ABOVE)

41. Have you introduced cereals or other solid foods?

Yes
 No
 NR

()
50

()
51

()
52

42. Which solids have you introduced? (CODE BELOW)

43. How many weeks old was/were the baby/ies when you introduced this solid food? (CODE BELOW)

(Beginning of card F5)
 CODE NUMBER

F 4

	FOOD	AGE INTRODUCED IN WEEKS
Baby A	1. _____ ()	()
	2. _____ ()	()
	3. _____ ()	()
Baby B	1. _____ ()	()
	2. _____ ()	()
	3. _____ ()	()
Baby C	1. _____ ()	()
	2. _____ ()	()
	3. _____ ()	()

1 3

44. Could you please tell me who gave you the most encouragement to continue breastfeeding once you had the baby/ies home with you? (CODE)

1. ()
31
2. ()
33
3. ()
35

45. After your baby/ies discharge from the Newborn Special Care Unit, how often were you in contact with the Lactation Nurse Specialist, _____? (READ CHOICES)

- 0 Never
- 1 Once or twice
- 2 Three to five times
- 3 Six to ten times
- 4 More than ten times
- B NR

()
37

46. Have you worked/gone to school since your baby/ies came home from the hospital?

- 1 Yes
- 0 No
- B NR

()
38

47. Has this interfered in any way with your breastfeeding?

- 1 Yes
- 0 No
- B NR

()
39

48. In what ways has this interfered with your breastfeeding? (CODE)

()
40

()
41

49. When did you stop breastfeeding your baby/ies entirely?

MONTH DAY YEAR
(42 / / 47)

50. Could you please tell me the main reasons you stopped breastfeeding when you did?

REASON ONE TWO

() ()
48 51

() ()
52 55

() ()
56 59

(Beginning of card F6)
CODE
NUMBER

--	--	--

51. Overall, did you enjoy or dislike breastfeeding?

- 1 Enjoy
- 2 Dislike
- 3 Neither disliked or enjoyed
- 4 NR

()
4

52. What did you particularly enjoy about breastfeeding?

- 1. _____
- 2. _____

()
5

()
7

53. What did you particularly dislike about breastfeeding?

- 1. _____
- 2. _____

()
9

()
11

54. Did you breastfeed for as long as you had planned to when you originally decided to breastfeed? Please consider the time period between putting your baby/ies to the breast weaning from the breast.

()
13

- 1 Yes
- 2 No
- 3 NR

()
14

()
15

55. If you delivered another premature baby, would you breastfeed again?

- 1 Yes
- 2 No
- 3 NR

()
16

56. Is there anything else that occurred any time after your baby's/ies' discharge from the hospital that you think would be important or useful for us to know about? (CODE)

- _____
- _____
- _____

1. ()
17

2. ()
19

57. What advice would you give to a mother who wishes to breastfeed a premature baby? (CODE)

- _____
- _____
- _____

1. ()
21

2. ()
23

58. What additional assistance could the hospital offer to mothers who wish to breastfeed their premature infants?

- _____
- _____
- _____

1. ()
25

2. ()
27

This section is to be completed by the interviewer immediately following the interview.

59. Please select the phrase which best describes the respondent's present mental alertness (status).

- Alert and fully oriented.....1
- Poor memory and attention span.....2
- Mental status fluctuates.....3
- Slightly confused most of the time.....4
- Confused and disoriented.....5

29

60. Please select the phrase which best describes the respondent's ability to speak and understand English.

- Fully able to speak and understand English.....1
 - Limited ability to speak and understand English.....2
 - Poor understanding of English.....3
- (LANGUAGE SPOKEN)

30

61. Please select the phrase which best describes how you would rate the respondent's frankness and accuracy during the interview.

- Absolutely frank and accurate..... 1
- Probably frank and accurate..... 2
- Not always frank and accurate..... 3
- Seldom frank and accurate..... 4
- Never frank and accurate..... 5

31

62. Please select the phrase which best describes how you would rate the respondent's attitude during the interview.

- Cooperative and interested.....1
- Cooperative.....2
- Ambivalent.....3
- Uncooperative.....4
- Uncooperative and hostile.....5

32

A-III. Equation for Grouped Variables

dscus=(q26a=1)+(q26b=1)+(q26c=1)+(q26d=1)+(q26e=1)+(q26f=1);
newdis=(dscus ge 1);
recc=(q27a=1)+(q27b=1)+(q27c=1)+(q27d=1)+(q27e=1)+(q27f=1);
newrec=(recc ge 1);

[dscus=individual with whom mother discussed her choice of feeding;
recc=feeding method the individual recommended;
q26a/q27a=infant's father; q26b/q27b=subject's mother; q26c/q27c=other
family members; q26d/q27d=friends; q26e/q27e=subject's OB;
q26f/q27f=infant's future pediatrician]





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DATE

