County of Yolo

Health Department

MOMMY AND ME ASSESSMENT

MAMA Project 2007
Infant Feeding Assessment
And
Breastfeeding Rate Study

Prepared By: Yolo County MCAH Program

MAMA Project 2007
Infant Feeding Assessment and Breastfeeding Rate Study

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I. Introduction

The MAMA Project Infant Feeding Assessment and Breastfeeding Rate Study was conducted in order to measure the extent to which families in Yolo County are able to provide optimal nutrition for their infants 0-6 months. Breastfeeding exclusively (no supplementation of any kind) for the first six months is considered the gold standard for infant nutrition. This is recognized by national and international health authorities including the American Academy of Pediatrics, American Academy of Family Practice Physicians, American College of Obstetrics and Gynecology, World Health Organization and United Nations Children's Fund (Chantry et al., 2006). Health benefits of breastfeeding have been demonstrated in multiple studies and include protection from acute and chronic health conditions, enhanced cognitive development, decreased risk of sudden infant death syndrome (SIDS), and lowered risk for obesity later in childhood. These health effects are related to the intensity and duration of breastfeeding (ACOG, 2007). For the greatest benefit, breastfeeding should be continued for at least the first year of life (AAP, 2005).

The extent to which breastfeeding prevails as "normal" infant feeding practice in American society has waxed and waned over the years. Prior to the pasteurization of milk, physicians pressed hard for their patients to breastfeed their infants as it was recognized that babies fed cow's milk died at a much higher rate than breastfed infants (Wolf, 2003). Unfortunately, after pasteurized cow's milk became widely available, both the public and the medical community came to regard cow's milk as an acceptable supplement and early weaning became the norm. By 1971 breastfeeding was at an all time low. Over the past 35 years gains have been made, but the increases in breastfeeding rates have not been of the magnitude that one might expect given the strong data regarding the health benefits of breastfeeding. Indeed, what our society defines as "normal" infant care may strongly influence parental behavior. Supplementing with formula shortly after birth and weaning from the breast within a few weeks or months has been a culturally acceptable practice for American mothers for many decades. A strong public health community response to this problem is critical in order to increase the prevalence and duration of breastfeeding, and reshape our cultural view of infant feeding.

The U.S. Department of Health and Human Services (USDHHS) Healthy People 2010 objectives for breastfeeding are that 75% of mothers will initiate breastfeeding, 50% will continue to breastfeed for the first 6 months and 25% for the first year (USDHHS, 2007). Data on breastfeeding initiation rates are provided by delivery hospitals that report feeding method at discharge of the newborn infant (California Department of Health Services [CDHS], 2007). In California, statewide surveillance systems are inadequate in that there are little data available on six-month or one-year breastfeeding rates and county-level data are not reported for smaller counties. Data sources that are available show wide variation in breastfeeding initiation and duration across geographic, economic and racial groups, and wide variation between hospitals (CDHS, 2004; Centers for Disease Control and Prevention, 2007). The MAMA Project data provided in this report addresses the need for community level data that encompasses the period from birth to six months of age. Our survey design reflects interest in determining where disparities exist in education, support and services for the breastfeeding new mother and infant.

Since 2001, Yolo County has enjoyed the advantage of an active breastfeeding advocacy group: The Community Breastfeeding Coalition of Yolo (Appendix A). As a result of discussions within this group, the need was recognized and a plan was developed for obtaining

baseline breastfeeding rates and community assessment data. In preparation for conducting the study, an advisory group of interested experts in the field of breastfeeding and maternal child health was convened (Appendix B). Through literature review and consultation with the advisory group, a survey consisting of 67 items was developed. Mothers were eligible to be in the study if they were current residents of Yolo County and their infant was between the ages of 6 to 8 months during the data collection period. In order to locate these families and offer them a chance to participate in the survey, contact forms were distributed to multiple partner agencies in the community (Appendix C). Interested mothers could fill out the contact form, which was collected by a trained Maternal Child Adolescent Health (MCAH) Program intern. The intern would then conduct the survey over the phone in either Spanish or English at the point when baby was 6-8 months old. The incentive for participation was a $30 gift card mailed to the participant after survey completion.

Approximately 90% of the women who turned in contact forms completed the survey. Data collection took place from July 2006 to April 2007 with all interviews being conducted by one of two bilingual interns who stayed on the project from its beginning to its completion. Four hundred five surveys were completed reflecting 399 mothers and 405 infants (six sets of twins). One hundred thirty-six of the 399 interviews (34%) were in Spanish with the remainder conducted in English.

This report presents descriptive and analytic data as well as recommendations based on the MAMA Project surveys. The first section presents the comparison of the total cohort of Yolo County resident births to the group of women who participated in the MAMA Project. Sections III and IV present graphs and tables of our results. The final report section provides recommendations based on this data and what is currently known about evidence-based interventions to increase breastfeeding initiation and duration.

II. MAMA Participants Versus 2006 Yolo County Birth Mothers

Birth data

A total of 2,643 infants were born in Yolo County in 2006 (Yolo County Health Department, 2007). Infants born to Hispanic mothers accounted for approximately 46% of all 2006 births. White mothers are the next largest racial group at 40%. The remaining infants were born to Asian Americans, Pacific Islanders, native Americans, African Americans and women of mixed ethnic background. A comparison of the racial demographics of all 2006 births vs. MAMA project participants (Fig. II-1) showed that White and Asian mothers were slightly under-represented in the survey, while Hispanic mothers were over-represented (chi-squared test for difference between MAMA participants and 2006 birth mothers p-value=0.031).

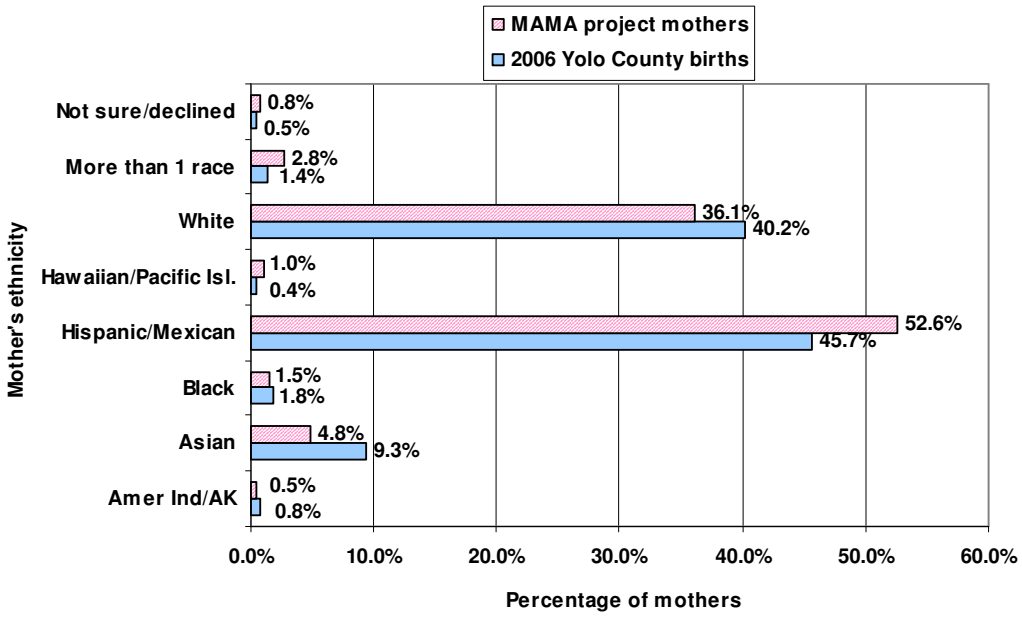

Figure II-1. Comparison of maternal ethnicity for MAMA project participants and 2006 Yolo County birth mothers.

Infants enrolled in the MAMA project were born between August 2005 and October 2006, with the majority born in the summer of 2006 (Fig. II-2). The average age of the infant on the date of interview was 28.6 wk (+/- 0.3 wk, range 21 to 42 wk). One-third (n=132) were born at out-of-county hospitals and three were born at home. Their average birthweight was 7.6 lb (+/- 0.1 lb, range 1.9 to 10.9 lb). The comparison to 2006 birthweight distributions for Yolo County appears in Figure II-3. Gestational age of MAMA project infants, as reported by their mothers, ranged from 26 to 44 wk, average 39.3 wk (+/- 0.2 wk). Ninety-two of the 399 deliveries (23%) were by Caesarean section compared to 25% for all 2006 deliveries in Yolo County. Gender was almost evenly split between boys and girls (49.9% and 50.1%,

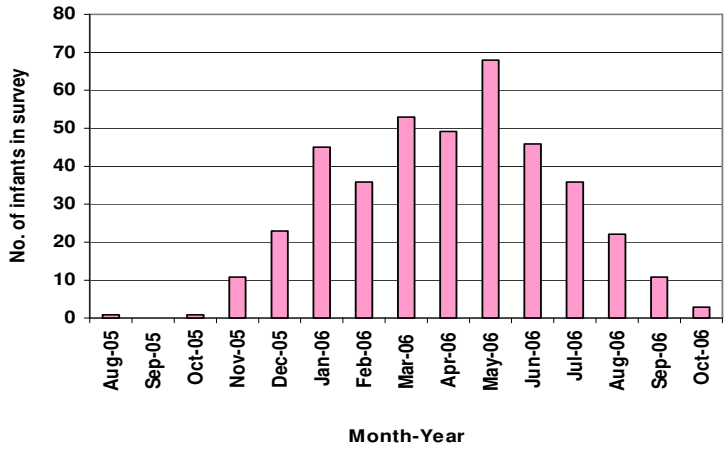

Figure II-2. Birth month of infants enrolled in the MAMA project, 2006-07.

respectively). Twins represented 1.5% of births, compared to 3.7% for all 2006 Yolo County births. Fifty-five of the 405 infants in the survey (14%) had a neonatal problem, and 27 (6.7%) were admitted to the Intensive Care Unit (ICU). These data suggest that the infants in the survey had similar physical characteristics to the 2006 Yolo County birth population.

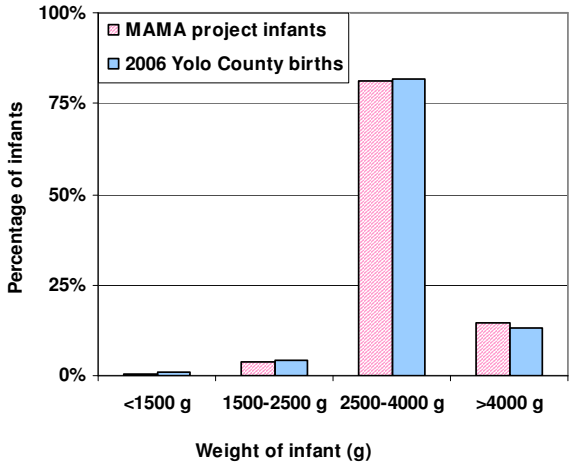

Figure II-3. Comparison of birthweights for MAMA project infants to 2006 Yolo County births. 1500 g=3.3 lb; 2500=5.5 lb; 4000 g=8.8 lb.

Maternal Demographics

Maternal Age: The average age of mothers in the MAMA survey was 26.9 yr (+/- 0.6 yr,range 14-44 yr) compared to 28.1 yr (range 14-51 yr) for all Yolo County birth mothers in 2006. The distribution of MAMA project participant ages compared to 2006 Yolo County birth mothers appears in Figure II-4, and differed significantly (chi-squared test p-value<0.0001). This was due to an over-representation of young mothers in the survey (15% of MAMA project participants vs. 9% of 2006 Yolo County birth mothers were less than 19 years old).

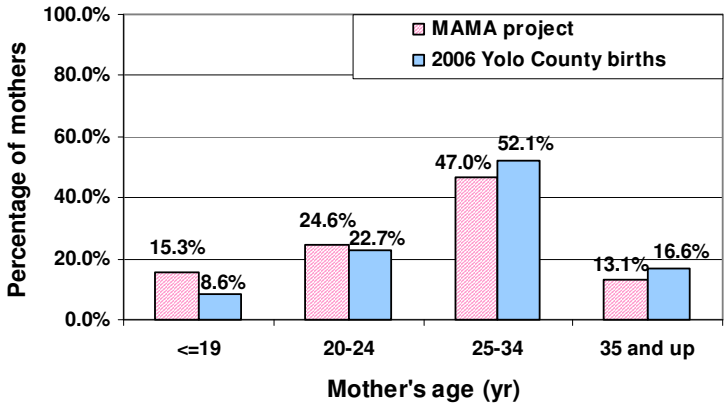

Figure II-4. Comparison of maternal age for MAMA project participants and 2006 Yolo County birth mothers.

Culture/ethnicity: Languages spoken in the home were mainly English, Spanish, or a mixture of both (Fig. II-5). Other languages included Farsi, Filipino, Hebrew, Hindi, Hmong, Italian, Korean, Japanese, Mandarin, Nepalese, Punjabi, Russian, Subanen and Urdu. Almost half the mothers (n=181 or 45%) had been born outside the U.S.A. with 140 (35%) born in Mexico. Other countries of birth represented were: Afghanistan, Argentina, Bahrain, China, Colombia, Czech Republic, Denmark, El Salvador, England, Fiji, Germany, Greece, India, Italy, Japan, Korea, Nepal, Pakistan, Philippines, Russian Federation, Taiwan, Ukraine, and Uzbekistan.

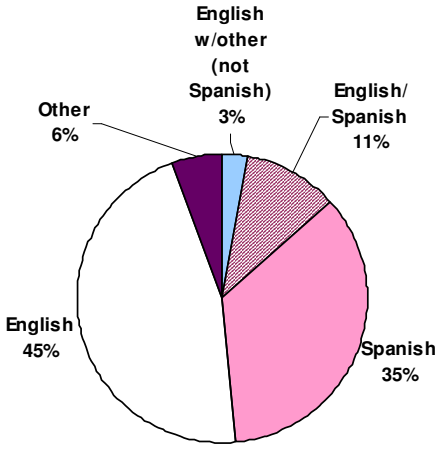

Figure II-5. Language spoken at home by MAMA project participants.

Socioeconomic status: A breakdown of household income for mothers in the survey appears in Figure II-6. Fifty percent of mothers lived in households with annual incomes of less than $25K, although the median household income for Yolo County is about $63K (American Community Survey, 2005). Lower income families were over-represented in the MAMA project compared to all Yolo County families. This is not surprising, since many of the MAMA project participants were contacted through the Supplemental

Nutrition Program for Women, Infants and Children (WIC), which provides services to low-income households.

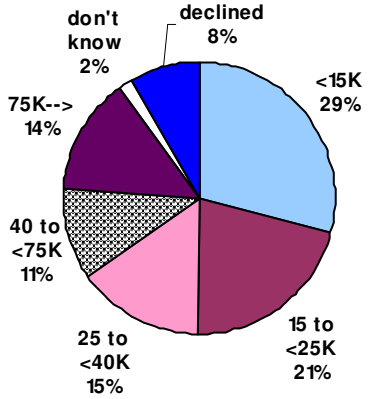

Figure II-6. Household income for participants in the MAMA project, 2006-07.

Despite the fact that many MAMA project mothers were low-income and receiving WIC benefits, they had attained similar levels of education to 2006 Yolo County birth mothers (Fig. II-7).

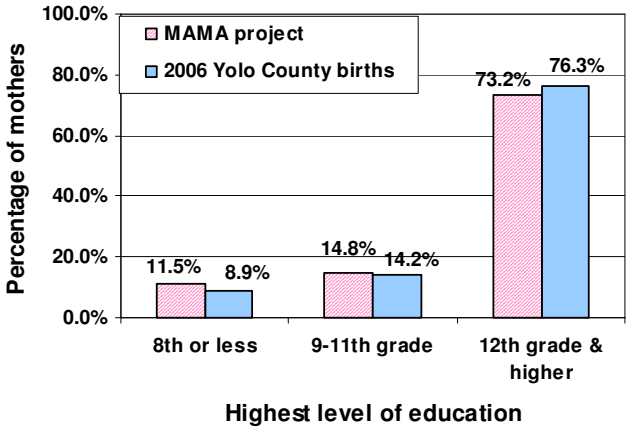

Figure II-7. Comparison of mother's highest level of education for MAMA project participants and 2006 Yolo County birth mothers.

Figure II-8 depicts the breakdown of educational attainment for MAMA project participants. About 25% of mothers had college or more advanced degrees. This is lower than the 37.5% of Yolo County residents who possess Bachelor's degrees or higher (American Community Survey, 2005).

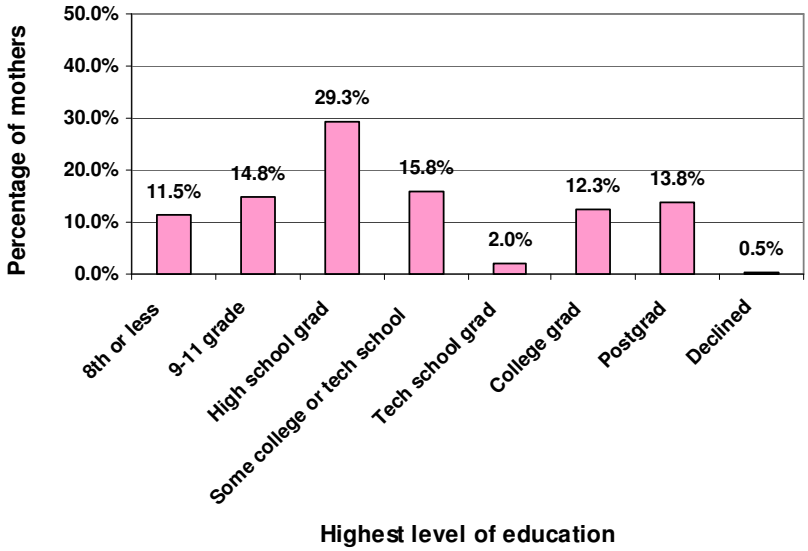

Figure II-8. Educational attainment of MAMA project participants.

Family make-up: Almost two-thirds of participants (64%) lived with a spouse, 24% lived with parents or in-laws, and 20% lived with another family member (Fig. II-9). All infants in the survey lived at the residences of their mothers.

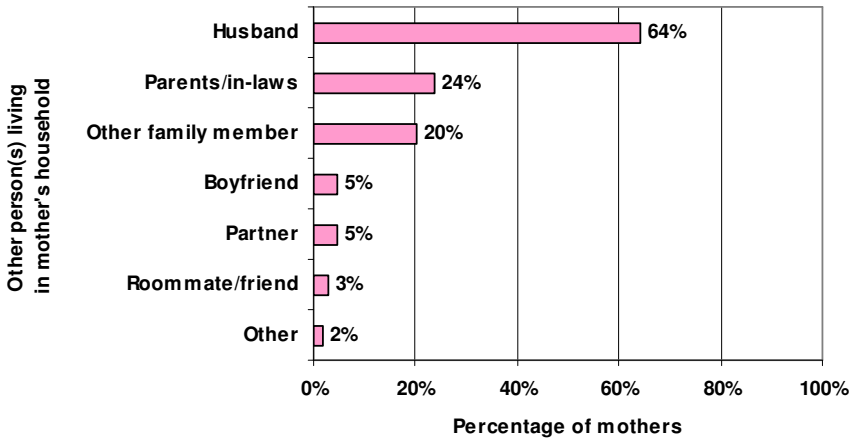

Figure II-9. Presence of other persons in the mother's household. Total does not equal 100% because some mothers lived with household members who fell into more than one category.

About half of participants had only one child in the home (Fig. II-10), and about 9% had four or more children.

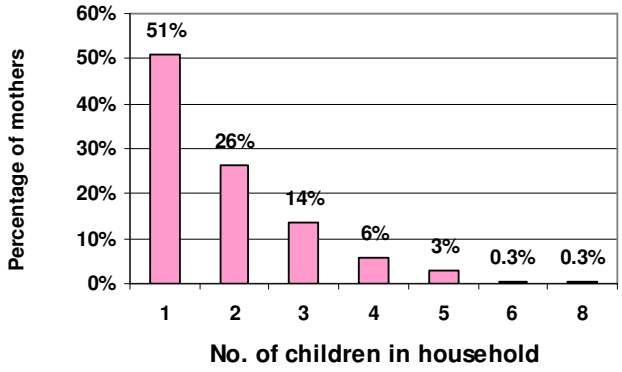

Figure II-10. Number of children in the mother's household, including the infant in the survey.

Geographic distribution: Compared to 2006 birth mothers, residents of Woodland were over-represented and residents of West Sacramento were under-represented in the MAMA project (Fig. II-11). Residence in other communities for MAMA project participants was similar to city of residence for 2006 Yolo County birth mothers.

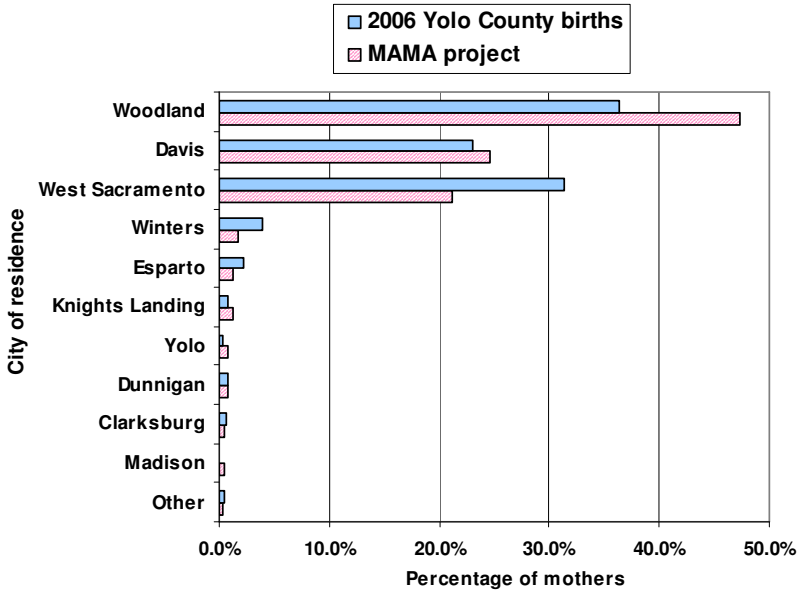

Figure II-11. Comparison of maternal city of residence for MAMA project participants and 2006 Yolo County birth mothers.

Health Insurance: The source of payment for the infant's medical care compared to Yolo County 2006 births appears in Figure II-12. Medi-Cal patients were over-represented in the survey.

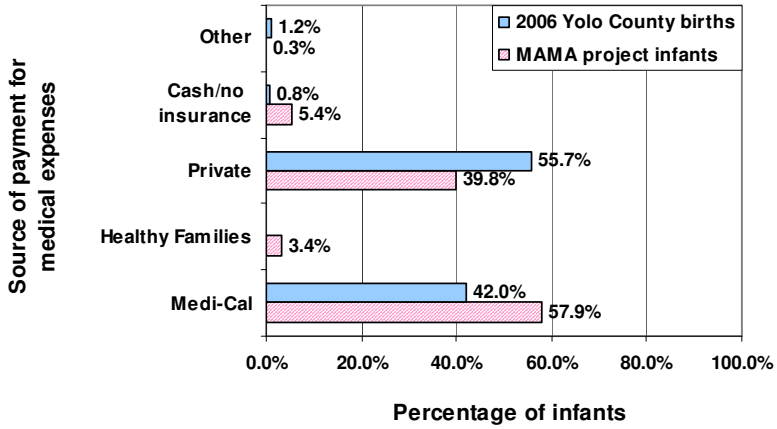

Figure II-12. Comparison of health insurance coverage for MAMA project infants to 2006 Yolo County birth population.

Delivery Hospital distribution

Two-thirds (67%) of the infants born to MAMA project mothers were born in one of the two hospitals in Yolo County: Sutter-Davis Hospital and Woodland Memorial Hospital. These two hospitals accounted for a comparable but slightly lower proportion of all live births (60%) in Yolo County in 2006 (Fig. II-13). Thus, the MAMA project participants were representative of all the delivery hospitals utilized by Yolo County families in 2006.

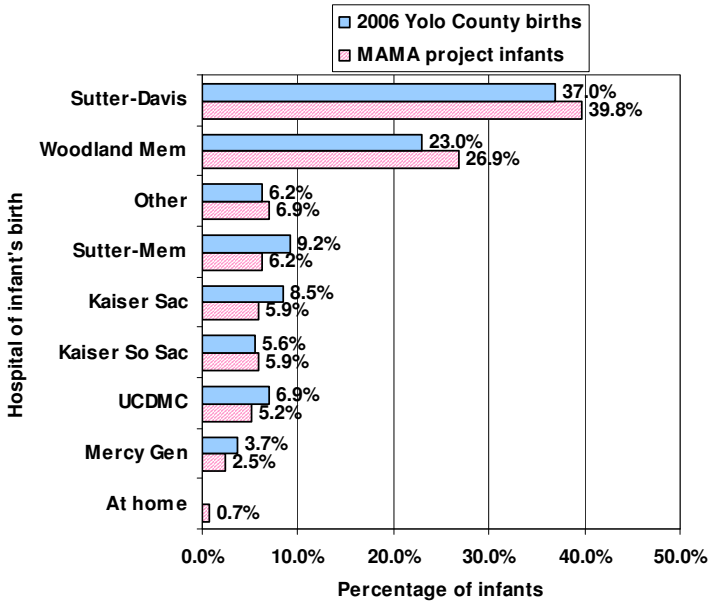

Figure II-13. Distribution of MAMA project infants (n=405) and 2006 Yolo County births by hospital of delivery.

Medi-Cal recipients were over-represented at Woodland Memorial Hospital but not at Sutter-Davis Hospital (Fig. II-14).

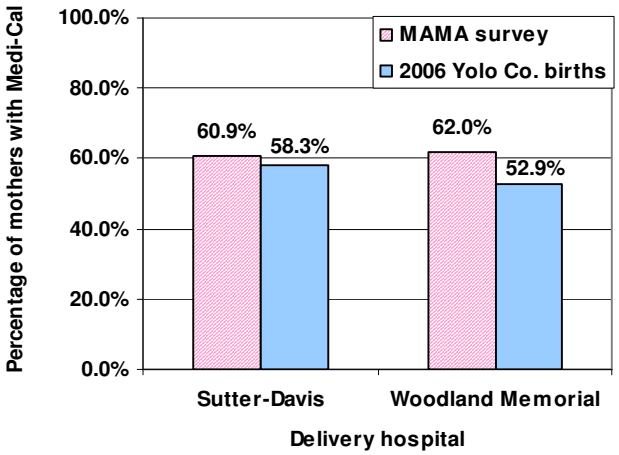

Figure II-14. Comparison of infants born to mothers on Medi-Cal in the MAMA project vs. 2006 Yolo County births for two Yolo County hospitals.

III. MAMA Project Results

Overall breastfeeding prevalence

Ninety-four percent of infants (382 of 405) were breastfed at least once. At 2 days old, 91% of infants were breastfeeding and by 2 weeks old, 89% were still breastfeeding, most of them exclusively (Fig. III-1). By 2 months of age, the breastfeeding rate had declined by almost 13%, as more infants progressed to formula feeding. At 6 months of age, 56% of infants were still breastfeeding. Although this percentage meets the Healthy People 2010 goal for 50% of infants to be breastfeeding at 6 months old (USDHHS, 2007), it falls far short of AAP guidelines (AAP, 2005). AAP recommends that infants be fed exclusively breast milk for the first 6 months of life. Only 30% of Yolo County infants were fed according to these guidelines.

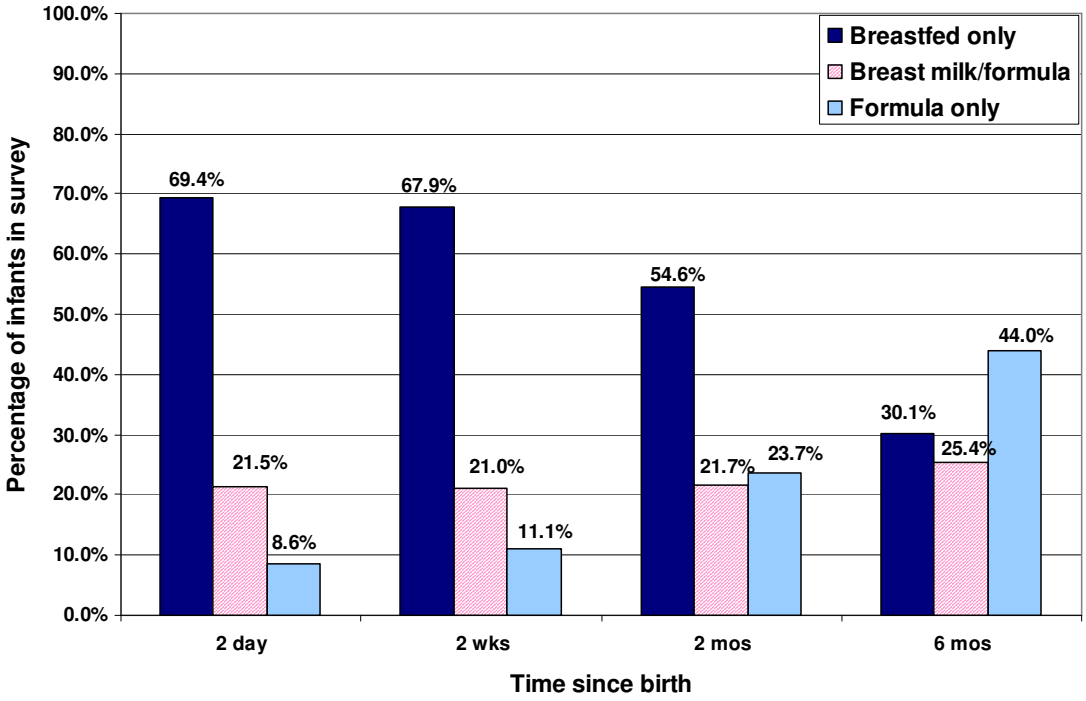

Figure III-1. Infant feeding practices in Yolo County at four time points, MAMA project, 2006-07.

Breastfeeding intentions

Prior to giving birth, most mothers (n=350, 88%) intended to try breastfeeding and another 5% indicated that they might try it (Fig. III-2). Eighty-six percent of mothers (n=341) knew of family members who had breastfed before with nine mothers unsure. Forty-four percent of mothers (n=177) had breastfed other children prior to the current pregnancy.

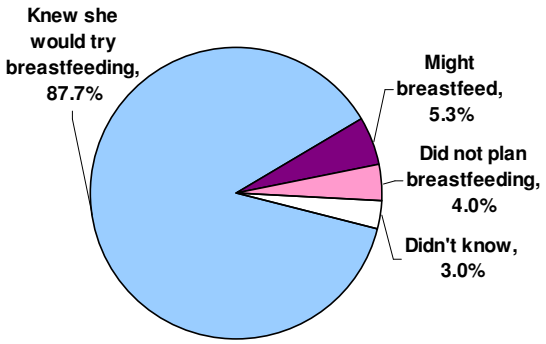

Figure III-2. Intentions of mothers in the MAMA project with regard to breastfeeding.

Sources of prenatal breastfeeding information and encouragement

Participants were asked where they got information about whether or not to breastfeed. Only half of mothers reported that they talked with their doctor or healthcare professional (Fig. III-3). It is also noteworthy that although 68% of the mothers in the survey were on WIC, only 23% reported obtaining breastfeeding information from this source.

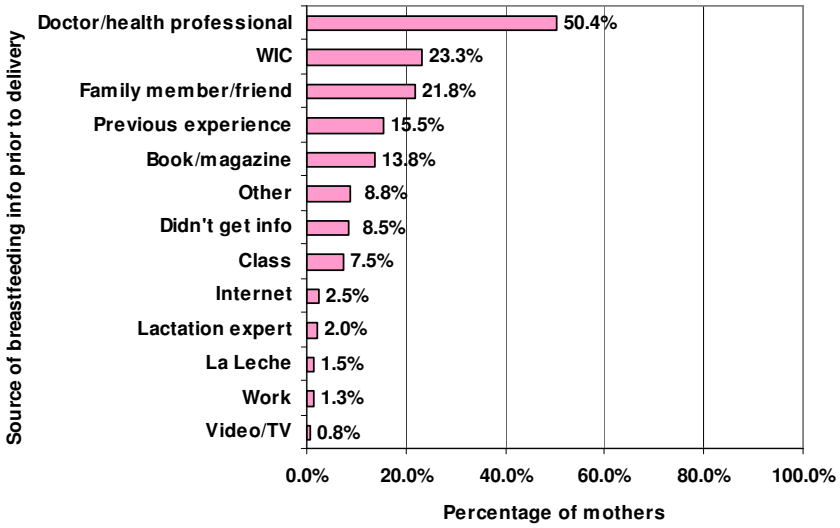

Figure III-3. Sources used to obtain breastfeeding information for mothers in the MAMA project prior to delivery. Respondents could indicate more than one category.

Participants were also asked if anyone encouraged them to breastfeed their infant before the infant was born. Family members were the most frequently cited sources of encouragement. Approximately 40% of women reported that their doctor had encouraged them to breastfeed and only 5% reported that WIC staff had done so. Persons who encouraged breastfeeding prenatally are depicted in Figure III-4. A total of 366 women (92%) received messages promoting breastfeeding.

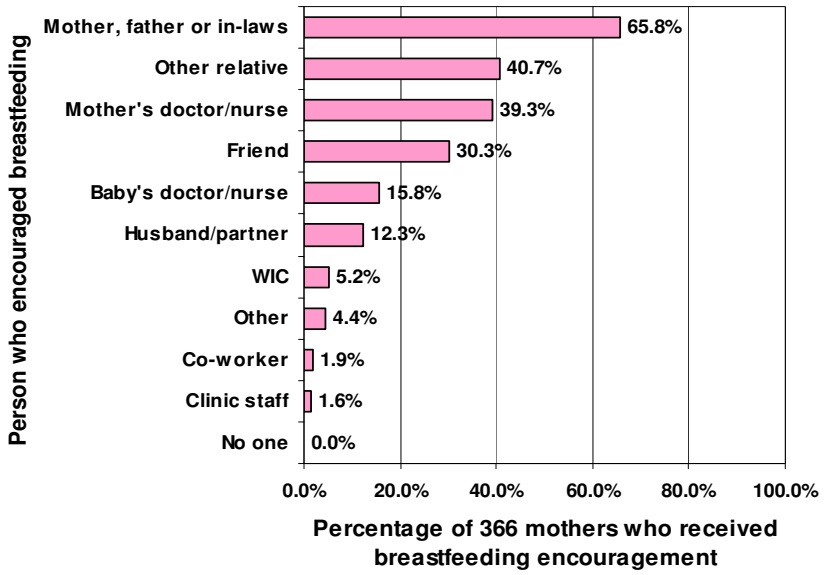

Figure III-4. Sources of prenatal breastfeeding encouragement for MAMA project participants. Respondents could indicate more than one person.

Forty mothers (5%) were discouraged from breastfeeding (Fig. III-5). The person most frequently cited as discouraging a woman from breastfeeding was a friend (55%), followed by parents or in-laws, and other relatives. The "other" category included a co-worker, a neighbor, a woman who had not breastfed herself, and one mother who was on medication contraindicated for breastfeeding.

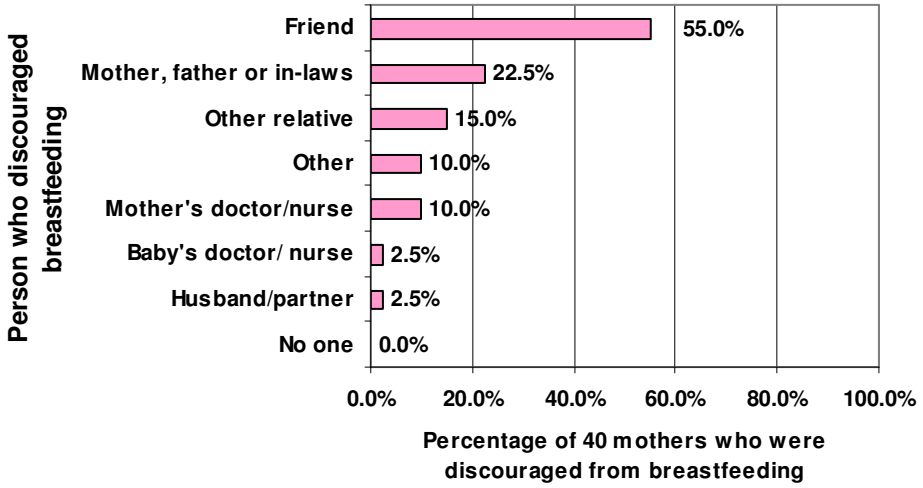

Figure III-5. Sources of prenatal breastfeeding discouragement for MAMA project participants. Respondents could indicate more than one person.

Sources of postpartum breastfeeding help

Participants were asked who helped them with breastfeeding their infant. During the postpartum period, doctors, nurses, and lactation experts or consultants were important in helping mothers with breastfeeding difficulties (Fig. III-6). Only 5.6% of women (n=21) reported receiving no help with breastfeeding. Family members and friends remained as important support resources. While only 12% of husbands or partners encouraged breastfeeding prenatally, 44% of mothers reported that they provided support for breastfeeding during the postpartum period. Only 2% of mothers indicated that they obtained information on breastfeeding from lactation consultants prior to delivery, but 44% of breastfeeding mothers obtained the assistance of lactation consultants after they gave birth.

When asked who provided the most help, 25% of respondents cited their mother or a family member, 24% the hospital staff, doctor or nurse, 18% the lactation consultant, and 15% their husband or partner. Other people who helped were sisters, WIC, myself, friends, the infant's doctor or nurse, books, support hotlines and no one.

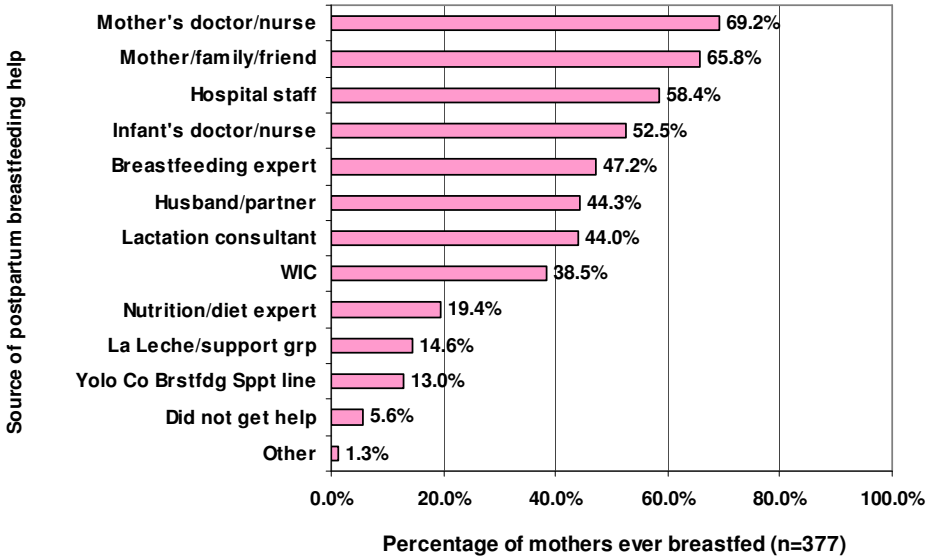

Figure III-6. Sources of postpartum breastfeeding help. Respondents could indicate more than one source.

Hospital experiences

Rate charts

For data analysis purposes, responses were grouped based on hospital or hospital system. This grouping allowed us to examine differences in breastfeeding rates and hospital practices among healthcare systems. Hospital groupings were designated as follows: Kaiser Sacramento and South Sacramento (n=48), Sutter-Davis Hospital (n=161), Woodland Memorial Hospital (n=109), and all others (n=84, excluding three home births). The identities of the hospital groupings have been masked for the purposes of this report. Initiation of any breastfeeding did

not differ significantly amongst hospitals, ranging from 85% to 93%, but Hospital D differed from Hospitals B and C at the six-month time point (Fig. III-7).

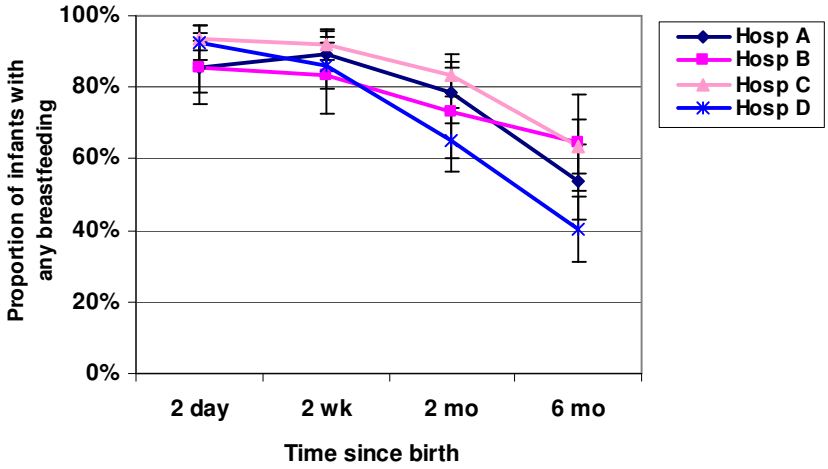

Figure III-7. Duration of any breastfeeding by hospital grouping. Three home births excluded.

Exclusive breastfeeding initiation varied between 50% to 78%, and was significantly higher at Hospital C compared to Hospital B (Fig. III-8). For women delivering at Hospital D, although the percentage (64%) initiating exclusive breastfeeding was comparable to Hospitals A and B, they were unable to sustain this advantage and had the lowest exclusive breastfeeding rate (16%) at the six-month time point.

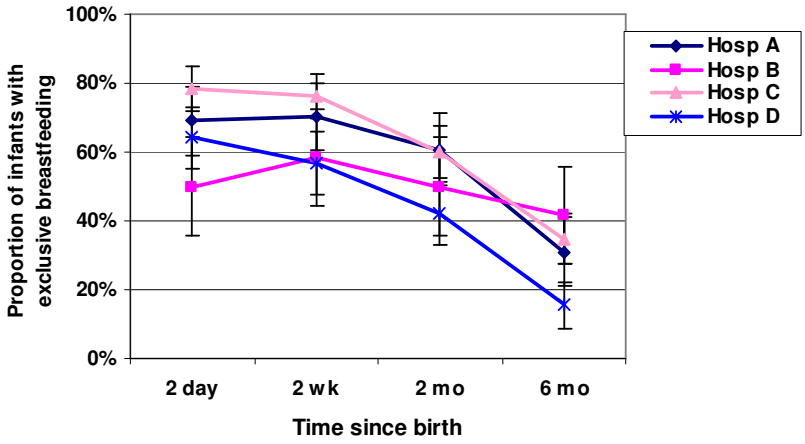

Figure III-8. Duration of exclusive breastfeeding by hospital grouping. Three home births excluded.

Hospital Practices

Twenty-two mothers (6%) reported that they experienced problems with their own health in the hospital. Twenty-two percent of infants were delivered by Caesarean section, including all six sets of twins. A series of questions designed to elicit information about hospital practices that may impact breastfeeding was answered by each participant. Women were asked to respond

'Yes' or 'No' as to whether an event had happened during their hospital stay when the infant was born. Aggregate data for all hospitals are presented in Figures III-9 to III-21. Where highly significant differences occurred amongst hospital systems, a bar chart comparing hospital group rates is included.

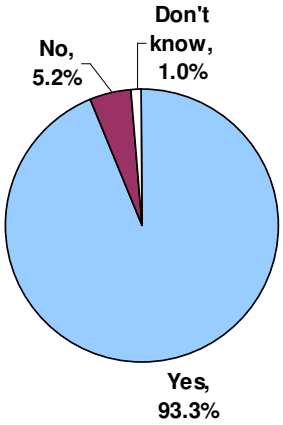

Figure III-9. Hospital provided breastfeeding information.

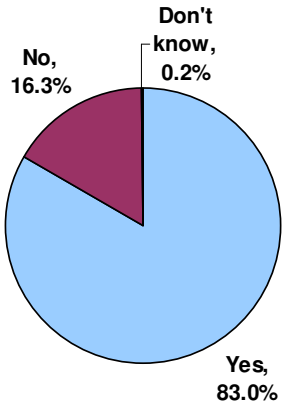

Figure III-10. Hospital staff helped mother learn how to breastfeed.

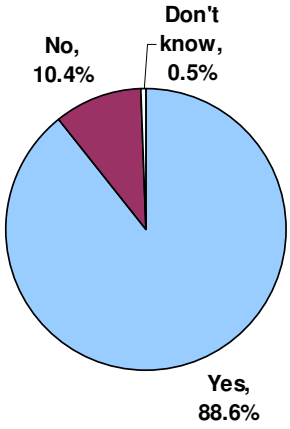

Figure III-11. Mother breastfed her infant at the hospital.

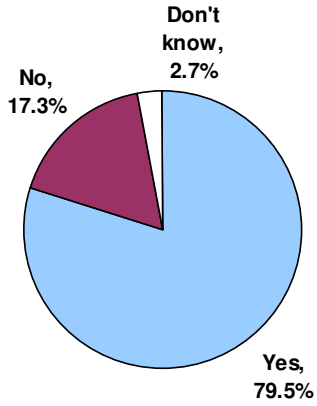

Figure III-12. Mother was told to feed the infant whenever s/he wanted.

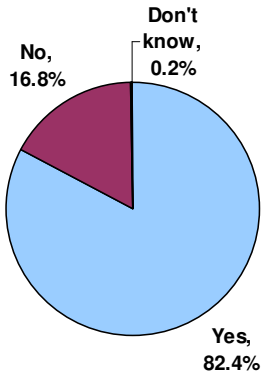

Figure III-13a. Infant roomed with mother for her entire hospital stay.

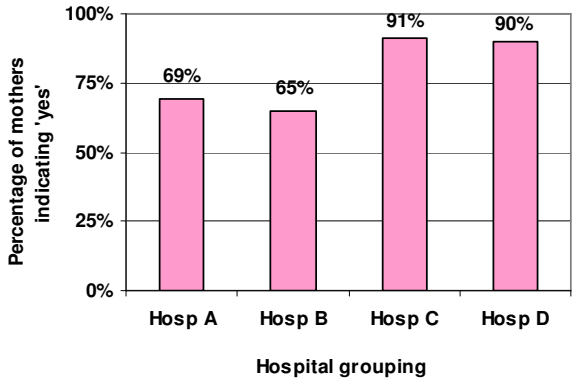

Figure III-13b. Comparison of hospital groups for infant rooming with mother for her entire hospital stay.

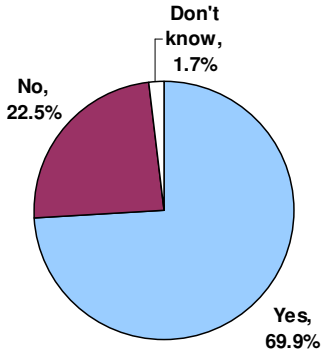

Figure III-14a. Mother breastfed her infant in the first hour of life.

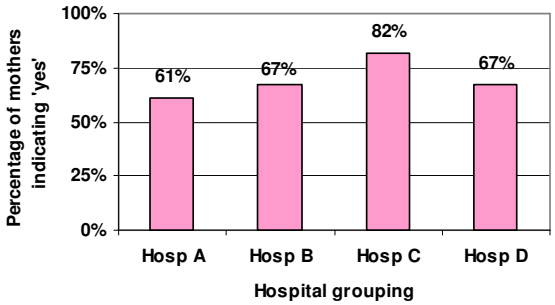

Figure III-14b. Comparison of hospital groups for mother breastfeeding her infant in the first hour of life.

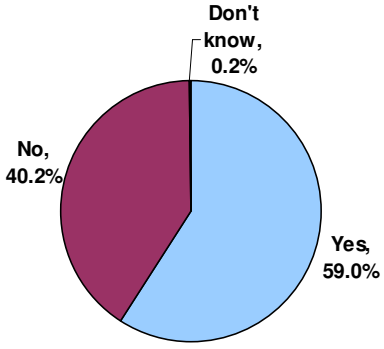

Figure III-15a. Infant was fed only breast milk at the hospital.

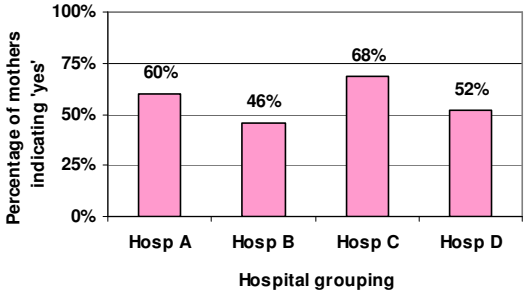

Figure III-15b. Comparison of hospital groups for infants being fed only breast milk at the hospital.

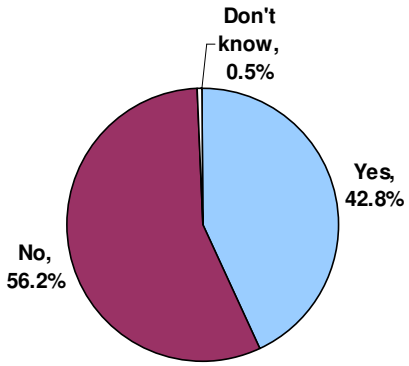

Figure III-16a. Infant was fed formula at the hospital.

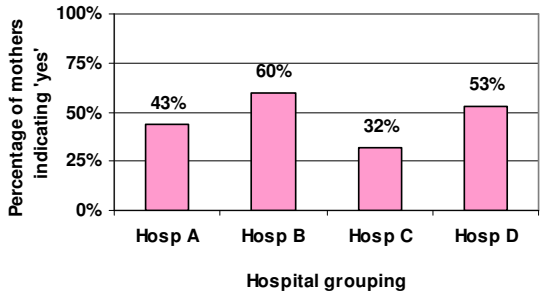

Figure III-16b. Comparison of hospital groups for feeding the infant formula at the hospital.

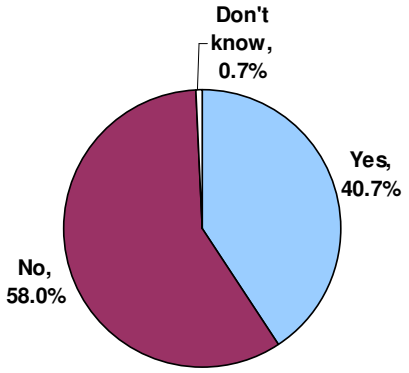

Figure III-17a. Infant was fed by bottle at the hospital.

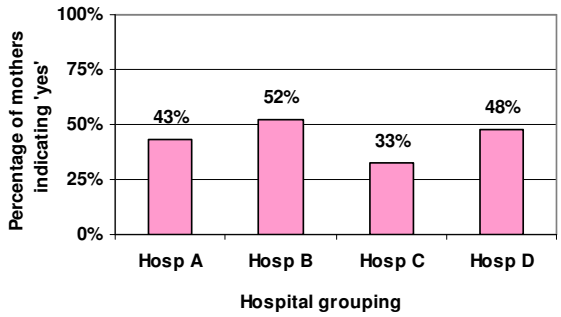

Figure III-17b. Comparison of hospital groupings for feeding the infant by bottle at the hospital.

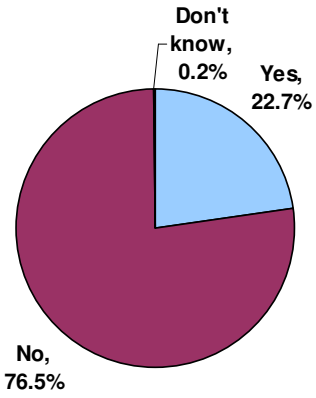

Figure III-18a. Mother used a breast pump at the hospital.

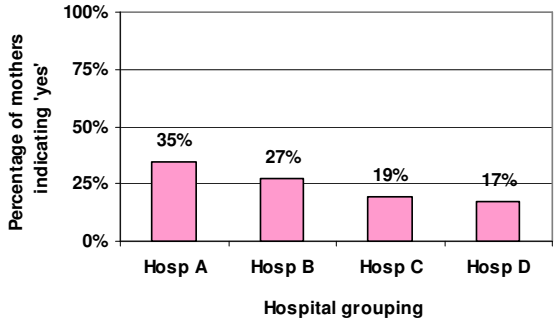

Figure III-18b. Comparison of hospital groupings for the mother using a breast pump at the hospital.

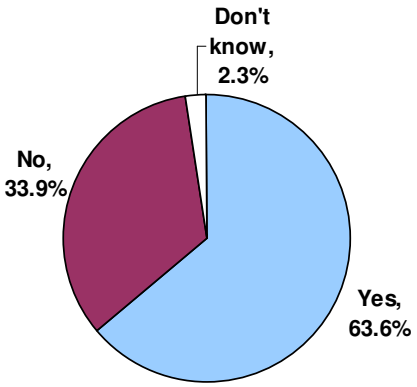

Figure III-19a. Hospital gave mother a gift pack containing formula.

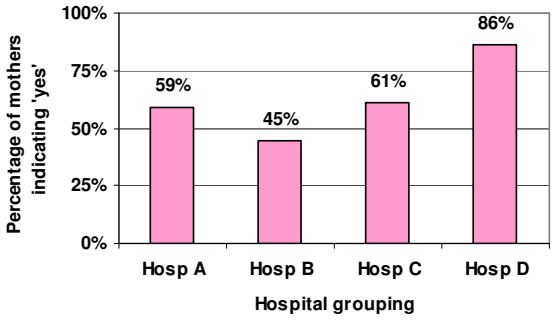

Figure III-19b. Comparison of hospital groupings by distribution of gift packs containing formula.

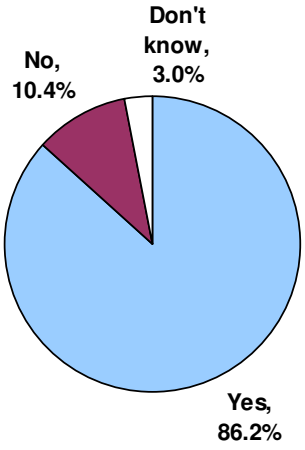

Figure III-20. Hospital gave mother a telephone number for breastfeeding help.

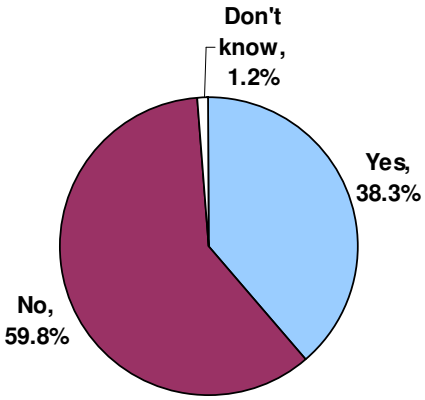

Figure III-21. Infant used a pacifier at the hospital.

Pacifiers used in the hospital were overwhelmingly provided by doctors, nurses or the hospital staff (Figure III-22).

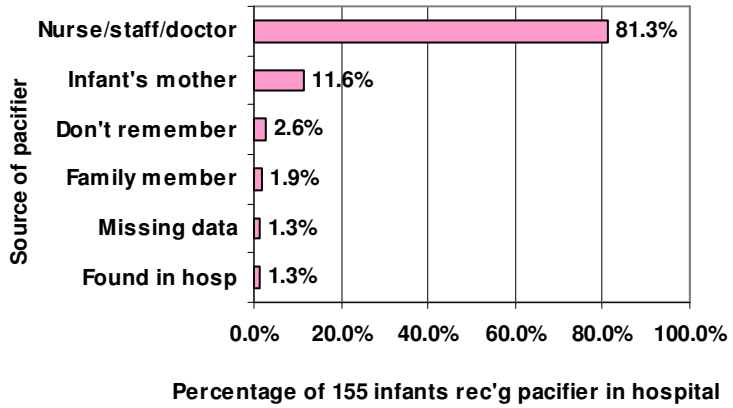

Figure III-22. Source of pacifiers given to infants in the hospital.

Additional support –
Participants were asked if they needed additional support when they first began feeding their infants. Fifty-four mothers (13%) wanted more support than they received from the hospital. Most of the comments (86%) were related to breastfeeding support, indicating a desire for more help and/or encouragement from hospital staff. A complete list of the actual comments appears in Appendix E.

Breast pump usage

About two-thirds of mothers who ever breastfed their infant (259 of 382) used a breast pump. The two most common reasons that a breast pump was needed were return to work or school (36%) and to establish breastfeeding (32%) (Fig. III-23).

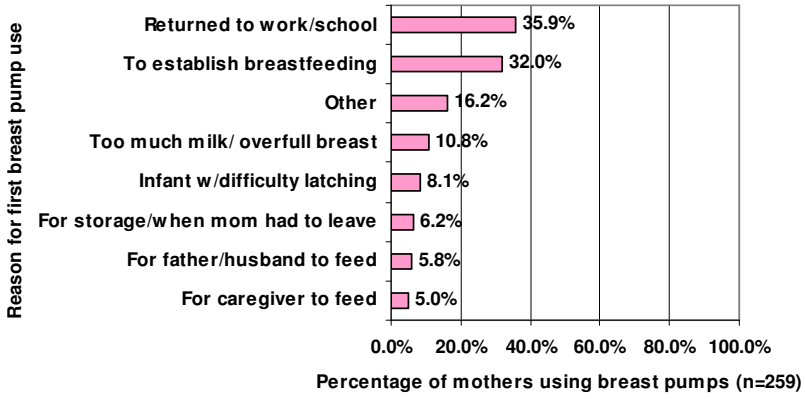

Figure III-23. Reasons for first breast pump use for 259 mothers using breast pumps.

Only nine mothers (3% of those who breastfed) were unable to obtain a breast pump every time they needed one. Electric pumps were most common, used by 71% of mothers who had ever breastfed. One-third also used battery-powered pumps, and only 6% used manual

pumps. Some mothers had used more than one type of pump. Although 36% of breast pump users could not remember the brand of the pump they had used, the most frequently used breast pumps were the Medela Pump-in-Style and Medela Symphony (Fig. III-24).

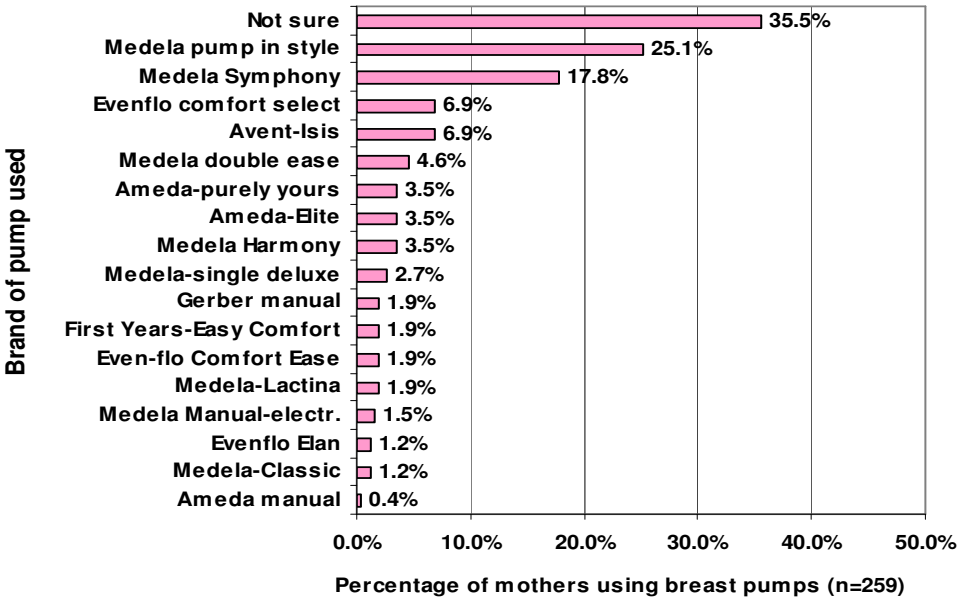

Figure III-24. Brands selected by 259 breast pump users in the MAMA project.

A high percentage of women (40%, 104 of 259 breast pump users) used previously owned breast pumps. About one-third bought their pumps from retail stores, notably Target, Mother & Baby Source, WalMart and Babies-R-Us. WIC, hospitals or clinics, and gifts were the other major sources of breast pumps (Fig. III-25).

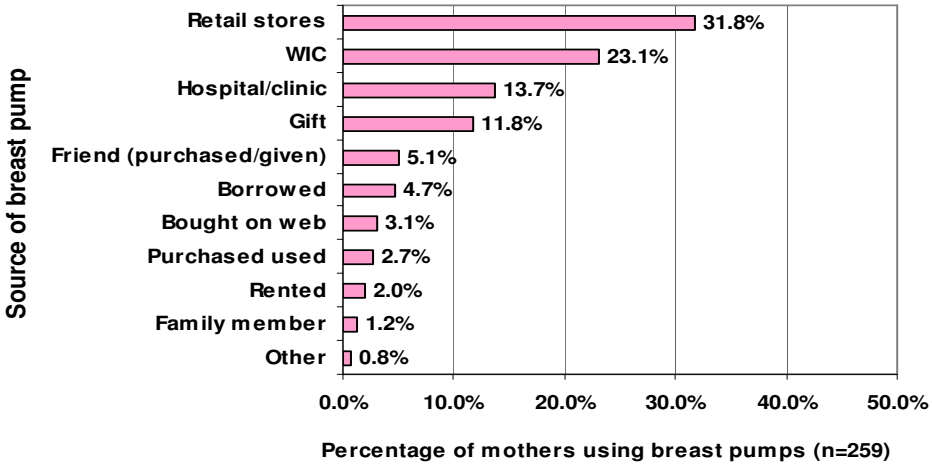

Figure III-25. Sources of breast pumps used by 259 mothers in the MAMA project.

Formula supplementation and feeding practices in the first months of life

Initiation of formula feeding

A total of 312 (82%) of the 382 infants who initiated breastfeeding had received formula supplementation by age 6 months (Fig. III-26). Thirty-eight percent received formula in the first seven days of life and 23% were fed formula within the first 24 hours of being born. Since only 14% of infants were reported to have a neonatal problem and even fewer 7% were admitted to the ICU (see Section II, page 4), these data suggest early formula supplementation that was not medically necessary.

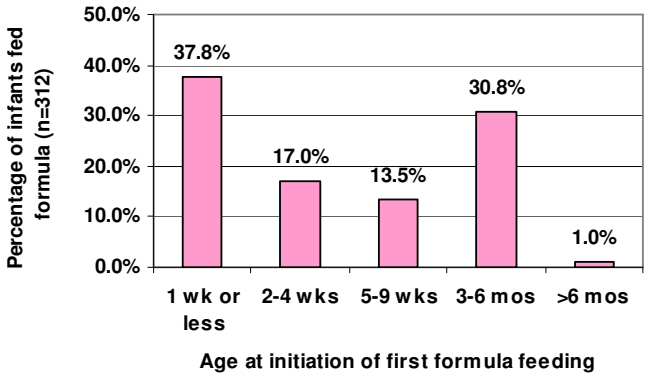

Figure III-26. Timing of formula feeding for 312 infants that had ever received formula.

The reasons for giving formula for the first time appear in Figure III-27.

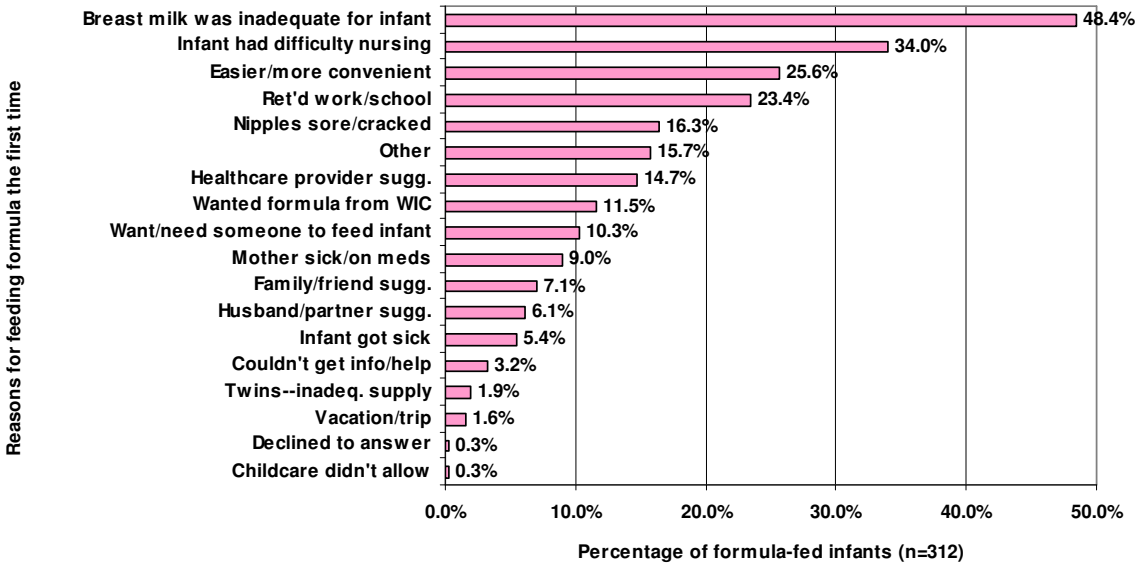

Figure III-27. Reasons 312 infants were fed formula for the first time. Respondents could indicate more than one reason.

Almost half of mothers cited not having enough milk as the reason their infant received formula. Furthermore, 106 mothers of the 312 formula-fed infants (34%) indicated that

difficulties with nursing were the reason for introduction of formula. This suggests that many mothers needed more information about normal infant feeding and behavior cues and more help with learning how to breastfeed.

Reasons cited in the "other" category included: too little milk, infant losing weight, time demands, not liking pumping, infant crying or refusing breastfeeding, infant with latch problems, doctor's recommendation, mother taking contraindicated medications or sick, wanting to stop or start mixed feeding, nurses feeding formula at the hospital, delayed milk onset, premature infant, recommendation from a class, and caregiver running out of milk.

Other foods fed in the first three months of life

About half of the infants in the survey received only breast milk or formula in the first three months of life. For those infants that did receive something else, water, sugar water or glucose was given to 42% (Fig. III-28). Supplementation with fluids or foods other than breast milk or formula is not routinely recommended during the first three months of life (AAP, 2005). Specifically, AAP states that during the first six months of life, "even in hot climates, water and juice are unnecessary for breastfed infants and may introduce contaminants or allergens" (AAP, 2005).

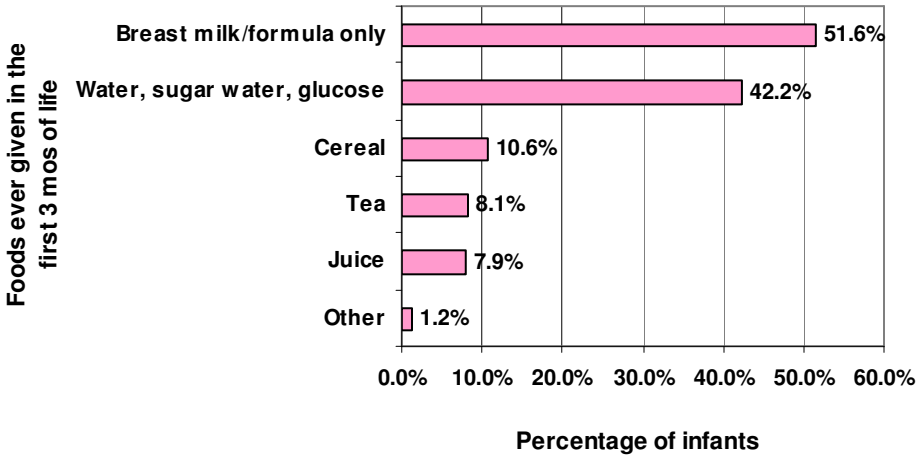

Figure III-28. Infant feeding practices during the first three months of life for infants in the MAMA survey. Respondents could indicate more than one category. "Other" foods included canned fruit or vegetable baby food.

Cessation of breastfeeding

Of the 382 breastfed infants, 179 (47%) had stopped breastfeeding at the time of the survey and 203 (53%) were still breastfeeding. The timing of breastfeeding cessation appears in Figure III-29. One in 10 infants stopped breastfeeding by four weeks of age, and 23% were no longer breastfeeding by nine weeks of age.

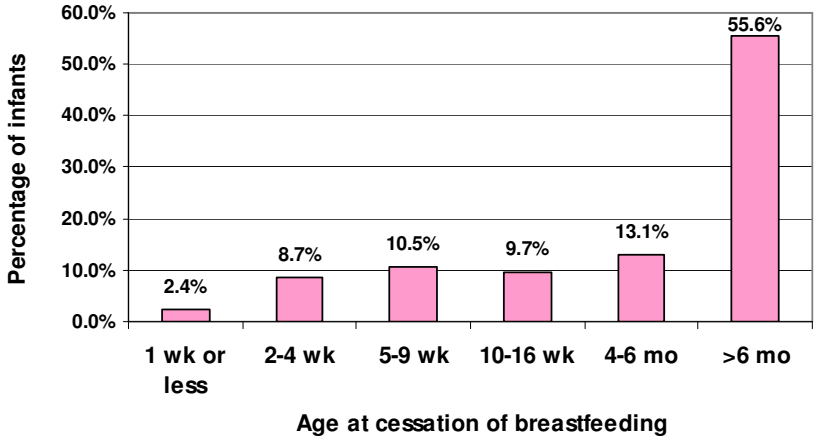

Figure III-29. Timing of breastfeeding cessation for 382 infants in the MAMA project; 203 infants were continuing to breastfeed on the date their mother was interviewed.

The top reason cited by mothers (49%) for stopping breastfeeding was not having enough breast milk for their infant (Fig. III-30). At two months old, 88 of 310 (28%) of infants still breastfeeding were fed a combination of breast milk and formula (Fig. III-31). By six

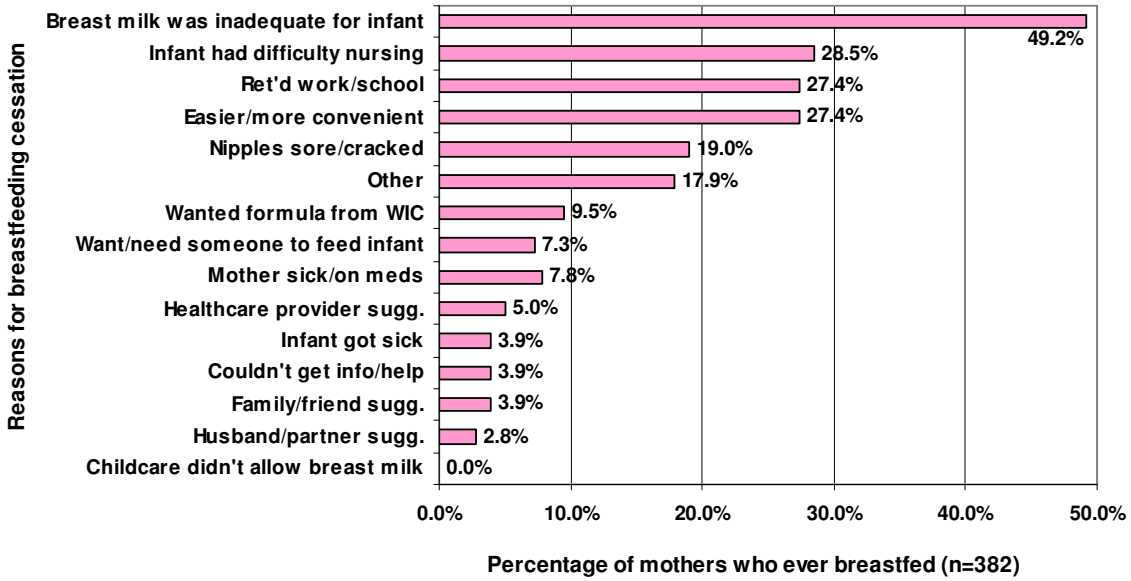

Figure III-30. Reasons for breastfeeding cessation cited by 179 mothers who stopped breastfeeding their infants. Respondents could indicate more than one reason.

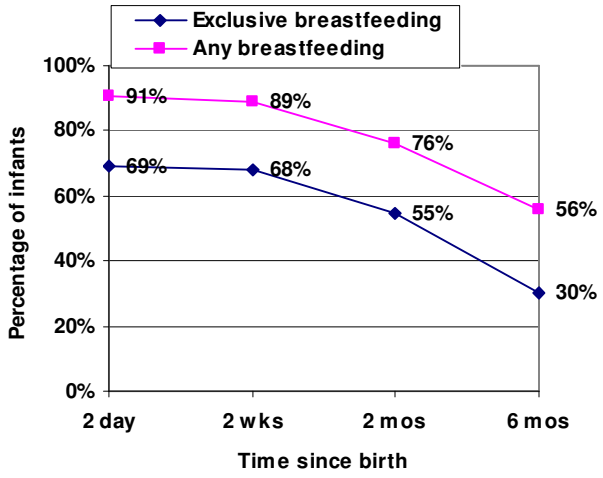

Figure III-31. Duration of exclusive and any breastfeeding for 405 infants in the MAMA project.

months of age, although 225 infants were still breastfeeding, the percentage receiving mixed feedings was close to half (46%). Mixed feeding will eventually cause a reduction in breast milk production, because the mother's body regulates breast milk output to the infant's level of consumption (ACOG, 2007).

The other top reasons for breastfeeding cessation included convenience (27%), problems nursing (29%) and sore or cracked nipples (19%). The latter two reasons suggest that issues related to poor latching or improper breastfeeding technique were not adequately addressed through healthcare provider education or peer support. Return to work or school also impacted the decision to stop breastfeeding. For the 100 mothers who had stopped breastfeeding and returned to work or school, 47% indicated that this was one of the reasons they stopped breastfeeding. For 216 mothers who had ever breastfed their infant and returned to work or school, 58 (27%) indicated that they did not attempt breast milk expression at the workplace or school.

Reasons for stopping breastfeeding cited in the "other" category included: time pressures, breast lump biopsy, milk drying up, infant weaning him/herself, infant refusing breast or preferring a bottle, breast pump not working, lactose-intolerant infant, preparing for return to work, infant sleeping through the night, mother taking contraindicated medications, pain, feeling ugly, stopping at six months as for a previously breastfed infant, not liking breastfeeding, the convenience of a bottle, and being told a few months of breastfeeding was adequate.

Women who returned to work or school

For women who had returned to work or school vs. stay-at-home mothers, a higher percentage of working or student mothers cited wanting/needing someone to feed their infant (10% vs. 3%, respectively) and having sore or cracked nipples (22% vs. 15%) as the reason for stopping breastfeeding. However, these proportions did not differ significantly at the 95% confidence level. A statistically significant lower percentage of working or student

mothers vs. stay-at-home mothers (10% vs. 28%, respectively) provided "other" answers as a reason for breastfeeding cessation.

Hispanic women

Although Hispanic women were more likely than all others to cite having too little breast milk (53% vs. 42%, respectively) and less likely than other mothers to cite wanting/needing someone to feed their infant (3% vs. 15%), formula being more convenient (23% vs. 37%), and having sore or cracked nipples (17% vs. 23%) as reasons for stopping breastfeeding, none of the differences were statistically significant at the 95% confidence level.

Work environment

Descriptive data on return to work or school and part- or full-time status

Fifty-four percent (n=214) of the 399 mothers had returned to work or school by the time they were interviewed (Fig. III-32). Fifty-one percent were full-time workers or students, 47% went back part-time, and 2% were seasonal employees or students. Their infants were on average 13.7 wk old +/- 0.9 wk, range 1-39 wk) when they returned to work or school. Two-thirds of mothers returning to work or school attempted to express breast milk after their return.

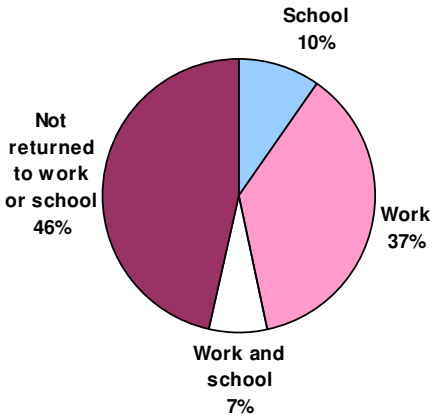

Figure III-32. Employment or student status of mothers at the time of interview in the MAMA project.

Rate charts

While breastfeeding rates did not differ at early time points for women who had returned to work, both work and school, or neither (Fig. III-33), mothers who had returned to school were about half as likely (18% vs. 32% for mothers in the other three groups) to exclusively breastfeed their infants at the six-month mark.

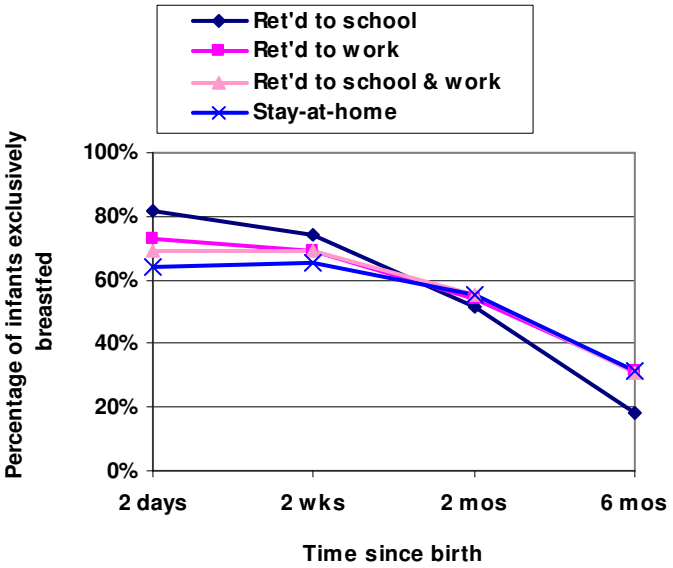

Figure III-33. Duration of exclusive breastfeeding by mother's by employment or student status.

Comparing women receiving WIC benefits to those who did not, with their working or student status, shows that fewer women on WIC were breastfeeding their infants at the two- and six-month time points (Fig. III-34). Mothers with the lowest breastfeeding prevalence (16%) were those receiving WIC benefits who had returned to work or school. For women with higher incomes (women not receiving WIC benefits), duration of exclusive breastfeeding was similar, regardless of whether they were still at home or had returned to work or school (53% and 56%, respectively).

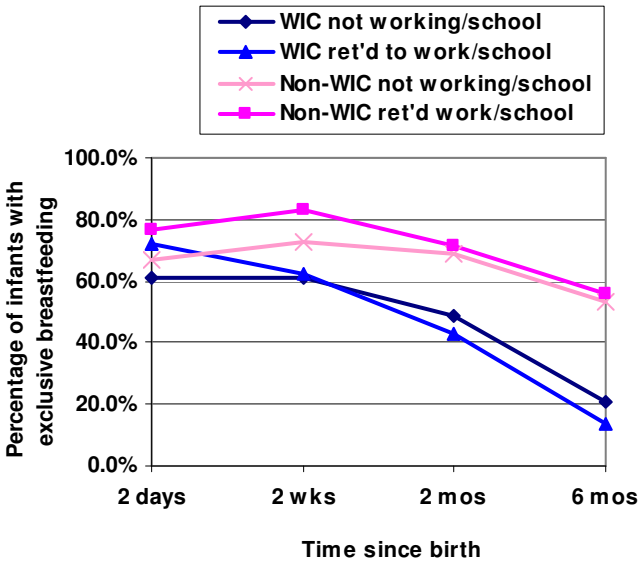

Figure III-34. Duration of exclusive breastfeeding for WIC recipients vs. other mothers, with working or school status.

Women who stayed home or worked part-time or seasonally were more likely to breastfeed for longer (31% and 37%, respectively) than full-time working or student mothers (22%), but this difference was not statistically significant (Fig. III-35).

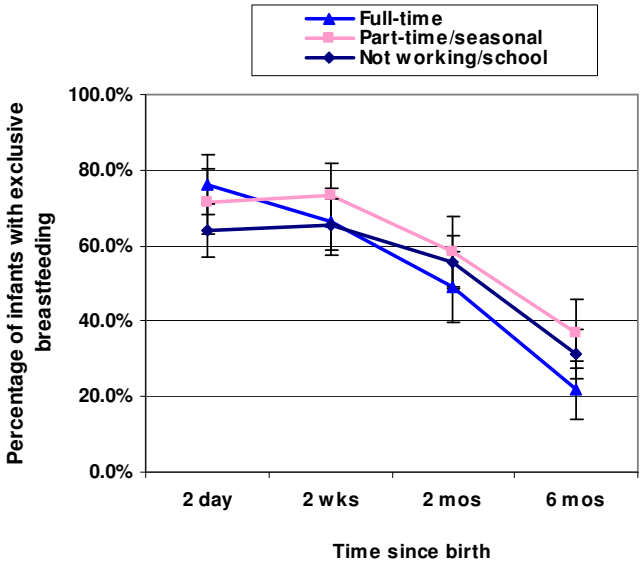

Figure III-35. Duration of exclusive breastfeeding for mothers returning to work or school full-time, part-time or seasonally, and staying home.

Knowledge of workplace law/rules

MAMA project participants who returned to work or school were asked to tell us how they found out the "rules" for breastfeeding or pumping breast milk at their work or school. California is one of a handful of states that has passed legislation regarding workplace accommodation for milk expression (WIC, 2007). Appendix D contains the text of the law. Although 29% of the 214 women spoke with their supervisors or Human Resources staff about their need for lactation accommodation, many women did not (Fig. III-36). Almost one-third of the women (29%) did not ask about the rules, did not know what they were, or expressed breast milk without any knowledge of the rules ("did without asking").

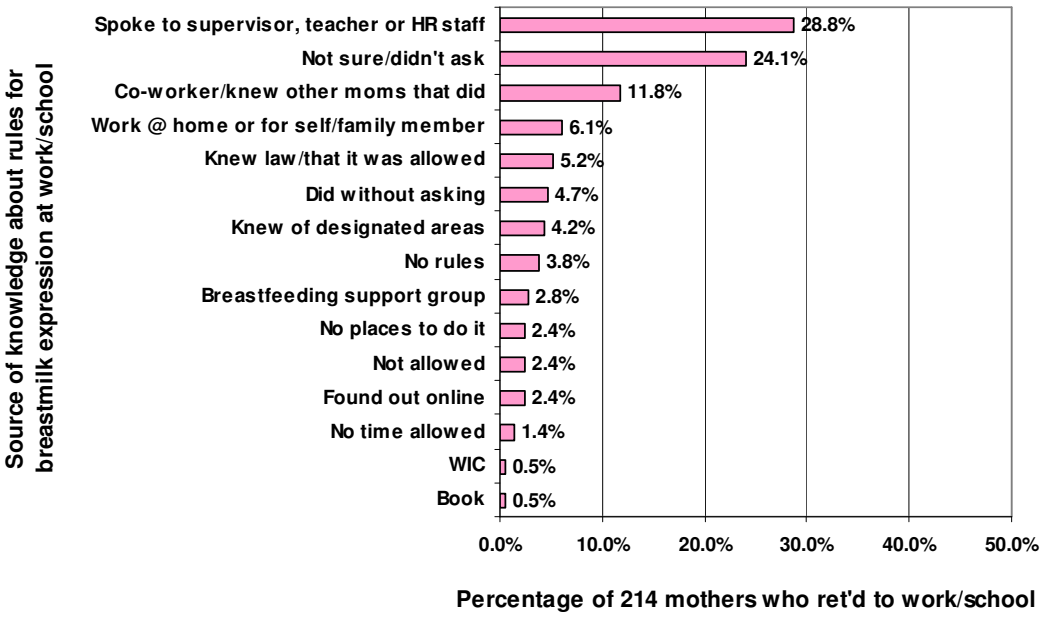

Figure III-36. Source of knowledge about breastfeeding rules in the work or school environment for 214 mothers who had returned to work or school at the time of interview.

Availability of space/time

Almost half of working mothers and about one-fourth of mothers returning to school had designated areas for breast milk expression (Fig. III-37). However, about one in four mothers (22%) did not have a designated area at either their workplace or school.

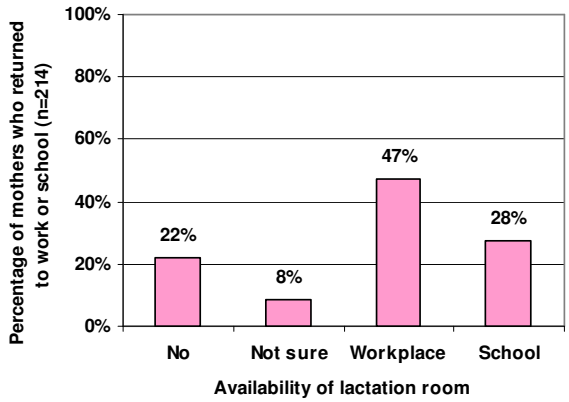

Figure III-37. Availability of designated areas for breast milk expression in the workplace or at school by mother's work or school status. Total does not add up to 100% because some women had places at both work and school.

While a space to accommodate breastfeeding mothers was not always available, more than half of employers (57%) did provide time for breast milk expression, compared to only one-third of schools (Fig. III-38). It may be more difficult to accommodate breastfeeding

students, because breaks between classes are often 10 minutes or less, and do not provide a mother with adequate time for breast milk expression (Slusser et al., 2004). Figure III-32 showed that student mothers appeared to have a difficult time combining breastfeeding and school, since only 16% of their infants were breastfeeding at six months of age. However, this estimate is not adjusted for other demographic factors that affect breastfeeding duration, such as age, ethnicity and family make-up. Student mothers tend to be younger in age and are less likely to be living with a spouse or partner, and these characteristics impact breastfeeding outcomes.

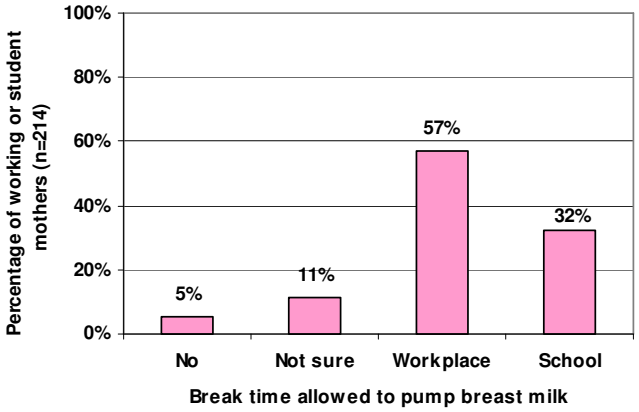

Figure III-38. Availability of break time for breast milk expression in the workplace or at educational institutions. Total does not add up to 100% because some women were allowed time at both work and school.

Racial and income disparities

Breastfeeding rates by geography

Yolo County has three cities that account for about 80% of the population: Davis, West Sacramento and Woodland (US Census Bureau, 2000). Our data indicate that breastfeeding rates differ by geographic location. Mothers living in the city of Davis were significantly more likely to breastfeed their infants at six months of age than mothers in Yolo County's two other largest cities, as well as outlying areas of the county (Fig. III-39). Sixty-five percent of infants born to Davis mothers were exclusively breastfeeding at the six-month time point compared to 19% and 17% for West Sacramento and Woodland, respectively. The only breastfeeding support groups that met regularly at the time of the survey were located in Davis. This community is also home to the University of California, Yolo County's largest employer. The university has a Breastfeeding Support Program on campus to support employees and students, as well as 19 lactation sites equipped with hospital-grade breast pumps. The US 2000 Census reported higher median annual household incomes for residents in Davis and Woodland than residents of West Sacramento ($42,454 and $44,449 vs. $31,718, respectively). While the three cities have similar proportions of white residents (65% to 70%), there were fewer Hispanic residents in Davis (10%) than Woodland (39%) or West Sacramento (30%) in the 2000 Census.

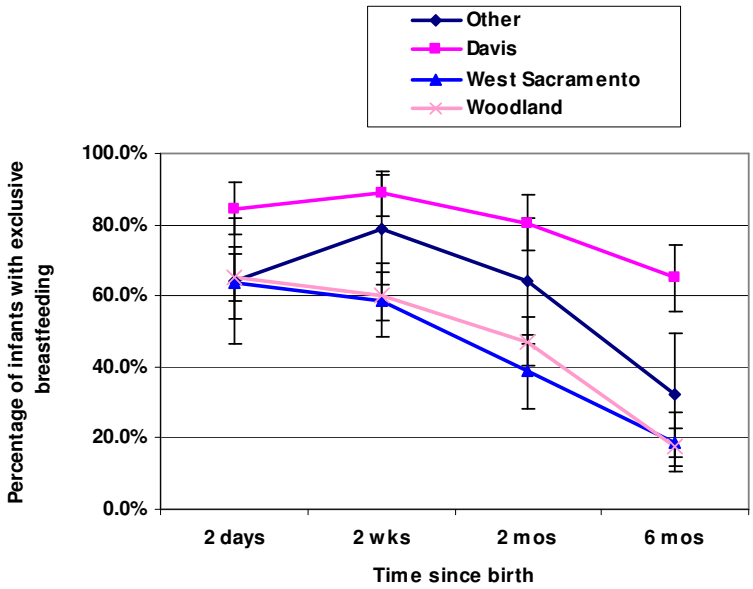

Figure III-39. Duration of exclusive breastfeeding by city of residence.

Breastfeeding rates by ethnicity

While 50% of infants born to white mothers were exclusively breastfeeding at six months of age, only 15% to 18% of infants with Hispanic mothers were doing so (Fig. III-40). There was little difference in breastfeeding outcomes for Hispanic infants whose mothers were foreign-born compared to Hispanic infants whose mothers were born in the U.S.A. Despite

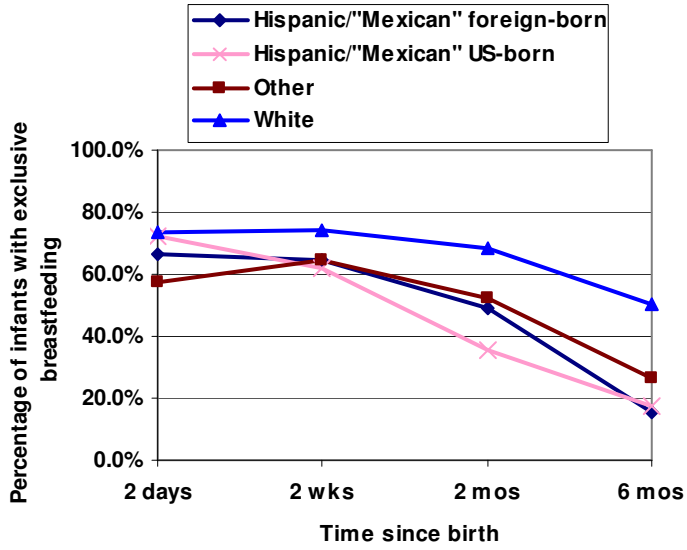

Figure III-40. Duration of exclusive breastfeeding by ethnicity (with mother's country of birth for infants born to Hispanic mothers).

the fact that initiation of exclusive breastfeeding was lowest for infants born to mothers of other racial backgrounds (57%), 26% were still exclusively breastfeeding at six months old.

Nonetheless, white infants were twice as likely as infants of other ethnicity to be breastfed at six months of age.

Breastfeeding rates by education

There was a marked contrast in breastfeeding outcomes at the two- and six-month time points for infants born to mothers who had graduated from college vs. mothers without college degrees (Fig. III-41). Eighty-two percent and 68% of infants were exclusively breastfeeding at two and six months old, respectively, if their mothers had attained a college degree or higher. In contrast, only 13% of infants born to mothers who had not graduated high school and 14% of infants born to high school graduates were exclusively breastfeeding at six months of age.

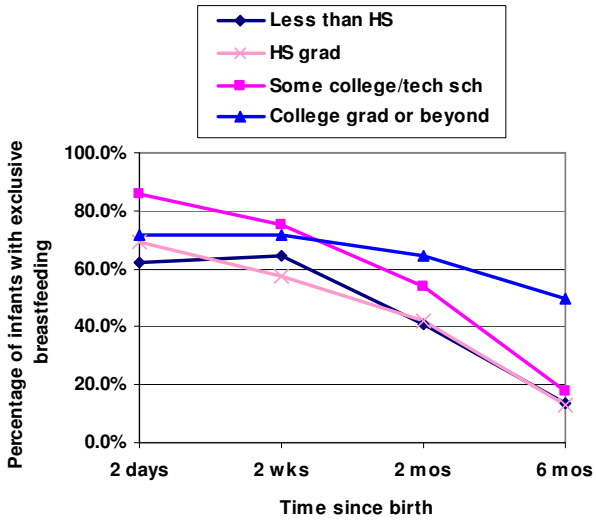

Figure III-41. Duration of exclusive breastfeeding by highest level of education.

When breastfeeding duration by level of education was further stratified by Hispanic ethnicity compared to all others, it is noteworthy that more highly educated Hispanic women were less likely to exclusively breastfeed their infants at several time points than women with similar education (Fig III-42). For example, 50% of infants born to Hispanic college graduates were exclusively breastfed at six months compared to 70% for infants born to all other mothers. When Hispanic mothers without college degrees were compared to mothers of all other ethnicities, their breastfeeding rate at six months was almost the same (14% and 19%, respectively).

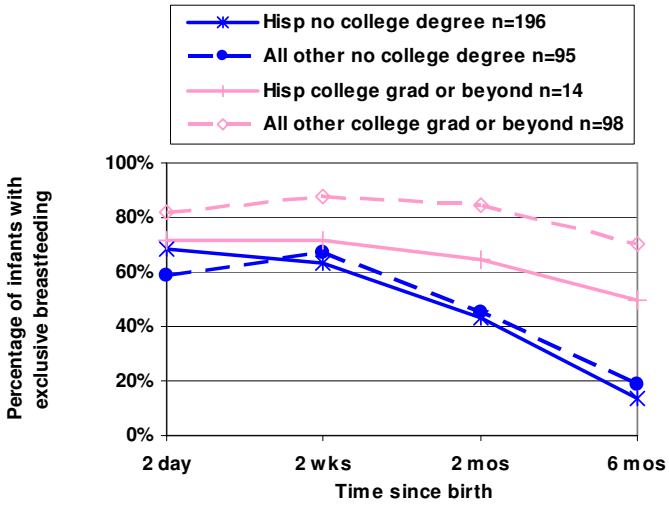

Figure III-42. Duration of exclusive breastfeeding by highest level of education for Hispanic mothers compared to all others. Solid lines represent Hispanic ethnicity and dashed lines all other ethnicities.

Breastfeeding rates by age

It is well-recognized that younger women are less likely to breastfeed (Beck et al., 2002; Dubois and Girard, 2003; Los Angeles County Department of Health Services, 2004; Merten et al., 2005; Grummer-Strawn et al., 2006), and this trend was evident in Yolo County when breastfeeding rates were stratified by age (Fig. III-43). Infants born to mothers aged 35 yr and up were more than seven times as likely to be exclusively breastfed at six months old as infants born to teenage mothers (58% vs. 8%, respectively).

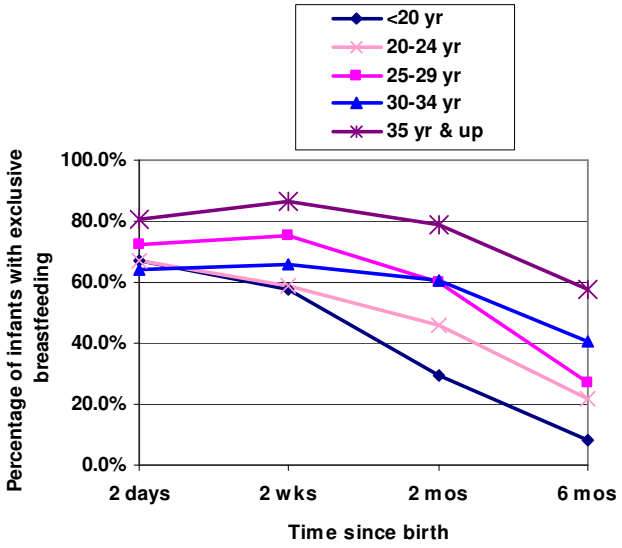

Figure III-43. Duration of exclusive breastfeeding by age grouping.

Breastfeeding rates by income

Exclusive breastfeeding was higher at the two-week, two-month and six-month time points for women with annual household incomes of $40K and above (Fig III-44). For income. strata below $40K, breastfeeding outcomes tended to be similar. The rates appeared to diverge at the $40K income level. When Hispanic mothers were compared to all others at the $40K household income cut point, exclusive breastfeeding rates were lower for Hispanic infants, regardless of income level (Fig. III-45). While 80% of infants born to non-Hispanic mothers with annual household incomes above $40K were exclusively breastfeeding at six months of age, only 11% of infants in Hispanic households with comparable incomes were exclusively breastfeeding at the same time point. In low-income households (<$40K/yr), Hispanic infants were almost half as likely to be exclusively breastfed at six months of age as infants in non-Hispanic households (16% vs. 30%, respectively). These data show that cultural influences play an important role in breastfeeding outcomes.

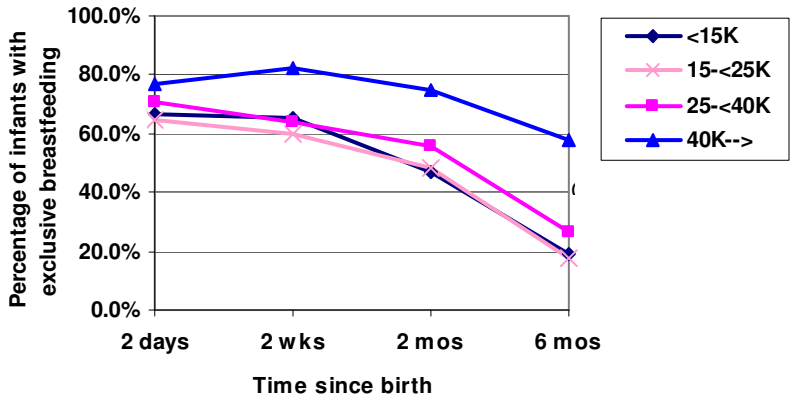

Figure III-44. Duration of exclusive breastfeeding by annual household income.

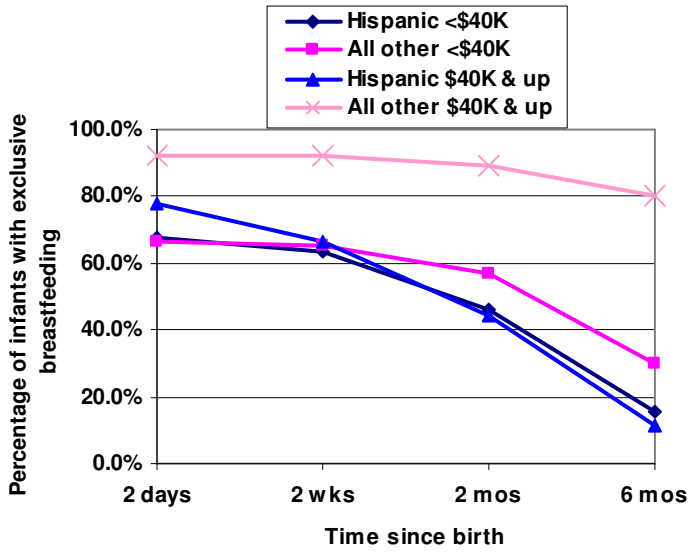

Figure III-45. Duration of exclusive breastfeeding by income for Hispanic mothers compared to all others.

Childcare environment

The majority of childcare providers allowed mothers to bring breast milk for their infants (Fig. III-46), allowed breastfeeding on-site (Fig. III-47), and 87% encouraged breastfeeding (Fig. III-48). This suggests that the childcare environment is not a barrier to breastfeeding continuation after return to work or school.

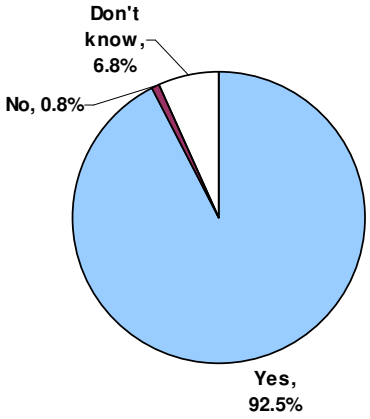

Figure III-46. The percentage of childcare providers allowing breast milk to be fed to infants under their care.

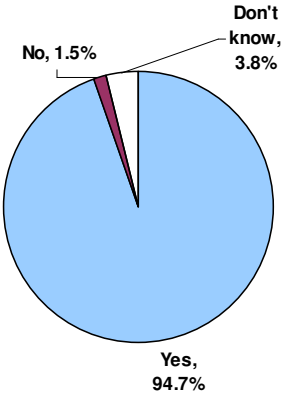

Figure III-47. The percentage of childcare providers allowing breastfeeding on their premises.

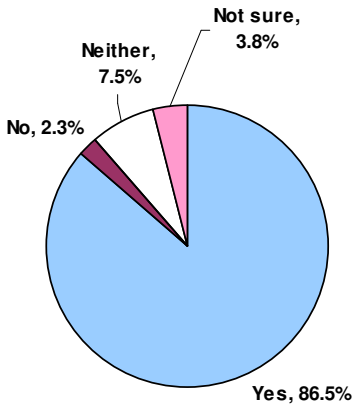

Figure III-48. The percentage of childcare providers who support/encourage breastfeeding.

Summary of open-ended comments regarding barriers to breastfeeding in the first six months after hospital discharge

Almost half the women who tried breastfeeding (45%, 175 of 382) experienced difficulties with breastfeeding in the first six months. Difficulties with their infant latching (31% of 175) and sore or cracked nipples (27% of 175) were cited as the most common barriers to breastfeeding. A small number did not specify what their difficulties were. A summary of the problems they experienced appears in Figure III-49, and a complete listing of the comments may be found in Appendix F.

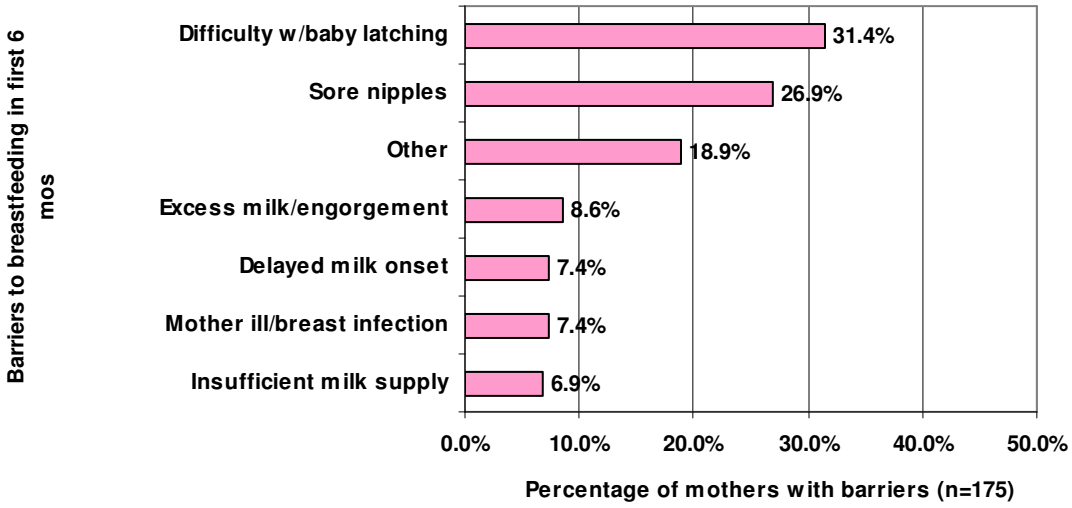

Figure III-49. Summary of barriers to breastfeeding experienced by 175 mothers who experienced difficulties with breastfeeding in the first six months after hospital discharge.

Women who never breastfed

Medical contraindications to breastfeed are few and include use of street drugs and uncontrolled alcohol use as well as use of certain prescription medications. Infectious

diseases such as HIV, tuberculosis (untreated), varicella and herpes can also be contraindications to breastfeeding (ACOG 2007).

Only 23 infants (6%) in the survey did not breastfeed, even once. Figure III-50 depicts the reasons mothers chose not to initiate breastfeeding. The most common reason cited was the convenience of bottle feeding (68%), followed by plans to return to work or school (45%), being sick or on contraindicated medication (41%) and having previously experienced problems with breastfeeding (36%). About one-fourth (27%) of mothers who never tried breastfeeding were concerned that they would not have enough milk. There were no mothers indicating they chose not to breastfeed because it was against their spouse or partner's wishes. In the "other" category, explanations included not eating a healthy diet, having to leave the infant during its first month of life, not having enough milk, an infant that refused breast milk, and the difficulty of breastfeeding twins.

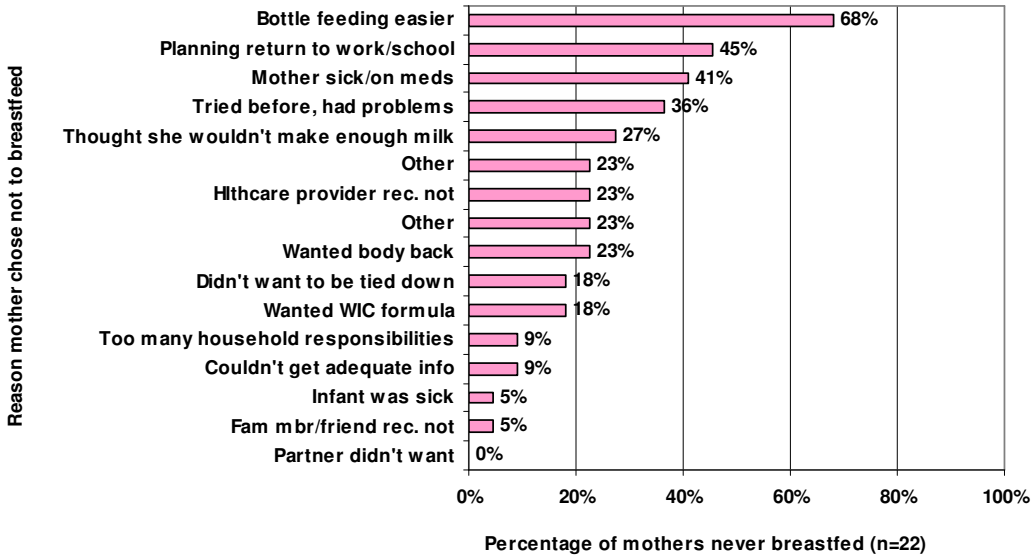

Figure III-50. Reasons 22 mothers chose not to initiate breastfeeding. Total may not equal 100% because mothers could cite reasons in more than one category.

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IV. Analytical Data

Logistic regression

Logistic regression was used to determine what factors influenced breastfeeding at the six-month time point. The analysis was conducted for both any breastfeeding and exclusive breastfeeding. Potential factors were first evaluated univariately (singly). Those with p-values of <0.20 were selected for inclusion into a multiple logistic regression model. This multivariable model evaluates the effect of a specific factor while controlling for covariates (other factors that exercise an effect simultaneously). In the multivariable model, only variables with p-values <0.05 were considered statistically significant. Categorical variables classified into three or more groupings were considered statistically significant if at least one category had a p-value of <0.05 compared to the referent level.

Variables were selected for the model in a manual forward stepwise selection process using Minitab™ Release 14.2 statistical software. Those variables with the smallest p-value in the univariate analysis were entered into the model first. Since several variables had highly significant and equally small p-values (<0.0001), demographic variables (such as ethnicity and presence of other household members) were included in the model before adding other explanatory variables. Where more than one subset of variables existed as candidates for the multivariable model, the models were compared using Aikaike's Information Criterion (AIC). The model with the smallest AIC was then selected as the most appropriate model.

Any breastfeeding at six months old

The outcome of any breastfeeding was defined as the infant receiving exclusive or mixed breastfeeding at six months of age. Six factors were found to be significant in the multivariable model to predict any breastfeeding at six months of age. Infants born to mothers who had graduated high school or completed any level of higher education were significantly more likely to be breastfeeding at six months of age than infants born to mothers who did not graduate high school. There was an increasing trend towards higher odds of any breastfeeding with increasing level of education (Table IV-1). For example, infants of college/tech school graduates were 12 times as likely to be breastfed at six months old as infants of non-high school graduates. For infants of mothers with postgraduate degrees, the odds ratio was 57. Women who were Mexican-born had a 3-fold greater likelihood of any breastfeeding at six months compared to U.S.-born mothers.

Maternal age was also an important predictor of any breastfeeding at six months old. The log of the odds ratios were plotted against five age groupings to confirm the linearity of the relationship (Fig. IV-1). An infant born to a mother who was 30 years old compared to a mother of 20 years old would be 2.3 times as likely to be breastfeeding at six months of age.

Regarding the delivery hospital experience, the two factors with negative effects on the duration of breastfeeding in the multivariable model were feeding the infant formula and use of a pacifier. Similar results have been reported in other studies (Blomquist et al., 1994; Howard et al., 1999; Whaley et al., 2002; Merten et al., 2005; Pincombe et al., 2006).

Table IV-1. Significant multivariable associations from stepwise logistic regression for any breastfeeding of infants at six months of age.

Risk factor	Coefficient	S.E. Coefficient	Adjusted Odds Ratio	p-value
Education (vs. less than high school)				
High school grad	0.8863	0.3742	2.43	0.018*
Some college/tech school	1.1601	0.4930	2.35	0.019*
College/tech school graduate	2.4960	0.5709	12.1	<0.001*
Postgraduate	4.0372	0.8588	56.7	<0.001*
Mother's birth country (vs. U.S.A.)				
Mexico	1.2049	0.3992	3.34	<0.001*
Other foreign country	0.5304	0.5288	1.70	0.32
Mother's age (for 1-year difference)	0.0833	0.0244	1.09	0.001*
Infant fed formula at the hospital (vs. not)	-0.9171	0.2688	0.40	0.001*
Infant used pacifier at hospital (vs. not)	-0.7159	0.2713	0.49	0.008*
Return to work/school (vs. not)				
Returned to school	-0.5055	0.4596	0.60	0.27
Returned to work	-0.7545	0.2897	0.47	0.009*
Returned work and school	0.0753	0.6049	1.08	0.90
Intercept	-2.6424	0.7515		<0.001

*Risk factors with statistically significant p-values (<0.05).

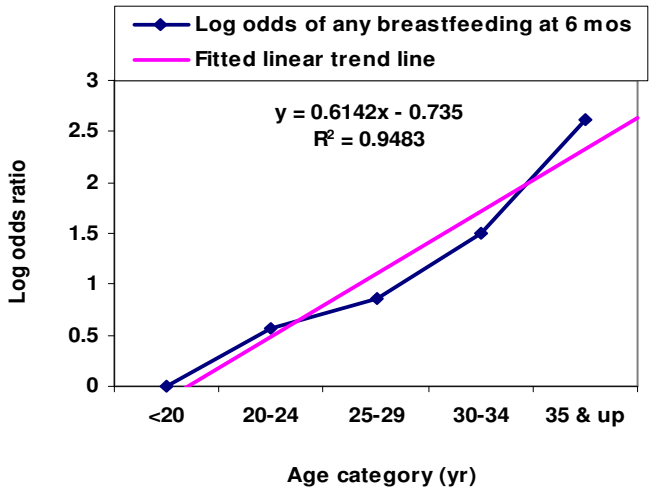

Figure IV-1. Log odds ratio vs. maternal age groupings demonstrates the linear relationship of age with breastfeeding outcome.

Finally, return to work was associated with shorter breastfeeding, as reported elsewhere (Ong et al., 2005; Kimbro, 2006; Ryan et al., 2006). Infants whose mothers returned to work were half as likely to breastfeed at six months old as infants of stay-at-home mothers. Surprisingly, infants whose mothers returned to school, or a combination of work and school, did not differ significantly from infants with stay-at-home mothers.

This finding suggests that after adjustment for other factors that influence any breastfeeding duration, the school environment provides better breastfeeding support for combination feeding than the workplace. Possible explanations are that schools offer more flexible schedules and provide places to express breast milk. However, mothers who return to work, school or both are significantly less likely to breastfeed exclusively at the six-month time point (see below).

Exclusive breastfeeding at six months old

The outcome of exclusive breastfeeding was defined as the infant receiving only breast milk up to six months of age, and included infants who received water or other (non-milk) liquids in a bottle, or were fed spoon feedings at this time point. The risk factors that were significant in the multivariable analysis are shown in Table IV-2. Similar to the results for any breastfeeding, mother's educational attainment and return to work or school were significantly associated with exclusive breastfeeding of the infant at six months old. However, only the two categories representing attainment of a college degree or beyond (vs. not graduating high school) were significant in this analysis. All categories of return to work or school had negative associations with exclusive breastfeeding at six months, whereas return to work was the only significant category associated with any breastfeeding at six months.

The remaining four covariates differed from those selected in the multivariable model predicting any breastfeeding at six months. Infants born to Hispanic mothers were half as likely to be exclusively breastfed at six months of age as infants born to white mothers. Being of "Other" ethnicity was also negatively associated with exclusive breastfeeding at the six-month time point. Infants born to White mothers were four times as likely to exclusively breastfeed at six months as infants born to mothers of "Other" ethnic descent.

Two factors in the multivariable model for exclusive breastfeeding at six months were related to the hospital delivery experience: feeding the infant by bottle (negative effect, adjusted OR=0.37), and the mother receiving a number to obtain breastfeeding help (positive effect, adjusted OR=4.91). Receiving a telephone number for breastfeeding help represents a group of mothers who know where and how to obtain breastfeeding support in the postpartum period.

Finally, mothers who had used a breast pump in the first six months after giving birth were more than two times as likely to exclusively breastfeed their babies at the six-month time point. In order to continue breastfeeding after return to work or school, it is absolutely necessary to have access to a breast pump and to know how to use it properly. Milk

Table IV-2. Significant multivariable associations from stepwise logistic regression for exclusive breastfeeding of infants at six months of age.

Risk factor	Coefficient	S.E. Coefficient	Adjusted Odds Ratio	p-value
Education (vs. less than HS)				
High school grad	0.0456	0.4962	1.05	0.93
Some college/tech school	0.1756	0.5823	1.19	0.76
College/tech school graduate	2.0551	0.6061	7.81	0.001*
Postgraduate	2.7492	0.6597	15.6	<0.001*
Ethnicity (vs. White)				
Hispanic	-0.6737	0.3591	0.51	0.061*
Other†	-1.4027	0.5431	0.25	0.01*
Infant fed by bottle at the hospital (vs. not)	-0.9905	0.3238	0.37	0.002*
Mother given phone number for breastfeeding help (vs. not)	1.5920	0.7102	4.91	0.025*
Mother used a breast pump in first 6 months (vs. not)	0.7859	0.3465	2.19	0.023*
Return to work/school (vs. not)				
Returned to school	-1.2448	0.5990	0.29	0.038*
Returned to work	-0.7900	0.3325	0.45	0.017*
Returned work and school	-1.3062	0.6149	0.27	0.034*
Intercept	-2.5042	0.8695		0.004

*Risk factors with statistically significant p-values (<0.05).
†Other ethnicities included Alaskan native, Asian, Black, native American, Pacific Islander, and women of mixed racial background.

expression at work or school can be a challenge because it takes a total of 45-60 minutes per day spread over 2 or 3 sessions to produce an adequate milk supply for the infant (Slusser et al., 2004). Even in a supportive work or school environment, mothers may find this commitment too demanding, or may have difficulty structuring their breaks around the schedule required for breast milk expression. It should also be noted that about one-third of mothers cited the reason they first used a breast pump was to begin breastfeeding (Section III, pg. 20). Early use of a breast pump may relieve problems of engorgement and help mothers to establish breastfeeding. Breast pumps can also be used in the hospital to express milk for infants who have to stay in the ICU, and their use enables mothers with preterm infants to breastfeed later, when the infant is capable of latching.

Impact of factors related to the workplace or school environment on any or exclusive breastfeeding at six months old

Because return to work or school was significantly associated with breastfeeding at six months, specific workplace- or school-related factors, for the subset of 201 infants who were ever breastfed and whose mothers were working or students, were evaluated for their effect on breastfeeding of infants at six months of age (Table IV-3). These factors were:

- Full- or part-time (and seasonal) return to work or school
- Having a designated area for breast milk expression
- Being allowed time for breast milk expression
- Knowledge of the rules about lactation accommodation at work or school
- Presence of supportive co-workers or colleagues at work or school

Table IV-3. Univariate analysis of work- or school-related factors associated with exclusive breastfeeding at six months old for infants born to mothers who had returned to work or school.

Risk factor	Description (categorical variables)	Odds Ratio	95% CI	p-value
Employment/student status	Full-time	Referent		
	Part-time/ seasonal	2.31	1.25-4.25	0.007*†
Availability of lactation room	No	Referent		
	Yes	2.49	1.08-5.77	0.033*†
Allowed break time to express milk	No	Referent		
	Yes	4.22	0.51-34.6	0.18†
Knowledge of workplace or school breastfeeding policy	Did not know	Referent		
	Knew rules	2.47	1.23-4.98	0.011*†
Co-workers supportive of breastfeeding	No	Referent		
	Yes	9.62	1.24-74.8	0.03*†

*Denotes statistical significance at $p<0.05$.
†Selected as a potential covariate in the multiple logistic regression model.

The results of the multivariable analysis (including the same other variables as previously assessed, with the exception of employment or student status) are shown in Table IV-4. Four variables were predictive of exclusive breastfeeding at the six-month time point for working or student mothers. None of them were specifically work- or school-related, although part- or full-time status, availability of a lactation room, knowledge of breastfeeding rules, and co-worker support for breastfeeding were all strongly associated with the outcome in the univariate analysis (Table IV-3). Hispanic working or student mothers were half as likely to exclusively breastfeed their infants at six months old as white mothers, but there was no such association for mothers of "other" ethnicity compared to white mothers. Older maternal age

was also associated with a higher likelihood of infants exclusively breastfeeding at six months old. Infants of working or student mothers were more than twice as likely to exclusively breastfeed at six months old if they were fed only breast milk at the hospital. Even when controlling for this factor, infants of working or student mothers who received gift packs with formula had a lower odds (0.36) for exclusive breastfeeding at the six-month time point.

Table IV-4. Significant multivariable associations from stepwise logistic regression for exclusive breastfeeding at six months of age for infants born to working or student mothers.

Risk factor	Coefficient	S.E. Coefficient	Adjusted Odds Ratio	p-value
Ethnicity (vs. white)				
Hispanic	-0.8504	0.3733	0.43	0.023*
Other	0.3639	0.6213	1.44	0.56
Mother's age (for one-year age difference)	0.1413	0.0317	1.15	<0.0001*
Infant fed only breast milk at the hospital (vs. not)	0.9347	0.3570	2.55	0.009*
Mother received a gift pack with formula from the hospital	-1.0097	0.3790	0.36	0.008*

* Denotes statistical significance at p<0.05.

Analysis of breastfeeding duration using survival analysis

Survival analysis consists of statistical methods used to analyze time-to-event data. It includes models fitted to known survival distributions (parametric models), Cox proportional hazards models, and Kaplan-Meier estimators. The advantages of using models based on parametric distributions for the MAMA project are that the median time to breastfeeding cessation can be computed for different categories of a variable, or for different combinations of predictor variables in a multivariable model. The effect of different predictor variables on breastfeeding duration can be compared via the "hazard ratio." This is similar to an odds ratio in logistic regression. For the exponential survival model, it should be interpreted as the odds of survival in one group compared to a referent group for categorical variables, and the odds of survival for a one-increment increase in a continuous variable (like age).

For purposes of this analysis, breastfeeding duration was converted into weeks. Infants who had ceased breastfeeding by the time their mother was interviewed were considered to have experienced the "event." Breastfeeding duration was fit to a survival model based on an exponential distribution for the 35 variables analyzed by logistic regression (excluding the variable of breastfeeding exclusively to three months of age, which is inappropriate for a time-to-event model). Variables with p-values <0.20 in the univariate analysis were potential candidates for the multivariable model, and were selected in a forward stepwise manner. Variables with p-values <0.05 were considered significant predictors of breastfeeding duration, and included categorical variables where at least one category had a p-value <0.05.

Kaplan-Meier estimates (unadjusted for covariates) were used to generate graphs of breastfeeding duration for the six variables selected in the multivariable analysis (Figs. IV-2 to IV-7). Restricted mean duration of breastfeeding and median was estimated for each level of the predictor variable (Tables IV-5 to IV-10). The restricted mean is the average duration of breastfeeding up to the time before the first censored observation. In this study, a censored observation was an infant who was still breastfeeding at the time the mother was interviewed, so the actual duration of breastfeeding was not known. The median duration of breastfeeding is not reported for some levels of predictor variables, because > 50% of infants were still breastfeeding at the time of interview. The median is the time point at which 50% of infants have stopped breastfeeding and 50% are continuing to breastfeed, so if the median has not been reached, statistical software outputs the value "infinity."

Table IV-5. Kaplan-Meier estimates of breastfeeding duration, stratified by maternal age.

Maternal age (year)	Restricted mean (wk)	95% CI	Median* (wk)
<20 yr	16.0	12.8-19.3	13
20-24	23.5	20.6-26.5	26
25-29	28.7	25.7-31.8	30
30-34	29.4	26.7-32.0	Infinity
> 34	33.9	31.0-36.8	Infinity

*If infinity, >50% of infants were breastfeeding at time of interview.

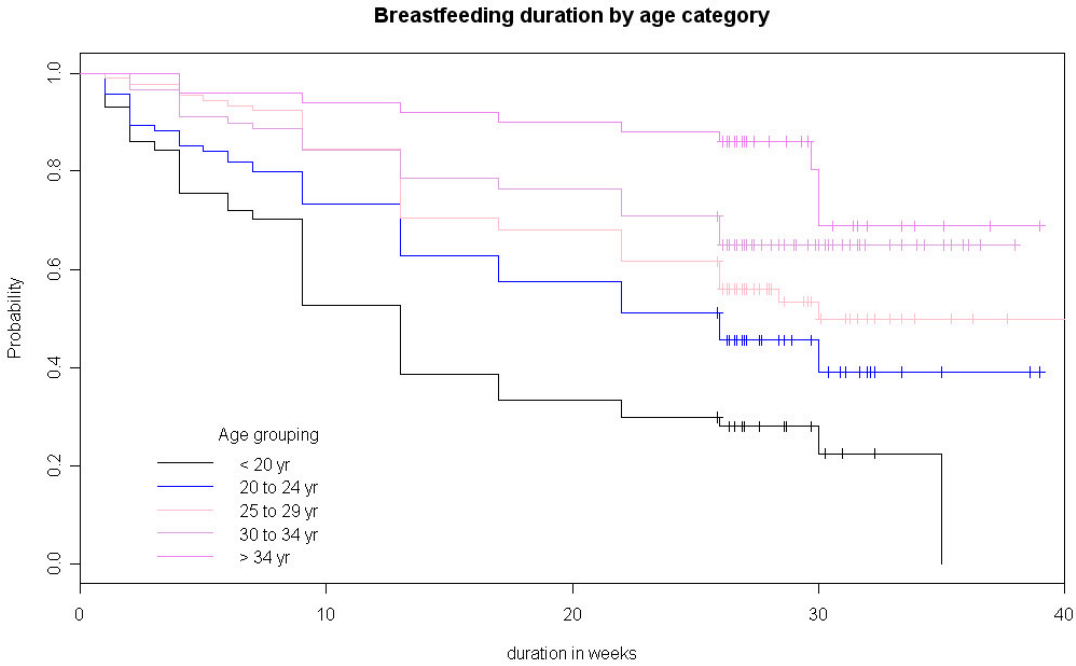

Figure IV-2. Duration of breastfeeding by age grouping, unadjusted for covariates. Hash marks indicate mothers who were still breastfeeding at the time of interview.

Table IV-6. Kaplan-Meier estimates of breastfeeding duration, stratified by formula feeding at the hospital.

Infant was fed formula at the hospital	Restricted mean (wk)	95% CI	Median* (wk)
Yes	21.6	19.2-24.0	22
No	30.8	28.4-33.2	Infinity

*If infinity, >50% of infants were breastfeeding at time of interview.

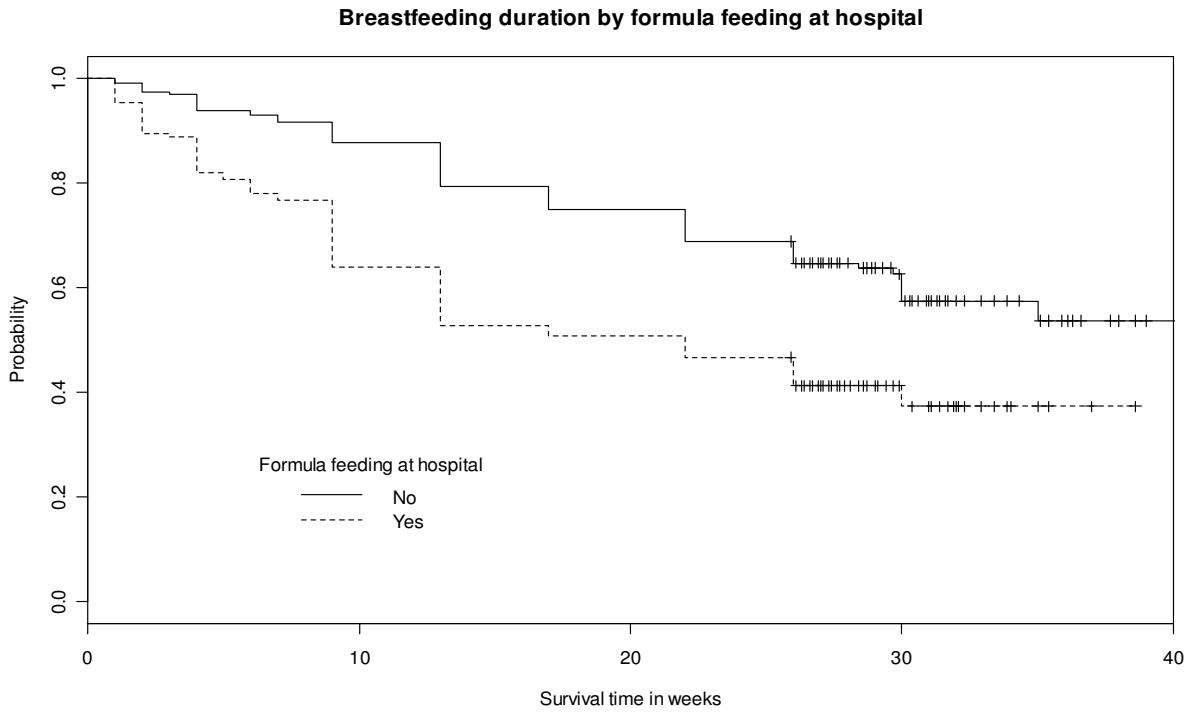

Figure IV-3. Duration of breastfeeding by formula feeding at the hospital, unadjusted for covariates. Hash marks indicate mothers who were still breastfeeding at the time of interview.

Table IV-7. Kaplan-Meier estimates of breastfeeding duration, stratified by pacifier use at the hospital.

Pacifier use at hospital	Restricted mean (wk)	95% CI	Median* (wk)
Yes	21.6	19.2-24.1	22
No	30.1	28.1-32.0	Infinity

*If infinity, >50% of infants were breastfeeding at time of interview.

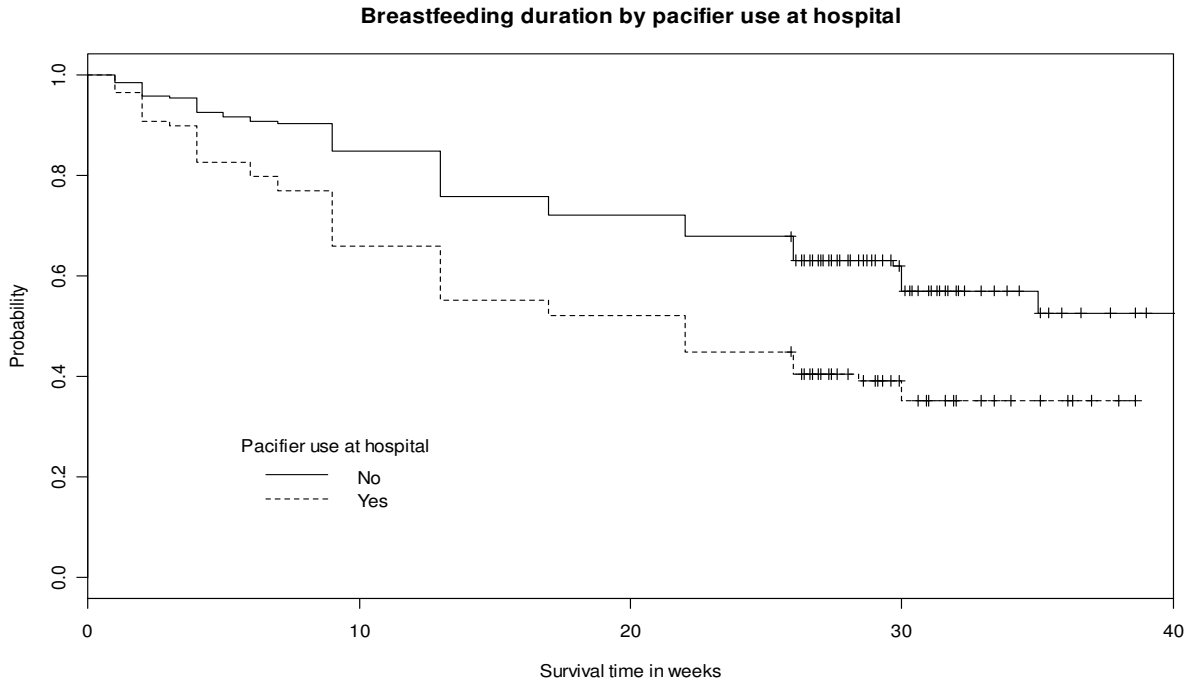

Figure IV-4. Duration of breastfeeding by pacifier use at the hospital, unadjusted for covariates. Hash marks indicate mothers who were still breastfeeding at the time of interview.

Table IV-8. Kaplan-Meier estimates of breastfeeding duration, stratified by mother's country of birth.

Mother's country of birth	Restricted mean (wk)	95% CI	Median* (wk)
Other foreign country	33.3	28.8-37.7	Infinity
Mexico	26.4	24.1-28.6	30
U.S.A.	25.2	23.1-27.3	30

*If infinity, >50% of infants were breastfeeding at time of interview.

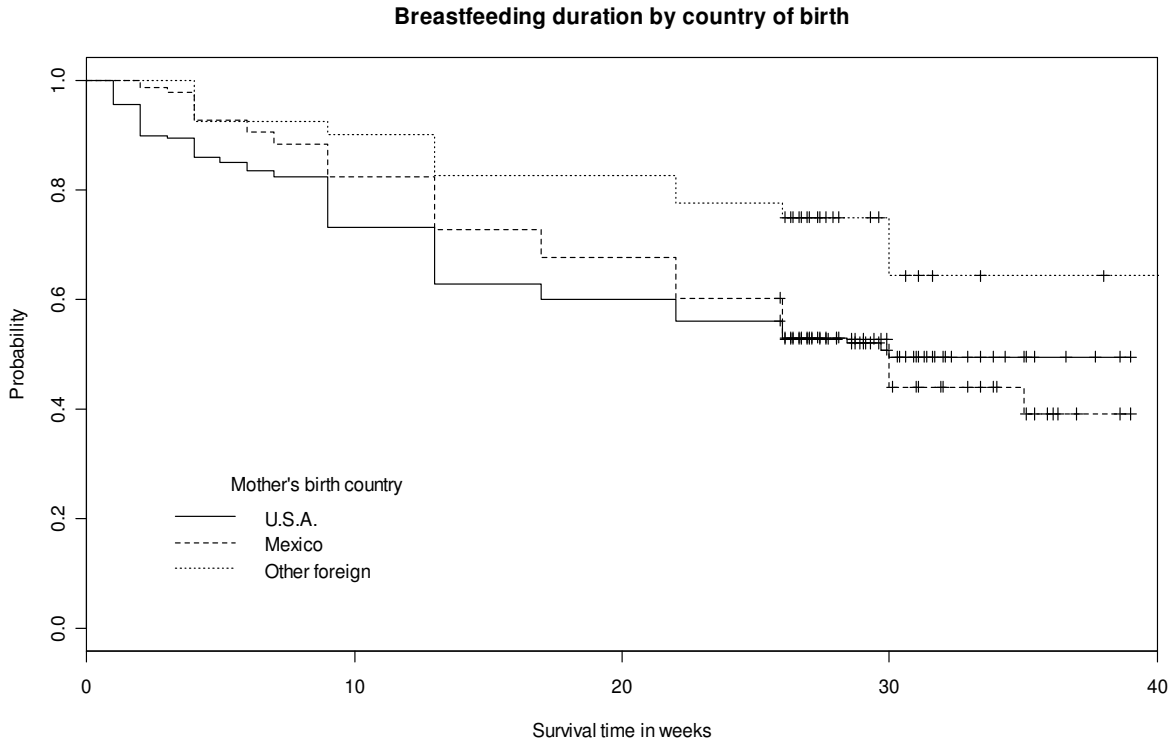

Figure IV-5. Duration of breastfeeding by mother's country of birth, unadjusted for covariates. Hash marks indicate mothers who were still breastfeeding at the time of interview.

Table IV-9. Kaplan-Meier estimates of breastfeeding duration, stratified by mother's highest level of education.

Highest level of education	Restricted mean (wk)	95% CI	Median* (wk)
No high school diploma	21.4	17.7-25.0	17
High school graduate	22.3	20.0-24.7	22
Some college/tech school	24.6	20.8-28.4	26
College/tech graduate	30.9	28.5-33.2	Infinity
Postgraduate training	35.5	34.0-37.0	Infinity

*If infinity, >50% of infants were breastfeeding at time of interview.

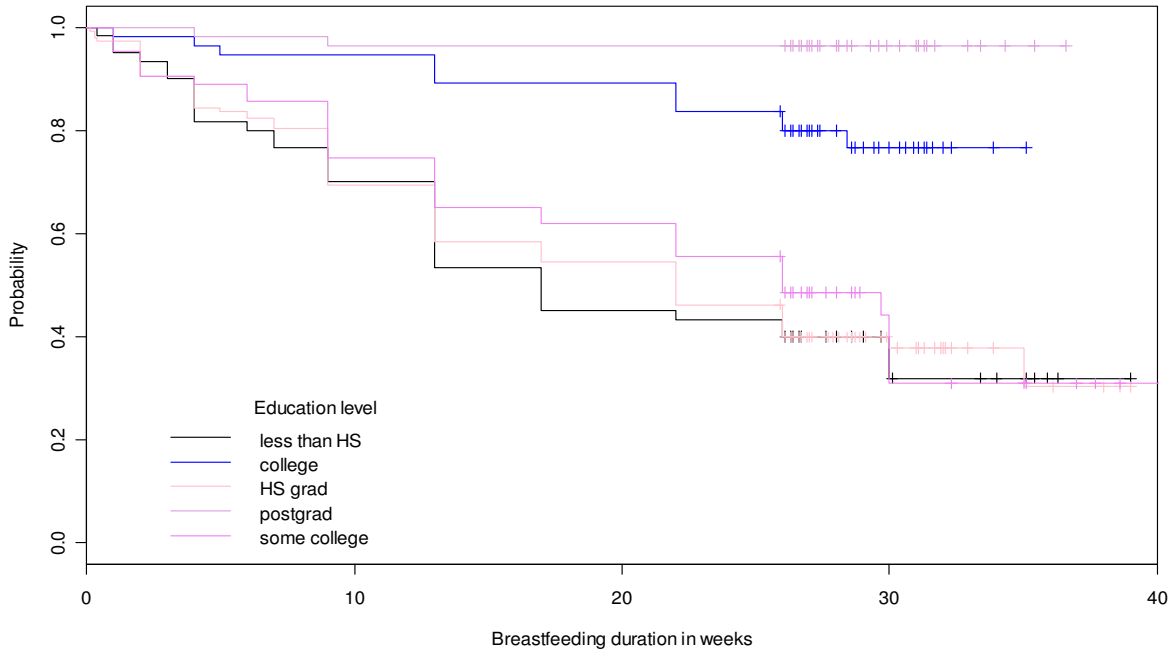

Figure IV-6. Duration of breastfeeding by highest level of education, unadjusted for covariates. Hash marks indicate mothers who were still breastfeeding at the time of interview.

Table IV-10. Kaplan-Meier estimates of breastfeeding duration, stratified by mother's return to work or school.

Mother's return to work or school	Restricted mean (wk)	95% CI	Median* (wk)
Did not return to work or school	28.6	26.3-30.8	Infinity
Returned to work	25.9	23.5-28.3	30
Returned to school	20.5	16.9-24.0	22
Returned to work and school	27.2	21.3-33.2	Infinity

*If infinity, >50% of infants were breastfeeding at time of interview.

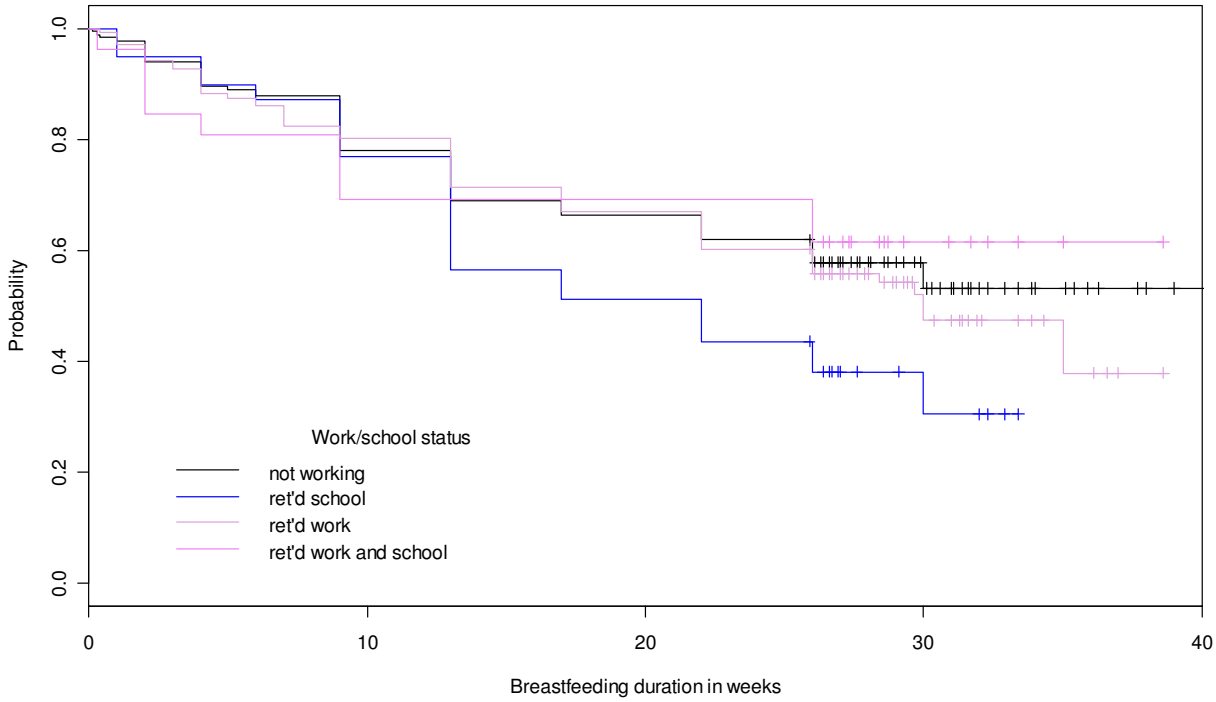

Figure IV-7. Duration of breastfeeding by work or school status, unadjusted for covariates. Hash marks indicate mothers who were still breastfeeding at the time of interview.

In the multivariable analysis, formula feeding and pacifier use at the hospital were significantly associated with shorter breastfeeding duration, as was return to work (Table IV-11). Other categories of this variable, return to school or return to work and school, were not significantly associated with breastfeeding duration. After adjusting for covariates, mothers born in Mexico were about twice as likely to breastfeed for longer than U.S.-born mothers. This association is only evident when controlling for age and education. Many Mexican-born mothers in the MAMA project were younger, less well-educated, and had annual household incomes < $25K. These factors are also associated with shorter breastfeeding duration, and two of them (age and education) were highly significant in the multivariable model. Both age and highest level of education were associated with breastfeeding duration in an upward linear fashion.

Table IV-11. Significant multivariable associations with breastfeeding duration using forward stepwise selection in an exponential survival model.

Risk factor	Adjusted Hazard Ratio	95% CI	p-value
Mother's age (for each additional year of age)	1.06	1.03-1.09	0.0014*
Infant fed formula at hospital (vs. not)	0.59	0.43-0.80	0.0009*
Infant used a pacifier at hospital (vs. not)	0.63	0.46-0.86	0.0039*
Education			
Did not graduate high school	Referent		
High school graduate	1.67	1.10-2.53	0.017*
Some college/tech school	2.21	1.25-3.91	0.0065*
College/tech school graduate	6.32	2.96-13.5	<0.0001*
Postgraduate	31.7	7.2-140	<0.0001*
Mother's country of birth			
U.S.A.	Referent		
Mexico	2.18	1.49-3.19	<0.0001*
Other foreign country	1.42	0.75-2.70	0.28
Return to work or school			
Not returned to work/school	Referent		
Returned to work	0.65	0.46-0.91	0.014*
Returned to school	0.92	0.56-1.50	0.74
Returned to work and school	1.34	0.62-2.91	0.43

*Denotes statistical significance at p<0.05.

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V. Summary and Recommendations

Summary

The rate of breastfeeding in Yolo County as measured by MAMA Project data is above the level set by the Healthy People 2010 objectives. Ninety-one percent of mothers in our study initiated breastfeeding and 55.5% continued to breastfeed for at least six months. Despite this benchmark, our data shows wide disparity in breastfeeding success amongst Yolo County women based on age, educational attainment, income level, race, and delivery hospital. In addition, only 30% of all infants received the health and developmental benefits of six months of exclusive breastfeeding. There is a very high rate of early supplementation with formula (1 out of 5 infants) and a clearly related high rate of weaning by six months (44%). Before delivery, MAMA Project participants overwhelmingly desired to breastfeed (88%). However, the majority of women reported concerns and/or difficulties related to breastfeeding that led to their decision to supplement and/or wean their infant. Additionally, fully half of all of women do not report receiving counseling and encouragement from their prenatal care providers regarding breastfeeding. Family support for breastfeeding is high. In the postpartum setting almost all women receive some support from their nurses, doctor or other health care staff. Unfortunately, most women are also discharged from the hospital with a formula gift pack in hand. Pacifier use is frequently initiated in the delivery hospital, which can interfere with the establishment of breastfeeding. Bottle-feeding and formula supplementation occur while at the delivery hospital for 4 of 10 infants. Finally, the work and school environment fail to provide accommodations for breast pump usage for many Yolo County women, especially for those with a lower income. Conversely, the childcare environment in Yolo County is very supportive of breastfeeding.

Recommendations

Recommendations have been developed in six areas: 1) maternal education and encouragement 2) peer support systems 3) hospital practices 4) workplace accommodation 5) community acceptance 6) future surveillance. In 2005 the Centers for Disease Control (CDC) published a summary of evidence-based interventions to support breastfeeding (Shealy, et. al 2005). In addition, the Breastfeeding Promotion Advisory Committee Report to the California Department of Health Services also provides a comprehensive report including recommendations (DHS/WIC 1996). Our recommendations are based on these evidence-based resources with consideration to the unique environment of our community.

Maternal education

It is recommended that mothers receive education on breastfeeding not only in order to increase their knowledge level and skill but also to influence their attitude towards breastfeeding. If a new mother has gained adequate understanding of infant sleep-wake cycles, feeding cues and elimination patterns, this may relieve much of the anxiety about adequate milk supply that appears to influence feeding decisions. This information is so important that it should be reinforced on multiple occasions.

Prenatal education should always include an opportunity to attend a breastfeeding class. Classes should be available regardless of a woman's ability to pay and should be culturally and linguistically appropriate. In addition, women and their partners should receive direct counseling from the medical provider regarding the benefits of breastfeeding. This should include a statement of advice and encouragement from the provider (ACOG, 2007). While the decision to breastfeed lies

solely with the mother, information must be available so that women can make an informed decision. The knowledge that breastfeeding is the best choice for the infant is a powerful consideration for most families. Our data show that family members and husbands can also support and encourage moms. When appropriate, information should be available to the family as well.

For low-income women, the WIC Program offers another opportunity to receive education and messages of encouragement. All pregnant women receiving WIC services should hear about the importance of breastfeeding at each contact with WIC staff. Curriculum and educational materials utilized by WIC should all consistently promote breastfeeding as the optimal nutrition for infants. Currently, there is a pending change to the WIC program that will enhance the quantity and quality of foods available to breastfeeding women via the WIC voucher. This is a positive step for breastfeeding support in this important nutrition program.

Other agencies that serve women of childbearing age have the opportunity to encourage breastfeeding as well and should incorporate breastfeeding information in their programs and educational materials where appropriate. Two programs: the Comprehensive Perinatal Services Program and the Yolo County Health Department MCAH PHN Home Visiting Program, specifically target low-income, under-served and high-risk women for expanded and more intensive perinatal services. These two programs, like WIC, should prioritize increasing breastfeeding rates in the families they serve by enhancing education and support services. Headstart and Early Headstart, migrant services, family resource centers, parenting education programs, childcare centers, school readiness programs, and social services programs are just some of the other programs in our community we encourage to provide breastfeeding information and encouragement as their program allows.

Peer support systems

Women's social support systems influence decisions made regarding breastfeeding. The MAMA Project data indicated that when women are discouraged from breastfeeding, they most frequently heard these negative messages about breastfeeding from their friends. New mothers turn to other mothers for information and support when access to an experienced peer is available. A formal peer support program provides mother-to-mother support by women who have had specific training to be a peer counselor. The peer counselor should have the same socio-cultural background as the new mother.

In Yolo County, La Leche League of Davis offers an all-volunteer group of trained local leaders who can provide one-to-one peer support when a new mother contacts them by phone. There is also a group meeting held once per month in Davis. We recommend that additional resources for peer support be developed in Yolo County so that access to peer support is available in all communities. Use of peer support programs within the Hispanic community might be one way to address the disparity between Hispanic and Caucasian breastfeeding rates. Peer support programs have been successfully based in WIC Programs throughout California, but funding is not always available. Yolo County WIC does not currently have a peer counselor program. Other examples of successful peer support programs have been collaborations between community clinics, public health departments and delivery hospitals. Curriculum such as the March of Dimes Comenzando Bien prenatal education curriculum could be used and taught by Community Health Assistants and/or Promotoras. Some models provide a visit by the peer counselor at the delivery hospital and home visitation postpartum. There are multiple possibilities for collaborative projects between the key agencies that serve women and children in Yolo County given our relatively small size. Critical factors for a successful peer support program include adequate formal training for the peer

counselors, financial reimbursement for the peer counselors, clinical supervision ideally from an International Board Certified Lactation Consultant (IBCLC), and a system for referral to medical and other services in the community.

Hospital Practices

Two resources for delivery hospitals regarding best practices to support breastfeeding are the Unicef Baby Friendly Hospital Initiative and the California Department of Health Services Model Hospital Policies. We recommend that all hospitals providing delivery services should incorporate these guidelines into their system. An important component of care that is recognized in these model policies is the need for staff to have an appropriate level of training in the support of breastfeeding. We recommend that all health care organizations that provide perinatal and/or pediatric services assure that their staff and providers receive breastfeeding support training. This is not an educational component typical of medical and nursing schools, so agencies would need to provide this for their staff (Freed et al., 1995).

Specific hospital practices that have a negative impact on breastfeeding were identified based on the MAMA Project data. These practices include: provision of bottle feedings, supplementation with formula, provision of pacifiers, and formula gifts supplied by hospital staff during the first few days of life. Feeding by bottle and early introduction of formula supplementation interferes with milk production and the infant's ability to latch. Pacifier use is also a practice that can interfere with breastfeeding and latch and should be delayed until breastfeeding has been firmly established (AAP 2005). Marketing of formula through the distribution of gift bags with formula company products and formula samples sends a mixed message about the importance of breastfeeding exclusively. Rather than seek help with breastfeeding, new mothers may offer the formula that the hospital supplied. These practices should be discontinued.

Hospital practices that are recommended and which MAMA Project data support include: breastfeeding within the first hour of life, 24 hour rooming-in, provision of breastfeeding support and education by delivery hospital nurses, and a phone number for breastfeeding support being given to the mother. In addition, as part of the delivery hospital experience, an assessment by an Internationally Board Certified Lactation Consultant (IBCLC) should be available to all breastfeeding mothers. Follow-up visits for breastfeeding support after discharge should be scheduled before the mother leaves the hospital. Hospital or clinic staff should follow-up with the family within 2 days of discharge. The AAP recommends that the infant have a breastfeeding check between 3-5 days of age so this pediatric appointment should also be given to mother prior to discharge.

Workplace Accommodation

The need to support breastfeeding in the work environment was formalized by California legislation passed in 2001, AB 1025 (Appendix D). This legislation requires employers to provide unpaid break time and private space (not a toilet stall) in order to express breast milk during the workday. In our study, over half of the mothers interviewed had returned to work or school by the time the infant was 6 months old. The average age of return was when the infant was just over 3 months old. The data summarized in preceding sections of this report demonstrate that the workplace accommodation law is not commonly known nor is it necessarily being implemented in our community. Only 29% of women had spoken with their employer or teacher about breastfeeding or pumping at work or school. A very minor percentage reported that they had learned about rules for breastfeeding or expressing milk from a source outside of their work/school setting such as their

healthcare provider, prenatal classes, or WIC. Additionally, women who enjoy a higher income may have a workplace environment that is more likely to contain a private space for breast milk expression (Kantor, 2006). These factors may all help explain the finding that women on WIC who return to work have the lowest prevalence of exclusive breastfeeding at six months compared to other groups.

In order to address the needs of breastfeeding women in the work and school environment, education about the law should be incorporated into prenatal education. Women should be encouraged to discuss workplace accommodation with their employer or school before going out on maternity leave. Resources for healthcare providers, including written Spanish and English materials are available for download on the WIC Works website, www.wicworks.ca.gov. This web site also includes materials to help employees understand their rights and information about how to file a complaint against an employer with the Division of Labor Standards enforcement.

Employers also need to be aware of the law and how support of breastfeeding employees can be beneficial to their business. When employers support breastfeeding women with workplace accommodations, they not only are in compliance with the law, but also reduce absentee-ism and healthcare costs. In addition, studies show that employees who participate in a breastfeeding support program at work are less stressed and more easily able to make the transition back to work (California Breastfeeding Coalition, 2006). We recommend that efforts be undertaken in Yolo County to increase employers' knowledge of the law. Development and distribution of a tool kit to help with implementation might increase compliance. Outreach should initially be targeted to businesses that employ a large number of women and lower wage earners. Public acknowledgement of businesses that are "baby friendly" through workplace awards has been successful in the past and should be continued. Governmental agencies as well as private businesses should be encouraged to have a lactation accommodation policy and a system in place to assure this policy is communicated to all new employees and all employees taking maternity leave.

Community Acceptance

At the state level, California has been actively working to improve public acceptance of breastfeeding. In order to protect the rights of breastfeeding families, civil law was enacted in 1997 to establish that mothers have the right to breastfeed in any location, public or private, except the private residence of another. Since then, additional legislative acts have addressed exemption from jury duty, the workplace environment and delivery hospital requirements for giving information to new mothers regarding breastfeeding resources. Complimentary to this legislative work, California has historically recognized Breastfeeding Awareness month in August with a Governor's proclamation. Within California DHS, the MCAH Branch has named increasing breastfeeding initiation and duration as a priority need on the Title V 2006-2010 Needs Assessment. MCAH Branch and the California WIC Program work collaboratively at the state level on breastfeeding promotion activities. In addition, in recent years the California Breastfeeding Coalition, which is comprised of representatives from local breastfeeding coalitions and other breastfeeding advocate organizations, has become active in our state as well.

On a local level, there is a continued need to use these statewide efforts as a means to stimulate change in our community. Our goal should be to create an environment throughout Yolo County that values, protects and encourages breastfeeding. We recommend continued efforts by our local government, business leaders, healthcare systems, community-based organizations, and individual advocates promoting breastfeeding support in all of our communities.

Our data indicate that one of our communities (Davis) has a phenomenally high prevalence of exclusive breastfeeding at six months. There is much work to be done to reduce the disparities seen between communities. Plans should include use of local media to publicize Breastfeeding Awareness month and baby friendly workplace awards. Local governing counsels could recognize via proclamation Breastfeeding Awareness month. Agencies providing services to pregnant and parenting families should actively participate in the Yolo Community Breastfeeding Coalition. This could also include involvement of local chamber of commerce representatives.

County and city public agencies should take steps to inform women that breastfeeding is welcome in their public spaces including buses, waiting areas and parks. This concept could also be promoted by private businesses with signage so that families understand that it's okay to breastfeed in restaurants and waiting areas. Finally, our schools should take note of what is depicted in books and materials used at all grade levels. Often, when a children's illustration shows a family taking care of an infant, it will typically include a bottle. When possible, positive images of breastfeeding families should be presented. All of these steps serve to communicate this simple message: that breastfeeding is valued. This message to our community can promote acceptance, and counteract years of bottle-feeding culture.

Future Surveillance

The 2007 MAMA Project data serves as a baseline by which we can measure future changes in breastfeeding rates in Yolo County. It also gives us an idea of possible gaps in our breastfeeding support systems. More in-depth data regarding the challenges faced by specific demographic groups could be gained through a focus group approach. This could be useful for instance with very young mothers. We recommend that all agencies working on breastfeeding promotion or planning new breastfeeding support programs put a system in place for measuring breastfeeding rates in their participants at the key time points described in our data. Large community-wide assessments should be conducted at regular intervals in order to continue to monitor breastfeeding rates and community needs. Especially important is to measure the changes that occur as both delivery hospitals in Yolo County move towards baby friendly status. A follow-up assessment of hospital experiences, breastfeeding initiation and duration in two to three years is essential. We would recommend that future surveys also measure breastfeeding rates for the entire first year of life.

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APPENDIX A

Yolo Community Breastfeeding Coalition Participants

Agency Name	Representative
Yolo County Health Department MCAH Program	Jan Babb
Yolo County Health Department WIC Program	Jennifer Sheldon Samantha Pfeifer
Sutter Davis Hospital Birthing Center	Ann Whelan
Woodland Clinic OB-GYN	Linda Johnson
Woodland Clinic Pediatrics	Julie Friesen
Woodland Memorial Hospital	Laura Ortiz
CommuniCare Health Centers	Barb Boehler Jean Mackin
Partnership Health Plan	Phyllis Pratt
Private Practice IBCLCs	Eve Dunaway
Family Resource Center	Sarah Rock
UC Davis Breastfeeding Support Program and La Leche League	Lonna Hampton

Individual Participants
Cristina Young
Bonnie Rose

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APPENDIX B

MAMA Project Expert Advisory Group

Djina Ariel, CNM
Woodland Clinic

Yali Bair, Ph.D.
Assistant Director for State Health Policy Research
University of California, Davis

Ani Cherry, MD
Esparto Family Practice

Eve Dunaway M.Ed., IBCLC
LLL Area Alumnae Representative

Julie Freisen, PNP
Woodland Clinic Pediatrics

Lonna Hampton- Lactation Specialist
UC Davis
Child Care & Family Services

Jane Heinig, Ph.D., IBCLC
Department of Nutrition, UC Davis
UC Davis Human Lactation Center

Linda Johnson, NP
Woodland Clinic OB-GYN

Laura Ortiz, IBCLC
Breastfeeding Coordinator
Woodland Memorial Hospital

Samrina Marshall, MD, MPH
Regional Medical Director
State Health Programs, Health Net

Ann Whelan, RN, IBCLC
Sutter Davis Hospital

Myrna Epstein, Ph.D., MPH, RN
Yolo County Health Department

Tim Wilson, DVM, MPH
Yolo County Health Department

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APPENDIX C

MAMA Project
Partner Agencies

CommuniCare Health Centers
- Davis Community Clinic
- Peterson Clinic
- Salud Clinic

Esparto Family Practice

Kaiser Davis Pediatrics

Madison Migrant Camp

Mother and Baby Source, Davis

Orchard Park UCD Student Housing

Sutter West Davis Pediatrics

UCD Childcare Services Breastfeeding Support Program

Woodland Clinic Pediatrics

Yolo County Public Health Nurses

Yolo County WIC
- WIC Woodland
- WIC West Sacramento
- WIC Davis

Other: Vital Records, personal contacts, County employees

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APPENDIX D

BILL NUMBER : AB 1025 CHAPTERED

BILL TEXT

CHAPTER 821
FILED WITH SECRETARY OF STATE OCTOBER 13, 2001
APPROVED BY GOVERNOR OCTOBER 12, 2001
PASSED THE ASSEMBLY SEPTEMBER 4, 2001
PASSED THE SENATE AUGUST 27, 2001
AMENDED IN SENATE AUGUST 22, 2001
AMENDED IN SENATE JULY 9, 2001
AMENDED IN ASSEMBLY APRIL 24, 2001

INTRODUCED BY Assembly Member Frommer

February 23, 2001

An act to add Chapter 3.8 (commencing with Section 1030) to Part 3 of Division 2 of the Labor Code, relating to employment.

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Chapter 3.8 (commencing with Section 1030) is added to Part 3 of Division 2 of the Labor Code, to read:

CHAPTER 3.8 LACTATION ACCOMMODATION

1030. Every employer, including the state and any political subdivision, shall provide a reasonable amount of break time to accommodate an employee desiring to express breast milk for the employees infant child. The break time shall, if possible, run concurrently with any break time already provided to the employee. Break time for an employee that does not run concurrently with the rest time authorized for the employee by the applicable wage order of the Industrial Welfare Commission shall be unpaid.

1031. The employer shall make reasonable efforts to provide the employee with the use of a room or other location, other than a toilet stall, in close proximity to the employees work area, for the employee to express milk in private. The room or location may include the place where the employee normally works if it otherwise meets the requirements of this section.

1032. An employer is not required to provide break time under this chapter if to do so would seriously disrupt the operations of the employer.

1033. (a) An employer who violates any provision of this chapter shall be subject to civil penalty in the amount of one hundred dollars ($100) for each violation.

(b) If, upon inspection or investigation, the Labor Commissioner determines that a violation of this chapter has occurred, the Labor Commissioner may issue a citation. The procedures for issuing, contesting, and enforcing judgments for citations or civil penalties issued by the Labor Commissioner for violations of this chapter shall be the same as those set forth in Section 1197.1.

(c) Notwithstanding any other provision of this code, violations of this chapter shall not be misdemeanors under this code.

SEC. 2. No reimbursement shall be made from the State Mandates Claims Fund pursuant to Part 7 (commending with Section 17500) of Division 4 of Title 2 of the Government Code for costs mandated by the state pursuant to this act. It is recognized, however, that a local agency or school district may pursue any remedies to obtain reimbursement available to it under Part 7 (commencing with Section 17500) and any other provisions of law.

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APPENDIX E

Comments from MAMA project mothers on additional support they would have liked at the hospital.
better lactation consultants at hosp., they weren't very educated, just gave me a book.
Breastfeeding hurt a lot, I wish I had help with that.
Everyone had different views on the best way to bf (ex: what to eat, how often).
family support about breastfeeding.
Help on how to latch baby.
Help with breastfeeding.
I did not have such a good lactation consultant; wish she was better. She gave me misleading info.
I was there for 4 days and never saw lactation consultant. Wish I had more help with breastfeeding.
I wish I could have gotten more sleep in the hospital.
I wish I got information on how to clean baby's umbilical cord and bathing baby in bath.
I wish I had a breast pump in the hospital.
I wish I had a doula/support person.
I wish I had a phone number or someone to talk to. I filled out a form for that but no one called.
I wish I had been given ointment for sore nipples earlier because it kept me from breastfeeding.
I wish I had consistent support or a lactation consultant because the nurses' advice was conflicting.
I wish I had known that I could have taken home the manual pump.
I wish I had more help from lactation consultant, more routine visits.
I wish nurse had come in sooner (she came in after 1 day).
I wish nurses had more patience in teaching me how to breastfeed.
I wish nurses had told me more about latching and breastfeeding.
I wish nurses were there to help me more.
I wish the lactation consultant had come in earlier because the nurse taught me to breastfeed incorrectly.
I wish the lactation consultant would have come into my room at the hospital a little bit earlier.
I wish the nurses had been more available to help with breastfeeding.
I wish the nurses had been more proactive in teaching me how to breastfeed, so I didn't have to ask.
I wish the nurses taught me better how to breastfeed instead of just telling me.
I wish the staff was with me in the room all the time for help.
I wish there had been a lactation consultant to help at the hospital.
I wish they would have asked for my consent before giving her antibiotics.
I would have like to receive the exercise classes and I wanted someone to show me how to bathe him.

APPENDIX E

I would have liked to see the lactation consultant more or more nurse help with breastfeeding.
Lactation consultant.
More attention from nurses to help me learn to breastfeed and a translator.
More breastfeeding assistance and info. No one said much about it.
More expert support from nurses about bf instead of just their personal experiences.
More help from nurses because I had a c-section (hard to move).
More help from the nurses when I came home.
More information on bf and encouragement to breastfeed.
More instructions on how to breastfeed.
More nurse support: she just told me what to do and left when I needed more help.
More preparation for breastfeeding moms before they leave hospital & more info about baby nutrition.
More resources in the hospital with help the first days out of the hospital.
More training from nurses on how to breastfeed.
Needed some information for the next few days after leaving the hospital.
no beds for moms in NICU: kept me from being able to be there a lot to breastfeed & NICU staff gave formula.
Support from the nurses, one gave my baby formula without asking me-I had her banned from my room.
The hospital was very supportive.
They provided great help to me and my whole family.
Wish a breastfeeding specialist was with me at all times to help.
wish all nurses were more supportive/empathetic of breastfeeding at NICU.
wish hospital had given info at birth about 'breastfriend' instead of 2 wks later when he'd lost 7oz.
Wish I had seen the lactation consultant sooner.
Wish nurses would've emphasized importance of breastfeed every 1.5 hrs so I would keep producing milk.
Yes, a little bit more support on breastfeeding.
Yes, help on breastfeeding.
Yes, I wish the lactation consultant would have arrived before I left the hospital.
Yes, more help
Yes, more information on breastfeeding
Yes, more information on breastfeeding.
Yes, more support on behalf of the nurses; wish there were more bilingual nurses.

APPENDIX F

Comments from MAMA project mothers on barriers to breastfeeding in the first six months.

It was hard to get me and my baby used to breastfeeding.
I had difficulty latching because I am visually impaired, so my husband helped in the first 2 weeks.
I had sore nipples in the first 2-3 weeks.
Only the soreness and bleeding from my nipples.
Mastitis-made it painful to nurse. A large cut on my nipple. Breasts engorged-baby couldnt fit mouth.
My daughter was born with reflex.
Trying to latch on and not producing enough milk.
The first days for him to latch on.
Yes, just painful and sore nipples.
Yes, my nipples were bleeding and I was in pain.
Sure, just painful nipples, nursing strikes and drops in milk supply.
I had cracked nipples, it was very painful.
One of my nipples got very irritated and bled, then later my breastmilk dried out.
I had to stop since I had too much milk and couldn't do it.
In the beginning my nipples were sore & cracked, at 2 months my baby refused to nurse.
The pain-it hurt!
Yes, not much information that I obtained.
Yes, my illness that lasted 3 days because of my surgery.
Yes, had too much milk and production.
My baby had difficulty latching.
At the beg. I had difficulty producing milk because I had a c-section.
Yes, in the first few weeks I had a lot of nipple soreness and trouble with pumping breastmilk.
My son was not latching on.
baby was eating a lot, I got tired of sitting so much to feed him.
The fact she would not latch on.
My baby would not breastfeed after he was given a bottle.
I had bleeding nipples.
I had mastitis 3 times, it caused pain but I still breastfed.
I got a couple of breast infections.
Just the fact of biting and showing her not to.
I initially used a nipple shield & it confused my baby & made it hard for her to want to breastfeed normally.
Yes, getting the milk to come down and latching on in the first month.
I was very tired, had personal fatigue.

APPENDIX F

Had to start school and I couldn't breastfeed her anymore.
Sometimes it was painful.
I had a cracked nipple that was somewhat painful.
early on my baby would throw up breastmilk after feeding. Doctor said it would stop & it did.
My baby wouldn't latch and then I wasn't producing enough milk.
I wasn't confident that I was producing enough milk.
Yes, latching on, breast hurting and soreness and bleeding nipples.
Yes, he didn't want to latch on.
Yes, he won't latch on and I didn't have much milk.
Yes, because of my nipples.
Baby wouldn't latch at first so I used a nipple shield for the first 2 months.
pain, bleeding, cracked nipples and overproduction of milk in later months.
The latching on, that lead to sore breasts and she was born a month early.
Basically him having trouble latching on.
Yes, milk did not come in until 4 to 5 days (delayed onset) after he was born.
Yes, he couldn't latch on, on one side.
Yes, wanted to give up in the first 3 weeks because nipples were sore/painful.
lack of milk supply.
I felt that my milk supply wasn't enough, hard to formula feed at first but glad I did.
breastfeeding and pumping took a lot of time.
When I got sick that I had to stop breastfeeding for 3 months.
Pain in the beginning, baby always hungry.
Difficulty latching in first 3 weeks.
Yes, not knowing if the milk was in or not and not knowing if he had enough milk.
initial pain when I started breastfeeding.
Yes, because my breasts would swell up a lot.
Yeast infection caused a lot of pain.
delayed onset-In first days my body wasn't producing enough milk.
pain and soreness if first 4 months.
Engorgement.
plugged ducts & I had trouble understanding the baby's hunger signals.
soreness in my nipples.
Baby had trouble latching on and I had sore nipples.
my baby was sucking on her bottom lip, had to untrain that & my husband said I shouldn't breastfeed.
my baby wouldn't latch on.
Pain at beginning, uncertainty if I'd produce enough & if baby was getting enough.

milk overflow.

Nipple infection, became engorged, milk would not come out.

plugged ducts.

nipple soreness.

Just once when he was a month, I got an engorgement-painful.

Pain from thrush.

dry and sore nipples.

Engorgement and cracked nipples were painful. Baby nursed a lot!

difficulty latching.

oversupply of milk.

baby had difficulty latching.

I was worried I wasn't making enough milk, breastfeeding is time consuming and depressing sometimes.

took 45 minutes to latch, mastitis, thrush.

infection, pain, difficulty latching.

inverted nipple so had difficulty latching.

difficulty latching.

difficulty latching, low milk supply.

postpartum depression for 3 weeks.

many clogged milk ducts.

frustration and pain because of difficulty latching.

My breast would get hard and they would hurt a lot.

insufficient milk production.

difficulty learning how to latch my baby.

difficulty latching & I had another young child to take care of.

painful sometimes to breastfeed.

baby has cleft palate.

a little difficulty latching at first.

baby biting, illness that required medication, clogged ducts, baby's lack of interest in breastfeeding.

Yes, the engorgement and she was allergic to milk protein.

Only the first 48 hours of her being in the Intensive Care Unit.

difficulty latching in first 2 weeks, I had a lumpectomy that made breastfeeding painful.

difficulty latching in first 3 weeks.

hard to handle twins & a four-year-old, very stressful so I didn't want to breastfeed.

baby had no interest in breastfeeding in first 24 hrs, engorgement in 1st week, difficulty latching.

Yes, the first day after she was born my breasts were not producing enough milk so we gave formula.

APPENDIX F

baby wouldn't fully latch.

pain & bleeding while breastfeeding in first 3 weeks before milk came.

pumping breast milk was difficult.

inverted nipples made it hard to latch the baby.

Soreness.

Yes, my baby would not latch on.

Yes, he would not latch on because my nipples were too small.

Yes, I was not producing enough milk

Yes, first 5 to 6 days it was difficult to get him to latch on.

Yes, latching.

Sore nipples; he would suck very hard.

Yes, I was not producing enough milk.

Yes, because I had to go back to work and also when I got sick.

Yes, just how to learn to position him and how to do it. I got really hurt from my nipples.

Yes, just that it was hard to get him to eat.

soreness and I dried out (stopped producing).

not enough milk, difficulty latching.

the first 3 days I didn't have milk.

baby had nipple confusion and difficulty latching.

she was latching strangely and biting me.

painful to breastfeed in the first 2 weeks.

I had mastitis multiple times.

In first weeks it was painful and I was bleeding.

trouble expressing milk with the pump.

sore nipples that were painful in the first 3 weeks.

a little bit of sore nipples.

trouble latching.

Yes, I would have a lot of milk in the beginning (engorgement).

Yes, my nipples would bleed and become sore.

Yes, he would get really upset at times.

Yes, I had too much milk.

Yes, the first two weeks were hard.

low milk supply.

APPENDIX F

I didn't know how to breastfeed and I didn't know what to do.
not knowing if she was getting enough milk.
Yes, first 10 weeks the latching on was a problem.
Yes, clogging in my breast and having to also deal with my 2 yr. old.
pain in the first few days & my milk stopped randomly for 2 days and then came back.
because of medication I had to stop breastfeeding, but otherwise it was very easy.
latching was difficult at first.
learning to nurse 2 babies at the same time & breast infections.
cracked and bleeding nipples.
Just time commitment and dietary restrictions.
Yes, the pain from my nipples.
1st month was difficult with latching and positioning.
Yes, cracked nipples and she did not eat very much at first.
Yes, my nipples were hurt.
Yes, her not latching on well, just the first few months of learning.
breast infections.
cracked and sore nipples, I was very nervous to breastfeed in public.
milk wasn't coming in, problems with my husband led to depression so doctors said I shouldn't breastfeed.
Yes, he would not latch on and lost a lot of weight.
uncomfortable to be in public.
I have a chronic circulatory problem that was constricting blood in nipples causing pain & cracking.
milk supply issues & airplane traveling with breastmilk is really difficult now.
cracked nipples and soreness.
lumps from clogged ducts, soreness, fever.
It took one week for baby to learn to latch.
baby had trouble latching, so I stopped breastfeeding.
difficulty latching in first 4 days.
Yes, my nipples would hurt a lot..
jaundice made him lazy to latch, then he wouldn't take bottle or latch.
Yes, latching on, sore nipples and clogging up.
It was hard for me the first months with breastfeeding.
at first it was painful to breastfeed.
at beginning baby was congested and so she had trouble breathing while nursing.

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