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WIC Program Evaluation: A Breastfeeding Study

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WIC Program Evaluation

A Breastfeeding Study

By

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Abstract

Poor nutrition is prevalent among low-income pregnant and postpartum women, and infants. Inadequate nutrition during these vital stages can have negative effects on the health status of this population. The Women, Infants and Children Program (WIC) was established specifically to help low-income women and children lead healthy lives by providing nutrition education, referrals to healthcare and other health-related services, breastfeeding promotion, and economic resources to purchase nutritious foods at retail grocery stores. WIC has been shown to have an influence on participating mothers' infant feeding decisions for both formula-feeding and breastfeeding. Although WIC is mandated to provide breastfeeding education and support, some studies have reported that WIC unintentionally promotes formula-feeding because it has provided formula to participating mothers and infants. To determine the success of WIC in encouraging breastfeeding in Santa Clara County, this paper used a program evaluation to answer whether the program ultimately fulfills the legislative intent.

Contents

List of Tables

List of Figures

Introduction

A mother's nutrition status and health during and after pregnancy have significant effects on the health outcomes of herself and her children. The dietary intake of a mother influences her baby's birth weight, rate of postnatal growth, and chance of survival (Brown, n.d.). The Women, Infants and Children Program (WIC) is established specifically to help low-income women and children lead healthy lives (Yehya, 2015). WIC has been identified as having an influence on participating mothers' infant feeding decisions for both formula-feeding and breastfeeding. The WIC program is mandated to provide breastfeeding education and support for all pregnant and postpartum women enrolled in the program. However, some studies have reported that WIC unintentionally promotes formula-feeding because it has provided formula for participating infants. To determine the success of WIC in encouraging breastfeeding in Santa Clara County, this paper used a program evaluation to answer whether the program ultimately fulfills the legislative intent.

Problem

Maternal and child undernutrition is prevalent among low income families, resulting in substantial increases in health problems and mortality (McKenzie, 2015). The underlying causes of undernutrition include environmental, economic, and social factors, with poverty playing a central role. Food insecurity, that is a lack of physical and economic access to nutritious food, is a term used to describe the cause of undernutrition among the low-income population (Black, et al., 2008). The low-income population struggles with food insecurity, as members of this population typically do not live in areas that offer access to fresh produce (Jacewicz, 2016).

Healthy nutritional status before, during, and after pregnancy optimizes maternal health and reduces the risk of pregnancy complications, birth defects, and chronic disease later in life.

A healthy, well-nourished woman is more likely to have a healthy pregnancy, which increases her chances of having a healthy baby (Pregnancy Nutrition - American Pregnancy Association, 2012). According to Prado and Dewey (2014), nutrition is especially important during pregnancy and infancy because these are crucial periods for brain development, which serves as the basis for the development of cognitive, motor, and socio-emotional skills throughout childhood and adulthood. Psychologists at the University of Wisconsin-Madison found that children of families below the federal poverty line had 8 to 10 percent below normal brain development. A separate study conducted by a neuroscientist and professor of pediatrics found that the brains of children whose families made 25,000 dollars or less annually had brain surfaces six percent smaller than families who made 150,000 dollars or more annually (McKenzie, 2015).

Solution

The roots of WIC originate in the 1960's when the United States started to recognize that several groups of low-income Americans were victims of hunger and malnutrition. The Poor Peoples' March on Washington, DC and a television documentary on CBS titled "Hunger in America" raised the public's awareness of the need for better nutritional support for the poor. The White House Conference on Food, Nutrition, and Health held in 1969 also brought national attention and resources to the root cause of hunger and malnutrition: poverty. One of the recommendations from the conference was that the nutritional needs of low-income pregnant women and children of preschool age must be a priority. In response, the United States Department of Agriculture (USDA) launched the Commodity Supplemental Food Program which provided resources to nourish low-income pregnant women, infants, and children up to the age of six years (Oliveira et al., 2002).

It was later discovered that the existing food assistance programs, including Commodity Supplemental Food Program and Food Stamps, were not addressing the specific needs of women, infants, and children. In response, officials from the Department of Health, Education, and Welfare (HEW) and the USDA met with a group of physicians to discuss certain ailments of pregnant patients caused by the lack of food. The group developed a plan to attach food commissaries to neighborhood clinics so that doctors could prescribe necessary foods with a voucher that women would take to the clinic to obtain the food. The first implementations of this plan were the USDA commissary program in Atlanta, GA and an independent voucher food distribution program in Baltimore, MD established by Johns Hopkins University (Oliveira et al., 2002). In January 2016, Samaritan House Redwood City Free Clinic partnered with Second Harvest Food Bank of Santa Clara County and San Mateo County to launch a food pharmacy similar to that of the WIC food commissaries to provide nutritious food to low-income patients with type II diabetes who otherwise suffer from food insecurity. While there is no cure for diabetes, doctors recommend a high-fiber, low-fat diet with plenty of fruits, vegetables, and whole grains to control it. The food pharmacy is based on the logic that people are more likely to follow a diet recommended by their doctors if they can obtain those foods for free immediately following their doctor visits (Jacewicz, 2016).

On September 26, 1972, WIC was formally sanctioned as P.L. 92-433 by an amendment to the Child Nutrition Act of 1966. The legislation used the earlier mentioned Johns Hopkins University model and established WIC as a two-year pilot program with the expectation that the program would be so successful, that it would turn into a fully-implemented program. The USDA was given oversight of the program component responsible for providing supplemental foods to participants. On January 15, 1974, over two years after the WIC program legislation

was established, the first WIC site opened in Pineville, KY and 45 more sites opened by the end of that year (Oliveira et al., 2002).

On October 7, 1975, less than two years after the first site was established, P.L. 94-105 recognized WIC as a permanent program. The WIC legislation states:

> Congress finds that substantial numbers of pregnant women, infants and young children are at special risk in respect to their physical and mental health by reason of poor or inadequate nutrition or health care, or both. It is, therefore, the purpose of the program authorized by this section to provide supplemental nutritious food as an adjunct to good health during such critical times of growth and development in order to prevent the occurrence of health problems (Oliveira et al., 2002).

The original legislation stated that WIC program eligibility included non-breastfeeding women up to six months postpartum and children up to five years of age who are at nutritional risk and have inadequate income, but there was no clear definition of what constituted as nutritional risk and as inadequate income; therefore, the Child Nutrition Amendments of 1978 (P.L. 95-627) established clear definitions and eligibility standards. According to Oliveira et al. (2002), there are five major categories that define nutrition risk for WIC eligibility: 1) harmful or abnormal nutritional conditions measurable by biochemical or anthropometric systems, such as anemia, low maternal weight gain, or inadequate growth in children; 2) other nutrition conditions, such as nutrient deficiency diseases, some specific obstetrical risks, or gestational diabetes; 3) dietary deficiencies that threaten health, such as highly restrictive diets, inadequate diet, or inappropriate infant feeding; 4) conditions that directly affect the nutritional health of a person, such as alcoholism or drug abuse; 5) conditions that predispose persons to inadequate nutritional patterns, such as homelessness. WIC also defines inadequate income for program eligibility as 185 percent of the federal poverty level (Oliveira, 2002).

Implementation

In 1989, Congress mandated that 8 million dollars be allocated for breastfeeding promotion in P.L 101-147 in response to concerns about the low rate of breastfeeding among WIC participating mothers. The federal government and private health organizations collaborated to promote breastfeeding to the public as the optimal form of infant feeding. "In response to the scientific evidence supporting breastfeeding and the recommendations by the American Academy of Pediatrics, the Child Nutrition and WIC Reauthorization Act of 1989 mandated inclusion of breastfeeding support in the WIC budget" (Tenfelde, 2011, p. 179). In 1991, P.L. 102-342 required that the Secretary of Agriculture establish a breastfeeding promotion program to support breastfeeding as the superior method of infant feeding and nutrition, and to encourage public acceptance of breastfeeding. In 1992, an enhanced WIC food package was established for women who exclusively breastfed their infants to encourage breastfeeding among mothers participating in WIC. In 1997, the USDA held the National Breastfeeding Promotion Campaign to encourage WIC participants to begin and continue breastfeeding (Oliveira et al., 2002).

The WIC Program encourages breastfeeding practices through nutrition education and breastfeeding promotion programs. Targeted support services include access to staff with training in lactation, peer counseling services, breast pumps for mothers returning to work or for mothers with other special needs, and education materials. The program provides incentives for breastfeeding participants including higher priority for certification into the program than non-breastfeeding postpartum women, and breastfeeding women receive a larger amount and variety of food than non-breastfeeding women. Also, breastfeeding participants are eligible to receive

program benefits for up to one year postpartum while non-breastfeeding women are eligible to receive benefits for only six months (Missouri Department of Health & Senior Services, n.d.).

According to Whaley et al. (2012), WIC is considered one of the leading health nutrition programs in the country. Currently, WIC serves more than nine million participants nationwide and 1.4 million in California alone. These participants include low-income pregnant, breastfeeding and post-partum women and children under age five who are at nutritional risk. Currently, WIC Program components include nutrition education, referrals to healthcare and other health-related services, breastfeeding promotion, and economic resources to purchase nutritious foods at retail grocery stores. In Santa Clara County, WIC services are delivered through seven offices located within the satellite clinics of Santa Clara Valley Health and Hospital System. WIC is a federal grant program, meaning Congress allocates a specific amount of funds each year to WIC operations. WIC also offers other services participants may be eligible for including WIC Farmers' Market Nutrition Program and the WIC Breastfeeding Peer Counseling Program (Women, Infants and Children Supplemental Nutrition, 2011).

Healthy People 2020 is the current program in the Office of Disease Prevention and Health Promotion within the Department of Health and Human Services for monitoring progress toward a healthier American population. Established in 2010, the goal is to increase the overall health of the American population by setting science-based health goals for all Americans in ten year increments. The program has several goals, but the one related directly to breastfeeding is "Attain high-quality, longer lives free of preventable disease, disability, injury, and premature death." (Healthy People.gov, 2016) "Maternal, Infant and Child Health" is a topical focus of this program, with several goals and objectives related to morbidity and mortality, pregnancy health

and behavior, preconception health and behavior, postpartum health and behavior, and infant care (HealthyPeople.gov, 2016).

Feedback

The Maternal, Child and Adolescent Health Program (MCAH) is a program under the California Department of Public Health (CDPH) that gathers data to assess the progress made towards achieving Healthy People 2020 objectives for breastfeeding initiation, duration and exclusivity, as well as hospital and workplace support for breastfeeding mothers and infants. The Maternal and Infant Health Assessment (MIHA) is an annual, statewide survey given to women with a recent live birth in California. The MIHA collects self-reported information on maternity care practices known to support breastfeeding, which include skin-to-skin contact, early breastfeeding initiation, rooming infants and mothers together in the same hospital room, formula supplementation, pacifier use, as well as duration and exclusivity of infant feeding practices. The Newborn Screening Program also collects in-hospital breastfeeding data in California. The Newborn Screening Program gathers in-hospital infant feeding data from birth to the time of the first specimen collection, which is usually 24 to 48 hours after birth. All non-military hospitals providing maternity services are required to complete the Newborn Screening Test Form and the MCAH analyzes the data and publishes breastfeeding rates by hospital, county and state (Women, Infants and Children Supplemental Nutrition, 2011).

Methodology

This research was based on a program evaluation of WIC in Santa Clara County, with comparisons to statewide birth data, data on the incidence of breastfeeding, and data on the incidence of breastfeeding specifically among WIC women and infants to determine whether WIC participation leads to a higher incidence of breastfeeding. Data was collected from the CDPH about the number of live births in California and in Santa Clara County, and the number of those infants who were breastfed in-hospital, and continued to breastfeed beyond hospital discharge. Data was also drawn from the USDA for the number of mothers and infants who participated in WIC, and the number of those mothers who were partially breastfeeding and number who were fully breastfeeding, as well as the number of those infants who were partially breastfed and the number of those infants who were fully breastfed in Santa Clara County.

Literature Review

Poor Nutrition

Poor nutrition among pregnant women and infants can cause several health and developmental problems. Although the pregnancy period is often considered in isolation, it is imperative that women receive adequate nutrition before, during, and after pregnancy (Brown, n.d). According to Alien (2014), lactating women are likely to suffer from micronutrient deficiencies which affect the composition of breast milk, and the development and nutritional status of the infant. Adequate dietary intake can increase the secretion of several essential nutrients in breast milk, and ultimately improve infant health status (Alien, 2014). Some nutrients are essential during specific periods of development; therefore, nutrient deficiency could have a severe impact on this delicate process. Although deficiency of any nutrient has the potential to create an impact on fetal development, several particular nutrients have been identified as causing specific birth defects if the nutrient is omitted from the mother's diet during a very narrow time period (Brown, n.d.).

Spina Bifida. According to Prado and Dewey (2014), adequate nutrition at the time of conception is vital to the development of the neural plate and neural tube that make up the brain and nervous system because their development is affected by folic acid, copper, and vitamin A (Prado and Dewey, 2014). "Approximately 22 days after conception, the neural plate begins to fold inward, forming the neural tube, which eventually becomes the brain and spinal cord" (Prado and Dewey, 2014, p.268). Folic acid is specifically essential in reducing spinal cord defects such as spina bifida. Spina bifida is a condition that occurs in the first month of pregnancy when the spinal column does not completely close. The effects of spina bifida include

fluid on the brain, full or partial paralysis, trouble controlling the bladder and bowel, learning disabilities, and depression (Pregnancy Nutrition - American Pregnancy Association, 2012).

Rickets. Vitamin D is a vital component for calcium absorption and phosphorus balance in the body. Vitamin D is mainly produced by ultraviolet B (UVB) sunlight rays hitting the skin; however, the vitamin is also found in oily fish, cod liver oil, and egg yolks. Vitamin D is essential for the general fetal growth, skeletal structure, and tooth-enamel development. Low levels of vitamin D have been shown to contribute to bone problems and deformities in children, such as rickets. Rickets is caused when mineralization or calcification of bones does not occur during a baby's development due to deficiency of vitamin D, phosphorus, or calcium (Delcour, 2011).

According to Delcour (2011), breast milk does not protect against rickets; therefore, the United States government decided to fortify all infant formula, milk, and some solid foods with vitamin D in the 1930's. Declour (2011) argues that breast milk has gained popularity over fortified formula in recent years and rickets is becoming more prevalent among infants; therefore, vitamin D supplementation is essential to combat rickets in breastfed infants. "The recommendation that bottle-fed babies need not be given Vitamin D supplements could impact on the woman's infant-feeding decision, as she may wrongly believe that formula milk is superior to breastmilk because of the added vitamin D" (Dean, 2012, p. 43).

Low birth weight. Maternal nutrition deficiency may cause low birth weight in infants. Low birth weight is defined as term or preterm newborns with a birth weight of under 2,500 grams, or about five and a half pounds. Low birth weight causes several health problems for the infant such as intrauterine growth restriction and the mortality rate for infants with low birth weight is 40 times more than infants with normal birth weight (Khalesi et al., 2015). According

to a study conducted by Khalesi et al. (2015), low birth weight in newborns could be related to maternal vitamin D deficiency and improving maternal nutrition could prevent low birth weight. Several studies have compared school-age children who have experienced low birth weight and severe acute malnutrition in the first few years of life to controls who had not. These studies demonstrated that the children who had suffered from early malnutrition had lower IQ scores, cognitive function, and school achievement (Prado and Dewey, 2014).

Breastfeeding Benefits

According to Prado and Dewey (2014), breastfeeding may improve cognitive development through ways related to the composition of breast milk and to the experience of breastfeeding. Breast milk is comprised of nutrients, growth factors, and hormones that are imperative for brain development. A study conducted by Brown University examined the brain growth in a sample of children under the age of four years. The research found that by the age of two years, babies who were exclusively breastfed for at least three months had better brain development in comparison to babies who were exclusively formula fed or partially breastfed. The enhanced development was particularly pronounced in parts of the brain associated with language, emotional function, and cognition (Brown University, 2013). Also, breastfeeding elicits a hormonal response in mothers during feeding, which may reduce stress and depression, thus improving caregiving and mother to infant interaction (Prado and Dewey, 2014). Breastfeeding also provides several economic and emotional benefits to mothers due to the cost savings from not having to purchase infant formula and reducing the time needed to accommodate sick babies (Women, Infants and Children, 2015).

Biringi et al. (2015) explain that exclusive breastfeeding, that is giving the infant nothing else other than breast milk, vitamins and medication, is one of the most effective preventive

strategies to combat infant mortality. Human milk also provides all of the necessary nutrients for the first six months of life and helps protect infants against illnesses and allergies because of the antibodies transferred from the mother to the infant (Oliveira et al., 2002). Breast milk provides adequate nourishment for the infant, so supplemental feedings of water or infant formula are unnecessary. Supplemental feedings may interfere with a mother's ability to produce milk because the amount of milk a mother produces is dependent on the rate of feeding or pumping occurrence (Women, Infants and Children Supplemental Nutrition, 2011).

Research provides strong evidence that breastfeeding reduces infant mortality rates and the incidence of several infectious diseases, including bacterial meningitis, bacteremia, diarrhea, respiratory tract infection, necrotizing enterocolitis, otitis media, urinary tract infection, and late-onset sepsis in preterm infants. Also, some studies have shown a reduction in the incidence of insulin-dependent and non–insulin-dependent diabetes mellitus, lymphoma, leukemia, overweight and obesity, hypercholesterolemia, and asthma in older children and adults who were breastfed, compared with individuals who were not breastfed (Breastfeeding and the Use of Human Milk, n.d.). A study conducted by Avila et al. (2015) determined that breastfeeding is more effective in preventing dental caries in early childhood than bottle feeding. Breastfeeding also poses several benefits to mothers including decreased postpartum bleeding, earlier return to pre-pregnancy weight, decreased risk of breast and ovarian cancer, and decreased risk of hip fractures and osteoporosis in the postmenopausal period (Breastfeeding and the Use of Human Milk, n.d.).

Breastfeeding Promotion and Support in WIC

According to the American Academy of Pediatrics (n.d.), breastfeeding promotion among WIC participants is essential because of its nutritional value and cost savings to the program.

Tenfelde et al. (2011) explain that formula-fed infants cost WIC twice as much as breastfed infants; therefore, increasing the number of breastfed WIC infants has substantial economic saving to the program. Whaley et al. (2012) also explain that breastfeeding is a nationally-recognized method of early childhood obesity prevention in the 2011 *Surgeon General's Call to Action to Support Breastfeeding.* "A major goal of WIC programs is to improve infant nutrition, and encouraging women to breastfeed is a vital component of this effort" (Campbell et al., 2014, p. 3).

WIC has changed its food package system to encourage breastfeeding among participants. Langellier et al. (2014) state that the intent of the change is to provide stronger incentives for mothers to breastfeed and to decrease the amount of formula given to partially breastfed infants. "Several scholars have suggested that the free formula distributed by the WIC program actually deters low-income women from breastfeeding their children" (Stolzer, 2010, p.424). The changes made to the food packages exclude infant formula from the food packages given to mothers in the birth month to breastfeeding infants because exclusively breastfeeding is crucial in the first month to ensure a sufficient milk supply. Also, partially breastfed infants now receive less formula to give mothers the opportunity to breastfeed more, and all infants receive infant foods starting from six months of age (Missouri Department of Health & Senior Services, n.d.). According to The CDC Guide to Breastfeeding Interventions (2005), supplemental feeds to breastfed newborns negatively impacts the overall health of the infant as well as breastfeeding outcomes, and distributing samples of infant formula to new mothers during their hospital stay has been shown to negatively affect breastfeeding. Langellier et al. (2014) found that implementation of the new food package system increased the prevalence of breastfeeding initiation and significantly increased exclusive breastfeeding at three and six months.

Barriers to Breastfeeding

Although there are several benefits to breastfeeding, many women choose to formula-feed their infants (Oliveira et al., 2002). According to Oliveira et al. (2002), reasons for this include concerns that breastfeeding may be difficult to establish, breastfeeding can be painful for the mother if not properly instructed, some mothers may feel breastfeeding is too time-consuming, and some mothers may feel concerned that their baby is not getting adequate nourishment because there is no way to measure the amount of milk the infant is consuming.

Lack of knowledge. There are several misperceptions women have about breastfeeding. One misperception is that formula is equivalent to breast milk in terms of the health benefits it provides. According to Barriers Related to Breastfeeding in the United States (n.d.) a national survey found that only 25 percent of the public agreed that formula feeding instead of breastfeeding increases the likelihood of the baby getting sick. Another misperception is that breastfeeding is inconvenient and threatens the mothers' freedom and independence. "In a national public opinion survey, 45 percent of U.S. adults indicated that they believed a breastfeeding mother has to give up too many habits of her lifestyle" (Office of the Surgeon General, n.d.). Another common misperception is that breast feeding is a natural behavior that does not need to be taught; however, breastfeeding is a skill that is learned by both mother and infant. The mother needs to be educated about how to hold and position the baby to allow the baby to latch on effectively (Exclusive breastfeeding, 2015).

Breastfeeding in public. In American culture, breasts have often been symbolized as sexual objects, while their natural function has been disregarded. This has led women to feel uncomfortable about breastfeeding in public. It is also often difficult for women to find comfortable public places to breastfeed because of the stigma associated with it. According to

Barriers to Breastfeeding in the U.S. (n.d.), a study that analyzed data from a national public opinion survey found that only 43 percent of U.S. adults believed that women should have the right to breastfeed in public places. Women may also find themselves left out of social interactions because others may not feel comfortable being around them while they breastfeed. "Often low-income women do not have the social support needed to feel confident about their ability to breastfeed" (Campbell et al., 2014, p. 4). The feeling of embarrassment restricts mothers from initiating and continuing to breastfeed (Flower et al., 2008).

Employment barriers. According to Langellier et al. (2012), breastfeeding duration is shorter among women who return to work three to six months postpartum. Returning to work is a major barrier to mothers choosing to breastfeed because many employers do not make special accommodations for breastfeeding. Some employers do not allow women to take breaks to expel breast milk, and existing breaks often do not allow sufficient time for expulsion. In addition, employers may not provide private areas for mothers to expel breast milk, which may cause the mother to resort to using the restroom for this purpose (Office of the Surgeon General, n.d.). Employers may also fail to provide refrigerators to store the milk (Oliveira et al., 2002). In a study conducted by Rojjanasrirat & Sousa (2010), it was found that some women, especially women who worked in constrained environments such as gas stations or schools, faced several challenges of combining breastfeeding and work. These challenges included having a male boss or co-workers who did not support their taking time to pump and lack of private, sanitary locations to pump at work (Rojjanasrirat & Sousa, 2010).

Father attitudes about breastfeeding. Mitchell-Box and Braun (2012) state that the male partner is often excluded from the mother-infant relationship, especially when it comes to breastfeeding. Mitchell-Box and Braun (2012) explain that breastfeeding causes some fathers to

feel helpless when their infants are hungry and mothers are not available. Also, some fathers may feel that their relationships with their infants need to be put on hold until they passed breastfeeding age. These attitudes among male partners may encourage women to believe that bottle-feeding is the only way the father could participate in feeding and bond with his baby (Mitchell-Box & Braun, 2012).

Health care barriers. According to Lowe (2011), significant barriers to breastfeeding are in health care. These barriers are caused by the traditional practice of separating mothers from their babies during their postpartum hospital stay and failure to put the baby to the mother's breast immediately after birth because breastfeeding initiation is essential in the first few moments of life. Another concern regarding breastfeeding within health care is that some hospitals provide gift packs containing formula to new breastfeeding mothers upon hospital discharge. This may encourage new mothers to supplement breastfed babies with formula and ultimately decrease the duration of breastfeeding (Lowe, 2011). Olson et al. (2010) also explain that several studies have shown that low-income mothers receive conflicting feeding advice from several sources including health care professionals and family. In addition, some research shows that healthcare professionals may not always be culturally sensitive to the way low-income women live, and therefore do not provide relevant feeding advice (Olson et al., 2010).

Other Breastfeeding Programs

The Baby Friendly Hospital Initiative (BFHI) incorporates ten steps to successful breastfeeding and has been implemented in over 19,000 maternity care facilities worldwide. The ten steps include:

1. Have a written breastfeeding policy that is routinely communicated to all health care staff
2. Train all health care staff about the skills necessary to implement this policy

3. Inform all pregnant women about the benefits and management of breastfeeding
4. Help mothers initiate breastfeeding within thirty minutes of birth
5. Show mothers how to breastfeed and how to maintain lactation even in the event of separation from their infants
6. Exclusively feed newborn infants breast-milk, unless medically necessary to feed formula
7. Allow mothers and infants to remain together 24 hours a day
8. Encourage breastfeeding on demand
9. Give no artificial teats or pacifiers to breastfeeding infants
10. Foster the establishment of breastfeeding support groups and refer mothers to them upon discharge from the hospital or clinic (Beake, et al., 2012)

Institutional changes in maternity care practices increase breastfeeding initiation and duration rates (The CDC Guide to Breastfeeding, 2005). The CDC Guide to Breastfeeding (2005) states that facilities that have implemented the BFHI Ten Steps typically experience an increase in breastfeeding rates, while those that have not implemented the Ten Steps were found to have mothers eight times more likely to stop breastfeeding before six weeks than mothers who have experienced at least five of the ten steps. This proves the value of implementing step-by-step change in the hospital setting (The CDC Guide to Breastfeeding).

In 1998, the Oregon Department of Human Services Health Division established the Breastfeeding Mother Friendly Employer Project to identify breastfeeding-friendly employers and to encourage other employers to support breastfeeding in the workplace. The project provides certification to all employers who can provide documentation that proves they meet the project criteria and publishes a list of participating employers annually. In 2002, the Arizona Department of Health Services adopted a breastfeeding policy for all of its employees with a goal to provide work environments that recognize a mother's responsibility to her job and her baby when she returns to work by assuming that the choice to breastfeed benefits the mother, baby, employer, and society. The policy initially authorizes new mothers returning to work, to

bring their infants to work until they reach four months of age, as long as the mother maintains her work performance and does not disrupt other employees' work. A designated breastfeeding coordinator educates employees about the policy and provides educational materials and support to any employee who wants to breastfeed her infant (The CDC Guide to Breastfeeding).

Findings

Healthy People 2020 Objectives

The Healthy People 2020 goal is to increase the proportion of infants who are breastfed (Office of Disease Prevention and Health Promotion, 2016). The five breastfeeding indicators as outlined in Healthy People 2020 are: 1) ever breastfed, 2) breastfeeding at six months, 3) breastfeeding at 12 months, 4) exclusive breastfeeding at three months, and 5) exclusive breastfeeding at six months (Maternal, Infant, and Child Health, 2016). The Healthy People 2020 objective is to have at least 81.9 percent of mothers breastfeed in the early postpartum period and 46.2 percent exclusively breastfeed three months after delivery *(See Table 1).* This research examined existing county and statewide data drawn from the most recently published Maternal and Infant Health Assessment (MIHA) (2014) to determine the progress made towards achieving the Healthy People 2020 goals regarding breastfeeding. The population for this survey was women with a live birth in 2012 with a sample size of 402 in Santa Clara County and 6, 810 in California. The data accounted for WIC participation, food insecurity during pregnancy, intention to breastfeed before birth, intention to exclusively breastfeed before birth, any breastfeeding, exclusive breastfeeding one month after delivery, any breastfeeding three months after delivery, and exclusive breastfeeding three months after delivery *(See Table 2 and Figure 1).*

Table 1: Healthy People 2020 Breastfeeding Goals

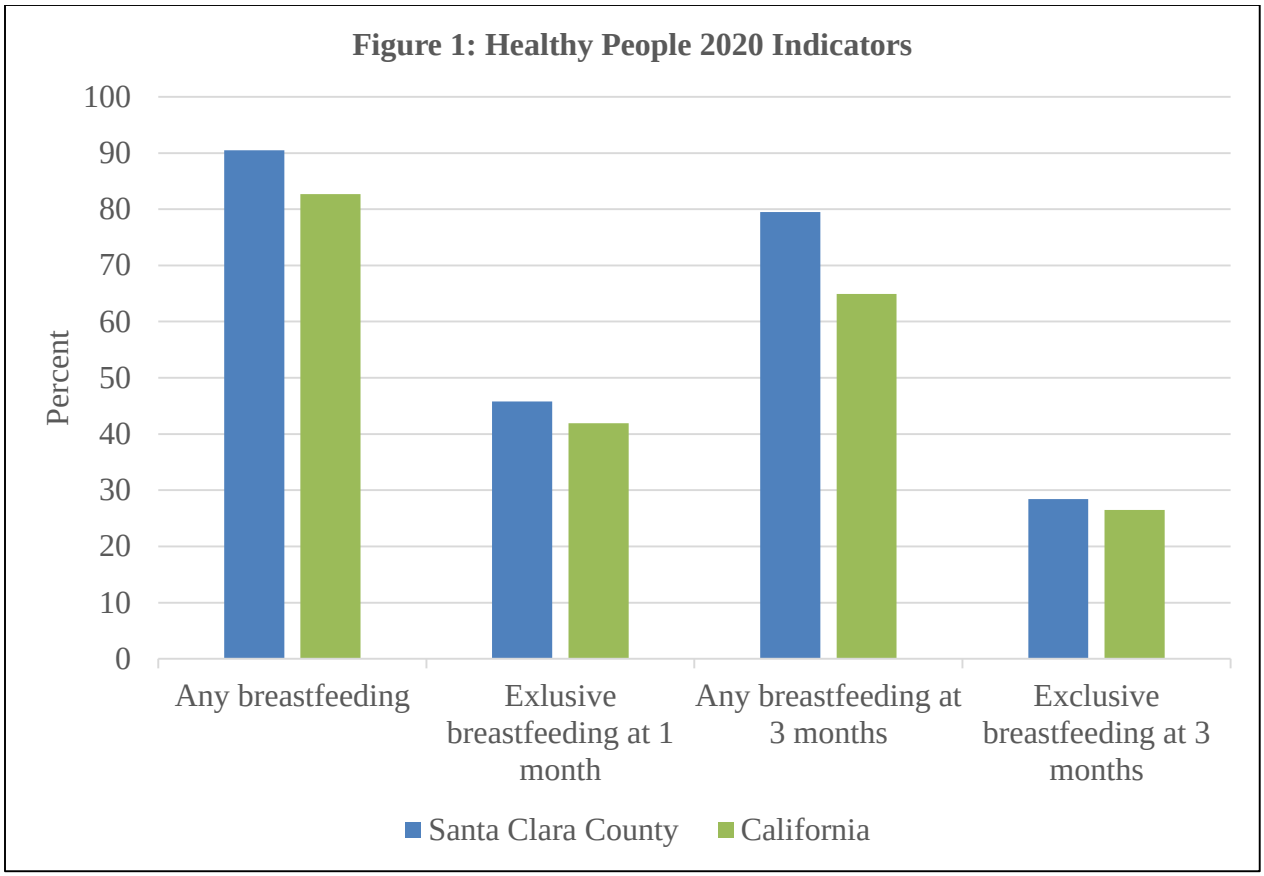
Objectives	Target (%)
Ever Breastfed	81.9
Breastfeeding at 6 months	60.6
Breastfeeding at 1 year	34.1
Exclusive breastfeeding at 3 months	46.2
Exclusive breastfeeding at 6 months	25.5
Increase the proportion of employers that have worksite lactation support programs.	38
Reduce the proportion of breastfed newborns who receive formula supplementation within the first 2 days of life	14.2
Increase the proportion of live births that occur in facilities that provide recommended care for lactating mothers and their babies	8.1

Source: Maternal, Infant, and Child Health, 2016

Table 2: Santa Clara and California Breastfeeding Data

	Santa Clara County (%)	California (%)
WIC participation	30.1	55.6
Food insecurity during pregnancy	17.5	18.6
Intended to breastfeed before birth	95.9	92.2
Intended to exclusively breastfeed before birth	67.2	62
Any breastfeeding	90.5	82.7
Exclusive breastfeeding one month after delivery	45.8	41.9
Any breastfeeding three months after delivery	79.5	64.9
Exclusive breastfeeding three months after delivery	28.4	26.5

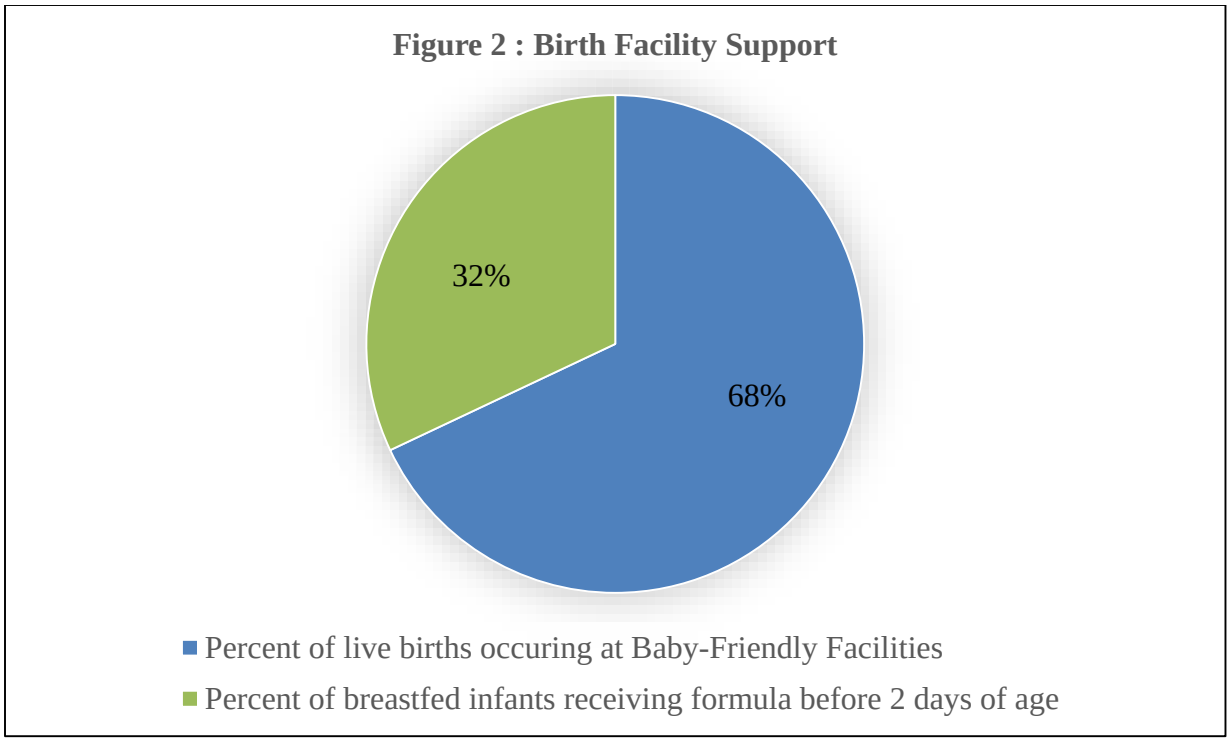
Source: Maternal and Infant Health Assessment, 2016



Source: Maternal and Infant Health Assessment, 2016

Birth Facility Support

As earlier mentioned, birth facility policies significantly impact a woman's decision to breastfeed and the duration she breastfeeds (Centers for Disease Control and Prevention, 2014). Data was drawn from the Centers for Disease Control and Prevention (CDC) for infants who were born at baby-friendly hospitals and those who were not. For the purpose of this study, baby-friendly hospitals were defined as hospitals that integrated the BFHI ten steps into their maternity care practices. The data was originally obtained through the National Immunization Survey (NIS) and was based on live births in California in 2011. The proportion of live births that occurred at facilities that support the BFHI, and infants who were born at facilities that do not support the BFHI is shown in *Figure 2*. Data for in-hospital breastfeeding was also gathered for each hospital in Santa Clara County for live births that occurred in 2014 to determine the influence these hospitals had on women's decision to initiate breastfeeding in the early postpartum period *(See Table 2 and Figure 3).*



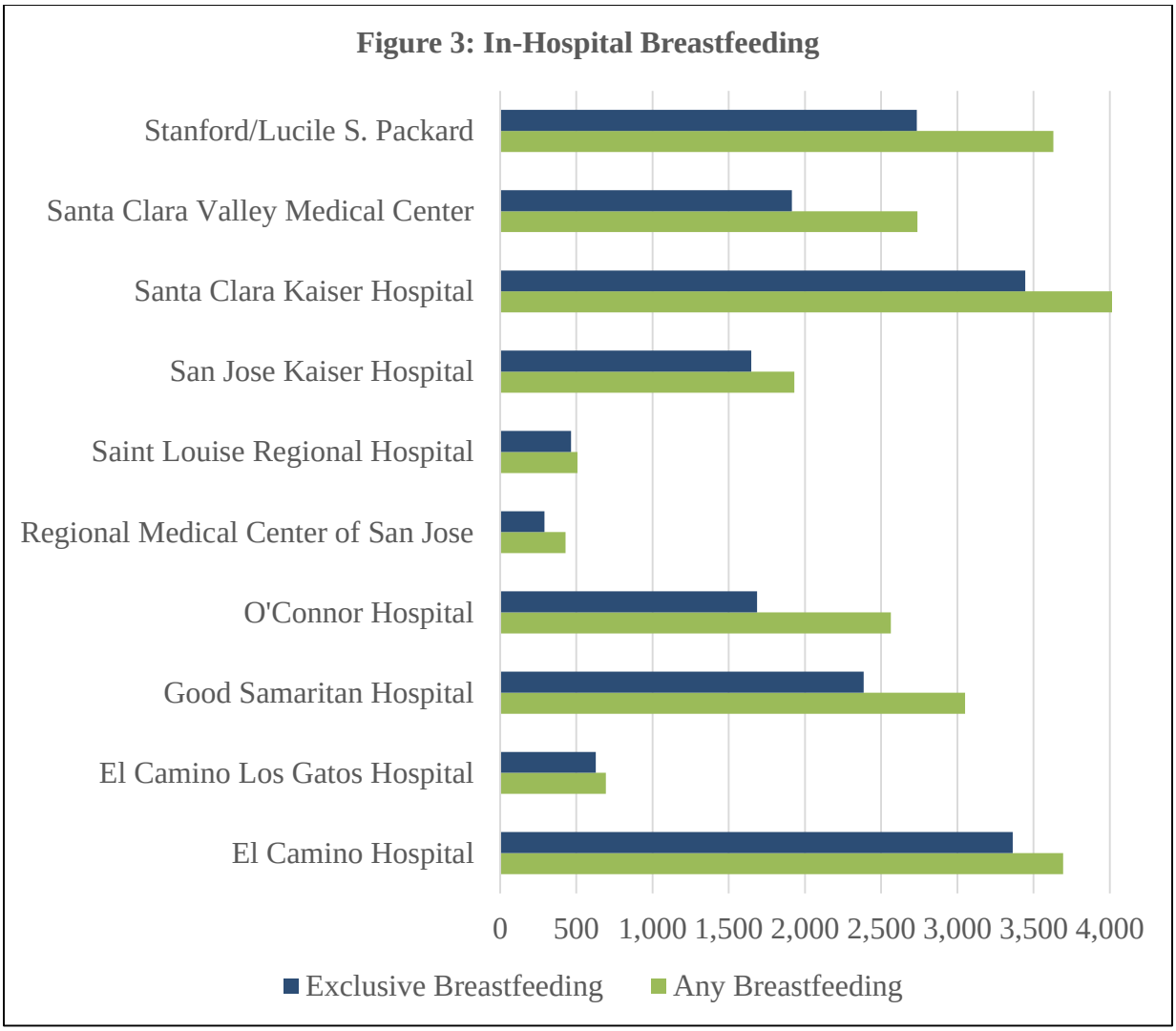
Source: Breastfeeding Report Card, 2014

Table 3: Santa Clara County In-Hospital Breastfeeding Data, 2016

		Any Breastfeeding		Exclusive Breastfeeding	
	Total	**Number**	**Percent (%)**	**Number**	**Percent (%)**
El Camino Hospital	3,725	3,694	99.2	3,363	90.3
El Camino Los Gatos Hospital	703	694	98.7	627	89.2
Good Samaritan Hospital	3,149	3,051	96.9	2,386	75.8
O'Connor Hospital	2,699	2,564	95	1,686	62.5
Regional Medical Center of San Jose	463	428	92.4	291	62.9
Saint Louise Regional Hospital	531	508	95.7	465	87.6
San Jose Kaiser Hospital	2,004	1,930	96.3	1,647	82.2
Santa Clara Kaiser Hospital	4,114	4,019	97.7	3,445	83.7
Santa Clara Valley Medical Center	2,906	2,738	94.2	1,915	65.9
Stanford/Lucile S. Packard	3,732	3,629	97.2	2,733	73.2
Total	24,026	23,255	96.8	18,558	77.2

Source: California In-Hospital Breastfeeding as Indicated on the Newborn Screening Test Form, 2016

Figure 3: In-Hospital Breastfeeding



Source: California In-Hospital Breastfeeding as Indicated on the Newborn Screening Test Form, 2016

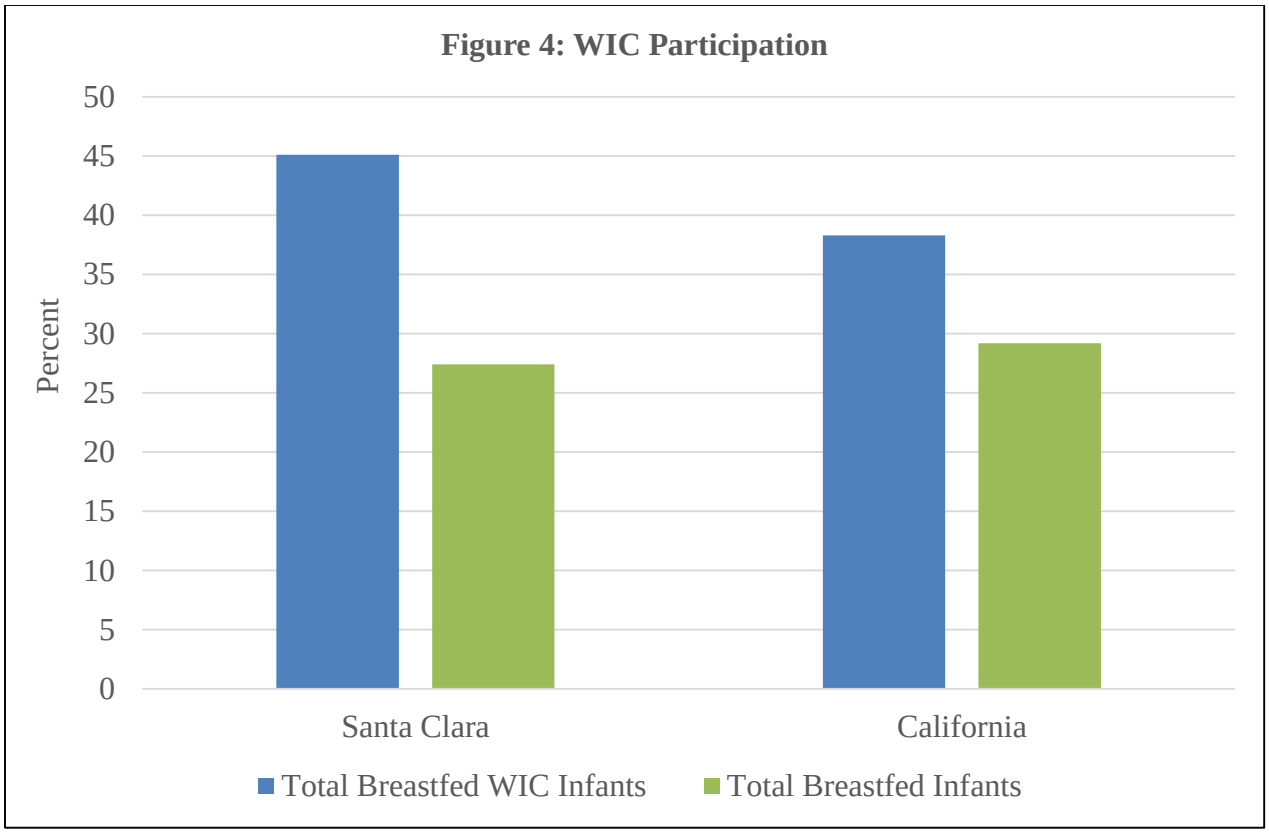
WIC Participation

This research compared county and statewide data for live births, WIC participation, and breastfeeding incidence among WIC participants to determine whether WIC participation leads to a higher incidence of breastfeeding. Data for WIC infants who were fully breastfed, partially breastfed, and fully formula-fed in 2012 was obtained from the *WIC Breastfeeding Local Agency Report (See Table 4)*. However, in the absence of data for breastfeeding specifically among non-WIC women, comparisons were made between overall state and county breastfeeding incidence rates and WIC participant breastfeeding incidence rates. The data for any and partial breastfeeding was converted into percentages and compared to the breastfeeding rates from the MIHA and Newborn Screening Test Form to determine whether the proportion of breastfeeding WIC participants was greater than that of the whole county and state in 2012 *(See Figure 4)*. For the purpose of this study, breastfeeding was defined as any breastfeeding from newborn through one year of age.

Table 4: WIC Participants Breastfeeding Comparison

	Exclusively Breastfed	**Partially Breastfed**	**Total Breastfed**	**Fully Formula-Fed**	**Total Infants**
California	60,523	50, 241	110, 764	178,801	289,565
Santa Clara County	1,221	838	2,059	2,505	4,564

Source: WIC Breastfeeding Data Local Agency Report, 2012



Sources: Maternal, Infant, and Child Health Brief, 2014; National Immunization Survey, 2015; WIC Breastfeeding Data Local Agency Report, 2012

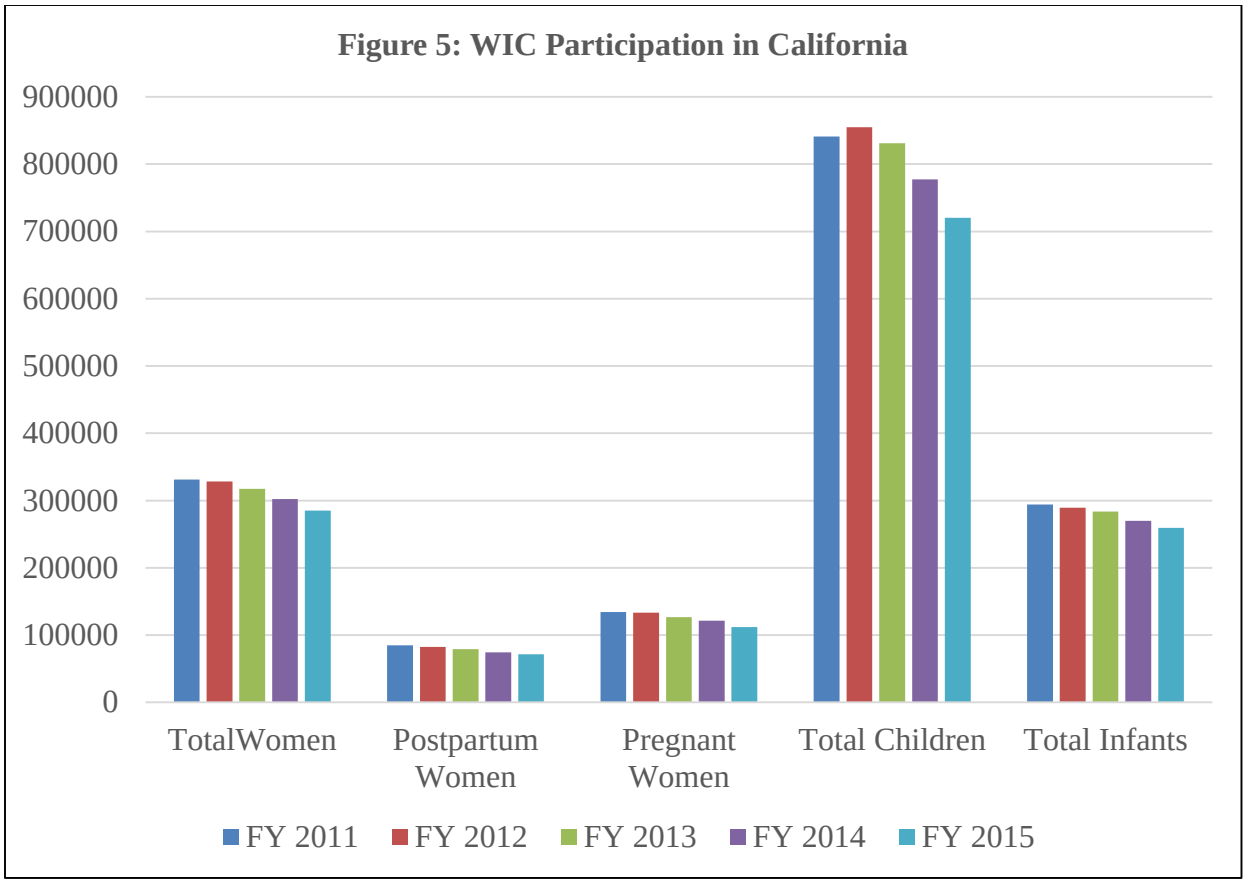
Breastfeeding Trends among WIC Participants

To learn the trends among WIC participation in California, data was gathered from the USDA for total participating women, postpartum women, pregnant women, children, and infants for fiscal years 2011 to 2015 *(See Table 5 and Figure 5).* To determine the breastfeeding characteristics and trends among WIC women and infants, data was also collected from the USDA for WIC women and infants who were fully breastfeeding and partially breastfeeding in California during fiscal year 2012 through fiscal year 2015 *(See Figures 6 to 9).*

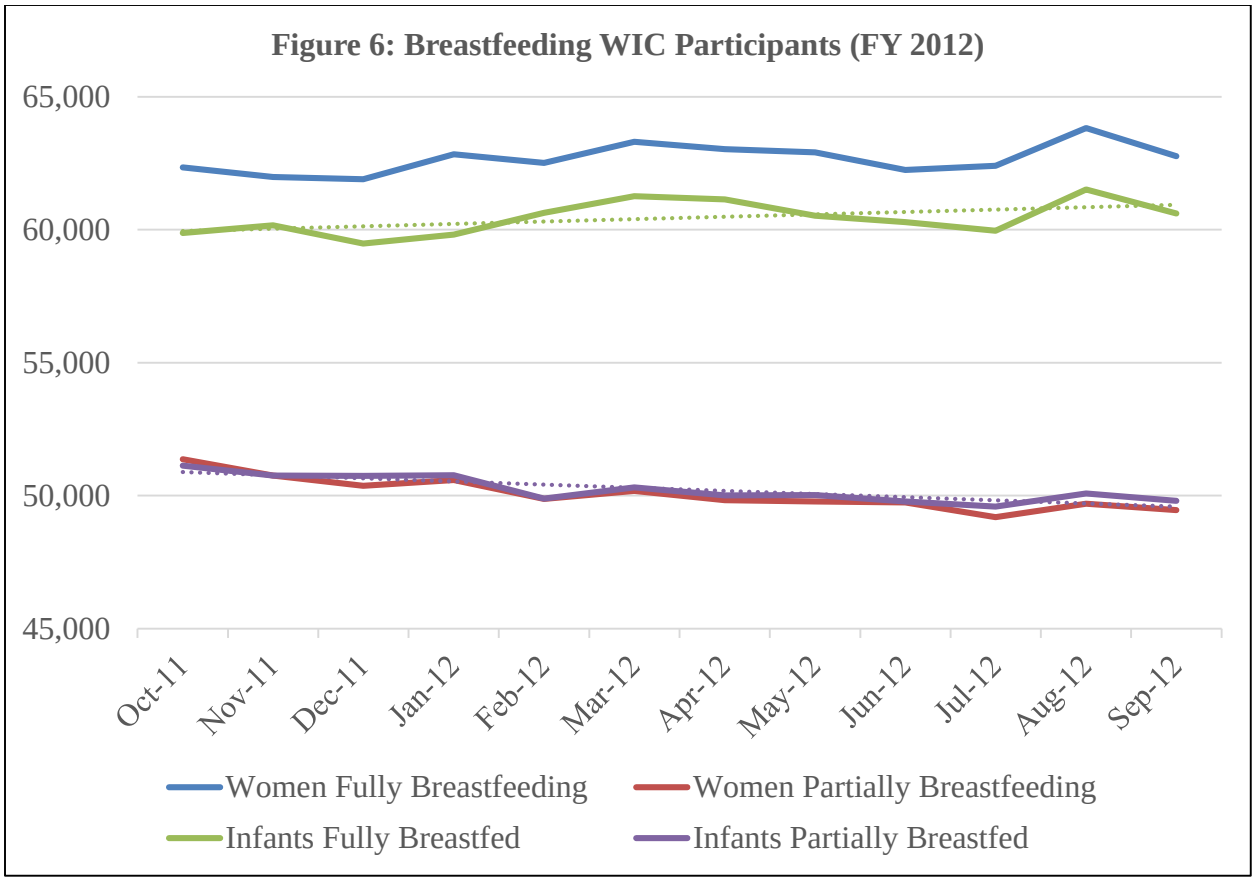
Table 5: WIC Participation in California

	Total Women	Postpartum Women	Pregnant Women	Total Children	Total Infants
FY 2011	331,144	84,633	134,350	841,137	294,283
FY 2012	328,203	82,308	133,150	854,700	289,565
FY 2013	317,211	79,040	126,482	831,109	283,562
FY 2014	302,070	74,587	121,242	777,154	269,715
FY 2015	285,136	71,494	111,725	720,450	259,419

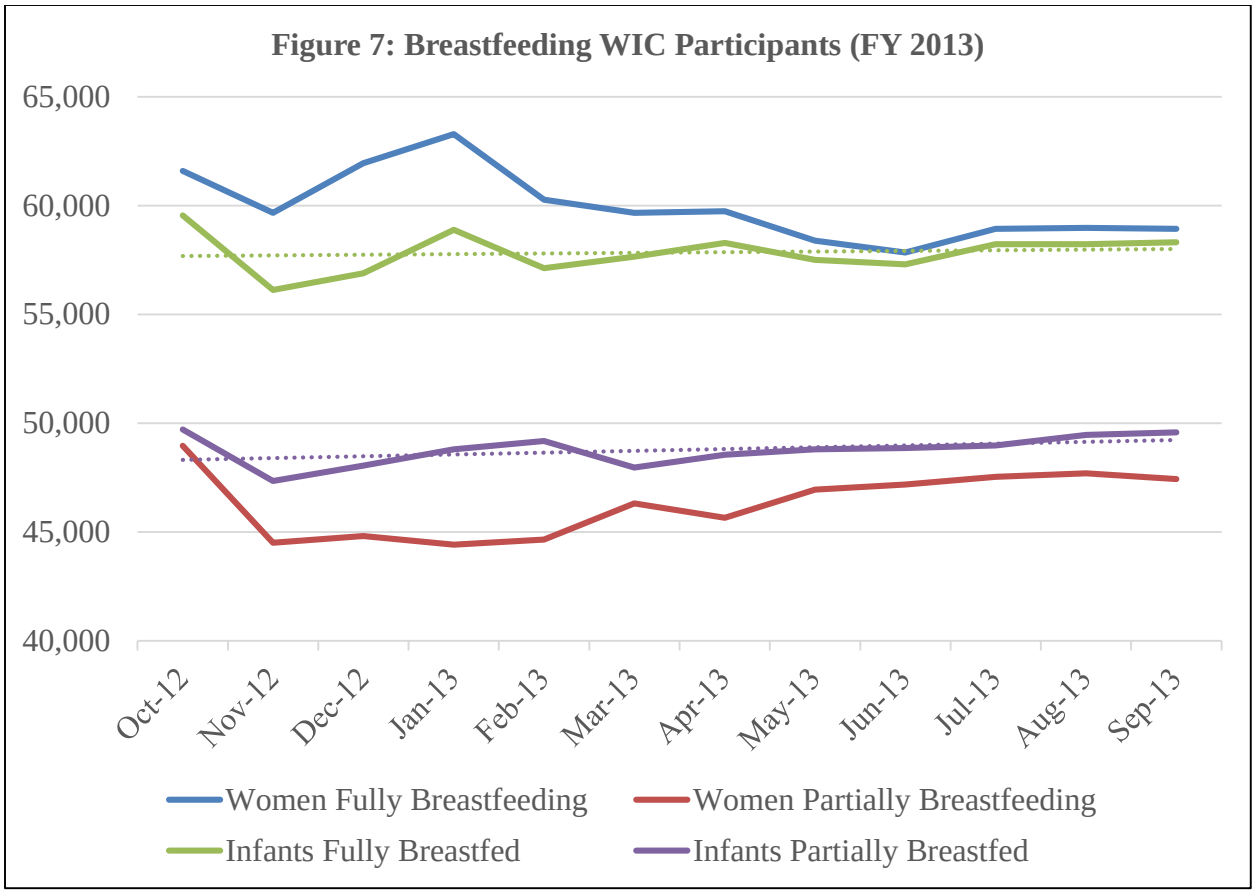
Source: Women, Infants, and Children, 2015



Source: Women, Infants, and Children, 2015



Source: Women, Infants, and Children, 2015



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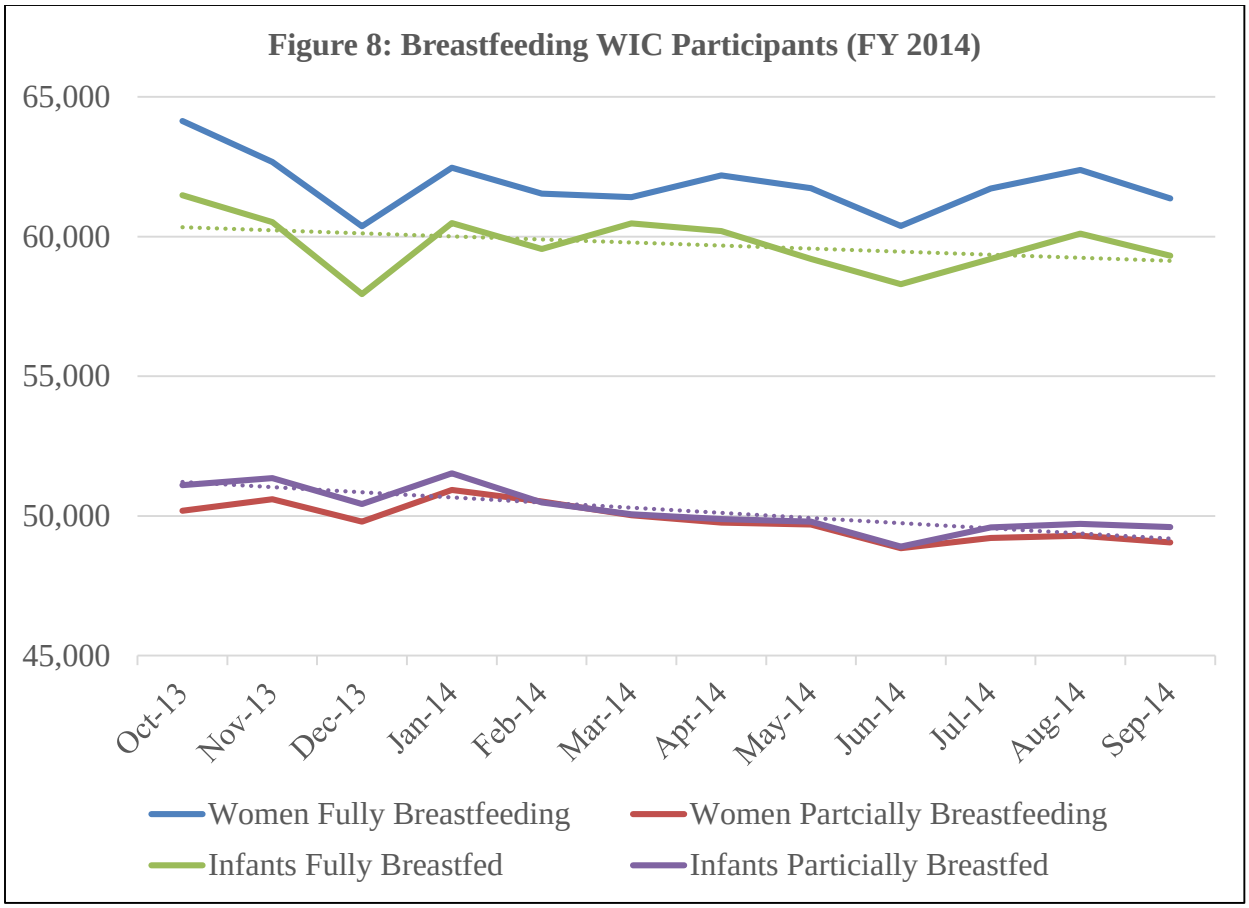
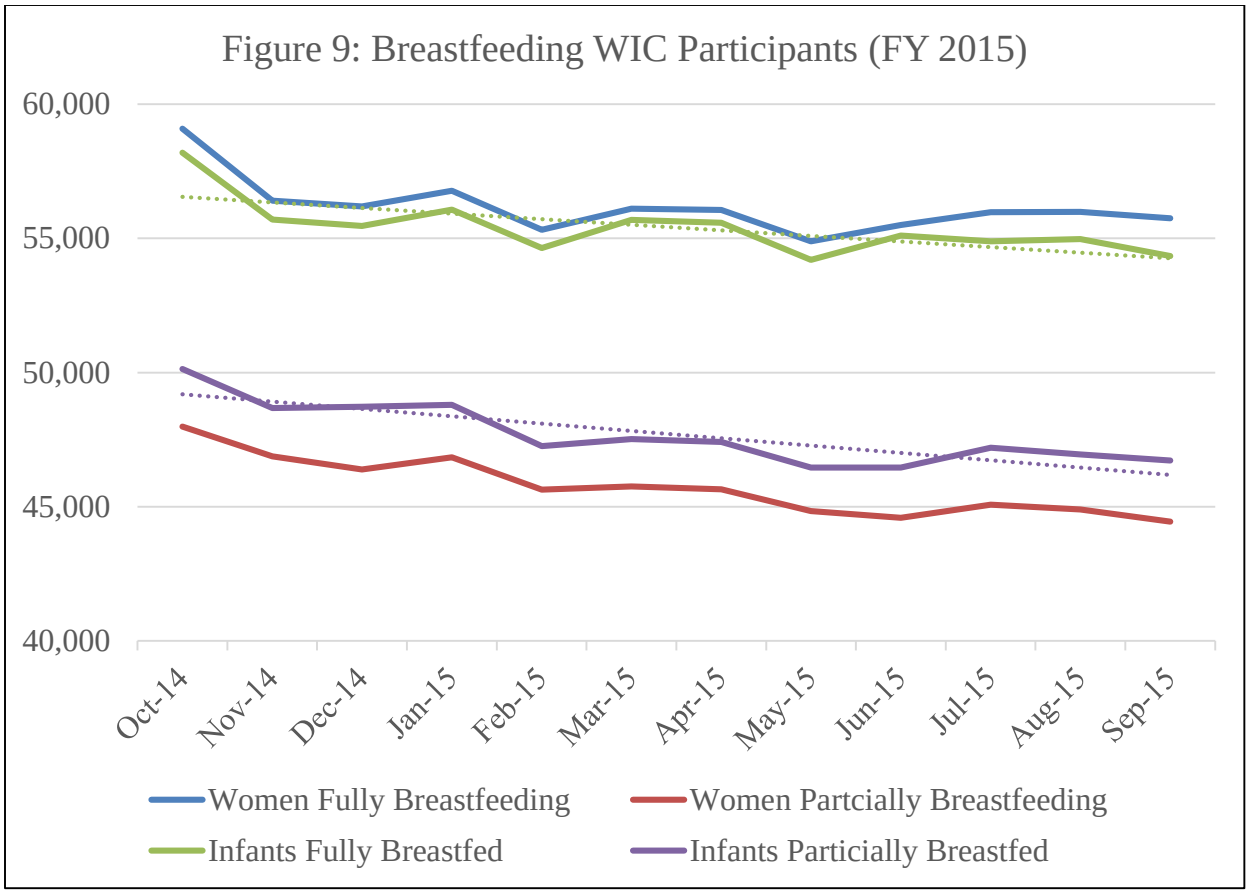


Source: Women, Infants, and Children, 2015



Source: Women, Infants, and Children, 2015

Infant Health

To learn the health status of infants in the studied regions, data was drawn from *County Health Status Profiles* by the California Department of Public Health for live births, infant mortality, infants with low birth weight, early prenatal care, and early breastfeeding initiation *(See Table 6).* Infant mortality was defined as death before the age of one year, low birth weight was defined as weighing less than 2,500 grams at the time of birth, early prenatal care was defined as prenatal care in the first trimester of pregnancy, and early breastfeeding initiation was defined as breastfeeding in the first 24 to 48 hours following birth. The data for infant mortality was based on a three -year average from 2010 to 2012. The data for low birth weight, early prenatal care, and early breastfeeding initiation was based on a three-year average from 2011 through 2013.

Table 6: Infant Health Status

	Santa Clara County			California		
	Live Births	**Number**	**Percent (%)**	**Live Births**	**Number**	**Percent(%)**
Infant Mortality	23, 966	74	.3	505,391	2,401	.5
Low Birth Weight	23,749	1,652	7	500,042	33,846	7
Early Prenatal Care	23,634	20,187	85	489,748	409,642	84
Early Breastfeeding Initiation	20,676	19, 890	96	432, 374	399,224	92

Source: County Health Status Profiles, 2015

Analysis and Conclusion

Healthy People 2020 Objectives

Data from the MIHA for any breastfeeding and exclusive breastfeeding three months after delivery was used to assess the progress made toward the Healthy People 2020 goals. It was found that in 2012, Santa Clara County and California both met the Healthy People 2020 objective to increase the proportion of breastfeeding mothers in the early postpartum period to at least 81.9 percent. However, the goal to increase exclusive breastfeeding at three months to 46.2 percent was not met. From the Santa Clara County sample, 91 percent of women breastfed in the early postpartum period while only 26 percent exclusively breastfed at three months. In the California sample, 83 percent of women breastfed in the early postpartum period while only 27 percent exclusively breastfed at three months. This data suggests that although the majority of women breastfed in the early postpartum period, they faced barriers in exclusively breastfeeding only three months postpartum; therefore, barriers to exclusive breastfeeding need to be examined to improve exclusive breastfeeding incidence and duration. Perhaps WIC should increase its efforts to encourage the duration of exclusive breastfeeding among its participants to work towards achieving the Healthy People 2020 goal.

Birth Facility Support

The majority of live births in California in 2014 occurred at facilities that support the BFHI. However, the Healthy People 2020 objective to reduce the proportion of breastfed newborns who receive formula supplementation within the first two days of life to 14.2 percent was not met, as 32 percent of infants were born at hospitals that did not have baby-friendly hospital practices. Santa Clara County also fell short in meeting this goal. Although any breastfeeding rates were above 92 percent, it is evident that all of the hospitals in Santa Clara County do not hold the

baby-friendly designation, as exclusive breastfeeding rates average 77.3 percent. This suggests that the infants born at hospitals in Santa Clara County in 2014 received formula supplementation before two days old, which may have adversely affected breastfeeding incidence, especially exclusive breastfeeding.

WIC Participation

In Santa Clara County, 45.1 percent of WIC infants were breastfed for up to one year in comparison to 27.4 percent of all babies born in the county. In California, 38.3 percent of WIC infants were breastfed for up to one year in comparison to 29.2 percent of all babies born in the state. The Healthy People 2020 target for breastfeeding at one year of age is 34.1 percent. Therefore, it was found that both countywide and statewide WIC breastfeeding rates met the Healthy People 2020 goal for breastfeeding at one year of age, while overall breastfeeding county and state rates missed the target by 6.7 percent and 4.9 percent respectively.

Breastfeeding among WIC infants was remarkably higher than that of the overall county and state. In Santa Clara County, breastfeeding incidence among WIC participants was 17.7 percent higher than the breastfeeding rates for all babies born in the county. In California, breastfeeding incidence among WIC participants was 9.1 percent higher than the breastfeeding rates for all babies born in the state. This indicates that WIC participation has a positive association with breastfeeding incidence.

Breastfeeding Trends among WIC Participants

Breastfeeding trends among WIC women and infants for fiscal year 2012 through fiscal year 2015 show that breastfeeding incidence was on the rise from 2011 to 2013, but has been decreasing since 2014. In fiscal year 2012, the incidence of fully breastfeeding infants was increasing while the incidence of partially breastfeeding infants was decreasing. In fiscal year

2013, the incidence of both fully breastfeeding and partially breastfeeding infants was steadily increasing. However, in fiscal year 2014, both rates were steadily decreasing and continued to decrease into fiscal year 2015. It is probable that this decrease in breastfeeding incidence is a result of the decline in total WIC participation since 2011. Breastfeeding incidence also tends to increase and decrease slightly throughout each fiscal year. However, the variance is small and statistically insignificant. These small changes could account for women and infants who began breastfeeding during a fiscal year and others who stopped breastfeeding during a fiscal year.

Infant Health

In regards to live births in Santa Clara County for the three year averages ranging from 2011 to 2013, infant mortality accounted for less than one percent and low birth weight accounted for seven percent, while 85 percent had early prenatal care and 96 percent initiated breastfeeding early. In California, infant mortality, low birth weight, and early prenatal care was comparable to Santa Clara County. However, early breastfeeding initiation was four percent less in California than it was in Santa Clara County. This suggests that although the majority of live births in California occurred at birthing facilities that embraced the BFHI ten steps, mothers' decision to breastfeed may not have been influenced. While none of the birthing facilities in Santa Clara County embrace the BFHI ten steps, early breastfeeding initiation was higher in the county than it was in the state. Therefore, it is presumed that WIC participation may have had a positive influence on women's decision to breastfeed early.

Conclusion & Recommendation

Upon analysis of the data collected in this study, it was found that WIC fulfills the legislative intent to increase breastfeeding incidence among participants. However, collaborative efforts between WIC and hospitals would be beneficial to support exclusive breastfeeding, and infant

and child nutrition. WIC enrollment should be encouraged during prenatal care visits, and hospitals within Santa Clara County should integrate the BFHI into their maternity care practices. In addition to breastfeeding support, WIC should also consider other outlets to promote infant health and long-term child and adolescent health. A food pharmacy, such as that of the Second Harvest Food Bank for diabetes patients, is a good model to ensure developing infants get proper nourishment during the key phases of brain development and beyond. In the case of WIC infants and children, the food pharmacy would use nutritious food to prevent and treat potential medical problems associated with the lack of nutrition, such as infants with small brains. These medical problems can be altered with good prenatal, infant, and childhood nutrition to overcome some of poverty's negative impacts.

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