Breastfeeding Promotion Research: The ES/WIC Nutrition Education Initiative and Economic Considerations. By Jon P. Weimer. Economic Research Service, U.S. Department of Agriculture. Agriculture Information Bulletin No. 744.

Abstract

Educating low-income women about the advantages of breastfeeding their babies increases the number who breastfeed. This report summarizes the results of four projects that focused primarily on promoting breastfeeding, which is considered to be the most healthful and beneficial feeding method for most infants. Research has shown that breastfeeding improves the general health, growth, and development of infants and significantly reduces the risk of several health problems both during early life and in later years. Lower income women have been less likely to breastfeed than higher income women. One step USDA has taken to promote breastfeeding is the ES/WIC Nutrition Education Initiative. This combines the strengths of two nutrition programs for low-income families—the Cooperative Extension System's Expanded Food and Nutrition Education Program and the Food and Nutrition Service's Special Supplemental Nutrition Program for Women, Infants, and Children. This report shows that breastfeeding education before delivery increases the initiation of breastfeeding among low-income women. The results also indicate that breastfeeding support soon after delivery increases the duration of breastfeeding.

Acknowledgments

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Summary

Educating low-income women about the advantages of breastfeeding their babies increases the number who breastfeed. This report summarizes the results of four projects that focused primarily on promoting breastfeeding, which is considered to be the most healthful and beneficial feeding method for most infants. Research has shown that breastfeeding improves the general health, growth, and development of infants and significantly reduces the risk of several health problems both during early life and in later years.

Lower income women have been less likely to breastfeed than higher income women. One step USDA has taken to promote breastfeeding is the ES/WIC Nutrition Education Initiative. This combines the strengths of two nutrition programs for low-income families—the Cooperative Extension System's Expanded Food and Nutrition Education Program and the Food and Nutrition Service's Special Supplemental Nutrition Program for Women, Infants, and Children.

This report shows that breastfeeding education before delivery increases the initiation of breastfeeding among low-income women during the first 2 weeks after delivery. The results also indicate that breastfeeding support soon after delivery increases the duration of breastfeeding. It was particularly evident that well-trained peer counselors who provide ongoing education and support can significantly influence breastfeeding initiation and duration among low-income women.

Under the 3-year Initiative, 18 Cooperative Extension System (CES) projects were competitively awarded special funds for the development of community nutrition education programs. The main goal of the Initiative was to change the behavior and promote the nutritional well-being of the neediest WIC participants. Another primary objective of the Initiative was to promote interagency cooperation between WIC and Extension projects, since cooperation between the two agencies at the local level was seen as being vital to strengthening referral networks and improving program efficiency. In addition, all 50 States and U.S. Territories received more limited amounts of funds to conduct projects. These additional 56 projects are not included in this report.

Part of the responsibility of the Economic Research Service in this Initiative was to provide advice and technical assistance to the projects in the evaluation and reporting of their respective nutrition education programs.

The Initiative generated a variety of innovative programs, with various target audiences, objectives, and educational strategies, and included the creation of a number of educational curricula and materials. Four of these projects—Guam, Iowa, Michigan, and North Carolina—focused primarily on promoting breastfeeding.

The Guam project provided breastfeeding education to WIC women in either their high schools or WIC clinics. The main thrust of the project's breastfeeding education effort was a three-lesson set that was culturally appropriate for Guam's multicultural population. Clients receiving the instruction had higher initiation and longer duration rates of breastfeeding than did a comparison group of WIC women.

The Iowa project trained volunteers from the community to serve as peer counselors who had contact with the women on a one-to-one basis, in person, and by telephone, both before and after delivery to provide support or information on breastfeeding. Breastfeeding initiation and duration rates were higher for the mothers who received peer counseling than they were for a group of mothers who did not receive counseling.

The Michigan project also employed peer counselors to encourage and support WIC clients who were interested in breastfeeding. Peer-counselor contacts would be made at different time points within both the prepartum and postpartum stages. Frequent contacts were made during the first 2 weeks postpartum when many breastfeeding problems are more likely. Peer counselors attempted to make a home visit to observe breastfeeding within 48 hours of hospital discharge. Compared with a reference WIC population in Michigan, the women receiving counseling had a higher breastfeeding initiation rate and breastfed longer.

The North Carolina project's focus was to increase the breastfeeding duration of WIC clients. This project also trained lay people (called paraprofessionals) to provide support for breastfeeding mothers. WIC clients participating in the intervention were contacted in the hospital after delivery, again within the first 72 hours after hospital discharge, and on additional home visits, if needed. The most frequent contacts came during the first 2 weeks postpartum. Duration of breastfeeding was significantly longer for the group receiving the paraprofessional support than it was for a comparison group of WIC clients that did not receive support.

The Guam, Iowa, and Michigan studies indicated that prenatal breastfeeding education increased breastfeeding during the first 2 weeks postpartum. All four projects suggested that early postpartum breastfeeding support is effective in increasing the duration of breastfeeding for a low-income population. The Iowa, Michigan, and North Carolina studies reinforced the results of several earlier studies that indicated that well-trained peer counselors have a positive effect on breastfeeding practices among low-income women.

There have been relatively few cost-benefit studies to determine the financial and health savings of breastfeeding, partly because of the challenges in getting accurate cost and benefit estimates for particular methods of infant feeding. This report discusses the need, in spite of these challenges, to show that promotion and support of breastfeeding are economically advantageous as well as nutritionally sound approaches.

Breastfeeding Promotion Research

The ES/WIC Nutrition Education Initiative and Economic Considerations

Jon P. Weimer

Introduction

Breastfeeding is widely believed to be the most beneficial method of feeding for the health and well-being of most infants. And, although breastfeeding is not recommended for all mothers (such as those who use illegal drugs, are receiving cancer chemotherapy, have tested HIV positive), public health experts, such as the American Academy of Pediatrics, the American Dietetic Association, and the Surgeon General, endorse breastfeeding as the preferred infant-feeding method in most cases. Most recently, the American Academy of Pediatrics issued a policy statement recommending that women breastfeed infants throughout the first year of the infants' lives (American Academy of Pediatrics, 1997).

Over the last two decades, research has shown that breastfeeding of infants provides advantages with regard to general health, growth, and development and significantly decreases risk for a large number of acute and chronic diseases. Specifically, there is fairly strong evidence that breastfeeding decreases the incidence and/or severity of diarrhea (Beaudry and others, 1995; Dewey and others, 1995; Howie and others, 1990; Reeves, 1993), respiratory infections (Alho and others, 1990; Beaudry and others, 1995; Howie and others, 1990; Wright and others, 1995), ear infections (Aniansson and others, 1994; Dewey and others, 1995; Duncan and others, 1993; Owen and others, 1993; Paradise and others, 1994), bacterial meningitis (Cochi and others, 1986; Istre and others, 1985), and urinary tract infections (Pisacane and others, 1992).

Breastfeeding may have a protective effect against insulin-dependent diabetes mellitus (Gerstein, 1994; Karjalainen and others, 1992; Mayer and others, 1988), Crohn's disease (Koletzko and others, 1989; Rigas and others, 1993), allergic diseases (Halken and others, 1992; Lucas and others, 1990; Saarinen and Kajosaari, 1995; Walker, 1985), and certain chronic digestive diseases (Arnold, 1993; Greco and others, 1988; Udall and others, 1985). Breastfeeding may also enhance cognitive development (Lucas and others, 1992; Morrow-Tlucak and others, 1988; Rogan and Gladen, 1993). The health of mothers may also benefit—less postpartum bleeding (American Dietetic Association, 1993; Chua and others, 1994) and less risk of breast cancer (Newcomb and others, 1994; Rosenblatt and Thomas, 1993).

One of the Surgeon General's National Objectives for the Year 2000 is to increase to at least 75 percent the proportion of mothers who breastfeed their babies in the early postpartum period and to increase to at least 50 percent the proportion who continue breastfeeding until their babies are 5 to 6 months old (U.S. Department of Health and Human Services, 1990). Lower socioeconomic groups have a lower incidence and duration of breastfeeding than higher socioeconomic groups and, thus, remain far from this goal (Abramson, 1992; Martinez and Kreiger, 1985; Ryan and others, 1991; Sciacca and others, 1995; U.S. Department of Agriculture, 1992). Recent data from a 1996 national survey, for example, indicate that women from households with less than $10,000 household income have breastfeeding initiation and 6-month duration rates of 42 and 12 percent, respectively (Abbott Laboratories, "Ross Mothers Survey," 1996).

In order to meet the Surgeon General's objective of increased breastfeeding, it is important that efforts to promote breastfeeding be directed toward women who are less educated, have lower incomes, and belong to minority groups. Nationally, the U.S. Department of Agriculture (USDA), which oversees the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), has taken many steps to promote breastfeeding, including establishing a Breastfeeding

Promotion Consortium to exchange information and collaborate on breastfeeding promotion activities. USDA recently announced a national campaign by Federal and State WIC programs to promote breastfeeding to WIC mothers and to support all women who choose to breastfeed. The goals of this special effort include encouraging WIC participants to begin and continue breastfeeding, to increase referrals to WIC clinics for breastfeeding support, to increase general public acceptance of and support for breastfeeding, and to provide support and technical assistance to WIC professionals in promoting breastfeeding. Ten pilot States were selected to initiate the campaign and receive technical assistance.

Strategies, then, to increase the initiation and duration of breastfeeding may be an important influence on the health of infants born to low-income women. The success of efforts to improve breastfeeding among low-income women has been inconsistent. Some studies indicate that the initiation of and duration of breastfeeding can be increased through education of pregnant women (for example, Johnson and others, 1984; Kistin and others, 1994; Saunders and Carroll, 1988; Sciacca and others, 1995). Other studies, however, show that educating women can be effective in increasing knowledge, but ineffective by itself in increasing the initiation or duration of breastfeeding (for example, Grossman and others, 1990; Kaplowitz and Olson, 1983; Kelley, 1983). A unique USDA interagency project, the ES/WIC Nutrition Education Initiative, has provided some evidence on what factors may contribute to increased initiation and duration of breastfeeding.

The ES/WIC Nutrition Education Initiative

The Department's WIC program serves as an adjunct to health care. It provides supplemental food, nutrition and health education, and referrals to other health and social services to low-income pregnant, postpartum nonbreastfeeding and breastfeeding women, and infants and children up to age 5 whose family income is at or below established income eligibility standards and who are found to be at nutritional risk. Recognizing the importance of local-level service coordination in meeting nutrition objectives, USDA funded community-based education projects in fiscal year 1993 designed to promote the nutritional health of the neediest WIC Program participants. Under the auspices of the ES/WIC Nutrition Education Initiative, 17 States were competitively awarded funds over a 3-year period for the development, delivery, and evaluation of innovative nutrition education projects. A total of 18 projects were operated at the State level through the Cooperative Extension System (CES), with funds administered at the Federal level by the Cooperative State Research, Education, and Extension Service (CSREES).[1,2]

The Economic Research Service (ERS) was asked to assist CSREES in the evaluation of these projects. This report is part of a larger evaluation effort by ERS, which included advice and technical assistance to the projects and Federal-level staff.

The Initiative was conceived as a way to combine the strengths of two nutrition programs aimed at the low-income population—WIC and the Cooperative Extension System's Expanded Food and Nutrition Education Program (EFNEP). Particularly important are WIC's resource of health professionals, access to a large at-risk low-income population, and successful combination of food assistance and nutrition education and EFNEP's intensive educational efforts carried out by paraprofessionals. EFNEP delivers experiential nutrition education to low-income homemakers through paraprofessional aides in a planned curriculum delivered over the course of several months. By emphasizing local flexibility, this Initiative allowed projects to design educational programs tailored to the specific needs of high-risk groups in each of the participating States.

One of the primary objectives of this Initiative was to promote interagency cooperation between WIC and Extension projects because cooperation between the two agencies at the local level was vital to strengthening referral networks and improving program efficiency. All 18 projects had project advisory committees with both WIC and Extension representatives.

A key element of this Initiative was targeting the neediest of WIC participants. The neediest population was defined as those who—as a result of such factors as geographic isolation, age, education, poverty, cultural background, or language—lack the skills, knowledge, and abilities to achieve a nutritious diet and a healthy lifestyle for themselves and their families.

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[1]One of the States, North Carolina, operated two projects—a breastfeeding promotion project and a pregnant adolescent project.

[2]The Initiative was originally administered by the Extension Service (ES), which has been reorganized into CSREES; thus, the Initiative was originally designated as the ES/WIC Initiative and retains that designation. A multiagency team, known as the ES/WIC Implementation Team, provided advice and support to the Initiative and was composed of members from CSREES, the Food and Nutrition Service (FNS), and the Economic Research Service (ERS).

The target audiences, objectives, and educational strategies of the 18 competitively funded projects were considerably diverse, a natural outgrowth of the CSREES commitment to tailoring community nutrition programs to meet local needs. For example, a number of projects focused on the rural poor because they often have less access to information and services. Other projects focused on specific ethnic groups (for example, Native Americans, immigrants from Central America, Haiti, Vietnam, and Thailand) because dietary habits vary widely by subculture and nutrition education messages must be tailored accordingly. A number of projects focused on improving the diets of participating women and collecting data on changes in nutrition knowledge and diet-related behavior. Other projects emphasized the importance of traditional EFNEP subjects, including meal planning, food shopping, and meal preparation. Four projects focused primarily on promoting breastfeeding and reporting results on breastfeeding initiation and/or duration. These projects were carried out in Guam, Iowa, Michigan, and North Carolina.

Guam

Specific circumstances on Guam that negatively impact infant feeding might be alleviated by increased rates of breastfeeding. Public health nutritionists and hospital records indicate that diarrhea and dehydration from improper infant feeding practices are common. Frequent power outages, which interrupt refrigeration, and the common practice of leaving food, including an infant's bottle, at room temperature, coupled with Guam's tropical climate, increase the incidence of food spoilage. Guam's project leaders thought that breastfeeding could help ameliorate these environmental and behavioral risks to the safety of infant food. Information available before the start of the project suggested that most young women on Guam did not initiate breastfeeding and, if they did, the duration of breastfeeding was brief. Very little data on breastfeeding initiation and duration had been collected before the start of this project, but WIC data indicated that the initiation rate for its clients might be as low as 12 percent. Therefore, education on breastfeeding was identified as especially important for this project's target population, pregnant adolescents. Thus, the objectives of this project were to increase the initiation and duration of breastfeeding on Guam, especially among adolescents.

Design Overview

The educational intervention component of Guam's project was referred to as Early Experiences and Counseling for Effective Lactation (EXCEL). It was designed to increase adolescent WIC clients' knowledge and skills that would contribute to improving their diets and lifestyles. The other component of EXCEL involved consistent ongoing breastfeeding education in high schools or at WIC clinics. High school students received twice monthly contacts; the group size was usually between 5 and 15 students. The lessons were designed to fit the 45- to 50-minute school class periods. Participants at WIC clinics were seen individually at monthly intervals. In the breastfeeding education portion of the EXCEL curriculum, there was a pre-training phase that allowed staff to learn the beliefs of the participants about breastfeeding and their expectations (for example, anticipated painful or pleasant experience; parents' reactions or support, etc.). Individualized home visits or telephone encounters were also available after birth to provide support for continuing breastfeeding.

Material Use and Development

The design of the EXCEL project included a commitment to produce educational materials that were culturally appropriate and met the needs of learners for whom English is a second language. The population of Guam is primarily Asian or Pacific Islander; 43 percent of the population is native Chamorro, 28 percent is Filipino, and 4 percent are from other jurisdictions of Micronesia. Because of the multicultural nature of Guam's population, 63 percent of all island households speak a language other than English. The EXCEL curriculum consisted of eight lessons, three of which addressed changes in breastfeeding behavior objectives. The breastfeeding topics were (1) The Benefits of Breastfeeding; (2) Getting Started with Breastfeeding; and (3) Succeeding at Breastfeeding. A video developed specifically for this project, *Breastfeeding, the Natural Beginning*, supported the three breastfeeding lessons. The cast of this video represented a cross-section of the ethnicities found on Guam, and most of those in the video were high school or WIC participants.

Evaluation Design and Project Results

To assess the effects of the EXCEL curriculum on participants, the project also gathered breastfeeding data

on a comparison group of adolescents who did not receive the EXCEL lessons but who received the usual care at WIC or with their physician. Assignment of participants to either the intervention or comparison group was not random, but an attempt was made to match the groups as similarly as possible. The intervention and comparison groups were well matched demographically, although there was some age discrepancy between the two groups (a mean age of 17.0 years for the intervention group, and a mean age of 17.8 for the comparison group). There was a total of 365 intervention participants, of whom 209 were women who were pregnant or less than 9 months postpartum. These women received no education from EXCEL staff and made up the nonrandomized comparison group for this study. A total of 574 adolescents who participated in this project represented approximately 23 percent of all adolescents on Guam who were pregnant during the 3-year term of this project.

Initiation of Breastfeeding

The breastfeeding rates of EXCEL intervention participants were consistently greater than that of the comparison group. Breastfeeding was initiated by 81 percent of EXCEL intervention participants who received breastfeeding education, while 65 percent of the comparison group initiated breastfeeding. Although significantly lower than that for the intervention participants, the incidence rate for the comparison group was surprising and unexplainable—a rate much higher than that estimated for WIC clients of all ages on Guam, which, as mentioned earlier, was estimated to be 12 percent.

Duration of Breastfeeding

Intervention participants who received breastfeeding education had a mean breastfeeding duration of 68.6 days compared with a mean of 39.33 days for the comparison group. Forty-two percent of these intervention clients still breastfed when their babies were 2 months old versus 32.2 percent for the comparison group (fig. 1). In addition, the 6-month duration rate (number breastfeeding at 6 months divided by number initiating) was 23 percent, one-third more than the 6-month duration rate for the comparison group, which was 17 percent. The higher initiation rate and 6-month duration rate of EXCEL mothers suggested to the project staff that additional breastfeeding education and support may overcome some of the barriers to longer breastfeeding duration, especially with the adolescent population.

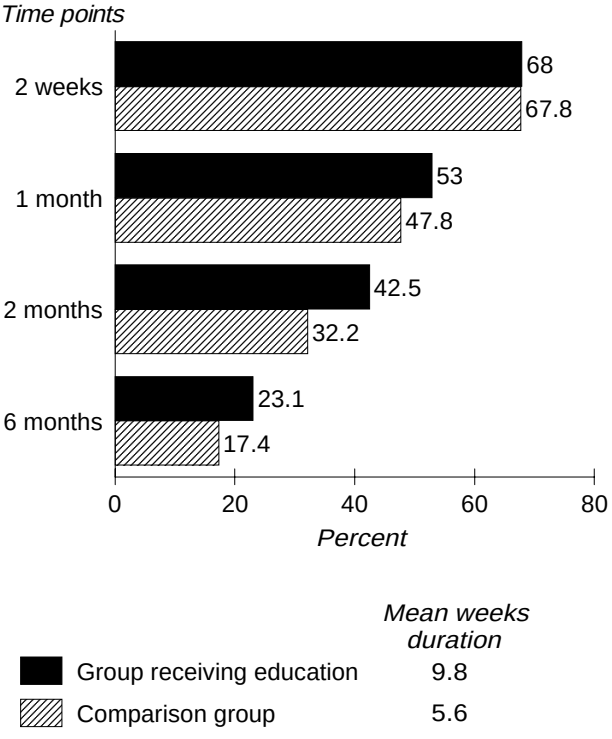
Reasons for Discontinuation of Breastfeeding

Returning to school was the most frequently identified reason for quitting breastfeeding given by adolescent mothers who received the EXCEL breastfeeding education (14 percent). Pain or physical discomfort was the next most frequently mentioned reason for ceasing to breastfeed (13 percent), followed by self-weaning of infant (11 percent). Reasons such as “too demanding” or “didn’t like it” were mentioned by less than 3 percent of the adolescent mothers receiving breastfeeding education.

Iowa

The rate of increase in child poverty in rural Iowa (21.7 percent) in the past decade has been almost twice that of the entire United States (11.9 percent). In addition, the poverty rate for young children in Iowa (ages 0-4) has been over one-third higher than for children

Figure 1
Guam: Share of initiators still breastfeeding at various time points



Source: Compiled by Economic Research Service, USDA, from R. Pobocik, 1996, "Early Experiences and Counseling for Effective Lactation (EXCEL)," unpublished Final Report for ES/WIC Nutrition Education Initiative, University of Guam.

ages 5-17 (17.5 percent versus 12.6 percent). From the perspective of the project leaders in Iowa, the conditions of poverty provided an incentive to increase breastfeeding initiation rates or, in the instances where breastfeeding had been initiated, to increase breastfeeding duration rates. As stated in the introduction of this report, for newborn infants, human milk provides an optimal nutritional start. The clientele of this project were WIC-eligible smalltown and rural mothers in two communities chosen because of a high need for intervention and services—communities that appeared to lack both adequate access to information and support for lactating mothers. Iowa's breastfeeding objectives were to increase the initiation and duration of breastfeeding in these two communities.

Design Overview

The educational intervention design was one-on-one support from peer volunteers for WIC-eligible clients who were either pregnant or postpartum and breastfeeding. Volunteers from the community were trained to be peer counselors. One of the criteria to serve as a peer counselor included successful breastfeeding. Peer support for breastfeeding mothers was envisioned as being particularly effective in communities where role-models for breastfeeding behaviors, knowledgeable health care providers, or cultural practices that included breastfeeding as a norm were scarce. Using referrals from WIC, project members talked with pregnant WIC-eligible women about their plans to feed their babies. Breastfeeding was encouraged as a choice. Clients who were interested in participating completed entry information. A client was then matched with a volunteer peer counselor who worked with the mother in person before and after delivery. The peer presented short lessons on nutrition and breastfeeding, provided support and information on nutrition and breastfeeding, answered breastfeeding questions, and made referrals for nonroutine assistance. On average, peers met with mothers 4 times, ranging from 1 to 16 contacts, with each session 1 to 1½ hours long.

Material Use and Development

The Iowa project developed the following educational materials: "Consider Breastfeeding" (a flip chart of the common concerns and advantages of breastfeeding); and *Breastfeeding Basics* (a series of five brochures encouraging a mother to consider breastfeeding and providing information on starting and continuing breastfeeding. These brochures were *Thinking About Breastfeeding, Getting Started, The Early Weeks, Common Concerns,* and *Returning to Work or School*. The project also developed a poster entitled Breastfed Babies Benefit the World.

Evaluation Design and Project Results

The control group consisted of women and their infants enrolled in WIC in six Iowa counties. To be selected for the control group, a county could not have had significant breastfeeding promotion activity in the 3 years before the study. Two demographic variables were available for direct comparison—age and household size. There were no statistically significant differences between control and treatment groups on these two variables. The project had 143 WIC-eligible women enrolled in the treatment group, 72 for whom there was completed data. The control group consisted of 64 WIC participants.

Initiation of Breastfeeding

Only 31 percent of the control group initiated breastfeeding compared with 82 percent of the treatment group. This striking difference may not be an entirely fair comparison because the treatment group was not a total WIC population as was the control group. Women self-selected participation in the project, so they already possessed a willingness to consider the breastfeeding option.

Duration of Breastfeeding

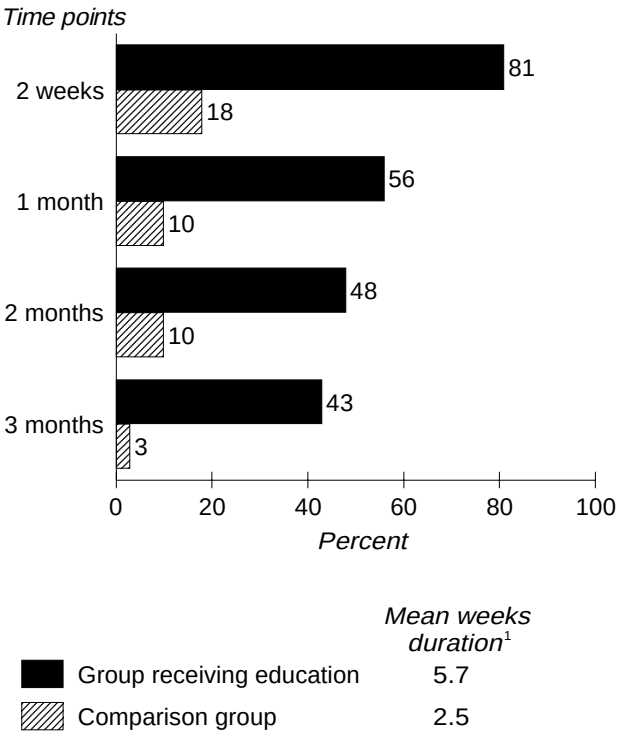
The mean duration of breastfeeding for the control group was 2.5 weeks compared with 5.7 weeks for the treatment group. Note, however, that records on duration for the Iowa project were kept until only 12 weeks after the infant's birth. If records had been kept longer, as they were in the three other State projects, it's reasonable to believe that the mean duration figures would have been higher. Forty-eight percent of the treatment group still breastfed at 2 months versus 10 percent for the control group. Breastfeeding rates declined progressively in the weeks after the baby's birth and at approximately the same rate for both control and treatment groups. Breastfeeding appears to have fallen off the most during the first month of the infant's life. If women were able to persist to at least 4 weeks, the rate of breastfeeding remained fairly constant. At all time points, the percentage of women in the treatment group who were breastfeeding their infants was much higher than in the control group. At

12 weeks, for example, 3 percent of control group participants were breastfeeding compared with 43 percent of treatment participants (fig. 2).

Reasons for Discontinuation of Breastfeeding

The most common reason for discontinuing breastfeeding was "inadequate milk" (22 percent of the mothers who initiated breastfeeding), closely followed by "too demanding" (19 percent) and by "physical discomfort" and "return to work or school" (both 16 percent). The Iowa project researchers felt that these most frequently cited reasons for discontinuing could be easily overcome with adequate information and support, and that these reasons were often the result of misinformation.

Figure 2
Iowa: Share of initiators still breastfeeding at various time points



[1]Records on duration kept until only 12 weeks after infant's birth.
Source: Compiled by Economic Research Service, USDA, from E. Schafer, 1996, "Building a Peer Network of Nutrition and Breastfeeding Support for Rural Iowans," unpublished Final Report for ES/WIC Nutrition Education Initiative, Iowa State University Extension.

Michigan

Given that, on a national level, lower socioeconomic groups have lower rates of breastfeeding initiation and duration than higher socioeconomic groups, Michigan project directors felt that geographic, economic, and racial/ethnic groups in the State would benefit from breastfeeding support programs. Six counties in the State with breastfeeding rates below the State average were selected. These counties were in the top quartile in number of families at or below the U.S. poverty level but had a high level of local commitment to the effort. The objective of the study was to develop a program that provided breastfeeding education and support to pregnant, Medicaid-eligible participants in the WIC program to increase the number of mothers who initiate breastfeeding and to increase the duration of breastfeeding.

Design Overview

Women with personal breastfeeding experience who were representative of the local WIC population were hired and trained as breastfeeding peer counselors to encourage and support WIC clients interested in breastfeeding their infants. WIC staff identified women who were considering breastfeeding based on their interest in breastfeeding information. Postpartum women entered the program at various stages of breastfeeding, usually because they were dealing with a problem related to breastfeeding. The average number of contacts made with women enrolled in the program was 6.3, with 3.5 being by phone and 3.1 in the mother's home. Many breastfeeding peer counselors visited mothers in the hospital before discharge, if invited to do so by the mother. Some contact was also made in the WIC clinic through nutrition education classes or support groups. Frequent contacts were made during the first 2 weeks postpartum, when many breastfeeding problems arise. Peer counselors attempted to make a home visit and observe breastfeeding within 48 hours of hospital discharge. Peer counselors referred problems beyond their expertise to lactation consultants or other skilled health care providers. Peer counselors wore pagers in order to increase their ability to respond quickly to mothers' questions and/or problems. The primary types of breastfeeding support offered were how to breastfeed (technique), preventing or solving breastfeeding problems, nutrition recommendations for the breastfeeding mother, and adding supplemental feedings and weaning.

Material Use and Development

All breastfeeding clients were introduced to material from a lesson developed jointly by the State WIC Lactation Consultant and Breastfeeding Counselor

Program Manager (*Eating Right for Two,* and *Feeding Your New Baby (0-4 months)*). All breastfeeding peer counselors incorporated teaching concepts from a parenting curriculum, Building Strong Families. In general, however, the Michigan project found structured curriculum had limited use in a peer counseling setting. Counselors felt that effective counseling came from asking open-ended questions, actively listening, and assessing the client's needs. Training efforts emphasized the importance of providing encouragement and support and addressing client concerns rather than formal instruction.

Evaluation Design and Project Results

The Michigan project did not use a control group but, rather, compared client breastfeeding initiation and duration rates with Michigan WIC reference data. For this project, 2,263 clients had been provided breastfeeding peer support. Completed data were obtained for 1,343 clients.

Initiation of Breastfeeding

Of the 560 participants enrolled prenatally, 87.5 percent initiated breastfeeding. This breastfeeding initiation rate appears high compared with Michigan WIC reference data (32 percent), but determining the true effect of the breastfeeding intervention on initiation is difficult due to lack of a true control group. The project participants represent, in essence, a self-selected group who are considering breastfeeding and are interested in joining a support program. The Michigan State WIC program, on the other hand, does not have a standard mechanism by which women are identified as "considering breastfeeding." Michigan researchers found that the factor most strongly related to initiation was previous breastfeeding experience—that is, initiation rates were higher for women who had previously breastfed than for those women who had not (table 1).

Duration of Breastfeeding

Women who had peer support breastfed longer than the general Michigan WIC population. The mean duration was 14.6 weeks, with 55 percent of breastfeeders still breastfeeding at 2 months compared with only 18 percent of the general Michigan WIC population (fig.3). Again, the same caveat about comparing data with the WIC reference group applies. Among the project's breastfeeding clients, the average duration was significantly higher for women who entered the program after their babies were born and for women with previous breastfeeding experience. Black women had the longest average duration of any ethnic group (17.1 weeks).

Reasons for Discontinuation of Breastfeeding

The most frequently cited reason for discontinuing breastfeeding in the Michigan project was "returning to school" (20 percent), a reason given most often by teens under 18 years of age, followed by "too demanding" (19 percent) and "baby self-weaned" (18 percent).

North Carolina

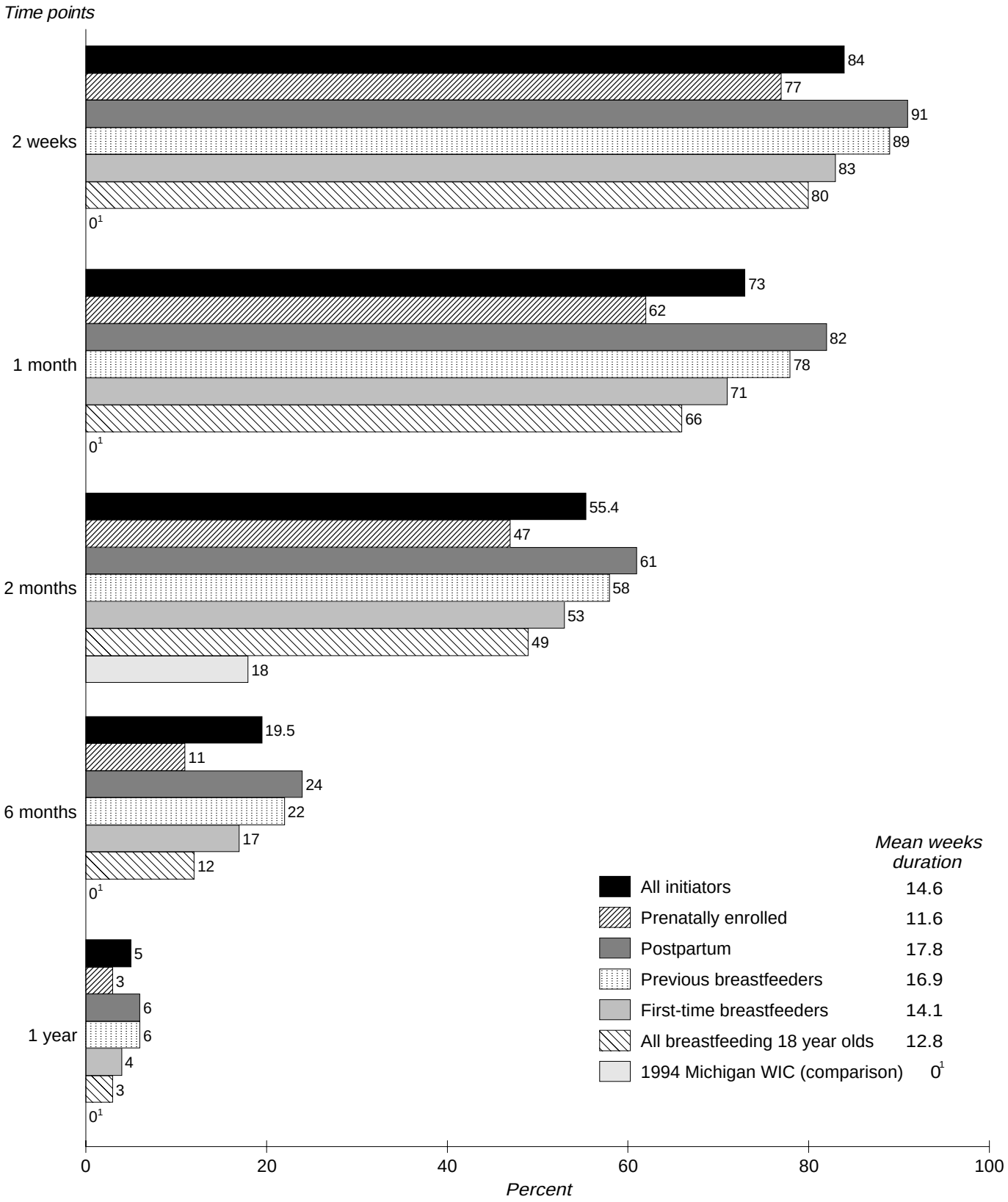
The rate of infant mortality in North Carolina is higher than the national average. The State infant mortality rate is 12 per 1,000 births compared with a national infant mortality rate of 7.2 per 1,000 births (U.S. Department of Health and Human Services, 1997b). For infants born to teenaged mothers, the mortality rate rises to 17 per 1,000 births. Of particular concern is the very high rate of infant deaths among minority populations. During 1985-89, the average rate of infant deaths for minority families in North Carolina was 17.5 percent compared with 9.3 percent for white infants. This State project saw promotion of breastfeeding to be the best method for feeding an infant and thus a strategy for reducing infant mortality in the State. The targeted population for this project was WIC clients in five counties who intended to breastfeed their infants. The objective of the project was to

Table 1—Michigan: Breastfeeding initiator rates of women enrolled prenatally

Participants	Initiators
	Percent
All prenatal women	87.5
Women with no breastfeeding experience	87.4
Women with previous breastfeeding experience	97.3
Teens less than 18 years old	81.4
By race:	
White	88.0
Black	85.0
Hispanic	89.0
1994 Michigan WIC	32.0

Source: Compiled by Economic Research Service, USDA, from B. Mutch and C. McKay, 1996, "Michigan's ES/WIC Nutrition Education Initiative: Breastfeeding Peer Counselor Initiative (BFI)," unpublished Final Report for ES/WIC Nutrition Education Initiative, Michigan State University Extension.

Figure 3
Michigan: Share of initiators still breastfeeding at various time points



[1] Information not provided.

Source: Compiled by Economic Research Service, USDA, from B. Mutch and C. McKay, 1996, "Michigan's ES/WIC Nutrition Education Initiative: Breastfeeding Peer Counselor Initiative (BFI)," unpublished Final Report for ES/WIC Nutrition Education Initiative, Michigan State University Extension.

increase the number of WIC clients who continued breastfeeding up to and beyond 2 months postpartum.

Design Overview

This project was designed to test the replication of an earlier pilot program conducted in 1991. The intervention in the pilot study and this project consisted of community-based support for breastfeeding WIC clients by one of two specially trained EFNEP paraprofessionals, one to take the primary role and the other to provide backup help as needed. Participants were contacted in the hospital after delivery, which helped to establish a relationship of trust and confirmed the client's location after hospital discharge.

The paraprofessional visited WIC mothers in their homes within the first 72 hours after hospital discharge. The mothers could call the paraprofessional's pager number for earlier help if needed. During home visits, the paraprofessional assessed progress with breastfeeding, explained supply and demand in lactation, checked on the baby's physical condition, corrected poor techniques, alleviated the mother's anxiety about breastfeeding ability, checked the adequacy of the mother's diet, and offered help in planning simple family meals. Additional visits were made as needed or at the client's request. The most frequent contacts came during the first 2 weeks postpartum and with mothers who were breastfeeding for the first time. For some experienced breastfeeding mothers, the only face-to-face contact was in the hospital and other contacts were made by telephone. A WIC nutritionist with lactation training was the consultant for questions concerning complications and the need for medical referral. The number of teaching contacts ranged from 1 to 13, averaging between 3 and 4.

Material Use and Development

Mothers received the pamphlet *Breastfeeding—Getting Started in 5 Easy Steps.* The paraprofessionals also taught maternal and breastfeeding material from the *Eating Right is Basic 2* curriculum developed by the Extension Service. However, as was the case in Michigan, the training in North Carolina emphasized formal instruction less than it did providing encouragement and support and addressing specific client concerns.

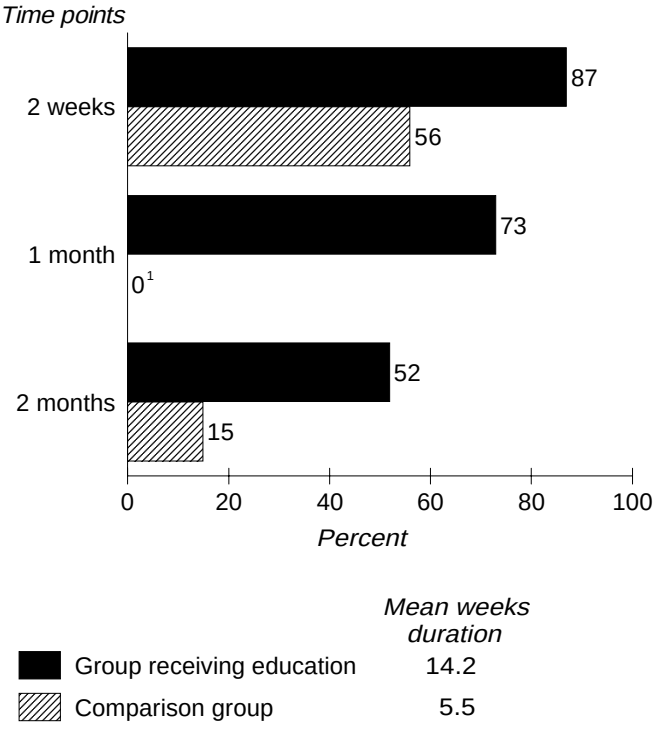
Evaluation Design and Project Results

Evaluation of this project was designed to compare breastfeeding duration with duration in the earlier pilot study. The earlier study used a comparison group of clients from a county that contained a similar WIC population, but that did not have an EFNEP program or special breastfeeding support. Completed data were obtained from 2,267 WIC clients who received the breastfeeding support intervention. The comparison group consisted of 115 WIC clients.

Duration of Breastfeeding

Average duration of breastfeeding among the intervention group was 14.2 weeks compared with 5.5 weeks among the control group. Eighty-seven percent of the intervention group was breastfeeding at 2 weeks compared with 56 percent among the control group. And 52 percent of the intervention group was breastfeeding at 8 weeks compared with 15 percent among the control group (fig. 4).

Figure 4
North Carolina: Share of initiators still breastfeeding at various time points



[1]Information not provided.
Source: Compiled by Economic Research Service, USDA, from N. Van Eck, 1996, "North Carolina EFNEP/WIC Breastfeeding Support Program," unpublished Final Report for ES/WIC Nutrition Education Initiative, North Carolina State University.

Discussion

Figures 5 and 6 encapsulate some of the key results from these four projects. The Guam, Iowa, and Michigan studies suggest that prenatal breastfeeding education was associated with an increase in breastfeeding in the immediate postpartum period. All four projects indicate that early postpartum breastfeeding support may be effective in increasing the duration of breastfeeding for a low-income minority population.

The Iowa, Michigan, and North Carolina studies reinforce the results of some earlier studies that suggest that peer counselors, well trained and with ongoing supervision, can have a positive effect on breastfeeding practices among low-income women who intend to breastfeed. Home support appears to be an especially effective way to encourage breastfeeding, particularly for low-income women for whom breastfeeding concerns can be identified and resolved by a trained person. A recent study, for example, found that breastfeeding support from lay people increased the odds of breastfeeding 3.3 times (Giugliani and others, 1994). Two studies (Serafino-Cross and Donovan, 1992; Seidel and others, 1993) examined in-home support by lactation consultants and found that breastfeeding duration significantly improved compared with control groups.

Personal one-on-one support may be even more appropriate now that the current practice of short hospital stays after giving birth results in less institutional support for the breastfeeding mother, whose milk supply may not be fully established before hospital discharge. In the initial planning and development of the three ES/WIC projects that used paraprofessional aides in the home, there was concern that low-income women in WIC would not be receptive to other people coming into their homes to talk about breastfeeding. The subject area may have been too intimate or too invasive, and women on public assistance were already inundated with home visitors. Apparently, this was not the case.

All four ES/WIC breastfeeding projects cited community coalitions as being essential for successful breastfeeding programs among low-income women and for sustainability beyond the 3-year funding of the Initiative. And the North Carolina project, specifically, cited the need to convince local government officials that breastfeeding promotion and support are cost effective.

Economics Involved

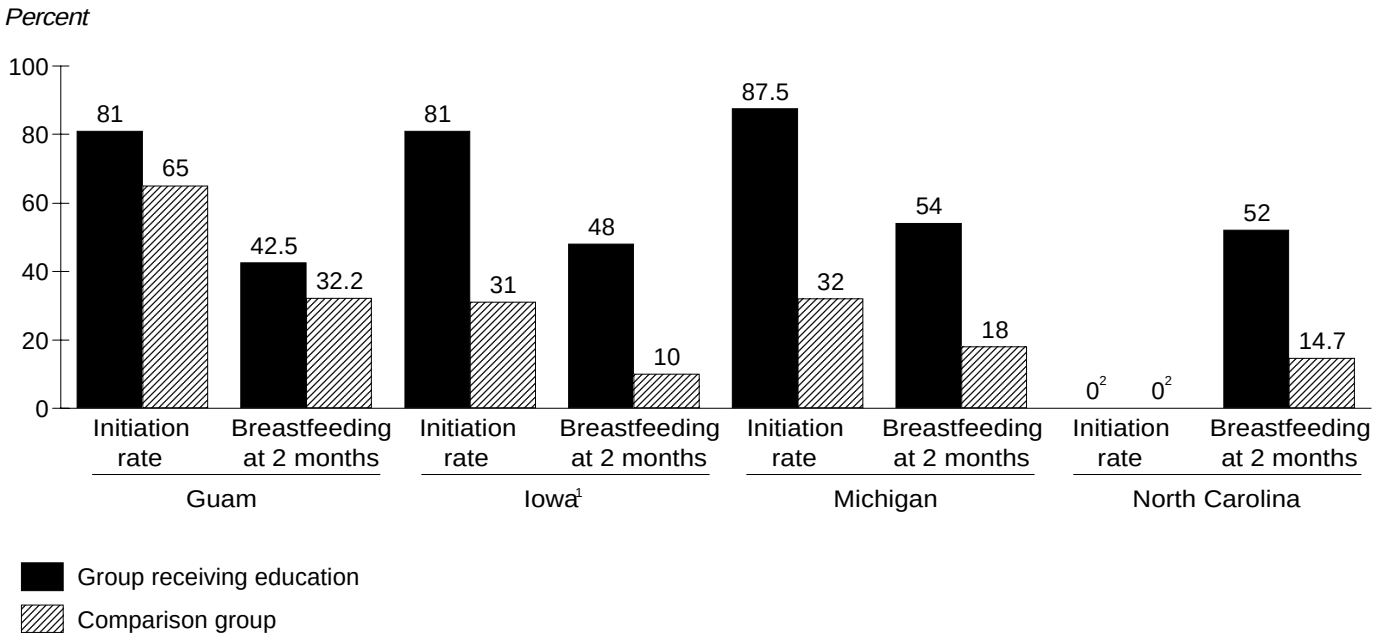
In addition to individual health benefits, breastfeeding may provide significant economic benefits to the Nation, including reduced health care costs and reduced employee absenteeism for care attributable to child illness. The significantly lower incidence of illness in the breastfed infant may allow the parents more time for attention to siblings and other family duties and reduce parental absence from work and lost income. The direct economic benefits to the family may also be significant. It has been estimated, for example, that the cost of purchasing infant formula for the first year after birth is about $1,000 (Tuttle and Dewey, 1996).

Costs of medical care continue upward. The Nation's total spending for health care in 1995 was nearly $1 trillion ($988.5 billion), an increase of 5.5 percent from the previous year, reflecting an estimated average of $3,621 per person. This figure represents 13.6 percent of the gross domestic product, a percentage approximately double that of any other developed nation (U.S. Department of Health and Human Services, 1997a). Although breastfeeding has been shown to provide immunologic protection against a variety of illnesses, it has not been included in the U.S. Department of Health and Human Services' Agency for Health Care Policy and Research (AHCPR) or other Federal cost-control deliberations. The aforementioned Health Objectives for Year 2000 are nonbinding. Also, employers have been reported to provide little support to working women who breastfeed (Fredrickson, 1993).

More evidence is needed showing that promotion and support of breastfeeding initiation and early intervention to help women (particularly low-income) extend breastfeeding duration are economically advantageous as well as nutritionally sound. Without health and cost-benefit studies, the Nation's employers, health and life insurance companies, and Federal health policymakers are unlikely to provide financial incentives to employees and insurance subscribers to breastfeed or to health providers to support and competently care for breastfeeding mothers. Many physicians and nurses, for example, are poorly trained in breastfeeding techniques and may not be motivated to care for breastfeeding mothers, perhaps because of the lack of financial reimbursement for such care by health insurance providers (Fredrickson, 1993; Michelman and others, 1990).

Figure 5

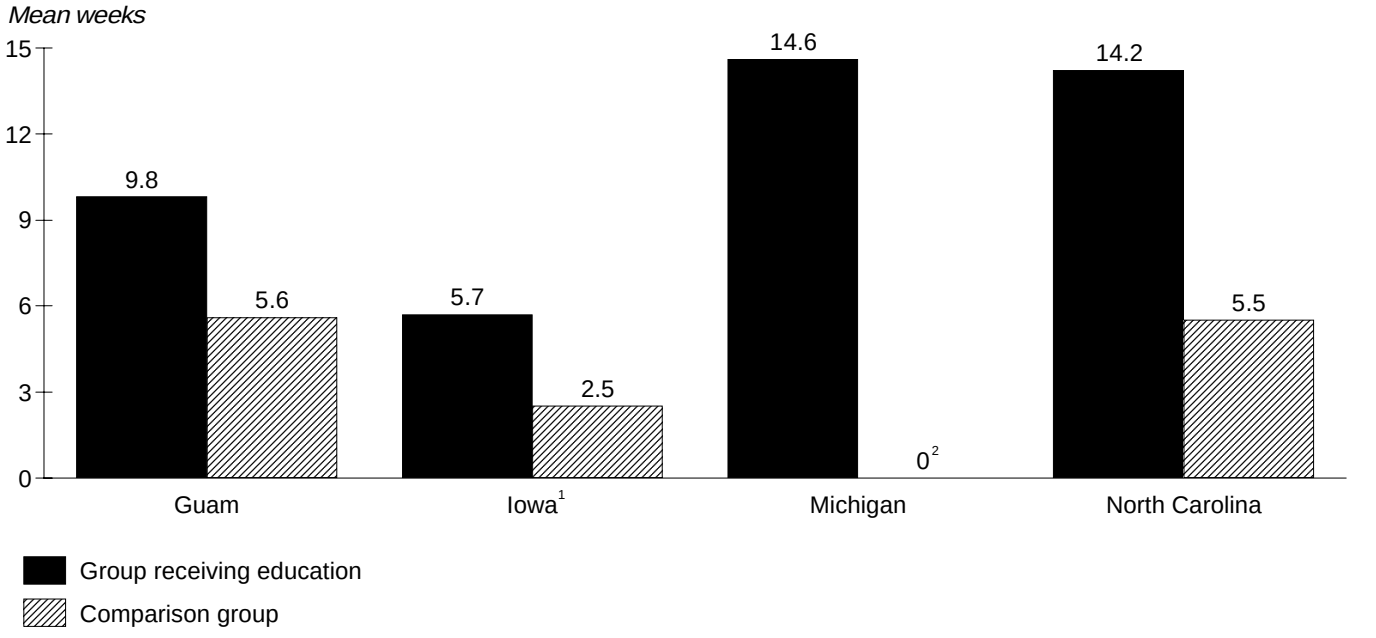
Selected results from the ES/WIC Initiative: Share of initiators still breastfeeding at 2 months



[1]Records on duration kept until only 12 weeks after infant's birth.
[2]Information not provided.
Source: Economic Research Service, USDA.

Figure 6

Selected results from the ES/WIC Initiative: Duration of breastfeeding



[1]Records on duration kept until only 12 weeks after infant's birth.
[2]Information not provided.
Source: Economic Research Service, USDA.

There have been relatively few cost-benefit studies to determine financial, psychosocial, and health savings afforded by breastfeeding. The few studies reported in the literature are those that have looked at the economic effect of breastfeeding in the context of comparing breastfeeding with formula feeding within WIC. Tuttle and Dewey (1996), for example, attempted to determine the potential cost savings for four social service programs (Medicaid, Aid for Families with Dependent Children, WIC, and Food Stamps) if breastfeeding rates increased among Hmong (Laotian) women enrolled in WIC in California. Similarly, Montgomery and Splett (1997) investigated whether breastfeeding of infants enrolled in WIC was associated with reduced Medicaid expenditures. Both studies estimated that a savings of over $400 per child can be expected the first year if a child is breastfed. In these two studies, savings from breastfeeding were related not only to the cost of formula, but also to the potential effect of breastfeeding on infant morbidity and, in the case of the Tuttle and Dewey study, maternal fertility.

Accurately estimating costs and benefits of a particular method of infant feeding poses methodologic challenges, which no doubt contributes to the scarcity of cost-benefit and cost-effectiveness studies on breastfeeding. Thus, the two studies just cited may have underestimated the savings by focusing only on the savings from specific public assistance programs and not on the savings from, for example, reduced costs for employers when working mothers are absent less often because their infants are ill less often. A comprehensive assessment of the economic benefits of reduced illness due to breastfeeding would be helpful because the information would be critical, for example, in performing cost-benefit analyses of breastfeeding promotion efforts. Getting accurate cost information is also a problem, particularly if it is from a second party. In the studies by Tuttle and Dewey and Montgomery and Splett, for example, incomplete Medicaid expenditures or inconsistent or uneven billing procedures among offices could lead to invalid conclusions.

On the other hand, cost-benefit analyses of breastfeeding promotion efforts, such as illustrated by the four ES/WIC State projects, requires documenting and quantifying relevant program costs, both direct (for example, personnel, educational materials) and indirect (for example, time and inconvenience for program participant). Although the four ES/WIC Initiative State projects contained an accounting of expenditures (both federally allocated and State-matched funds) over the 3-year life of the studies, they did not require the specificity needed for cost-benefit analyses. Expenditures were classified into broad expenditure categories, and a certain amount of costs were devoted to "front-end" expenditures for the developmental phases of these innovative projects. Note that the main goal of this Initiative was to change the behavior of and promote the nutritional well-being of the neediest WIC participants. The Initiative also involved projects that did not focus on promoting breastfeeding. The Initiative was not intended to be amenable to a cost-benefit or cost-effectiveness analytical framework.

Breastfeeding involves mostly primary, and to a lesser extent, secondary prevention. Primary prevention is any activity that prevents a disease from ever starting. Secondary prevention is any activity that cures or reduces the severity of a disease. As described earlier in this report, breastfeeding has been demonstrated to provide primary and some secondary protection against viral, bacterial, and allergic diseases. In addition, preventive health care services appear to be moving into managed care systems, such as health maintenance organizations and home health care services. In order for breastfeeding promotion efforts to be marketed as a cost-effective way to encourage mothers to breastfeed, additional research is needed to provide an assessment of the economic benefits of breastfeeding and the allocation of resources needed to conduct and evaluate the effectiveness of breastfeeding promotions.

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