

Food Assistance, Nutrition, and Health

WIC Participation and the Initiation and Duration of Breastfeeding

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Grant awarded by the Institute for Research on
Poverty, University of Wisconsin-Madison

This study measured the effect of participation in the Supplemental Nutrition Program for Women, Infants, and Children (WIC) after the birth of a child on one important health behavior: the initiation and persistence of breastfeeding. In the United States, many low-income mothers do not initiate breastfeeding at all and very few breastfeed for at least 4 months, although most pediatricians recommend breastfeeding exclusively for at least 4 to 6 months. Recognizing this problem, during the 1990s, the U.S. Department of Agriculture implemented many new policies intended to promote and support breastfeeding among WIC participants. While the new policies promote breastfeeding, the program provides infant formula in food packages, a major incentive for mothers to participate in WIC. The provision of infant formula in WIC food packages may work against the program's emphasis on breastfeeding.

To build on previous research on breastfeeding among WIC participants, this study used data from the children of the National Longitudinal Survey of Youth—a large, longitudinal data set that includes children born between 1990 and 1995. Average annual expenditures on breastfeeding education and promotion increased from \$9 million in 1990 to \$36 million in 1995. The authors employed econometric methods to account for self-selection into the WIC program and linked

mothers' breastfeeding practices to State WIC and Medicaid policies.

Very little is known about the effect of WIC participation on breastfeeding practices among participants during the 1990s. Previous research suggests that a woman's participation in WIC during pregnancy leads to important health benefits for children, including increases in birth weight, reductions in iron deficiency anemia, and reductions in infant mortality. Much less is known, however, about the benefits of WIC participation after pregnancy, during infancy, and during early childhood. Although research on the effectiveness of the WIC program focuses almost exclusively on a woman's participation during pregnancy, most WIC participants are not pregnant women, but rather are infants, young children, and post-partum women. A large proportion of WIC funds are targeted at these groups, but little is known about whether WIC improves health behaviors and outcomes for them. This information is necessary to evaluate the overall effectiveness and cost-effectiveness of the program, as well as to better target existing funds.

The main empirical challenge in this study was to account for the possibility that women select into WIC based on unobservable characteristics that also determine breastfeeding practices. For example, mothers disinclined toward breastfeeding might be more likely to participate in WIC. In this case, standard estimation methods will lead to a biased and inconsistent estimate of the effect of WIC on breastfeeding. The authors used three methods to account for this problem:

- (1) They estimated standard probit models with a rich set of covariates intended to capture many factors associated with breastfeeding decisions.
- (2) They estimated the models using an instrumental variables approach with State-level WIC and Medicaid policies as identifying instruments.
- (3) They took advantage of data available on siblings to estimate heteroscedastic, family-level fixed effects models that control for differences across families in unobservable characteristics.

The results of the study suggest that WIC participation has a negative effect on initiating breastfeeding, but it is not clear whether the program affects breastfeeding

persistence. Baseline results, which are preferable to instrumental variables results, indicate that WIC participation has a strong, negative effect on breastfeeding initiation, but no effect on breastfeeding for at least 16 weeks. A heteroscedastic fixed-effects model suggests that within families, WIC participation is associated with fewer weeks of breastfeeding. It is important to note that these results are based on a sample of mothers who are older and probably more advantaged than the national WIC population. It is also important to note that expenditures on WIC breastfeeding education and promotion have increased

significantly since 1995, which would be expected to influence the effect of the program on breastfeeding.

To generate implications for policy, more qualitative and quantitative research is needed that confirms the results from this small body of work. However, if these results can be replicated using other data, they imply that, while WIC has the potential to affect infant feeding practices, the program faces the challenge of increasing breastfeeding rates among participants, while continuing to offer infant formula to mothers who decide not to breastfeed.

The Effects of Food Stamp and WIC Programs on Nutrient Intakes of Children

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This study investigated factors determining participation in the Food Stamp Program (FSP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and the effects of these programs on nutrient intakes of small children. In previous studies, program participation was often investigated without consideration of the decisions on food and nutrition intakes. However, consumers typically make food choices from several commodities, and each food item typically contains multiple nutrients. Further, the decision to participate in the FSP and WIC is likely to be made simultaneously with the food and nutrient intake decisions. Statistical estimation procedures that ignore cross-equation correlation can cause loss of efficiency, and failure to accommodate simultaneity also leads to biases in empirical estimates.

This study addressed participation and effectiveness of the FSP and WIC in a multi-equation framework for nutrient intakes with endogenous FSP and WIC participation. The model considered is a multivariate generalization of the sample selection model and can also be viewed as a restricted form of switching regression for a system of equations.

In this study, the author examined (1) simultaneity of program (FSP and WIC) participation, food and nutrient intakes, and program participation and nutrition intakes, (2) effects of income and other explanatory variables on program participation, (3) effects of programs on nutrition intakes, and (4) effects of income and other explanatory variables on nutrient intakes. Nutrient intakes are expressed as a percentage of the recommended daily allowance reported in Federal dietary guidelines.

Empirical analysis was conducted for formula-fed infants and children, using data from the 1994-96 Continuing Survey of Food Intakes by Individuals and the 1998 supplemental Children's Survey. The findings indicate that the decision to participate in the FSP and WIC, as well as nutrient intake decisions, are made simultaneously. WIC participation is found to increase the intakes of most nutrients, whereas the effects of FSP are mixed. Overall, participation in both programs increases the intakes of all nutrients except protein. The methodology developed in this study can be used in future studies of the effects of other food assistance programs, such as the National School Lunch Program, on food intakes, nutrient intakes, and other outcome variables.

The Relationship of Nutritional and Health Status, Diabetes, and Stress to Food Security Among the Northern Cheyenne

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This project examined the relationships between food insecurity, nutrition, stress, and health status on the Northern Cheyenne Reservation. The authors assessed the food security and nutritional status of Northern Cheyenne residents, identified stress factors that may contribute to the development of health problems—especially the risk for diabetes.

The research design included collection of both quantitative and qualitative data. The authors collected quantitative data from a stratified sample of approximately 475 households on the Northern Cheyenne Reservation. The survey included questions about demographic characteristics and questions used to measure household food security and individual and family stress levels. The survey also contained questions about nutrition and health risks, including the risk factors associated with diabetes. The authors also collected qualitative data from 10 indepth, unstructured interviews with reservation residents and diabetes program

staff regarding nutrition and diet, as well as sources of stress that may affect health and quality of life.

The authors found that almost 70 percent of residents of the Northern Cheyenne Reservation live in food-insecure households, and that almost 35 percent live in households classified as food insecure with hunger. Almost one-fourth of survey respondents report that they have been diagnosed with diabetes, compared with roughly 4 percent of the overall U.S. population. Survey respondents were asked about several conditions or behaviors associated with an increased risk of diabetes. The research found that almost three in four residents are classified at medium or high risk for diabetes, as defined by the American Diabetes Association. The risk of diabetes is fairly constant throughout many different subgroups of the population and at many different levels of education and employment status. However, reservation residents age 55 and older are at a lower risk of diabetes than younger residents. The researchers also found that about one-fourth of reservation residents report high levels of stress, and that those with higher levels of education and who work more hours are more likely to report high stress levels.

The results of the logistic regression analysis indicated that the age of the household head and the number of children in the household are positively related to the likelihood that the household is food insecure. Households in which the head is employed part-time or in seasonal work experience higher rates of food insecurity than those in which the head is employed full-time. Respondents that report high levels of stress are more likely to experience food insecurity.

The authors note that this data analysis suggests the importance of continued attention to many aspects of reservation life and, in particular, to the factors producing high levels of diabetes and diabetes risk in Native American populations.

Food Stamp Program Participation and Obesity: Estimates From the NLSY79

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Grant awarded by the Joint Center for Poverty Research, Northwestern University and University of Chicago

This study examined the relationship between Food Stamp Program (FSP) participation and adult obesity. Based on past empirical research and the human capital model of the demand for health, the relationship between FSP participation and obesity is indeterminate. This study used the National Longitudinal Survey of Youth (NLSY79) to examine the relationship between FSP participation and obesity. A benefit of using the NLSY79 is that it is possible to include detailed controls for current income, FSP participation, and long-term eligibility for and participation in the FSP, as well as individual fixed effects.

Current and long-term FSP participation are positively and significantly related to obesity for low-income women in models with individual fixed effects. The estimates suggest that food stamp benefits do not have the same relationship to obesity as do cash income or other benefits provided by the Government. FSP participation is associated with approximately a 9.2-percent increase in the probability of obesity, and 5 years of FSP participation in the previous 5 years is associated with approximately a 19-percent increase in the probability of obesity for low-income women. By contrast, the relationship between FSP participation and high body mass index (BMI), although statistically significant, is considerably less. Current FSP participation is associated with an almost 1-percent increase in BMI, and 5 years of FSP participation in the previous 5 years is associated with an almost 3-percent increase in BMI for low-income women. Current and long-term FSP participation is not significantly related to obesity for low-income married men in models with individual

fixed effects. However, long-term FSP participation is positively and significantly related to BMI. Five years of FSP participation in the previous 5 years is associated with approximately a 3-percent increase in BMI for low-income married men.

The models did not control explicitly for food insecurity, and this exclusion may confound the relationship between FSP participation and obesity. Assuming the relationship between FSP participation and obesity is estimated correctly, recommendations for policy changes to reduce obesity will depend on the mechanism for the relationship between FSP participation and obesity. The analyses in this research are based on the human capital model of obesity, where FSP participation is related to obesity as a result of the resources and education provided by the FSP. Therefore, the model implies that education and changes in restrictions on the use of FSP benefits, the mode of delivery, and the amount of FSP benefits are possible policy tools to reduce the prevalence of obesity among FSP participants.

The large increase in the predicted probability of obesity for low-income women who participate in the FSP suggests the usefulness of nutrition education or other education programs that aim to reduce the obesity of FSP participants, regardless of whether obesity is caused by or simply correlated with FSP participation. The author also notes that the research findings suggest that more attention should be paid to the food choices made by FSP participants and the ways in which the program influences those food choices. Other possible policies aimed at reducing obesity could change the mode of delivery or the amount of FSP benefits. However, it is important to note that obesity is not a problem for all FSP participants. A reduction in benefits may increase other problems for the participant or members of his or her family.

A person's obesity status is influenced by current and past choices concerning food consumption and health behaviors. In order to determine the most effective policies for reducing obesity among food stamp recipients, more research is needed that will examine the relationship between FSP participation and these choices.

Associations Among Food Insecurity, Food Assistance Programs, and Child Development

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Grant awarded by the Institute for Research on Poverty, University of Wisconsin-Madison

Few studies have evaluated the link between food insecurity and children's development. The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and the National School Lunch Program (NSLP) are Federal programs that have the potential to reduce food insecurity among children and to influence children's development. This project examined ways in which participation in these programs and levels of food insecurity operate together to influence measures of well-being among children.

Specifically, the authors examined four research questions: (1) What are the roles of WIC and the NSLP in alleviating food insecurity? (2) What is the impact of food insecurity on the development of toddlers and school-aged children? (3) What is the effect of participation in NSLP and WIC on children, and is this effect mediated by levels of food insecurity? and (4) Does participation in WIC or NSLP moderate the effects of food insecurity on children? The results from this

project provide insight into the role of two important food assistance programs in alleviating food insecurity and influencing the well-being of U.S. children.

The effect of food insecurity on the development of U.S. children has not been widely researched, though previous research has found food insufficiency to be associated with adverse outcomes among children. Previous research on the WIC program has found positive effects of participation in WIC on infant birth weight, reduced Medicaid expenditures, and children's nutritional intake. Although there has been little research on the effects of WIC participation on child adjustment and age-appropriate achievement measures, studies have found that WIC has positive effects on verbal ability and infant temperament. Many of the available evaluations of the NSLP focus on the relationship between participating in the program and increased nutrient intake.

The study used data from the 1997 Child Development Supplement to the Panel Study of Income Dynamics (CDS-PSID), a longitudinal study of a representative sample of the U.S. population. The analyses focus on two samples of children: those under 2 years old in 1997, for whom there are measures of WIC participation in 1997; and those 6-12 years old in 1997, for whom there are measures of participation in the NSLP in 1997.

The authors used logistic regression and Ordinary Least Squares (OLS) methods to estimate the relationships of interest. They also employed methodological techniques to address the selection issues that may bias estimates of the effects of food assistance programs on individual outcomes.

The authors did not find a significant association between participation in the WIC program and food insecurity. While they did observe a positive association between participation in NSLP and food insecurity, the association did not hold when they addressed the selection issue.

The study also estimated the effect of food insecurity on the development of toddlers and school-aged children. Among younger children, food insecurity was associated with higher levels of difficult temperament. Food insecurity was also associated with lower levels of positive behavior among older children. This association persisted in the restricted sample models where selection was addressed. These results suggest that

while food insecurity may not affect cognitive outcomes, it does affect the social behaviors of children.

The research investigated the effects of NSLP and WIC participation on child outcomes and examined the potential for these effects to be mediated by levels of food insecurity. The authors found no association between participation in the WIC program and early child outcomes. They found evidence of negative associations between participating in NSLP and achievement, behavior, and health. However, when the authors controlled for selection bias, NSLP participation no longer had significant negative effects on child outcomes. These results demonstrate that selection bias must be addressed in any policy evaluation of the effects of NSLP.

The authors did not find evidence that food insecurity had a mediating effect on the influence of food assistance programs on children. This result suggests that, at least in this sample of children, the effects of participation in food assistance programs on children are not mediated by coexisting levels of food insecurity. Finally, the authors tested whether participation in WIC or NSLP moderated the effects of food insecurity on children. Among older children, they found evidence of one moderating relationship. Logistic regression results indicate that food insecurity and participation in NSLP increase the odds of having health limitations. However, for children in food-insecure households participating in NSLP, the odds of health limitations are significantly reduced. Thus, participation in NSLP may help protect children from the detrimental effects of food insecurity.