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# Food Assistance and Nutrition Research Small Grants Program

## Executive Summaries of 2003 Research Grants

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*Food Assistance & Nutrition  
Research Program*

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## **Abstract**

This report summarizes research findings from the Food Assistance and Nutrition Research Small Grants Program. The Economic Research Service created the program in 1998 to stimulate new and innovative research on food assistance and nutrition issues and to broaden the participation of social science scholars in these issues. The report includes summaries of the research projects that were awarded 1-year grants in summer and fall 2002. The results of these research projects were presented at the November 2003 Small Grants Program conference. The projects focus on food assistance and child well-being, food insecurity and hunger, the dynamics of food assistance program participation, obesity, and the role of community factors in dietary intake and food security. Some projects focus on specific populations, such as people living in the rural South and those living on American Indian reservations.

**Keywords:** Food assistance, nutrition, vulnerable populations, food security, food insecurity, hunger, hungry, food assistance, food spending, well-being, Food Stamp Program, food stamps, National School Lunch Program, WIC, Food Assistance and Nutrition Research Program

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## Preface

The Economic Research Service's (ERS) Food Assistance and Nutrition Research Small Grants Program offers grants to social science scholars to stimulate new and innovative research on food and nutrition assistance and to broaden participation in research on these issues. To administer the program, ERS partners with five academic institutions that competitively award grants for 1-year research projects. Most grants are for \$20,000 to \$40,000. The program seeks to give junior scholars an opportunity to gain experience in conducting research on food security and food and nutrition assistance programs and to encourage more senior scholars to apply their skills and knowledge in these areas. The program also seeks to nurture the development of strong networks of scientists who interact and work collaboratively on critical food and nutrition challenges that cross local or State borders.

This report presents summaries of the research findings from the fifth set of small grants, which were awarded in summer and fall 2002. Preliminary findings were presented at a conference at ERS in Washington, DC, in November 2003, and the research projects were completed in December 2003. More information about the Small Grants Program partners and many of the completed research papers can be found on the web sites of the administering institutions, listed below:

### **Institute for Research on Poverty, University of Wisconsin-Madison**

**Focus:** The Effects of food assistance programs on food security, income security, and other indicators of well-being on low-income individuals and families.

Web address: <http://www.ssc.wisc.edu/irp/smgrants/smhome.htm>

### **Irving B. Harris School of Public Policy Studies, University of Chicago**

**Focus:** Interactions between food assistance programs and other welfare programs, and the effects of the macroeconomy on the need for food assistance, the level of participation, and costs of food assistance programs.

Web address: <http://harrisschool.uchicago.edu/funding/foodassistance/>

### **The American Indian Studies Program, University of Arizona**

**Focus:** The relationship between food assistance programs on reservations and family poverty.

Web address: <http://w3.arizona.edu/~aisp/foodassistance/foodassistance1.htm>

### **The Department of Nutrition at the University of California, Davis**

**Focus:** The impact of food assistance programs on nutritional risk indicators (anthropometric, biochemical, clinical, and dietary), food purchasing practices, and food insecurity.

Web address: <http://nutrition.ucdavis.edu/USDAERS/>

### **Southern Rural Development Center, Mississippi State University**

**Focus:** Food assistance research issues impacting vulnerable rural people, families, and communities in the South.

Web address: <http://srdc.msstate.edu/focusareas/health/fa/food.htm>

# **Food Assistance and Nutrition Research Small Grants Program**

## **Executive Summaries of 2003 Research Grants**

Eileen Stommes and Laura Tiehen, Editors

### **Introduction**

Federal food and nutrition assistance programs form a crucial component of the social safety net in the United States. Unlike a number of other social programs, food assistance programs provide benefits and have eligibility requirements that are essentially uniform nationwide. The Food Stamp Program (FSP)—the largest Federal food assistance program—is, with few exceptions, available to all Americans whose income and assets fall below certain levels. The other food assistance programs are generally targeted to specific demographic groups. Altogether, the 15 Federal food assistance programs collectively reach an estimated one in five Americans at some point each year. The U.S. Department of Agriculture (USDA) administers nearly all Federal food and nutrition assistance programs and has a particular interest in monitoring program effectiveness and contributing to the policy goal of a healthy, well-nourished population.

The purpose of the Small Grants Program is to stimulate new research on food and nutrition policy issues and to broaden the participation of social science scholars in the research effort. Grant recipients come from a number of disciplines and employ a variety of approaches in their research. They include economists, sociologists, nutritionists, anthropologists, and public health professionals. Some conduct exploratory research using ethnographic methods to examine underlying factors influencing program participation and outcomes. Others use descriptive statistics to characterize the populations of interest. Still others use statistical models to analyze individuals' responses to policy changes. All the methods employed contribute to a growing body of knowledge on the food needs, coping behaviors, and food program outcomes of low-income families and individuals. Oftentimes, the work supported by the Small Grants Program develops new theories or research methodologies, elements that become the basis for securing expanded funding from other public or private sources to further develop these promising innovations.

## Small Grants Program Partners

ERS created partnerships with five academic institutions to administer the Small Grants Program. Partner institutions are prominent members of the research community and close to the regional and State environments that influence program delivery and outcomes. ERS chose two of the five partner institutions for their experience in conducting policy-relevant poverty research at the national level and their ability to attract prominent scholars from a variety of social science disciplines to work on poverty and hunger issues. One of these is the Institute for Research on Poverty (IRP) at the University of Wisconsin-Madison. IRP has a distinguished history of research and policy evaluation, including previous involvement in administering small research grants funded by the USDA's Food and Nutrition Service. The second partner is the Irving B. Harris Graduate School of Public Policy Studies at the University of Chicago. The Harris Graduate School of Public Policy, which was part of the Joint Center for Poverty Research from 1996 to 2002, has a strong history of conducting and supporting research on America's poor.

ERS chose the remaining three of the five partner institutions for their ability to direct research of policy interest to USDA, either on a particular subset of food assistance and nutrition issues or on a particular subpopulation of those eligible for food and nutrition assistance. The Department of Nutrition of the University of California, Davis, specializes in nutrition education design and evaluation. A core group of faculty focuses its research efforts on identifying meaningful approaches to the design and evaluation of nutrition education for ethnically diverse, low-income families served by a variety of food assistance programs. They view multidisciplinary research as critical to effectively monitoring the outcomes of nutrition programs.

The Southern Rural Development Center (SRDC) was chosen to administer small grants for its ability and commitment to conduct research on the problems of the rural poor in the South and its particular commitment to study the effects of welfare reform on this population. USDA has special ties to the SRDC because of its close working relationship with the region's 29 land-grant universities. The South is also of particular interest to USDA because of its populations of rural poor and rural African Americans.

American Indian families living on reservations are a significant component of the low-income rural population in many Western and Plains States. ERS chose the University of Arizona's American Indian Studies Program (AISP) to administer small grants for research on the food assistance and nutrition needs and problems of American Indians. AISP is the home of the only doctoral program in American Indian Studies in the country. The program maintains close ties to the tribal colleges, which were given land-grant status by Congress in 1994.

## Research Overview

The research projects completed in 2003 cover five broad topic areas.

**1. Food Assistance and Child Well-Being.** USDA administers four domestic food assistance programs that exclusively or primarily serve the nutritional needs of children. The child nutrition programs, which account for nearly a third of USDA's domestic food assistance expenditures, work individually and in concert to provide a nutrition safety net for children. Bitler and Currie examined the effect of participation in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) on the risk of childhood obesity and other health outcomes. They used recent changes in Medicaid eligibility that affected WIC participation to distinguish the effect of WIC on child health outcomes. Dunifon and Kowalewski-Jones explored the effect of participation in the National School Lunch Program on children's behavior, test scores, and body weight, and tested whether the effects differ for boys and girls.

**2. Food Insecurity and Hunger.** The recent development of a Federal measure of food security makes it possible to monitor food-related material hardship in U.S. households and its relationship to program participation and other outcomes. Van Hook and Balistreri examined the effect of the 1996 welfare reform legislation on the Food Stamp Program participation and benefits of households headed by immigrants, and on the food security of children of immigrants. Daponte and Stephens examined the relationship between food assistance, food spending, and food insecurity. Cason and coauthors interviewed a sample of migrant farm workers in Pennsylvania to assess their food security status and the potential barriers they face to achieving food security. Kabbani and Yazbeck examined how employment and food assistance program participation help food-insecure families avoid hunger. Harrison used data on California households to explore the relationship between food insecurity and the use of preventive medical care.

**3. Dynamics of Program Participation and Food Insecurity.** Food assistance programs serve a dynamic population of low-income Americans. Many people enter and leave the programs each month, which calls for research that examines program participation over time. Heflin used data that followed women who were receiving cash welfare benefits in early 1997 to examine the factors associated with their leaving the Food Stamp Program between 1997 and 2000. Mills and coauthors focused on working poor families and their use of food and cash assistance, comparing the rural South to the Nation as a whole. Leete and Bania examined how households transition on and off multiple assistance programs, using administrative data from 1992 to 2003.

**4. Obesity.** Since the mid-1970s, the prevalence of obesity and overweight has increased dramatically in the United States. The prevalence of overweight has tripled among children and adolescents over that period of time, and nearly two out of three adult Americans are either overweight or obese. Serrano and Cox documented the prevalence of obesity among both Latino and non-Latino youth from low-income households in Virginia. Olson and Strawderman examined the relationship between obesity and food insecurity



among a sample of pregnant women. Lopez and coauthors gathered information about the practical and cultural knowledge needed for educational programs to effectively encourage healthy eating habits among members of the Tohono O'odham Nation. Warner used the National Longitudinal Survey of Adolescent Health to examine overweight and obesity trends among adolescents in the South.

**5. Community Factors, Dietary Intake, and Health.** A household's participation in food assistance programs and its level of food security are likely to be influenced by the characteristics of the community. Blanchard and Lyson developed a community-level measure of access to supermarkets and supercenter stores in the United States, and assessed the relationship between this access measure and the consumption of fruits and vegetables within the community. Parrish gathered information from elders of the Keweenaw Bay Ojibwa tribe about the cultural practices associated with the preparation and consumption of traditional Ojibwa foods. Bezuneh and Yiheyis focused on two different types of housing assistance communities in Atlanta, GA, and documented the prevalence of food insecurity among housing assistance recipients in these two communities. Parisi and coauthors focused on how local community characteristics affect a community's ability to adapt to the provisions of the 1996 welfare reform legislation and to serve its low-income population.

## Executive Summaries

### Food Assistance and Child Well-Being

#### Medicaid at Birth, WIC Takeup, and Children's Outcomes

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The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) provides participants with supplemental foods, nutrition education, and health referrals. While WIC was originally established to address malnutrition and hunger, today many children are at risk of obesity. The Surgeon General's 2001 report on obesity emphasizes the importance of early intervention to prevent obesity, since eating habits are hard to change once they are formed. Hence, the prevention of overweight and obesity is now an important goal of WIC. This study examined to what extent WIC is meeting this goal among young children.

Most previous research focuses on WIC participation during pregnancy and on birth outcomes. This study examined the WIC participation rate among eligible 4-year-old children (which is referred to as WIC takeup) and documented the effect of childhood WIC participation on risk of obesity. The study used data on WIC participation, child anthropometrics, health, and health care utilization from the 1996 and 2001 panels of the Survey of Income and Program Participation (SIPP). The main empirical challenge in this study was to account for the possibility that women select into WIC based on unobservable characteristics that also affect their health outcomes. For example, if women in poor health are more likely to participate in WIC, then standard estimation procedures will lead to biased estimates of the effect of WIC on health outcomes. The authors showed that recent changes to the Medicaid program had significant effects on WIC takeup, and used the Medicaid changes as instruments to identify the effects of WIC on child outcomes.

WIC participation among children may have been affected by two recent changes to the Medicaid program. First, higher Medicaid cutoffs for infants

are likely to affect childhood WIC participation because most children who use WIC began using the program as infants, and Medicaid confers automatic eligibility for WIC. The authors showed that higher Medicaid cutoffs during infancy induced the infants' mothers to join both Medicaid and WIC, and that some fraction of these new entrants remained on the program through early childhood.

The second Medicaid eligibility change occurred through the State Child Health Insurance Program (SCHIP). Under SCHIP, States were given the option of extending public health insurance to uninsured children either by expanding Medicaid or by creating a separate, standalone program (or by some combination). Because Medicaid participants are eligible for WIC, States that used SCHIP to expand Medicaid also expanded eligibility for WIC among children. However, the study showed that these changes had little impact on children's WIC participation, suggesting that it is difficult to enroll children who did not participate as infants.

In the instrumental variables models, WIC participation at age four is associated with a large and statistically significant reduction in the probability that children are at risk of overweight (defined as having a Body Mass Index above the 85th percentile for sex and age). WIC has no significant effect on use of health care, which supports the interpretation that the effects on weight are due to the nutritional component of the WIC program rather than to any links between WIC and current access to medical care.

The study results suggest that either the nutrition education, the provision of nutritious foods, or both helps prevent obesity among young children. An important caveat is that the close link between Medicaid coverage of the birth, WIC participation during infancy, and WIC participation during childhood makes it difficult to isolate the net effect of WIC during childhood.

## **Exploring the Influence of the National School Lunch Program On Children Using The Early Childhood Longitudinal Study**

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This study examined the effects of participation in the National School Lunch Program (NSLP) on changes in children's behavior, test scores, and body weight, and whether these effects differ by gender. The NSLP serves approximately 28 million children each school day with estimated expenditures in 2002 of \$6.1 billion. Results from this study can assist policymakers in understanding the role of the NSLP in influencing child health, academic well-being, and social development.

Most previous work on the NSLP has focused on how participating in the program influences children's nutritional intake, finding some evidence of increased intakes of some vitamins, minerals, and fats. Previous research has not examined thoroughly how the NSLP influences other outcomes, such as test scores, body weight, or social adjustment. Nor has previous work on the NSLP examined how sub-groups of children may respond differently to the program. Previous research by the authors investigated the associations between food insecurity, NSLP participation, and children's well-being, and found that participation in the NSLP did not significantly impact these outcomes. However, that study was limited by the use of only 1 year of data on children.

The authors used data from the 1998 Early Childhood Longitudinal Study-Kindergarten Cohort, a nationally representative sample of approximately 22,000 children who were enrolled in roughly 1,000 kindergarten programs during the 1998-1999 school year and were followed through their first grade year in 1999-2000.

Because children who participate in the NSLP may differ in unobservable ways from those who do not, the authors used a first-difference model that relates changes in children's participation in the NSLP to changes in child outcomes between kindergarten and first grade. The model controlled for all time-invariant factors that may be associated with the likelihood that a child participates in the NSLP.

The analysis showed that receiving a school lunch is associated with an increase in children's math and reading scores. No effects of NSLP participation on children's body weight or behavior problems were found. Looking separately by gender revealed that receiving a school lunch is particularly beneficial for boys' reading scores, but is not associated with improved test scores for girls.

The results from these analyses provide insight into the ways in which a widely used food assistance program may influence the well-being of U.S. children. In general, participating in the National School Lunch Program can lead to improvements in the test scores of boys between kindergarten and first grade.

## Food Insecurity and Hunger

### Ineligible Parents, Eligible Children: Food Stamps Receipt, Allotments, and Food Insecurity Among Children of Immigrants

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The Personal Responsibility and Work Opportunity Reconciliation Act of 1996 (PRWORA), known as welfare reform, and its subsequent amendments eliminated welfare as an entitlement for working-age adults and noncitizens while maintaining limited support for poor children regardless of citizenship. This policy changed the treatment of mixed-eligibility-status immigrant households, i.e., households containing both those deemed ineligible for welfare (noncitizens) and those deemed eligible (poor children). Rather than providing full welfare benefits, welfare policy reduces or eliminates welfare benefits for mixed-status households relative to nonimmigrant households whose every member can be eligible. The effects of this new policy depend, in part, on the extent to which a reduction in allotments to mixed-status households has a negative impact on children. This study also examines the effect of cutbacks on welfare allotments on "mixed status" families and whether these changes in Food Stamp Program (FSP) participation and benefits led to higher levels of food insecurity among children of noncitizens.

Prior research has shown that the FSP serves as an important source of food for immigrant families. This study added to earlier work by using a longitudinal data source, the Survey of Program Dynamics (SPD), to follow a cohort of children through multiple years. This study used a national-level sample and controlled for State-level fixed effects in multivariate models of food stamp receipt and food insecurity. The authors used measures of "unmet need" for food stamps, based on the extent to which an individual child's predicted participation levels changed since the enactment of welfare reform.

Five specific findings emerged from the analysis. First, household-level food stamp receipt declined steadily between 1993 and 2000 among all nativity/citizenship groups independent of changes and variation in social, demographic, and economic characteristics. In contrast, the decline in food stamp benefits was temporary among children of noncitizens. Second, food insecurity was higher for these children of noncitizens who did not natu-

ralize immediately following welfare reform, but food insecurity levels declined and became more equal across all nativity/citizenship groups by 2001. Third, reductions in FSP benefits rather than reductions in household-level food stamp participation appear to explain the higher food insecurity levels of children of parents who never naturalized. Fourth, reductions in unmet need for both receipt and allotments between 1997 and 2000 appear to explain, in part, the decline in food insecurity for all nativity/citizenship groups. Fifth, the results suggest that children of noncitizens would have lower levels of food insecurity if they were given access to food stamps and allotments equal to those given to children of natives.

The study results suggest that providing food assistance to needy children alone is probably not enough to reduce food insecurity among eligible immigrant children. Food insecurity among the children in the SPD increased due to reductions in FSP participation by mixed-status households despite the fact that most of the children remained eligible. Another policy change could be to provide food assistance to all members of needy households that contain children rather than only to household members who are eligible children.

## **The Relationship Between Food Assistance, the Value of Food Acquired, and Household Food Security**

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The research examined household food spending relative to household need for food and the relationship between food expenditures and measures of food security. The research addressed four questions:

- 1) What household characteristics are associated with spending enough on food?
- 2) What household characteristics are associated with reporting food insecurity?
- 3) To what extent does spending enough on food decrease the probability of food insecurity?
- 4) Do the budget shares devoted to household budget items other than food differ between households that do and those that do not spend enough on food?

The research used data from the 2001 Food Security Supplement of the Current Population Survey and the 1986-2000 Consumer Expenditure Surveys (both diary and interview surveys). These samples are designed to be nationally representative.

The authors defined "spending enough on food" by considering whether or not the household achieves its Extended Thrifty Food Plan (ETFP) amount. The Thrifty Food Plan (TFP) is defined as the minimum amount in food expenditures required to potentially meet the household's food needs. The authors calculated an ETFP amount for each household by summing the amounts from the TFP for each individual in the household, based on age (including infants) and gender, and multiplying this amount by an economy of scale factor based on household size used by USDA when calculating maximum food stamp benefits. The authors examined the correlation between the degree to which a household meets its ETFP and its reported food insecurity. A logistic regression model examined the probability of a household reporting food insecurity within the last 30 days, with separately estimated models for households that receive food stamps and those that do



not. Linear probability models examined factors that move households closer to achieving their ETFP, with a series of expenditure share regressions explaining whether the ETFP was associated with differences in expenditures across a number of items.

Study findings included the following:

- ◆ Low food expenditures are significantly associated with an increased probability of food insecurity.
- ◆ Households that use food assistance have a higher probability of reporting food insecurity than statistically comparable households. Households using food pantries are far more likely to report food insecurity than households using other forms of food assistance.
- ◆ In spite of their higher incomes, food stamp households that do not receive at least 75 percent of their ETFP amount from Food Stamps have lower food expenditures than those that receive at least 75 percent of their food needs from the FSP.
- ◆ While having an elderly person in the home is associated with a higher probability of not spending enough on food, households with at least one elderly person have a lower probability of reporting food insecurity than statistically comparable households.
- ◆ Among food stamp households, those that achieve at least 90 percent of their TFP amount devote lower shares of their expenditures to apparel, child care, housing, utilities, and entertainment relative to the households that do not achieve this food expenditure threshold.

Study findings encompassed several research implications. Additional research is needed to examine the budget constraints of food stamp households, especially with respect to the constraints that child care, housing, and utility expenses represent. While the food stamp rules account for and deduct some of these expenses to compute a household's net income, the threshold limits are not updated annually. Future research can also contribute to a better understanding of household budgeting decisions made by low-income households. Some low-income households manage their resources so the household obtains enough food and does not feel food insecure. Learning the strategies these households employ could increase understanding of the causes of food security.

## **Dietary Intake and Food Security Among Migrant Farm Workers in Pennsylvania**

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While the labor of migrant farm workers gives the U.S. population access to high-quality, affordable foods, migrant workers themselves often suffer from food insecurity, malnutrition, poor health status, poverty, and low job security. They often live and work in unsafe and unsanitary conditions that contribute to a myriad of health, mental health, social, and behavioral problems, including chronic health conditions, substance abuse, domestic violence, and other co-morbid mental health problems. This study examines critical components of health and well-being: the nutrition, food security, and food sufficiency maintenance practices of migrant farm workers in Pennsylvania, and the impact of food program participation on these outcomes.

The study methodology involved the collection of quantitative and qualitative data using focus group interviews and surveys in five Pennsylvania agricultural counties. The focus groups, conducted with 117 participants, had three main objectives: 1) to identify barriers to achieving good nutrition; 2) to understand the programmatic, social, cultural, and lifestyle factors responsible for these barriers; and 3) to reveal practices employed to increase food security.

The survey was administered to 401 participants. It consisted of the USDA food security instrument, information on utilization of food assistance programs, 24-hour dietary recall data, and demographic characteristics. The data were compared to an existing dataset from the Current Population Survey (CPS) to determine how factors such as ethnicity, migrant status (seasonal, settled), and other factors affect the use of food assistance programs among migrant workers.

Study findings indicate that the migrant population is diverse and its composition varies from county to county. The Pennsylvania migrant population consists mainly of Spanish-speaking workers from Mexico. Some are "settled" while others follow a migrant stream originating in Florida and moving on to New York or Indiana after their work in Pennsylvania.

This study examined the food security of migrant farm workers. While the majority of the participants surveyed were food secure, 8.9 percent were food insecure, and 4.7 percent were food insecure with hunger. The CPS sample indicated a higher level of food insecurity among migrant farm workers than the Pennsylvania sample, but with fewer participants experiencing food insecurity with hunger. A higher percentage of the Pennsylvania sample participates in the National School Lunch and Breakfast Programs while more of the CPS sample participates in WIC, FSP, and food pantries.

Based on the 24-hour recall intake data, a considerable number of participants did not meet the recommended intake levels for food groups and/or certain nutrients. Indeed, a large number of participants reported consuming no fruit, vegetables, or dairy products.

The focus group interviews revealed additional information that could help explain the survey results. Participants appeared to be concerned with a variety of nutrition and diet-related health issues, including diabetes, heart disease, obesity, and anemia. Focus group participants cited issues affecting their food choices such as flavor, habit, tradition, and pleasure. Reported barriers to adequate access and consumption included the perception that American foods are of low quality and expensive, lack of transportation, language barriers, unfamiliarity with their community of residence and what foods are available, and difficulty in identifying foods by their name.

Participants in all focus groups mentioned that their eating habits changed dramatically after arrival in the United States. For example, consumption of fresh fruits and vegetables decreased because of the perceived poor quality and high price. Practices to attain food security included sharing with friends and family, avoiding certain foods and beverages because of the cost, eating larger quantities of beans, rice and tortillas, buying food on sale, eating less, and maximizing use of leftover foods. Participants made suggestions regarding the content and format for educational programs. They stated that they need information about how to feed babies and children, how to make more nutritious and cheaper food, how to use American foods, weight loss information for both children and adults, and information about diabetes. All focus groups mentioned that the programs should be fun and interactive, be conducted in Spanish, and involve cooking.

Study findings indicate a need for culturally appropriate health and nutrition education, focusing on how to prepare healthy, nutritious, and inexpensive meals as diet-related disease risk reduction. Additional funding could enhance existing health and nutrition education programs such as those operating through the Cooperative Extension Service and local health departments. Culturally appropriate educational programs could be developed to target the migrant farm worker population. Bilingual educators indigenous to the farm worker community could deliver them.

## **The Role of Food Assistance Programs and Household Employment in Helping Food-Insecure Families Avoid Hunger**

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Since 1995, USDA has been tracking the prevalence of food insecurity and hunger at the national level through an annual Food Security Supplement to the Current Population Survey. The Supplement's questions form the basis of the Food Security Scale, which is used to classify households into three levels of food security: food secure, food insecure without hunger, and food insecure with hunger.

USDA's annual food security reports have consistently documented that the prevalence of food insecurity and hunger in the U.S. is higher among households with children than households with no children. Using multinomial logistic regression analysis, the authors found that households with children were more likely to experience food insecurity even after controlling for other factors. However, the authors also found that households with children were less likely to experience hunger. This finding suggests that food-insecure households with children may be drawing on personal and/or public resources to help them avoid hunger.

To explain this empirical finding, the authors assessed the extent to which household employment circumstances and Federal food assistance programs, which serve a larger share of families with children, play a role in helping households with children avoid hunger.

The employment variables in the analysis included the average number of jobs held, the average number of usual hours worked, and the average unemployment duration of adult household members, the employment status of the household head, and the proportion of household adults who were employed. While these variables affected hunger and food security, they did not fully explain the observed differences between households with and without children.

Controlling for participation in food assistance programs was not a straightforward exercise. At the same time, it is possible that the level of a household's food insecurity could affect the household's decision to participate in food assistance programs, resulting in a positive association between program participation and hunger. If so, then self-selection into the program must be controlled for to assess the degree to which program participation

reduces food insecurity and hunger. It is expected that the program reduces hunger.

The authors addressed this self-selection problem in two separate ways. First, for the largest Federal food assistance program, the Food Stamp Program (FSP), they identified three State-level food stamp policy variables that affect participation but not food security: State use of short recertification periods (3 months or less); Federal food stamp outreach spending by State; and the timing of State implementation of the electronic benefit transfer system, a debit-like card that replaced traditional food stamp coupons in most States during the 1990s. The authors then followed a two-step procedure that used the predicted value of participation as an instrument in the food security equation. The authors found that participating in the FSP reduced the likelihood of a household's experiencing food insecurity or hunger. However, program participation did not fully explain the observed differences between households with and without children.

Second, for households that experienced some degree of hunger during the course of a year, the authors studied whether participation in any of the four largest Federal food assistance programs was associated with lower levels of food insecurity during the last 30 days of that year. The programs covered in the analysis were the FSP, the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), the National School Lunch Program (NSLP), and the School Breakfast Program (SBP). The authors found evidence that the FSP, NSLP, and SBP all helped households that experienced hunger during the year escape food insecurity. They also found that controlling for participation in the NSLP completely eliminated the observed differences between households with children age 5-16 and households without children. The results suggest that the NSLP plays an important role in helping households with school-age children escape hunger.

## Household Food Insecurity, Food Assistance Program Participation, and the Use of Preventive Medical Care

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This study used the 2001 California Health Interview Survey (CHIS) to examine relationships between household food insecurity and the delay or absence of primary and secondary preventive medical care. Instances of prescribed care included prescription drugs, recommended medical tests, and other medical treatments among adults with certain diagnosed chronic diseases that require ongoing management (diabetes, heart disease, high blood pressure, asthma, and arthritis). The study hypothesized that food insecurity would be associated with low rates of utilization of preventive health services for adults with chronic diseases, i.e., poorer disease management as indexed by postponement or failure to get needed care. It was further hypothesized that these relationships would be stronger for adults in households with children, and that health insurance and participation in food assistance programs would mitigate these relationships.

It is well established that some types of preventive medical services reduce morbidity and save health care costs. Particularly for individuals with chronic disease, effective clinical preventive services have been shown to markedly improve outcomes. For the individual with a chronic disease that requires ongoing medical, nutritional, or pharmacological management, foregoing or postponing medical care or the purchase of necessary drugs and supplies may result in increased rates of complications and poorer outcomes. There is now considerable descriptive literature on food insecurity at the household level, indicating that the management of scarce resources in the face of food insecurity and hunger often results in sacrificing or postponing other basic needs. To date, little attention has been given to food insecurity in relation to use of medical care although recent research suggests that food insufficiency—a measure of household difficulty in acquiring food that antedates the current food security measure—is associated with higher complication rates, poorer disease management, and increased medical care utilization among adult diabetics.

CHIS is the largest State health survey conducted in the United States. It is the only large database from in the Nation that incorporates both a measure of household food security and extensive data on the preventive medical services, health insurance status, and participation in food assistance programs and other public assistance programs. The 2001 survey collected data from 55,428 households. Individual interviews were completed with one adult per household, with one adolescent (age 12-17) if present, and with a parent on behalf of one child under 11 years if present, resulting in 55,428 adult interviews, 5,801 adolescent interviews, and 12,592 parent interviews on behalf of

children under 11 years. The food security measure used in the study is the 6-item screener derived from the 18-item Federal instrument. Food security questions were only asked of adults residing in households with per capita incomes below 200 percent of the Federal poverty level. The author examined distributions and bivariate relationships; multivariate logistic regression analysis was utilized to examine predictors of key dependent variables.

Food insecurity among this population of low-income adults was 28.3 percent, while 8.3 percent reported food insecurity with hunger. More than one-quarter (28.9 percent) had no current health insurance, and for nonelderly adults (<65 years of age), the figure exceeded one-third (35.6 percent). Food stamp participation was only 10.2 percent among individuals in households with incomes below 130 percent of poverty. WIC participation was higher, with 58.5 percent of income-eligible (<185 percent of poverty) pregnant women reporting their own or their child's participation.

Contrary to the hypothesis, there was no consistent relationship between living in a food-insecure household and several basic preventive indicators, including having had a flu shot in the last year, and several screening indicators including mammograms, Pap smears, stool blood tests, and bone density screening. There was a significant association of food insecurity with never having had a blood cholesterol check or an endoscopic colon cancer screening for both men and women, or having had a prostate-specific antigen test (which helps detect prostate cancer) in men over 40.

Food-insecure adults reported significantly higher utilization of medical care, including number of doctor visits and use of an emergency room in the previous year. On the other hand, adults in households reporting hunger were more likely to have had their last dental visit more than 5 years ago than adults in food-secure households.

Among adults with diagnosed chronic disease, there was a striking and consistent relationship between food insecurity, particularly food insecurity with hunger, and the likelihood of postponing or failing to acquire prescriptions or obtaining recommended care or treatment for the disease. There was also a clear and significant relationship, across all diseases examined, between food insecurity and an emergency room visit for complications of the disease in the previous year. In multivariate models, the relationships remained significant when controlling for income, age, gender, ethnicity, family type, and health insurance, with food-insecure individuals two to five times more likely to have postponed or foregone needed care. Lack of health insurance coverage was the strongest predictor of failure to obtain or postpone care, but food insecurity remained independently predictive, in models controlled for income.

Based on these preliminary analyses, it appears that food insecurity, particularly food insecurity with hunger, is associated with postponing or foregoing medical care, including prescription drugs, for low-income adults independent of other contributing factors. An association was also found for higher medical care utilization, including the likelihood of seeking emergency room care for the disease in the previous year. These relationships are strikingly consistent across all chronic conditions examined.

# Dynamics of Program Participation and Food Insecurity

## Who Exits the Food Stamp Program After Welfare Reform?

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This study explored factors associated with the termination of food stamp benefits among women on welfare. Earlier studies suggest that women who stop receiving cash welfare benefits are at risk of losing food stamp benefits even though they remain eligible. There is also some evidence that women with poor physical and mental health, those owning a car, and those with poor knowledge of Food Stamp Program (FSP) rules are at increased risk of leaving the FSP.

This study used data from 4 waves of the Women's Employment Survey (WES). The WES is a random sample of 753 women on the welfare caseload in February 1997 in an urban Michigan county. In-home structured interviews were conducted between August and December 1997, between August and December 1998, between November 1999 and March 2000, and between September and December 2001. The response rate was 86.2 at wave one; 92 percent at the second wave; 91 percent at the third wave; and 90 percent at wave four. The survey includes a variety of measures of barriers to employment at each interview period, as well as monthly measures of employment, food stamp receipt, and cash welfare receipt.

This study used Cox proportional hazard models in a competing risk framework to examine factors associated with leaving the FSP and the cash welfare program jointly, as well as factors associated with leaving the FSP while continuing to receive cash welfare. Independent variables included race, total number of children in the household, total number of adults in the household, marital status, education level, percentage of years on welfare since age 18, monthly welfare receipt, monthly employment, physical health limitations, major depression, alcohol dependence, drug dependence, child health problem, car ownership, possession of driver's license, and knowledge of FSP eligibility rules.

The study estimates indicate that women who leave the FSP and cash welfare program at the same time are likely to be employed. Evidence on the role of physical and mental health problems in exiting the FSP is mixed. Depression and alcohol dependence are not associated with leaving the FSP. However, women who are drug dependent are more likely to leave the FSP than those who are not. Additionally, having a child with a health problem decreases the probability of exiting the FSP and cash welfare in the same



month. Having access to a car decreases the odds of leaving the FSP and cash welfare in the same month, which suggests that the asset test may be less of a barrier to FSP participation than the lack of transportation to attend recertification appointments. Finally, results are consistent with qualitative reports that some women who leave the FSP are unaware that they remain eligible for program benefits.

## **Public Assistance and Working Poor Families: Has the Nation Become More Like the Rural South?**

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The last two decades have brought profound changes in U.S. social welfare policies. The changes were driven in part by the idea that able-bodied adults should work to support their families, and that their families should be able to escape poverty by earnings from work perhaps supplemented by Federal programs, such as the Earned Income Tax Credit. In 2002, 36 percent of persons below the national poverty line were in families where adult members worked on average more than 1,000 hours per year. This represents a substantial increase from 28 percent of persons in poor families with the same level of attachment to the workforce in 1982. The rural South, historically the poorest region of the country, shows different trends from the nation as a whole, with the share of the poor in working families essentially constant at about 36 percent in 1982 and 2002.

This study provided a comprehensive portrait of working poor families and their use of food stamps and cash assistance nationally, in rural America, and in the rural South. The authors used Current Population Survey data at 4-year intervals from 1982 to 2002. The study found that the share of working poor families headed by a person who was Hispanic, a single parent, or who had some education beyond high school, was higher in 2002 than in 1982. In 2002, the characteristics of working poor families in the rural South appear to be much more similar to those seen in the Nation as a whole than in 1982. This similarity suggests that a comparable set of policies to address family characteristics that perpetuate poverty in the Nation may be employed in the rural South.

Families headed by a person with no more than a high school degree were more likely to be poor in 2002 than in 1982, which offset decreases in the poverty rate that resulted from the average increase in education levels. Thus families, particularly in the rural South, increasingly need a member with some college education to substantially increase income and reduce the risk of being a working poor family. However, the rural South appears to have experienced less severe erosion in economic well-being among families headed by a person with a low level of education. This regional difference is largely because the levels of economic well-being associated with a

high school degree or less were initially lower in the rural South than in the Nation as a whole in 1982.

The authors also identified factors associated with food stamp and cash assistance use among the working poor. While overall rates of food stamp use by working poor families were similar in 1982 and 2002, there has been a significant structural change in the relationship between food stamp use and family characteristics. The differential propensity for African Americans to use food stamps has diminished. Hispanic-headed families are more unlikely to use the FSP relative to non-Hispanic families.

The study also found a decrease in the probability that working poor families used cash assistance and food stamps. The authors suggest that part of the decline in food stamp use may be linked to the increased requirements for households to periodically certify their eligibility for food stamps. Efforts have been undertaken in some States to streamline program reauthorization procedures and establish office hours that accommodate working family heads.

## **The Interaction Between Food Stamps and Welfare Programs: An Empirical Model of Program Dynamics in the Cleveland Metropolitan Area, 1992 - 2003**

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The authors examined the joint dynamics of the use of Temporary Assistance for Needy Families (TANF), food stamps, and medical assistance in Cuyahoga County (Cleveland), Ohio, for the period July 1992 to April 2003. They used administrative data that includes information on individuals participating in any combination of these three programs and categorized individuals by the array of programs in which they are enrolled on a monthly basis. Analyzing the seven possible combinations of programs, they modeled three different aspects of program dynamics: (1) program inflows, which consist of new entry into any assistance program; (2) transitions from one category of assistance to another; and (3) exits from all types of assistance.

In many States, including Ohio, as cash assistance caseloads fell dramatically over the late 1990s, FSP caseloads declined. The study investigated the extent to which these declines were related to one another and to other underlying economic, demographic, and policy factors. The authors decomposed the sources of change over time and distinguished between changes in people who began receiving assistance, those who changed the types of assistance they received, and those who stopped receiving assistance. For example, they measured the decline in the number of people receiving food stamps associated with persons leaving cash assistance versus people exiting who had been receiving only food stamps.

The authors estimated that, prior to January 2002, welfare reform transition and implementation were largely coincident with declines in the FSP caseload that were not attributable to other underlying changes in demographics and economic conditions. These declines were primarily driven by fewer people entering the FSP. After January 2002, it was estimated that overall food stamp usage was higher under the influence of welfare reform policies than it would have been without those policies.

The study's methodology allowed the authors to make a number of other observations about the nature of food stamp usage and caseload dynamics in Cuyahoga County. First, they found that many people used only food stamps—transitions to and from other programs were minor. Second, the authors documented a shift in the relationship between the receipt of all three types of assistance (food stamps, cash, and medical) and cash and medical combined. During the post-welfare reform period, fewer individuals began receiving food stamps when they were already receiving cash and medical assistance. The authors suggest that this change could be related to the “doubling-up” phenomena, in which recipients choose to share households with friends or relatives with other sources of income. In doing so, they retain their eligibility for cash and medical assistance but not for food stamps.

On a practical level, joint study of multiple programs can lead to a better understanding of the interdependencies between food stamp receipt and other program participation. This understanding can help program administrators predict how changes in the policies of one program might affect enrollment and the characteristics of the enrollees in other program categories.

## Obesity

### **Assessing the Prevalence of Childhood Obesity Among Limited-Resource Latino and Non-Latino Families in Virginia**

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Obesity among U.S. children is an increasing concern. Nationwide data from 2000 show that an estimated 15 percent of children and adolescents age 6-19 are overweight, a rate that has tripled within 30 years. The risk of obesity crosses all socioeconomic and ethnic groups, but obesity is slightly more prevalent in low-income groups, and in Native American, Hispanic, and African American populations. In Virginia, few data exist on the prevalence of overweight or obesity among the youth population, particularly Latinos, a growing population in the South. This study investigated the prevalence of overweight among Latino and non-Latino low-income Virginia youth. The research also identified potential contributors to obesity and examined alternative methods for determining overweight.

Data were gathered from two population groups: Latina mothers (Part I) and Latino and non-Latino children (Parts II & III). In Part I, 85 Latina mothers were recruited through the Virginia Expanded Food and Nutrition Education Program (EFNEP) and the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). Demographic information, acculturation, and dietary and physical activity patterns were assessed using bilingual written survey instruments.

Part II involved the collection of height, weight, and waist circumference data from 217 children from 5 ethnically diverse elementary and middle schools attended by low-income students in rural and urban areas of Virginia. A sub-sample of this population (Part III) was used to evaluate body figure scales developed specifically for Latinos. A short survey instrument exploring dietary and physical activity patterns was also administered. Informed consent was obtained from all subjects and parents.

The results indicated that the Latinas included in the study were mainly from Bolivia and El Salvador, demonstrated limited acculturation, and spoke Spanish as a primary language. Almost half the participants were overweight or obese (based on reported height and weight), nearly 50

percent reached the 5-A-Day goal for fruits and vegetables, and only 15 percent met the recommendations for physical activity. Fifty percent of subjects were female, 41.7 percent White, 25 percent Black, and 20.7 percent Latino. Body Mass Index (BMI) percentiles, based on age and sex, ranged from 3.6 to 99.9, with a mean percentile of 64.9 and a median of 68.5. Less than 5 percent (4.5 percent) of subjects were considered underweight, one-sixth (14.7 percent) were at risk of overweight, and almost one-quarter (22.6 percent) were overweight, based on Centers for Disease Control and Prevention (CDC) cutoff points. Females had significantly higher BMI percentiles than males, with means of 67.4 and 64.5, respectively. Multivariate regression found an interaction between rural/urban residency and ethnicity. White rural children were significantly heavier and had larger waist circumferences than those living in urban areas. Conversely, Latino and Black children living in urban areas were significantly heavier than those living in rural areas.

The study also examined an alternative method to determine overweight. Respondents were asked to choose the body figure, a visual representation of different body weights that most closely resembled their own. Results indicated that respondents with higher BMI were more likely to choose a figure choice that indicated overweight.

The study documented a rate of obesity among Latino and non-Latino low-income youth and mothers that is much higher than national averages. The study used a convenience sample, and thus it may not be representative of other regions and/or population sub-groups.

## The Food Insecurity-Obesity Paradox in Women

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This study examined the relationship between food insecurity and obesity and the mechanisms through which food insecurity might lead to obesity in a sample of 436 healthy adult women from rural upstate New York.

The study had a prospective cohort design and women were followed from early pregnancy until 2 years postpartum. Data were collected through self-administered behavioral questionnaires, food frequencies, and a medical record audit. Height and weight measurements at all time points were measured by healthcare providers following standardized study protocols.

Study results indicated that food insecurity at the beginning of pregnancy was positively associated with major weight retention at 2 years postpartum, but only in initially obese women (at a marginal significance level of 0.007). Initial obesity was also associated with increased risk of becoming food insecure (at a marginal significance level of less than 0.05). Measures of quantity of food intake, dietary quality, eating patterns, and physical activity were examined as potential mediators. Consuming fewer than three fruits and vegetables per day and a more binge-like pattern of eating were associated with initial food insecurity and major weight retention at 2 years postpartum (at a marginal significance level of less than 0.05). When these variables were added to the regression model they did not reduce the coefficient for food insecurity, a final criterion for being a mediating variable.

Obesity during early pregnancy was associated with increased risk of becoming food insecure. The cross-lagged panel analysis indicated that this causal direction was statistically significant when controlling for initial food insecurity and weight status, while the other was not. This result provides support for what can be described as "reverse causality." Thus, the previous findings from cross-sectional studies of an association between food insecurity and obesity may be due to the fact that obese women are at increased risk of becoming food insecure over time.

Overall, no variables emerged as obvious mediators of the relationship between initial food insecurity and major weight gain or change in food security status (particularly becoming food insecure) and major weight gain. The small sample sizes and the large variation of some of the variables may have contributed to the lack of significant findings related to the mediators.



There are several other potential explanations for the study findings. One is the possible timing of the measurement of the mediating variables. They were measured over a year after the initial food insecurity measurement was taken and this time period included a pregnancy. Additional data indicate that all women's diets were similar during pregnancy regardless of their initial food insecurity status. Seventy percent of food-insecure women participated in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) during pregnancy. The additional food from this program may have blunted any impact of food insecurity on eating during pregnancy and this effect may have carried over into the postpartum period, although the data clearly indicate that the initially food-insecure women ate differently at 1 year postpartum than did food-secure women. The dietary variables were measured a year before the weight measurement was taken and it may be that change in diet related to weight change took place closer to 2 years postpartum.

Women who were initially food insecure and were also obese formed a distinct subgroup especially vulnerable to weight gain. This is a group that may merit targeting for special intervention in food assistance programs. Development and implementation of approaches to secondary prevention, in the context of WIC, which is generally oriented toward primary prevention, would require careful consideration of the length of postpartum participation allowed, the composition of the WIC food package, and the focus and content of nutrition education.

## **Community Attitudes Toward Traditional Tohono O'odham Foods**

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The Tohono O'odham Nation resides in the heart of the Sonoran desert, 60 miles west of Tucson, AZ. Approximately 18,000 of the tribe's 28,000 members live on the main section of the Tohono O'odham reservation. The Tohono O'odham people have the highest rate of diabetes among Native American tribes. About 50 percent of the tribe's adults have adult-onset diabetes, compared with 4-6 percent of the overall U.S. population. A number of studies have shown that many traditional Tohono O'odham foods such as tepary beans, cholla cactus buds, and wild spinach, help regulate blood sugar and reduce the incidence and effects of diabetes. Previous work found that tribal members were interested in incorporating more traditional food into their diets and in learning how to grow, collect, and cook these foods.

In this study, the authors gathered information about the practical and cultural knowledge needed for educational programs to effectively encourage healthy eating habits, including the consumption of healthy, traditional Tohono O'odham foods. The authors collected ethnographic data from approximately 20 tribal elders. The ethnographic data include information about the production, processing, and preparation of traditional Tohono O'odham foods that help regulate blood sugar levels. The ethnographic data also contain cultural information, such as songs, legends, and ceremonial practices pertaining to Tohono O'odham foods. The authors also conducted a survey of the scientific and nutrition literature to gather information on the nutritional content of traditional Tohono O'odham foods.

The authors plan to use the practical, cultural, and nutritional information gathered in their study to develop a set of educational resources for use within the Tohono O'odham community. One example is an educational brochure that contains step-by-step descriptions of how the food is cultivated or harvested in the wild, processed or preserved, and prepared. The brochure and its recipes will provide descriptions of both traditional preparation techniques and modern preparation techniques that are often less time-consuming.

The authors propose that the brochure and other educational materials will strengthen cultural incentives to eat healthy Tohono O'dham foods, provide the practical information necessary for people to consume these foods, and improve health.

## **The Incidence of Overweight and Obesity in Southern Adolescents**

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Obesity has emerged as a critical health issue in the United States, particularly among children and adolescents. Previous research has noted that the percentage of overweight children has accelerated significantly among African Americans and Hispanics from 1986 to 1998, with over 20 percent of these children now classified as overweight. Furthermore, the largest proportion of overweight children has been found in the U.S. South. To explore overweight and obesity among adolescents in the South, this study used data from the National Longitudinal Survey of Adolescent Health (Add Health).

The Add Health data were collected in two waves between 1994 and 1996 to explore health-related behaviors of adolescents enrolled in grades 7 through 12. Data at the individual, family, school, and community levels were collected from a school-based cluster sample of over 20,000 students. The study focused on how the students' social context (such as families, friends, peers, schools, and communities) contributed to their health and risk behaviors.

In 2001 and 2002, Add Health respondents age 18-26 were re-interviewed in a third wave to investigate the influence that adolescence has on young adulthood. This study used the Wave I and III data to explore the relationships between a student's Body Mass Index (BMI) and other personal, family, school, and community characteristics. Age- and gender-specific BMI were calculated for individuals at Wave I and Wave III using a program developed by the Centers for Disease Control and Prevention (CDC), so each student was classified as very underweight, underweight, normal weight, overweight, or obese. The study focused on 7,600 students enrolled in schools in the Southern region of the United States. Whenever appropriate, the Southern cohort was compared with students from other regions of the United States.

Multiple linear regression and logit models delineated the most important factors contributing to the BMI percentile of students at Wave I. BMI percentiles were significantly higher among males, African Americans, and Hispanics (when compared with non-Hispanics). Students who rarely socialized tended to be heavier, and the number of hours spent in sedentary pursuits had a small, but significant, impact on their BMI percentile. Student exercise had a positive relationship with BMI, suggesting that exercise may have contributed to more muscle development.

Family factors were important in explaining students' BMIs, particularly parental obesity. Household income had a negative impact on BMI,

suggesting that students from more affluent households were less likely to be overweight or obese. BMI percentiles tended to be lower among students who were breastfed for 3 months or longer, who judged their health to be excellent or very good, who ate breakfast on a regular basis, who suffered no disabilities, and who had reached their physical (sexual) maturity.

Comparison of participants' BMIs at Wave III and Wave I showed that weight gains were far greater among Southerners than those living in others regions of the country. Fifty-three percent of African American females in the South were either obese or overweight at Wave III, versus 39 percent for African American females located in other regions of the United States. Multiple regression exploring changes between Wave I and Wave III participants' BMIs indicated that many of the factors that proved important in Wave I analysis remained significant at Wave III. Wave III included items to capture activities and habits of participants during their early adulthood. Persons who spent more hours playing sports in a week, or who walked to school or work, were less likely to be overweight or obese. Dieting and exercising to lose weight at Wave I was linked to larger weight gains in Wave III. Obesity tends to be multi-generational with obese parents, especially the mother, having overweight or obese adolescents. Moreover, these adolescents gained more weight than their peers as they moved into young adulthood.

These study findings suggest several program implications. Given the multi-generational nature of obesity indicated in this study, programs to prevent or reduce obesity should focus on the entire family. Wave I findings indicated that lack of knowledge by parents was a key factor among overweight/obese children, indicating a role for nutrition education. An emphasis on healthy food (including breakfast) and an active lifestyle may prevent weight gain among young people. In young adulthood, team and individual sports have a larger impact on moderating weight gain than other exercise, though both tend to reduce weight gain. Walking to work or school has a negative impact (4-6 pounds less gained) on weight gain and should be encouraged. Communities could help by including safe walking routes in their development plans.

## Community Factors, Dietary Intake, and Health

### Retail Concentration, "Food Deserts," and Food-Disadvantaged Communities

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Food retailing in the United States has changed dramatically over the past 20 years. As large food retailers have entered smaller, rural markets, many local grocers have gone out of business, resulting in fewer local food retailers. A "food desert" is an area where residents have limited access to supermarkets and supercenter stores. The term originated in Europe to describe places with few food retailers. U.S. researchers have only recently begun to apply this concept to rural areas in the U.S.

This study used data on food retailers from the 1999 County Business Patterns data from the U.S. Bureau of the Census to develop a measure of U.S. food deserts. In addition, the study described the characteristics of food desert populations, and assessed the impact of food deserts on the consumption of fruits and vegetables.

The authors used Geographical Information System (GIS) technology to identify census blocks in which residents must travel at least 10 miles to access a supermarket or supercenter food retailer, which they defined as low-access areas. A county is designated to be a food desert based on the proportion of its population that lives in low-access areas. The food desert measure was then linked to data from the 2000 Census of Population and Housing to characterize the population of food desert counties.

The study found that food desert counties contain more small grocery and convenience stores than non-food desert counties. Because these stores often sell lower quality groceries at higher prices than supermarkets, food desert residents must sometimes travel long distances to access the quality, low-price groceries available at a supermarket or supercenter. Additionally, food deserts are less likely to have fruit and vegetable markets such as farmers markets. A second key finding was that food desert counties contain a higher percentage of low-income persons, lower median income families, a less-educated population, and higher rates of unemployment.

The authors also used data from the Behavioral Risk Factor Surveillance System to estimate the effect of living in a food desert county on the dietary

intake of Mississippi residents. They found that residents of food deserts are 23.4 percent less likely to consume five or more servings of fruits and vegetables than residents of non-food deserts, after controlling for age, race, gender, and education. In addition, the positive effect of education on consumption of fruits and vegetables is weaker in food desert counties than in non-food desert counties.

The study documented the prevalence and severity of food deserts in U.S. nonmetropolitan areas. Individuals living in food deserts may pay higher prices for groceries, since the greater travel costs incurred to access a large food retailer may not offset the savings available at these stores. Some sources of healthy food, such as fruit and vegetable markets, are less available in food deserts. Thus, living in a food desert may have an impact on the dietary quality of vulnerable segments of the population, including low-income families and the disabled, who comprise a greater share of the population in food desert counties. For these persons in particular, it may be inconvenient to shop at a large food retailer because of travel costs and other constraints.

Study findings indicate that food deserts affect dietary intake. Residents of food deserts experience a greater risk of poor dietary intake. Recent research identifies links between fruit and vegetable consumption and major health problems, such as heart disease, stroke, some forms of cancer, and pregnancy complications. These links underscore the health risks and public health costs associated with poor nutrition.

## **Nutrition Assessment and Education for the Keweenaw Bay Ojibwa**

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Keweenaw Bay Ojibwa Community College established the Nutrition Assessment and Education project to assess the nutritional needs of the Ojibwa people and to examine ways to address these nutritional needs while maintaining traditional tribal nutrition practices. The author initiated the project, in collaboration with other tribal organizations and businesses, in response to the high risk and prevalence of diabetes, heart disease, and other nutrition-related health problems among the Ojibwa people.

The author focused on the members of the Keweenaw Bay Ojibwa community living on or near the L'Anse reservation in northern Michigan on Keweenaw Bay of Lake Superior. About 860 of the 3,550 members of the Keweenaw Bay Ojibwa tribal community live on the reservation. This study provided information on the second year of the nutrition project, in which the project team continued their survey of local food establishment operators and tribal elders living on or adjacent to the L'Anse reservation.

Interviews with elders provided information about their eating habits and their views on eating traditional Ojibwa foods such as wild rice, fish, wild game, and seasonal fruits and vegetables. Many elders reported that they had to stop eating traditional food when they were sent as children to residential boarding schools or orphanages that did not serve these foods. Others who grew up on the reservation reported that they felt they were forced to eat many of the staple traditional foods (venison, bear, and muskrat) too frequently because they could not afford other foods. Therefore, they associated traditional foods with the conditions of poverty in which they grew up. However, over half the elders reported that they would like to eat traditional Ojibwa food at least once per week and over one-fourth reported that they would like to eat it at least once per day.

The nutrition project team gathered information from elders with knowledge of the preparation of traditional foods and of the cultural practices associated with their preparation and consumption. To encourage the Ojibwa people to eat traditional food, the nutrition project produced a cookbook of traditional Ojibwa foods and has encouraged local restaurants and feeding programs to incorporate these foods in their menus.



## **Assessing the Relationship Between Food Insecurity Events and Food Assistance Programs in Two Different Public Housing Communities**

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In spite of the economic growth and relatively low unemployment that characterized the U.S. economy over much of the past decade, food insufficiency and hunger continued to affect certain segments of the U.S. population. This study estimated the prevalence of food insecurity for a sample of housing assistance recipients in Atlanta, GA, and examined how the timing of food stamp receipt influences a household's food insecurity status.

The study compared households in two different types of public housing communities. The first type is a traditional public housing unit that consists of 500 apartment units occupied by eligible low-income families. The second type is a mixed-income housing community, in which a portion of units are subsidized for eligible low-income families and the remainder are available to anyone at market prices. The authors conducted a survey of 322 housing assistance recipients, collecting information on demographic characteristics, income, and receipt of government assistance, as well as information used to determine a household's food security status.

The study found that 52 percent of the respondents were food insecure and 16 percent were food insecure with hunger. The majority of the respondents (61 percent) reported receipt of food stamps and other forms of government assistance (in addition to their housing subsidy) in the month prior to the interview period. Respondents in mixed-income housing units had higher average income, higher employment rates, and were less likely to be food insecure than respondents in traditional public housing communities. It is not known whether the relatively favorable conditions for housing assistance recipients in mixed-income households are a result of the difference in the type of housing assistance or whether households that are most likely to experience better conditions are more able to access mixed-income housing assistance.

The study found that 22 percent of respondent households contained at least one adult who reduced food intake. The survey's items that register reduced food intake included cutting the size of or skipping meals or going without

eating for a whole day because of a lack of money for food at some time during the month before the survey. Among these households, the incidence of reduced food intake was more likely to occur during the fourth week of the month, especially for public assistance recipients. The authors note the need for further research on the timing of the disbursement of public assistance.

## Community Capacity and Food Insecurity in the Era of Welfare Reform

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This study examined the strategies used by the State of Mississippi to implement the Food Stamp Program after the passage of the 1996 welfare reform legislation, focusing on how local characteristics affect a community's ability to adapt to new policy requirements and serve its low-income population. The authors used administrative data from the Mississippi Department of Human Services (DHS) and decennial census data over the 1970 to 2000 period. They also conducted interviews with food stamp recipients from two counties in Mississippi and with 44 State- and community-level key informants who were knowledgeable of welfare policy in Mississippi.

Many of these key informants believed that reducing caseloads was a higher priority than increasing workforce participation. They suggested that State policies and practices took a punitive stance against cash welfare recipients, but were more accepting of the receipt of food stamps. They suggested that food stamp participation declined because the State did not clearly communicate the policy changes in public assistance to DHS employees located within State- and community-level offices. In particular, key informants noted that DHS staff did not receive training about the policy changes and that the mass mailing used by the State to inform welfare recipients of policy changes was ineffective.

Key informants also noted that welfare recipients faced numerous barriers to employment, including a lack of available jobs and limited access to transportation and child care for those who could secure jobs.

The authors examined county-level characteristics from Coahoma and Lee Counties in Mississippi. Coahoma County had a poverty rate of 35.9 percent and an unemployment rate of 10.1 percent in 2000. In contrast, Lee County had a poverty rate of 13.4 percent and an unemployment rate below 5 percent in 2000. In Lee County, community-level organizations played a major role in helping clients seek public assistance by linking them to State and other public agencies. Key informants indicated that the high degree of collaboration among local organizations in the county allowed them to better serve the low-income population.