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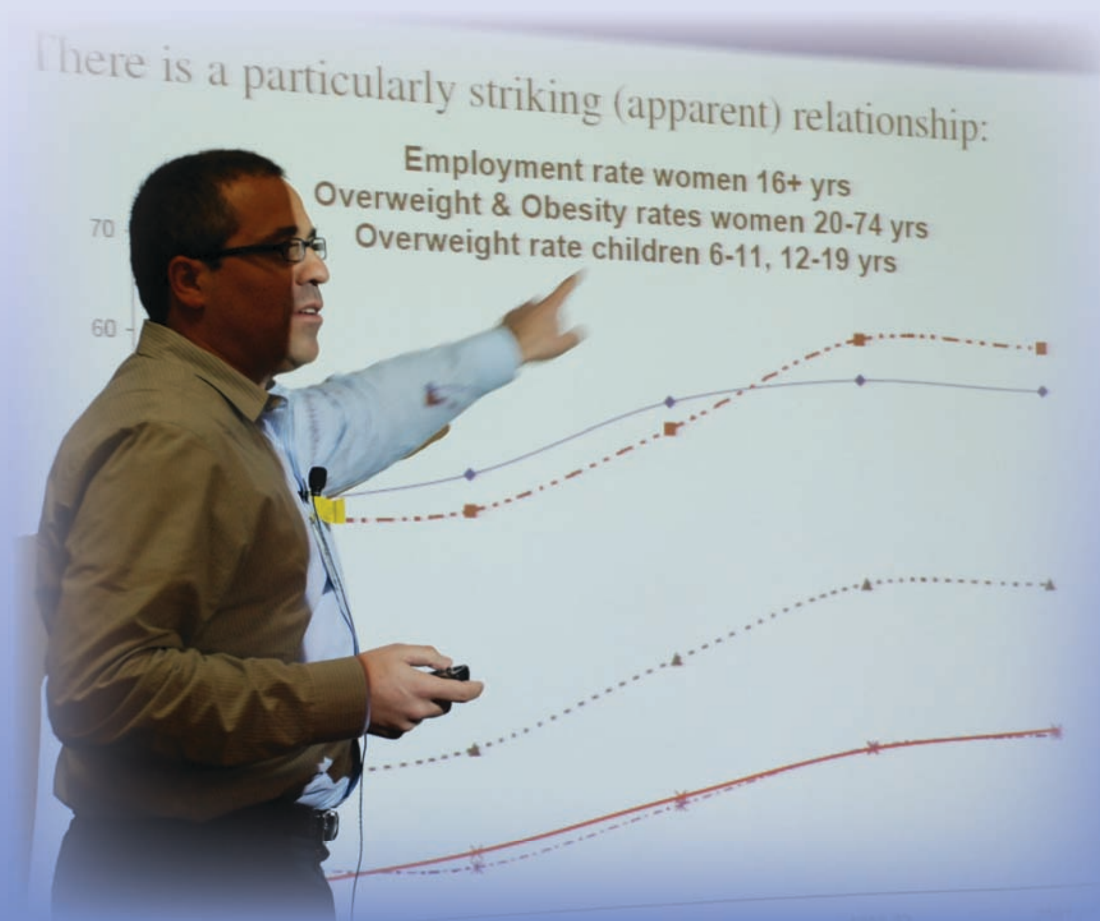
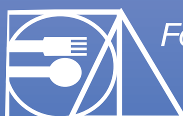
RIDGE Project Summaries, 2009

Food Assistance and Nutrition Research Innovation and Development Grants in Economics Program

T. Alexander Majchrowicz, editor





Food Assistance and Nutrition Research Program

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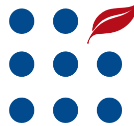


A Report from the Economic Research Service

www.ers.usda.gov

RIDGE Project Summaries, 2009

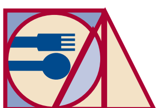
Food Assistance and Nutrition Research Innovation and Development Grants in Economics Program

T. Alexander Majchrowicz, editor

Abstract

This report summarizes research findings from the Food Assistance and Nutrition Research Innovation and Development Grants in Economics Program (RIDGE), formerly known as the Small Grants Program. The Economic Research Service created the program in 1998 to stimulate new and innovative research on food and nutrition assistance issues and to broaden the network of social scientists that collaborate in investigating the food and nutrition challenges that exist across communities, regions, and States. The report includes summaries of the research findings of projects that were awarded 1-year grants in summer and fall 2008. The results of these research projects were presented at the RIDGE conference in October 2009. The projects include analyses of the impact of the Special Supplemental Nutrition Program for Women, Infants, and Children on food insecurity and childhood health outcomes, cognitive achievement and the School Breakfast Program, childhood obesity, food choices, and food stamp use among the elderly. Several of the projects focus on specific populations, such as immigrants, Native Americans, or people living in the rural South.

Keywords: Food assistance, nutrition, food security, food insecurity, obesity, childhood obesity, food assistance, food spending, Food Stamp Program, Supplemental Nutrition Assistance Program, SNAP, food stamps, WIC, Food Assistance and Nutrition Research Program, RIDGE Program



Food Assistance & Nutrition Research Program

The studies summarized herein were conducted under research grants originating with the Economic Research Service. The views expressed are those of the authors and not necessarily those of ERS or USDA.

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Introduction

Federal food and nutrition assistance programs form a crucial component of the social safety net in the United States. The Supplemental Nutrition Assistance Program (formerly the Food Stamp Program)—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 four Americans at some point each year. The U.S. Department of Agriculture (USDA), the Federal department charged with administering nearly all of the Federal food and nutrition assistance programs, has an interest in monitoring program effectiveness and contributing to the policy goal of a healthy, well-nourished population.

Research Innovation and Development Grants in Economics Program

The USDA Economic Research Service's (ERS) Food Assistance and Nutrition Research Innovation and Development Grants in Economics (RIDGE) Program, known as the Small Grants Program during 1998-2006, offers grants to social science scholars to stimulate new and innovative research on food and nutrition assistance issues. Moreover, the RIDGE Program seeks to broaden and strengthen the network of university-based researchers who collaborate in tackling the unique food and nutrition challenges existing across communities, regions, and States. Building pockets of expertise across the United States is a vital part of ensuring that food assistance policies and programs meet the needs of families and communities across a variety of special circumstances.

RIDGE researchers are drawn from an array of disciplines and include economists, sociologists, nutritionists, anthropologists, and public health professionals. The researchers employ a variety of approaches in their studies, such as using statistical models to analyze individual and household response to policy changes. Others conduct exploratory research that uses ethnographic methods to examine underlying factors that influence program participation and outcomes. Still others use descriptive statistics to characterize the populations of interest. All the research methods contribute to a growing body of literature on the food needs, coping behaviors, and food program outcomes of low-income families and individuals. The work supported by the RIDGE Program often inspires the development of 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.

This report presents summaries of the research findings from the RIDGE awards that were granted in summer and fall 2008. Preliminary findings were presented at a conference at ERS in Washington, DC, on October 15 and 16, 2009, and the research projects were completed in December 2009.

RIDGE Program Partners

ERS created partnerships with five academic institutions and research institutes to administer the RIDGE Program and to competitively award grants for 1-year research projects. Most grants are for $20,000 to $40,000. Partner institutions

have the advantage of being closer to the particular regional and State environments that influence program delivery and outcomes. Each partner institution provides a different emphasis on food and nutrition assistance research.

ERS chose two of the five partner institutions for their experience in conducting policy-relevant poverty research at the national level. One of these is the Institute for Research on Poverty (IRP) at the University of Wisconsin-Madison. IRP has a history of research and policy evaluation, including previous involvement in administering small research grants funded by 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, a part of the Joint Center for Poverty Research from 1996 to 2002, has a strong history in conducting and supporting research on what it means to be poor in America.

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. Among these, the Department of Nutrition at the University of California, Davis brought to the RIDGE Program its expertise in nutrition education design and evaluation. A core faculty group focuses their 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) at Mississippi State University was chosen to administer the RIDGE awards 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 the large proportion of rural poor and rural African-Americans who reside in the region.

American Indian families living on reservations are a significant component of the low-income rural population in many of the Western and Plains States. ERS chose The University of Arizona's American Indian Studies Program (AISP) to administer RIDGE awards 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. AISP also reaches out to Native American scholars in a variety of academic settings.

In 2009, RIDGE was restructured from five to two partnership institutions that administer the program. The newly created centers, each possessing an expanded role in the program, are the RIDGE Center for National Food and Nutrition Assistance Research at the Institute for Research on Poverty (IRP), University of Wisconsin-Madison, and the RIDGE Center for Targeted Food and Nutrition Assistance Research at the Southern Rural Development Center

(SRDC), Mississippi State University. Information about the previous RIDGE partners administering the research projects summarized in this report, as well as many of their previously supported studies, can be found on the Websites of the institutions listed below. Also, ERS provides summaries of all RIDGE projects conducted since 1998 in an electronic database that allows users to perform customized searches of studies by keyword(s), project, research center, investigator, or year at: www.ers.usda.gov/Briefing/FoodNutritionAssistance/Funding/ridge.htm:

Institute for Research on Poverty, University of Wisconsin-Madison
Judi Bartfeld, RIDGE Program Center Director
Focus: The effects of food assistance programs on food security, income security, and other indicators of well-being among low-income individuals and families. Web address: *http://www.irp.wisc.edu/initiatives/funding/usdasgp.htm*

Southern Rural Development Center, Mississippi State University
Lionel J. "Bo" Beaulieu, RIDGE Program Center Director
Focus: Food assistance research issues impacting vulnerable rural people, families, and communities in the South. Web address: *http://srdc.msstate.edu/ridge/*

Irving B. Harris School of Public Policy Studies, University of Chicago
Robert LaLonde, RIDGE Program Center Director
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/Research/funding.asp*

The American Indian Studies Program, The University of Arizona
Jay Stauss, RIDGE Program Center Director
Focus: The relationship between food assistance programs on reservations and family poverty. Web address: *http://www.nptao.arizona.edu/usda.cfm*

The Department of Nutrition at the University of California, Davis
Lucia Kaiser, RIDGE Program Center Director
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/*

Project Summaries

Grants Awarded by the American Indian Studies Program, The University of Arizona

Using an Ecological Perspective as a Framework for Understanding Native American Elders' Views of Diabetes for the Development of an Indigenous Prevention Plan

Stephany Parker, Oklahoma State University and Chickasaw Nation Nutrition Services; Dwanna Robertson and Teresa Jackson, Oklahoma State University; and Sarah Miracle and Janice Hermann, Chickasaw Nation Nutrition Services

Background and Methodology

Type 2 diabetes is a growing concern for Native American adults and youth who exhibit diabetes prevalence rates at more than twice that of non-Hispanic Whites. The Centers for Disease Control and Prevention (CDC), Office of Minority Health Disparities (OMHD) reports that American Indians ages 10-19 have the highest prevalence of type 2 diabetes among people younger than 20.

Diabetes is a multifaceted problem that requires multifaceted solutions. Preliminary formative research indicated that diabetes is a major health concern for Native American families in Oklahoma. Native American participants indicated a preference for intergenerational health programs and identified elders as important change agents for health improvements. Previous research with Native American families supports the use of an ecological perspective as nutrition and health behaviors were frequently described as being affected by multiple levels of influence, including individual, interpersonal, and environmental factors.

The Social-Ecological Model offers a conceptual framework for understanding the health behaviors of Native Americans and can assist in developing plans for and evaluation of multiple-component nutrition and health programs. Furthermore, the results of previous research presented cogent reasons for using formative assessment approaches to investigate the role of elders as possible change agents for improved health among American Indian families. As such, the socioecological model was used in this study as the framework for evaluating Native American elders' views of diabetes. The rationale underlying this investigation was that indigenous involvement is necessary to gain insight into the complex reasons for the disparate occurrence of diabetes among Native Americans.

The study design was qualitative and descriptive. Objectives of the study were to (1) frame diabetes from the perspective of elders who live in the Chickasaw Nation and (2) develop an indigenous plan for diabetes prevention using elders as agents of health change to address diabetes and improve overall health. Elders ages 60 or older who received Food Distribution Program on Indian Reservations (FDPIR) benefits from one site in Oklahoma were recruited to participate in the study. Elders participated in one or more of the four phases of research. In Phase I, seven focus groups were conducted to identify the individual sphere of influence. In this phase, five focus groups were conducted with elders who had diabetes and two groups were conducted with elders who did not have diabetes. In phase 2, storytelling video

documentaries were used to identify interpersonal and community aspects of diabetes and included four elders diagnosed with diabetes and four elders who did not have diabetes. Phase 3 consisted of five focus group discussions to identify environmental aspects necessary for the prevention of type 2 diabetes. In Phase 4, investigators presented elders with seven possible prevention plans based on findings from the previous phases. In phase 4, three roundtable discussions were conducted with elders to identify the preferred prevention plans.

Findings

A total of 47 elders, with a mean age of 67 years, participated. Most participants (72 percent, n=34) were female, and approximately 60 percent (n=28) indicated that they had diabetes. Not only were elders commonly diagnosed with diabetes, but they also indicated strong familial ties to diabetes. At the individual and interpersonal levels, participants shared repeated traumatic loss, with family members and friends frequently being affected by the experience of type 2 diabetes. Devastating complications, such as limb loss and kidney failure, were associated with the diabetes experience. Elders conveyed a sense of internalized blame and related diabetes to heredity, genetics, and upbringing. Elders shared that historical trauma brought about a shift in the way of living for Native American families that has led to the consumption of less healthful foods, declines in physical activity, and increased rates of diabetes. Elders conveyed a sense of contamination that has affected ways of living and food supply. Elders perceived the current food supply, including meat and produce, as being contaminated by food processing and handling procedures. Often elders conveyed a general sense of hopelessness surrounding diabetes prevention in younger generations because of the repeated loss, internalized blame, and historical trauma associated with the disease.

Partnerships and support were indicated as important environmental factors for the prevention of diabetes in younger generations. Most frequently tribal specific support was mentioned as central to prevention and included locations for programming, incentives for participation, and funding for diabetes prevention efforts. In addition to tribal support, family, religious, school, and community support were also cited as necessary for prevention. Elders most strongly favored diabetes prevention plans that were family, spiritual, and tribal based.

The results of this study indicate that diabetes prevention plans need to be developed that involve tribal members and address multiple levels of influence. The study also supports a need to redefine principles of practice related to diabetes prevention and to foster collaborative solution-based diabetes prevention strategies that acknowledge and address historical and generational trauma.

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Understanding the Impact of Food Assistance Program Use on Food-Related Psychosocial Factors and Behaviors Among American Indians

Joel Gittelsohn, Muge Qi, and Sonali Suratkar, Johns Hopkins University

Background and Methodology

Food assistance programs, including the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), the Food Stamp Program (FSP)—now the Supplemental Nutrition Assistance Program (SNAP)—and the Food Distribution Program on Indian Reservations (FDPIR), aim to ensure low-income American Indian households an adequate, nutritious food supply. Many low-income American Indian households on reservations rely heavily on food assistance programs to meet their nutritional needs. However, limited accessibility, availability, and affordability of healthy foods on American Indian reservations may constrain food purchasing and consumption. While food assistance program participation helps in promoting food security and increases food purchasing power of low-income households, its impact on food-related psychosocial factors, food behaviors, and diet quality of low-income American Indian households is unclear.

The goals of this study were to (1) examine the impact of patterns of food assistance program use on other aspects of food acquisition and use; (2) examine relationships between food assistance program use and dietary quality among American Indian food assistance program participants; and (3) develop culturally appropriate nutrition-intervention components for the Healthy Stores programs that support food assistance program use, including healthier cooking methods.

The research was conducted on three American Indian reservations: the San Carlos and White Mountain Apache Tribes and the Navajo Nation. Surveys on random samples of adult tribal members (baseline: Apache, n=342; Navajo, n=284) were conducted and a Healthy Stores intervention was implemented in all three settings. Data collection instruments included an Adult Impact Questionnaire (AIQ), which included questions on sociodemographics, food assistance use, food purchasing, food preparation, food security, and psychosocial factors. A second instrument used was a quantitative food frequency questionnaire that recalled dietary intake of more than 100 foods over the past 30 days. The study followed up with a post-intervention evaluation on the Navajo Nation only (n=121 respondents), which included an instrument to assess exposure to intervention components.

Findings

The Apache Study: Of 342 Apache respondents, 83 percent were the main food preparers and shoppers, 93 percent were female, 40 percent were married, and 29 percent were employed full time. The mean age of the sample was 41.5 (standard deviation (SD)=13), and mean household size was 5.0 (SD=2.3). At the time of data collection, 24 percent of participants were from households that participated in only the FSP, 9 percent from households that participated in only the FDPIR, and 6 percent from households that participated in only WIC during the last 12 months. In addition, 25 percent of participants were from households that participated in both the FSP and WIC (FSP+WIC) and

3 percent from households that participated in both WIC and the FDPIR (WIC+FDPIR). Household participation in only the FSP was negatively associated with the frequency of getting healthy alternative foods (beta=-7.56, p=0.0002) and with the frequency of getting fruits and vegetables (beta=-6.76, p=0.0521). The frequency of American Indian households that participated in only the FSP getting healthy alternative foods or fruits and vegetables was about 7.6 times and 6.8 times, respectively, lower during the last 30 days than that of households that did not participate in any food assistance program. Food-related knowledge of respondents who participated in only the FSP was significantly lower than the knowledge of households that did not participate in any food assistance program (beta=-1.305, p=0.0038).

The study did not find significant associations between types of food assistance program participation and frequency of getting unhealthy foods, healthy food preparation and prepared food purchasing, and food-related self-efficacy and intention. Further analyses indicated that households that participated in WIC (either alone or in combination with the FSP) do better than households that participated in only the FSP in terms of frequency of getting healthy alternative foods and getting prepared foods, and that main food preparers and shoppers in these households had higher food-related knowledge. WIC-only households had a greater frequency of purchasing prepared foods. These findings were incorporated into the Apache Healthy Foods intervention.

Results of Navajo Baseline Data: Of the baseline Navajo respondents, 77 percent were female with a mean age of 46.6 (SD=17.1). The mean household size was 4.2 (SD=2.3), and a major proportion (34.1 percent) were married. Navajo respondents reported high levels of chronic disease both among themselves and their immediate families. Over 10 percent of respondents reported that they had heart disease, 22.2 percent reported diabetes, and 28.3 percent reported high blood pressure. The sample of Navajo adults had very high rates of obesity, with 86 percent of the sample either overweight or obese.

Navajo households reported extremely high levels of food insecurity. More than three-quarters of all Navajo households studied had some level of food insecurity, with more than a quarter of all households reporting child hunger, the most severe form of food insecurity. Respondents who were more obese tended to have greater knowledge of healthier food choices and were better able to read food labels. Respondents who were more obese also reported using healthier cooking methods and obtaining unhealthy foods less frequently. The baseline findings demonstrated that the Navajo Healthy Stores (NHS) program would have to rely on more than just straightforward education as a means of changing behavior and reducing risk for obesity and diabetes.

Results of Baseline Navajo Data by Food Assistance Program Participation: A third of the baseline Navajo sample was on WIC and /or food stamps (10.6 percent on WIC only, 13.6 percent on FSP only, and 9.9 percent on FSP+WIC), while 18.3 percent received commodity foods, 20.5 percent ate at the senior center (part of the Nutrition Services Incentive Program), and 8.8 percent used Food Bank/Navajo Way. A higher proportion of food-insecure households were participating in either one or more of the food assistance programs (FSP, WIC, commodity foods, food bank/Navajo Way, or senior center) compared with their food-secure counterparts. Of the psychosocial

factors, only healthy eating self-efficacy seemed to be significantly lower ($p=0.03$) in participants of the FSP and commodity food programs, after controlling for age, sex, socioeconomic status, and other sociodemographic characteristics. Food knowledge scores were also lower in those eating at senior center/food bank/Navajo Way, but these lower scores were not significant ($p=0.07$ to 0.08). Those receiving commodity foods showed a trend toward higher food-getting frequency scores after adjustment ($p=0.11$), while those receiving food stamps tended to have worse healthy cooking scores ($p<0.01$). On the other hand, those on food stamps had a greater frequency of vegetable consumption ($p<0.05$).

Results of Navajo Post-Intervention Data: No impact of the NHS intervention was observed in terms of the primary psychosocial and behavioral outcomes by treatment group. Few significant differences were observed between the intervention and comparison group respondents in terms of level of exposure to specific intervention components. This finding is unlike previous findings in similar intervention trials with the Apache and First Nations, where significant exposure differences were found between intervention and comparison respondents. In all likelihood, respondents from comparison areas were not significantly less exposed to the intervention. The entire sample of respondents was pooled to examine the manner in which their outcomes varied by level of exposure. Those respondents most exposed to the intervention were much more likely to have visited an intervention store in the past 30 days.

When divided into quartiles by level of exposure, many trends were found where greater exposure was associated with changes in the individual outcomes in the direction expected, including a statistically significant improvement in food intentions. People who were more exposed to the intervention tended to show trends toward greater improvements in food-related knowledge, self-efficacy, and intentions. Respondents who were more exposed to the intervention also showed greater changes in behaviors, including healthy cooking methods and frequency in getting healthy foods. In conclusion, a point of purchase (POP) intervention in American Indian food stores appears to be associated with psychosocial and behavioral improvements. POP and environmental changes to improve food access may be an effective way to complement food assistance program efforts.

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Using Research About Traditional Foods of Puget Sound Indians To Create a Healthier Diet and Lifestyle for Indian People

Elise Krohn and Valerie Segrest, Northwest Indian College

Background and Methodology

Research has shown that Native Americans are less likely to suffer from chronic diseases, such as diabetes, if traditional foods are consumed. In this study, Native foods experts and Northwest Coastal Indian tribal community members used existing archeological and ethnographic data to create a modern traditional foods diet that might improve the health of Indian people today. In addition, the study defined barriers to implementing a traditional foods diet and documented ways tribal communities are attempting to overcome those barriers.

The study builds on research from The Puget Sound Traditional Food and Diabetes Project, in which the University of Washington Burke Museum, The Tulalip, Muckleshoot, and Suquamish Tribes, and King County partnered to find archaeological and historic data that would provide a long-term picture of the traditional Native American diet in the Puget Sound region before European contact. While the findings of the study are of interest both to diabetes researchers and to tribal members, the results are difficult to interpret and use.

In order to make the dietary findings of the Puget Sound study more useful, the research team partnered with the Northwest Indian College's Diabetes Prevention Through Traditional Plants Program. Since 2005, this program has facilitated monthly workshops and mentorship programs that emphasize lifestyle changes based on traditional foods. The program has served over 200 participants from 10 tribes in the Puget Sound region. The current project was created to meet the needs identified by these program participants.

Existing archeological and ethnographic data were analyzed to determine which historically used Native foods are still readily available and safe to use today. A team of experts, including tribal elders, ethnobotanists, and a nutritionist, worked together to develop a modern traditional foods diet.

Tribal cooks, food-related administrators, diabetes-prevention staff, nutritionists, diabetes counselors, tribal decisionmakers, welfare program administrators, elders, cultural specialists, and educators gathered at two roundtable discussions to address these questions:

- Is your community/family currently accessing Native foods and local healthy foods? If so, how?
- What are the barriers in your community/family to accessing these foods on a regular basis?
- How is or how might your community/family increase access to Native foods and healthy local foods?

The discussions were documented by video and audio recording.

After the roundtable discussions, 20 tribal cooks from 8 communities met for 3 days to develop healthy and affordable recipes that could be easily prepared.

Findings

Many of the foods that were historically eaten by Northwest Coastal Indian people are still available. A few foods have become extinct and others, such as seagull eggs, are no longer accessible or considered palatable. To develop a modern traditional foods diet, the research team compiled a list of Native foods that are still available and added locally grown foods that are nutritionally similar to Native foods. For example, blueberries can be eaten if huckleberries are not readily available.

Although knowledge of the Native foods that kept Northwest Coastal Indian ancestors healthy is interesting, the information is only useful if people are able to access those foods. Over 90 people from tribal communities in the Puget Sound region gathered at roundtable discussions to explore issues related to accessing traditional foods. Many elders reported that they had harvested more Native foods in their youth. Some community members are still harvesting and preparing Native foods, although these activities have decreased significantly over the last two generations. Among the most important barriers to accessing traditional foods are toxins in the environment, a loss of traditional harvesting grounds, cultural oppression, and economic challenges. Participants shared ways that their communities are already increasing access to traditional foods and healthy local foods. Examples include community gardens, classes on harvesting and preparing traditional foods, plant restoration projects, a traditional foods bank, farm-to-elder programs, and partnerships with local landholders.

The results of the study, including a list of Native foods that were historically eaten by Northwest Coastal Indian ancestors, the modern traditional foods diet, results of roundtable discussions, and recipes from the tribal cook's camp are being compiled in book format and are scheduled for release in March 2010. The book will be distributed to participating tribal communities and will serve as a resource for those interested in revitalizing Northwest Coastal Indian traditional food culture.

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Ancestors' Choice™ Environmental Strategy for Prevention of Childhood Obesity in Native Populations

Anita L. Dupuis, Salish Kootenai College

Background and Methodology

American Indians and Alaska Natives (AIAN) suffer the highest rates of health disparities, such as obesity, where lifestyle is a key risk factor. Previous interventions to change the behavior of AIAN have had Native cultural components incorporated into them in the hope of making the intervention culturally relevant. For this study, however, we incorporated the interventions into the Native culture. In other words, the study started with Native culture and indigenous wisdom as the community strength and foundation upon which to stimulate the motivation for, and design of, an intervention. This study was developed from the groundwork of the Community Health and Development Department, in which a social marketing campaign entitled Ancestors' Choice™ was launched. Ancestors' Choice promotes the choice for healthy foods and lifestyles based on the wisdom of traditional Native values and culture. Ancestors' Choice is a strategy to assist Native people living in contemporary times to make healthier diet and lifestyle choices that in essential ways honor and emulate the practices that produced the health benefits for the people who lived during ancestral times. Considerable evidence indicates that an approach that encourages Native people in the direction of Ancestors' Choice may result in improved health outcomes.

The hypothesis for this study was that children will choose and consume healthier foods, snacks, and drinks if (1) messages attempting to motivate healthy eating habits in Native children, youth, and teens are culturally congruent, (2) products have packaging and taste appeal, and (3) healthy foods are made readily available in the environments where children congregate.

The three aims of the study were to (1) tailor the campaign to address children, youth, and teens of the Flathead Indian Reservation, (2) evaluate the campaign's impact on brand-name recognition and sales/consumption of items with the Ancestors' Choice label by children, youth, and adults, and (3) further develop a RezChef™ cooking class to include cooking shows with children, youth, and teens. These shows would be aired on public television and made available with a healthy eating curriculum, teacher's guide, and DVD to Northern Plains and plateau tribes.

Participants in the study included people of Native American or Alaska Native descent between the ages of 3 and 75 currently residing on or near the Flathead Reservation. Participants were invited to (1) taste products being considered for endorsement by the Ancestors' Choice Social Marketing campaign, and (2) through focus groups, provide input on the social marketing messages that had roots in and connections to traditional culture that would address market appeal, channels of distribution, tastes, and preferences. A family-friendly indigenous nutrition class, plus the development of a play and public performance promoting Ancestors' Choice healthy diet and lifestyles, premiered. Future showings are scheduled with children and youth actors and audiences throughout the Reservation.

Surveys were conducted before and after the study with various children, youth, and adults throughout the Reservation to ascertain brand name recognition for Ancestors' Choice and RezChef. Youth Groups were interviewed through focus groups at the beginning of the study to enlist their involvement in developing the Social Marketing Campaign for promoting healthy eating messages to children and youth. Taste-testing events were conducted for snacks, drinks, and menus developed through the RezChef programs. Recipes receiving youth approval were included with the RezChef DVDs.

As this was a preliminary study, methods did not involve a control group, placebo, or blinding. Data collection included in-person questionnaires, focus groups, or tasting events at which people were invited to sample the foods offered through Ancestors' Choice. All questionnaires and data collection procedures were developed and reviewed as part of the study.

Findings

Only 6 percent of participants recognized the Ancestors' Choice (AC) logo prior to the study, but that percentage increased to 25 percent recognition after the study. Similar results were demonstrated for recognition of the RezChef logo. These results indicate that the intended message is being delivered. Responses to the question "What comes to mind when you look at the AC logo?" included traditional lifestyles, togetherness, unity, smoothies, Native culture, Indian wisdom, healthy traditional choices, and "heritage in the now." Responses for the question "What is it trying to get you to do?" included live strong, balance your life, choose ancestral ways, and live a healthier lifestyle. The most common responses to "What would help you make healthier choices on a daily basis?" were availability of healthy local food and better nutritional education.

The biggest exposure to Ancestors' Choice took place during the smoothie sales held throughout the Reservation. A cooking show that involves children in making smoothies is in final editing as a half hour DVD program. Focus group results included suggestions for further activities involving the community, such as a "biggest loser" contest, a play about making healthy choices using Native themes and humor, and weigh-in and run competitions.

Limitations of the study are the nonrandomized samples, difficulty coordinating children and parental schedules, difficulty in accessing children for surveys, and high staff turnover. Enthusiasm for the various projects that promote a Native-based diet and healthy lifestyle continues to grow as more connections within the community are developed. The play Beansy and Peasy Choose Ancestors' Choice™ is being requested by the local schools and Head Start Programs throughout the Reservation and is expected to become the primary vehicle for increasing brand name recognition for Ancestors' Choice™.

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Nutrition and Cognitive Achievement: An Evaluation of the School Breakfast Program

David E. Frisvold, Emory University

Background and Methodology

Well-nourished children perform better in school. Because food insecurity, food insufficiency, and nutrition deficiencies are more prevalent for poor children than nonpoor children, low-income children are less likely to acquire the educational benefits from better nutrition. In the United States, food assistance programs have been established to improve the well-being of poor and low-income children. Although substantial evidence shows that nutrition interventions for young children in developing countries lead to increases in cognitive achievement and greater educational attainment, evidence of the influence of food assistance programs in the United States on cognitive achievement is limited. This study investigated the impact of eating breakfast through the School Breakfast Program (SBP) on cognitive achievement.

The primary difficulty in determining the impact of participation in the SBP on cognitive achievement is that participation in the program is determined primarily by the choices of schools and families, and the determinants of these choices may also be related to the cognitive achievement of students. This study used State mandates to account for the endogeneity of participation in the SBP. To increase participation in the SBP, many States mandated that schools must provide breakfast through the SBP if the percentage of students in the school who are eligible for free and reduced-price breakfasts exceeds a set threshold. A small difference in the percentage of students eligible for free and reduced-price breakfasts around these State-mandated thresholds may lead to a large change in the likelihood that a school offers breakfast through the SBP. Using a regression discontinuity design, we compared the academic achievement of students in schools where the number of students eligible for free and reduced-price breakfasts is just below the mandated threshold with the academic achievement of students in schools where the number of students eligible for free and reduced-price breakfasts is just above the threshold.

Data from the Early Childhood Longitudinal Study, Kindergarten Cohort of 1998-99 (ECLS-K) were used to estimate the impact of the SBP. The ECLS-K includes information about the percentage of students eligible for free and reduced-price breakfasts; whether the school provides breakfast through the SBP (responses from a school administrator); whether the student eats school breakfast (from a parent); and direct cognitive assessments of the student in reading, mathematics, and science. The analysis for this project focused on the third and fifth grade waves. Information about the State mandates is provided by the Food Research and Action Center.

Findings

The results from this study suggest that State mandates requiring schools to participate in the SBP once the percentage of the schools' students eligible for free and reduced-price breakfasts exceeds a specific threshold have been

effective in increasing the participation of schools in the SBP and the consumption of breakfast within schools. Exceeding the State threshold increases the probability that a school participates in the SBP by 21 percentage points and the probability that a student eats breakfast as part of the SBP by 8 percentage points. The results also suggest that these State mandates do not influence reading achievement, although this relationship is not estimated precisely, but do increase math and science achievement. Thus, there is some evidence that the improved nutrition through SBP participation increases cognitive achievement.

Further results demonstrate that State mandates requiring schools to offer breakfast do not increase consumption of breakfast within schools among low-income students. Instead, the increase in the provision of school breakfasts benefits students whose family income exceeds the free- and reduced-price-eligibility criteria.

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Welfare Stigma Due to Public Disapproval

Colleen Flaherty Manchester, University of Minnesota, and
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Background and Methodology

A large share of households that are eligible for federally funded food assistance programs do not participate. This empirical regularity implies that eligible households do not know that they can participate in food assistance programs or that a utility cost is associated with participation. One part of this utility cost is that households that choose to participate must bear the associated time cost of filling out forms and obtaining required documents needed to verify eligibility. Rather than a one-time event, ongoing re-verification of eligibility is required as well as other time costs, which may include visits to the welfare office and inconvenience at the grocery store. Past research has also recognized the potential role of psychological costs (welfare stigma) as a deterrent of welfare program participation. Prior studies have shown that observable characteristics, which the researchers argue are associated with psychological costs, are negatively associated with program participation.

Although the existing literature agrees that there are both time costs and psychological costs, the only attempts to estimate the size of these costs have been to estimate them together in an all-encompassing welfare stigma term. The literature has found that together these costs are large. However, policymakers would benefit from knowing the degree to which psychological costs, rather than time costs, are responsible for the lack of participation in food assistance programs.

This study contributes to the literature by decomposing the costs associated with participation in the Food Stamp Program (FSP)—now the Supplemental Nutrition Assistance Program (SNAP)—and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) into time costs and psychological costs. In addition, this study measures the change in psychological costs caused by FSP adoption of the electronic benefit transfer (EBT) system, which makes food stamp use at the grocery store much less observable to the public.

Identification of the psychological costs separate from the time costs of participation in WIC and FSP comes from a structural assumption about the nature of the psychological costs. The model is constructed around the assumption that the total psychological costs for participants do not increase with the number of programs in which the household participates. Time costs are specific to the program and thus accrue according to the specific programs in which the household participates. This means that, for a participant in one program, the marginal cost of participation in the other program is just the program-specific time cost; there are no additional psychological costs. However, with the adoption of EBT, participating in FSP is assumed to have a reduced level of psychological costs as well as reduced time costs (due to the EBT adoption and other reforms).

The data used in this study are two samples of female household heads from the Survey of Income and Program Participation (SIPP), the first from 1997 and the second from 2004. To alleviate concerns about joint labor supply

decisions, the sample consists of working-age nonmarried women who are in households in which they are the sole decisionmaker. The parameters of the structural model are estimated using a simulated quasi-maximum likelihood estimation procedure that allows for heterogeneity in psychological costs, preference for leisure, and earning ability. Once estimated, the structural model is used to make predictions about outcomes of alternative scenarios, such as the manner in which the take-up rate would be affected if WIC were to adopt EBT.

Findings

One of the implications of the model is that the reduction in the psychological costs for FSP participants implies that WIC participation should fall among FSP participants. Simple regression analysis gives strong evidence in favor of this prediction of the model, indicating that the data are consistent with the structural assumptions of the model.

Estimation of the parameters of the model reveals that psychological costs are much more important than time costs in explaining the lack of participation in food assistance programs by eligible female-headed households. FSP adoption of the EBT system is estimated to have reduced average psychological costs by 31 percent, although there is a great deal of heterogeneity in the response. Using the model to simulate what would have happened if WIC had implemented the EBT system at the same time that FSP did leads to the finding that WIC take-up rates (participation rate among eligible female-headed households) would increase by 20 percent, with little change in eligibility. An important caveat is that this result assumes that the EBT system implemented for WIC is identical to that implemented for FSP, which may be impractical given the current denomination of WIC benefits in ounces rather than dollars.

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The Impact of WIC Participation on Food Insecurity and Early Childhood Health Outcomes for a Nationally Representative Sample of Children

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Background and Methodology

Most research examining child health outcomes for Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) participants beyond infancy has focused on nutrient deficiencies, immunization, and health care service use. In order to examine the effectiveness of WIC as a multidimensional food and health assistance program for income-eligible families, it is imperative that research move beyond these examinations of limited health outcomes of children at very young ages that usually focus on nonrepresentative samples. Instead, research is needed that focuses on how WIC may serve as a mechanism to reduce disparities in early childhood health outcomes for low-income children by offering food, health, and social service resources to income-eligible participants. Additionally, research must consider appropriate comparison groups when examining associations between WIC participation and child health outcomes. Selection bias and inappropriate comparisons with children who do not meet income and categorical WIC requirements could lead to incorrect associations that mislead policy discussions. In this study, we examine associations between WIC participation and child health outcomes by using appropriate comparison groups and statistical methods with a nationally representative sample of children.

Research has shown the impact that poverty, or low-income status, can have on childhood health and developmental outcomes. However, one large dimension missing from the policy-relevant empirical work at the national level is the role that child WIC participation may play in helping to reduce poor health and nutrition outcomes for low-income children and their families. Poverty has been shown to generate various health risks for children, including a variety of morbidity conditions and increased mortality. By adding empirical information about WIC eligibility and child participation when testing the relationship between low-income status and childhood health, we may be better able to explain why this relationship persists or is reduced for certain at-risk families. This more complex relationship is important to this study because higher morbidity risks have been found for middle ear infections, high blood lead levels, asthma, and lower respiratory illness among children living in poverty than for those illnesses among nonpoor children. However, the association between child WIC participation compared with nonparticipation and specific child morbidities is not known from a population perspective among WIC-eligible families. This research helps to fill this gap.

Data for this analysis were taken from the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), Longitudinal 9-month-Preschool Restricted-Use Data File. The ECLS-B is a current and comprehensive national data source that provides information on family poverty status, child WIC participation, diverse racial/ethnic groups, and childhood morbidities. The ECLS-B follows a nationally representative probability sample of U.S. children born between January and December 2001. For this analysis, approximately 6,100 children of the total 10,700 complete 9-month sample were used. The sample was restricted to

include only children who were eligible to receive WIC benefits. Four variables in the ECLS-B were used to determine WIC eligibility, including whether the child's family income was at or below 185 percent of poverty at the 9-month interview or an adult in the household had used one of the following social service programs in the year since the focal child's birth: Medicaid, the Food Stamp Program (FSP)—now the Supplemental Nutrition Assistance Program (SNAP)—or Temporary Assistance for Needy Families (TANF).

Five child health measures were used as dependent variables in the analysis, including whether a doctor gave the child a diagnosis of asthma, a respiratory illness (bronchitis, pneumonia, or bronchiolitis), a severe gastrointestinal illness (frequent vomiting, diarrhea, or dehydration), or an ear infection and a parental rating of the child's health as fair or poor at the 9-month interview. Additional variables used in the analysis included focal child use of WIC vouchers for formula or food in the past 30 days at the 9-month interview, maternal race/ethnicity, family poverty status, adult in household used Medicaid in past year, adult in household used food stamps in past year, adult in household used TANF in past year, maternal age at focal child's birth, maternal educational level, mother employed full-time at 9-month interview, mother married at focal child's birth, maternal poor self-rated health, and urban residence.

In order to compare child health outcomes among WIC participants and nonparticipants, statistical techniques were employed that allowed for an explicit comparison between children that used WIC benefits in the past 30 days and those that did not use WIC benefits but were eligible to participate. Propensity-score-matching methods were used to create these comparison groups. To estimate the propensity scores, the maternal sociodemographic variables listed above were used as predictors in a logistic regression model to determine child WIC participation. The PSMATCH2 module, prepared for use in Stata statistical software, was used to estimate the propensity scores and conduct the matching. Once the propensity scores were estimated, children participating in the program were matched to children not participating in the program based on their propensity score. The average effect of the treatment on the treated (ATT) then was estimated, which provides the average effect of child WIC participation on the childhood morbidity diagnoses and poor health rating for those children who participate in the program. The ATT is a rate ratio obtained from comparing the percentage of children with a specific diagnosis among children participating in WIC with what the percentage of children with a diagnosis or poor health rating would have been if the child did not participate.

Findings

Results from this empirical analysis indicate that WIC does not lead to poorer child health outcomes for participants than for nonparticipants, once appropriate comparison groups are generated based on observed maternal characteristics. Stated differently, once the characteristics that have been shown to be associated with both WIC participation and poor child health outcomes are balanced between child WIC participants and nonparticipants, no significant differences in childhood morbidity diagnoses of asthma, gastrointestinal illnesses, respiratory illnesses, or ear infection are observed. Similarly, child WIC participants and nonparticipants have similar odds of their mothers rat-

ing their health as poor, once appropriately matched comparison groups are created. However, prior to matching, children using WIC benefits in the past 30 days apparently have much higher odds of having an asthma, respiratory illness, or ear infection diagnosis or having their mothers rate their health as poor compared with children eligible to receive WIC benefits but not participating. These significant differences are likely due to differences in maternal sociodemographic characteristics because mothers of children not participating in WIC but eligible for benefits tend to be racial/ethnic minorities, have lower levels of education, be younger than 20 when the child is born, live in poverty, and be unmarried when the child is born.

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The Effects of Female Labor Force Participation on Adult and Childhood Obesity

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Background and Methodology

Obesity is a critical issue faced by adults and children in the United States and in many other developed and developing countries. For the first time in history, the number of overweight individuals around the world rivals the number of those underweight. In 2003, the World Health Organization reported that more than 1 billion adults were overweight and at least 300 million of them clinically obese. Understanding the causes behind recent increases in obesity rates is fundamental for devising policies aimed at controlling and eventually lowering obesity rates.

This study assessed whether labor force participation of single mothers is associated with obesity of both mothers and their children. To understand and quantify the causal effects of changes in female labor force participation on obesity, the study exploited a "natural experiment" generated by the 1987 and 1994 expansions of the Earned Income Tax Credit (EITC).

The contribution of using changes in the EITC to study obesity is that they provide a credible exogenous variation in labor force participation. The study exploited two important features of the EITC. First, the expansion in the value of the credit starting in 1987 introduced an important incentive for women with children to increase their labor force participation. Therefore, comparisons of single women with and without children, before and after the 1987 expansion, were one of the sources of identification. Second, the study exploited the differential effects of the EITC for families with one child versus more than one, which became relevant after the 1994 EITC expansion. Thus, the second strategy for identification compared families with more than one child versus families with just one. These policy changes provided a credible empirical strategy with which to study the effects of labor force participation on obesity. Specifically, by comparing between groups and across time, we were able to control for other confounding factors that might be related to changes in both labor force participation and obesity.

To implement the empirical strategy, we used two different datasets with different characteristics, which allowed us to perform complementary analyses. The first dataset is the National Health Interview Survey (NHIS), a nationally representative annual sample of U.S. households. The second data source is the National Longitudinal Survey of Youth 1979 (NLSY79), which contains information on adults, and the NLSY79 Children and Young Adults (NLSY-79CYA) for the information on their children. Estimating the adult models by using both repeated cross sections and longitudinal data made the study more robust as it can exploit different sources of identification with each dataset.

Findings

Using NHIS data, we replicated the findings of the EITC literature regarding the positive effects of employment for single mothers. These results are robust with regard to different identification strategies, either by comparing women with children to women with no children or by comparing women with two or more children to women with one child. In addition, we estimated differences-in-differences regressions and exploited differences in maximum EITC benefits. Using NLSY79 data, we also replicated most of those employment results, but for some groups, these are very noisily estimated. In general, we found that increased labor force participation modestly affected the adults' body mass indexes (BMI), overweight rates, and obesity rates. In addition, based on NLSY79 data, we found evidence of an increase in the children's overweight and obesity rates, particular for children of low-education mothers. However, we are reluctant to attribute these increases to changes in the labor force participation status of their mothers because the adults' regression coefficients are very imprecisely estimated.

We interpret the employment effects and the results of the robustness checks as justifying our identification strategy. We also interpret the variety of obesity-related results as weak evidence of a causal link between female labor force participation and increased adult and childhood obesity. The results apply to a particular population, single women with children with relatively poor labor prospects, which make them potentially affected by the EITC policy changes. Future research could address whether our conclusions would apply to married women and women with higher earnings potential.

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Family Food Decisionmaking: Child and Adult Perspectives on Household Food Practices and Food Insecurity

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Background and Methodology

Household food insecurity is associated with many negative health and well-being outcomes for individuals, including obesity, maternal depression and stress, and diminished physical activity and psychosocial functioning for children. Although food insecurity impacts individual well-being, it also shapes interactions among individuals, including, for example, compromised parent/child interactions, stressful family processes, and changes in family eating patterns and socializing. These interpersonal and intrafamilial dynamics are important both in their direct impact on the well-being of those involved and through their potential influence on household decisionmaking about managing food insecurity.

Existing studies of household food insecurity rely heavily on data collected from mothers. The prioritization of mothers' experiences may be somewhat warranted in food-insecurity research for several reasons. First, mothers tend to play primary roles in food acquisition within families. Next, mothers are overrepresented in the food-insecure population. Over 30 percent of all single-mother households with children are food insecure. Further, people living in single-parent (mostly single-mother) households represent about 44 percent of all those receiving assistance from the Food Stamp Program (FSP), now the Supplemental Nutrition Assistance Program (SNAP), and 17 percent of those using food pantries. Finally, when food assistance programs do not meet a family's needs, mothers have reported that they absorb the suffering, skipping meals, or cutting back portions so that children will not experience hunger. But without asking children, fathers, or other adults about their experiences, the extent to which mothers' perspectives and reports accurately reflect household dynamics versus reflecting only one important part of a more complex picture is unclear.

This study extended the understanding of the experiences and consequences of food insecurity by attending to child, father, mother, and other household adult perspectives on food decisionmaking and household food practices. A total of 29 South Carolina families were interviewed, including rural and nonrural families, White and Black families, and families with focal children ranging from 9 to 16 years old. Recruitment took place using fliers, posters, and informational tables at food pantries, soup kitchens, agencies serving low-income families, laundromats, churches, and grocery stores. Interviews (used a semistructured interview guide) were conducted in families' homes or places that participants identified as being more convenient (for example, a local park). Adult interviews ranged from 45 minutes to nearly 2 hours,

whereas child interviews lasted about 30 minutes on average. Interviews were audiotaped, transcribed, de-identified, and coded thematically using Nvivo software. Interview transcripts were coded in an iterative process, reconciling a priori codes based on the interview guide, with codes generated inductively through an open-coding process. Relationships among codes were then assessed, and patterns were explored based on family-member demographics and other characteristics.

Findings

Although many parents try to spare their children from food hardships, children often are not fully "buffered." Moreover, when children are not buffered, the impacts include not only hunger but additional psychosocial domains critical for children's growth and development. Specifically, children are affected by the awareness of household food insecurity and by taking responsibility for trying to make food resources last. Awareness falls into three main dimensions: cognitive awareness (knowing that food is scarce), emotional awareness (worry, sadness, or anger related to food scarcity), and physical awareness (hunger, pain, tiredness, and changes in nutritional quality related to food scarcity). Responsibility ranges from participation (going along with parental food management strategies) to initiation (child-initiated strategies for making food resources last) to resource generation (child activities aimed at bringing more food or money for buying food into the household). Parents are unaware of some of the experiences of food insecurity by their children, which implies that the prevalence of child hunger and food insecurity may be underestimated when estimates are based solely on maternal reporting.

Participation in the FSP is an effective buffer against children's most severe experiences of food insecurity. For instance, only one child reported physical awareness of food insecurity (for example, hunger) in a family in which parents reported receiving food stamps. This one report occurred in a family with multiple, complex issues. In addition, when parents participated in the FSP, children reported less worry about food issues. Although these children sometimes had to forego foods they preferred, eat inexpensive and/or less healthy foods, assist with budgeting, and use their own money to help buy food, the children expressed confidence that parents would ultimately manage to provide them with enough food. Families that were food insecure but did not receive FSP benefits included those with some of the highest levels of child-reported food hardships, such as child hunger, child worry, and child responsibility for making food resources last. Parents in these families reported complex problems, such as severe and persistent mental illness, history of trauma and/or domestic violence, recent job loss, recent relocation, or caring for sick family members. Such problems may have been barriers both to accessing and maintaining FSP benefits and to being more broadly responsive to children's needs (including food needs).

Overall, this study shed new light on child food insecurity and hunger by suggesting that children have experiences of food-related worries and hardships distinct from, though related to, parental experiences, behaviors, resource choices, and struggles. Additional research is needed to further explain children's experiences in diverse settings in the United States; assess the prevalence, distribution, correlates, and consequences of child food insecurity; and explain methods to best to assist families with different sets of problems and capacities to maximize the impact of food assistance programs.

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Assessing the Impact of a Modernized Application Process on Florida's Food Stamp Caseload

Colleen Heflin and Peter Mueser, University of Missouri

Background and Methodology

The Florida Department of Children and Families (DCF) has been a leader in the modernization of its service-delivery system by eliminating the need for an applicant to visit a State office and fill out an application. In 2004, Florida implemented a major modernization of its application process, replacing caseworkers with specialized staff who perform separate administrative tasks. Florida next adopted ACCESS (Automated Community Connection to Economic Self-Sufficiency) in 2005, an Internet-based system that uses a single online application for eligibility determination in public assistance programs, including Temporary Assistance for Needy Families (TANF), the Food Stamp Program (FSP), now the Supplemental Nutrition Program (SNAP) , and Medicaid.

One of the main issues regarding modernization efforts such as those implemented in Florida is their impact on FSP participation by eligible populations. Nationally, about 60 percent of those eligible for FSP were estimated to participate in 2004. For the "working poor" (people who were eligible for FSP and lived in households in which someone earned income from a job), the participation rate was lower at 51 percent. In Florida, FSP participation rates trailed national averages, with 55 percent of the eligible population and 42 percent of the working poor participating in the program during 2004. Studies of FSP nonparticipation among eligible individuals often list factors such as "too many hassles" as reasons for not participating.

However, the ability of Internet-based services to increase participation in social service programs is an untested proposition. As the Internet and its applications continue to expand, there is persistent evidence of differences in the rates of Internet use, with members of disadvantaged groups less likely to use the Internet, a difference termed the "digital divide." Thus, on the one hand, modernization efforts, such as those in Florida, raise concerns about access to the social service system given that the client base is low income by definition and disproportionately low education and non-White, attributes that impede access to, and use of, the Internet. This concern is amplified in Florida, where modernization has been accompanied by a 43-percent reduction in staff and a 33-percent reduction in brick-and-mortar DCF offices throughout the State. On the other hand, the reduction of transaction costs associated with use of the Internet in applying for benefits (possible reductions in time, transportation costs, child care costs, and stigma) may well have increased access for some populations, such as the working poor.

The major changes associated with Florida's modernization efforts are detailed in the table (p. 26). The impact of these changes on the size of the caseload operates through individuals flowing on and off of FSP. If potential recipients find that applying for food stamps is facilitated by modernization, the number of individuals applying for benefits and the number entering the program is likely to grow. If current recipients find that recertification is easier, fewer people are expected to leave the program. The policy impact is captured with three measures. The first is the number of applications that are

filed in a given month, reflecting individual decisions to apply for benefits. The second is the number of households that enter the caseload in a given month. Last is the number leaving the caseload. In each case, the dependent variable is based on a flow count from State administrative data for 23 county groups in a particular month during January 2003-May 2008 and models that control for the unemployment rate, seasonality, and county fixed effects.

Summary of application procedure changes

Application activity	Before modernization	After modernization
First contact	Paper application	Online application
Location	DCF Customer Service Center	Anywhere where there is a computer with Internet access
Eligibility interviews	Full 1-hour interview for all	One 15-minute (or shorter) interview for most
	Eligibility interview by phone uncommon	Eligibility interviews by phone are the norm
Documentation	Most expenses, assets, and income require documentation	Most expenses, assets, and some income do not require documentation
	Need to submit documentation in person to DCF worker	Self-service submission of documentation either in person or by fax

Findings

The study finds that the modernization of the DCF and the downsizing of agency staff have reduced both the number of applications and the level of inflows to FSP. Effects of these policies on outflows were generally small and not statistically significant in the full sample. Simulations suggest that the strongest negative effects of modernization were observed among the elderly and African Americans. High earners, while still negatively affected by the staffing reductions, may have actually gained from modernization.

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Federal Food Assistance Programs: Part of the Early Childhood Obesity Solution or Part of the Problem?

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Background and Methodology

With approximately a third of U.S. children overweight and children struggling with weight problems at earlier ages, preventing obesity early in childhood is a pressing Government policy goal. In response, policymakers are experimenting with a range of novel policy proposals, such as regulating food served in schools, taxing snack foods, and limiting advertising to children. Despite the media attention paid to these anti-obesity policies, the Federal Government is already deeply engaged in food policy through its $53 billion annual expenditure in food assistance programs for low-income families. This assistance is provided in a range of forms, which overlap substantially during the early childhood period—beginning with the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and ending with the National School Lunch Program (NSLP) when children enter formal schooling.

Because Federal food assistance programs, by design, intervene early in children's lives and serve low-income children most likely to be overweight, these programs hold real potential to combat the obesity epidemic by reversing early risk factors and setting in place healthy weight trajectories. However, the ability of the programs to combat the obesity epidemic is under question, as these programs were originally designed to encourage food expenditure at a time when alleviating hunger, rather than preventing obesity, was the primary policy objective. Further, mounting evidence suggests that the Food Stamp Program (FSP), now the Supplemental Nutrition Assistance Program (SNAP), may be associated with increased body mass index (BMI) for adult women. Is this also true for these mothers' young children? To answer this question, we used new data on young children, ages 3 and 5, who comprise a primary target population for the various Federal food assistance programs to examine the relationship between receiving food assistance and children's BMI. We asked: Is Federal food assistance part of the early childhood obesity solution or part of the problem?

We examined the effects of changes in Federal food program participation on young children's weight status (BMI) by using data from the longitudinal Fragile Families and Child Well-Being Survey (FFCWS), waves III and IV.

In 1998-99, participating parents and infants were recruited in 20 large U.S. cities, which vary in terms of cost-of-living factors (such as grocery prices) that may influence the effectiveness of food assistance policies. The analytic sample (n=681) was limited to low-income children born to U.S.-born parents who participated in the In-Home portion of the study at both age 3 (2001-02) and age 5 (2003-04). Because children may receive food assistance through multiple Federal programs during early childhood and each program may have a unique effect on children's weight, the effect of each type of food assistance was examined while controlling for simultaneous participation in other programs. As many of the same characteristics affecting children's weight may also influence whether or not families are eligible for and use Federal food assistance programs, individual-level fixed-effects models were estimated.

Findings

The results demonstrate that participation in Federal food assistance programs can affect the BMI of young children. However, distinguishing among the multiple food assistance programs that low-income children may receive during their early childhood years, as well as the food environment in which these programs are experienced, is necessary. In particular, subsidized meals (either in child care or schools) exhibited a protective effect, leading to lower BMIs for children receiving these meals. This finding suggests that efforts to combat childhood obesity might be enhanced by increasing access to subsidized meals through a range of strategies, such as increasing outreach to child care providers not participating in the Child and Adult Care Food Program, providing schoolwide presumptive eligibility for Title I schools, and instituting summer food programs for schoolchildren and their families.

Yet, the study also warns of the potential for food assistance programs to exacerbate the childhood obesity problem. This outcome was most likely for the FSP—the program that provides the broadest food choice to families. In cities with high food prices (those in which FSP benefits provide the least purchasing power), participation in FSP was related to increases in BMI among the poorest children. Efforts to prevent childhood obesity need to take seriously this important role of local context, in which the same Federal program, with the same Federal guidelines and benefit plans, can have a different effect in some parts of the country than in others. This study highlights one such factor—food prices—although many other contextual effects are likely to influence the relationship between Federal food assistance and childhood obesity in a similar way.

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Exploring the Structural Determinants of Food Stamp Program Participation in the South: Does Place Matter?

Tim Slack and Candice A. Myers, Louisiana State University

Background and Methodology

Geographic space is increasingly being recognized as a key dimension of social inequality. Analysts concerned with spatial inequality have called for special attention to issues of comparative advantage (and disadvantage) across space as well as to the consideration of the subnational scale. Previous research has clearly demonstrated enduring relationships between subnational geographic location and economic hardship. A prime example of this relationship is the high and persistent poverty that characterizes the U.S. South—particularly in areas such as the Black Belt, Central Appalachia, Mid-South Delta, and Texas Borderland—compared with other regions of the country.

The Food Stamp Program (FSP), now the Supplemental Nutrition Assistance Program (SNAP), is the Nation's largest food assistance program and a critical component of the social safety net. As such, the FSP plays a key role in addressing food assistance and nutrition issues faced by vulnerable populations, especially in the U.S. South. To date, the bulk of research on FSP dynamics has either focused on individual or household-level data drawn from large national panel surveys or on State-level data. This study extends prior research on food assistance in the U.S. South by exploring the relationship between county-level FSP participation and the local social structure. The research design is comparative in focus, examining how the structural determinants of FSP participation differ between the South and non-South and between high-poverty areas—the Black Belt, Central Appalachia, Mid-South Delta, and Texas Borderland—and other regions of the country.

The overarching aim of this study was to assess how the prevalence of FSP participation varies across space and establishes how other place-based (that is, county-level) characteristics influence existing differences. Accordingly, three specific research questions are examined: (1) Does the prevalence of FSP participation differ between the South and non-South? (2) Does the prevalence of FSP participation differ between high-poverty areas and other regions of the country? (3) Do the aggregate mechanisms related to FSP participation differ between the regions of interest?

The study drew on data from USDA and the U.S. Census Bureau. Counties were the units of analysis. In all, the study area included 2,561 counties in 34 States. The study assessed the influence of 20 independent variables that tap five dimensions of place-based characteristics in relation to FSP participation. The five dimensions of independent variables included county-level labor market conditions, population structure, human capital, residential context and inequality, and expenditures on cash assistance programs. The analysis was carried out by using both descriptive statistics and Ordinary Least Squares (OLS) regression. The regression models used a lagged panel design, in which independent variables were measured at an earlier point in time compared with the dependent variable. The independent variables represented county-level measures circa 2000, while the dependent variable measured county-level FSP participation circa 2005. Spatial effects were included in

the models, given significant regional clustering of high and low FSP participation. In addition, State fixed effects were controlled due to differences in State approaches to FSP administration specifically and to addressing poverty and inequality more generally.

Findings

In short, this study shows that geographic space and place matter. The South, particularly its high-poverty areas, is home to especially high regional concentrations of FSP participation. Even when considering a full range of additional predictors suggested by the literature, the regional clustering of high and low FSP participation rates continues to be a significant consideration. Further, this study shows that the structural determinants of FSP participation differ between the South and non-South and between high-poverty areas and the rest of the country in significant ways.

The main implication of this research is that spatial variation in FSP participation is not subject to a nationally uniform set of aggregate determinants. Rather, region-specific considerations are warranted. We hope that the information presented in this study will prove useful to policymakers and practitioners by helping to identify communities that are likely to have special food assistance needs and by helping to anticipate how local social change may influence such needs in the future.

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The Role of Food Insecurity and Caregiver Feeding Styles in Diet Quality and Weight Status in Head Start Children

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Background and Methodology

Food insecurity may create family pressure and stress that affects parenting behaviors and parent-child interactions. Prior research indicates that economic hardship is linked to harsher and less responsive parent-child interactions, resulting in adverse outcomes for children. Therefore, food insecurity may reflect more hardship associated with less competent parenting and less competent feeding practices, including those that increase the risk of low-income children to be overweight or obese. A limited number of studies have explored the interrelationship between food insecurity, feeding styles, or parenting styles and health or feeding outcomes for infants and children.

Earlier studies that examined parents' feeding styles and their influence on children's diet quality or weight status focused on the restrictive (demandingness) and not the supportive (responsiveness) domains of parenting, without regard to food security status. Findings demonstrated that high parental control of a child's food intake does not lower caloric intake compared with lower parental control. Parental attempts to restrict access to highly palatable foods may actually increase children's demand for these foods. Parental pressure and restriction of food may promote children to focus on negative cues (emotional or external) rather than on positive cues (internal hunger and satiety).

Using the parenting-style typology as a framework, we developed an instrument that includes both the demandingness and responsiveness aspects of parenting to categorize how low-income parents fit into feeding styles. From these two domains, four feeding styles of authoritarian, authoritative, indulgent, and uninvolved emerged. Authoritarian parents encourage eating by using demanding and nonresponsive approaches, the authoritative type encourages eating by using nondirective and supportive behaviors, indulgent parents impose few demands but remain supportive, and uninvolved parents make few demands on their children to eat and are unsupportive. In this study, these variables were measured by using the instrument described.

The goal of this study was to determine the interrelationship between food insecurity and caregiver feeding styles in the outcomes of diet quality and weight status in Head Start children. To answer the research questions for this study, we completed a secondary analysis on data collected from a cross-sectional assessment of mother-child dyads (n=755) in Head Start families recruited from Head Start centers in three geographical areas: northern rural Alabama, northern urban Alabama, and southeastern urban Texas. We administered the feeding-style questionnaire to the primary caregiver and characterized the respondent in one of four styles in the feeding of their preschool child: authoritarian, authoritative, indulgent, or uninvolved. Demographic characteristics of the caregiver and child examined were age, marital status, and ethnicity. We interviewed the parent and used the Nutrient Database System (NDS) methodology to collect one complete 24-hour dietary recall

for the child's food intake on the weekend. Using the USDA Center for Nutrition Policy and Promotion guidelines for calculating the Healthy Eating Index-2005 (HEI-2005), we computed the 12 component and total scores of the HEI-2005 by using specific information from data files generated by the data analysis from NDS (nutrients, ingredients, and serving count). The food security status of the household was measured by the short six-question version of the U.S. Household Food Security Scale. Finally the height and weight of the child were measured and then converted to body mass index (BMI Z-score) according the Center for Disease Control standards for children.

Findings

The sample was comprised of African-American (43 percent), Hispanic (28 percent), and White (29 percent) children. Food insecurity was significantly associated with race/ethnicity; Hispanics had the highest prevalence of food insecurity (50 percent), whereas Blacks and Whites were 25 percent and 34 percent, respectively. The overall distribution of feeding style was 33 percent indulgent, 30 percent authoritarian, 19 percent uninvolved, and 16 percent authoritative. Food insecurity was significantly associated with feeding style; 37 percent of the food insecure were indulgent, and 38 percent were authoritarian. Significant differences by race were found by feeding style: 31 percent of Whites, 38 percent of Hispanics, and 40 percent of Blacks were authoritarian.

Evaluation of the impact of food insecurity on primary outcomes of weight status, or HEI-2005 total and component scores, revealed no significant differences. Race and feeding styles continued to influence weight and diet outcomes. White children had a mean BMI Z-score of 0.99, Hispanic 0.89, and African-American 0.50. Children with an indulgent parent had a mean Z-score of 1.05, authoritative 0.82, uninvolved 0.81, and authoritarian 0.68. The overall mean HEI-2005 score was 52.7 (out of the optimal 100.0 score). Hispanics had the highest mean score at 54.2, followed by Whites 50.7, and African-Americans 52.3.

The mean HEI-2005 scores by feeding styles were authoritative 53.0, authoritarian 52.9, indulgent 52.8, and uninvolved 51.9. No differences were detected for HEI-2005 until race was entered as a covariate, and a race and race feeding interaction was observed. The highest scores were African-American authoritarian (54.7), Hispanic indulgent (56.2), and Hispanic uninvolved (54.6). These findings show that race was a strong predictor of diet and weight status outcomes. Trends in feeding style and race show promising aspects for further research and interventions for health outcomes of low-income children.

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Is Being in School Better? Using School Starting Age To Identify the Impact of Schools on Children's Obesity

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Background and Methodology

In recent decades, the increase in childhood obesity has been stark, with rates tripling from 5 percent in the early 1970s to 15 percent by the early 2000s. This increase in childhood obesity raises many concerns about children's current and future health and well-being. Although adult obesity has been rising over this same period, recent research finds that increases in parental obesity cannot fully explain the increase in children's obesity, suggesting that the increase in children's obesity does not merely reflect changes within the family. Child-specific environments, like schools, may play an important role in children's health outcomes. Given that children spend a great deal of time in schools and consume about 30-50 percent of their daily calories in schools, it is important for policymakers to understand the role of schools in determining children's obesity outcomes.

Research into the specific role that schools play in determining obesity rates tends to show that what happens in school matters. For example, an increase in availability of junk food leads to an increase in student body mass index (BMI). Research into school lunch consumption reveals that children who regularly eat the school lunch (as opposed to bringing lunch from home) are about 2 percentage points more likely to be obese.

These research findings suggest that the school food environment—eating the school lunch or having access to junk food—affects children's weight outcomes. This study shows that some school environments are better than others. A second related, but different, question is whether being in school, as opposed to being out of school, is better or worse for children's weight outcomes. This research adds to this second line of inquiry. Further, if being in school is better for children's weight outcomes, is it better for the outcomes of all children? In particular, this research examines whether the impact of being in school is different for students who do and do not participate in various Government programs, where participants are typically poorer than nonparticipants.

The goal in this research is to examine the causal impact of being in school, as opposed to not being in school, on children's obesity and BMI. The main methodological challenge is to be able to compare children who have and have not been exposed to additional schooling, but who are the same in other ways that affect their weight outcomes. We used data from the Early Childhood Longitudinal Study, Kindergarten Cohort (ECLS-K) and the National Longitudinal Survey of Youth, Mother-Child matched samples, to get information on children's height and weight, years of schooling at a given age, and a large set of other individual and family characteristics.

In order to compare otherwise similar children who have different exposure to schooling at a given age (in other words, to get exogenous variation in exposure to schooling), we used a child's exact birth date and the school starting-age laws in the child's State to determine whether a child who is 6 years old, for example, should be expected to be in kindergarten or first grade. Consider a child in a State with a school starting-age cutoff of October 1: a child who is 5 on September 2 will start kindergarten and have 2 years of school exposure when he is observed in the data at the age of 6. A child with this birthday in a State with a September 1 cutoff will start kindergarten the following year and will only have 1 year of school exposure at the age of 6. By using the child's birthday relative to his State's school start-age cutoff date, we compared individuals who have more and less exposure to schooling at a given age, where this variation comes solely from birthdays and State laws, not from parental choices about when to start their children in school. In addition to using variation in State laws and birthdays, we controlled for a rich set of family and individual characteristics.

Findings

This study first demonstrates that a positive relationship between school exposure and obesity is spurious because of parents' reluctance to send small-stature children to school "on time." Turning to the estimates that compare only those students who are exposed to more and less school by virtue of their birthdays and their States' starting-age cutoffs, the study finds that children exposed to an additional year of schooling have obesity outcomes that are not statistically different from students exposed to less schooling. However, the causal effect of school exposure varies significantly by subgroup. For example, an additional year of school exposure benefits weight outcomes for children who do not eat school lunch, who are not food stamp recipients, and who have not been on the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). By contrast, school exposure does not appear to be causally related to weight outcomes for children who do participate in these programs, and these children will typically be less well-off than children who do not participate in these programs.

For children participating in these programs (poorer children), additional school exposure is not related to weight outcomes, suggesting that there is little difference in opportunities for caloric intake and expenditure between their school and alternative (for example, home or daycare) environments. However, for students who do not participate (better off children), school and alternative environments offer different opportunities for caloric intake and expenditures, with the school environment leading to better weight outcomes.

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National School Lunch Program Participation and Weight Trajectories Among Low-Income Children

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Background and Methodology

The National School Lunch Program (NSLP), established in 1946, served more than 30.5 million children each day in 2007. The NSLP is the second most expensive Federal food program, trailing only the Food Stamp Program (now the Supplemental Nutrition Assistance Program), at a cost of $8.7 billion per year. The NSLP is an intervention and prevention program intended to mitigate poor nutrition and promote healthy development during school hours by providing a nutritional safety net for low-income children. The program increases the availability of food and protein and is associated with lower intakes of added sugars and increased intakes of vitamins and minerals. Although the NSLP was not originally designed as an obesity-prevention program, it has undergone criticism for contributing to an increase in dietary fat and calories among children who participate in the program.

Given the pervasiveness of the NSLP and the adverse health and economic consequences related to being overweight, this study applies longitudinal data to investigate indepth the association between participation in NSLP by income-eligible children and their weight status from kindergarten to eighth grade. Specifically, the study uses data from kindergarten to eighth grade to examine (1) the various participation patterns (that is, persistent, transient, and no participation) in the NSLP, (2) how participation relates to childhood body mass index (BMI) trajectories, and (3) whether participation influences girls' BMI trajectories differently than boys' trajectories.

The study contributes to the literature in several ways. First, the study provides a longitudinal examination of the patterns of NSLP participation. This information is necessary to gain a greater understanding of whether socioeconomic characteristics differ between children who consistently or temporarily participate in the program and possible impacts on weight gain. Second, the study examines the manner in which program participation influences BMI trajectories from kindergarten to eighth grade. Most studies that have investigated the NSLP and weight trajectories have focused on cross-sectional data or longitudinal data from elementary school years. Third, the focus on gender differences is important as studies have shown a positive association between food assistance program participation and weight status for girls.

Data were drawn from the Early Childhood Longitudinal Study (ECLS-K), a nationally representative, longitudinal study of children's school experiences and development collected by the National Center for Education Statistics (NCES). The ECLS-K follows children in the fall and spring of kindergarten (1998-1999), the fall and spring of first grade (1999-2000), the spring of third grade (2002), fifth grade (2004), and eighth grade (2007). For consistency, the study focused on data collected in the spring term of each grade listed.

Children's BMIs were calculated from direct measurement of height and weight collected at each time point. Parental reports were used to determine

participation in the NSLP (that is, received free or reduced-price lunches) at each data-collection survey. Three mutually exclusive variables that capture the duration of participation in the NSLP were created. Families who never participated in the NSLP at any of the five time points comprised the no-participation group. Families who participated in the NSLP at all five time points comprised the persistent participation group. Families who participated at some grade levels but not in others comprised the transient participation group. Factors capturing child, maternal, household, community, and State-level characteristics that are related to program participation and weight status were included in the models as controls. Logistic regression models estimated the likelihood of children experiencing persistent and transient participation, while mixed models estimated the effects of NSLP participation on BMI from kindergarten to eighth grade.

Findings

Logistic regression results indicate that similar disadvantaged socioeconomic characteristics are associated with persistently or temporarily participating in the NSLP. Thus, families with comparable background characteristics are opting into the program, although their patterns of participation differ. Results from mixed models suggest that children enter kindergarten at a healthy weight, indifferent of program participation. However, NSLP participation among income-eligible girls influences more rapid weight gain over time. Income-eligible girls displayed higher BMI averages beginning in third grade compared with income-eligible nonparticipating girls. Differences were not observed among income-eligible boys. The association between NSLP participation and weight status may not only be related to the food available during the lunch hour but also to the environment in which the children reside and the biological differences between girls and boys.

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The Longitudinal Impact of Food Assistance Program Participation on Food Insecurity and Nutritional Risk in Low-Income Community-Dwelling Older Adults in Georgia

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Background and Methodology

With the aging population and the current economic recession, the use of convincing research designs and methods to provide evidence that food assistance programs benefit nutritionally vulnerable older adults is more critical than ever. The ideal way to assess the impact of food assistance programs would be to compare outcome measures between participants and nonparticipants with comparable level of needs for food assistance programs. This approach is difficult in practice because the nutritional needs of older participants in food assistance programs are not well characterized and difficult to determine. Furthermore, this problem is complicated by complex social and psychological dynamics of help-seeking behaviors of older adults in need of food assistance programs. A longitudinal study design to sort out need status and program impact and their changes within each older individual across an appropriate time frame is necessary to assess unbiased impacts of food assistance programs in older adults.

The Older Americans Act Nutrition Program (OAANP) has been a primary source of food assistance targeted to older adults with greatest economic and social needs while providing congregate meals (CM) and home delivered meals (HDM). Already unable to meet the program demand, this program is in urgent need of robust research designs, methods, and evidence-based outcome measures to document its benefits. Food insecurity and nutrition risk measured by the Nutrition Screening Initiative DETERMINE Checklist (NSI checklist) have been most widely recommended as outcome measures. However, the feasibility and ability of these measures to detect OAANP's impact on a large scale is unknown.

This study examined the impact of OAANP participation on food insecurity and nutritional risk, as well as the ability of the NSI checklist to detect this impact among older Georgians, using the unique data collected from the Georgia Advanced Performance Outcome Measures Project 6 (GA Advanced POMP6). GA Advanced POMP6 was designed to accurately measure the impact of OAANP on nutritional health status while adopting several innovative approaches, including the adoption of a longitudinal study design, the waitlisted people as the best available comparable comparison group, and a modified six-item version of U.S. Household Food Security Survey Module (HFSSM) as a sensitive outcome measure of meal services.

This study analyzed two waves of self-administered mail survey data from GA Advanced POMP6 conducted 4 months apart of all persons who began OAANP participation (CM new participant, HDM new participants), as well as those added to program waitlists (CM new waitlisted, HDM new waitlisted) in Georgia between July and early November 2008 (n = 4,952). A self-administered survey measured food insecurity, NSI checklist, and various nutritional health status indicators that were developed and adapted from

previously validated survey tools. Additional study participant data were retrieved from the Georgia Aging Information Management System. Descriptive and appropriate longitudinal data analysis methods, including generalized estimating equations and mixed-effects models, were used.

Findings

The study population identification process suggested a critical unmet need for OAANP in Georgia. Over the 19-week period when the economic crisis had deepened across the Nation in 2008, about 57.4 percent of those requesting OAANP services, especially a majority of HDM applicants, had to be on the waiting lists. Based on the baseline survey data, those requesting HDM services and waitlisted people were more likely to show poorer sociodemographic and nutritional health status than their counterparts.

The findings of this study suggest that food security can be reasonably measured by a mail survey and a short form of HFSSM in older adults requesting OAANP. Most of the respondents (91 percent) completed all six food security questions. Infit and outfit statistics for each of the six questions and overall Rasch model fit were within an acceptable range. Overall psychometric properties observed in the food security data were comparable to the national food security statistics provided by USDA. Some NSI checklist questions (eating few fruit or vegetable and dairy products), however, showed limited ability to reliably identify older adults at nutritional risk and to detect short-term change in nutrition risk status among OAANP participants. Improving nutrition risk-assessment tools could help to better evaluate nutrition risk and its change over time among vulnerable older adults receiving OAANP services.

OAANP improved participants' food security over the 4-month period. At baseline, a majority of the sample was food insecure (53.8 percent) and at high nutrition risk (74.9 percent). Waitlisted people reported higher levels of persistent food insecurity (45.9 percent) or becoming food insecure (10.0 percent) than the participants (29.3 percent and 7.1 percent, respectively) over the 4-month period. While considering potential confounding factors, the estimated odds of achieving food security were 1.65 times (95 percent confidence interval: 1.10-2.48) higher in participants than in waitlisted people in the 4-month period.

Georgia's OAANP is serving a high-risk group of older adults and helped participants achieve food security in 4 months compared with those on the waiting list. However, the critical unmet need is in GA OAANP. Given that achieving optimal nutrition is critical for older Americans to retain their independence and delay disease and disability, improving the capacity and targeting of OAANP is essential.

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The Impact of Food Stamp Program Participation on Adult Obesity and Child Overweight Status

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Background and Methodology

Over the past three decades, the prevalence of child obesity in the United States has more than tripled and the prevalence of adult obesity has more than doubled. The increasing prevalence of obesity has become one of the most pressing public health challenges facing the United States and other industrialized nations given its association with numerous health conditions, higher medical expenditures, and a greater risk of mortality. A clear income gradient exists in the prevalence of child obesity and that of adult females: Low-income children and women are significantly more likely to be obese than those from families with higher incomes.

One suggested cause of the higher prevalence of obesity among low-income families is participation in the Food Stamp Program (FSP), now the Supplemental Nutrition Assistance Program (SNAP). Researchers have documented that obesity rates are higher among FSP participants than among eligible nonparticipants and that the provision of FSP benefits increases expenditures on food. However, participation in the FSP also could decrease the likelihood of being obese, particularly among children, given that it could reduce food insecurity, decrease the number of meals consumed away from home, or increase the purchase of more nutritious, less calorically dense foods. Although several studies have examined the relationship between FSP participation and obesity for both children and adults, none have adequately addressed the possibility that the relationship is driven by unobserved determinates of both FSP participation and obesity, such as experiencing food insecurity and enjoying food.

This study contributes to the literature by estimating the causal effect of FSP participation on body mass index (BMI) and obesity for both adults and children by using data from the National Longitudinal Survey of Youth, 1979 cohort (NLSY79) and the NLSY79 Children and Young Adults cohort. The NLSY79 contains detailed longitudinal information on numerous demographic and economic characteristics, including FSP participation and self-reported weight and height. The NLSY79 Children and Young Adults data contains similar information on the children born to women in the NLSY79. Both datasets also contain State identifiers that allow for the addition of relevant State-level characteristics, including food prices and cigarette prices.

In order to generate causal estimates of the effect of FSP participation on BMI and obesity, a two-stage least squares estimation strategy is employed that exploits exogenous variation in FSP participation driven by the labor supply response to changes in the parameters of State and Federal Earned Income Tax Credit (EITC) programs. Specifically, the number of years in the previous 5 that a person has participated in the FSP program is instrumented for using the average value of combined State and Federal EITC benefits in a given State and year. State-level fixed effects are also employed in order to eliminate sources of time-invariant heterogeneity.

Findings

The findings for children suggest that participation in the FSP program actually reduces BMI and the probability of being obese. For boys ages 5-11, an additional year of FSP participation reduces the BMI percentile by 15 points and the probability of being obese by 6.7 percentage points. For girls ages 5-11, an additional year of FSP participation reduces the BMI percentile by 12 points and the probability of being obese by 7.5 percentage points. The similar direction and magnitude of the effect of FSP participation on obesity for young children is contrary to previous research, which found that FSP participation decreased obesity for boys and increased obesity for girls, but is much more plausible since there is little reason to expect differential effects of FSP participation for boys and girls ages 5 through 11.

The results for boys ages 12-18 are similar to those for younger children, with an additional year of FSP participation reducing the BMI percentile by 8 points and the probability of being obese by 7.4 percentage points. However, for girls ages 12-18, FSP participation appears to have an insignificant effect on BMI percentile and obesity. These differential effects for older children may be driven by the divergence in physiology that occurs at puberty, as well as differences in eating habits in adolescence.

The reduction in the BMI percentile and probability of obesity observed for most children as a result of FSP participation likely operates through its expansion of food budgets— reducing household food insecurity and binge eating, which have previously been associated with child obesity.

For adults, FSP participation appears to consistently increase BMI and the probability of being obese. An additional year of FSP participation is associated with a 1.6-unit increase in BMI and a 12.6-percentage-point increase in the probability of being obese for women. For men, an additional year of FSP participation increases BMI by 1.6 units but has no significant effect on the probability of being obese. These results suggest that, for adults, the FSP program serves only to increase food consumption and, thus, weight.

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Assessing the Link Between Food Assistance Program Participation and Obesity, Metabolic Syndrome, and Risk for Chronic Disease in U.S. Adolescents

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Background and Methodology

Childhood obesity has become a public health concern over the past three decades. Overweight children and adolescents are now beginning to present with obesity-related chronic diseases, such as hypercholesterolemia, hypertension, and diabetes. Earlier onset of these chronic conditions and resultant disabilities will have long-term ramifications for society and public policy. Lifestyle behaviors, including dietary intakes and physical activity habits, have been identified as primary contributors to increasing obesity rates in the United States. Nutrient-poor, high-fat, energy-dense diets, which are linked to chronic disease development, are common among those with limited incomes. Research is needed to examine the potential of food assistance programs to reduce risk for obesity and resultant chronic diseases in families with limited resources. The primary goal of this project is to investigate the impact of food assistance on the risk of early development of obesity and metabolic syndrome among U.S. adolescents (12-18 years of age) across levels of eligibility and participation in Federal food assistance programs.

A secondary data analysis of adolescents ages 12-18 from the 1999-2006 National Health and Nutrition Examination Survey was conducted to examine the differences in obesity, central adiposity, and metabolic syndrome across levels of food assistance participation. Adolescents were classified into income eligibility and participation/nonparticipation categories for the Food Stamp Program (FSP) (now the Supplemental Nutrition Assistance Program, SNAP), School Breakfast Program (SBP), and National School Lunch Program (NSLP). Further, to elucidate the impact of nonparticipation, income-eligible adolescents were categorized as “participating” or “eligible, not participating.”

Rates of obesity and metabolic syndrome were classified based on anthropometric assessments and laboratory data collected during the mobile examination center visit. Body mass index (BMI)-for-age percentiles were generated based on age and gender to assess body weight. Weight status was categorized based on the 2000 Centers for Disease Control and Prevention (CDC) Growth Charts. The International Diabetes Federation (IDF) definition of metabolic syndrome for children and adolescents was used to identify adolescents with central adiposity (>90th percentile) and metabolic syndrome. The IDF defines metabolic syndrome as the presence of central obesity plus one of four additional risk factors: elevated blood pressure, glucose, and triglycerides and low high-density lipoprotein (HDL).

Findings

FSP: Of the sample, 9.1 percent (n=1,031) were participating in FSP, while 21.5 percent (n=2,108) and 69.4 percent (n=4,184) of the nonparticipants were eligible and not eligible, respectively. FSP participants had a significantly higher mean BMI-for-age percentile than those not participating (P=0.003), but there were no significant mean differences in central obesity (P=0.067). FSP participants were significantly more likely to be overweight (17.1 percent) or obese (23.3 percent, P=0.001). Eligible nonparticipants exhibited higher rates of overweight (17.4 percent) and obesity (17.8 percent) than nonparticipants. Also, nearly a quarter of participants (24.8 percent) exhibited a waist circumference in the >90th percentile (P=0.001) in contrast to 17.8 percent of those not eligible, not participating.

Significant differences (P=0.002) in waist circumference existed across categories of FSP participation, with those "participating" (24.8 percent) and "eligible, not participating" (21.8 percent) having the greatest proportion displaying the risk factor. The most prevalent risk factor in all groups was low HDL, with rates highest in the "eligible, not participating" group (35.4 percent, P<0.001). Similar patterns of the presence of the blood pressure risk factor were seen across all groups at nearly 5 percent. The triglyceride risk factor was most prevalent among those "eligible, not participating" (7.1 percent, P=0.009), while those participating in the FSP had the lowest rate of elevated triglycerides. The rates of metabolic syndrome were higher among children "participating" (3.3 percent) or "eligible, not participating" (3.6 percent), but the differences were not significant.

NSLP: Nearly a quarter (n=1,711, 23.0 percent) of children participated in the free or reduced-price breakfast program. Another 1,435 children (20.0 percent) were income eligible but did not participate. Participation in the School Lunch Program was more frequent, with 32.4 percent (n=3,064) receiving free or reduced-price lunches and an additional 41.1 percent (n=1,810) paying full price. No significant differences existed in BMI percentiles or waist circumference by school breakfast participation. Rates of obesity (P<0.001) and central adiposity (P<0.001) were highest among adolescents receiving free or reduced-price lunches (21.6 percent and 24.3 percent) or "eligible, not participating" (21.2 percent and 20.4 percent).

SBP: No significant differences were evident for metabolic syndrome across levels of participation in the SBP. Similar trends existed regarding the most prevalent risk factors, where the waist circumference and HDL risk factors were greatest in each group. Rates of metabolic syndrome were highest in the "eligible, not participating" group (3.7 percent), but the differences among the groups were not significant. Differences in the rates of central obesity were more pronounced for those eligible for participation in the NSLP. Presence of the waist circumference risk factor was 50 percent more likely in the "participating" (24.3 percent) and the "eligible, not participating" (20.4 percent) groups compared with those "participating, paying full price" (18.2 percent) or "not participating" (15.5 percent, P<0.001). The HDL (34.1 percent) and triglyceride (8.7 percent) risk factors were most common in the "eligible, not participating" category, but the differences were not significant.

More information is needed to explain the differences noted in these analyses. Differences in dietary habits and food procurement habits may identify correlates of weight status in these adolescents, which would provide valuable information for targeted nutrition education and policy development for food assistance programs.

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Maternal Nutrition Knowledge, Adolescent Overweight, and Participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)

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Background and Methodology

Uniform nutrition labels were introduced as part of the Nutrition Labeling and Education Act (NLEA) in 1994. Use of food labels has been associated with increased knowledge about the nutrition and fat content of food and a reduction in fat intake. Similarly, knowledge of the dietary guidelines is associated with increased likelihood of meeting dietary guidelines for fruit, dairy, and protein. However, little is known about the frequency of nutrition label reading or awareness of dietary guidelines or other nutritional programs by at-risk populations, such as participants in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) or adolescents who are beginning to make food purchases for themselves.

The 2005-06 National Health and Nutrition Examination Survey (NHANES) added new questions to evaluate awareness of dietary guidelines and other nutrition programs, as well as questions on the use of nutrition facts panels and ingredient lists. This study used NHANES data to investigate the relationship between responses (n=643 for 2005-06) to the nutritional and diet questions from (1) mothers of children ages 0-5, comparing WIC participants with WIC-eligible nonparticipants, and (2) adolescents ages 16-19 (n=1,160). Specifically, the study assessed nutritional awareness of programs such as "Dietary Guidelines for America," "Food Guide Pyramid," and "5-A-Day for Better Health Program." The study further analyzed nutritional behavior based on the frequency of participants' use of the nutrition facts panel, list of ingredients, size of a serving, and information on total calories, product calories from fat, total fat content, trans fat content, saturated fat, cholesterol, and sodium in making a product selection.

The main outcomes of interest included maternal and adolescent nutritional awareness of nutritional program and active use of nutritional panel information. Statistical analyses included chi-square tests to evaluate differences in proportions and t-tests to evaluate differences in means. Multivariate logistic regression models were used to assess binary outcomes for awareness of nutritional programs and frequency of use of nutrition label programs while adjusting for maternal age, education level, and race/ethnicity. For adolescents, nutritional awareness and use of nutritional information was also evaluated in relationship to overweight and obesity.

Findings

Less than 25 percent of adolescents regularly check the nutritional information on the facts panel prior to making a food purchase, with 23.7 percent checking the calories from fat and total calories and 16.4 percent checking the trans fats. Only 25.1 percent said that they regularly evaluated the ingredient list on a food label prior to making a food purchase, while 43.8 percent stated that they used the health claims on a food package to influence their food purchases. A much higher percentage of adolescents was aware of the Food

Pyramid guidelines (92.4 percent), while only 29.3 percent had heard of the Dietary Guidelines and 43.5 percent had heard of the 5-A-Day for Better Health Program. Adolescent overweight and obesity was not associated with the frequency of use of the nutritional facts panel information or nutritional awareness of most programs. Adolescents of normal weight, however, had greater odds of having heard about the 5-A-Day Program (odds ratio (OR) 1.23, 95-percent confidence interval (CI) 1.00-1.52) compared with overweight/obese adolescents but were less likely to check cholesterol on food labels (OR 0.53, 95-percent CI 0.28-1.00).

The study found a consistently lower frequency of awareness of nutritional programs among WIC participants than among WIC-eligible nonparticipants and a more infrequent use of the nutrition facts panel information. Specifically, 35.7 percent of WIC participants had heard of the dietary guidelines, whereas 45.1 percent of eligible nonparticipants were aware of this program. For the Food Pyramid, 76.9 percent of WIC participants were aware of this program compared with 85.3 percent of eligible nonparticipants. For the 5-A-Day Program, 44.4 percent of WIC participants knew of this program compared with 52.1 percent of nonparticipants. Only 19.1 percent of WIC participants stated that they used the nutritional facts panel information prior to making a food purchase compared with 31.1 percent of nonparticipants.

The differences were also significant for checking the food label for calories (54.6 percent of WIC participants versus 81.1 percent of nonparticipants), total fat (52.5 percent versus 72.8 percent), and trans fats (30.6 percent versus 60.5 percent). When we adjusted for maternal age, ethnicity, and education level, we found that WIC participants had decreased odds of using the facts panel to check calories (OR 0.26, 95-percent CI 0.14-0.49), trans fats (OR 0.25, 95-percent CI 0.10-0.62), or saturated fats (OR 0.35, 95-percent CI 0.14-0.88) compared with eligible nonparticipants. WIC participants were also less likely to use the ingredient list compared with eligible nonparticipants (OR 0.45, 95-percent CI 0.22-.96). When we adjusted for potential confounders in multivariate logistic regression analysis, we found no difference between WIC participants and nonparticipants in terms of differences in awareness of nutritional programs.

In summary, the study found a low frequency of using nutritional facts panel information (less than 30 percent) by adolescents in the United States. Awareness of nutritional programs by adolescents varied with greater recognition of the Food Pyramid Program than of the 5-A-Day Program or the Dietary Guidelines. When we adjusted for age, education level, and race/ethnicity, we found that WIC participation among mothers with children younger than 5 years and pregnant women was associated with less frequent use of the nutrition facts panel information.

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Why Do So Few Elderly Use Food Stamps?

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Background and Methodology

Low program take-up(participation) by the elderly in most means-tested transfer programs is a persistently puzzling phenomenon. Approximately 3.6 million persons ages 65 and older live below the poverty line, of which over 40 percent report experiencing hunger. At the same time, far below 100 percent of the elderly population who are eligible for public assistance programs collect benefits. The Food Stamp Program (FSP, now the Supplemental Nutrition Assistance Program, SNAP), the Nation's largest program designed to ensure food security and provide adequate nutrition for low-income Americans, has the lowest rate of participation among the major public assistance programs for the elderly. In 2006, only 34 percent of the elderly eligible to participate collected food stamp benefits compared with a take-up rate of 67 percent among the general population.

This study investigates the reasons for the low take-up of food stamps among the elderly and its implications for their well-being. The study considers a broad array of explanations for the low incidence of take-up, including measurement error, behavioral factors, information barriers, and interactions between the FSP and other food assistance programs.

Low food stamp take-up by the elderly should interest policymakers for several reasons. First, poverty is a persistent problem among the elderly. Although the poverty rate has fallen for older adults over the past half century, 40 percent of all individuals will experience a spell of poverty at some point between the ages of 60 and 90. Moreover, the number of the elderly in poverty would be nearly twice as high as the official measure suggests if the poverty measure accounted for medical care costs. Struggling with inadequate income, poor elderly persons often have to curb their spending on food to have money for prescription drugs and so experience hunger and even malnutrition as a result. At the same time, the FSP has the potential to help improve the well-being of the elderly if they were to participate in the program.

In addition, the phenomenon of eligible individuals not participating in Government transfer programs is a topic of general interest that has spurred an extensive literature. However, despite many years of research, relatively little is known about what factors matter most in the participation decision and how enrollments in transfer programs might be increased. A better understanding of the decisions underlying food stamp take-up by the elderly may provide us with some insight into the take-up behavior of this population in other social programs, as well as contribute to studies evaluating the impact of transfer programs.

Using the Panel Study of Income Dynamics (PSID) for the period 1980-2005 and other data sources, this study focuses on several issues. First, the study asks whether measurement error may help explain the low take-up rate of the elderly. After considering this evidence, the study investigates whether low take-up is caused by a low initial entry rate by eligible individuals for the program or by a high exit rate from the program. The study then examines the determinants of participation, using a variety of methods, including pooled logit regression, individual fixed-effects models, and techniques from duration analysis, and looking separately at entry and exit. In many specifications, the study contrasts the participation behavior of the elderly with that of the nonelderly to explore whether these two groups differentially respond to costs and benefits of participation, and if so, whether this difference may help explain the low take-up rate of the elderly. In addition, the study gives special attention to the potential interaction between participation in the FSP and other food assistance programs, such as the Elderly Nutrition Program (ENP), which includes Meals on Wheels and the senior congregate meal programs. Taken as a whole, the study provides a complete picture of factors determining food stamp participation among the elderly.

The study departs from the existing literature in several ways. First, this work emphasizes the importance of confronting measurement error when calculating program eligibility. The study considers several types of measurement error, such as misclassification due to insufficient information, measurement errors of income/asset variables, and misreporting of participation status. While far from perfect, this study improves on the accuracy of take-up estimations compared with many of its predecessors. Second, while most of the existing literature treats take-up as a stock variable, the longitudinal nature of the PSID enables this study to directly study the flow aspect of participation. A major advantage of this approach is that this study is able to estimate two sets of hazard rates for movements into and out of the FSP since both movements may potentially contribute to the low take-up rate. Third, the interaction between the FSP and the ENP has not been examined in the literature. The potential crowding-out effect by the ENP may provide an additional explanation for nonparticipation.

Findings

The study finds that the low take-up rate of the elderly is best explained by a low initial rate of entry into the program. Once enrolled, the elderly are no more likely to leave the FSP than the nonelderly. Second, the participation decision is strongly related to economic incentives. The lower expected benefit level and relatively better financial situation of the elderly account for about a third of the difference in take-up between elderly and nonelderly. Third, the evidence also suggests that a lack of information contributes to nonparticipation among the elderly. Responses to survey questions about reasons for nonparticipation indicate that about 60 percent of elderly eligible nonparticipants either believe that they are ineligible or report being unaware of their eligibility status. Finally, the study finds a strong negative correlation between food stamp take-up among the eligible elderly and the Elderly Nutrition Program caseload. This result suggests that, for the elderly seeking food assistance, group and home-delivered meals largely substitute for, rather than supplement, food stamps.

This study finds that, despite the low take-up rate for food stamps, elderly individuals who are eligible for the program but do not participate appear to be less needy than participants. Over 70 percent of eligible nonparticipants report that they have enough food and the types of food they want. Objective measures also indicate that they spend more on food consumption and eat more nutritious foods. Therefore, low participation does not appear to be a concern of nutritional well-being at the population level for the elderly.

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Trends in Income Volatility and Food Insufficiency Among U.S. Households: The Effects of Imputed Income in the Survey of Income and Program Participation

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Background and Methodology

Food assistance benefits, such as food stamps and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), exist, in part, to mitigate the year-to-year variability in worker earnings and in household incomes. Several previous studies have found that households with more volatile incomes are more likely to be food insufficient. The amount of year-to-year variability in U.S. household incomes is substantial, although there is debate as to whether this variability has been increasing in recent decades. Increases in imputation rates across Survey of Income and Program Participation (SIPP) panels can create a mechanical, and incorrect, increase in measured income volatility over time. This study explores the relationship between household income volatility and food insecurity, the trend in this relationship, and whether these measured relationships are affected by the rising rates of income imputation in the SIPP.

This study uses data from the 1991, 1993, 1996, 2001, and 2004 SIPP panels. Income volatility is measured by using an indicator of total (pre-tax) household income, which is the sum of earned and nonearned income for each household member, declining by 25 percent or more. Our main outcome variable of interest is food insufficiency, which is measured in the SIPP based on respondents' answers to the following question: "Getting enough food can also be a problem for some people. Which of these statements best describes the food eaten in your household in the last four months?" Households are coded as being food insufficient if they respond that there is "sometimes not enough to eat" or "often not enough to eat."

The study determines the relationship between income volatility and the probability that a household reports being food insecure, controlling for its level of income and other household characteristics. It then determines whether this relationship changes when we drop observations with imputed income. It measures these relationships among all households, among households below 130 percent of the Federal poverty line (FPL), and among households below 200 percent of FPL. It also determines the trend in the relationship between income volatility and food insufficiency and whether this trend changes when households with imputed incomes are excluded from the analysis.

Findings

Rates of income imputation in the SIPP are large and growing. In the 2004 panel, for example, roughly 60 percent of observations have some source of household income imputed over a 2-year period. This study shows that the inclusion of imputed observations leads to a serious understatement of the association between income drops and food insufficiency, both among

households of all income levels and among low-income households. It also shows that this association is getting smaller over time and that including imputed observations partially masks this decline (reducing its apparent rate of decline by half).

In particular, the association between income volatility (income drops) and food insufficiency is about 75 percent larger than one would believe using all of the observations provided by the Census Bureau, including the imputed observations. This association has been declining over time—a decline that is twice as large as one would believe if one used the imputed data. We strongly advise caution when using imputed observations and examining changes in income in the SIPP.

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Food Subsidies for Child Care Providers: Correlates of Program Participation and Child Outcomes

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Background and Methodology

This study examines child care food subsidies provided through the Child and Adult Care Food Program (CACFP). Because of the very limited prior research on the CACFP, the study addresses three basic questions about participation in and effects of the program:

- Does the CACFP reach targeted children?
- How do participating families and child care providers differ from nonparticipating families and providers?
- What is the association between attending CACFP-participating child care and children's food consumption, food insecurity, and body weight?

To answer these questions, the study uses a nationally representative sample of children and child care providers from the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B). In 2001, the ECLS-B sampled newborns from Vital Statistics birth records from nearly every State. The child's primary non-parental child care provider was contacted for an interview when the child was age 2 and again at age 4. ZIP Code information is used to link information on the child's area of residence to the ECLS-B data. This area analysis is motivated by program rules that base provider eligibility, in part, on area characteristics (such as local poverty rates and participation in school meal programs).

Findings

Does the CACFP reach targeted children? Results on program targeting indicate both that CACFP misses many targeted (poor) children and that it serves a sizable fraction of nonpoor children. Targeting of benefits to needy 2-year-olds is particularly problematic because over 80 percent of 2-year-olds are cared for by parents at home or in an unlicensed child care home, yet children in those settings are generally ineligible. Targeting of needy 4-year-olds is better because many spend time in Head Start centers, where CACFP participation is nearly universal, or in other participating centers. Still, poor children who live outside of high-poverty areas and are cared for in centers are much less likely to receive CACFP than similar children in high-poverty areas. Moreover, even at age 4, nearly 40 percent of children are cared for by parents at home or in an unlicensed child care home, and a substantial proportion of these children are poor.

How do participating families and child care providers differ from nonparticipating families and providers? Family and provider characteristics, including location, are associated with participation in CACFP. Participation is higher among parents who work long hours, who emphasize child care quality, and those of lower socioeconomic status. Provider characteristics also clearly matter. Large, licensed, accredited and nonprofit centers are more likely to participate, as are those connected to Head Start through referrals (or that serve children who participate in Head Start).

What is the association between attending CACFP-participating child care and children's food consumption, food insecurity, and body weight? Among low-income 4-year-olds in centers, participation in CACFP is associated with increased milk, vegetable, and fruit consumption (two or more servings per day) and lower risk of underweight status. There is little evidence that CACFP increases the prevalence of overweight among this group of 4-year-olds or that CACFP is associated with food insecurity.

Although additional research is needed to replicate our results, ideally with a stronger causal design, evidence of an association of CACFP with these positive nutritional outcomes for disadvantaged children should give additional emphasis to improved targeting of the program. Highest priority should go to reaching poor children cared for outside of licensed homes and child care centers and to those who reside in areas where market forces may work against participation by providers, such as lower poverty areas.

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Food Stamps, Blood Sugar Control, and Medicare Costs of Older Diabetics

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Background and Methodology

Incidence of diabetes is rapidly escalating in the United States despite a Healthy People 2010 goal to decrease its disease and economic burden. This problem is particularly pronounced among low-income and older Americans. Nearly a quarter of the U.S. elderly population has been diagnosed with diabetes, facing increased risk of premature death, disability, heart disease, kidney failure, and other complications. The illness burden not only reduces patient quality of life but imposes significant economic costs. Medicare spent 75 percent more on elderly diabetics than nondiabetics in 2005. Despite a well-documented role of diet in diabetes management and evidence of a socioeconomic gradient in diabetes, little is known about the relationship between participation in USDA's Food Stamp Program (FSP)—now the Supplemental Nutrition Assistance Program (SNAP)—and diabetes management.

Food stamp receipt may impact health through several mechanisms. Food stamp receipt may directly affect health by altering the amount or quality of food purchased, or if benefits function as an income transfer, by increasing household budgets for spending on food and other health inputs. Food stamp recipients may have difficulty in smoothing consumption across the benefit cycle, purchasing larger amounts of food early in the month and running out of food prior to receiving the next month's benefit. Periods of food deprivation, such as at the end of the benefit cycle, can impede blood sugar control if households are unable to purchase appropriate foods for medical nutrition therapy. Because theoretical predictions about food stamp effects on diabetic health outcomes are ambiguous, this study empirically tests the relationship between food stamp receipt and multiple health outcomes for diabetics.

This study analyzes data from the Health and Retirement Study (HRS), a nationally representative longitudinal survey of older Americans. The HRS reinterviews respondents and participating spouses biennially. In each wave, households report FSP participation by month, income, assets, and participation in means-tested programs. Respondent-level data detail health measures, including diabetes and other chronic conditions, as well as sociodemographic variables, including age, race, education level, household composition, and employment history. Respondents also report two health behaviors, whether they smoke (counterindicated for diabetics) and whether they engage in physical exercise (recommended for diabetics), which can indicate positive (negative) selection into the FSP.

HRS survey data is linked to Medicare administrative claims data for respondents who have previously consented to its release and measured hemoglobin A1c levels. The claims data include several health outcomes of interest. This study estimates fixed-effect regressions of (logged) total annual Medicare spending for each respondent, as well as counts of outpatient medical visits, and indicators for whether a beneficiary is hospitalized during the year for any reason, hospitalized for diabetes, or has end-stage renal disease (ESRD).

The HRS Medicare data allow several controls for nonrandom selection into the FSP. Rates of food stamp take-up (participation) are particularly low among eligible elderly adults, raising concerns that participants differ from nonparticipants in typically unobservable ways that may affect program take-up and health. Medicare claims data allow controls for clinical compliance with diabetes treatment guidelines, providing information about positive or negative selection into program participation. Individual fixed effects absorb time-invariant sources of individual heterogeneity.

A biomarker collection module provides measured A1c levels for some HRS respondents, a measure of blood sugar control over the past 2-3 months. Fractional logit regressions and propensity score matching techniques are used to assess the relationship between A1c level and food stamp receipt in cross-sectional data.

Findings

This work documents the high and rapidly growing prevalence of diabetes among elderly Americans. This trend is particularly salient for elderly food stamp recipients, 32 percent of whom were diabetic in 2006. In unadjusted data, food stamp recipients have slightly higher Medicare use and spending and worse glycemic control than eligible nonparticipants. In fixed-effect regression analysis, the difference in Medicare spending, outpatient medical visits, and blood sugar control is not statistically significant between recipients and nonrecipients. Food stamp recipients are 7 percentage points more likely to experience an inpatient hospitalization, although heart disease is the primary diagnosis for the additional hospitalizations rather than hospitalizations for diabetes. Food stamp receipt is associated with a 3-percentage-point decrease in the probability of end-stage renal disease for non-Whites, who are disproportionately affected by ESRD.

Biomarker data are used to consider the relationship between food stamp receipt and glycemic control. This relationship is one pathway through which food stamp receipt could influence use of and spending on health care. Using both fractional logit regression and propensity score matching in cross-sectional data, we find an insignificant relationship between food stamp receipt and health. Food stamp receipt is associated with an economically and statistically insignificant 0.01- to 0.02-percentage-point increase in hemoglobin A1c level. Food stamp recipients are insignificantly less likely to have HbA1c levels that are in compliance with American Diabetes Association treatment guidelines but also less likely to have high levels, which indicates severe diabetes management problems.

This study contributes to an underdeveloped literature on the health effects of food stamp receipt. Overall, the study finds little evidence that food stamps hurt or improve the health of elderly diabetics. The findings are consistent with the related food stamp and obesity literature, which also fails to find causal evidence that food stamp receipt impacts obesity. While many studies have considered the high rates of obesity among food stamp recipients, the growing diabetes epidemic among food stamp recipients and eligible nonparticipants has received little attention. An important contribution of this research is the documentation of the high and growing prevalence of diabetes

in the food-stamp-eligible and recipient population. With nearly a third of elderly food stamp recipients currently diabetic, policy intervention may be appropriate. A third of food stamp recipient diabetics also report food insufficiency. Changes to program design, such as larger benefits or more frequent benefit disbursements, or additional guidance on food choices, may benefit older diabetics.

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