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Food Assistance and Nutrition Research Small Grants Program

Executive Summaries of 2004 Research Grants

Eileen Stommes
Editor

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Abstract

This report summarizes research findings from the Food Assistance and Nutrition Research Small Grants Program. The Economic Research Service created the program in 1998 to stimulate new and innovative research on food assistance and nutrition issues and to broaden the participation of social science scholars in these issues. The report includes summaries of the research projects that were awarded 1-year grants in summer and fall 2003. The results of these research projects were presented at the December 2004 Small Grants Program conference. The projects focus on the economics of obesity, food insecurity and childhood obesity, food assistance program participation and household well-being, community influence on food assistance and dietary choices, and welfare reform and food assistance participation. Several of the projects focus on specific populations, such as people living in the rural South and those living on American Indian reservations.

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

The studies summarized herein were conducted under cooperative research contracts with USDA's Economic Research Service (ERS) Food and Nutrition Assistance Research Program (FANRP). The views expressed are those of the authors and not necessarily those of ERS or USDA.

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Preface

The Economic Research Service;s (ERS) Food Assistance and Nutrition Research Program offers grants to social science scholars to stimulate new and innovative research on food and nutrition assistance and to broaden participation in research on these issues. To administer the program, ERS partners with five academic institutions and research institutes that competitively award grants for 1-year research projects. Most grants are for $20,000 to $35,000. The Small Grants Program seeks to stimulate new research on food and nutrition policy issues and to broaden the participation of social science scholars in the research effort. Moreover, it seeks to nurture the development of strong networks of researchers who interact and work collaboratively on critical food and nutrition challenges that cross local or state borders.

This report presents summaries of the research findings from the sixth set of small grants, which were awarded in summer and fall 2003. Preliminary findings were presented at a conference at ERS in Washington, DC, on December 2 and 3, 2004, and the research projects were completed in December 2004. More information about the Small Grants Program partners and many of the completed research papers can be found on the web sites of the administering institutions, listed below:

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

Irving B. Harris School of Public Policy Studies, University of Chicago
Focus: Interactions between food assistance programs and other welfare programs, and the effects of the macroeconomy on the need for food assistance, the level of participation, and costs of food assistance programs.
Web address: *http://www.jcpr.org/usdafp.html*

The American Indian Studies Program, University of Arizona
Focus: The relationship between food assistance programs on reservations and family poverty.
Web address: *http://aisp.web.arizona.edu/foodassistance/foodassistance1.htm*

The Department of Nutrition at the University of California, Davis
Focus: The impact of food assistance programs on nutritional risk indicators (anthropometric, biochemical, clinical, and dietary), food purchasing practices, and food insecurity.
Web address: *http://nutrition.ucdavis.edu/USDAERS/*

Southern Rural Development Center, Mississippi State University
Focus: Food assistance research issues impacting vulnerable rural people, families, and communities in the South.
Web address: *http://srdc.msstate.edu/focusareas/health/fa/food.htm*

Introduction

Federal food and nutrition assistance programs form a crucial component of the social safety net in the United States. Unlike a number of other social programs, food assistance programs provide benefits and have eligibility requirements that are essentially uniform nationwide. The Food Stamp Program (FSP)—the largest Federal food assistance program—is, with few exceptions, available to all Americans whose income and assets fall below certain levels. The other food assistance programs are generally targeted to specific demographic groups. Altogether, the 15 Federal food assistance programs collectively reach an estimated 1 in 5 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 a particular interest in monitoring program effectiveness and contributing to the policy goal of a healthy, well-nourished population.

The purpose of the Small Grants Program is to stimulate new research on food and nutrition policy issues and to broaden the participation of social science scholars in the research effort. Grant recipients come from a number of disciplines and employ a variety of approaches in their research. They include economists, sociologists, nutritionists, anthropologists, and public health professionals. Some use statistical models to analyze individual and household response to policy changes. Others conduct exploratory research using ethnographic methods to examine underlying factors influencing 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. Oftentimes, the work supported by the Small Grants Program develops new theories or research methodologies, elements that become the basis for securing expanded funding from other public or private sources to further develop these promising innovations.

Small Grants Program Partners

ERS created partnerships with five academic institutions and research institutes to administer the Small Grants Program. 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 the USDA's Food and Nutrition Service. The second partner is the Irving B. Harris Graduate School of Public Policy Studies at the University of Chicago. The Harris Graduate School of Public Policy, which was part of the Joint Center for Poverty Research from 1996 to 2002, has a

strong history 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 of the University of California at Davis brought to the Small Grants 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) was chosen to administer small grants for its ability and commitment to conduct research on the problems of the rural poor in the South and its particular commitment to study the effects of welfare reform on this population. USDA has special ties to the SRDC because of its close working relationship with the region's 29 land-grant universities. The South also is 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 small grants for research on the food assistance and nutrition needs and problems of American Indians. AISP is the home of the only doctoral program in American Indian Studies in the country. The program maintains close ties to the tribal colleges, which were given land-grant status by Congress in 1994. AISP also reaches out to Native American scholars in a variety of academic settings.

Research Overview

The research projects completed in 2004 cover five broad topic areas.

1. Economics of Obesity Two out of every three adults in the United States are now considered overweight or obese, a result of increasing prevalence over the past four decades. Obesity is both an economic and health concern to health care providers, nutritionists, and the general public. The annual health care costs of obesity are estimated as high as $19 billion, with government health care programs covering a portion of these costs. The low-income adult population may receive both food assistance and medical assistance from government programs. Scorsone and Tietyen used county-level data from a Kentucky state health care program for rural low-income individuals to examine the economic burden of obesity among uninsured individuals. Kolbo, Khoury, and Bounds assessed medical spending that could be attributed to obesity in Southern states. Daponte and Cook used an age-period cohort analysis to examine obesity trends from 1976 to 2001 among the adult population, finding that all groups had increased weight during each 5-year increment.

2. Food Insecurity and Childhood Obesity. Not only is the prevalence of obesity rising among adults, but data also indicate that children are gaining weight at ever-earlier ages. Research indicates that food insecurity and the inability to maintain healthy dietary intake over time may contribute to childhood obesity. Rose uses the Early Childhood Longitudinal Study to examine the links between food insecurity, food assistance participation, and overweight status in children to determine whether participation in food assistance program contributes to childhood obesity. Gibson-Davis and Foster utilize propensity scores to simulate comparison groups to estimate the effect of food stamps on food insecurity, an important methodological issue since study of food assistance programs is complicated by selection bias, or the inability to determine whether participants differ from non-participants in ways that correlate with outcomes of interest.

3. Food Assistance Program Participation and Household Well-Being. Food assistance programs contribute to household well-being by providing program benefits that enhance access to food. To some extent, the additional food resources may allow the household to allocate its other resources to housing, utilities, childcare, and transportation. The programs serve a population of low-income Americans that is dynamic, with many people entering and leaving the programs each month. Research that examines household resource allocation and program participation over time can provide information on the decision-making process of participating households. O'Neil and Monroe looked at the short-term and long-term physical and psychosocial outcomes associated with obesity in low-income women in Louisiana, focusing on energy intake patterns related to the monthly timing of the receipt of food stamps. Joyce and Gibson analyzed the association between infant health and prenatal participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) in New York City from 1998 to 2001 during a period when Medicaid rules were relaxed and a state health program provided increased benefits to low-income women. Waehrer examined the effect of WIC on prenatal use of alcohol, tobacco, and marijuana by pregnant women participating in the program. Herman analyzed data from an intervention to increase consumption of fresh produce among WIC participants to determine whether better access to fresh produce would result in sustained improvement of fruit and vegetable consumption.

4. Community Influence on Food Assistance and Dietary Choices. A household's food assistance participation and diet could potentially be affected by community influence, i.e., factors associated with the local area rather than characteristics of the household. Such factors can be difficult to specify, define, and measure. Many times, research on community influence calls for an interdisciplinary approach that considers the various components of the community, including geography, culture, organizations, and ethnic groups. Hoyt and Scott use county-level data from all Southern States and a sample of other States to analyze how differences in State program policies and eligibility, in combination with county population eligibility characteristics, affected food stamp participation as implementation of welfare reform took place and Supplementary Security Income (SSI) enrollment increased. Parrish described activities by a Native American Indian community college to develop nutrition surveys for families with children ages 0-4, create a

database of food served by childcare centers, and promote the use of traditional foods as a healthy alternative to current diets.

Johnson described a school meal nutrition education intervention on a Native American reservation that increased healthy food choices in school meal menus to reduce childhood diabetes. Muhammad and Tegegne examined the food stamp participation of the Latino/Hispanic population in the South, a rapidly growing subpopulation characterized by a poverty rate twice that of the U.S. population. Steinberg et al. studied the impact of "Contract for Change," a California nutrition education program involving a signed participant commitment to improve dietary quality. Dollahite and Dickin examined how the Expanded Food and Nutrition Education Program, designed to provide nutrition education to low-income populations, has responded to changes brought about by welfare reform.

5. Welfare Reform and Food Assistance Participation. DeLeire and Levy examined how food stamps affect the composition of household food spending, analyzing data from the Consumer Expenditure Survey-Diary Component from 1990 through 2000 which provides detailed information on food expenditures and the demographic characteristics of a large, nationally representative sample of American households. London and Scott drew upon data from the Manpower Demonstration Research Corporation's (MDRC) Project on Devolution and Urban Change to examine stability and change in food security from 1998 to 200l, the period immediately following the welfare reform of 1996. Reidy used linked administrative data from the mid-1990s through 2002 to examine how nonparticipation in both the Food Stamp Program and WIC affect the subsequent economic self-sufficiency of Illinois families who leave the Temporary Assistance for Needy Families (TANF) program. Onianwa et al. examined the food security status of nonprofit food assistance recipients in several Southern States by interviewing center directors and their clients.

Executive Summaries

Economics of Obesity

The Economic Burden of Obesity on Rural Communities: A Case Study of Kentucky Homeplace Counties

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Grant awarded by the Southern Rural Development Center, Mississippi State University

The increasing prevalence of obesity and the health-related costs of obesity are of concern to healthcare providers, professionals and communities at large. Two out of every three adults in America are considered overweight or obese, compared to less than one in every four persons four decades ago. The economic burden of overweight and obesity is rising in the United States. The costs associated with overweight and obesity account for $117 billion, over 9 percent of total U.S. medical costs, with $61 billion in direct costs, and $56 billion in indirect costs.

This economic burden is greater among residents of the South and rural areas. Dietary quality and quantity, low levels of physical activity, the physical environment, and certain policies adopted by public and private institutions work in concert to create an environment where most people find it difficult to maintain a healthy body weight. Overweight and obesity have been linked to unhealthy diets and physical inactivity. Kentucky ranks 39th in meeting the healthy dietary consumption, and second highest in physical inactivity in the nation.

The objective of this study was to estimate the county-level economic burden of obesity in the rural South. Specifically, 59 counties in Kentucky were selected. County selection was based on the availability of data via a Medicaid-financed program known as Kentucky Homeplace. Homeplace data served as the basis for the economic burden of obesity estimates at the county level.

A second objective was to develop a methodology that could be applied to limited data sets to estimate the economic burden of obesity at the county or community level. To date, the literature on the economic burden of obesity has focused on estimating National and State-level expenditures. However, this same information may be useful to local decision makers as they too face resource allocation decisions related to preventing or reducing obesity at the community level. This research is the first known effort to estimate the economic burden of obesity at the county level.

In estimating the economic burden of obesity at the county level, it is important to focus on the out-of-pocket expenditure category. As medical costs are shifted to these patients, Medicare, Medicaid, and private insurance obesity-related expenditures are shifted to taxpayers and to insurance companies mostly located outside of rural communities. The burden of out-of-pocket expenditures thus falls on the households located in the study counties. The results indicate that the economic burden of obesity is significantly higher for obese individuals compared to normal weight individuals. This finding is of particular interest to Medicare and uninsured individuals.

These findings may not be generalizable to the population, as the sample has an over-representation of older, female population compared to the population at large. However, this limitation does not affect the general process used to estimate the county-level economic burden of obesity; it does point to the need to check sample statistics.

This study found the out-of-pocket economic burden of obesity for the 59 Kentucky counties was nearly $38 million. This burden is distributed in differing degrees within counties based on their sociodemographic characteristics and levels of obesity, and is not solely a function of population size. This economic burden on individuals could present an opportunity for a county willing to invest in obesity prevention or reduction measures.

The Economic Impact of Obesity in the South: Assessing Medical Spending Attributable to Obesity

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The study objectives were to:

(1) Determine the prevalence of overweight and obesity among adults in the Southern Region of the United States
(2) Estimate the increase in adult per capita medical spending attributable to overweight and obesity
(3) Assess overweight and obesity related healthcare expenses (both in dollars and as a percentage of total spending)
(4) Analyze costs by payer group and sociodemographic groups.

Two nationally representative data sets were used to develop cost estimates: the Medical Panel Survey (MEPS) and the National Health Interview Surveys (NHIS). MEPS is conducted by the Agency for Healthcare Research and Quality (AHRQ). It is a nationally representative survey of civilian non-institutionalized population that collects data about people's healthcare utilization and annual medical spending, including the percentage of spending by out-of-pocket and third-party payers. MEPS contains information about insurance status, region (Northeast, Midwest, South, and West), and sociodemographic variables.

Assessing medical expenditures related to overweight and obesity in the Southern Region can inform policy for food and nutrition assistance programs and strategies to address weight loss and prevent weight gain. In addition, state health departments may use the information to develop new prevention programs appropriate for their populations.

The sampling frame was derived from linking the 1996-2000 MEPS public use file to the records of the same persons in the appropriate years of the NHIS. Height and weight data, necessary to calculate Body Mass Index (BMI), were available for a subset of adult NHIS participants and were merged with the MEPS data. The final sample included adults nineteen years of age and older residing in the Southern Region with weighting variables that allowed generation of regionally representative estimates. Excluded from the analysis were those in the MEPS/NHIS population missing height and weight data, which included all individuals under 18 at the time of the NHIS interview and pregnant women.

A four-equation regression approach was used to predict annual overweight- and obesity-attributable medical spending. Variables representing the four BMI categories (underweight, normal, overweight, and obese) were included in the regressions to predict their impact on annual medical spending. All regressions controlled for age, sex, race/ethnicity, income, education, and marital status. Insurance status (i.e., private, Medicaid, Medicare, uninsured) was included to estimate the increase in annual medical spending attributable to overweight and obesity for each insurance category. Prevalence rates were combined with per capita spending estimates, and the percentages of aggregated expenditures attributable to overweight and obesity were computed.

Based on the data analysis, overweight and obesity are pervasive in the Southern Region; prevalence rates are increasing; associated medical costs are significant; expenditures vary by age, gender, race, and payer group; rates are highest among those receiving public assistance; and the greatest increases in expenditures are among private and out-of-pocket payers.

This research provides the first estimates of obesity-related medical costs in the Southern Region. The results can be used to estimate cost savings associated with incremental reductions in the prevalence of obesity in the south. Trends in obesity-related medical spending over time could be determined by comparing future estimates of spending with baseline data from this study.

Findings may be used to develop obesity-related programs by public agencies, private health plans, and employers. Findings may guide policymakers who determine the distribution of limited resources to address obesity prevention or develop policies for food and nutrition assistance programs. Since some of these programs are a source of nutrition education for low-income families, they may play a role in the prevention of obesity.

An Age-Period-Cohort Analysis of the Rise in the Prevalence of the U.S. Population Overweight and/or Obese (PO&O)

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

This research examines trends in the propensity of obesity and overweight (PO&O) in the United States from 1976 to 2001. An age-period-cohort analysis examined:

(1) The life course trajectory of weight gain
(2) The years in which Americans displayed the greatest degree of weight gain
(3) Whether trends differ by birth cohort.

The objective was to isolate time periods and determine which time periods are associated with a detrimental impact on Americans' weight.

The analyses use data from the National Health Interview Survey (NHIS), a nationally representative annual health survey conducted by the National Center for Health Statistics. The NHIS data are adjusted for the misreporting of weight and height. The analyses use demographic methods, specifically age-period-cohort analysis, and ordered logit models.

The ordered logit models show that the probability of being obese versus overweight, and overweight versus normal weight has increased in every 5-year period, after controlling for a host of factors. Between 1976 and 2001, the probability of the adult population being obese has tripled. The probabilities of obesity for women are now nearing those of men. Of the race/sex groups studied, Black and Hispanic females possess the highest probabilities of being obese, with Black women having a higher probability. Hispanic men have the highest probability of being obese. When the data are disaggregated by year, the results show the youngest age groups are increasing their likelihood of being obese at the fastest rates.

Findings indicate that for every age group and for every birth cohort, current group average Body Mass Indexes (BMIs) are larger than the previous period's BMI. Altogether, the adult population in the United States has increased its BMI every 5-year period between 1976 and 2001. Further, the growth in PO&O seems to be accelerating over time. Taking into account the characteristics of the population does not mitigate the effect of period on Americans' increased weight gain. One limitation of the data is that the sample contained

adults only. It is not known how many individuals entered the sample already overweight or obese.
Because every birth cohort and age group showed an increase in BMI, explanations that focus on specific subpopulations were not supported by the data. Initially, it was hypothesized that a particular time period, age group, or cohort could be isolated as an indicator of BMI increase. If that had been the case, one could target policy interventions and design appropriate policy interventions to mitigate the situation. The findings demonstrate that this was not the case and that period effects dominate: the PO&O increases with every time period, without exception.

This study provides some important insights into the age-period-cohort effects of PO&O. Future research might concentrate on the aspects of American culture that result in eating behavior that yields PO&O, how the American lifestyle might be adapted to expend more energy, and how public policies might arrest the PO&O trend in the United States.

Food Insecurity and Childhood Obesity

Women, Infants, and the Food Environment: Influences on Food Security and Obesity

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Over the past decade there has been a new interest in neighborhood-level effects on health. The role that the local food environment—in particular, the presence of large supermarkets—plays in providing high diet quality foods to neighborhood residents is being studied. Although the proportion of meals eaten away from home has increased, families on average continue to purchase most of their food from supermarkets and grocery stores. Those families who spend more of their food dollars on at-home foods have higher diet quality than those families who spend more money on away-from-home foods. Supermarkets provide the greatest food variety at lower cost compared to restaurants. The presence of grocery stores in a neighborhood varies by neighborhood racial composition, with fewer supermarkets located in African-American neighborhoods, and by whether the neighborhood is in a rural area.

As part of an ongoing cohort study to investigate risk factors for postpartum weight retention, this study investigated the food and physical activity environments in a three-county area in central North Carolina.

The study had two objectives:

(1) To identify environmental influences on shopping behaviors, dietary intake, meal patterns, and physical activity among postpartum women, infant caregivers and infants

(2) To identify policies and social factors that influence food resource and recreation location, and to investigate the relationship between food environment and dietary intake.

Various factors make it difficult to assess the hypothesis that supermarkets have an independent influence on diet quality. First, endogeneity, or omitted variable bias, may not take into account the personal choice that influences both residence and the distance to supermarket that might influence diet quality. Second, although an independent relationship has been found between presence of a supermarket and diet, the impact of distance from a supermarket on diet is not fully understood.

Women were recruited within 1 year postpartum, primarily through clinics supporting the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). A total of 34 women participated in focus groups and individual interviews. These sessions were organized by race and Body Mass Index (BMI) status. Each focus-group interview lasted about 90 minutes and each individual interview lasted 30-45 minutes. In addition, nine interviews were conducted with community leaders including nutritionists at three WIC clinics, a manager of a convenience store, town planners, representatives from State and national nonprofit organizations that promote smart growth and active living, and State public health officials. All interviews were audiotaped, transcribed verbatim, coded, and imported into software for data management and analysis.

The open coding process produced 47 themes categorized into eight headings: neighborhood social and physical characteristics, food environment, supermarket environment, physical activity environment, individual resources, individual considerations, individual physical activity issues, and perceived societal and programmatic influences.

Preliminary findings of postpartum women's perception of their food environment, especially as it applies to a supermarket survey, suggest that food purchase decisions are affected by more than cost, quality and food variety. The general atmosphere of supermarkets, specifically cleanliness and customer service, also influences where women shop. Study participants articulated a strong preference for two of seven commonly mentioned supermarket chains in three central North Carolina counties. Women conveyed a vague sense of "fitting" with their preferred supermarkets. Stores perceived as having higher quality food also were seen as more expensive. The women were not as comfortable shopping in the more expensive stores because they either didn't feel welcome or familiar with item locations, which increased their shopping time.

Although most women shopped at large chain supermarkets, they spoke of the quality of the supermarkets differing by neighborhood wealth. Findings also suggested that individual self-esteem may confound the association of neighborhood food resources on diet and weight. Other psychosocial factors, such as anxiety and discrimination, might be important characteristics to measure, especially among low-income households. Such variables have not been included in models of the neighborhood food environment and diet.

Is There a Link Between Food Insecurity and Overweight Status in Children? Evidence from the Early Childhood Longitudinal Survey

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Grant awarded by Department of Nutrition, University of California, Davis

Recent literature indicates that close to two-thirds of the U.S. adult population is overweight or obese. Moreover, the prevalence of obesity has increased in the United States, particularly among children. This research identified literature linking obesity with increased risk of poor health outcomes, such as cardiovascular disease, diabetes, and cancer.

While there is little controversy about the proximal determinants of overweight status—imbalance between energy intake and expenditure—there is considerable complexity in the framework of distal factors that give rise to this imbalance. An emerging area of research exploring distal factors is concerned with the relationship between household food insecurity and obesity.

Several empirical studies cited in the report have explored the food insecurity-weight status relationship. There is apparent agreement among studies of adult women: most studies show a positive association between food insecurity and the probability of being overweight. While a positive relationship may seem paradoxical, several explanations are possible. Food insecurity could lead to overweight status if individuals overcompensate for periods when food is scarce, resulting in greater overall intake. Weight cycling could also make the body more efficient in utilizing dietary energy, leading to weight gain over time. Finally, energy-dense foods are often less expensive, so that food-insecure households who cannot afford to eat balanced meals or who must rely on a few kinds of low-cost foods may have an overall greater energy intake.

No clear pattern has emerged regarding the food insecurity-overweight link in children. Some authors have suggested that the issue in children is unresolved because of limitations (including sample size) of previous datasets. Literature cited in the report has found that food insecurity or hunger is associated with negative academic outcomes and poor psychosocial functioning at school, adverse health outcomes, and poor mental health. The objective of this research is to test the hypothesis that household food insecurity is positively associated with overweight status in children.

The study analyzes data collected in the Department of Education's Early Childhood Longitudinal Survey-Kindergarten Cohort (ECLS-K). The ECLS-K is a large nationally representative survey of children which began with the kindergarten class of 1998-99. The survey collected measures of children's

heights and weights twice per year in the kindergarten and first grade, the full 18-item USDA food insecurity module in the spring of 1999, and a rich set of variables on the home and school environments of these children. Algorithms from the Centers for Disease Control and Prevention (CDC) were used to assign Body Mass Index (BMI)-for-age percentiles to each child's measurements. Children with a BMI greater than or equal to the 95th percentile of their sex-specific BMI-for-age chart were considered overweight. In addition to this indicator, the study calculated a dichotomous variable indicating "risk of overweight," a CDC term for children with a BMI greater than or equal to the 85th percentile of their BMI-for-age chart.

Weight status is affected by a number of biological and socio-economic factors. To control for potentially confounding variables, the research developed multivariate logistic regression models in which the dependent variable was a dichotomous indicator of overweight status. Independent variables included a measure of household food insecurity and a full set of control variables, including: age, sex, and birth weight of the children; maternal educational attainment; income, region, and urbanization of the household; as well as family meal patterns and child activity patterns. All analyses used ECLS-K weighting variables, and accounted for the clustered nature of the sample by using jackknife replicate methods to estimate standard errors.

The primary study finding is that household food insecurity, when modeled with appropriate controls, is not associated with a higher prevalence of overweight among young school children. If anything, household food insecurity seems inversely associated with weight status. The finding is relatively robust, since similar results were demonstrated across a range of different models. The study applied dichotomous (food secure/insecure) and trichotomous (food secure/insecure without hunger/insecure with hunger) expressions of the household food security variable and also used dichotomous and trichotomous expressions for child food insecurity. Models using different expressions of the dependent variable were performed, using "risk of overweight" as an indicator in one model, and simply BMI in continuous form in another. A cross-section analysis based on data collected in the spring of the children's kindergarten year was run. It should be noted that parents reported on household status in the 12 months prior to the interview, so in effect a food-insecure condition would have preceded the children's weight status. The research further tested whether household food insecurity in the spring of 1999 was predictive of overweight status a year later and found that it was not. Additionally, the study tested whether household food insecurity in 1999 was predictive of a high weight gain over the next year and found an inverse association.

These findings may mean that food insecurity is less relevant for those whose main concern is childhood obesity than for those focused on academic and psychosocial outcomes or physical and mental health. In addition, study estimates indicated that while 10 percent of the sample overweight children came from food insecure households, 24 percent came from households in poverty. Thus, targeting overweight prevention might be more focused on a general population of the poor than on the food-insecure population. Moreover, social marketing techniques or environmental change strategies that affect large groups of people may cost less than strategies that must first identify food-insecure households.

A Cautionary Tale: Using Propensity Scores To Estimate the Effect of Food Stamps on Food Insecurity

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In 2003, the Food Stamp Program (FSP) provided assistance to 9.2 million households, including 5 million households with children. It is the largest Federal food program and is the cornerstone of Federal food assistance. FSP attempts to ensure that low-income families have sufficient resources to purchase a nutritionally adequate diet. Food insecurity is an FSP outcome measure. A module designed by the U.S. Department of Agriculture (USDA) and the Department of Health and Human Services (HHS) consists of 18 items that classify families as either food secure or food insecure. Reducing levels of food insecurity is an important goal, particularly for children: those who are food insecure are more likely to suffer from a range of academic and behavioral deficits.

The impact of the FSP on food insecurity is difficult to analyze since unmeasured or unobserved characteristics may be correlated with both program participation and food insecurity. This correlation introduces statistical bias, which may either understate or overstate program impact. Most research indicates that those who use food stamps have measurable disadvantages relative to income-eligible persons who do not participate. These disadvantages may increase the likelihood that these families are also food insecure. Simple comparisons between those who use food stamps and those eligible persons who do not may understate the program's impact if there are unmeasured disadvantages that prompt the most food insecure households to become FSP participants. However, the direction of the statistical bias may operate in the opposite direction. Eligible families who apply and participate may be better organized or otherwise advantaged in comparison to eligible nonparticipants. In that case, the program impact may be overstated.

Recent developments in nonexperimental methodology provide new techniques for evaluating a nonrandomized program such as the FSP. The use of propensity scores is one such method. Under key assumptions, propensity scores approximate a randomized experiment by creating a “matched” treatment and control group who are, save for treatment status, comparable. When the two matched groups are compared on an outcome, any resulting differences should reflect the treatment and not unmeasured characteristics. This method depends heavily on the ability to control for observed determinants of both program participation and food insecurity.

This research uses propensity scores to examine the effect of the FSP on food insecurity. Data come from the first and second waves of the Early Childhood Longitudinal Survey-Kindergarten Cohort (ECLS-K), a nationally representative dataset of over 21,000 children. Propensity scores were developed to create equivalent groups, with one receiving the treatment while the other group does not. Propensity scores represent the predicted probability of participating in the treatment, based on the observed and measured characteristics used in the prediction equation. The literature does not provide definitive guidance on how propensity scores should be calculated, so this research used several models, with each model varying the number of covariates.

The study found no effect of the FSP on the likelihood that a household will be classified as food insecure: the estimates were small and not consistent across the model specifications. As a further step, however, the study estimated the effect of food stamps on the level of food insecurity. Among households that indicated some amount of food insecurity, FSP participation reduced the amount of food insecurity.

This research makes two contributions:

(1) It uses statistically rigorous methods to evaluate the potential impact of food stamps among a sample of households with young children.

(2) The advantages and disadvantages of propensity scores are compared to more traditional linear regression models.

The use of the method is illustrated, highlighting how it may be applied in other research efforts. The study demonstrates limitations to the use of propensity scores based on their underlying assumptions. In order to help attain unbiased estimates, scores should be based on a rich array of covariates. This research found that estimates using regular linear regression methods were similar to results of the propensity score models. It is possible that a rich dataset such as ECLS-K, where many potentially confounding factors can be controlled for, could be sufficient for estimating the program's effect. Propensity scores should be used with caution. To examine the impact of a program like the FSP, where a randomized experiment cannot take place because eligible recipients cannot be denied benefits, using propensity scores in conjunction with more traditional linear regression models may provide informative results on program impact.

Food Assistance Program Participation and Household Well-Being

Effects of Weight History, Resource Cycling, and Fast Food on Overall Diet Quality and Health in Low-Income Louisiana Women

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Obesity is associated with health problems including heart disease, high blood pressure, and diabetes. Low-income women are more likely to be overweight or obese than those with higher incomes. The purpose of this project was to study the weight and diet of women receiving food stamps and to assess their understanding of diet, health, and food choices that contribute to obesity. Interviews were conducted with a convenience sample of 64 women receiving food stamps to determine food security status, diet history, and perception of diet and weight.

A modified version of the USDA food security short form was used to determine the women's food security status: food secure (FS), food insecure (FIS), and food insecure with hunger (FISH). Twenty-nine subjects were food secure (FS), 26 were food insecure (FIS), and 9 were food insecure with hunger (FISH).

After determining the women's food insecurity status, the study used the National Institutes of Health Criteria to calculate their Body Mass Index (BMI) by using their stated height and weight as measured by the researchers. The average BMI for each food security group was in the obese range. When asked to select a silhouette that matched their BMI, on average, all three groups chose a figure in the overweight group; and when asked to select their desired BMI, all groups selected a BMI in the normal weight range. FISH individuals were the least likely to identify themselves as obese (33 percent), while 44 percent of FS and 53 percent of FIS individuals were able to identify correctly their weight status.

Diet histories determined that the overall diet quality of the women was very poor: Both at the beginning of their resource cycle (Day 1), when they received their food stamps, and at the end of their resource cycle (Day 2). In all groups, energy intake dropped from the beginning of the month. Average intake of protein, carbohydrates, and total fat was within recommended ranges. However, for Day 1, the percentage of women exceeding recom-

mendations for total fat was 41, 38, and 44 for FS, FIS, and FISH, respectively. For Day 2, these percentages were lower, with the exception of the FS group which maintained the same level of fat intake. Average saturated fat, cholesterol, and sodium levels exceeded recommendations for all groups on both days of the resource cycle. All three groups reported a very low intake of fruits, vegetables, and dairy for both days.

Women self-rated their eating habits, the nutritional quality of their diet, and their knowledge of nutrition. Sixty-two percent of FS women rated the nutritional quality of their diet as poor/fair, while 65 percent of FIS women and 78 percent of FISH women rated their dietary quality as poor/fair. Fifty-nine percent of FS women ranked their eating habits in poor/fair range, whereas 54 percent of FIS women and 44 percent of FISH women did. Finally, 45 percent of FS women rated their nutrition knowledge as fair/poor, whereas 62 percent of FIS and 67 percent of FISH women did. When asked, the overwhelming majority of women were unable to define a healthy meal as outlined by the Food Guide Pyramid regardless of how they rated their own nutrition knowledge or eating habits.

About half (49 percent) of the total sample reported having received formal nutrition education through programs such as the Expanded Food and Nutrition Education Program or the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). In the FS group, 47 percent reported having had some nutrition education, and 52 percent of FIS group reported some exposure to nutrition education. Thirty-three percent of the FISH group reported receiving some type of nutrition education.

The study results underscore the lack of nutrition knowledge among low-income women. The research can aid policymakers, nutrition educators, and the women themselves understand more fully the relationship between food choices, past and present weight, and health status.

The Use of Twins To Understand the Effect of WIC on Birth Outcomes

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There is little evidence in the clinical literature to suggest that supplemental nutrition for pregnant women in developed countries has an important effect on birth outcomes. By contrast, studies in the social science literature indicate that the Supplemental Nutrition Program for Women, Infants, and Children (WIC) has had a major impact on the incidence of preterm birth. Clinicians view this finding as suspect, since few interventions tested in randomized trials have proven effective at preventing preterm birth. This study takes a first step towards reconciling the belief among policy analysts of the efficacy of WIC with the skepticism among medical researchers that nutritional supplementation in the United States is a meaningful determinant of birth outcomes.

The original study objective was to analyze the effect of prenatal WIC participation on birth outcomes among twins. However, during the research, it became evident that the overall association between prenatal WIC participation and birth outcomes had weakened considerably in New York City between 1988 and 2001. Accordingly, the scope of the project was expanded to analyze why the association between WIC and infant health among all births had become less robust over time. The analysis of twins was an important auxiliary project to support this larger research question.

Associations in the social science studies between WIC and preterm birth may be due to omitted variable bias. Therefore, this research considered measures of fetal growth in addition to preterm birth as an outcome.

Second, cross-sectional birth certificate data were utilized to examine the extent to which the association between WIC and birth outcomes had changed over time, and if so, whether the changing composition of participants could explain the difference. The growth in WIC coincided with the expansion in Medicaid eligibility thresholds that occurred in the late 1980s and early 1990s. Women on Medical Assistance are automatically eligible for WIC, even if the income thresholds for Medicaid exceed those for WIC. As a result, the growth in WIC among pregnant women was likely to include proportionately fewer women at risk for adverse birth outcomes. With 14 years of data and over 800,000 births to women on Medicaid in New York City, the data provided a unique opportunity to test whether the changing composition of women on

Medicaid and WIC from the period before the Medicaid eligibility expansions through the most recent expansions for pregnant women under State Children's Health Insurance Program (SCHIP) could explain the weakening association with infant health.

Third, many studies reported that improvements in birth outcomes associated with WIC were greater among women at medical risk such as smokers, teenagers and those with a previous premature delivery. Such results were interpreted as evidence that WIC was more beneficial for women in need of nutritional assistance. But these risk factors tended to be correlated with other, harder to measure, determinants of birth outcomes such as substance abuse, sexually transmitted disease, and stressful home environments.

Effects associated with WIC among a sample of women who smoke, for instance, may reflect greater unobserved heterogeneity between WIC and non-WIC participants than was found among lower-risk groups such as nonsmokers. As a potentially less biased test of whether the association between WIC and birth outcomes was greater among women at nutritional risk, the analysis compared outcomes between WIC and non-WIC participants who deliver twins. Multiple gestations represent a random health shock that increases the risk of anemia, inadequate weight gain and adverse birth outcomes, but should be orthogonal to other risky behaviors.

Finally, a universal concern among WIC analysts has been selection bias. Do women who participate in WIC differ from non-participants in ways that are hard to measure but that are correlated with the outcomes of interest? As with almost all previous studies, this research lacked a truly exogenous instrument or quasi-experimental design to address selection bias directly. However, the analysis allowed the effects of WIC on fetal growth to vary over time and within relatively homogenous groups of women. Therefore, treatment effects that were clinically implausible and differed substantially over time and across groups should be interpreted cautiously and viewed as possible evidence of selection bias.

Findings indicate no statistical association between WIC and fetal growth, except for a positive association among US-born blacks who deliver twins. One implication may be that targeted nutritional supplementation during pregnancy might be useful. The broadly held notion that WIC improves birth outcomes emanates from its association with preterm birth, which the clinical literature has suggested is implausible. The analysis showed that prenatal WIC participation had at best a modest impact on fetal growth. Previous assessments of WIC by social scientists have tended to overlook the rather weak association with fetal growth.

Does WIC Reduce Prenatal Substance Use?
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This study examines the effect of the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) on prenatal use of alcohol and tobacco of participating pregnant women. Previous research shows that small-scale interventions similar to those provided in a WIC clinic can have an effect on preventing or reducing prenatal smoking or drinking. Yet few studies have examined the impact of WIC education on prenatal substance use. This is an important issue since prenatal exposure to alcohol, drugs and tobacco is one of the leading preventable causes of birth defects, mental retardations, and neurodevelopmental disorders in the United States. Pregnant WIC participants exhibit these behaviors: 29 percent smoke during pregnancy, 16 percent drink alcohol, and 8 percent use marijuana. Such behaviors directly undermine WIC's goal of improving birth outcomes of poor children.

The study also examines the effect of state policies towards pregnant substance abusers on both WIC participation and prenatal substance use. These policies—which range from supportive (e.g., treatment and/or education) to punitive (e.g., child welfare investigations, termination of parental rights over prenatally exposed children, civil retention in a drug treatment facility for prenatal drug use)—may affect the participation of pregnant women in public health services. Yet little is known about their effects. The research reviews whether these policies change rates of prenatal drinking or smoking or have the unintended consequence of keeping women away from needed social services, including WIC.

Data from the National Longitudinal Survey of Youth, 1979 (NLSY) are used to study the effect of WIC on prenatal smoking and drinking. NLSY data are supplemented with information on state policies towards pregnant substance users. These data are rich enough to allow two-stage estimation models that control, where necessary, for sample selection into the pool of WIC participants. County characteristics help identify WIC effects in the two-stage models. The analysis incorporates the presence of multiple sibling families in the NLSY and estimate WIC effects using fixed-effect models.

Study results indicate that WIC's non-nutrition activities play a role in moderating prenatal drinking and smoking. The results were stronger for white mothers and for models of smoking reduction while pregnant. However, WIC participation did not result in complete abstinence from smoking or drinking for all pregnant WIC women. The results are consistent

with the literature showing that brief interventions can have a positive but limited effect on maternal behavior for the duration of the pregnancy.

The results suggest that, for nonwhite mothers, the State requirements for prenatal drug testing may discourage the use of health services like WIC. Instead, States with education and prioritized treatment may be more successful at exposing pregnant women to WIC services, including its array of nutrition-related activities Although punitive State approaches have received much media attention, these policies may not be a major factor in WIC participation, though this result could be driven by the limited number of affected pregnancies in the data.

The study suggests that pregnancy is a “teachable moment” when pregnant women are responsive even to small interventions that appeal to their desire to have healthy children. WIC provides a unique opportunity to engage low-income women who are at higher risk for prenatal substance use and unfavorable birth outcomes. WIC appears to affect the behavior of pregnant women even though its nutrition education sessions are not required for the receipt of other benefits.

Are Economic Incentives Useful for Improving Dietary Quality Among WIC Participants and Their Families?

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Dietary quality, as measured by fruit and vegetable intake, is a powerful protective factor against a number of common chronic diseases, including several causing premature death and disability. Low income is well-established as a risk factor for poor dietary quality in the United States. The Special Supplemental Nutrition Program for Women, Infants and Children (WIC) program provides a context for investigating means to improve fruit and vegetable consumption in a vulnerable population.

WIC was designed and developed before the relationship of fruit and vegetable intake to chronic disease risk was well-established, and the foods were selected to supplement the nutrients that were thought to be most limited in the diets of low-income women and children, namely protein, calcium, vitamin A, and vitamin C. Recently, there has been discussion about adding fruits and vegetables to the WIC food package, potentially on a cost-neutral basis. A recent report by the Institute of Medicine reviewed the current public health context for the development of WIC food packages and proposed criteria for the inclusion of food items. Fruits and vegetables were among the highest priority food groups. This research investigated whether providing supplemental financial support targeted for purchase of fresh fruits and vegetables would result in high uptake of the supplement and whether the individuals would continue to consume more fruits and vegetables after financial support was discontinued.

A nonequivalent control group design was used to provide vouchers for fresh fruits and vegetables to low-income women participating in the Public Health Foundation Enterprises WIC program in Los Angeles, CA. The study recruited 602 women who were enrolling for postpartum services at three selected WIC program sites (approximately 200 per site). Sites were assigned to: intervention with vouchers redeemable at a local supermarket; intervention with vouchers redeemable at a nearby year-round farmers' market; and a control site with a minimal nonfood incentive for participation in interviews. Vouchers were issued bimonthly, at the level of $10 per week. Interventions were carried out for 6 months, and participants' diets were followed for an additional 6 months after the intervention. Quantitative 24-hour dietary recalls were conducted at four interviews for each participant.

At the intervention sites, two extra interviews spaced 2 months apart were held to obtain information on the fruits and vegetables purchased with the vouchers. Specifically, participants were asked to respond to the question "What did you buy with your fruit and vegetable coupons last week?" Voucher redemption rates were obtained from scanned data from the supermarket's corporate headquarters. In the farmers' markets, vouchers presented for purchase were collected by the farmers' market manager and turned into the city government's accounting department for tallying. Vouchers were then mailed to the study's research staff, who re-counted the redeemed vouchers and logged the tallies into an electronic database.

In all, $44,000 worth of vouchers were issued for the supermarket and $44,960 for the farmers' market. Redemption rates were 90.7 percent for the farmers' market and 87.5 percent for the supermarket. Overall, participants reported purchasing 27 and 26 different fruits, and 34 and 33 different vegetables in the farmers' market and supermarket outlets, respectively. Five fruits and five vegetables accounted for about 70 percent of the items reported for each group. The 10 most frequently reported items were oranges, apples, bananas, peaches, grapes, tomatoes, carrots, lettuce, broccoli and potatoes. A larger number of item purchases were reported for the farmers' market although the total number of types of fruits and vegetables did not differ significantly between the two market settings.

Participation in the interventions increased consumption of fruits and vegetables with use of the supplement and that increase was sustained 6 months after the intervention. At baseline, participants at the farmers' market reported eating 2.2 servings/1,000 kilocalories (kcal) on average, 2.9 servings/1,000 kcal at the supermarket site, and 2.6 servings/1,000 kcal at the control site. Six months postintervention, this same comparison was made, and the increase in participant fruit and vegetable intake reported by intervention site was sustained. Participants at both the farmers' market and supermarket sites reported eating 4.0 servings of fruits and vegetables/1,000 kcal on average, while control site participants reported eating 3.1 servings/1,000 kcal on average. The difference in consumption between each of the intervention sites and the control site was statistically significant even after adjusting for multiple factors. The results were unaffected when evaluating consumption of fruits and vegetables excluding beans and potatoes, and fruits and vegetables excluding juices. Increases in vegetable consumption were primarily responsible for the overall increases in fruit and vegetable intake.

A linear regression analysis using baseline demographics, government program participation, body composition, food security status, reported energy intake, reported fruit and vegetable intake, infant feeding method, and treatment site explored which of these factors were associated with fruit and vegetable intake six months post-intervention. The results indicated that higher reported intake of fruits and vegetables 6 months postintervention was associated with reported fruit and vegetable intake at baseline, preference for speaking Spanish, and participating at either the farmers' market site or the supermarket site compared to the control site.

In summary, the variety of choices of fruits and vegetables exhibited in this study leads to the conclusion that, in this setting, low-income consumers make

varied and nutritious choices from available produce. The findings point to the potential for dietary improvement with a targeted subsidy that allows free choice within the fresh produce category. Neither the supermarket nor the farmers' market found the study particularly burdensome, and both outlets were positive about their participation. No specific barriers arose to voucher redemption by participants or retailers. In addition to the economic intervention, the high intake of fruits and vegetables may be attributed to the large proportion of Latinos included in the study population. The study participants' sustained intake of fruits and vegetables may reflect retained cultural food behavior habits and the study's timing at a critical point in a family—the birth of a child and the surrounding concern for a healthy child.

Community Influence on Food Assistance and Dietary Choices

Geographic Variation in Food Stamp and Other Assistance Program Participation Rates: Identifying Poverty Pockets in the South

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Temporary Assistance to Needy Families (TANF) rolls declined dramatically following the 1996 welfare reforms, while Supplemental Security Income (SSI) enrollment increased slightly. Since Food Stamp participation rates are considerably lower among SSI recipients than among TANF recipients, Food Stamp Program (FSP) enrollment was significantly affected by welfare reform even though it was not directly targeted by the legislation. Understanding changes in FSP participation benefits from a simultaneous analysis of participation in TANF and SSI.

Food stamp participation declined in the late 1990s along with TANF participation, although by a smaller magnitude. Given that the Personal Responsibility and Work Opportunity Reconciliation Act of 1996 for welfare reform made minimal adjustments in the FSP compared to changes in welfare programs, the reductions in FSP participation may seem puzzling. As a result of the observed reductions in participation in both programs, evaluating the link between TANF participation and FSP participation may help explain why FSP participation declined so sharply during this period.

This project directly examines the FSP-TANF participation link and the FSP-SSI participation link, using county-level participation data in these three programs. The study included a sample of states throughout the United States and all the Southern States. The model controlled for demographic, economic, and program characteristics most likely to affect both eligibility and participation. Study results indicate that a strong relationship exists between the level of FSP participation and both TANF and SSI participation. The results indicate that FSP-TANF link in 2001 appears stronger than the link between Assistance to Families with Dependent Children (AFDC) participation and FSP participation in 1995.

Results also show that FSP participation responds to the different options states now have as a result of welfare reform. States have greater flexibility to tailor welfare benefits, within parameters defined by Federal regulation, creating cross-State differences in how income, resources, eligibility, and

assets are calculated to determine FSP eligibility. This study finds that county administration has a negative impact on FSP participation, while State administration has a positive impact. Exempting child support from income and expanded categorical eligibility each increase FSP participation. State-required training and employment appear to have a significant negative impact on FSP participation, particularly in the Southern States. One-Stop Centers—multiple agencies co-located to provide services—appear to have little impact on participation, at least in the South. The longer the certification period, the higher the FSP participation rate appears.

The study examined the change in FSP participation, both in absolute terms (change in the number recipients per 1,000 residents) and percentage terms, while controlling for the levels and changes in both TANF and SSI participation. Absolute changes in FSP participation between 1995 and 2001 are generally negatively related to the levels of both AFDC and SSI participation in 1995. However, changes in FSP participation are positively related to changes in AFDC/TANF participation, suggesting that counties with large reductions in welfare case loads have large reductions in FSP caseloads as well. This result, however, is not robust. When the change in FSP participation is measured as a percentage change, larger percentage reductions in welfare participation result in smaller percentage reductions in FSP participation. One interpretation may be that FSP and welfare benefits might serve as substitute benefits rather than complementary benefits.

Assessing Nutritional Habits of Ojibwa Children

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The Keweenaw Bay Indian Community is a federally recognized Indian tribe located on the L'Anse Indian Reservation in Baraga County, Michigan. To date, no nutrition screening or other health assessments have been conducted on any of the early childhood programs on the reservation. The Keweenaw Bay Ojibwa Community College carried out this project to utilize traditional Ojibwa teachings to change the eating habits of children through their families, daycare providers, and to develop an early childhood education program.

The project goals include:

(1) Documenting the prevalence of health diseases and obesity among tribal youth

(2) Reducing the incidence of chronic health diseases

(3) Creating programs that integrate Ojibwa culture to enhance learning that in turn would bring about healthy lifestyle changes.

The project developed nutrition surveys for families of children ages 0-4 years. Distribution of the surveys proved difficult since tribal operations do not have mailing lists for these children. Assessment forms were distributed through childcare centers, a youth center and faculty, staff, and students of the Keweenaw Bay Ojibwa Community College. Survey results show that most families ate three meals and two snacks per day, ate candy four to five times a week, and ate very little traditional Ojibwa food. Families in the study exercised one to two times per week.

A database of menus used at childcare centers was created to determine nutrient content and consumption of traditional Ojibwa foods. The Food Guide Pyramid was used in developing the menus, which rotated on a 6-week basis. Traditional foods were served infrequently. The research found that eating took up a major portion of the childcare day, with breakfast served at 9 am, snack at 10:30 am, lunch at 12 noon, and a snack at 2 pm, with the children going home at 3 pm. The project distributed Ojibwa recipe books to encourage use of traditional foods in menu planning. Barriers to increased use of traditional food included seasonality and cost.

An Ojibwa spiritual leader taught Ojibwa children at a reservation childcare center about nutrition, plants, and other culturally relevant topics targeted to a school-age audience. This activity resulted in the development of a new 4-

credit course at the Community College on Fundamentals of Human Nutrition. The course incorporates both contemporary nutritional and traditional Ojibwa information to reduce chronic health diseases.

To encourage the preparation of traditional Ojibwa foods as a healthier alternative to current diets, the *Ojibwa Recipe Book* developed through the project is being made available to the parents who completed the nutrition surveys. However, since many families rely on commodity foods or food stamps, financial limitations may make it difficult to change eating behaviors. The nutrition project will be integrated with the Community College website to increase access to study findings and the *Ojibwa Recipe Book*.

Children and Nutrition: The Growing Health Epidemic of Diabetes in Indian Country

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This paper provides a literature review that examines the prevalence of diabetes among American Indian children, and compares it to the incidence found at the Fort Peck Indian Reservation in Montana. It describes the activities of the Healthy Schools Summit, an effort designed to educate Indian children about the role that nutrition and exercise can take in controlling diabetes, and concludes with recommendations from the Healthy Schools Summit.

American Indians are experiencing a surge in the prevalence of obesity and diabetes. Diabetes, especially adult-onset, or type 2, diabetes, is a growing health problem throughout the region and the country, but indications are that it is more serious on the Fort Peck Indian Reservation and on other Montana Indian Reservations. Risk factors for type 2, or adult-onset, diabetes, include older age, obesity, physical inactivity, and race/ethnicity. However, diabetes is beginning early among American Indians, between the ages of 2 and 5. Approximately 13 percent of American Indian preschool children are overweight, with up to 40 percent of American Indian and Alaskan Native children reportedly overweight. An especially worrisome trend in childhood obesity is the sharp rise in type 2 diabetes, normally found only in adults.

Montana's American Indians experience a higher prevalence of diabetes, smoking, and obesity compared to whites, according to a report of the Montana State Advisory Council on Food and Nutrition issued in 2001. Diabetes ranks seventh among the leading causes of death for Montanans, but fourth for American Indians.

During spring 2003, health officials from seven reservations in Montana formed the Healthy Schools Summit to address childhood diabetes. The Summit developed strategies to reduce the rate of diabetes and its complications, including early screening and treatment, utilization of Tribal College Wellness Centers for exercise and physical fitness, Indian Health Service clinic visits, and clinical trials to prevent the onset of type 2 diabetes among individuals at most risk for developing the disease.

Dietary habits contribute to development of obesity, with the diet of many American Indians characterized by frequent intake of nonindigenous protein,

combined with a high proportion of low-nutrient-density carbohydrates and fats. The Summit worked with three Fort Peck Reservation schools to promote a healthier school food environment. In cooperation with the Indian Health Service, the Summit is developing a software program to track and analyze health-screening data from reservation schools. The Summit also actively collaborated with reservation schools to educate Indian communities about healthier school environments, including educating parents to foster family eating practices that can reduce the incidence of obesity.

Key recommendations resulting from the project include:

(1) Prevention of diabetes on the Fort Peck Indian Reservation should begin in the classrooms and in the home using targeted information appropriate for the intended audience.

(2) All agencies whose mission includes diabetes prevention should build strong coalitions to maximize resources and share information that can be used to educate at-risk populations.

(3) Special efforts should be made to involve all children in physical activity.

(4) Health services need to be designed to engage entire families in physical activities.

(5) Diabetes prevention outreach should target sedentary and at-risk individuals and their families to provide nutrition education and involve them in physical activity.

Participation of Latino/Hispanic Population in the Food Stamp Program in the South

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The Hispanic population is growing rapidly throughout the United States, particularly in the Southern States. The Hispanic population is characterized by high poverty rates among children and the elderly compared to other major demographic groups. Further, the Hispanic population has relatively low educational levels, is disproportionately low income, lacks proficiency in English, and often requires a variety of public assistance programs to support their families. Many in the Hispanic population are not aware of the Food Stamp Program (FSP) and their potential eligibility.

The study objectives were to:

(1) Develop a socioeconomic and demographic profile of the Latino/Hispanic population in the South

(2) Examine the FSP participation of the Hispanic population in Tennessee

(3) Identify barriers to FSP participation by eligible the Hispanic population

(4) Develop programs and strategies to enhance FSP participation among Hispanics.

This study uses Census data to describe poverty rates among the U.S. Hispanic population; State administrative data from Tennessee to analyze FSP participation rates among Hispanics; and survey data collected from Hispanics in Tennessee and Kentucky to describe their participation in FSP.

Census data indicate that poverty rates among Hispanics were higher than those found in the total U.S. population from 1972 to 2003. The highest poverty rate for the total population was 15 percent in 1983. By comparison, the lowest poverty rate for the Hispanic population was 21 percent in 2001, down from a high of 31 percent in 1994. The poverty rate was about 30 percent among Hispanic children and 20 percent among the Hispanic elderly population.

Analysis of Tennessee administrative data showed that participation of Hispanics in the FSP during January-December 2003 increased rapidly, compared to the total population. Total participation increased by 11 percent, but increased by 32 percent for the Hispanic population. Hispanic children

increased their participation by 31 percent, exceeding the 20 percent increase for Hispanic adults. In the total population, both children and adults increased their participation by 11 percent. Hispanic participation increased by 35 percent in metropolitan counties, by 24 percent in counties adjacent to metropolitan counties, and by 10 percent in nonadjacent counties. Similarly, participation for the total population increased more in metropolitan counties than in nonmetropolitan counties. The increase for metropolitan counties was 12 percent, lower than the 35 percent increase in Hispanic population.

A survey of Hispanics conducted by the researchers in conjunction with the State Department of Human Services and a faith-based organization serving the Hispanic population in Tennessee and Kentucky showed that government assistance (20 percent), including food stamps, were a primary food source for Hispanics, followed by religious organization (18 percent) and friends (11 percent). Twenty-two percent of Hispanic respondents indicated that they did not know about the FSP, and 23 percent indicated they did not know whether they were eligible.

The results also indicate that 52 percent of the respondents were not comfortable applying for food stamps. One factor may be that the average waiting time when applying for food stamp was 2.86 hours, with 63 percent of the respondents indicating that the waiting time was excessive. The main sources of information about food stamps for the Hispanic population are: church/religious organizations (33 percent), followed by friends (32 percent) and radio/TV/newspapers (7 percent). Respondents also indicated that information about the program would have a broader audience if the FSP used radio/TV/newspapers and religious organizations more frequently as an outreach mechanism. Forty-four percent suggested that participation in the FSP could increase if Spanish-speaking staff were increased, with 20 percent indicating more Spanish materials should be made available, and 12 percent stating that more friendly FSP office staff would increase participation.

Use of a "Contract for Change" To Evaluate the Effectiveness of Nutrition Education to Increase Fruit and Vegetable Consumption in Low-Income Women

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The rates of chronic diseases, such as cardiovascular disease, type 2 diabetes mellitus, and obesity, continue to rise in the United States. Diet is a modifiable risk factor known to significantly affect chronic disease risk. Preventative measures, including improved dietary quality of Americans, are a key focus of nutrition public policy and education. The challenge for government and nutrition educators is how to encourage at-risk populations to make positive dietary and lifestyle changes and to overcome barriers to fruit and vegetable consumption.

The purpose of this research was to determine the effectiveness of pairing personalized goal-setting exercises within community-based nutrition education programs to promote behavior change in a low-income population. It was hypothesized that through an increased sense of self efficacy, the goal-setting group would have the following outcomes:

(1) Advance within the "stages of change" model toward accepting dietary change
(2) Increase produce consumption more than the control groups
(3) Increase markers of fruit and vegetable intake more than the control groups.

This intervention targeted English-speaking, low-income women who were potential recipients of University of California Cooperative Extension (UCCE) Expanded Food and Nutrition Education (EFNEP)/ Food Stamp Nutrition Education (FSNE) programs. After recruitment, 65 women were randomly assigned to a control group or to one of the treatment groups, an "education" group, or a "contract" group. They were asked to attend four 1-hour classes over 4 weeks. The control group received the "Gateway to a Better Life" series discussing money management.

The education group received the "Food Guide Pyramid" series currently used by California EFNEP/FSNE. The contract group received the "Food Guide Pyramid" series as well, and completed a "Contract for Change" goal-setting exercise at the initial meeting. The control group was reminded of their goals at subsequent classes. The "Contract for Change" tool was adapted from previous work demonstrating its effectiveness in changing

dietary behavior. Validated questionnaires assessed study participants' readiness to make dietary changes, to determine food consumption patterns, and to estimate actual fruit and vegetable consumption. Outcome measures were assessed three times, at both pre- and post-intervention, and with a final assessment occurring 1 month after intervention to evaluate maintenance of the anticipated dietary changes. The completion rate for the full program intervention was 58 percent.

The goal-setting contract group made significantly more progress toward acceptance or readiness to increase vegetable consumption in comparison with the control group. The results for the education group were not significantly different from the other two groups. A trend toward increased vegetable consumption was observed in the contract group. Data regarding actual consumption of fruit showed a significant increase from baseline to final time points and at one-month follow-up for the contract group in comparison to the education group. Estimates of beta-cryptoxanthine and vitamin C intake (markers of fruit intake) significantly increased in the contract group, supporting these observations.

The research results demonstrate that tailored goal-setting exercises, paired with nutrition education, can be an effective tool for nutrition professionals to facilitate dietary change in a low-income population. This approach can be utilized in existing community-based education programs targeting low-income women without increasing programmatic cost, or modifying local economic or societal conditions. The California State EFNEP/FSNE program has adopted the "Contract for Change" as a tool for county educators.

Findings, however, are limited by the relatively small number of study participants, and future research should consider certain factors at the study design stage. The primary challenge in conducting the research was participant recruitment, as the original goal of 180 women from 7 counties resulted in 38 women in 5 counties. It is believed that three factors contributed to actual participation not reaching anticipated participation:

(1) The original plan was to collect blood samples as a biomarker of dietary change. However, some potential participants declined when learning about the blood draw. While the biochemical component of the study was ultimately dropped to alleviate participant concerns and streamline study procedures, considerable time had been lost in the research timetable.

(2) The study design requirement that all participants speak English reduced the participant pool, and resulted in the withdrawal of two counties.

(3) The diversity of the target populations proved to be an additional barrier to recruitment. While training sessions were held to review the study protocol to make needed changes, the protocol did not accommodate the full diversity of participants. Future use of a new curriculum might consider recruiting participants from a more homogenous area to refine the curriculum and allow more precise evaluation of its effectiveness before expanding its use to a more diverse set of participants.

Adapting EFNEP to Meet the Changing Needs of Food-Assistance Eligible Families: Investigating the Results of Program Responses to Welfare Reform

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This research was designed to investigate how the Expanded Food and Nutrition Education Program (EFNEP) adapted to keep services for low-income participants relevant, accessible, and effective during the period of welfare reform. EFNEP's adaptation strategies were examined using qualitative assessment of the experiences of EFNEP personnel and quantitative analysis using program monitoring data on implementation and outcomes.

To gather the study data, indepth interviews were conducted with State EFNEP coordinators and selected county or regional EFNEP supervisors in three States. Six focus group discussions with EFNEP paraprofessional Community Nutrition Educators (CNEs) and two interviews with key informants were conducted in one State. Verbatim transcripts were analyzed qualitatively. A national dataset of selected program variables for the period of 1997-2003 was created from State-level data excerpted from the national EFNEP monitoring system. Regression analysis was used to examine trends over time in program implementation and outcomes at the national and State levels. The study also examined the characteristics of a subsample of 10 States with the strongest trends (5 positive, 5 negative) in behavior change score, and the proportion of program graduates reporting an improvement in dietary practices between program entry and completion.

EFNEP personnel reported that families transitioning to work continued to need EFNEP, but had little time to attend nutrition education classes. Low-income working parents who have less time for food preparation and acquisition reportedly need information on managing food resources, preparing quick healthy meals for home and work, and making good choices when eating away from home. To reach these participants, EFNEP collaborated with other agencies to deliver services to groups formed for other purposes, offered programs on weekends or evenings, and identified new audiences. Collaborating agencies included adult education and English language programs, residential programs addressing various needs (e.g., domestic abuse, homelessness, mental disabilities, and drug rehabilitation), welfare-to-work training programs, and occupational groups (e.g., daycare providers). CNEs now teach more groups, reach more diverse audiences, and address mandated audiences who must attend an agency's program to

avoid sanctions (such as loss of Temporary Assistance for Needy Families (TANF) benefits). Sustained collaboration with agencies serving similar populations and interested in providing nutrition education to their clients was critical to successful adaptation. This collaboration was difficult in some rural areas where few agencies were available to collaborate with EFNEP and where low population density and lack of transportation limited attendance at group educational sessions.

Most EFNEP personnel felt that EFNEP was adapting successfully to serve potential participants. The challenges posed by interagency collaboration included constraints on the number and length of lessons, resulting in less time for education and hands-on activities. Some personnel were concerned that shorter program duration and group methods could reduce impact. To preserve program quality, some sites established standards for minimum length and frequency of lessons and provided extra individual or home-study lessons for people seeking more information and support. Training CNEs to work with new audiences, revising curricula to focus on priority topics, and subdividing large groups were other strategies to maintain effective teaching. Such strategies required resources and were not practiced equally in all sites. Program impact may depend on whether a supervisor is primarily concerned with program survival and maintenance of large caseloads, or employs strategies to sustain both high participation rates and program quality.

Analysis of national EFNEP monitoring data confirmed many of the qualitative findings. The proportion of participants reached by group (rather than individual) methods increased from under 60 percent in 1997 to almost 72 percent in 2002-03. Characteristics of EFNEP participants also changed. From 1997 to 2003, there was a reduction in the proportion of participants living in rural areas or small towns, an increase in the proportion of Hispanics, and a decrease in the proportion of African Americans.

Nationally, the percent of graduates reporting an improvement in dietary behavior between program entry and completion remained relatively constant, although trends in individual states varied widely. The rate of program completion increased, probably due to inclusion of more mandated participants and changes in graduation criteria associated with group methods. The size of the Federal funding allocation to a State was the program characteristic that best distinguished programs whose participants improved their dietary behavior (from inadequate to adequate by program graduation) from those state programs whose participants did not demonstrate improvement in dietary behavior.

EFNEP has developed innovative strategies to adapt to welfare reform and to contribute to its success by helping families practice healthy nutrition and resource management as they transition to work. While the trends identified in this study occurred during the era of welfare reform, EFNEP was also influenced by other socioeconomic and policy conditions. Continued funding constraints have implications for program access, quality, intensity, and duration.

These analyses illustrate how data from EFNEP's extensive program monitoring system can be used to assess changes in program implementation and behavior change outcomes. Research would be enhanced if program monitoring data were complemented by an external EFNEP evaluation of contrasting program approaches and multiple outcomes among participants and nonparticipants.

Welfare Reform and Food Assistance Participation

The Material Well-Being of Single Mother Households in the 1980s and 1990s: What Can We Learn from Food Spending?

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The research objective was to analyze trends from 1986 to 2001 in the composition of the food budgets of single mothers relative to single women without children and to married mothers. During this period, a combination of welfare reform, expansion of the Earned Income Tax Credit, and other policy changes led to increases in the labor supply of single mothers and a decline in their participation in cash welfare programs. This research analyzes whether there was a shift in the composition of the food budget from food consumed at home to food consumed away from home.

Research has shown that single mothers' food expenditures increased during the 1990s and concludes that single mothers' well-being increased or at least did not decrease. This work re-examines whether single mothers' well-being changed by exploring the possibility that the increase in food spending may in fact have been driven by a change in the composition of food spending rather than a true increase in consumption. Microdata on food spending from the Consumer Expenditure Survey-Diary Component for 1986-2001 were analyzed. This study used multivariate regression to control for differences in household composition and other observable characteristics, such as race, between single-mother households and other households.

The research results found that the increase in single mothers' food spending over this period was entirely driven by a shift from spending on food at home to spending on food away from home. The study results suggest that caution is needed before concluding that increases in total expenditure on food results in an improvement in material or nutritional well-being. Given the rise in obesity throughout the general population during this period, these findings also suggest that future research examine whether the changes in the pattern of food spending for single mothers were accompanied by increases in obesity in this subpopulation relative to other groups of women.

Food Security Stability and Change Among Low-Income Urban Women

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Many welfare-reliant and working poor families experience financial difficulties and develop strategies to cope with competing demands for limited resources. Needs, resources, and the strategies of low-income families may change as family circumstances and contextual conditions evolve in response to changing policy environments. Such changes may affect outcomes such as food security. This research draws upon two complementary data sources to examine stability and change in food security in the context of the post-1996 welfare reforms.

Food security is an indicator of family well-being and material hardship that is likely to be affected by a household's economic resources, Food Stamp Program (FSP) participation, and the availability of time to carefully plan food purchases and prepare meals. As such food security may be affected by welfare reform and low-income employment. Recent studies provide indications of the relationships among welfare, low-income employment, food insecurity stability and change, and physical and mental health. This research focuses on individual-level State-specific stability and change in food security among low-income women.

Two complementary data sources are used in this study: longitudinal survey data collected from random samples of initially welfare-reliant women living in highly disadvantaged neighborhoods in four large urban counties (Cleveland, Los Angeles, Miami-Dade, and Philadelphia), and longitudinal qualitative interview data from initially welfare-reliant women living in neighborhoods of concentrated poverty in Cleveland. These data were collected under the auspices of the Manpower Demonstration Research Corporation (MDRC) Project on Devolution and Urban Change. The women's 1998 baseline data and 2001 followup data were cross-tabulated, using the four food security categories used in the Household Food Security Scale—food secure, food insecure with hunger, food insecure with moderate hunger, food insecure with severe hunger. The three food-insecure categories were collapsed into one food-insecure category to create a dichotomous food secure/food insecure variable for baseline and followup analysis.

In the survey sample (N=3210), 25.3 percent of those who were food secure in 1998 were classified as food insecure in 2001, while 43.7 percent of those classified as food insecure in 1998 were food secure in 2001. Multivariate logistic regression analyses indicated that the number of children under 18 years old in the household, income, and physical and mental health status were the most consistent predictors of transitions into and out of food security over time. Among women who were food secure in 1998, the odds of transitioning to food insecurity were increased among those who: had more minor children in the household in 1998; those who had an increased number of minor children in the household over time; those with lower income in 1998; those with decreasing income over time; those with higher Center for Epidemiologic Studies Depression Scale (CES-D) scores in 1998; those with increasing depression over time; those with worse self-reported health; and those with worsening self-reported health status over time.

Among women who were food insecure in 1998, the odds of transitioning to food security in 2001 were lower among those who had a larger number of minor children in their households over time, those with decreasing income over time, those with higher CES-D scores in 1998, those with increasing depression scale scores over time, those with worse self-reported health status in 1998, and those with worsening health status over time.

In the qualitative sample (N=36), a strong correlation emerged between depression and food insecurity: 72.7 percent of those who scored low on the depression scale were food secure in 2000 and 2001 compared to 21.4 percent of those who scored high on the depression scale. Stated otherwise, nearly 80 percent of the women who scored high on depression in 1999 experienced food insecurity in either 2000 or 2001 or at both later points in time.

Inductive analyses of the qualitative interviews provide some clues that help understand the link between depression and physical health problems and food insecurity. These data indicate that low-income women generally used multiple strategies to prevent or reduce food hardships for their families. The qualitative data also indicate that food-secure women tended to have better employment and income outcomes than the food-insecure women. They also tended to be less socially isolated.

Given the strong correlation between depression and food insecurity in this sample, and other evidence that physical and mental health problems are barriers to employment, one implication of these results is that the women in the qualitative sample who were more depressed may have been less able to obtain and maintain good jobs and less able to maintain the social connections that would allow them to rely on family and friends for food resources. Women who were depressed or had health problems may also have been less able to engage in the various strategies necessary to achieve food security with extremely constrained resources.

Taken together, these mixed-methods results suggest that depression and/or health problems may interfere with the time- and labor-intensive strategies many women employ to maintain adequate food for their families. These results also suggest that access to economic and social resources contributes to food insecurity among these low-income women. Depression and other

health problems are often thought of as barriers to employment. To the extent that they compromise women's ability to pursue public or community-based food resources or maintain ties with family that would allow them to access assistance, depression or other health problems might also be conceptualized as barriers to food security.

Recent research documenting an association between food insufficiency and mental and physical health outcomes among a sample of initially welfare-reliant women suggested that more research could help better understand the relationship between household food insufficiency and the nutritional status of household members, along with the immediate and long-term consequences of nutritional deprivation on physical and mental health. The mixed-methods results in this study suggest that the relationship may work in the opposite direction as well: mental and physical health problems may be barriers to food security for low-income women because such problems impede their ability to engage in the range of activities necessary to achieve or maintain food security.

Food Stamp and WIC Take-Up and the Relationship between Take-Up and TANF Recidivism Among Illinois TANF Leavers: Understanding the Food Stamp Program Participation Decisions of the Working Poor

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Food assistance programs are an integral component of the public assistance safety net for the working poor, but not all families use these programs when eligible. A body of research indicates that nonparticipation in both the Food Stamp Program (FSP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is substantial. Less is known, however, about the interaction of FSP and WIC participation, and the relationship between multiple program participation and the self-sufficiency pathways of families.

This paper begins to fill that gap by focusing on a group of Temporary Assistance to Needy Families (TANF) leavers with children under age 5 (ages 0-4)—a group that includes many persons eligible for both FSP and WIC at TANF exit. The paper uses linked individual-level longitudinal administrative data from the Illinois Integrated Database (IDB) to examine how participation in one of these programs is correlated with the decision to participate in the other, and to explore how participation is correlated with TANF recidivism. A series of new TANF entry cohorts is followed from the time of entry between 1995 and 1997 over time through December 2001. For those who exit TANF, the Unemployment Insurance (UI) wage records are used to estimate income eligibility for the FSP (130 percent of Federal poverty level) and WIC (185 percent of Federal poverty level). Using FSP and WIC administrative data records, the research distinguishes between those who are income eligible and take up services (program participants) from those who are eligible but do not take up services (nonparticipants). TANF records are then examined to determine how TANF recidivism varies across these groups.

Two broad conclusions emerge. The first conclusion is that the primary predictors of FSP participation by eligible people—that is, characteristics associated with poverty—do not hold for WIC program participation. Greater FSP take-up is associated with being unmarried, having a long history of TANF receipt, having poor work histories, and lack of a high school diploma. These results mirror those found in the FSP literature and

offer considerable support for the simple model that those who stand to benefit the most choose to participate. By contrast, WIC program take-up is not clearly related to income alone. WIC also considers nutritional risk, with the value of the benefit package based on recipient characteristics, including pregnant woman, infant, and eligible children. If anything, the more economically advantaged use the WIC program more. This may reflect the fact that in Illinois families with income even above 185 percent of poverty may be eligible for Medicaid and thus WIC.

Second, the relationship between food assistance participation and TANF recidivism also differs significantly. FSP participation is correlated with more rapid return to TANF, whereas the effects of WIC take-up are smaller. And, for those who delay WIC participation, there is a reduction in the rate of return to TANF.

This work is informative for several reasons. First, it furthers understanding of the distributional consequences of FSP and WIC for individuals in families with earnings in Illinois. The results for FSP show that it is disportionately those who are better off by any of several measures who choose not to participate. Second, the study begins to to fill an important research gap on the role of food assistance programs in welfare trajectories of families with very young children. Given time limits on welfare receipt, it is critical for those exiting TANF to avoid rapid recidivism—the return to the welfare rolls after a short-term spell of employment.

Food Security Status of Nonprofit Food Assistance Recipients in Selected Southern States

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Recent indirect evidence indicates there may be an increase in the demand for food from nonprofit food assistance agencies such as food banks, soup kitchens, shelters, and other programs. ERS research indicates that 89 percent of U.S. households were food secure in 2002, while 11 percent were food insecure at least some time during that year. The prevalence of food insecurity rose from 10.7 percent in 2001 to 11.1 percent in 2002, while the prevalence of food insecurity with hunger increased from 3.3 percent to 3.5 percent.

The rural South presents a unique opportunity to better understand the food security status of clients served by nonprofit food assistance agencies and its social consequences. Previous research has shown that hunger is more common in the South and the West than in other regions. Therefore, research in the South can help assess the role of nonprofit food assistance agencies in meeting the food needs of the local population and in improving the social well-being of their clients.

The study objective was to assess the food security status of families who use nonprofit food assistance agencies in selected Southern states. In addition, urban and rural differences in food security and household socio-demographic characteristics were examined. The study data were generated from a random sample of 606 clients of nonprofit food assistance agencies in the selected States.

The results indicate that most of the users were moderately or severely food insecure with hunger. However, a majority of the clients were not utilizing the Food Stamp Program even though their use of nonprofit food assistance agencies may indicate income-eligibility for the program. To address food insecurity among low-income households, policies could be promoted to encourage nonprofit food assistance agencies to assist in identifying needy and food stamp-qualified families, and to encourage these families to apply for food stamp benefits. These policies could greatly enhance the efforts of food stamp agencies in their quest to mitigate hunger and food insecurity among low-income households.