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May 2013

Food Insecurity in Households With Children

Prevalence, Severity, and Household Characteristics, 2010-11

Alisha Coleman-Jensen
William McFall
Mark Nord





United States Department of Agriculture

Economic Research Service

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Food Insecurity in Households With Children

Prevalence, Severity, and Household Characteristics, 2010-11

Alisha Coleman-Jensen, acjensen@ers.usda.gov
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Abstract

An estimated 79 percent of households with children were food secure throughout the year in 2011, meaning that all the household members had consistent access to adequate food for active, healthy lives. The remainder (nearly 21 percent) were food insecure at some time during the year, including 10 percent in which children were food insecure and 1 percent in which one or more children experienced very low food security—the most severe food-insecure condition measured by USDA. In this latter 1 percent of households, caregivers reported that children were hungry, skipped a meal, or did not eat for a whole day because there was not enough money for food. A range of studies suggest that children in food-insecure households face higher risks of problematic health and development outcomes than children in otherwise similar food-secure households. The present study shows that in 2010-11, 75 percent of households with food-insecure children had one or more adults in the labor force, including 60 percent with a full-time worker. More than half of households with food-insecure children included an adult with education beyond high school, including 15 percent with an adult who held a 4-year college degree. Federal food and nutrition assistance programs provided benefits to 84 percent of low-income food-insecure households with children in 2010-11.

Keywords: food security, food insecurity, hunger, children, SNAP, Supplemental Nutrition Assistance Program, Special Supplemental Nutrition Program for Women, Infants, and Children, WIC, National School Lunch and School Breakfast Programs

About the Authors

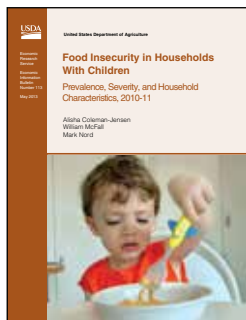
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Alisha Coleman-Jensen, William McFall, and Mark Nord

What Is the Issue?

Most U.S. households with children have consistent, dependable access to adequate food for active, healthy living for both adults and children—they are food secure. However, 21 percent of households with children were food insecure at times during the year in 2011, and in some of those households, children as well as adults were food insecure. The U.S. Department of Agriculture (USDA) monitors the extent and severity of food insecurity in U.S. households through an annual, nationally representative survey, with special attention to households with children.

Food security is especially important for children because their nutrition affects not only their current health, but also their physical, mental, and social development—and thus their future health and well-being. Previous studies suggest that children living in food-insecure households face elevated risks of many problematic health and development outcomes, compared with children in otherwise similar food-secure households. USDA's domestic food and nutrition assistance programs improve children's food security by providing low-income households with access to a healthful diet and nutrition education. Knowledge about the extent of food insecurity in households with children and the household characteristics associated with food insecurity contributes to the effective operation of these and other programs that support the well-being of children. This report describes the extent and severity of food insecurity in households with children in 2011, food security trends since 1999, and characteristics of households affected by food insecurity in 2010 and 2011. A previous ERS report described the characteristics of food-insecure households with children as of 2007.

What Did the Study Find?

The ERS report *Household Food Security in the United States in 2011* (September 2012) indicated that 79 percent of households with children were food secure throughout the year, meaning they had consistent access to adequate food for active, healthy lives for all household members. The remaining nearly 21 percent of households with children were food insecure at some time during the year. In about half of those households, only adults were food insecure, but in 10 percent of all households with children, one or more of the children also were food insecure at some time during the year. In 1.0 percent of households with children, one or more child experienced the most severe food-insecure condition monitored by USDA—very low food security. In households with very low food security among children, caregivers had reported that children were hungry, skipped a meal, or did not eat for a whole day because there was not enough money for food.

This study, focusing on households with children age 0-17, averaged 2 years of data (2010-11) and found that in households headed by an unemployed adult, the prevalence of food insecurity among children was three and a half times as high as in households headed by one or more adult employed

full-time. However, three-quarters of households with food-insecure children had one or more adult in the labor force, either full time (60 percent) or part time (15 percent).

- For households headed by an adult with less than a high school diploma, the prevalence of food insecurity among children was six and a half times as high as for households headed by an adult with at least a 4-year college degree.
- Children were food insecure in about 20 percent of households that included an adult who was out of the labor force because of disability, compared with about 9 percent of households in which no working-age adult had a disability.
- Federal food and nutrition assistance programs provided benefits to 84 percent of low-income households with food-insecure children (low-income households are those with incomes below 185 percent of the Federal poverty line).
- Children in about 70 percent of low-income households with food-insecure children received free or reduced-price school meals in 2010-11, about 42 percent of low-income households with food-insecure children received Supplemental Nutrition Assistance Program (SNAP) benefits, and about 25 percent received Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) benefits. Many households received assistance from multiple programs, although about 31 percent reported receiving only free or reduced-price school meals.
- Low-income households not receiving assistance from any of the programs were less likely to be food insecure (12 percent) than those that did receive assistance (approximately 23-30 percent, depending on the mix of programs). This difference suggests that low-income households with greater food security are less likely to choose to participate in food assistance programs.
- Food insecurity among children was more likely for households that had left SNAP during the previous year than for those currently receiving benefits. This finding suggests that some households left the program even though their economic resources were not yet adequate to meet their food needs.

How Was the Study Conducted?

Data for the study came from annual food security surveys sponsored by USDA's Economic Research Service and conducted by the Department of Commerce's U.S. Census Bureau as supplements to the monthly Current Population Survey. The survey respondents were representative samples of the U.S. civilian noninstitutionalized population and included 13,000-18,000 households with children each year. The food security survey asked one adult respondent in each household a series of questions about experiences and behaviors that indicate food insecurity. The food security status of the household was assessed based on the number of food-insecure conditions reported (such as being unable to afford balanced meals, cutting the size of meals because there was too little money for food, or being hungry because there was too little money for food). The food security status of children in the household was assessed by responses to a subset of questions about the conditions and experiences of children in the household. Survey respondents also reported whether, and to what extent, they used food and nutrition assistance programs. Peer-reviewed studies on those topics by other researchers were reviewed and summarized to provide information on how children's health and development may be affected by food insecurity.

Introduction

Food security—access at all times to enough food for an active, healthy life—provides an important foundation for good nutrition and health. Food security is especially important for children because the nutritional content of their diets affects not only their current health, but also their physical, mental, and social development—and thus, their future health and well-being.

USDA provides annual statistics on the food security of U.S. households, including summary statistics on households with children by demographic characteristics and income (Coleman-Jensen et al., 2012). This report gives additional detailed information on the food security of households with children in 2010-11 and presents a breakdown by household characteristics, such as the employment, education, and disability status of adults in the household. Food security statistics are also provided for households with children using various Federal food and nutrition assistance programs. Our findings update those from a previous report on food insecurity in households with children as of 2007 (Nord, 2009). Differences across groups and changes from the previous report are mentioned in the text only if they are statistically significant at the 90-percent confidence level. All household statistics in this report refer to households with children age 0-17.

In fiscal year (FY) 2011, USDA spent about \$103.8 billion on domestic food and nutrition assistance programs to ensure access to nutritious, healthful diets for all Americans (Oliveira, 2013). Children make up the largest share of the beneficiaries of those programs. Almost half of the beneficiaries of the largest program—the Supplemental Nutrition Assistance Program (SNAP, formerly called the Food Stamp Program)—are children younger than age 18. The second and third largest programs—the National School Lunch Program (NSLP) and the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)—focus primarily on children. Understanding the extent of food insecurity in households with children and characteristics associated with food insecurity contributes to the effective operation of these and other programs that support the well-being of children.

Food Security and Insecurity: Concepts and 2011 National Statistics

Food insecurity—the lack of consistent access to adequate food—is an economic and social condition that may result in hunger (a physiological condition) if it is severe or prolonged. USDA differentiates food-insecure households by the severity of food insecurity they have experienced (see box, “About the Data,” p. 4). Food insecurity in households with children is differentiated further by whether it affects only adults or also affects children and by the severity of food insecurity among the children.

In 2011, 85.1 percent of all U.S. households were *food secure* throughout the year. The remaining 14.9 percent of all households (17.9 million households) were *food insecure* at some time during the year. The prevalence of food insecurity was lower for households with no children under age 18 than for households with children. In 2011, 12.2 percent of households with no children under age 18 (9.9 million households) were *food insecure* at some time during the year (Coleman-Jensen et al., 2012).

In 2011, 79.4 percent of households with children (30.8 million households) were *food secure* throughout the year (fig. 1). The remaining 20.6 percent of households with children (8.0 million households) were *food insecure* at some time during the year.

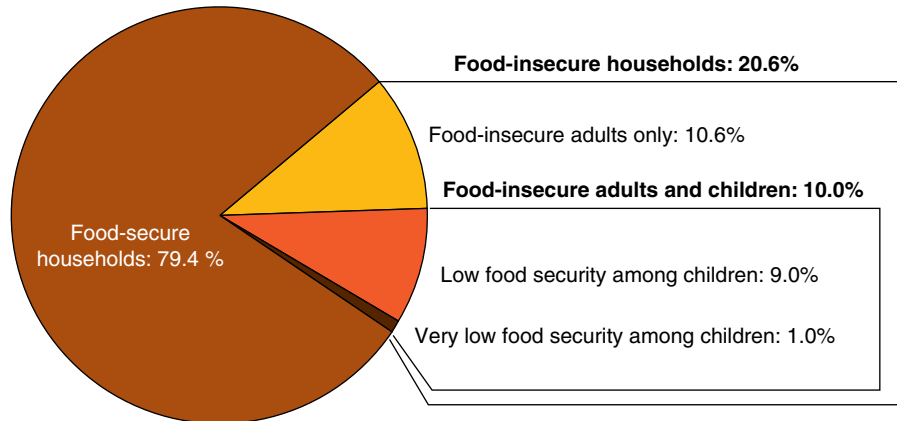
Parents often are able to maintain normal or near-normal diets and meal patterns for their children, even when the parents themselves are food insecure. In about half of food-insecure households with children in 2011, only adults were food insecure; in the rest, children were also food insecure. Thus, in 10 percent of all households with children (3.9 million households), children were sometimes food insecure. USDA refers to these households as having *food insecurity among children*.

In 1.0 percent of households with children (374,000 households), food insecurity among children was so severe that caregivers reported that children were hungry, skipped a meal, or did not eat for a whole day because there was not enough money for food. USDA describes these households as having *very low food security* among children.

Figure 1

Food security status of households with children, 2011

Adults, children, or both were food insecure at some time during the year in 20.6 percent of households with children. In 10.0 percent of households with children, children were food insecure (with either low or very low food security) at some time during the year.



Source: USDA, Economic Research Service calculations based on data from the December 2011 Current Population Survey Food Security Supplement.

About the Data

Data for this study came from annual food security surveys sponsored by USDA and conducted by the U.S. Census Bureau from 1999 to 2011 as supplements to the monthly Current Population Survey (CPS). The surveys were of representative samples of the U.S. civilian population and included between 13,000 and 18,000 households with children each year. The survey was conducted both by telephone and in person so that households with no telephone would not be underrepresented. The food security survey asked one adult respondent in each household a series of questions about experiences and behaviors that indicate food insecurity. The food security status of the household was assessed based on the number of food-insecure conditions reported (such as being unable to afford balanced meals, cutting the size of meals because there was too little money for food, or being hungry because there was too little money for food). The food security questions from the survey are presented in the box on page 6. The food security status of children in the household was assessed by responses to a subset of questions about the conditions and experiences of children. Survey respondents also reported whether they had used various Federal food and nutrition assistance programs.

Household characteristics (other than food security and receipt of food and nutrition assistance) were calculated from data collected in the labor force section of the CPS. The core CPS collects data on household composition, household income, demographic information for each household member, disability status, and employment information for all persons age 15 and older.

Weighting factors were calculated by the U.S. Census Bureau so that, when properly weighted, responses to the food security questions were representative at State and national levels. All statistics in this report were calculated by applying the appropriate weights to responses of the surveyed households to obtain nationally representative prevalence estimates.

Limitations of the Data

Some limitations to the data exist that may affect estimates of food insecurity. The CPS selects households to interview from a list of addresses and does not include homeless individuals or families. The omission of homeless persons may bias food insecurity and very low food security estimates downward. With regard to food insecurity among children, in particular, parents or caregivers may be embarrassed or afraid to report that their children are not getting enough to eat, so food insecurity among children may be underreported. Additionally, parents may believe that they have protected their children from experiencing food insecurity, but older children may have reduced their own food intake in response to household food insecurity without their parents' knowledge. The extent of bias related to homelessness and misreports of children's food insecurity is unknown.

Food-Insecure Households With Children: Severity of Food Insecurity

The severity of food access problems in each category of food insecurity can be gauged by the specific conditions reported by households in that category. The food security status of households with children is assessed by adult responses to a series of 18 questions about conditions and behaviors that typically occur in households when they have difficulty meeting their food needs (see box, “Questions Used To Assess the Food Security of Households in USDA’s Annual Food Security Survey,” p. 6). Households reporting three or more indicators of food insecurity in response to any of the 18 questions are classified as food insecure. In many of these households, only adults are food insecure.

The food security status of children is assessed by responses of an adult in the household to the eight questions about food-related conditions among children (questions 11-18; see box, “Questions Used To Assess the Food Security of Households in USDA’s Annual Food Security Survey,” p. 6). Households that report two or more food-insecure conditions among children are classified as having *food insecurity among children*. These households are classified further as having *low* or *very low food security among children*. Households reporting two to four conditions that indicate food insecurity among children are classified as having *low food security among children*.¹ Those reporting five or more conditions are classified as having *very low food security among children*. Figure 2 depicts the share of households in each food-insecure category that reported each of the eight indicators of food insecurity among children in the 2010 and 2011 food security surveys. (Two years of data were combined to provide more stable and reliable estimates.)

Food Insecurity Among Adults Only

Households with food insecurity among adults only are classified as food insecure, but report no food-insecure conditions among children or only one such condition. (Two or more indicators are required to classify the household as having food insecurity among children.) About 42 percent of households with food insecurity only among adults reported no indicators of food insecurity among children. The remaining households in this category (58 percent) reported one indicator of food insecurity among children. The majority of those reporting one indicator reported the least severe one (i.e., that they had relied on a few kinds of low-cost foods to feed the children because they were running out of money to buy food).

¹This specification of the threshold for low food security among children (reports of two or more food-insecure indicators) was adopted by USDA to be conceptually consistent with the corresponding threshold for adult/household food insecurity. For the adult and household scales, the threshold for food insecurity corresponds with the severity of not being able to afford balanced meals. For the child scale, the threshold corresponds with the severity of not being able to afford to feed children balanced meals. Low food security among children is identified in the Current Population Survey Food Security Supplement (CPS-FSS) data, beginning with December 2006 data, and USDA first published statistics on the category in 2009, using data from 2006-07 (Nord, 2009).

Questions Used To Assess the Food Security of Households in USDA's Annual Food Security Survey

1. "We worried whether our food would run out before we got money to buy more." Was that often, sometimes, or never true for you in the last 12 months?
2. "The food that we bought just didn't last and we didn't have money to get more." Was that often, sometimes, or never true for you in the last 12 months?
3. "We couldn't afford to eat balanced meals." Was that often, sometimes, or never true for you in the last 12 months?
4. In the last 12 months, did you or other adults in the household ever cut the size of your meals or skip meals because there wasn't enough money for food? (Yes/No)
5. (If yes to question 4) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
6. In the last 12 months, did you ever eat less than you felt you should because there wasn't enough money for food? (Yes/No)
7. In the last 12 months, were you ever hungry, but didn't eat, because there wasn't enough money for food? (Yes/No)
8. In the last 12 months, did you lose weight because there wasn't enough money for food? (Yes/No)
9. In the last 12 months, did you or other adults in your household ever not eat for a whole day because there wasn't enough money for food? (Yes/No)
10. (If yes to question 9) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?

(Questions 11-18 were asked only if the household included children ages 0-17)

11. "We relied on only a few kinds of low-cost food to feed our children because we were running out of money to buy food." Was that often, sometimes, or never true for you in the last 12 months?
12. "We couldn't feed our children a balanced meal, because we couldn't afford that." Was that often, sometimes, or never true for you in the last 12 months?
13. "The children were not eating enough because we just couldn't afford enough food." Was that often, sometimes, or never true for you in the last 12 months?
14. In the last 12 months, did you ever cut the size of any of the children's meals because there wasn't enough money for food? (Yes/No)
15. In the last 12 months, were the children ever hungry but you just couldn't afford more food? (Yes/No)
16. In the last 12 months, did any of the children ever skip a meal because there wasn't enough money for food? (Yes/No)
17. (If yes to question 16) How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
18. In the last 12 months, did any of the children ever not eat for a whole day because there wasn't enough money for food? (Yes/No)

Coding of Responses

Questions 1-3 and 11-13 are coded as affirmative (i.e., possibly indicating food insecurity) if the response is "often" or "sometimes." Questions 5, 10, and 17 are coded as affirmative if the response is "almost every month" or "some months but not every month." The remaining questions are coded as affirmative if the response is "yes."

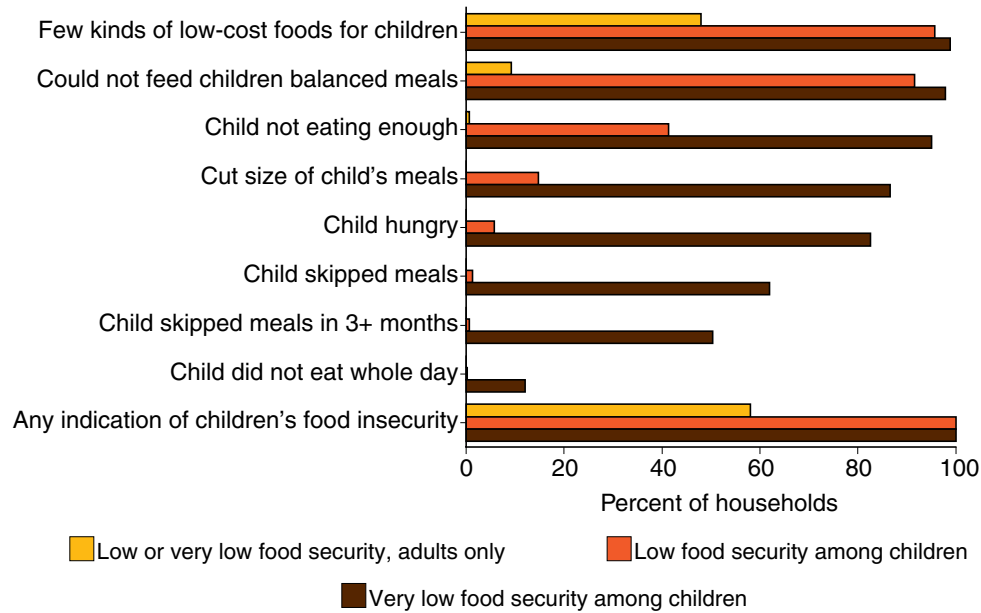
Assessing Food Security Status

Households are classified as food insecure if they report three or more indications of food insecurity in response to the entire set of 18 questions.

The food security status of children in the household is assessed by responses to the child-referenced questions (questions 11-18). Households reporting two or more of these conditions are classified as having food insecurity among children. Households reporting five or more are classified as having very low food security among children.

Figure 2

Reported conditions in food-insecure households with children, by food security status, 2010-11 average



Note: See the box on the food security survey questions for complete wording of the questions.
 Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

Low Food Security Among Children

Households with low (but not very low) food security among children mainly reported reductions in the quality and variety of children's meals. About half of these households reported some reduction in the amount of food children ate, but only 5 percent reported more than a single indicator of reduced food intake.

Very Low Food Security Among Children

Very low food security among children is a severe range of food insecurity identified by caregivers who report five or more food-insecure conditions among children. Taken together, these reports indicate that children are not getting enough to eat. Households with very low food security among children all reported multiple indicators of reduced food intake. Almost 83 percent reported that at some time during the year a child had been hungry, but the household just could not afford more food (and also reported four other indicators of food-insecure conditions among children). Those households that did not report that a child had been hungry reported that either a child had skipped a meal or had not eaten for a whole day because there was not enough money for food.

Food Insecurity and Childhood Hunger

Statistics on food insecurity among children provide important information about the social and economic context in which childhood hunger may occur, but they do not indicate directly the extent of hunger. Although hunger is related to food insecurity, it is a different phenomenon. Food insecurity is a household-level economic and social condition of limited access to food, while hunger is an individual-level physiological condition that may result from food insecurity (National Research Council, 2006). Thus, hunger is a potential, although not inevitable, outcome of food insecurity.

Specific information about the incidence of hunger would be of considerable interest to advocates, policymakers, and researchers and might be of value for policy and program design. USDA's nutrition assistance programs are intended, in part, to prevent or alleviate hunger. But providing precise and useful statistics about hunger has been hampered by lack of a consistent definition of the word and a validated method for measuring it. "Hunger" is variously understood to refer to conditions across a broad range of severity, from relatively mild food insecurity to prolonged clinical undernutrition (Nord et al., 2009; National Research Council, 2006).

The National Academies' Committee on National Statistics (CNSTAT) provided authoritative guidance on the definition and concept of hunger in official statistics in 2006. An independent panel of experts convened by CNSTAT concluded that in official statistics, resource-constrained hunger (i.e., physiological hunger resulting from food insecurity) "...should refer to a potential consequence of food insecurity that, because of prolonged, involuntary lack of food, results in discomfort, illness, weakness, or pain that goes beyond the usual uneasy sensation" (National Research Council, 2006, p. 48).

Validated methods have not yet been developed to measure the prevalence of resource-constrained hunger in this sense. Such measurement would require the collection of more detailed and extensive information on physiological experiences of individual household members than is available currently in nationally representative survey data.

Emerging Research on Children's Knowledge of and Experiences With Food Insecurity

USDA's measure of food insecurity among children relies on parental reports of food insecurity among children. Parents or caregivers are assumed to be knowledgeable about the food experiences of their children. Recent research has examined this assumption. Two studies investigated the food insecurity experiences of children, primarily adolescents, and compared children's reports of food insecurity with caregivers' reports of children's food insecurity. Both qualitative interview data (Fram et al., 2011) and quantitative survey data (Nord and Hanson, 2012) indicate that parents' reports of a child's food insecurity do not always correspond with the child's own reports.

Qualitative research on children ages 9-16 indicates that some youth take active roles in trying to reduce household food insecurity, sometimes without their parents' knowledge (Fram et al., 2011). Children reported strategies for reducing household food insecurity that included not asking for snacks, not eating between mealtimes, and trying to earn money for food. In some households, parents tried to hide household food insecurity and believed that they successfully shielded their children from food insecurity, but children were aware of the household's food insecurity and worried about a shortage of food; in some cases, children reported reducing their own food intake when they knew food was running low. That study did not administer the full household food security survey to adults and children, so it is unclear whether parents and children would have differed in their survey reports of food insecurity among children. The study did conclude that, at times, parents were unaware of the degree to which their children knew about household food insecurity and the degree to which children reduced their own food intake or took other steps to try to reduce household food insecurity. Earlier research also indicated that children were aware of adult attempts to hide food insecurity or to shield them from food insecurity (Connell et al., 2005).

Quantitative survey data from the National Health and Nutrition Examination Survey (NHANES) were used to examine agreement between adult caregiver reports of adolescent food insecurity and the adolescents' (ages 15-17) own reports of food insecurity (Nord and Hanson, 2012). Adolescent self-reported food insecurity was more common than parental reports of adolescent food insecurity. The study also examined dietary quality differences among adolescents and found that dietary quality was lowest for adolescents with both self-reported food insecurity and parental-reported adolescent food insecurity. Dietary quality was highest for adolescents with neither self-reported nor parental-reported food insecurity. Dietary quality was intermediate for adolescents whose self-reported and parental-reported food insecurity differed. There were no systematic differences in dietary quality when adolescents' and caregivers' reports of adolescent food insecurity disagreed, making it difficult to determine which report corresponded most accurately with the child's dietary intake.

A second study using NHANES data found that youth ages 12-17 were considerably less likely to be food insecure than adults in the same household, based on self-reported personal food insecurity of both youth and adults (Nord, 2013). The extent

of the youth-adult gap in likelihood of self-reported food insecurity was greater when food insecurity was more severe. Depending on the method used to compare findings between that analysis and USDA's national food security statistics, the extent to which children are protected from food insecurity compared with adults in the same household was found to be somewhat greater or less than indicated by the national statistics, but any difference did not appear to be very large. However, even if national prevalence rates do not substantially misrepresent the extent of food insecurity among children, the extent of misreporting could substantially weaken associations of adult-reported food insecurity of children with children's health and developmental outcomes.

Associations Between Children’s Health/Development and Food Insecurity

A substantial and growing body of research has demonstrated associations between children’s health, development, and well-being and measures of food security and food sufficiency. Food sufficiency—a condition closely related to food security—was assessed in several Federal surveys before the development of the food security measures and was used in much of the earlier research on outcomes of inadequate food access.² Most of the associations studied in earlier research focused on household-level food insecurity (or food insufficiency), not specifically on food insecurity among children. Most of these studies used cross-sectional data, which makes causality difficult to determine. More recent studies have advanced the research through expanded use of longitudinal data and measures of food insecurity among children. A wide range of methodologies and datasets have been used, and most studies controlled for confounding conditions, such as income, employment status, race, and ethnicity. These study findings are consistent with the hypothesis that food insecurity is a risk factor for the problematic outcomes studied. In most of these studies, the higher rates of problematic health and development outcomes for children were associated with food insecurity at the household level, regardless of whether there was evidence of food insecurity among children in the household.

Findings of studies on child health and development outcomes associated with food insecurity and food insufficiency are summarized in Appendix A. Although most of the studies found statistically significant associations between food insecurity and various outcomes for children, some of the associations were not statistically significant, and these findings are also shown in Appendix A. Statistically significant findings included associations of food insecurity or food insufficiency with:

- Poorer health of children and adolescents, as reported by parents;
- Lower bone mineral content in adolescent boys;
- Impaired development of non-cognitive abilities (i.e., interpersonal relations, self-control) among school-age children;
- Iron deficiency anemia among young children and adolescents;
- Insecure attachment and less advanced mental proficiency in toddlers;
- Higher rates of developmental risk among young children;
- More stomach aches, frequent headaches, and colds among children;

²Prior to the development of the food security measures, the National Health and Nutrition Examination Survey (NHANES) and the Continuing Study of Food Intake by Individuals (CSFII) assessed the adequacy of households’ food access using a single question. Respondents were asked which of three statements best described the food eaten in their household:

- “We always have enough to eat.”
- “Sometimes we don’t have enough to eat.”
- “Often we don’t have enough to eat.”

Households were classified as food sufficient if they reported that they always had enough to eat and food insufficient if they reported that they sometimes or often did not have enough to eat.

- Higher hospitalization rates among young children;
- Behavioral problems among 3-year-old children;
- Lower physical function among children ages 3-8;
- Poorer psychosocial function and psychosocial development among school-age children;
- Higher rates of depressive disorder and suicidal symptoms among adolescents;
- More anxiety and depression among school-age children;
- Higher numbers of chronic health conditions among children;
- More “internalizing” behavior problems (such as withdrawal or anxiety) among children;
- Lower math achievement and math progress in kindergartners;
- Lower math and reading gains from kindergarten to third grade; and
- Lower arithmetic scores and higher likelihood of repeating a grade among children ages 6-11.

Findings for food insecurity and children’s weight status are less clear. Larson and Story (2011) conducted an extensive literature review of studies that analyzed this relationship and found that statistically significant findings were not in agreement. Additional research is needed to understand the reasons for these inconsistencies.

Trends in Food Insecurity in Households With Children, 1999-2011

The prevalence of food insecurity in households with children increased from 1999 through the recession in 2001 (fig. 3). It continued to increase during 2002-04 despite renewed economic growth and then declined in 2005, remaining around that level through 2007. The prevalence of food insecurity in households with children increased substantially with the 2008 recession. In 2009, food insecurity in households with children reached a historic peak since Federal food security monitoring began in 1995, at just over 21 percent. It declined in 2010 and was essentially unchanged in 2011. From 1999 to 2011, the trends of food insecurity among children were similar to those for food insecurity of all household members.

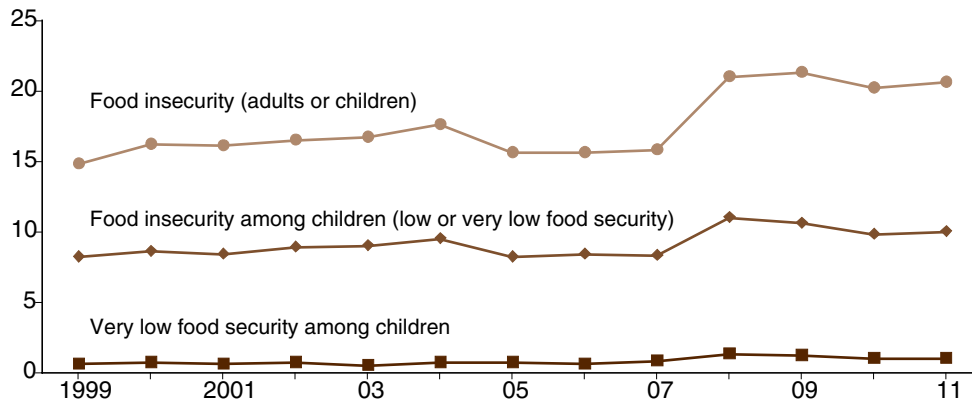
The prevalence of very low food security among children varied little from 1999 to 2006, fluctuating between 0.5 and 0.7 percent. This rate increased to 0.8 percent in 2007, rose to a high of 1.3 percent in 2008, and declined to 1.0 percent in 2010 and 2011.

USDA gives particular attention to food insecurity in households with children with annual household incomes less than 185 percent of the Federal poverty line, because these households may be eligible for food and nutrition assistance programs.³ The income cutoff for participation in reduced-price school meals and WIC is 185 percent of the Federal poverty line. School-age children in households in this income range are likely to be eligible for free or reduced-price school meals. Households in this income range may be eligible for WIC benefits if they include children under the age

Figure 3

Trends in food insecurity in households with children, 1999-2011

Percent of households



Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

³The Federal poverty line for a family of two adults and two children in 2011 was an annual income of \$22,811; 185 percent of the poverty line for that family was \$42,200.

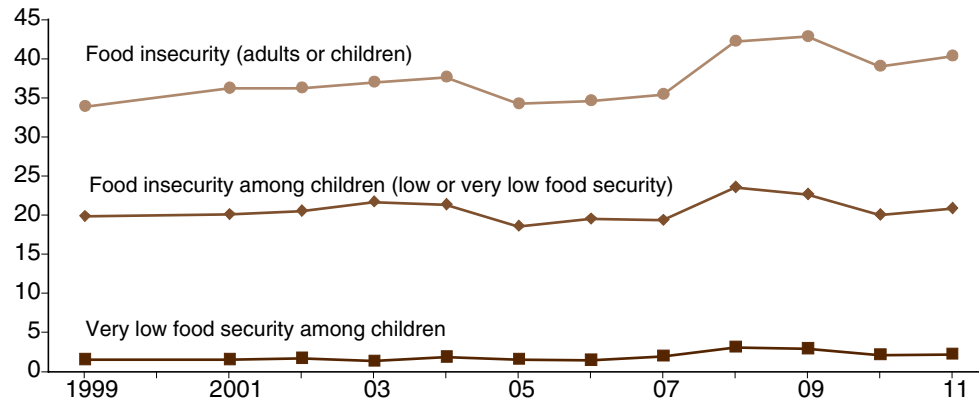
of 5 or pregnant/postpartum women. Households with incomes less than 130 percent of the Federal poverty line may be eligible for SNAP benefits.

The prevalence of food insecurity for households with annual incomes less than 185 percent of the Federal poverty line was almost twice as high (40 percent in 2011) as that for all households with children. Trends over 1999-2011 in low-income households were generally similar to those in all households with children (fig. 4).

Figure 4

Trends in food insecurity in households with children, with annual incomes less than 185 percent of the Federal poverty line, 1999-2011

Percent of households



Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

Food Insecurity Among Children in Selected Subpopulations, Average 2010-11

The economic and demographic circumstances of households determine their food security to a great extent. In this section, the prevalence and distribution of food insecurity among children is described across 10 sets of economic, demographic, and geographic characteristics that past research has found to be associated with food insecurity. Data for these analyses are from the December 2010 and December 2011 Current Population Survey Food Security Supplements. Data from 2 years were aggregated to provide more reliable estimates, especially for small subpopulations.

Three charts are presented for each set of household characteristics:

- **Bar chart:** depicts, for households with each characteristic (e.g., income level, disability status, etc.), the percentage of households with food-insecure children (households with food-insecure children include those with low and very low food security) and the percentage that had children with very low food security;
- **Pie chart 1:** shows the distribution of households with food insecurity among children across the characteristics; and
- **Pie chart 2:** shows the distribution of households with very low food security among children across the characteristics.

See Appendix B for the numbers underlying the graphic presentations in this section. The table in appendix B also includes statistics (not presented in the graphics) for the broader category of food insecurity that includes food insecurity among adults as well as children.

Household Income

Nearly 25 percent of households with annual incomes below the Federal poverty line had food insecurity among children in 2010-11 (fig. 5).⁴ They made up 44 percent of all households with food insecurity among children and about 52 percent of households with very low food security among children.⁵ The prevalence rate of food insecurity among children for households with annual incomes below the Federal poverty line was seven times that of households with annual incomes above 185 percent of the Federal poverty line.

Federal food and nutrition assistance programs may not be accessible to some households with food insecurity among children because their income exceeds the

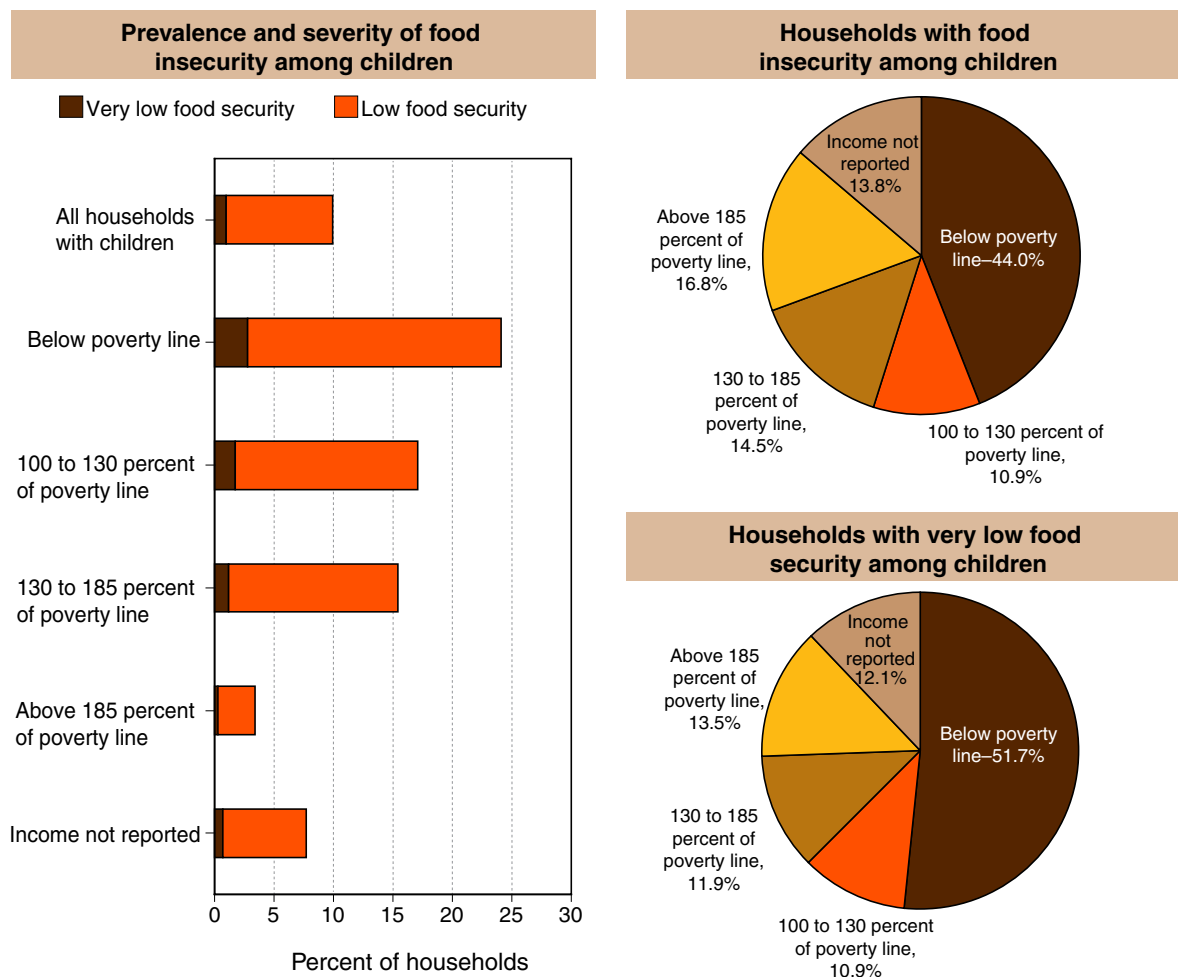
⁴In 2011, the poverty rate for children under age 18 was just under 22 percent (DeNavas-Walt et al., 2012). In 2011, the Federal poverty line was \$22,811 for a family of four with two adults and two children.

⁵These percentages may be higher, depending on the income of those households that did not report income.

eligibility threshold.⁶ Between 31 and 45 percent of households with food insecurity among children may not have been eligible for SNAP or for free school meals in 2010-11 because they had annual incomes higher than 130 percent of the poverty line—the income eligibility limit for these programs (the exact percentage of households ineligible for these programs cannot be determined because some households failed to report income). Some of these households may have been eligible for the programs because income eligibility is determined by monthly rather than annual income. Nevertheless, a large share of households with food insecurity among children likely was not eligible. Between 17 and 31 percent may not have been eligible for WIC or for reduced-price school lunches in 2010-11 because their incomes were above 185 percent of the poverty line, the income eligibility limit for these programs.

Figure 5

Prevalence and distribution of food insecurity among children, by annual household income, 2010-11 average



Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

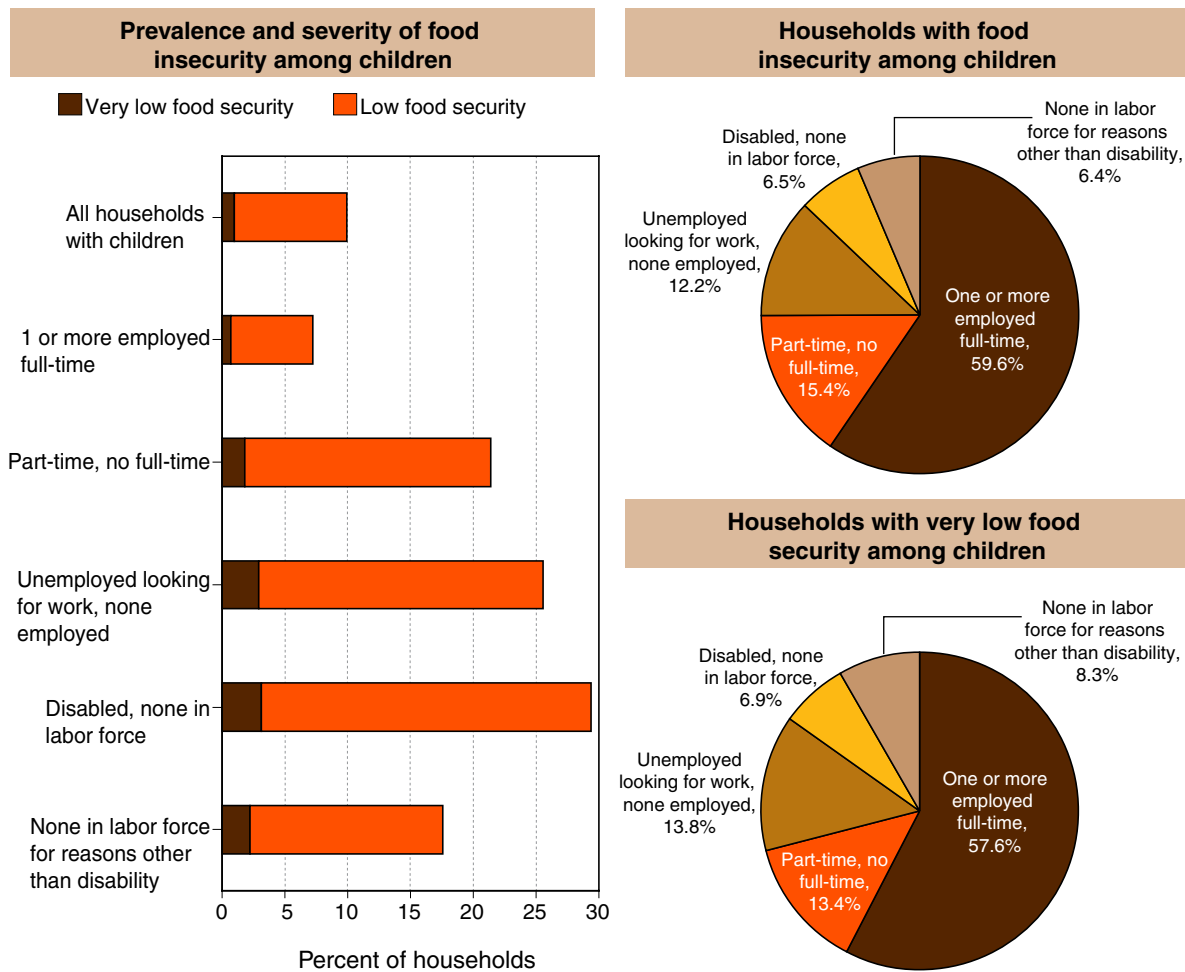
⁶Eligibility for Federal food and nutrition assistance programs is based on an income cutoff that differs across programs and other criteria that differ across States for some programs. Eligibility for programs is determined by current monthly income, whereas income reported here is annual income.

Employment and Labor Force Status of Adults in the Household

Rates of food insecurity among children were much higher for households with no employed adults (such as those with an unemployed adult and those with an adult who was unable to work due to disability) than for those with one or more adults employed full time (fig. 6). Rates also were higher for households in which an adult was employed only part-time than in those with an adult employed full-time. About 60 percent of households with food insecurity among children had one or more full-time workers in 2010-11, and another 15 percent had one or more part-time workers. Together, the unemployed and not-in-labor-force-due-to-disability categories comprised about 19 percent of households with food insecurity among children and 21 percent of households with very low food security among children. (The next section has additional information on households with adults with disabilities.)

Figure 6

Prevalence and distribution of food insecurity among children, by employment and labor force status of adults in the household, 2010-11 average¹



¹Households classified as none in labor force for reasons other than disability had no adults that were identified as not in labor force due to disability. Disability identified in this figure is related to labor force status only. Adults with other reported disabilities are shown in figure 7.

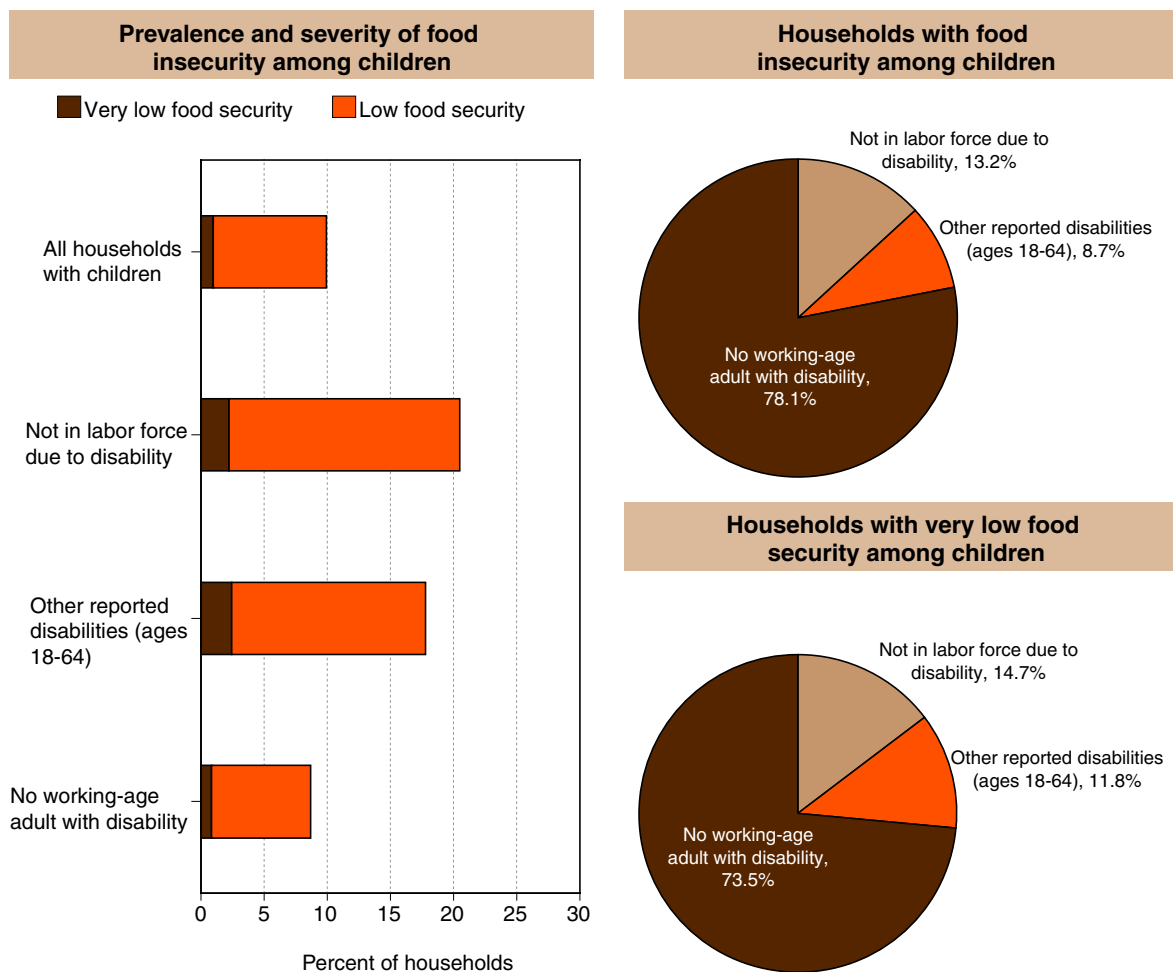
Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

Disability Status of Working-Age Adults in the Household

Food insecurity among children was more than twice as prevalent in households with an adult who was unable to work due to disability and in households with a working-age adult with other reported disabilities as in households with no working-age adult with a disability (fig. 7).⁷ An estimated 22 percent of households with food insecurity among children had a working-age adult member (ages 18-64) with a disability. About 27 percent of households with very low food security among children included a working-age adult with a disability.

Figure 7

Prevalence and distribution of food insecurity among children, by disability status of working-age adults in the household, 2010-11 average¹



¹Working-age adults with “other reported disabilities” were reported as having a vision, hearing, mental, physical, self-care, or going-outside-home disability but were not identified as being unable to work due to disability.

Source: USDA, Economic Research Service calculation based on Current Population Survey Food Security Supplement data.

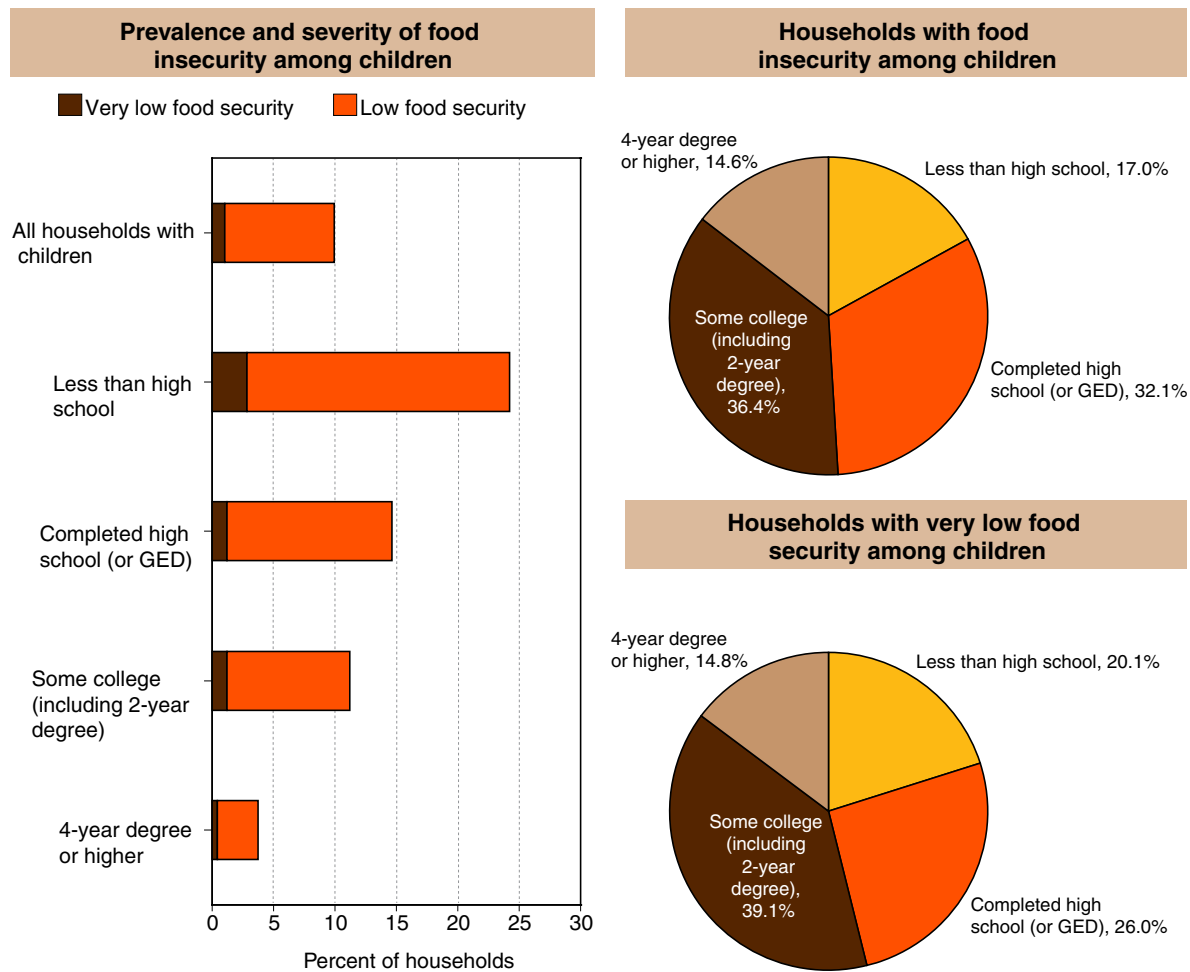
⁷Working-age adults with “other reported disabilities” were reported as having a vision, hearing, mental, physical, self-care, or going-outside-home disability but were not identified as being unable to work due to disability. For more detailed information on this classification, see Coleman-Jensen and Nord, 2013.

Educational Attainment of Adults in the Household

The prevalence of food insecurity among children is strongly associated with the education of adults in the household (fig. 8). Food insecurity was six and a half times as prevalent in households in which no adult had completed high school (24 percent) as in households where an adult had a 4-year college degree (almost 4 percent). In 49 percent of households with food insecurity among children and 46 percent of those with very low food security among children, no adult in the household had any education beyond high school.

Figure 8

Prevalence and distribution of food insecurity among children, by educational attainment of most educated adult in the household, 2010-11 average



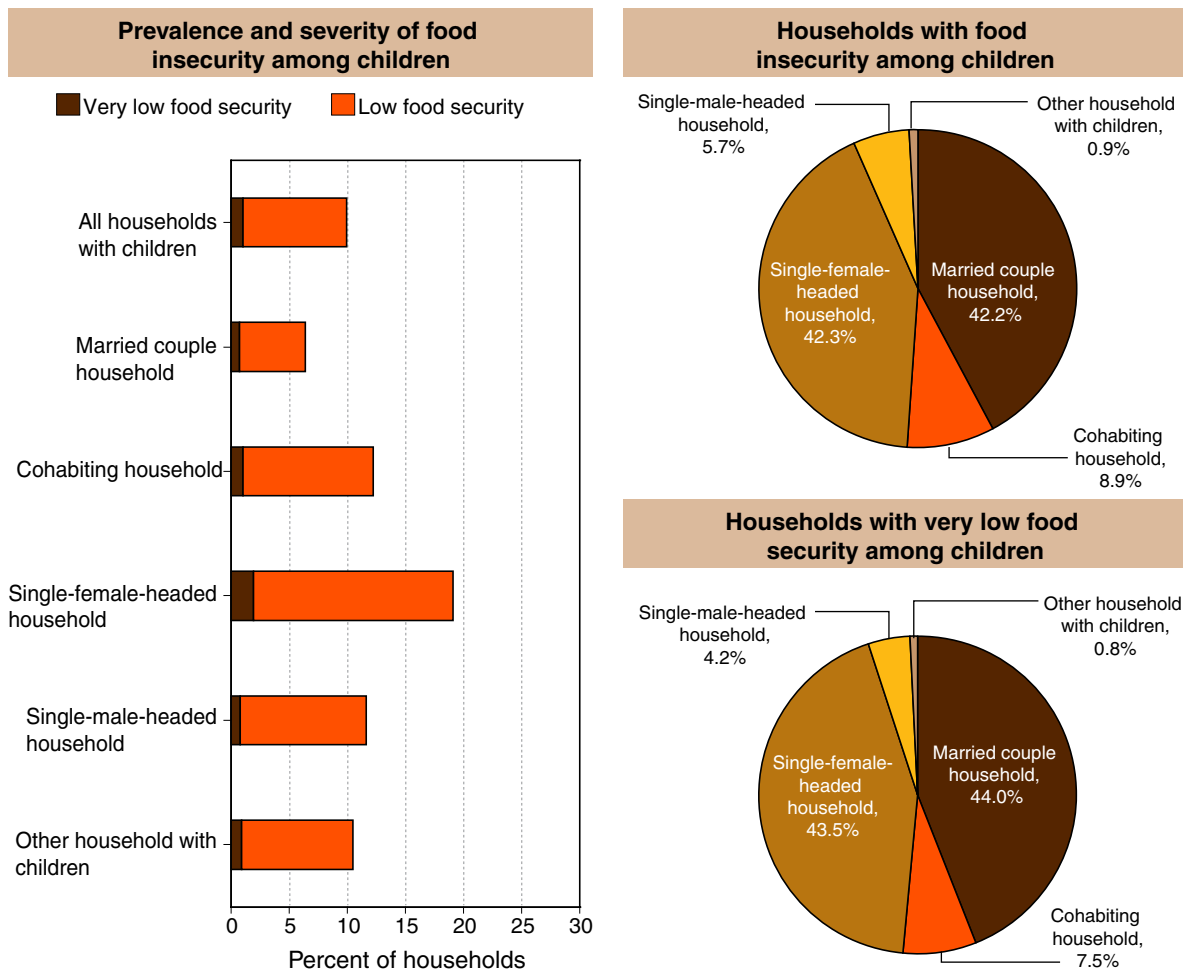
Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

Household Composition

Food insecurity among children was three times as prevalent in households headed by single women (19.2 percent) as in households headed by married couples (6.4 percent) (fig. 9). Children were food insecure in about 12 percent of households headed by unmarried cohabiting adults and in households headed by single men.⁸ In spite of the lower rate of food insecurity among children in married-couple households, primarily due to their larger share of the population overall, married-couple households were a sizable minority (42 percent) of households with food insecurity among children, about equal to the proportion of households with food insecurity among children that were headed by a single woman (42 percent).

Figure 9

Prevalence and distribution of food insecurity among children, by household composition, 2010-11 average



Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

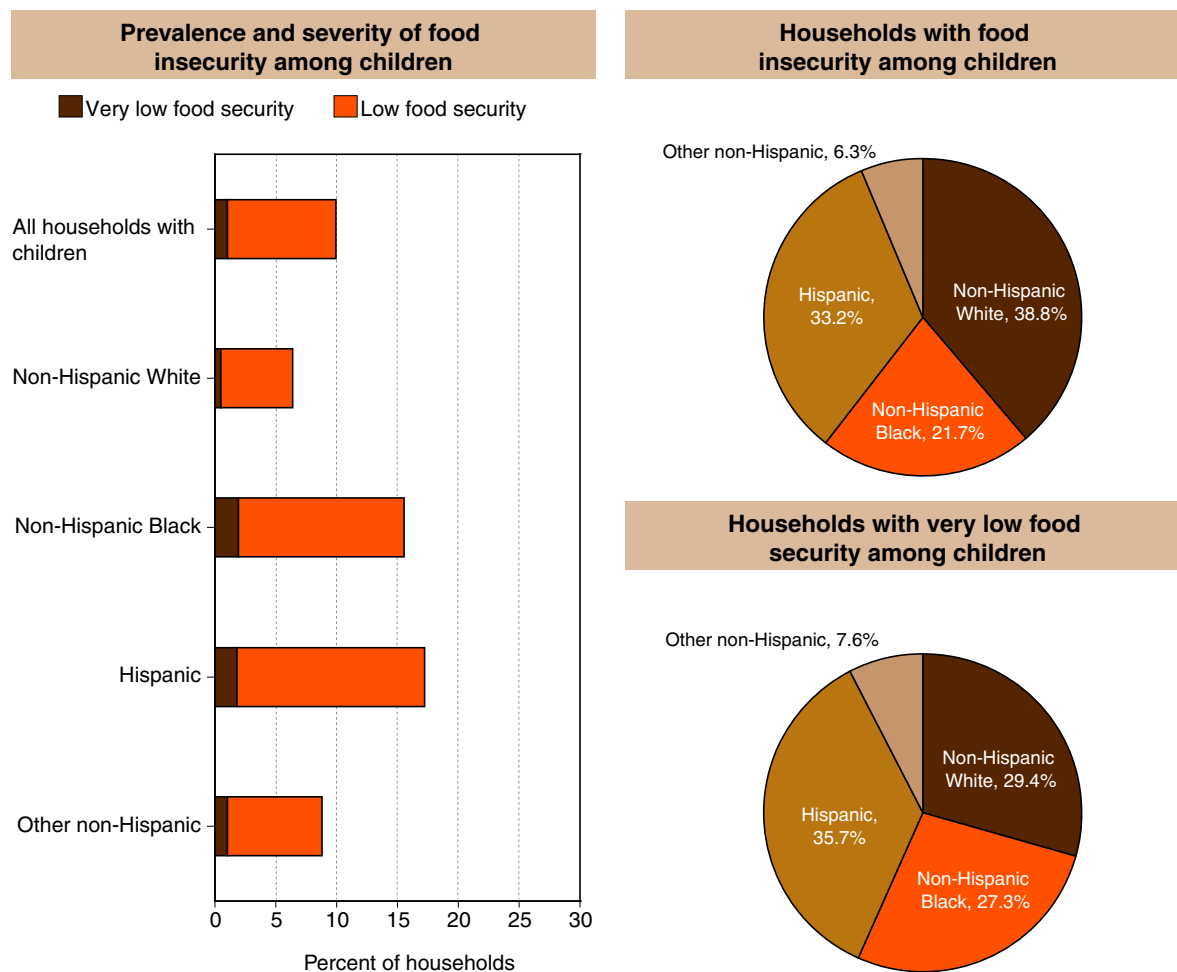
⁸This is the first ERS report to provide separate food security statistics for households with a cohabiting couple. The category comprises households in which an adult member was identified as an unmarried partner of the household reference person. In previous reports, these households were classified as single female-headed households, single male-headed households, or other households with children.

Race and Hispanic Ethnicity

Food insecurity among children was more than two and a half times as prevalent for households headed by non-Hispanic Black and Hispanic persons as for those headed by non-Hispanic Whites (fig. 10). Nevertheless, the highest percentage of households with food insecurity among children was headed by non-Hispanic Whites (about 39 percent) because of their larger share of the entire population. In the most severe category—households with very low food security among children—Hispanic households represented a larger share (about 36 percent) than any of the other race-ethnic groups in 2010-11.

Figure 10

Prevalence and distribution of food insecurity among children, by race and Hispanic ethnicity of household reference person, 2010-11 average



Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

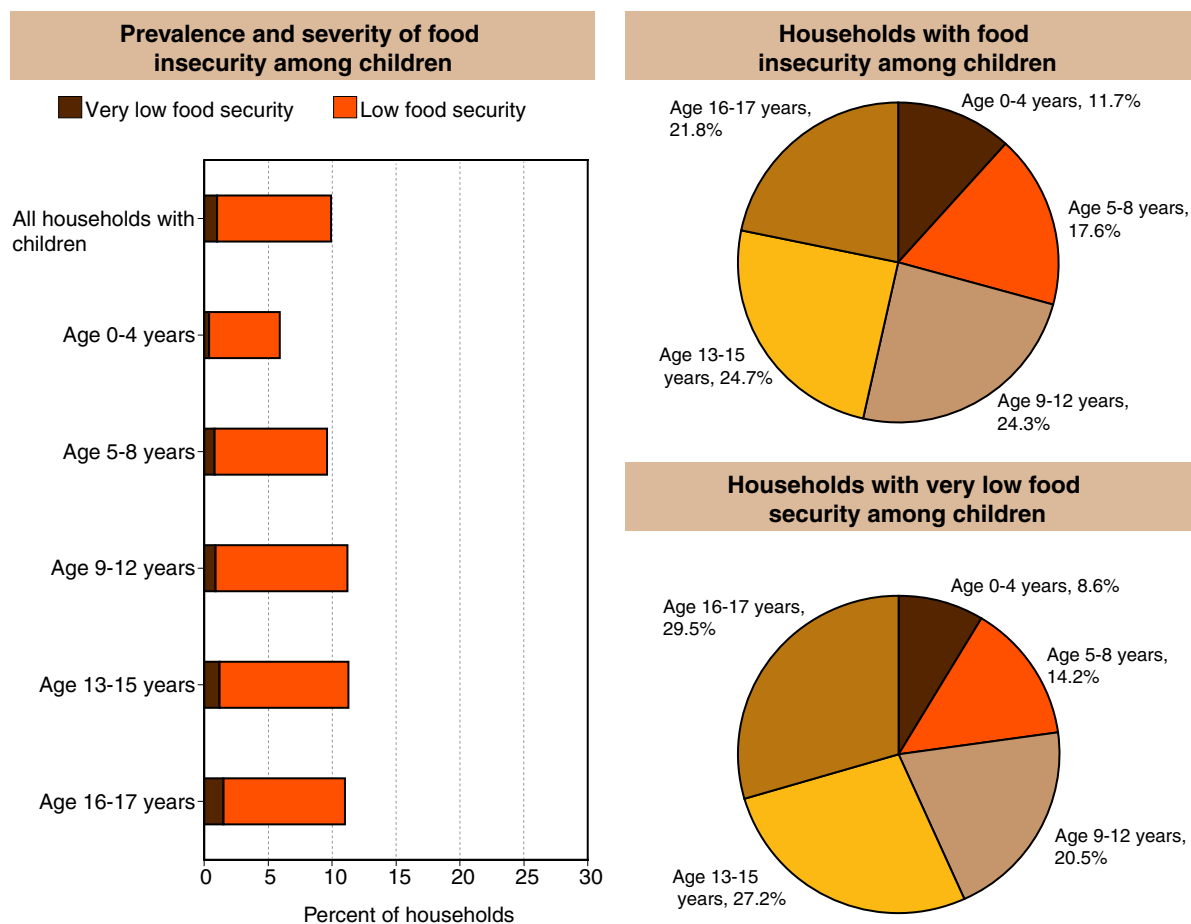
Age of Oldest Child

Most parents attempt to shield their children from the more severe effects of food insecurity, even though they may have to reduce their own food intake to do so. Only about one out of six households with very low food security among adults had very low food security among children (analysis not shown).

Younger children are shielded from food insecurity to a greater extent than older children. The food security survey does not collect information on the food security of each individual child in the household, but examining the prevalence of food insecurity among children by the age of the oldest child in the household sheds light on the greater protection afforded to younger children (fig. 11). For example, food insecurity among children was almost twice as prevalent in households with teenage children as in households in which the oldest child was no older than age 4. Very low food security among children was more than three times as prevalent in households with teenage children as in households in which the oldest child was no older than age 4.⁹

Figure 11

Prevalence and distribution of food insecurity among children, by age of oldest child in the household, 2010-11 average



Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security

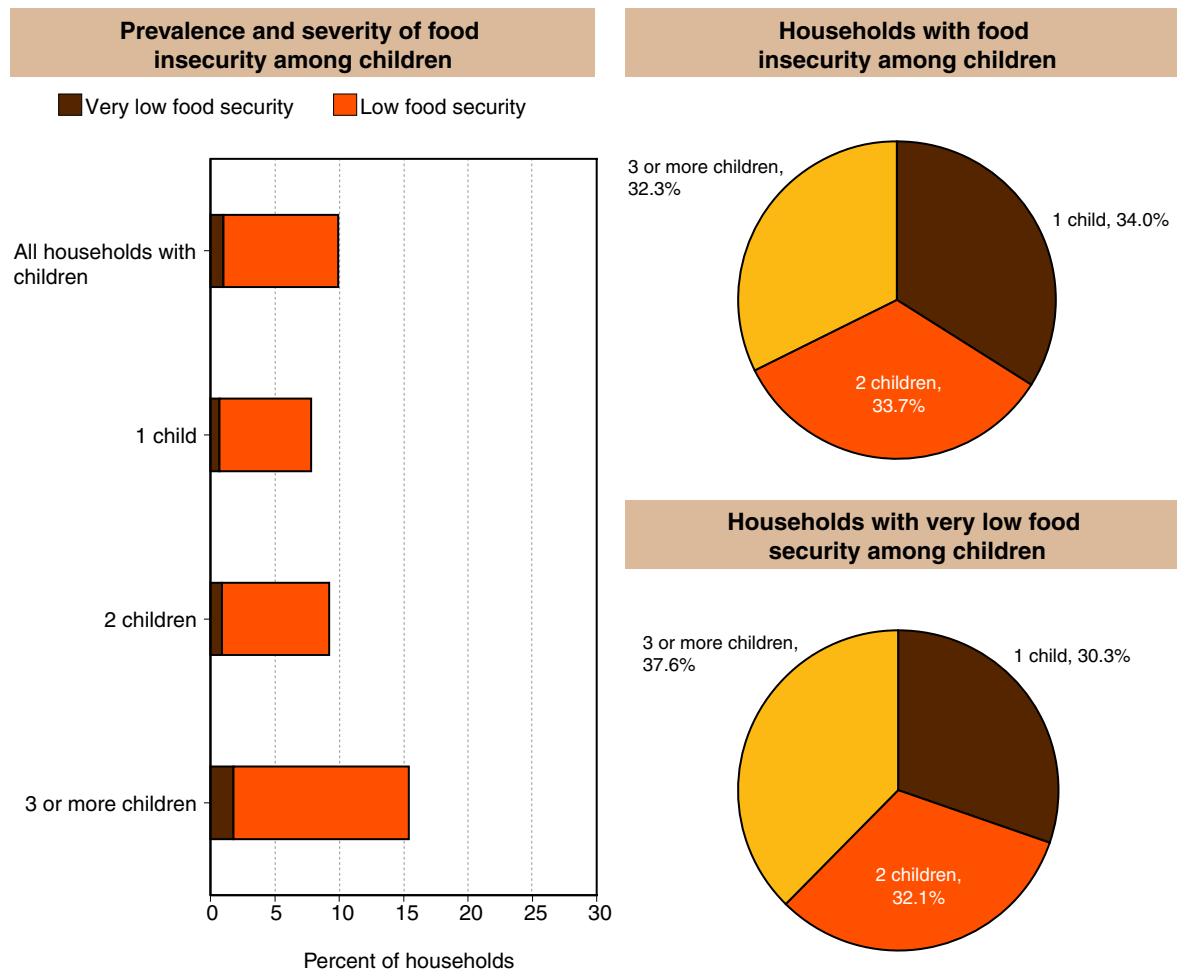
⁹Multivariate analysis (not shown) confirms that this association is largely independent of the number of children in the household and the greater food needs of older children.

Number of Children in the Household

Food insecurity among children was more prevalent in larger families, especially those with three or more children (fig. 12). The rates of food insecurity and very low food security among children were both twice as high in households with three or more children as in households with only one child. Households with food-insecure children were distributed about equally across households with one, two, and three or more children.

Figure 12

Prevalence and distribution of food insecurity among children, by number of children in the household, 2010-11 average



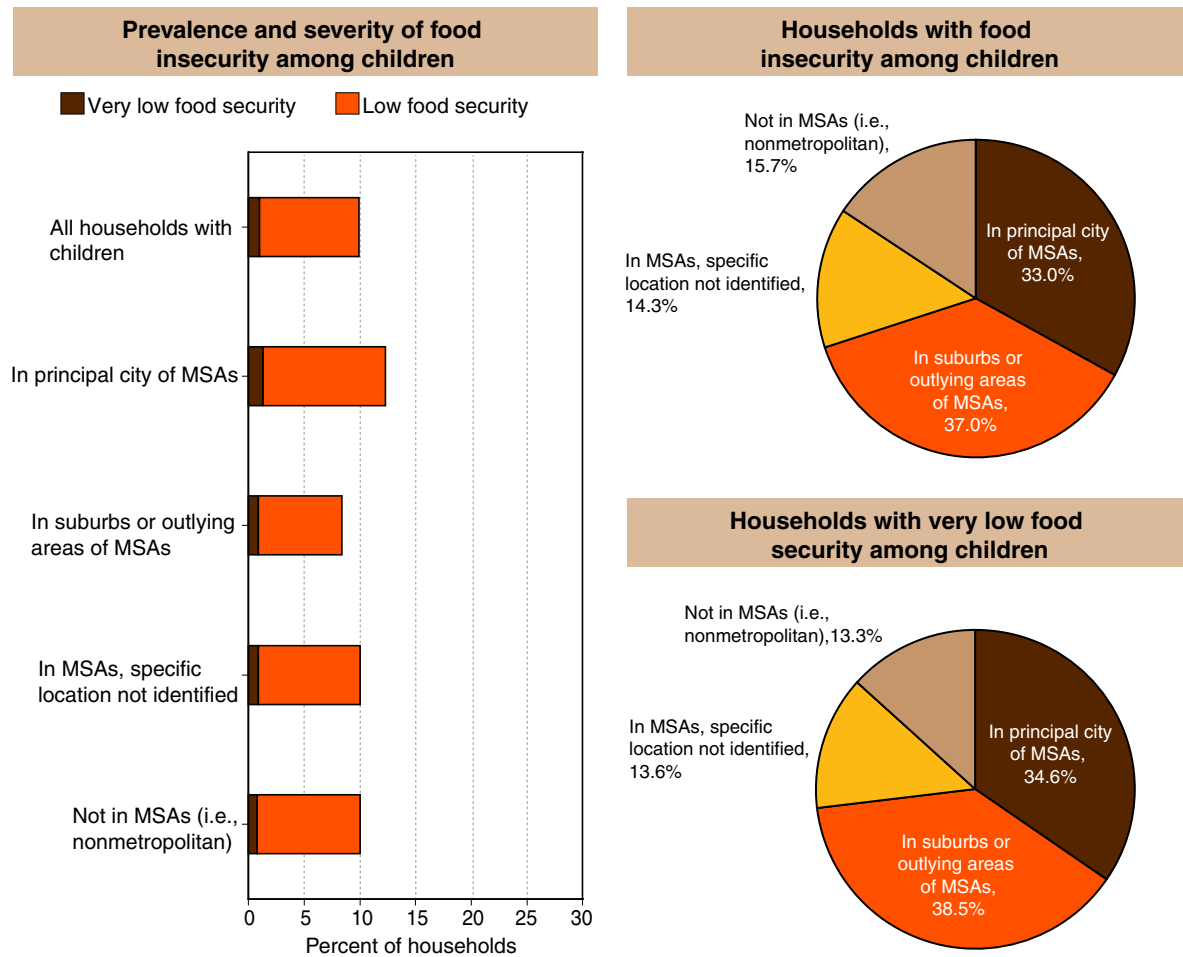
Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

Residence Relative to Metropolitan Statistical Areas

Food insecurity among children was most prevalent in large cities of Metropolitan Statistical Areas (MSAs) followed by nonmetropolitan (largely rural) areas, and was least prevalent in the suburban and exurban commuting areas around large cities (fig. 13).¹⁰ The largest shares of households with both food insecurity and low food security among children were in the principal cities of MSAs and the suburban and outlying commuting areas around MSAs.

Figure 13

Prevalence and distribution of food insecurity among children, by residence relative to Metropolitan Statistical Areas (MSAs), 2010-11 average



Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

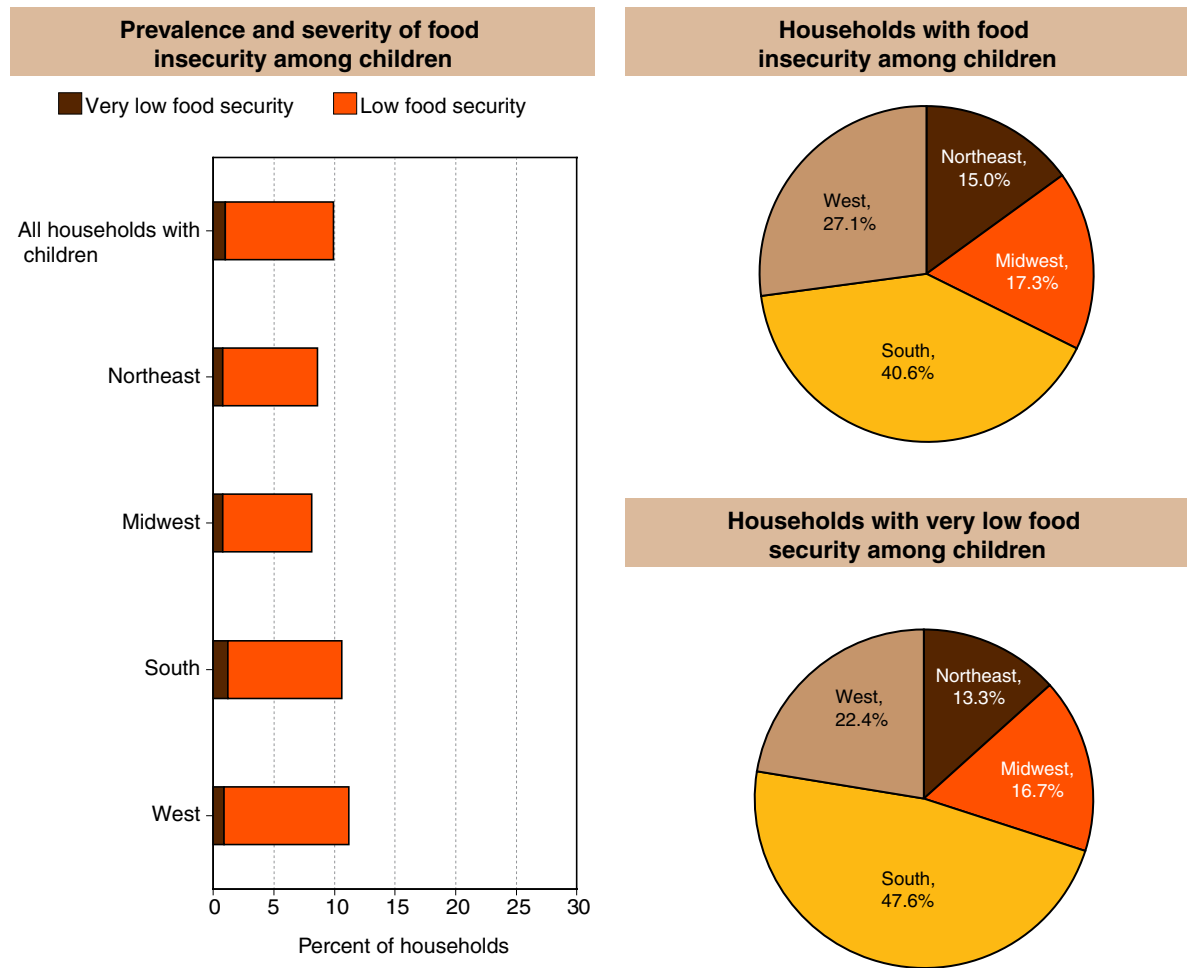
¹⁰The food security survey identifies Metropolitan Statistical Areas (MSAs) and principal cities within them in accordance with standards delineated in 2003 by the Office of Management and Budget, based on revised standards developed by the U.S. Census Bureau in collaboration with other Federal agencies. Principal cities include the incorporated areas of the largest city in each MSA and other cities in the MSAs that meet specified criteria based on population size and commuting patterns.

Residence by Census Region

The prevalence of food insecurity among children was higher in the West and South Census Regions than in the Midwest and Northeast (fig. 14). The prevalence of very low food security among children was highest in the South. Just over 40 percent of households with food insecure children and about 48 percent of households with very low food security among children were located in the South.

Figure 14

Prevalence and distribution of food insecurity among children, by Census Region, 2010-11 average



Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

Food and Nutrition Assistance Program Participation and Children's Food Insecurity, Average 2010-11

Most food-insecure households with children received assistance from one or more of the three largest Federal food and nutrition assistance programs: the Supplemental Nutrition Assistance Program (SNAP, formerly called the Food Stamp Program), the National School Lunch Program, and the Special Supplemental Nutrition Assistance Program for Women, Infants, and Children (WIC). Table 1 and figure 15 show the prevalence of overall food insecurity and food insecurity among children for low-income households (households with children and annual incomes less than 185 percent of the Federal poverty line) participating in these programs.¹¹ The share of low-income food-insecure households with children and share of households with food insecurity among children participating in these programs are also shown.

These statistics come from a 30-day measure of food insecurity (covering mid-November to mid-December), rather than the standard 12-month measure, so that the period over which food security is assessed is more likely to match the period during which program benefits were received or not received. The prevalence of food insecurity is lower when assessed over a 30-day period, since some households were food insecure only in earlier months of the year. The prevalence of food insecurity in households with children and with annual incomes less than 185 percent of the Federal poverty line was 22.4 percent during the 30 days prior to the food security surveys in 2010 and 2011, compared with 39.6 percent that were food insecure at some time during the year (calculated from estimates shown in Appendix B). For food insecurity among children, the 30-day prevalence was 11.5 percent of low-income households compared with 20.4 percent when assessed over 12 months.

Households that did not receive assistance from any of these programs were generally more food secure than those that did. The prevalence of food insecurity was lower (about 12 percent) for nonparticipating households than for any recipient categories, likely reflecting the self-targeting of participation in these programs by the most food-needy households.

An estimated 84 percent of low-income households with food insecurity among children received assistance from one or more of the three largest Federal food assistance programs in 2010-11. About 70 percent of low-income households with food-insecure children received free or reduced-price school meals, including about 40 percent that received benefits from SNAP or WIC or both, in addition to school meals. Many households with food-insecure children in this income range (less than 185 percent of the Federal poverty line) were not eligible for all of these programs, and some were not eligible for any of them. Households with no children in school

¹¹Statistics on very low food security among children are not presented by program participation categories because of inadequate sample sizes in some categories. Numbers of households are not reported because about 18 percent of households with children do not report income. Most such households are not asked about participation in food and nutrition assistance programs. The omission of those households would result in understating the numbers of households in the various participation categories. Participation in food and nutrition assistance programs is also underreported in the CPS-FSS, which would further distort estimated numbers of participants.

Table 1

Prevalence and distribution of food insecurity during the 30-day period ending in mid-December for low-income¹ households with children, by participation in selected Federal food assistance programs, 2010-11 average

Characteristic	Households with food insecurity among adults or children		Households with food insecurity among children (low or very low food security among children)	
	Prevalence ²	Share ³	Prevalence ⁴	Share ⁵
	<i>Percent</i>			
All low-income households with children ¹	22.4	100.0	11.5	100.0
Received SNAP in past 30 days	27.5	45.3	13.3	42.4
Received free or reduced-price school lunch in past 30 days	27.8	66.2	15.3	70.3
Received WIC in past 30 days	26.3	25.3	13.4	25.0
Multiple-program patterns: ⁶				
Received SNAP, free or reduced-price school lunch, and WIC	30.3	8.6	17.1	9.4
Received SNAP and free or reduced-price school lunch	29.1	24.6	14.7	24.0
Received SNAP and WIC	23.5	5.7	9.6	4.5
Received SNAP only	23.2	6.3	8.2	4.4
Received free or reduced-price school lunch and WIC	25.2	5.0	15.7	6.0
Received free or reduced-price school lunch only	26.5	27.8	15.2	30.6
Received WIC only	25.2	6.1	10.9	5.1
Received benefits from one or more of these programs	26.9	84.1	13.9	84.0
Did not receive benefits from any of these programs	12.3	15.9	6.4	16.0

SNAP = Supplemental Nutrition Assistance Program.

WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

¹Analysis was limited to households with children and with annual incomes less than 185 percent of the Federal poverty line. Most households with incomes above that range were not asked whether they received benefits from food assistance programs. In 2011, the poverty line for a family of two adults and two children was an annual income of \$22,811.

²Households with food insecurity among adults or children as a percentage of all households with the specified characteristic.

³Households with the specified characteristic and with food insecurity among adults or children as a percentage of all households with food insecurity among adults or children.

⁴Households with food insecurity among children as a percentage of all households with the specified characteristic.

⁵Households with the specified characteristic and with food insecurity among children as a percentage of all households with food insecurity among children.

⁶Percentages summed across multiple-program patterns may not exactly match those for SNAP, free or reduced-price school lunch, and WIC reported at the top of the table due to rounding. Also, some households only responded to questions about one or two programs but not all three, and their multiple-program participation could not be determined.

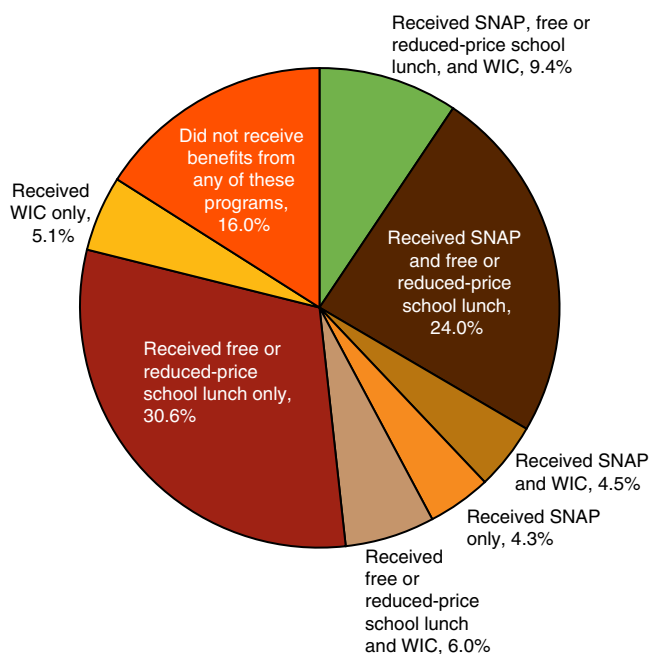
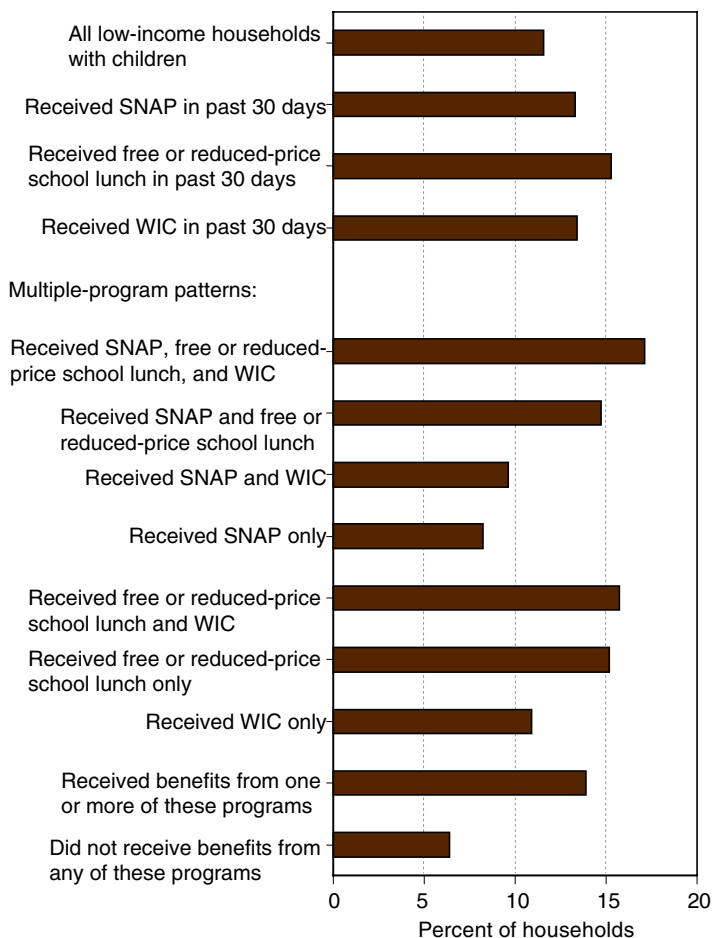
Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

Figure 15

Prevalence and distribution of food insecurity among children in low-income¹ households during the 30-day period prior to the food security survey, by participation in selected Federal food and nutrition assistance programs, 2010-11 average

Percentage of low-income households with food insecurity among children (low or very low food security among children)

Low-income households with food insecurity among children (low or very low food security among children)



SNAP = Supplemental Nutrition Assistance Program.

WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

¹Households with annual incomes less than 185 percent of the Federal poverty line. In 2011, the poverty line for a family of two adults and two children was an annual income of \$22,811.

Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

were not eligible for free or reduced-price school lunches. Among households with school-age children, 78.9 percent with food insecurity among children received free or reduced-price school meals (analysis not shown). Households with no children under age 5 were not eligible for WIC unless a woman in the household was pregnant. Among households with young children (ages 0-4), 58.2 percent with food insecurity among children participated in WIC (analysis not shown). About 28 percent of these low-income households reported annual incomes higher than 130 percent of the Federal poverty line (the gross income eligibility limit for SNAP); most of those were income-ineligible for SNAP.¹² Among households with incomes below 130 percent of the poverty line, nearly 50 percent with food insecurity among children participated in SNAP (table 2).

Some households leave SNAP because their economic situation has improved enough to cover their food needs without assistance. For many SNAP recipients who exit the program, however, that does not seem to be the case. Households with children that received SNAP earlier in the year, but not in the 30 days prior to the food security survey, were more likely to be food insecure during that 30-day period (about 35 percent; table 2) than those still receiving benefits (approximately 28 percent), and much more likely to be food insecure than low-income households that

Table 2

Prevalence and distribution of food insecurity during the 30-day period ending in mid-December in households with children, with annual incomes less than 130 percent of the Federal poverty line,¹ by receipt of SNAP (food stamp) benefits, average 2010-11

Characteristic	Households with food insecurity among adults or children		Households with food insecurity among children (low or very low food security among children)	
	Prevalence ²	Share ³	Prevalence ⁴	Share ⁵
	<i>Percent</i>			
Received SNAP in past 30 days	27.7	52.2	13.7	49.9
Received SNAP in past 12 months, but not during the past 30 days	35.3	11.4	20.9	13.1
Did not receive SNAP at any time in past 12 months	19.6	36.3	10.4	37.1

SNAP = Supplemental Nutrition Assistance Program.

¹In 2011, the Federal poverty line for a family of two adults and two children was an annual income of \$22,811.

²Households with food insecurity among adults or children as a percentage of all households with the specified characteristic.

³Households with the specified characteristic and with food insecurity among adults or children as a percentage of all households with food insecurity among adults or children.

⁴Households with food insecurity among children as a percentage of all households with the specified characteristic.

⁵Households with the specified characteristic and with food insecurity among children as a percentage of all households with food insecurity among children.

Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

¹²Some households with average annual incomes above the income eligibility limit may have been eligible for food assistance if their monthly income was within the income eligibility limits.

did not receive SNAP benefits at any time during the year (nearly 20 percent). ERS research found that leaving SNAP was strongly associated with increases in income and full-time employment, suggesting that many food-insecure households that leave SNAP do so because they are no longer income-eligible (Nord and Coleman-Jensen, 2010). Even though these former participants appeared to be better off economically, they were still more likely to be food insecure after leaving SNAP.

Table 3

Prevalence of food insecurity in households with children, by State, average 2003-11¹

State	Number of households with children		Households with food insecurity among adults or children (low or very low food security)		Households with food insecurity among children (low or very low food security among children)	
	Average 2003-11	Interviewed	Prevalence	Margin of error ²	Prevalence	Margin of error ²
	<i>Number</i>	<i>Number</i>	<i>Percent</i>	<i>Percentage points</i>	<i>Percent</i>	<i>Percentage points</i>
U.S. total	39,573,000	133,083	18.3	0.22	9.4	0.17
AK	94,000	1,962	16.0*	1.77	8.0*	1.13
AL	593,000	1,526	20.1	1.90	9.3	1.76
AR	378,000	1,574	21.8*	2.77	11.5*	1.88
AZ	817,000	1,741	21.5*	1.87	10.9*	1.19
CA	4,901,000	11,056	19.2*	0.78	10.8*	0.42
CO	662,000	2,959	17.0	1.58	8.8	0.94
CT	465,000	2,747	14.7*	1.29	8.0*	0.98
DC	60,000	1,197	21.7*	2.24	11.2*	1.64
DE	116,000	1,925	12.7*	1.13	7.0*	0.79
FL	2,173,000	4,692	18.4	0.87	9.4	0.66
GA	1,311,000	2,901	20.5*	1.44	10.5*	0.95
HI	155,000	1,903	15.2*	1.41	8.4*	0.93
IA	377,000	2,464	17.3	1.29	8.3*	0.86
ID	208,000	1,760	18.7	1.06	8.7	1.40
IL	1,698,000	4,285	15.3*	1.01	7.4*	0.73
IN	847,000	2,231	16.1*	1.54	7.8*	1.27
KS	378,000	2,173	19.8*	1.53	9.3	1.21
KY	559,000	1,957	19.9*	1.62	10.0	1.12
LA	609,000	1,351	17.1	1.47	9.0	1.16
MA	848,000	2,093	12.7*	1.40	7.1*	1.05
MD	741,000	2,900	14.4*	1.29	7.9*	0.86
ME	158,000	2,329	19.8*	1.47	10.3	1.12
MI	1,293,000	3,238	17.1	1.79	8.0*	0.99
MN	659,000	3,108	13.6*	1.24	7.1*	1.09
MO	777,000	2,300	18.6	1.66	9.0	1.41
MS	395,000	1,280	22.1*	2.22	12.4*	2.18
MT	115,000	1,266	19.2	2.29	9.0	1.36
NC	1,160,000	2,682	20.7*	1.77	10.2	1.02
ND	83,000	1,825	11.1*	1.37	5.8*	0.80
NE	237,000	2,098	16.1*	1.22	8.1*	0.76
NH	166,000	2,700	10.7*	0.90	5.1*	0.67
NJ	1,172,000	2,896	14.4*	1.67	7.4*	1.06
NM	261,000	1,270	21.9*	1.87	12.4*	1.72
NV	327,000	2,164	17.7	2.11	9.5	1.48
NY	2,452,000	5,291	17.2*	0.83	9.5	0.60
OH	1,522,000	3,854	19.8*	1.45	8.6	0.85
OK	487,000	1,762	21.0*	1.79	11.4*	1.25
OR	462,000	1,852	19.2	1.94	10.4	1.39
PA	1,555,000	3,949	16.9*	1.04	7.9*	0.72
RI	144,000	2,255	18.4	1.76	9.8	1.56
SC	563,000	1,784	20.4*	1.33	9.8	1.14
SD	100,000	2,045	15.5*	1.69	7.9*	1.15
TN	796,000	1,785	19.4	1.83	10.1	1.04
TX	3,371,000	7,217	23.5*	0.78	12.8*	0.58
UT	384,000	1,978	17.4	1.72	9.0	1.35
VA	1,004,000	2,700	12.4*	1.00	6.2*	0.71
VT	79,000	1,771	17.4	2.02	8.0	1.58
WA	841,000	2,409	18.3	1.67	8.7	1.17
WI	724,000	2,569	15.4*	1.10	7.7*	0.82
WV	226,000	1,488	17.0	2.18	7.4*	1.28
WY	70,000	1,821	15.8*	1.57	7.9*	0.88

*Difference from U.S. average was statistically significant with 90-percent confidence ($t > 1.645$).

¹Totals exclude households whose food security status is unknown because they did not give a valid response to any of the questions in the food security scale. Each year, these represented about 0.3 percent of all households.

²Margin of error with 90-percent confidence (1.645 times the standard error of the estimated prevalence rate).

Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.

Conclusions

In the wake of the economic downturn that began in late 2007, food insecurity in households with children remains near the highest level observed since monitoring began in 1995. In 2011, 20.6 percent of households with children were food insecure at some time during the year. In about half of those households, only adults were food insecure; in the other half, children were also food insecure. In 1.0 percent of households with children, one or more of the children experienced very low food security.

Results from this study suggest that employment is a key determinant of food insecurity in households with children. Full-time job opportunities, work supports (e.g., tax credits and child care assistance), and employee benefits (e.g., health insurance) may reduce food insecurity. In 2010-11, food insecurity among children was three and a half times as prevalent for households headed by an unemployed adult as for households headed by one or more full-time employed adults. However, 75 percent of households with food-insecure children had one or more adults in the labor force, with about 60 percent having at least one full-time worker and an additional 15 percent having one or more part-time workers. In 2006-07, before the economic downturn, a higher percentage of households with food-insecure children had at least one full-time worker (67 percent), and a lower percentage had one or more part-time workers (10 percent; Nord, 2009).

Educational attainment is also strongly associated with food insecurity in households with children. Food insecurity among children was six and a half times as prevalent for households headed by an adult with less than a high school diploma as for households headed by an adult with at least a 4-year college degree. Adult education and job training programs may help adults with low levels of education to improve their employment status and household food security.

Disabilities are an important risk factor for food insecurity. Access to disability assistance programs, work supports, healthcare, and other assistance for adults with disabilities may reduce the incidence and severity of food insecurity for a substantial share of those that are currently food insecure (Coleman-Jensen and Nord, 2013). Current benefit levels in disability assistance programs (such as Supplemental Security Income or SSI) appear inadequate to ensure food security for those affected by disabilities. Food insecurity was twice as prevalent for households with children that included adults who were unable to work due to disabilities and for those with working-age adults with other reported disabilities, even if they were not reported to be unable to work because of disabilities, as for households with children in which no working-age adults reported a disability.

In 2010-11, Federal food and nutrition assistance programs provided benefits to 84.1 percent of low-income (less than 185 percent of the poverty line) food-insecure households with children. Many households received assistance from multiple programs, although about 28 percent reported receiving only free or reduced-price school meals. The free or reduced-price school meals program reaches a larger share of food-insecure households with children than either the SNAP or WIC programs. It is worth noting that participation in food and nutrition assistance programs, especially SNAP, increased with the onset of the economic downturn.

In 2006-07, about 39 percent of food-insecure households with children received SNAP (Nord, 2009). In 2010-11, about 45 percent of food-insecure households with children received SNAP.

Low-income households that did not receive assistance from any of the food and nutrition assistance programs were less likely to be food insecure (just over 12 percent) than those that did receive assistance (23-30 percent, depending on the mix of programs). The lower prevalence of food insecurity among income-eligible nonparticipants suggests that many of these households were able to meet their food needs without assistance. About one in five food-insecure households with children had annual incomes above 185 percent of the poverty line. Many of these households may not have been eligible to receive free or reduced-price school lunches or assistance from the WIC program, and most were probably not eligible to receive SNAP benefits.¹⁴

As food insecurity prevalence rates hover around historic highs since food security monitoring began, and new research finds that children living in food-insecure households face elevated risks of negative health and development outcomes compared with children in otherwise similar food-secure households, the impetus to understand and address the underlying causes of food insecurity in households with children has increased. For example, in the 2010 Healthy, Hunger-Free Kids Act, Congress allocated \$10 million for research into the causes and consequences of childhood hunger and food insecurity, with the research beginning in FY 2013. This report lays the foundation for such research by identifying the populations most at risk of childhood food insecurity.

¹⁴Some households with average annual incomes above the eligibility thresholds may have had monthly incomes that qualified them for food assistance in some months of the year.

References

- Alaimo, Katherine, Christine M. Olson, and Edward A. Frongillo Jr. 2001a. "Food insufficiency and American school-aged children's cognitive, academic, and psychosocial development," *Pediatrics* 108(1): 44-53.
- Alaimo, Katherine, Christine M. Olson, and Edward A. Frongillo Jr. 2001b. "Low family income and food insufficiency in relation to overweight in US children," *Archives of Pediatrics and Adolescent Medicine* 155(10): 1161-67.
- Alaimo, Katherine, Christine M. Olson, and Edward A. Frongillo Jr. 2002. "Family food insufficiency, but not low family income, is positively associated with dysthymia and suicide symptoms in adolescents," *The Journal of Nutrition* 132(4): 719-25.
- Alaimo, Katherine, Christine M. Olson, Edward A. Frongillo Jr., and Ronette R. Briefel. 2001. "Food insufficiency, family income, and health in US preschool and school-aged children," *American Journal of Public Health* 91(5): 781-86.
- Bhargava, Alok, Dean Jolliffe, and Larry L. Howard. 2008. "Socio-economic, behavioural and environmental factors predicted body weights and household food insecurity scores in the Early Childhood Longitudinal Study-Kindergarten," *British Journal of Nutrition* 100(2): 438-44.
- Bronte-Tinkew, Jacinta, Martha Zaslow, Randolph Capps, Allison Horowitz, and Michelle McNamara. 2007. "Food insecurity works through depression, parenting, and infant feeding to influence overweight and health in toddlers," *The Journal of Nutrition* 137(9): 2160-65.
- Casey, Patrick H., Kitty L. Szeto, James M. Robbins, Janice E. Stuff, Carol Connell, Jeffrey Gossett, and Pippa M. Simpson. 2005. "Child health-related quality of life and household food security," *Archives of Pediatric and Adolescent Medicine* 159(1): 51-6.
- Chilton, Mariana, Maureen M. Black, Carol Berkowitz, Patrick H. Casey, John Cook, Ruth Rose Jacobs, Alan Meyers, Deborah A. Frank, Diana Cutts, Timothy Heeren, Stephanie Ettinger de Cuba, and Sharon Coleman. 2009. "Food insecurity and risk of poor health among US-born children of immigrants," *American Journal of Public Health* 99(3): 556-62.
- Coleman-Jensen, Alisha, and Mark Nord. 2013. *Food Insecurity Among Households With Working-Age Adults With Disabilities*, ERR-144, U.S. Department of Agriculture, Economic Research Service, <http://www.ers.usda.gov/publications/err-economic-research-report/err144.aspx>.
- Coleman-Jensen, Alisha, Mark Nord, Margaret Andrews, and Steven Carlson. 2012. *Household Food Security in the United States in 2011*, ERR-141, U.S. Department of Agriculture, Economic Research Service, <http://ers.usda.gov/publications/err-economic-research-report/err141.aspx>.

- Connell, Carol L., Kristi L. Lofton, Kathy Yadrick, and Timothy A. Rehner. 2005. "Children's experiences of food insecurity can assist in understanding its effect on their well-being," *The Journal of Nutrition* 135(7): 1683-90.
- Cook, John T., Deborah A. Frank, Carol Berkowitz, Maureen M. Black, Patrick H. Casey, Diana B. Cutts, Alan F. Meyers, Nieves Zaldivar, Anne Skalicky, Suzette Levenson, Tim Heeren, and Mark Nord. 2004. "Food insecurity is associated with adverse health outcomes among human infants and toddlers," *The Journal of Nutrition* 134: 1432-38.
- DeNavas-Walt, Carmen, Bernadette D. Proctor, and Jessica C. Smith. 2012. "Income, poverty, and Health Insurance Coverage in the United States: 2011," *Current Population Reports*, P60-243, U.S. Department of Commerce, U.S. Census Bureau, <http://www.census.gov/prod/2012pubs/p60-243.pdf>.
- Eicher-Miller, Heather A., April C. Mason, Connie M. Weaver, George P. McCabe, and Carol J. Boushey. 2009. "Food insecurity is associated with iron deficiency anemia in US adolescents," *The American Journal of Clinical Nutrition* 90(5): 1358-71.
- Eicher-Miller, Heather A., April C. Mason, Connie M. Weaver, George P. McCabe, and Carol J. Boushey. 2011. "Food insecurity is associated with diet and bone mass disparities in early adolescent males but not females in the United States," *The Journal of Nutrition* 141(9): 1738-45.
- Fram, Maryah Stella, Edward A. Frongillo, Sonya J. Jones, Roger C. Williams, Michael P. Burke, Kendra P. DeLoach, and Christine E. Blake. 2011. "Children are aware of food insecurity and take responsibility for managing food resources," *The Journal of Nutrition* 141(6): 1114-19.
- Hernandez, Daphne C., and Alison Jacknowitz. 2009. "Transient, but not persistent, adult food insecurity influences toddler development," *The Journal of Nutrition* 139(8): 1517-24.
- Howard, Larry L. 2011a. "Does food insecurity at home affect non-cognitive performance at school? A longitudinal analysis of elementary student classroom behavior," *Economics of Education Review* 30(1): 157-76.
- Howard, Larry L. 2011b. "Transitions between food insecurity and food security predict children's social skill development during elementary school," *The British Journal of Nutrition* 105(12): 1852-60.
- Jyoti, Diana F., Edward A. Frongillo, and Sonya J. Jones. 2005. "Food insecurity affects school children's academic performance, weight gain, and social skills," *The Journal of Nutrition* 135: 2831-39.
- Kirkpatrick, Sharon I., Lynn McIntyre, and Melissa L. Potestio. 2010. "Child hunger and long-term adverse consequences for health," *Archives of Pediatrics and Adolescent Medicine* 164(8): 754-62.

- Kleinman, Ronald E., J. Michael Murphy, Michelle Little, Maria Pagano, Cheryl A. Wehler, Kenneth Regal, and Michael S. Jellinek. 1998. "Hunger in Children in the United States: Potential Behavioral and Emotional Correlates," *Pediatrics* 101(1):e3.
- Larson, Nicole I., and Mary T. Story. 2011. "Food insecurity and weight status among U.S. children and families. A review of the literature," *American Journal of Preventive Medicine* 40(2): 166-73.
- National Research Council. 2006. *Food Insecurity and Hunger in the United States: An Assessment of the Measure*, Committee on National Statistics, Panel to Review the U.S. Department of Agriculture's Measurement of Food Insecurity and Hunger, Gooloo S. Wunderlich and Janet L. Norwood (Eds.), Washington, DC: The National Academies Press.
- Nord, Mark. 2013 (Forthcoming). "Youth are less likely to be food insecure than adults in the same household," *Journal of Hunger and Environmental Nutrition*.
- Nord, Mark. 2009. *Food Insecurity in Households with Children: Prevalence, Severity, and Household Characteristics*, EIB-56, U.S. Department of Agriculture, Economic Research Service, <http://ers.usda.gov/publications/eib-economic-information-bulletin/eib56.aspx>.
- Nord, Mark, and Alisha Coleman-Jensen. 2010. "Food insecurity after leaving SNAP," *Journal of Hunger & Environmental Nutrition* 5(4): 434-53.
- Nord, Mark, and Karla Hanson. 2012. "Adult caregiver reports of adolescents' food security do not agree well with adolescents' own reports," *Journal of Hunger & Environmental Nutrition* 7(4): 363-80.
- Nord, Mark, Max Finberg, and James McLaughlin. 2009. "What should the government mean by hunger?" *Journal of Hunger & Environmental Nutrition* 4(1):1-28.
- Oliveira, Victor. 2013. *The Food Assistance Landscape: FY 2012 Annual Report*, EIB-109, U.S. Department of Agriculture, Economic Research Service, <http://www.ers.usda.gov/publications/eib-economic-information-bulletin/eib109.aspx>.
- Park, Kyong, Margaret Kersey, Joni Geppert, Mary Story, Diana Cutts, and John H. Himes. 2009. "Household food insecurity is a risk factor for iron-deficiency anemia in a multi-ethnic, low-income sample of infants and toddlers," *Public Health Nutrition* 12(11): 2120-28.
- Rose-Jacobs, Ruth, Maureen M. Black, Patrick H. Casey, John T. Cook, Diana B. Cutts, Mariana Chilton, Timothy Heeren, Suzette M. Levenson, Alan F. Meyers, and Deborah A. Frank. 2008. "Household Food Insecurity: Associations with At-Risk Infant and Toddler Development," *Pediatrics* 121(1): 65-72.
- Ryu, Jeong-Hee, and Judith S. Bartfeld. 2012. "Household food insecurity during childhood and subsequent health status: The Early Childhood Longitudinal Study - Kindergarten Cohort," *American Journal of Public Health* 102(11): e50-5.

- Skalicky, Anne, Alan F. Meyers, William G. Adams, Zhaoyan Yang, John T. Cook, and Deborah A. Frank. 2006. "Child food insecurity and iron deficiency anemia in low-income infants and toddlers in the United States," *Maternal and Child Health Journal* 10(2): 177-85.
- Slack, Kristen S. and Joan Yoo. 2005. "Food hardship and child behavior problems among low-income children," *Social Service Review* 79(3): 511-36.
- Weinreb, Linda, Cheryl Wehler, Jennifer Perloff, Richard Scott, David Hosmer, Linda Sagor, and Craig Gundersen. 2002. "Hunger: Its impact on children's health and mental health," *Pediatrics* 110(4): e41.
- Whitaker, Robert C., Shannon M. Phillips, and Sean M. Orzol. 2006. "Food insecurity and the risks of depression and anxiety in mothers and behavior problems in their preschool-aged children," *Pediatrics* 118(3): e859-68.
- Winicki, Joshua, and Kyle Jemison. 2003. "Food insecurity and hunger in the kindergarten classroom: Its effect on learning and growth," *Contemporary Economic Policy* 21(2): 145-57.
- Zaslow, Martha, Jacinta Bronte-Tinkew, Randolph Capps, Allison Horowitz, Kristin A. Moore, and Debra Weinstein. 2009. "Food security during infancy: Implications for attachment and mental proficiency in toddlerhood," *Maternal and Child Health Journal* 13(1): 66-80.

Appendix A: Previous Study Findings

Findings from selected studies on the effects of food insecurity and food insufficiency on children's health, development, and well-being (statistically significant associations, with controls included in the model, are shaded)

Introductory notes:

- Most of the associations reported here are based on food insecurity or food insufficiency at the household level, not on food insecurity among children. Many presumed effects of household food insecurity on children appear even though the children themselves may not experience reductions in diet quality or quantity.
- Studies controlled for income and other household characteristics likely to confound the relationships of interest.
- The studies are listed by year of publication and alphabetically by author.

Appendix table A					
Condition studied	Population	Finding	Data ¹	Comments	Citation
Parent reported general health status of child on a 5-point scale ranging from poor to excellent	Children in kindergarten through eighth grade	Persistent food insecurity (3 or 4 observation years) was associated with lower health status in eighth grade.	ECLS-K	The study controlled for child's kindergarten health status and parental depression.	Ryu and Bartfeld, 2012
		Transient food insecurity (1 or 2 observation years) was not associated with health status at eighth grade.			
Bone mineral content	Boys ages 8-11	Significantly lower bone mineral content in total body, trunk, lumbar spine, pelvis, and left arm in households with food insecurity among children.	NHANES		Eicher-Miller et al., 2011
	Boys ages 12-19 and girls ages 8-19	No statistically significant association.			
USDA Food Guide recommended servings of dairy and estimated average requirement for calcium intake.	Boys ages 8-11	2.5 times more likely to report less than the recommended servings of dairy and 2.3 times more likely to have calcium intake below the estimated average requirement.	NHANES		
	Boys ages 12-19 and girls ages 8-19	No statistically significant association.			
Noncognitive abilities (teacher-reported: interpersonal relations, self-control, approaches to learning, and externalizing problem behavior)	Children in first, third, and fifth grade	Transition from food-insecure household in first grade to food-secure household in third grade was negatively associated with interpersonal relations, self-control, and approaches to learning persisting through fifth grade.	ECLS-K	Controls for county characteristics in addition to household characteristics.	Howard, 2011a
		Contemporaneous household food insecurity was negatively associated with interpersonal relations, self-control, and approaches to learning.			
		No statistically significant association between food insecurity and externalizing problem behavior.			
Social skills (teacher reported: interpersonal relationships, self-control, approaches to learning, externalizing problem behavior)	Girls in first, third, and fifth grade	Contemporaneous household food insecurity was negatively associated with composite social skills scores, self-control and approaches to learning scores.	ECLS-K	Controls for county characteristics in addition to household characteristics.	Howard, 2011b
		Transitions between food insecurity and food security were not statistically significantly associated with social skills scores.			
	Boys in first, third, and fifth grade	Transitioning from food insecurity in first grade to food security in third grade was negatively associated with composite social skills scores, self-control, and approaches to learning scores.			
		Other transitions between food insecurity and food security were not statistically significantly associated with social skills scores. There was no statistically significant association between food insecurity and social skills measured contemporaneously.			

Appendix table A—Continued					
Condition studied	Population	Finding	Data ¹	Comments	Citation
General health (parent reported)	Children ages 10-15	Poor or fair (vs. excellent, very good, or good) health 2.48 times more likely for children classified as hungry. Poor or fair health 4.73 times as likely for children who have experienced two or more episodes of hunger than those that have never experienced hunger.	NLSCY ²	Controlled for baseline health status and chronic health conditions. In analyses stratified by gender rather than age, associations were stronger for girls than for boys.	Kirkpatrick et al., 2010
	Children ages 16-21	No statistically significant association.			
Chronic health conditions (heart condition, cerebral palsy, epilepsy, kidney disease, asthma, bronchitis, or allergies)	Children ages 10-15	No statistically significant association.			
	Children ages 16-21	Higher odds of having any chronic health condition or of having asthma (considered separately from other health conditions) among youth with two or more episodes of hunger.			
General health (parent reported)	Children ages 0-36 months	Poor or fair (versus excellent, very good, or good) health 1.74 times more likely in food-insecure households	Children's Health-Watch (formerly C-SNAP)		Chilton et al., 2009
		Food insecurity mediated the association between immigrant status of mothers and fair or poor health among children.			
Iron deficiency anemia	Children ages 3-5	10.71 times as likely for children in households with food insecurity among children	NHANES	Wide confidence intervals for the estimates for children ages 3-5 and 6-11; although statistically significant, the estimate should be interpreted with caution.	Eicher-Miller et al., 2009
	Children ages 6-11	8.05 times as likely for children in households with food insecurity among children			
	Children ages 12-15	2.95 times as likely for adolescents in households with food insecurity among children.			
	Children ages 16-19	No statistically significant association.			
Iron deficiency	Children ages 6-11	49 percent less likely among children in households with food insecurity among children.	NHANES	Unexpected finding that children from households with food security among children were more likely to be iron deficient than children from households with food insecurity among children.	Eicher-Miller et al., 2009
	Children ages 3-5 and ages 12-19	No statistically significant association.			
Estimated average requirement (EAR) for iron intake	Children ages 16-19	Dietary iron intake 1.87 times below the EAR among youth from food-insecure households.			
	Children ages 3-15	No statistically significant association.			

Appendix table A—Continued

Condition studied	Population	Finding	Data ¹	Comments	Citation
Cognitive scores	Children age 9 months and 24 months	Children in households with food insecurity among adults at wave 2 (when child was 24 months old) scored 1.5 points lower on cognitive scores at 24 months. In separate analyses of boys and girls, the effect on boys' scores was not statistically significant, but girls in food-insecure households scored 2.33 points lower.	ECLS-B	Data were collected at two time points, or waves. Wave 1 of data collection was conducted when the child was 9 months old. Wave 2 of data collection was conducted when the child was 24 months old. Food insecurity was assessed at both waves, while the outcomes of interest were assessed at wave 2.	Hernandez and Jackowitz, 2009
		Food insecurity among adults at wave 1 (when child was 9 months old) was not significantly associated with child cognitive scores at wave 2 (age 24 months). Food insecurity at both waves was not associated with scores at wave 2.		Counterintuitive finding that food insecurity among adults at wave 2 affected child's cognitive scores, but food insecurity at both wave 1 and at wave 2 did not significantly affect cognitive scores.	
Motor scores		No statistically significant association between child motor scores at wave 2 and food insecurity among adults measured at wave 1, wave 2, or persistent food insecurity in both waves.			
Weight-for-age Z-score		No statistically significant association between weight-for-age Z-scores at wave 2 and food insecurity among adults measured at wave 1, wave 2, or persistent food insecurity in both waves.			
Health Status (Mother reported)		Children in households with food insecurity among adults at wave 2 had poorer health (0.17 points lower) at wave 2. In separate analyses of boys and girls, the effect on boys' health was not statistically significant, but girls in food insecure households had poorer health (0.19 points lower).		Counterintuitive finding that food insecurity among adults at wave 2 affected child's health status, but food insecurity at both wave 1 and at wave 2 did not significantly affect health status.	
	Food insecurity among adults at wave 1 was not significantly associated with child health status at wave 2. Food insecurity at both waves was not associated with health status at wave 2.				
Iron deficiency anemia	Children ages 0-36 months	1.98 times more likely for children in households with very low food security	Children's Health-Watch (formerly C-SNAP)		Park et al., 2009
Iron deficiency		No statistically significant association.			

Appendix table A—Continued

Condition studied	Population	Finding	Data ¹	Comments	Citation
Attachment and mental proficiency	Children age 9 months and 24 months	Children in food insecure households at 9 months more likely to have insecure child attachment at 24 months and less advanced mental proficiency through indirect pathways operating through maternal depression and in turn parenting practices.	ECLS-B		Zaslow et al., 2009
Weight and BMI	Children in first, third, and fifth grade	Weak, nonsignificant negative association with food insecurity in current period (for boys, girls, and combined).	ECLS-K	Extensively specified dynamic model controlled for weight in previous period (kindergarten, first, and third grade).	Bhargava et al., 2008
Developmental risk (parent reported concerns about child's development in: expressive and receptive language, fine and gross motor, behavior, social/emotional, self-help, and school)	Children ages 4-36 months	1.76 times as likely for children in food-insecure households	Children's Health-Watch (formerly C-SNAP)		Rose-Jacobs et al., 2008
General health (parent reported)	Children ages 9 and 24 months	Poor or fair health (versus excellent or good) more likely in food-insecure households. Main pathway is through parental depression, direct effect marginally significant ($p=.09$), not through measured parenting or feeding practices.	ECLS-B	Could be biased by measurement artifact of parental depression, leading to upward bias on measured food insecurity and children's poor health.	Bronte-Tinkew et al., 2007
Weight for length (overweight)	Children ages 9 and 24 months	Higher weight for length in food-insecure households. Pathway is through parenting practices and infant feeding practices (mainly a measure of breastfeeding).		Structural model may be problematic. Food insecurity associated with better infant feeding practices and marginally significant ($p=.07$).	
Length for age	Children ages 9 and 24 months	No significant association with food insecurity or mediating variables.			
Iron deficiency anemia	Children ages 7-36 months	2.5 times more likely in households with food insecurity among children.	Children's Health-Watch (formerly C-SNAP)	Sample was small. Should be repeated with larger sample.	Skalicky et al., 2006
Anemia without iron deficiency	Children ages 7-36 months	1.6 times more likely in households with food insecurity among children, but not statistically significant.			

Appendix table A—Continued

Condition studied	Population	Finding	Data ¹	Comments	Citation
Behavioral problems (problem in one or more of three domains: aggressive, anxious/depressed, inattention/hyperactivity)	Children age 3	Significant behavioral problems 1.6 times more likely in households with marginal food security among adults and 2.1 times more likely in households with food-insecure adults. Similar and statistically significant associations with each problem domain individually.	Fragile Families	Strong results in a large sample. In addition to demographic and economic controls, mother's mental health (which could be a confounding measurement factor) was controlled.	Whitaker et al., 2006
Physical function (a subscale of the Pediatric Health-Related Quality of Life measure)	Children ages 3-17	Physical function of children in food-insecure households 3.3 points lower (87.4 versus 90.7 mean for children in food-secure households); association was strongest for ages 3-8, weaker and not statistically significant for ages 9-11, and near zero for ages 12-17.	Delta NIRI		Casey et al., 2005
Psychosocial function (a subscale of the Pediatric Health-Related Quality of Life measure)		Psychosocial function of children in food-insecure households 3.6 points lower (77.1 versus 80.7 in food-secure households); association was strongest for ages 12-17, weaker and not statistically significant for ages 3-8, and near zero for ages 9-11.			
Change in BMI and weight from kindergarten to third grade	Girls in third grade	Higher in households with marginal food security or insecurity at kindergarten age; higher in households with marginal food security or insecurity in both kindergarten and third grade.			
	Boys in third grade	No statistically significant association.			
Change in math score from kindergarten to third grade	Girls and boys in third grade	Lower in households marginally food secure or food insecure in kindergarten than in households food secure in both kindergarten and third grade.	ECLS-K		Jyoti et al., 2005
Change in reading score from kindergarten to third grade	Girls in third grade	Lower in households marginally food secure or food insecure in third grade (or in both kindergarten and third grade) than in households food secure in both periods.			
Change in social skills as assessed by teachers in kindergarten and third grade	Boys in third grade	No statistically significant association.			
	Girls in third grade	Greater improvement in households that transitioned from marginally food secure or food insecure in kindergarten to food secure in third grade than in households food secure in both periods.			
	Boys in third grade	Smaller improvement (opposite of girls) in households that transitioned from marginally food secure or food insecure in kindergarten to food secure in third grade than in households food secure in both periods.		Unexpected finding, and unexpected that boys and girls have opposite patterns.	

Appendix table A—Continued					
Condition studied	Population	Finding	Data ¹	Comments	Citation
Externalizing behavior problems	Children ages 3-5	Positively associated with food hardship. The relationship is mediated by parental characteristics (parental stress, warmth, and depression).	Illinois Family Study ³		Slack and Yoo, 2005
	Children ages 6-12	No statistically significant association.			
Internalizing behavior problems	Children ages 3-5	Positively associated with food hardship. The relationship is mediated by parental characteristics (parental stress, warmth, and depression).			
	Children ages 6-12	Positively associated with food hardship. The relationship is mediated by parental characteristics (parental stress, warmth, and depression).			
Health status (reported by caregiver)	Children ages 0-36 months	Fair or poor health (versus excellent or good) nearly twice as likely in food-insecure households; no dose-response pattern observed.	Children's Health-Watch (formerly C-SNAP)		Cook et al., 2004
Hospitalization since birth		30 percent more likely in food-insecure households; dose response: 2.3 times more likely in households with very low food security.			
Hospital admission on day of interview		Not statistically significant; weak negative association in sample.			
At risk for growth problems (either low weight for age or weight for height)		Not statistically significant; weak positive association in sample.			
Educational achievement—math score in fall of kindergarten year	Children in kindergarten	Lower by a half-point (mean math score was 19 points) in marginally secure and food-insecure households. Some dose response: score 1 point lower in households with very low food security.	ECLS-K		Winicki and Jemison, 2003
Educational achievement—gain in math score from fall to spring of kindergarten year		Lower by 0.4 points (mean gain in math score was 8 points) in marginally secure or food-insecure households; no dose-response pattern.			
Physical growth—height, weight, BMI, and changes in these from fall to spring		Not statistically significant; associations in the sample weak and inconsistent.			
Depressive disorder and suicidal symptoms	Children ages 15-16	Adolescents in food insufficient households much more likely to have depressive disorder and suicidal symptoms.	NHANES III		Alaimo et al., 2002

Appendix table A—Continued

Condition studied	Population	Finding	Data ¹	Comments	Citation
Chronic health condition count	Preschool children	Significantly higher in households with moderate child hunger.	Worcester, MA survey of homeless and low-income, housed mothers and children		Weinreb et al., 2002
	School-age children	Significantly higher in households with severe child hunger (measured by CCHIP items). ⁴			
Internalizing behavior problems (based on Child Behavior Checklist)	Preschool and school-age children	Significantly higher in households with severe child hunger, associations positive but weaker and not statistically significant with moderate child hunger.			
Anxiety/depression (based on Child Behavior Checklist)	School-age children	Significantly higher in households with severe child hunger.			
Academic achievement (based on Wechsler Individual Achievement Test Screener)	School-age children	No statistically significant association.			
Risk of overweight (weight-for-age higher than 85th percentile on CDC growth chart)	Girls ages 2-7	Significantly lower in food insufficient households.			
	Boys ages 2-7	No statistically significant association.			
	Boys ages 8-16	No statistically significant association.			
	White non-Hispanic girls ages 8-16	No statistically significant association.			
	Black non-Hispanic girls ages 8-16	No statistically significant association.			
	Mexican-American girls ages 8-16	Significantly higher in food insufficient households.			

Appendix table A—Continued

Condition studied	Population	Finding	Data ¹	Comments	Citation
Fair or poor health status (versus excellent or good)	Children ages 1-5	49 percent more likely in food insufficient households.	NHANES III		Alaimo et al., 2001
	Children ages 6-16	58 percent more likely in food insufficient households.			
Frequent stomach aches	Children ages 4-5	3 times as likely in food insufficient households.			
	Children ages 6-16	88 percent more likely in food insufficient households.			
Frequent headaches	Children ages 4-5	2.5 times as likely in food insufficient households.			
	Children ages 6-16	67 percent more likely in food insufficient households.			
Number of colds in previous 12 months	Children ages 1-5	57 percent more likely in food insufficient households.			
	Children ages 6-16	Moderately strong positive association in the sample, but not statistically significant.			
Number of ear infections in lifetime	Children ages 1-5	Association weakly positive in sample, but not statistically significant.			
	Children ages 6-16	Association weakly positive in sample, but not statistically significant.			
Iron deficiency	Children ages 1-5	Association negative (opposite of expected) in sample, but not statistically significant.			
	Children ages 6-16	Association negative (opposite of expected) in sample, but not statistically significant.			
Restrictive impairment (ages 1-5, prevented usual activity; ages 6-16, prevented school attendance)	Children ages 1-5	Association positive in sample, but not statistically significant.			
	Children ages 6-16	Association positive in sample, but not statistically significant.			

Appendix table A—Continued

Condition studied	Population	Finding	Data ¹	Comments	Citation			
Cognitive development (two subtests of Weschler Intelligence Scale for Children-Revised)	Children ages 6-11	No statistically significant association.	NHANES III		Alaimo et al., 2001a			
	Children ages 12-16	No statistically significant association.						
Academic development (two subtests of Wide Range Achievement Test-Revised, repeated grade, days absent)	Children ages 6-11	Lower arithmetic score and more likely to have repeated a grade in food insufficient households.						
	Children ages 12-16	No statistically significant association. Associations in sample weak and inconsistent.						
Psychosocial development (school absence, professional help for mental health, school suspension, number of good friends, trouble getting along with other children, shyness or slow to make friends)	Children ages 6-11	Child in food insufficient households 89 percent more likely to have seen psychologist or other mental health professional because of an emotional, mental, or behavioral problem.						
	Children ages 6-11	Positive association with “difficulty getting along with others” in sample, but not statistically significant.						
	Children ages 12-16	Child in food-insufficient households 82 percent more likely to have seen psychologist or other mental health professional because of an emotional, mental, or behavioral problem, 95 percent more likely to have been suspended, 74 percent more likely to have difficulty getting along with others.						
Psychosocial dysfunction (based on Pediatric Symptom Checklist)	Children ages 6-12	Significantly more likely in households with hungry children. Aggression and anxiety components particularly strongly associated with hunger.				CCHIP ⁵ Pittsburgh area		Kleinman et al., 1998

BMI=Body mass index.

¹Data source abbreviations: ECLS-B, Early Childhood Longitudinal Study-Birth Cohort (National Center for Education Statistics); ECLS-K, Early Childhood Longitudinal Study-Kindergarten Cohort (National Center for Education Statistics); C-SNAP, Children’s Sentinel Nutrition Assessment Program, renamed Children’s Healthwatch in 2009; Delta NIRI, Lower Mississippi Delta Nutrition Intervention Research Initiative (consortium of USDA’s Agriculture Research Service, several land-grant universities, and other institutions in the region); Fragile Families, The Fragile Families and Child Wellbeing Study (Princeton University); NHANES III, National Health and Nutrition Examination Survey III (National Center for Health Statistics); NLSCY, National (Canadian) Longitudinal Survey of Children and Youth (Statistics Canada and Human Resources and Skills Development Canada)

²The Kirkpatrick et al. (2010) study determined child’s hunger status based on a “yes” response by the person most knowledgeable of child’s food intake to the question, “Has [the child] ever experienced being hungry because the family has run out of food or money to buy food?”

³The Slack and Yoo (2005) study determined food hardship by summing parental responses to four items derived from the child items of USDA’s Household Food Security scale.

⁴The Weinreb et al. (2002) study used a methodology developed by the Community Childhood Hunger Identification Project (CCHIP). The measure is closely related to the Children’s Food Security Scale based on the HFSSM and includes many of the same items. Based on the number of food insecure conditions reported, households are classified as no hunger, adult or moderate child hunger, or severe child hunger.

⁵The Kleinman et al. (1998) study used data from a Community Childhood Hunger Identification Project (CCHIP) survey in low-income areas of Pittsburgh and surrounding Allegheny County. Children’s food security status was measured by the same eight questions as in Weinreb et al. (2002; see footnote 4), but categories were labeled as not hungry, at risk for hunger, or hungry.

Appendix B: Incidence of Food Insecurity in Selected Subpopulations, Average 2010-11

Appendix B table provides the statistics presented graphically in the main body of the report on food insecurity in households with children by selected household characteristics. The corresponding statistics for the broader category of food insecurity also are included for households with food insecurity among either adults or children.

For example, out of a total of 25.6 million married-couple households with children, about 3.5 million were food insecure, comprising 13.9 percent of all married-couple households with children and 44.4 percent of all food-insecure households with children. Children and adults were food insecure in about 1.6 million married-couple households (a subset of the 3.5 million that were food insecure), comprising 6.4 percent of married-couple households with children and 42.2 percent of all households with food insecurity among children. Children experienced very low food security at times during the year in 167,000 married-couple households, comprising 0.7 percent of married-couple households with children and 44.0 percent of all households with very low food security among children. These households with very low food security among children represent a more severely food-insecure subset of the households with food insecurity among children.

Appendix table B

Prevalence and distribution of food insecurity in households with children, by selected household characteristics, 2010-11 average

Characteristic	All food security statuses	Food-insecure households (food insecurity among adults or children)	Households with food insecurity among children (low or very low food security among children)						Households with very low food security among children		
	Number <i>1,000</i>	Number <i>1,000</i>	Prevalence		Prevalence		Prevalence		Prevalence		Share
			— Percent —	— Percent —	— Percent —	— Percent —	— Percent —				
All households with children	39,111	7,980	20.4	100.0	3,861	9.9	100.0	380	1.0	100.0	
Household composition:											
Married-couple household	25,575	3,546	13.9	44.4	1,629	6.4	42.2	167	0.7	44.0	
Cohabiting household	2,790	805	28.8	10.1	342	12.3	8.9	29	1.0	7.5	
Single female-headed household	8,528	3,112	36.5	39.0	1,635	19.2	42.3	165	1.9	43.5	
Single male-headed household	1,896	459	24.2	5.7	221	11.7	5.7	16	0.8	4.2	
Other household with children	322	58	18.1	0.7	34	10.5	0.9	3	0.9	0.8	
Race and Hispanic ethnicity: ¹											
White non-Hispanic	23,453	3,509	15.0	44.0	1,498	6.4	38.8	112	0.5	29.4	
Black non-Hispanic	5,416	1,685	31.1	21.1	838	15.5	21.7	104	1.9	27.3	
Hispanic ²	7,455	2,344	31.4	29.4	1,280	17.2	33.2	136	1.8	35.7	
Other non-Hispanic	2,787	443	15.9	5.5	245	8.8	6.3	29	1.0	7.6	
Annual household income:											
Below Federal poverty line ³	7,067	3,166	44.8	39.7	1,700	24.1	44.0	196	2.8	51.7	
100-130 percent of poverty line	2,468	906	36.7	11.3	422	17.1	10.9	41	1.7	10.9	
130-185 percent of poverty line	3,615	1,140	31.5	14.3	558	15.4	14.5	45	1.2	11.9	
Above 185 percent of poverty line	19,021	1,631	8.6	20.4	647	3.4	16.8	51	0.3	13.5	
Income not reported	6,940	1,138	16.4	14.3	534	7.7	13.8	46	0.7	12.1	
Residence relative to Metropolitan Statistical Area (MSA):											
In principal city of MSA ⁴	10,409	2,548	24.5	31.9	1,274	12.2	33.0	131	1.3	34.6	
In suburbs or outlying areas of MSA ⁵	17,199	3,009	17.5	37.7	1,429	8.3	37.0	146	0.9	38.5	
In MSA, specific location not identified	5,496	1,135	20.7	14.2	553	10.1	14.3	52	0.9	13.6	
Not in MSA (i.e., nonmetropolitan)	6,007	1,288	21.4	16.1	605	10.1	15.7	50	0.8	13.3	

Appendix table B

Prevalence and distribution of food insecurity in households with children, by selected household characteristics, 2010-11 average—Continued

Characteristic	All food security statuses		Food-insecure households (food insecurity among adults or children)		Households with food insecurity among children (low or very low food security among children)			Households with very low food security among children		
	Number <i>1,000</i>	Number <i>1,000</i>	Prevalence		Number <i>1,000</i>	Prevalence		Number <i>1,000</i>	Prevalence	
			Share <i>— Percent —</i>	Share <i>— Percent —</i>		Share <i>— Percent —</i>	Share <i>— Percent —</i>			
Census Region:										
Northeast	6,761	1,230	18.2	15.4	578	8.5	15.0	51	0.8	13.3
Midwest	8,311	1,469	17.7	18.4	670	8.1	17.3	63	0.8	16.7
South	14,696	3,193	21.7	40.0	1,567	10.7	40.6	181	1.2	47.6
West	9,343	2,089	22.4	26.2	1,046	11.2	27.1	85	0.9	22.4
Employment and labor force status of adults:										
One or more employed full-time	32,247	5,073	15.7	63.6	2,301	7.1	59.6	219	0.7	57.6
Part-time, no full-time	2,767	1,111	40.2	13.9	593	21.4	15.4	51	1.8	13.4
Unemployed looking for work, none employed	1,840	861	46.8	10.8	470	25.5	12.2	53	2.9	13.8
Disabled, none in labor force	849	453	53.3	5.7	249	29.4	6.5	26	3.1	6.9
None in labor force for reasons other than disability	1,408	483	34.3	6.1	248	17.6	6.4	31	2.2	8.3
Disability status of adults in household:										
Not in labor force due to disability	2,483	1,005	40.5	12.6	509	20.5	13.2	56	2.2	14.7
Other reported disability (ages 18-64) ⁶	1,879	691	36.8	8.7	335	17.8	8.7	45	2.4	11.8
No working-age adult with disability	34,749	6,284	18.1	78.7	3,017	8.7	78.1	279	0.8	73.5
Education of most highly educated adult:										
Less than high school	2,706	1,147	42.4	14.4	655	24.2	17.0	77	2.8	20.1
Completed high school (or GED)	8,525	2,525	29.6	31.6	1,238	14.5	32.1	99	1.2	26.0
Some college (including 2-year degree)	12,515	3,069	24.5	38.5	1,406	11.2	36.4	149	1.2	39.1
Four-year degree or higher	15,366	1,241	8.1	15.5	564	3.7	14.6	56	0.4	14.8
Age of oldest child in the household:										
0-4 years	7,630	1,403	18.4	17.6	452	5.9	11.7	33	0.4	8.6
5-8 years	7,075	1,436	20.3	18.0	680	9.6	17.6	54	0.8	14.2
9-12 years	8,353	1,819	21.8	22.8	938	11.2	24.3	78	0.9	20.5
13-15 years	8,374	1,792	21.4	22.5	952	11.4	24.7	103	1.2	27.2
16-17 years	7,678	1,529	19.9	19.2	840	10.9	21.8	112	1.5	29.5

Appendix table B

Prevalence and distribution of food insecurity in households with children, by selected household characteristics, 2010-11 average—Continued

Characteristic	All food security statuses		Food-insecure households (food insecurity among adults or children)		Households with food insecurity among children (low or very low food security among children)			Households with very low food security among children		
	Number <i>1,000</i>	Prevalence Share <i>— Percent —</i>	Number <i>1,000</i>	Prevalence Share <i>— Percent —</i>	Number <i>1,000</i>	Prevalence Share <i>— Percent —</i>	Number <i>1,000</i>	Prevalence Share <i>— Percent —</i>	Number <i>1,000</i>	Prevalence Share <i>— Percent —</i>
Number of children in the household:										
1 child	16,853	3,158	18.7	39.6	1,311	7.8	34.0	115	0.7	30.3
2 children	14,145	2,656	18.8	33.3	1,301	9.2	33.7	122	0.9	32.1
3 or more children	8,113	2,166	26.7	27.1	1,249	15.4	32.3	143	1.8	37.6

Notes: For each characteristic and food security status, “prevalence” means the number of households with the specified food security status and the specified characteristic as a percentage of all households with the specified characteristic. “Share” means the number of households with the specified food security status and the specified characteristic as a percentage of all households with the specified food security status. For example, 13.9 percent of married-couple households were food insecure and married-couple households made up 44.4 percent of all food-insecure households.

¹Race and Hispanic ethnicity refers to that of the household reference person (i.e., the person in whose name the residence is owned or rented). If residence is jointly owned or rented, any of the owners or lessees may be designated reference person.

²Hispanics may be of any race.

³The Federal poverty line for a family of two adults and two children in 2011 was an annual income of \$22,811.

⁴Households within incorporated areas of the largest cities in each metropolitan area.

⁵Households in counties (or townships in New England) that are densely populated and linked to principal cities of the MSA by daily commuting patterns.

⁶Other reported disabilities include hearing, vision, mental, physical, self-care, and going-outside-home disabilities. Working-age adults with these disabilities were not reported to be out of the labor force due to disability.

Source: USDA, Economic Research Service calculations based on Current Population Survey Food Security Supplement data.