

1. INTRODUCTION

This is the third in a series of detailed statistical reports on food security, insecurity, and hunger in U.S. households. It reports on the prevalence of food insecurity and hunger in U.S. households in 1998 and 1999 based on nationally representative surveys conducted by the U.S. Census Bureau. The report provides national-level prevalence rates as well as breakdowns by household structure, race, ethnicity, income, metropolitan residence, and region.

Preceding reports in the series were:

- *Household Food Security in the United States in 1995, Summary Report of the Food Security Measurement Project.* (Hamilton, W., et al, 1997).
- *Household Food Security in the United States, 1995-1997: Technical Issues and Statistical Report.* (Ohls, J., L. Radbill, and A. Schirm, 2001).

In addition, overview reports were published as follows:

- *Household Food Security in the United States, 1995-1998, Advance Report.* (Bickel, G., S. Carlson, and M. Nord, 2000)
- *Household Food Security in the United States, 1999.* (Andrews, M., M. Nord, G. Bickel and S. Carlson, 2000).
- *Prevalence of Food Insecurity and Hunger, by State, 1996-1998.* (Nord, M., K. Jemison, and G. Bickel, 1999).
- *Measuring the Food Security of Children in U.S. Households, 1995-1999.* (Nord, M. and G. Bickel, 2002).

For more than 50 years the Federal government has administered various programs to reduce hunger in America. Although various nutrition-related and program specific surveys have been used throughout the years to monitor the success of these programs and the degree to which people in the United States consume adequate amounts of food, until 1995 there wasn't a succinct measure of hunger and food security used in these surveys. The Federal interagency food security measurement project was organized to address the need for a standardized mechanism and instrument for measuring and obtaining data on the prevalence of food insecurity or food sufficiency in the U.S. Their

efforts were based on prior work conducted in the early 1990's that defined the concept of food security and developed underlying individual and household indicators (Campbell, 1991; Cohen and Burt, 1990, Radimer et al., 1992 and Wehler et al., 1992). Food security measurement has been guided by these concepts and the definitions developed by an expert working group of the American Institute of Nutrition that were published by the Life Sciences Research Office (LSRO) of the Federation of American Societies for Experimental Biology (Anderson, ed. 1990). These are as follows:

- ***Food Security.*** “Access by all people at all times to enough food for an active, healthy life. Food security includes at a minimum: (1) the ready availability of nutritionally adequate and safe foods, and (2) an assured ability to acquire acceptable foods in socially acceptable ways (e.g., without resorting to emergency food suppliers, scavenging, stealing, or other coping strategies).”
- ***Food Insecurity.*** “Limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.”
- ***Hunger.*** “The uneasy or painful sensation caused by a lack of food. The recurrent and involuntary lack of access to food. Hunger may produce malnutrition over time...hunger...is a potential, although not necessary, consequence of food insecurity.”

Beginning in 1992, a Federal interagency project team began a systematic effort to develop a common battery of questions on food insecurity that could be administered regularly on Government-conducted national surveys as well as on state and local surveys. The culmination of their work was a survey module that was fielded for the first time as a new Food Security Supplement to the Current Population Survey (CPS) in April 1995. These questions obtained information about various aspects of food insecurity, as experienced in both the previous 30 days and the previous 12 months. To ensure that respondents are reporting on actions or concerns that result from financial constraints, every question includes a phrase such as “because we couldn’t afford it” or “because there wasn’t enough money for food”. It is recognized that there may be other valid reasons for household food insecurity, including functional ability and mobility issues faced by isolated elderly or chronically ill people. However, the measure does not capture food insecurity resulting solely from these non-financial circumstances. Since

1995, the Food Security module has been collected annually as the key component of a supplement to the CPS, alternating between Spring and Fall.

A. The Food Security Measurement Project (Data Analysis for 1995-1997)

Abt Associates worked closely with the Federal interagency food security project team to analyze the 1995 CPS food security supplement data. This team's first objective was to develop and test a scale that measured the severity of food insecurity for each household. The scale was developed using an Item Response Theory (IRT) model, which posits an underlying latent variable (in the present context, food insecurity and hunger) that cannot be observed directly but that can be estimated from respondent answers to a set of instrument items. The statistical model assigns a relative "severity" to each of the 18 survey questions on which the scale is based, ranging from such low-severity items as whether the respondent "worried whether our food would run out" to severe items, such as a child skipping a meal because no food was available. Taken together, these severity-level measures establish the measurement scale, which effectively captures the full range of severity of food insecurity as experienced in U.S. households. Each household's food security scale score is computed on the basis of the total number of affirmative answers to the 18 increasingly severe food security questions (or 10 questions if no children are present in the household). This scale is then divided into ranges of severity that classify households in the following categories:

- **Food secure:** Households show no, or minimal, evidence of food insecurity.
- **Food insecure with no hunger evident:** Food insecurity is evident in household concern about adequacy of household food supply and the adjustments made by the household in managing their supplies, including reducing the quality of food and increasing unusual coping patterns. There is little or no reduction in household members' food intake.
- **Food insecure with hunger evident:** Adults in the household have reduced their food intake to an extent that implies that they have repeated experiences of the physical sensation of hunger.

In the report on 1995 data, the third category was subdivided into two categories. In the category "food insecure with hunger (moderate)" the hunger experiences were

usually limited to the adults in the household. The category “food insecure with hunger (severe)” included hunger experienced by children in the household. It was defined as:

- **Food insecure with severe hunger evident:** For households with children, this level implies that the children’s food intake has been limited to an extent that the children have repeated experiences with the physical sensation of hunger. For households without children and for adults living in households with children, this level implies a more severe level of adult hunger.

The more severe category was specifically intended to identify households with hunger among children. In subsequent reports (on 1996 through 1999 data), the two hunger categories were combined because it was found that the “severe” category did not reliably identify households with hunger among children. In this report as well, the two household-level hunger categories are combined, and a separate child-specific scale is used to identify households with hunger among children.

It is important to note that the scale represents the food security status of a household, not of specific individuals within the household. Correspondingly, if a household’s status is reported as “food insecure with hunger” it does not mean that all members of the household necessarily experienced hunger but that one or more members of the household had this experience at some time within the referenced time period.

The food security scale, as developed from the 1995 data, was found to perform quite well on standard tests of statistical reliability, and the model-based ranking of food security questions on which it is based has strong intuitive face validity. In addition, as compared with methods involving observing nutrient intake or nutrient availability, the food security scale represents an inexpensive approach to assessing food security for large populations, and it provides an assessment tool that covers a longer period than just a day or a week.

Another important objective of the food security analysis was to produce estimates of the prevalence of household-level food insecurity for the 12-month time period. The overall prevalence of food insecurity among U.S. households (all levels of insecurity) was estimated at 11.9 percent, equivalent to 11.94 million households in 1995.

This varied by household type, from 19.5 percent among households with children under 6 years of age, to 5.9 percent among households with elderly members but no children (Hamilton, 1997). Estimates of prevalence were also made for various subpopulations based on household characteristics, area of residence, and geographic region. Given that this was the first study using this food security measure, comparisons to similar estimates were not possible. However, comparisons were made to other somewhat comparable work conducted on food security (Cohen, et al., 1993; Wehler et al., 1991; USDA Continuing Survey of Food Intakes by Individuals, 1989-1991), and prevalence rates were found to be consistent with these earlier estimates.

Continuing the work begun by Abt Associates, Mathematica Policy Research (MPR) analyzed the 1996 and 1997 CPS food security data (Ohls, et al., 1999, 2001). The objectives of their work included the validation of the original scale, testing the stability of the scale over time and across population subgroups, development of prevalence estimates, and the comparison of these estimates to those from 1995 data. Their results verified the stability and robustness of the scale and measurement techniques utilized. The order of the calibrated items varied only at two points with two sets of inversions: “children not fed balanced meals/adult cut or skipped meals” and “children fed few, low-cost foods/respondent not eating balanced meals.” The size of these changes was small and was not substantively significant. They report that, when tracked over time, food security did not change substantially from 1995 to 1996, but did improve significantly in 1997.

The Food Security core survey module is already being used in several other surveys including: the 5-year longitudinal Survey of Program Dynamics, the Early Childhood Longitudinal Study, and the 4th National Health and Nutrition Examination Survey (NHANES-4). The core module is also being used by states and local groups to assess the food security status of the households within their communities.

B. The Food Security Measurement Project (Data Analysis for 1998-1999)

The work conducted on 1995-1997 data suggested the need to explore some additional issues, including developing methods to measure the food security status of individuals in a household and developing a scale that is appropriate for measuring the food security of children. Methods for measuring individuals' food security experiences are under development in connection with collection and analysis of data from NHANES IV. Work on the development of a children's food security scale is currently being conducted by USDA, with some results reported in this paper.

The household scale, whether with three or four categories, falls short of adequately describing the prevalence of hunger among children in a household. When the scale was first developed, the fourth category, "food insecure with severe hunger", was intended to provide a proxy for children's hunger in U.S. households. However, households in which children are experiencing hunger may not reach the level of severity of hunger among adults to be included in this fourth category and thus may be under-represented. On the other hand, households falling into this most severe category also include households with children in which only the adults are experiencing more severe levels of hunger and thus the proxy measure could also over-represent the prevalence of children's hunger. In large part, these distortions are related to the age of children in the household. While young children are usually protected from hunger even when adults experience quite severe food deprivation, older children are often treated more like adults and may experience more food insecurity with hunger than the younger children in the household.

To address this issue, a new children's food security scale has been developed (Nord and Bickel, 2001; Nord and Bickel, 2002). The children's food security scale is calculated from the eight items that relate specifically to children's experiences with food and hunger. A household affirming five or more of the eight child-referenced items is considered to be food insecure with hunger among children.

This report complements the statistics presented in earlier reports based on 1998 and 1999 data by providing:

- additional detail on prevalence estimates of food security, food insecurity, and hunger, at the household-level for all households, and for the adults in those households;
- estimates of the prevalence of food insecurity in households with children, and of hunger among children in those households, using a child-specific scale;
- an assessment of the changes in prevalence of food insecurity and hunger for selected periods between 1995 and 1999; and,
- standard errors for all prevalence and change estimates.

The report begins with a descriptive methodology chapter, and is followed by the an overview of the prevalence of food security, food insecurity and hunger. Following this, the final chapter provides detailed tables, presenting all relevant statistics and their standard errors.

A separate technical report, *Household Food Security in the United States, 1998 and 1999: Technical Report* (Cohen, et. al., 2002), on the analysis of the 1998 and 1999 Food Security Supplement Data includes: a detailed review of the methodology used for data analysis; a discussion on the balanced repeated replication techniques used to calculate standard errors; an assessment of the use of generalized variance functions (GVFs) developed by the Census Bureau for estimating standard errors; an assessment of the influence of the alternation of survey periods between Spring and Fall for the 1995-1999 CPS Supplement; and a presentation of 1998 and 1999 item calibrations and household scores developed through the use of IRT modeling and a discussion on the impact of different IRT modeling applications on food security analysis.