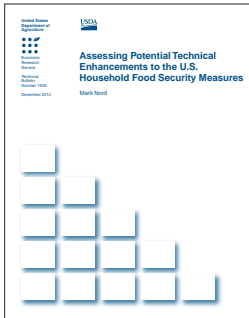


ERS *Report Summary*

Economic Research Service

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This is a summary
of an ERS report.

Find the full report at
[www.ers.usda.gov/
publications/tb-techni-
cal-bulletin/tb1936.aspx](http://www.ers.usda.gov/publications/tb-technical-bulletin/tb1936.aspx)

ERS is a primary source of economic research and analysis from the U.S. Department of Agriculture, providing timely information on economic and policy issues related to agriculture, food, the environment, and rural America.

Assessing Potential Technical Enhancements to the U.S. Household Food Security Measures

Mark Nord

What Is the Issue?

The U.S. Department of Agriculture's Economic Research Service (ERS) monitors the food security of the Nation's households—the extent to which they can consistently acquire adequate food for active healthy living—using data from an annual, nationally representative survey. Responses to multiple indicators of food insecurity by each surveyed household are combined to determine the food security status of the household. Statistical methods based on a single-parameter logistic latent-trait measurement model are used to assess the food security questions and scales based on them.

In 2003-06, at USDA's request, the Committee on National Statistics (CNSTAT) of the National Academies convened an expert panel to assess the methods USDA uses to measure and report household food security. The panel recommended that USDA continue to monitor food insecurity, affirmed the general statistical approach, and recommended that USDA consider several potential technical enhancements to the statistical methods. This report describes findings from ERS' assessments of five of those potential enhancements.

What Were the Study Findings?

- **It may not be appropriate to incorporate all available frequency-of-occurrence information into the main measure using polytomous item-response theory (IRT) statistical models.** The current standard measure represents the greatest severity of food insecurity experienced at any time during the year. Frequent or persistent food insecurity appears to represent a somewhat distinct dimension, and it may not be appropriate to represent the two dimensions in a single measure. An alternative may be to represent frequent or persistent food insecurity based on a separate scale.
- **Frequency-of-occurrence followup questions that are included in the measure should be modeled along with their base items as ordered polytomous items rather than as two independent questions.** ERS has already adopted this methodology as recommended by the CNSTAT panel.
- **Allowing item-discrimination parameters to differ from item to item would improve measurement precision only slightly and would make prevalence statistics less understandable to a lay audience than those based on the single-parameter model.**
- **The extent of differential item function (DIF) between households with and without children is not great enough to substantially distort comparisons of prevalence.**

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- **Assigning the food security status of households probabilistically to reflect the measurement error inherent in the latent-trait measurement model would reduce the error in prevalence estimates and eliminate the bias in the current methodology between households with and without children, but would not change other patterns of prevalence across subpopulations or over time.** Although the bias between households with and without children is an important issue, that bias could, alternatively, be obviated by cross-classifying households with children based on separate measures of food insecurity for adults and children. Such an approach would be more readily understood by policy officials and the public and less disruptive to the overall measurement system.
- **The findings hold when three methods are assessed in combination.** Patterns of food security prevalence over time and across subpopulations based on the most complex model—combining three of the possible enhancements—differ little from those based on the current methods.

The findings suggest that little would be gained by measuring food security with any of the more complex measures, provided an alternative methodology can be implemented to remove the current bias in comparing the prevalence of food insecurity between households with and without children.

How Was the Study Conducted?

The various measurement models were explored using data from the Current Population Survey Food Security Supplements (CPS-FSS). ERS sponsors the annual collection of the CPS-FSS, which is conducted by the U.S. Census Bureau and includes 45,000 to 50,000 households each year. The survey provides the data for USDA's annual report on food security in U.S. households. Data for various years and multiyear periods from 1995 to 2010 were used for the analyses.