

## Data and Measurement

### Data

The data for this report are drawn from the Panel Study of Income Dynamics (PSID), a nationally representative longitudinal study of families that began in 1968.<sup>2</sup> Data on income, cash and noncash transfers, and marital and fertility behavior have been collected annually through 1997 and biennially thereafter. When appropriate weights are used, as was the case here, the data are representative of the population of the United States in each year. See appendix A for more information on this study.

Comparable data on food security were collected from families with children under age 13 interviewed in 1997 and from all families interviewed in 1999. The subset of children's families interviewed in 1997 was matched to their families in 1999 to form the longitudinal data for this study.

### Measurement of Persistence and Entry Into Food Insecurity

In order to examine changes in food security of children's families, we first categorized families as (a) food secure in both 1997 and 1999, (b) food insecure in both years, (c) food insecure in 1997 but not in 1999, and (d) food insecure in 1999 but not in 1997. Categories (a) and (b) indicate continuation of the 1997 food security status from 1997 to 1999, while categories (c) and (d) indicate a change in food security status. We examine these four categories according to family demographic and economic characteristics, such as age of child, age of head, race, education, family size, family structure, having low family income (under 185 percent of the poverty line), disability, immigrant/citizen status, and receipt of food stamps. These characteristics have been shown to be associated with food insufficiency or food insecurity in other studies (Borjas, 2002; Gundersen and Oliveira, 2001; Nord, Andrews, and Carlson, 2002; Ribar and Hamrick, 2003). Our variables include not only the characteristics of families in 1997, but also changes in them between 1997 and 1999. We examine changes in family size, family structure, low income, receipt of food stamps, and disability. Thus, this report describes not only how levels of these characteristics (e.g., the amount of family income in a year) but also how changes in family characteristics (e.g., the amount by which income changed between 1997 and 1999) are related to the level and change in food insecurity status between 1997 and 1999.

To better describe the dynamics of food insecurity over the period, we calculated two additional statistics: persistence and entry. Persistence is the proportion of food-insecure families with children in 1997 that were still food insecure in 1999, calculated as the number of food insecure families in both years divided by the number of food insecure families in both years plus the number of food insecure families in 1997 only. Subtracting the proportion that persists from 1 equals the proportion that became food secure, "exiters." Because the fraction of food insecure families is small, changes comprise a large proportion of the base. Entry is the proportion of families who were not food insecure in 1997 but became food insecure by 1999, calculated as the

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<sup>2</sup> The PSID is a study of families. Because cohabiting partners are treated as married partners and included in the family and all our families have children, the PSID family is equivalent to the Census Bureau's "family household." A small number of subfamilies are counted as separate families in the PSID instead of being counted as part of the household in which they reside.

number of food insecure families in 1999 only, divided by the number of food secure families in both years plus the number of food secure families in 1999 only. The fraction that is food secure is large and includes high- as well as low-income households; entrants, therefore, constitute only a small fraction of the food-secure group from year to year. Even if entrants are equal in number to persisters, entrants can still comprise only a small fraction of those families eligible to enter. If entrants and exiters are similar in absolute numbers, the total number of food-insecure/food-secure families remains stable from year to year. If, as we show here, entrants exceed exiters, food insecurity rises.

We report how each of the demographic and economic characteristics is related to the four categories of food insecurity in 1997 and 1999 and then to persistence and to entry between the two time points. This model assumes that food insecurity persistence and entry result from economic and family circumstances in 1997 and changes in those circumstances between 1997 and 1999. First, each characteristic alone is examined. In bivariate analyses, however, the separate impacts of each variable cannot be estimated because many of these characteristics co-occur. Consequently, using logistic regression, persistence (and, then, entry) is regressed on all of these family characteristics and circumstances simultaneously.<sup>3</sup> The coefficients in this model indicate the influence of a single variable on persistence or entry net of all the other variables. Because the model is not linear, coefficients are not as easily interpreted as in ordinary least squares regression. We have transformed each coefficient into an odds ratio by exponentiating. If the independent variable is categorical, the result is the risk ratio or odds ratio of each category relative to the omitted category (table 3, columns 3 and 6). Subtracting 1 from the odds ratio and multiplying by 100 represents the percentage increase or decrease in the adjusted odds of persisting in or becoming food insecure associated with the category of interest relative to the comparison category. If the variable is continuous, the difference between the odds ratio and 1 multiplied by 100 represents the percentage increase or decrease in the adjusted odds of a 1-unit change in the independent variable.

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<sup>3</sup>  $\ln(P_{it} / (1 - P_{it})) = \alpha_i + \beta_x x_i + \beta_z z_{it} + e_{it}$

where:

$P_{it}$  is a probability of a particular transition, either entry or persistence.

$x_i$  is a vector of time-invariant explanatory variables for family  $i$ .

$z_{it}$  is a vector of time-varying explanatory variables for family  $i$  in year  $t$ .

$e_{it}$  is an error term for family  $i$  in year  $t$ .