

## ***Food Insecurity and Overweight among Infants and Toddlers: New Insights into a Troubling Linkage***

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July 2007

**O***verview.* Periodically not having enough to eat, having a diet that is inadequate, and worrying about being able to afford the amount and type of food that a household needs are all markers of food insecurity. Food insecurity persists across many households with young children and may have negative consequences for the health and well-being of infants and toddlers, who are at an especially vulnerable period in life.

*Overweight, paradoxically perhaps, is one of the negative consequences that may result when very young children experience food insecurity, though research findings have been inconsistent and inconclusive. This Research Brief draws on recently released data from the 9-month and 24-month waves of the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B) to present a portrait of food insecurity among households with very young children in the United States. The brief also examines the indirect links through which food insecurity may affect overweight for infants and toddlers.*

*Analyses indicate that very low food security in households with a nine-month old infant is associated with a higher likelihood of overweight later among toddlers. We also find that very low food security is strongly associated with parenting practices, infant feeding practices, and depressive symptoms among parents, which may affect the likelihood of overweight among toddlers. This research breaks new ground by identifying these additional factors through which overweight for infants and toddlers is likely to be influenced.*

### **DEFINING FOOD INSECURITY**

The U.S. Department of Agriculture uses the term *food insecurity* to describe a condition of “limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire food in socially acceptable ways.”<sup>2</sup> In contrast to food-insecure households, food-secure households are those in which household members are confident of having enough food at all times. There are two degrees of food insecurity.

- *Very low food security* exists when there are reports of multiple indications of disrupted eating patterns and reduced food intake.<sup>2</sup>
- *Low food security* exists when there are reports of reduced quality, variety, or desirability of diet, but there is little or no indication of reduced food intake.<sup>2</sup>

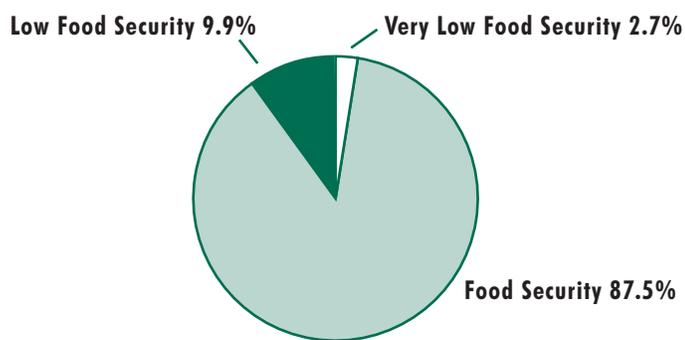
### **PREVALENCE OF FOOD INSECURITY AMONG HOUSEHOLDS WITH YOUNG CHILDREN**

Growing evidence suggests that food insecurity may be present in numerous households with young children.

**One in eight U.S. households with infants (12.5 percent) reports being food insecure.** Figure 1 shows food insecurity among all households with infants in 2001-2002. For U.S. households overall:

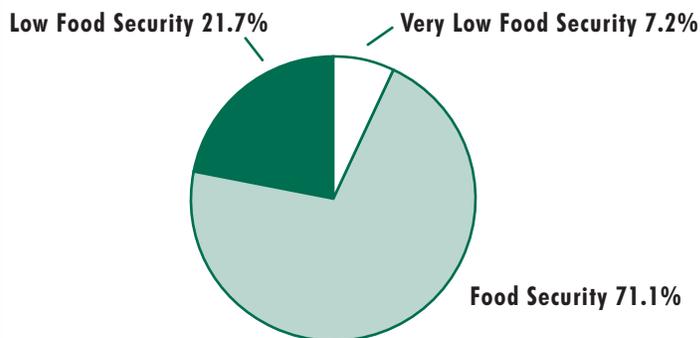
- Seven out of eight (87.5 percent) were food secure.
- Nearly 10 percent (9.9 percent) experienced low food security.
- An additional 2.7 percent experienced very low food security.<sup>b</sup>

**Figure 1** One in Eight Households With Infants (12.6%) Is Food Insecure



Source: Early Childhood Longitudinal Study-Birth Cohort, 9-month survey

**Figure 3** Nearly Three in Ten Poor Households With Infants (28.9%) Are Food Insecure



Source: Early Childhood Longitudinal Study-Birth Cohort, 9-month survey

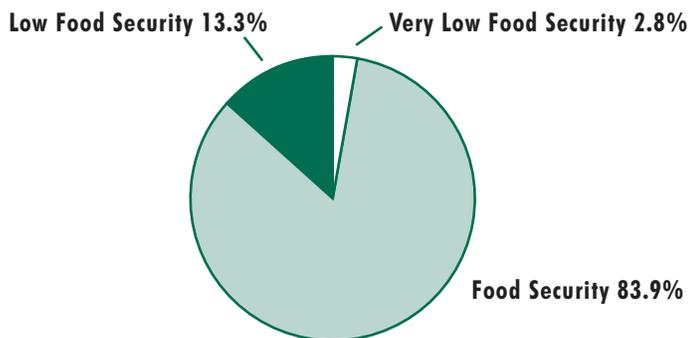
**About one in six immigrant households with infants reports food insecurity.** In 2001-2002, households with infants with at least one parent born outside the United States had a higher rate of food insecurity than did households with infants with both parents born in this country.

- Overall, 16.1 percent of households with a foreign-born parent reported experiencing food insecurity—2.8 percent reporting very low food security, and 13.3 percent reporting low food security (see Figure 2).

**About one in seven households with low-birth-weight infants is food insecure.** In 2001-2002, households with infants who weighed less than 5.5 pounds at birth (the standard cutoff for low birth-weight) had a higher rate of food insecurity than did households with normal-weight infants (see Figure 4).

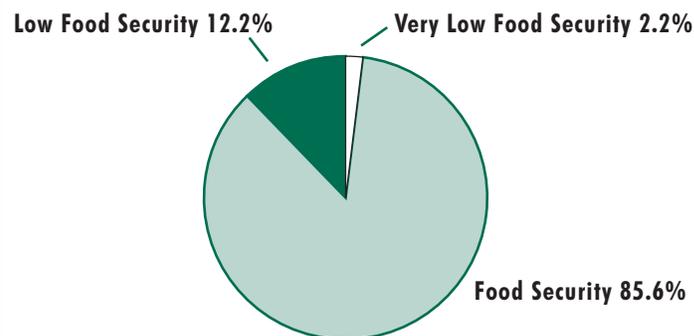
- Of households with low-birthweight infants, 14.4 percent reported having experienced food insecurity—2.2 percent reporting very low food security, and 12.2 percent reporting low food security.

**Figure 2** One in Six Immigrant Households With Infants (16.1%) Is Food Insecure



Source: Early Childhood Longitudinal Study-Birth Cohort, 9-month survey

**Figure 4** One in Seven Households With Low Birth Weight Infants (14.4%) Is Food Insecure



Source: Early Childhood Longitudinal Study-Birth Cohort, 9-month survey

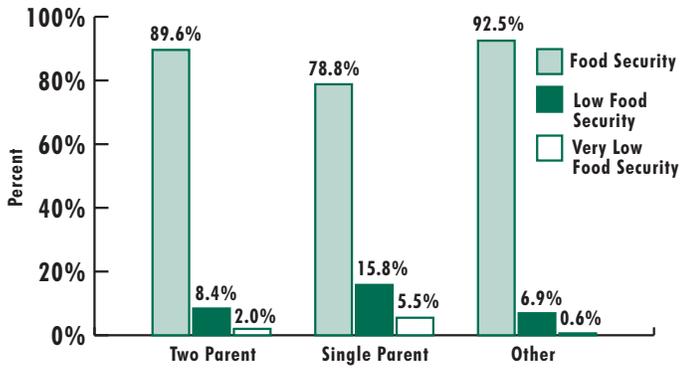
**Nearly three in 10 poor households with infants report being food insecure.** Figure 3 shows that in 2001-2002, households with incomes below 100 percent of the federal poverty level reported higher rates of food insecurity than did households overall.

- Of households with incomes below the poverty level, 28.9 percent reported food insecurity.
- Of those households, 7.2 percent reported very low food security, and 21.7 percent reported low food security.

**Food insecurity is higher in single-parent households with infants than in other types of households (see Figure 5).**

- One in five single-parent households with infants (21.3 percent) was food insecure (5.5 percent reporting very low food security, and 15.8 percent reporting low food security).
- About one in 10 two-parent households with infants was food insecure (10.4 percent). Of those households, 2 percent reported very low food security, and 8.4 percent reported low food security.

**Figure 5** Food Insecurity Is Higher in Single Parent Households With Infants (21.3%)



Source: Early Childhood Longitudinal Study-Birth Cohort, 9-month survey

### FOOD INSECURITY AND THE OVERWEIGHT QUESTION: COULD “FAMILY PROCESSES” BE THE LINK?

We turn next to the question of whether food insecurity in homes with infants is associated with the likelihood of overweight for toddlers. Although a growing body of research has examined the health consequences of food insecurity for children,<sup>3,4</sup> little of this work has looked specifically at the consequences for infants and toddlers. Instead, most research has focused on food insecurity among school-aged children. Some previous studies indicate that children from food-insecure households have an increased likelihood of being overweight, whereas other studies show no such association.<sup>5</sup>

Some other studies also suggest that food insecurity may influence or accompany family processes (depressive symptoms, parenting practices, and infant feeding practices) that, in turn, could adversely affect the weight of very young children. If policymakers do not fully understand the mechanisms through which food insecurity affects children’s overweight, they will be unable to adequately plan and respond to young children’s needs. The multivariate analyses (analyses which examine several variables at the same time) conducted for this brief show that food insecurity is associated with both overweight and a range of family processes, as seen below.

**Very low food security is strongly associated with overweight.** Young children living in households with very low food security are 61 percent more likely to be overweight than are young children living in food-secure households.

**Food insecurity is associated with mothers’ depressive symptoms.** Mothers living in food-insecure households are significantly more likely to

report symptoms of depression, such as feelings of loneliness and sadness, than are mothers living in food-secure households. Child Trends’ analyses reveal that this association exists for mothers living in households experiencing low or very low food security, and holds when other confounding influences are taken into account. The association between food insecurity and maternal depressive symptoms has also been found in studies using other data sources.<sup>6-8</sup> More research is needed to examine the links between food insecurity, depressive symptoms, and overweight.

**Food insecurity is associated with less positive parenting behaviors.** Food insecurity is also associated with less positive interactions between parents and their infant children. In these interactions, parents in food-insecure households demonstrated less sensitivity to infant cues, less responsiveness to infant distress, and less behavior directed at fostering their babies’ social and emotional growth, when compared with parents in food-secure households. While prior studies have speculated on a possible link between food insecurity and less positive parenting, Child Trends’ analyses reveal that this association holds true for parents of young children in food-insecure homes, net of other confounding factors. More research is needed to examine the links between food insecurity, parenting behaviors, and overweight.

**Food insecurity is not related to breastfeeding and early introduction of solid foods.** Prior research has not specifically examined whether food insecurity affects how parents feed young children. Child Trends’ analyses reveal no associations between food insecurity and the length of time that a mother breastfeeds her child. Moreover, we found no associations between food insecurity and the introduction of solid foods before four months, which is the earliest age recommended by the American Academy of Pediatrics.<sup>9</sup> Note that these analyses include measures of timing of the introduction of solid food, not the quality of the food.

A growing number of studies suggest that food insecurity affects the quality of food, that is, diet quality. Some studies have found that food insecurity is linked to lower dietary quality and less dietary variety, with food insecure children consuming fewer fruits, vegetables, milk, and meat; more pastas, cereals, and eggs; and less yogurt and nuts.<sup>10-12</sup> Lower diet quality may also lend itself to overweight among children.<sup>13</sup> More research is needed to establish these links.

## DISCUSSION

Little research has examined the effects of food insecurity among very young children or the factors through which food insecurity may operate to affect overweight in young children. Studies focusing on this issue are needed, especially in light of the commitment that the federal government has made to reducing food insecurity in the United States. Although the government has set a goal of making 94 percent of American households food secure by 2010,<sup>1</sup> our analyses of recent national data show levels of food insecurity among families with infants are about twice this level, with even higher levels for those in such risk groups as families with incomes below the poverty line.

Two key “take-home” points have emerged from our work.

- *Food insecurity among households with 9-month olds is linked with more maternal depressive symptoms and with less positive parenting behavior.* Prior research had suggested that the coping strategies that food-insecure households use to stave off hunger are likely to affect adults’ psychological functioning. Our findings support recent research that indicates that mothers in food-insecure households are significantly more likely to exhibit symptoms of depression than are other adults.<sup>14</sup> Food insecurity may be a stressor that results in depression.<sup>15</sup>
- *Even very early in life, children living in food-insecure households have a greater chance of being overweight—even if they do not go hungry.* By age two, food insecurity affects children’s overweight. Because the first years of life are so critical for children’s later development,<sup>16</sup> reducing—and eventually eradicating—food insecurity among families with infants is important to ensuring that children grow up healthy.

Why are children in food-insecure households more likely to be overweight than their counterparts who grow up in food-secure homes? Do parents in food insecure households, who are more likely to be depressed and at the same time less responsive in their parenting, overfeed their children today because they are uncertain about whether they will have enough to feed them tomorrow? Do families in food-insecure households try to stretch their food dollars by choosing food that “fills them up” rather than food that is high in nutrients? The common-sense answers to these questions would probably be “Yes,” but rigorous research is needed to confirm that what we think we know is, in fact, true.

## CONCLUSION

Overall, the findings presented in this brief underscore the importance of continuing and strengthening programs and policies that focus on helping to assure that families with infants and toddlers have access to food that is sufficient, readily available, predictable, reliable, and, of course, nutritious. These efforts have the potential to contribute to improved parental mental health and parenting behaviors and to children’s healthy outcomes during the very important early years of life.

This *Research Brief* is based on a forthcoming paper in the *Journal of Nutrition* titled “Food Insecurity Works Through Depression, Parenting and Infant Feeding to Influence Overweight and Health in Toddlers,” authored by Jacinta Bronte-Tinkew, Ph.D., Martha Zaslow, Ph.D., Randolph Capps, Ph.D., Allison Horowitz, B.A., and Michelle McNamara, B.A. Research for this product was made possible by the generous support of the U.S. Department of Agriculture – Economic Research Service (USDA-ERS) through Cooperative Agreement No. 43-3AEM-5-80092. The authors are indebted to the USDA-ERS for its support of the writing, editing, and production of this document. We would like to thank Ram Chandran at the USDA for his suggestions, Kristin Anderson Moore for her review of our work, and Harriet J. Scarupa for her editorial support.

## ABOUT THE DATA AND METHODS USED FOR THIS BRIEF

Data: All data reported in this brief were taken from the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B) 9-month and 24-month data collection waves. The ECLS-B is the first longitudinal study in the United States to track a nationally representative sample of children from infancy until the time that they enter school. The study oversamples important populations, such as Asians and Native Americans, twins, and low to moderately low-birthweight infants. Data collection is occurring in five waves: at approximately nine months after birth, 24 months, 48 months, entrance to kindergarten, and first grade. The primary modes of data collection are in-person interviews, direct child assessments, and videotaping of mother-child interactions, all occurring during home visits. Information on children is also drawn from birth certificates.

The ECLS-B offers several advantages for examining food insecurity and outcomes for infants and toddlers. First, the study includes the USDA Household Food Security Scale.<sup>1</sup> The ECLS-B asks a series of questions about food insecurity in the household in the 12 months prior to the survey. As a result, researchers can determine whether households were food insecure at any time in the past year and, if so, the severity of the food insecurity. Second, because the same children are followed over a period of years, analyses that look at effects over time can be conducted. Third, as part of the ECLS-B in-home interviews, health and anthropometric indicators—specifically, the child’s height, weight, and middle upper arm circumference—are collected. Having data on these indicators enables researchers to create variables that assess overweight and physical health outcomes.

Methods: We used Ordinary Least Squares (OLS) regression and logistic regression<sup>17</sup> for multivariate analyses.

### Measures:

- Household Food Security was measured at nine months using the USDA Household Food Security Scale.<sup>2</sup> An ordinal variable was created based on parent responses to 18 questions regarding a variety of food insecurity issues (e.g., experiencing hunger, skipping meals, and running out of food) over the past 12 months. This variable was coded to identify the child’s household as either (0) being food secure, (1) having low food security, or (2) having very low food security.
- Maternal Depressive Symptoms were measured at nine months using the 12-item abbreviated version of the Center for Epidemiological Studies of Depression Scale (CES-D).<sup>18</sup> The CES-D was designed to measure the frequency of depressive symptoms that have been identified in the clinical literature on depression, as well as in other existing depression inventories, and is well known for its psychometric properties.<sup>18</sup> The CES-D asks respondents to rate how often they have exhibited symptoms of depression, such as feeling lonely or having problems sleeping, over the past two-week period. Total scores ranged from 0 to 36 on the scale. Higher scores indicate higher levels of depressive symptoms.
- Parenting Practices were measured at nine months using the Nursing Child Assessment Teaching Scale (NCATS). This tool is a measure of parent-child interaction. The NCATS rates caregiver and child behaviors using four subscales: sensitivity to the infant’s cues, response to distress, social and emotional growth-fostering behavior, and cognitive growth-fostering behavior. The NCATS has been shown to have good reliability and validity.<sup>19</sup> The NCATS was a direct assessment administered and videotaped during the nine-month interview, and coded and scored later by specially trained observers. In our analysis, total scores on this scale ranged from 0 to 43. Higher scores indicate more positive parenting practices.
- Infant Feeding Practices were measured using two separate variables. *The duration of breastfeeding* was a two-part dichotomous variable assessing whether or not children had been breastfed for at least six months, as recommended by the American Academy of Pediatrics.<sup>9</sup> Children whose mothers reported that they had not been breastfed were coded as having breastfed for zero months. Children who were not breastfed or who were breastfed for less than six months were coded as (0), and those who were breastfed for at least six months were coded as (1). *Introduction of solid foods* was measured using a two-part variable indicating when the child began eating solid foods, such as Cheerios™ or food from baby jars. Children who began eating solid foods at or before three months of age were coded as (0), and those who began eating solid foods after three months were coded as (1).
- Overweight. At 24 months, using CDC-defined percentiles for child height and weight, we identified overweight children as those weighing equal to or greater than the 95th percentile.<sup>20</sup> Those who met these criteria were coded as (1), and those who did not meet the criteria who were coded as (0).

Child Trends, founded in 1979, is a nonprofit, nonpartisan research center serving those dedicated to creating better lives for children and youth. For additional information on Child Trends, including a complete set of available *Research Briefs*, visit our Web site at [www.childtrends.org](http://www.childtrends.org). For the latest information on more than 100 key indicators of child and youth well-being, visit the Child Trends DataBank at [www.childtrendsdatabank.org](http://www.childtrendsdatabank.org).

## ENDNOTES

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<sup>b</sup> Please note that percentages may not add to 100% due to rounding.

<sup>c</sup> All analyses take into account maternal employment, mother's age at birth, family structure, receipt of food stamps, WIC receipt, child's exposure to cigarette smoke, receipt of well-baby visits, child gender, and child age at survey assessment.

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