

# Food Insecurity and Stress

Among Children in the Western United States

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Does family stress contribute to childhood obesity? Are children living in the Western US more apt to be obese than their counterparts elsewhere in the country?

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## Introduction

Approximately one-in-three children in the US are either obese (i.e., BMI above the 95th percentile for age and gender) or overweight (i.e., BMI between the 85th and 95th percentile). In light of this prevalence and its consequences, childhood obesity has become a critical public health issue. Extensive research has examined the environmental and genetic determinants of childhood obesity. Two environmental factors that have recently been investigated in the literature are the roles of food insecurity and stress (e.g., Garasky et al., 2009; Gundersen et al., 2008a, 2008b, 2009; Lohman et al., 2009.) The relationship with stress is relatively straightforward – children in households experiencing greater stress are more likely to be obese than children in households with less stress (e.g., Garasky et al., 2009). The results for food insecurity are more complex with some studies finding a positive relationship with childhood obesity, others finding a negative relationship, and still others finding no relationship. (For a review see Gundersen et al., 2009.) Some research has investigated interactions. The findings are again mixed with some evidence that

stress interacted with food insecurity leads to increases in the probability of obesity and other studies finding stress interacted with food insecurity leading to decreases in the probability of obesity.

To date, the role of geographic location has been missing from this literature. In particular, there has been no work regarding whether living in the Western United States may make children more or less likely to be obese viz. food insecurity and stress relative to living elsewhere in the country. Moreover, no one has investigated whether living in a rural area matters for this issue. In response to this research lacuna, we address the following two questions. First, are children in the Western US at more or less risk of being obese in comparison to those in other regions of the country? Second, are children in the rural west at more or less risk of being obese in comparison to those in non-rural West? In this article, we consider both these questions through an examination of whether the risk factors of stress and food insecurity are more prevalent in the West.

## Data

We employ data from the second Child Development Supplement (CDS) of the Panel Study of Income Dynamics (PSID) conducted in 2002. The PSID, begun in 1968, is a longitudinal study of a nationally representative sample of individuals and the families in which they reside. The CDS, a research component of the PSID focusing on children age 0–12 years old in PSID families, was introduced in 1997. The CDS examines a range of developmental outcomes within the context of family, neighborhood, and school environments.

The PSID and CDS have four principal strengths for this study. These data provide (1) the full set of 18 questions from the Core Food Security Module (CFSM) which are used in the establishment of official food insecurity rates in the US; (2) the heights and weights of children measured by trained surveyors (rather than being reported by a parent or self-reported) that are used to determine obesity status; (3) a wide array of household-level stress measures including financial stress; and (4) the state and urbanicity (established via Beale codes as discussed in Parker and Ghelfi (2004)) of residence of each responding household.

To measure food insecurity, we use the standard 18-item scale from the CFSM. Each question is designed to capture some aspect of food insecurity and, for some questions, the frequency with which it manifests itself. Examples include “I worried whether our food would run out before we got money to buy more” (the least severe outcome); “Did you or the other adults in your household ever cut the size of your meals or skip meals because there wasn’t enough money for food?” and “Did a child in the household ever not eat for a full day because you couldn’t afford enough food?” (the most severe outcome). A complete listing of the food insecurity questions can be found in Nord et al. (2008).

We examine six categories of stressors using indices based on the number of affirmative responses to questions within each category. More specifically, the stressors and the variables used to create the indices are (1) family disruption and conflict with questions about aggravation

in parenting, alcohol use, marital status; (2) mental and physical health problems that include mental disability, physical disability, psychological distress, self-efficacy, and self-esteem; (3) housing issues including moving to cheaper quarters, moving in with others, sending a child to live with others, and spending a high share of income on housing; (4) health care struggles such as lacking health insurance coverage and spending a high share of income on health care; (5) financial strain with questions about selling possessions, postponing major purchases, postponing medical care, borrowing money from friends or relatives, filing for bankruptcy, falling behind in paying bills, being contacted by creditor, having wages garnished, having a lien filed against property, and repossession of home, car or other property); and (6) lack of cognitive stimulation and emotional support based on the Home Observation for Measurement of the Environment-Short Form (HOME-SF) scale. For more specifics on how these measures are calculated, see Garasky et al. (2009).

**Results**

In Table 1, column (1) displays the mean values for each of the variables described above for the Western region of the country. (We use the same categorization of the West as defined by WDRC, i.e., Alaska, Hawaii, Washington, Oregon, California, Idaho, Nevada, Montana, Wyoming, Utah, Arizona, Colorado, and New Mexico.) Column (2) provides values for the other regions. For most of the stressor indices, the mean value in the West is similar to the remainder of the country. The exceptions are that housing stressors are higher in the

West (0.29 out of 4.00 versus 0.18) and financial stressors are lower in the West (0.89 out of 10 versus 1.20). Additionally, food insecurity rates are substantially higher in the West (14.5% versus 9.1%).

Table 2 is structured the same as Table 1 except that column (1) is for the rural West and column (2) is for the non-rural West. As in Table 1, most index means are not statistically different. However, the stressor measuring lack of cognitive stimulation and emotional support has a higher mean in Western non-rural areas (0.327 out of 1 versus 0.174) while food insecurity is higher in Western rural areas (15.8% versus 0.0%). In interpreting these results, one should keep in mind that the sample size for this study is quite small – 34 households – in the rural West.

**Conclusions**

Garasky et al (2009) found many of the stressors examined here to be positively associated with childhood obesity. As such, policies and programs designed to reduce aspects of family stress may have a secondary beneficial impact of reducing childhood obesity. Based on these results, policy makers in Western states may wish to pay particular attention to housing issues as housing related stress appears to be more prevalent among families in this area.

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Table 1: Rates of Food Insecurity and Stress: West and Non-West Regions

	West region	Non-West Region
	Mean (s.e.)	Mean (s.e.)
Family disruption and conflict index (0-3)	0.755 (0.053)	0.781 (0.029)
Mental and physical health problems index (0-5)	1.207 (0.073)	1.264 (0.041)
Housing issues index (0-4)	0.293** (0.040)	0.183 (0.018)
Health care struggles index (0-2)	0.234 (0.035)	0.250 (0.017)
Financial strain index (0-10)	0.893** (0.110)	1.201 (0.068)
Lack of cognitive stimulation and emotional support (0-1)	0.315 (0.036)	0.299 (0.020)
Food insecure (0-1)	0.145* (0.030)	0.091 (0.013)
Unweighted sample (N)	385	1,722

Notes: West includes Alaska, Hawaii, Washington, Oregon, California, Idaho, Nevada, Montana, Wyoming, Utah, Arizona, Colorado, and New Mexico. Superscripts of \*, \*\*, and \*\*\* are used if the p-value of the difference in means is less than 0.10, 0.05, or 0.01, respectively.

Table 2: Rates of Food Insecurity and Stress in the West: Rural and Non-Rural Regions

	Rural	Non-Rural
	Mean (s.e.)	Mean (s.e.)
Family disruption and conflict index (0-3)	0.871 (0.169)	0.745 (0.055)
Mental and physical health problems index (0-5)	1.165 (0.241)	1.211 (0.078)
Housing issues index (0-4)	0.337 (0.130)	0.289 (0.042)
Health care struggles index (0-2)	0.236 (0.098)	0.234 (0.037)
Financial strain index (0-10)	0.763 (0.209)	0.904 (0.117)
Lack of cognitive stimulation and emotional support (0-1)	0.174* (0.076)	0.327 (0.039)
Food insecure	0.000*** (0.000)	0.158 (0.033)
Unweighted sample (N)	34	351

Notes: West includes Alaska, Hawaii, Washington, Oregon, California, Idaho, Nevada, Montana, Wyoming, Utah, Arizona, Colorado, and New Mexico. Superscripts of \*, \*\*, and \*\*\* are used if the p-value of the difference in means is less than 0.10, 0.05, or 0.01, respectively.