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What Fa ors Account for Stat o-State Differen es in Food Se urity?

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What Factors Account for State-to-State Differences in Food Security? By Judi Bartfeld, University of Wisconsin-Madison, Rachel Dunifon, Cornell University, Mark Nord, Economic Research Service, U.S. Department of Agriculture, and Steven Carlson, Food and Nutrition Service, U.S. Department of Agriculture. Economic Information Bulletin No. 20.

Abstract

States differ in the extent to which their residents are food secure—meaning that they have consistent access to enough food for active, healthy living. The prevalence of food security in a State depends not only on the characteristics of households in the State, such as their income, employment, and household structure, but also on State-level characteristics, such as average wages, cost of housing, levels of participation in food assistance programs, and tax policies. Taken together, an identified set of household-level and State-level factors account for most of the State-to-State differences in food security. Some State-level factors point to specific policies that are likely to improve food security, such as policies that increase the supply of affordable housing, promote the use of Federal food assistance programs, or reduce the total tax burden on low-income households.

Keywords: Food security, food insecurity, hunger, very low food security, State predictors of food security

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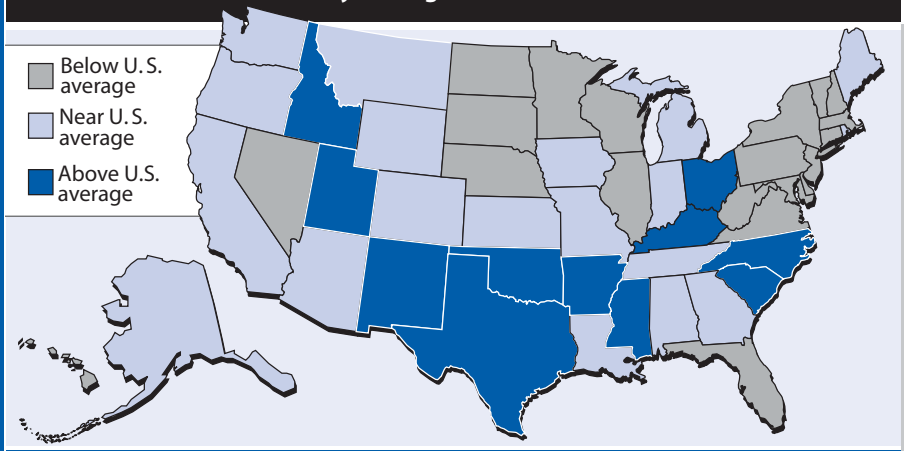
Introduction

Food security, defined as access by all people at all times to enough food for an active, healthy life, is one of several conditions necessary for the Nation's population to be healthy and well nourished. USDA's food security monitoring project has found that food security differs substantially among States. For example, the most recent statistics available indicate that during the 3-year period 2003-05, the prevalence of food insecurity—the lack of consistent access to enough food—varied from over 16 percent in New Mexico and Mississippi, to less than 7 percent in North Dakota, New Hampshire, and Delaware (fig. 1). The prevalence of food insecurity among households with children during the period 1998-2001—one of the main categories analyzed separately in this study—ranged from about 23 percent in New Mexico to 10 percent in Connecticut, Maryland, and Minnesota.

State-level differences in food insecurity reflect both differences in the makeup of State populations, such as the income, employment, age, education, and family structure of their residents, as well as differences in State characteristics, such as

Figure 1
Prevalence of food insecurity, average 2003-05



Note: The prevalence of food insecurity in the United States averaged 11.4 percent during this period.
Source: U.S. Department of Agriculture, Economic Research Service. *Household Food Security in the United States, 2005*, www.ers.usda.gov/publications/err29/

economic conditions, the accessibility and use of food assistance programs, and tax policies. Taken together, these two sets of characteristics account for most of the State-to-State differences in food insecurity, but the relative importance of each set differs depending on the State. While household income and employment contribute largely to the differences, other factors also have substantial effects on the extent of food insecurity in many States.

This bulletin reports on household-level and State-level characteristics associated with food insecurity during the 4-year period 1998-2001.[1] (See box, "How Is Food Security Measured?") Households with children and households without children are analyzed separately, since some programs and policies are expected to affect only households with children, or to affect them differently than households without children. The final analysis, which explores the extent to which household-level and State-level factors accounted for high or low prevalence rates of food insecurity in different States, is restricted to households with children.

[1]The research on which this bulletin is based used data from several years ago due to availability of both food security data and data for explanatory variables at the time the research commenced. The effects of household and State characteristics on food security are likely to have remained quite stable over the intervening years, but the State-specific outcomes may have changed if a State's population-composition, policies, or program characteristics have changed.

How Is Food Security Measured?

The U.S. Census Bureau collects information on the food security of the Nation's households in annual, nationally representative surveys sponsored by USDA's Economic Research Service (ERS). The food security survey, conducted as a supplement to the Current Population Survey (CPS), includes about 50,000 households and obtains information about how much households spend for food, whether they use various food assistance programs, and whether they have any problems affording enough food for household members. The food security of households in the survey is assessed by a series of questions about behaviors and experiences that are known to characterize households that are having difficulty meeting their food needs. The labor force section of the CPS obtains information on the demographic characteristics, employment, and income of members in the surveyed households. This study used data from five food security surveys conducted between 1998 and 2001. (Due to a change in the survey schedule, two surveys were conducted in 2001.) State characteristics were assembled from a variety of sources, including program administrative data, Census data, government economic reports, and private research organizations. Researchers at the University of Wisconsin-Madison and Cornell University, with funding assistance and collaboration from ERS, analyzed these data using statistical methods that assess associations among characteristics of both households and States jointly. The results of these analyses, therefore, represent the association of each characteristic with food insecurity while holding all other characteristics constant.

For further information about measurement of food security, see:

Bickel, G., M. Nord, C. Price, W.L. Hamilton, and J.T. Cook. *Guide to Measuring Household Food Security*, Revised 2000, U.S. Department of Agriculture, Food and Nutrition Service, 2000, www.fns.usda.gov/fsec/files/fsguide.pdf.

U.S. Department of Agriculture, Economic Research Service. *Food Security in the United States: Measuring Household Food Security*, www.ers.usda.gov/briefing/foodsecurity/measurement.htm.

For the most recent national and State-level statistics on food security in the United States, visit the Food Security in the United States briefing room on the ERS website at www.ers.usda.gov/briefing/foodsecurity/

The Makeup of a State's Population Affects the Prevalence of Food Insecurity in the State

Households with the following characteristics are more likely than others to be food insecure (holding other factors constant). Consequently, States with above-average proportions of households with these characteristics tend to have higher prevalence rates of food insecurity:

- Low income—income less than the Federal poverty line, but also income in the range just above the poverty line (up to about 185 percent of the poverty line)
- Low education—especially those with less than high school education
- Black, Hispanic, and Native American household heads
- Renting their home (rather than owning it)
- Living in the central city of a metropolitan area
- Three or more children
- Single mother with children
- No adult in the household employed
- No elderly in the household
- Disabled household member
- Noncitizen household head

State-Level Policies, Programs, and Economic Conditions Also Affect the Prevalence of Food Insecurity in the State

The context in which households function can make it easier or more difficult for them to ensure consistent access to enough food. The employment and earnings opportunities in the local economy as well as States' policies and programs affect the resources available for households to meet their needs for food and other goods and services. Local costs of housing and other basic necessities affect the amounts households can spend for food. Social contexts such as supportive family and community networks and institutions may also help tide families over during periods of economic difficulty.

It is more difficult to identify, measure, and assess the impact of State-level factors than of household-level factors.[2] Nevertheless, analysts found the following State-level factors (in approximate order of importance) to be associated with higher likelihood of food insecurity:[3]

- Low average wages.
- High rental cost for housing.
- Low summertime participation in the National School Lunch Program and Summer Food Service Programs.[4]
- High unemployment rate—States with higher unemployment rates have higher rates of food insecurity, even after adjusting for current employment within households. This effect may

[2]State factors affect households' food security less directly than household factors, and some State-level factors can only be measured indirectly. As a result, effects of State-level factors tend to be more diffused and difficult to detect than household factors. Also, more complex statistical methods (called hierarchical regression methods) are required in the joint estimation of household and State factors in order to appropriately account for the fact that all households in a State face the same State factors.

[3]The order of importance is approximate because it differs somewhat for households with and without children and some factors affect only households with children.

[4]Caution is suggested in interpreting the association with summertime participation in the National School Lunch Program (NSLP), however, because this State factor appears to affect food security in households with no children in a manner that is similar although slightly weaker. Thus, it may be that other State factors only coincidentally associated with summertime NSLP meals could be responsible for some of this association in households with children.

reflect less consistent employment during the year, since food insecurity in these analyses is assessed over the entire year. The State unemployment rate especially affects households with incomes that are low but above the poverty line.

- Residential instability—States in which people move more frequently have higher rates of food insecurity. People move for many reasons; some move to a better job or home; some move to reduce housing costs or to avoid eviction. On balance, high residential mobility appears to reflect a high incidence of economic problems and family disruptions. Frequent or long-distance moves may also weaken social ties to family and community—ties that can help buffer against food insecurity.
- Low participation in the Food Stamp Program (adjusted for numbers of persons in poverty)—This association has been confirmed only for households with children and appears to be important only for households with incomes that are low but above the Federal poverty line.
- High tax burden on low-income households (including combined effects of property, sales, and income taxes)—This association has been confirmed only for households with children and appears to be important only for households with incomes that are low but above the Federal poverty line.

These Household and State-Level Factors Account for Most of the Inter-State Differences in the Prevalence of Food Insecurity

Taken together, the household and State characteristics included in this study account for most of the inter-State differences in the prevalence of food insecurity both for households with children and for those without children. For households with children, which were a focus of the study on which this bulletin is based, household and State characteristics together accounted for about 86 percent of the differences in the prevalence of food insecurity across States during the period 1998-2001. On average, household-level and State-level factors are about equally important in accounting for inter-State differences in food insecurity, but the relative importance of household and State factors differs from State to State.

States Differ in the Extent to Which Household-Level Versus State-Level Characteristics Account for Prevalence Rates of Food Insecurity

Differences between each State's prevalence rate of food insecurity (for households with children) and the national average of 15.4 percent are presented under three analytic scenarios—actual (observed), adjusted for characteristics of the households in the State, and adjusted for both household- and State-level factors (table 1). For example, in Michigan, the rate was 3.7 percentage points below the national average. This was 3.2 percentage points below the rate that would be expected given the demographic and economic characteristics of Michigan's households. Thus, a half percentage point (the difference between -3.7 and -3.2) of Michigan's lower-than-average food insecurity was attributed to favorable demographic, economic, and other characteristics of Michigan's households. Favorable State economic characteristics, policies, and programs accounted for another 2.8 percentage

Table 1

State prevalence rates of food insecurity for households with children compared with the average across States, 1998-2001

State	Actual[1]	Difference: State prevalence less average across all States (15.4 percent)		State	Actual[1]	Difference: State prevalence less average across all States (15.4 percent)	
		Remaining after accounting for characteristics of households in the State	Remaining after accounting for both household- and State-level characteristics			Remaining after accounting for characteristics of households in the State	Remaining after accounting for both household- and State-level characteristics
	Percentage points				*Percentage points*		
AK	-0.9	2.3	-0.7	MT	5.1	3.0	1.1
AL	1.4	-1.9	-.3	NC	-.3	-1.9	-2.1
AR	4.1	-.3	-1.0	ND	-2.4	-2.6	-2.4
AZ	5.0	1.4	-2.0	NE	-.4	.9	1.0
CA	4.2	.8	.6	NH	-3.9	-.4	-.7
CO	-3.0	1.3	-2.0	NJ	-4.0	.3	.9
CT	-5.4	-2.0	2.1	NM	7.5	2.8	1.6
DC	1.9	-5.3	-1.2	NV	0.0	-.2	-.8
DE	-3.9	-2.8	.5	NY	-.8	-4.0	-1.2
FL	3.5	2.9	-.7	OH	-.1	.1	1.0
GA	3.0	1.7	1.0	OK	4.0	.7	0.0
HI	3.2	4.0	-.3	OR	6.4	7.1	2.5
IA	-3.8	-1.9	-1.0	PA	-3.4	-2.1	.9
ID	3.9	3.6	.1	RI	-2.6	-2.4	-1.8
IL	-1.7	-1.1	.1	SC	-1.1	-2.3	-1.2
IN	-2.8	-1.4	.1	SD	-1.6	-1.6	-.2
KS	.6	1.6	-.2	TN	1.3	-.1	1.1
KY	-1.0	-2.1	-.1	TX	6.0	2.5	1.6
LA	5.2	-1.2	-1.5	UT	3.2	6.6	3.1
MA	-4.2	-3.7	-1.3	VA	-1.9	.3	.1
MD	-5.4	-.1	-1.0	VT	.9	4.1	3.5
ME	-2.3	-.1	.7	WA	2.1	4.5	.4
MI	-3.7	-3.2	-.4	WI	-3.5	-1.4	-1.4
MN	-5.2	.8	2.0	WV	.4	-3.3	-.5
MO	-2.7	-2.1	-.2	WY	-.2	1.0	1.4
MS	5.6	.2	-.7				

[1] State rates of food insecurity for households with children are not precisely represented by adding these deviations to the all-State average of 15.4 percent. For technical reasons, these models were estimated without applying the survey weights, which adjust for the complex sample design of the Current Population Survey. Additional factors, such as the differences across years, would also need to be taken into account to precisely represent the State prevalence rates.

Source: Calculated by the authors using Current Population Survey Food Security Supplement data from 1998-2001.

points (the difference between -3.2 and -0.4), leaving a residual of -0.4 percentage points. That is, after accounting for all of the household-level and State-level factors for which data were available in this study, the prevalence of food insecurity in Michigan was 0.4 percentage points lower than would be expected—a residual difference that the model fails to explain.

Household factors (that is, the composition of the State population) account for unusually high prevalence rates of food insecurity in some States, while State-level characteristics are more important in others. In Louisiana, for example, household-level demographic and economic characteristics fully accounted for the State's above-average prevalence of food insecurity, while State-level factors played no substantial role. The observed prevalence of food insecurity in Louisiana was more than 5 percentage points above the national average but was actually lower (by 1.2 percentage points) than the prevalence that would have been expected given the economic and demographic characteristics of the resident households. The further adjustment for State-level factors in Louisiana had little effect, indicating that the combined effect of State-level economic conditions, policies, and programs was similar to that of the average State and played no substantial role in the above-average prevalence of food insecurity in the State. In Oregon, on the other hand, State-level factors (economic characteristics, policies, and programs) accounted for most of the State's above-average prevalence of food insecurity, while household-level characteristics played no measurable role.

Similar differences in contributing factors were observed in States with low prevalence rates of food insecurity. For example, low rates of food insecurity in Minnesota, Maryland, and New Hampshire were completely, or almost completely, accounted for by household factors; the demographic and economic characteristics of the populations in these States made them less vulnerable to food insecurity than populations in other States. In Michigan and Massachusetts, on the other hand, below-average rates of food insecurity resulted more from State-level factors than from household-level factors.

States also differ in the extent to which the combined household and State characteristics account for their observed rates of food insecurity. For example, in Idaho, Illinois, Indiana, Oklahoma, and Virginia, the deviations that remained after accounting for both household and State-level characteristics were near zero. In other words, the prevalence rates of food insecurity in these States were almost exactly as expected given the characteristics of the households in the States and the economic conditions, policies, and programs of the States. In other States, relatively large residuals remained after accounting for the combined effects, indicating that unidentified factors resulted in prevalence rates considerably lower (North Dakota) or higher (Oregon, Utah, and Vermont) than would have been expected given the characteristics of the households in the States and the economic conditions, policies, and programs of the States.

In most cases, adjusting for the demographic and economic characteristics of a State's population moderates the food insecurity rate if it is substantially higher or lower than the national average. In some States, however, the opposite is true. Some States with food insecurity rates close to the national average had prevalence rates considerably above or below average after adjusting for the demographic and economic characteristics of the population. For example, the prevalence of food insecurity in Washington, DC, was 1.9 percentage points above the national average. That rate was, however, 5.3 percentage points lower than would have been expected, taking into account the composition of DC's population. To a large extent, this lower rate was due to a favorable economic and policy context, as indicated by the size of the residual after accounting for those characteristics. Conversely, the prevalence of food insecurity in Utah (3.2 percentage points above the national average) was 6.6 percentage points higher than expected after taking into account the composition of the population, due in part to a less favorable economic and policy context.

State Action Can Improve the Food Security of Residents

Household and State characteristics identified in this study accounted for about 86 percent of the variation across States in prevalence rates of food insecurity among households with children during the study period. About half of the variation was associated with State-to-State differences in economic characteristics, policies, and programs. Some State-level factors identified in this study point to specific State policies and programs that can help promote access by all households to enough food for active, healthy living. For example, State policies that increase the supply of affordable housing for low-income households, promote the use of Federal food assistance programs by eligible households, and reduce the total tax burden of low-income households are likely to reduce the prevalence of food insecurity in the State.

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