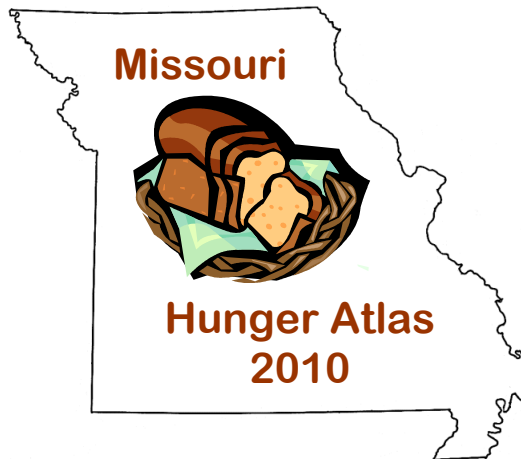


Interdisciplinary Center for Food Security
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Missouri Hunger Atlas 2010

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Executive Summary

Background: According to the US Department of Agriculture, 15.8 percent of Missouri’s nearly six million residents were food insecure in 2008. This suggests that 934,034 residents faced uncertainty in acquiring sufficient food for their household. Further, the USDA estimates that 5.8 percent of the population, or roughly 344,000 Missourians, had “very low food security” (formerly “food insecure with hunger”) in 2008, suggesting they experienced hunger. Trends in food insecurity and hunger are not positive ones for our state, as current averages for both measures have continuously increased over the first decade of this century. Public spending on hunger programs (e.g., SNAP/Food Stamps) totaled more than 1.4 billion dollars in 2008. The *Missouri Hunger Atlas 2010* is a collaborative effort of University of Missouri faculty to document, at the county-level, the breadth and extent of hunger need, and the performance of public and private programs in meeting that need.

Hunger “need” key findings

- County food uncertainty levels, as well as eligibility rates for SNAP/Food Stamps, WIC, and free/reduced lunch programs, are generally highest in chronically-poor regions in the southern and northern thirds of the state, and particularly in the Missouri Ozarks and southeastern (“bootheel”) regions. St. Louis City also continues to have high need.
- Rates of food uncertainty and eligibility for every major public program to address food insecurity have increased in virtually all areas of the state.
- Levels of food uncertainty remain higher in households with children than in those without children.
- Suburban counties have lower rates of food uncertainty and program eligibility but these percentages continue to increase. Given the high concentration of population in these counties, the absolute numbers of people in need may be masked by low percentages.
- Rural regions have the highest concentrations of high need counties in the state.

Hunger “performance” key findings

- The success of reaching citizens in need varies greatly across the state and is not consistent across programs.
- Many of the counties with the highest rates of food uncertainty and program eligibility are also doing comparatively well in levels of participation in federal assistance programs.
- Fourteen Missouri counties, the majority of them located in the southwest and southcentral regions, are considered high need and low performing counties.
- Many highly-populated suburban counties are among the lowest performers in terms of public program participation, which suggests citizens in these areas are less likely to be receiving the help they need.

Background

This atlas assesses the extent of food insecurity in the state of Missouri. It also begins to gauge how well public programs are doing in meeting the needs of those of our fellow citizens who have difficulty acquiring sufficient amounts and qualities of food. The concept of food security, as the Food Assistance and Nutrition Research Program within the United States Department of Agriculture defines it, refers to “access by all people at all times to enough food for an active, healthy life.” Food insecurity in this country is normally due to insufficient resources for food purchases, and the majority of food insecure households avoid hunger by relying on a more narrow range of foods or acquiring food through private and public assistance programs. The USDA reported that 17.1 million households in the US (14.6 percent of households), or more than 49 million Americans, experienced “low food security” in 2008. Of these, 6.7 million households, comprising more than 17 million citizens had “very low food security,” meaning the food intake of some household members was reduced and their normal eating patterns were disrupted because of the lack of money and other resources.¹

According to the USDA, food insecurity in Missouri from 2006 to 2008 averaged 14.0 percent. This rate is nearly 20

¹ Prior to 2005, the USDA described households with “very low food security” as “food insecure with hunger” and those with “low food security” as “food insecure”. The labels changed at the recommendation of the Committee on National Statistics (National Research Council, 2006). The criteria by which the USDA classified households remained unchanged, however, and in this atlas we use the older phrases of “food insecure” and “food insecure with hunger”.

percent higher than the figure for 2003-2005 and 39 percent higher than the average (10.1 percent) one decade ago (1996-1998). Among children, the percentage is even greater. The USDA estimates that food insecurity affected 23.4 percent of all households in the state with children in 2008, which would mean more than 160,000 households including roughly 360,000 children worry about meeting basic food needs. In the more severe case of food insecurity with hunger, state levels averaged 4.0 percent over the 2006-2008 period but stood at 5.8 percent in December 2008. Missouri is one of 17 states with rising rates of food insecurity with hunger, and the increase over the first decade of the 21st century is among the highest five in the country.

The costs of food insecurity are economic, social, physical and psychological. For example, the economic costs of food insecurity among adults include income loss, work absenteeism, higher demand for public benefits and social services and increased health care expenditures. Food insecurity and poverty are clearly connected—poverty is the best single predictor of food insecurity, and hunger strongly correlates with lower educational achievement, unemployment and impaired work performance. Recent studies of children show food insecurity and hunger are significant predictors of chronic illness, low birth weight, lower school performance and developmental problems.

To help Missourians gain a greater understanding of the extent and depth of food insecurity and hunger in the state, researchers at the University of Missouri’s Interdisciplinary Center for Food Security compiled county-level data to provide (1) a snapshot of the extent and depth of food insecurity and hunger (*which we refer to as “need” in this*

atlas) and (2) an assessment of participation in programs intended to mediate food insecurity and hunger needs (labeled as “*performance*” in this *atlas*). With the cooperation of many public and private sector agencies and organizations, we identified appropriate variables or indicators that we could use to measure hunger “need” and “performance” for each of Missouri’s 114 counties and St. Louis City. The largest part of this report is the county pages that include the need and performance indicators for each of these 115 units. We also provide maps of selected indicators to show the distribution of data across the state.

We hope this atlas will:

- Raise Missourians’ awareness of the extent and depth of food insecurity and hunger needs in their own locations and in other regions of the state;
- Increase Missourians’ knowledge of the extent of the work of public programs and food banks in their regions and the success of these programs in reaching food insecure populations;
- Reveal geographic patterns, including regional and county-level differences, in hunger need and performance in our state;
- Provide measures of need and performance that can be updated on a periodic basis and compared to assess trends in need and performance variables; and,
- Help public and private decision-makers assess food insecurity need and program performance as a means

for improving the delivery of human, technical, and fiscal resources to residents and regions requiring assistance.

This publication is consistently a “work in progress” in two senses. First, it is our plan to update the atlas every two years with the latest available information and increasingly validated measures of need and performance. Second, we welcome comments and suggestions from readers and users of this atlas. Readers might identify different sets of indicators than those described here, for example, or might have creative ideas for more effective presentations of the findings. As our goal is to have this atlas used by diverse groups in Missouri and outside our state, we sincerely hope that dialogue about both our methods and results become part of wider discussions among all citizens, from those professionally involved in hunger programs to concerned residents of our state.

Reading the Atlas, County Tables, and State Maps

This atlas presents information on indicators that measure both food insecurity and hunger need, and program success in meeting citizen needs. We have identified seven indicators related to “need” and sixteen measures of “performance.” Depending on the variable, our measures focus on the 2008 calendar year, or the state fiscal year 2009 (July 1, 2008 - June 30, 2009). In the county pages that make up the bulk of this report, readers will find county-level information on (A) general profile indicators, (B) economic indicators, (C) need indicators, and (D) performance indicators.

The next few pages of this atlas provide an overview of these four categories, as well as important information on how to read the county tables. This section also includes information on how to read the state maps included in this atlas.

County General Profile Indicators

At the top of each county page are six general indicators, three each related to population and health. These give readers a general profile of the county context. We present health variables due to the close correlations between food security, diet, and health status.

Economic Indicators

In the lower left corner are three poverty measures that we include because poverty is the best predictor of food security in the United States. Median household income,

unemployment rate, and percent of female headed households are additional measures of economic well-being.

Need Indicators

The purpose of the “Need Indicators” is to provide measures of the extent of food insecurity and hunger in each Missouri County.

How to read the table of “Need Indicators”

The left side of each table provides information on seven indicators of food insecurity and hunger need. Four columns of information are presented for each variable. To demonstrate how to read this information, here is the first need indicator for SNAP/Food Stamps for Adair County (see Page 30):

	County	Trend	State	County Rank*
SNAP/Food Stamps				
% total population income eligible	30.5%	↑	18.2%	Very high

- The *first column*, “County,” reports the result for the county on this indicator; in this case, 30.5% of Adair County’s total population has an income level that qualifies for SNAP/food stamp eligibility.
- The *second column*, “Trend,” shows whether the county’s level has increased (↑) decreased (↓) or stayed the same (-). The trend period, usually three or five years, is defined for each variable in the next section. If an increase or decrease is shown, this

means a growth or decline of more than 5 percent over the trend period. In our example, the Adair County rate has increased more than 5 percent over the past three years.

- The *third column*, “State,” shows the average across all counties and St. Louis City for the indicator, in this case 18.2 percent.
- The *fourth column* is labeled “County Rank.” This last column indicates the county’s rank in comparison with all other Missouri counties and St. Louis City. Individual county results are normally divided into five quintiles to reveal if a county’s need is in the top 20%, second highest 20%, and so on. The labels under “county rank” indicate the following groups:

Very High – in the highest quintile (from the 80th to the 100th percentile) of need in MO

High – in the second highest quintile (60th to 79th percentile) of need

Average – from 40th to 59th percentile of need

Low – in the second lowest quintile (20th to 39th percentile of need)

Very Low – in the lowest quintile (1st to 19th percentile) of need in MO

The example on Page 3 shows the level in Adair County, in comparison to other counties, is in the highest quintile of percent of total population eligible for SNAP/Food Stamps.

The reader will find the designation “NA” where data is not available or appropriate to report.

Performance Indicators

The “Performance Indicators” provide county-level measures of the extent to which residents are participating in public and private programs intended to help residents cope with food insecurity. Knowing county needs, we now examine the success of programs established to address those needs.

How to read the table of “Performance Indicators”

The right side of each table provides information on sixteen indicators of performance. Four columns of information are presented for most variables. To demonstrate how to read this information, here is the performance indicator for Adair County (see Page 30) related to the need variable just discussed:

	County	Trend	State	County Rank*
SNAP/Food Stamps Participation				
% income eligible Population	34.8%	↓	70.5%	Very low

- The *first column*, “County,” reports the measure of the performance indicator for that county. In this case, the table reveals participation of 34.8 percent of the total population eligible for the SNAP/Food Stamps.
- The *second column*, “Trend,” shows whether the county’s level has increased (↑) decreased (↓) or stayed the same (-). The trend period, usually three or five years, is defined for each variable in the next section. If an increase or decrease is shown, this means a growth or decline of more than 5 percent over

the trend period. In our example, the Adair County participation rate has decreased more than 5 percent over the past three years.

- The *third column*, “State,” shows the average across all counties and St. Louis City for the indicator. The average Missouri participation rate is 70.5 percent.
- The *fourth column* is labeled “County Rank.” This last column indicates the county’s rank in comparison with all other Missouri counties and St. Louis City. For most variables, individual county results are divided into five categories or quintiles to reveal if a county’s performance is in the top 20%, second highest 20%, and so on. The labels under “county rank” indicate the following groups:

Very High – in the highest quintile (from the 80th to the 100th percentile) of performance in MO

High – in the second highest quintile (60th to 79th percentile) of performance

Average – from 40th to 59th percentile

Low – in the second lowest quintile (20th to 39th percentile) of performance

Very Low – in the lowest quintile (1st to 19th percentile) of performance in MO

The example on Page 4 shows the level of income eligible participation in Adair County is in the “very low” quintile, or the bottom 20 percent of rates in the state.

The reader will find the designation “NA” where data is not available or appropriate to report.

State Maps

For selected indicators of food insecurity and hunger need and performance we provide maps to graphically represent patterns among Missouri’s 114 counties and St. Louis City. The maps allow the reader to quickly note the rankings of all counties in the state.

Each map divides the state into five equal fifths, or quintiles, according to the complete results for the measure. A quintile thus includes one-fifth of the counties in the state.

The quintiles on each need indicator map are arranged from very low (the 23 counties with lowest need on that measure) to very high (the 23 counties with highest need). For example, “Food uncertainty” rates for total county population range from a state low of 8.4 percent (St. Charles County) to a high of 20.2 percent (Pemiscot County). To make the state map of Food Uncertainty for the total population, the 23 counties with the lowest levels of food uncertainty (8.4 – 11.0 percent) are in the first, or lowest need, quintile. The second quintile includes the 23 counties next lowest in levels of food uncertainty, with rates from 11.1 to 12.3 percent. This pattern continues to the fifth quintile or highest need group, which includes 23 counties with food uncertainty rates from 15.0 to 20.2 percent.

Final Notes

This atlas emphasizes percentages rather than absolute numbers. In other words, most of our indicators reveal the percentage of a county's population that is, for example, food insecure, or eligible for a particular program. With this approach, we are able to compare need and performance measures between counties with different population numbers. However, we should remind readers that emphasizing percentages and comparatively assessing need and performance percentages between counties could cloak important differences in the absolute numbers of people affected by any single variables. The large proportion of people in Missouri's highest populated counties, for example St. Louis City, St. Louis County and Jackson County, means that the number, rather than level, of people who are food insecure, eligible for a program or participating in a program are almost always highest in these regions. St. Louis City, for example, appears to be doing well in participation rates for

specific programs and has a higher participation rate than many other counties with lower numbers of eligible participants. However, a participation rate of 80% in a highly-populated county may mean that more people remain nonparticipants than in a county with a lower population and 70% participation rate. Similarly, a rate of eligibility for a program may be lower in a highly populated county than a less populated area, but there may well be more individuals eligible in the former county due to the high number of residents.

The next four sections of the report present the indicators that readers will find on the county pages. These are the county profile, economic, need, and performance indicators. We present the name of each indicator, how it is measured, and the source of our data. We also provide state maps of selected indicators as well as information on some of the key programs in Missouri to address food insecurity and hunger.

County Profile Indicators

Total population

Number of people of all ages living in the county in 2008. Source: U.S. Census Bureau

Population < 18 years

Percent of population in county under 18 years of age in 2008. Source: U.S. Census Bureau

Population > 64 years

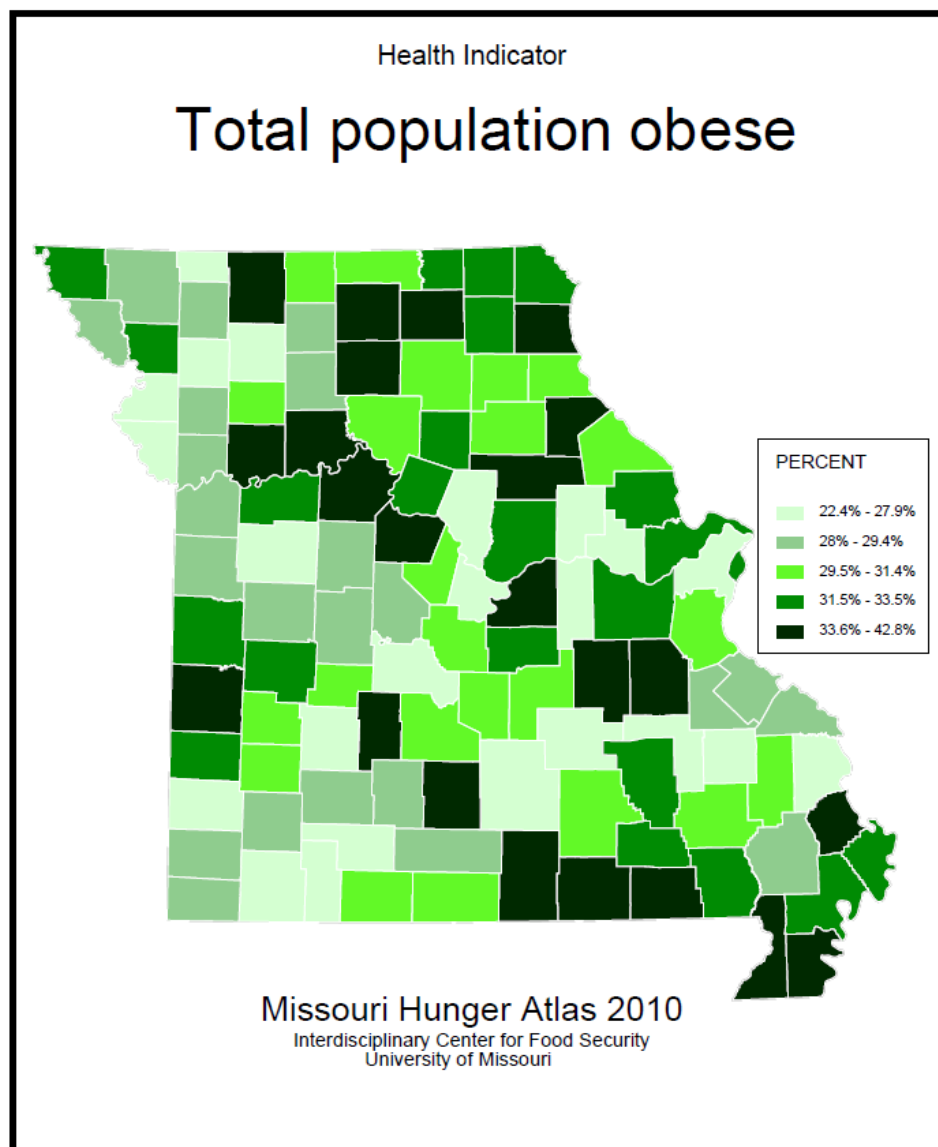
Percent of population in county 65 years of age and older in 2008. Source: U.S. Census Bureau

Obesity (MAP)

Percent of the population 18 years of age and older in 2007 that is obese (Body Mass Index equal to or greater than 30). Source: 2007 Missouri County-level Study Questionnaire, Missouri Department of Health and Senior Services

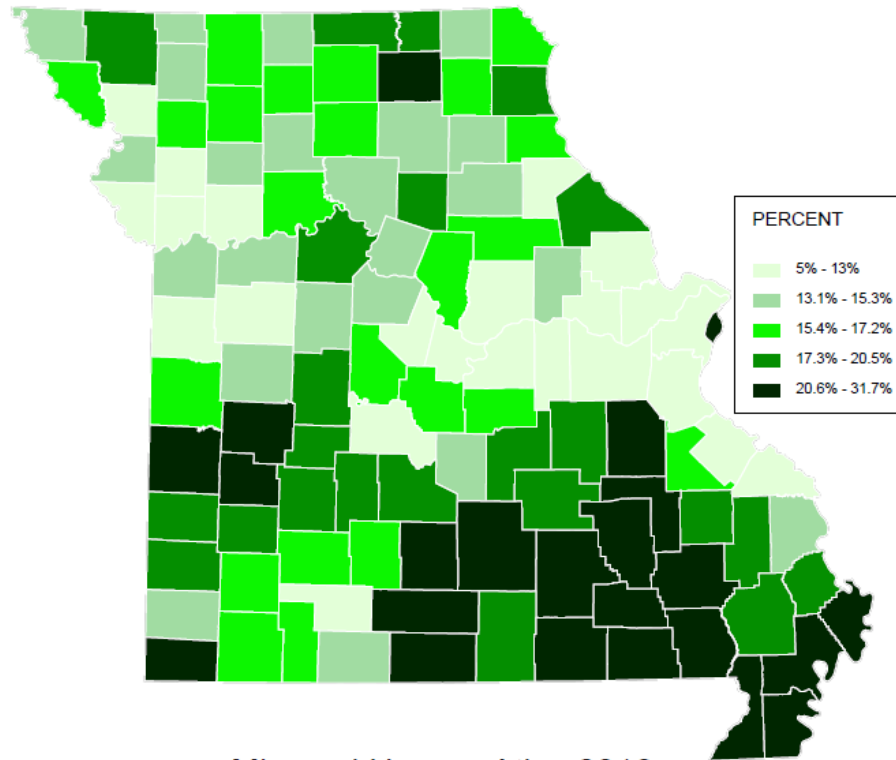
Diabetes

Percent of the population 18 years of age and older in 2007 that has had their blood glucose levels checked by a health professional and been told that they have diabetes. Source: 2007 Missouri County-level Study Questionnaire, Missouri Department of Health and Senior Services.



Economic Indicator

Total population below poverty



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Hypertension

Percent of the population 18 years of age and older in 2007 that has been told by a doctor, nurse, or other health professional that they have high blood pressure. Source: 2007 Missouri County-level Study Questionnaire, Missouri Department of Health and Senior Services

Economic Indicators

The six economic indicators are found in the lower left corner of each county page.

Population below poverty (MAP)

Percent of the county's total population living at or below 100 percent of the poverty rate in 2008. Source: U.S. Census Bureau Small Area Income and Poverty Estimates

< 18 years below poverty

Percent of the county's population <18 years of age living at or below 100 percent of the poverty rate in 2008. Source: U.S. Census Bureau Small Area Income and Poverty Estimates

>64 years below poverty

Percent of the county's population 65 years of age or older living at or below 100 percent of the poverty rate in 2008. Source: U.S. Census Bureau Small Area Income and Poverty Estimates

Median Household Income

Average household income in county in 2008.
Source: U.S. Census Bureau Small Area Income and Poverty Estimates

Unemployment Rate

Average unemployment rate over 2008. Source: U.S. Bureau of Labor Statistics

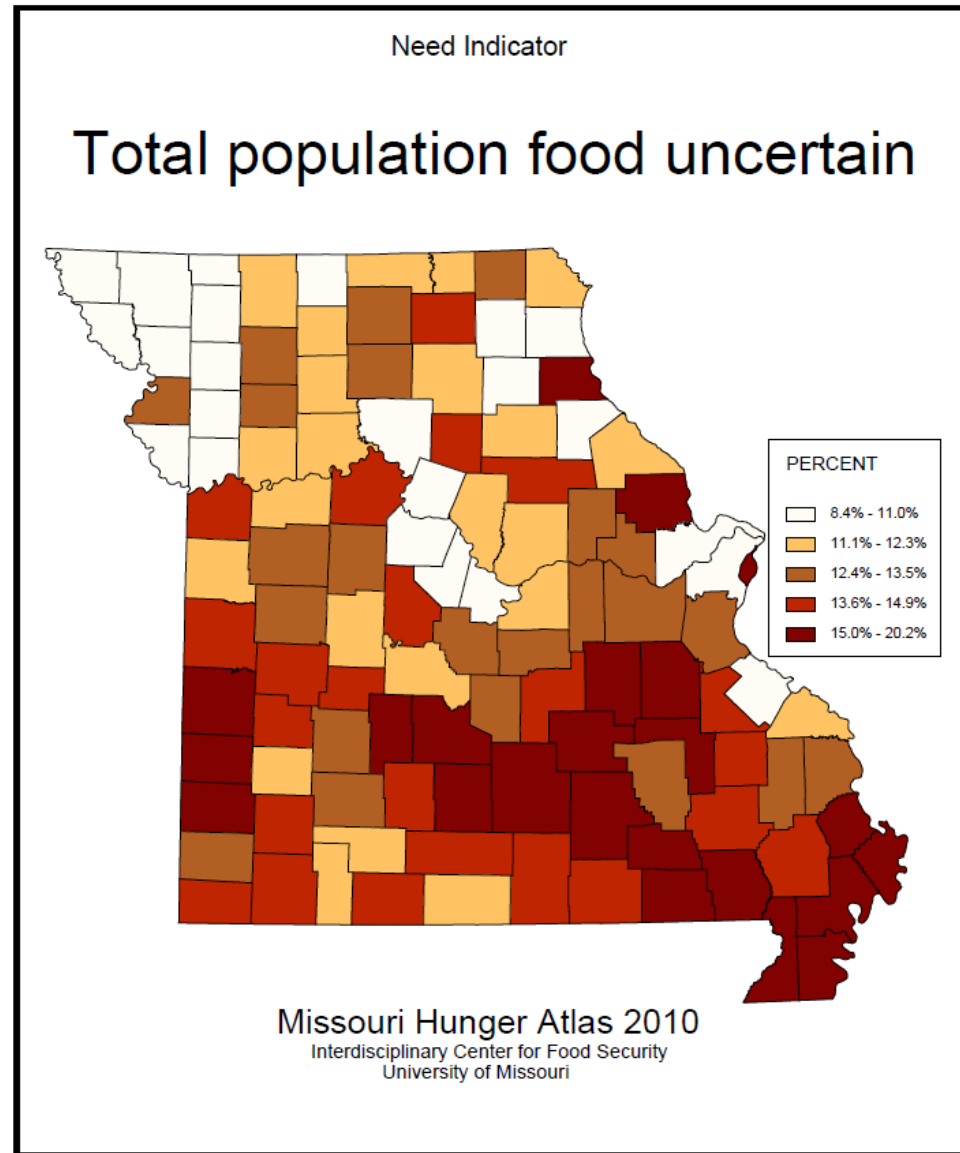
Female Headed Households

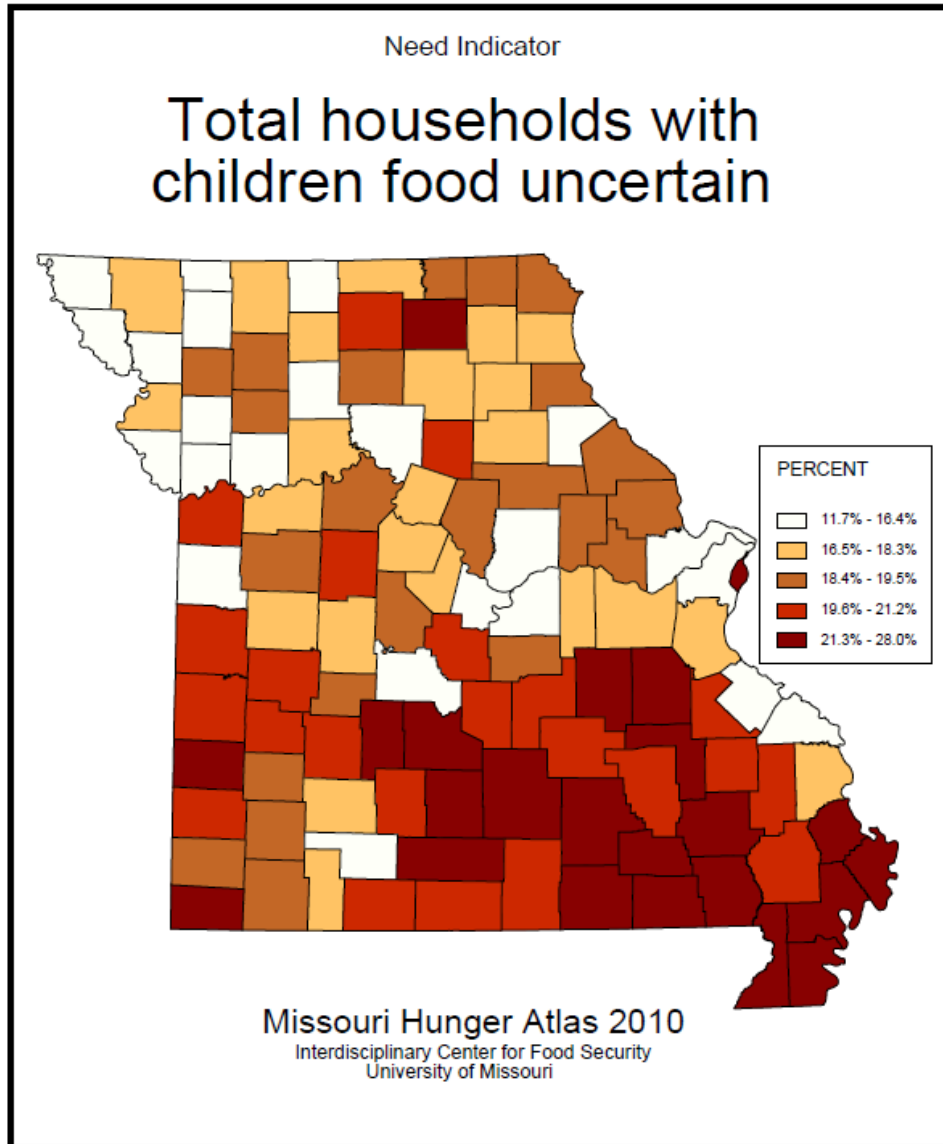
Percent of households in county in 2008 headed by a female who is not currently married or living with her spouse. Source: American Community Survey data modeled by Office of Social and Economic Data Analysis (MU)

Need Indicators

Food Uncertainty

Households food uncertain (MAP) Estimated percent of the total households food uncertain in 2008 in county, based on modeling of variables related to citizenship, age, race, female headed households, poverty, median household income, and unemployment. Variables and modeling coefficients derive from American Community Survey, US Census Bureau, Bureau of Labor Statistics, USDA, and Small Area Income and Poverty Estimates. For more information on the modeling, please see the





note at the bottom of this page or contact atlas authors. No trend data is given due to a change in methodology between the first hunger atlas and the present volume. Readers may, however, compare the two publications to note general trend directions.

% households with children food uncertain (MAP)

Estimated percent of the total households with children under the age of 18 food uncertain in 2008 in county, based on methods, variables and sources described above for “Households food uncertain.”

% food uncertain w/hunger

Estimated percent of the total households food uncertain with hunger in 2008 in county, based on methods, variables and sources described above for “Households food uncertain.”

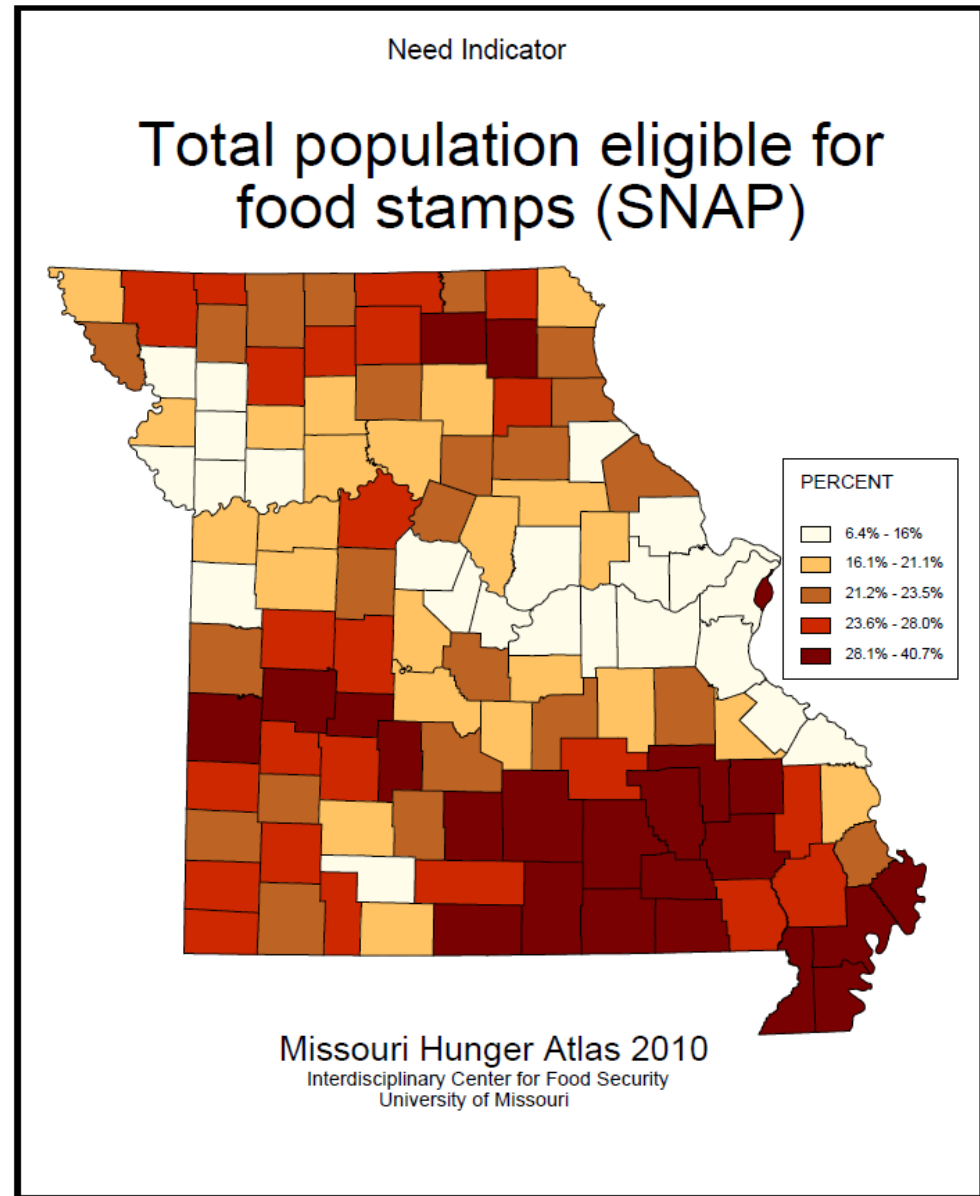
Note on “food uncertainty” indicators: The USDA publishes survey-based food insecurity numbers only at national and state levels. To develop county-level numbers, we use known predictors of food insecurity to develop a model of food uncertainty using USDA state-level data. We then use this model to estimate county-level patterns based on county-level socio-demographic information. Because our estimates are model-based and not survey-based we employ the phrases “food uncertainty” and “food uncertainty with hunger” rather than the USDA terms of food insecurity to suggest that our county-level measures reflect, but are not identical to, Federal variables.

SNAP/Food Stamp Program

% total population income eligible (MAP)

Estimated percent of total population income eligible for participation in the Supplemental Nutrition Assistance Program (Food Stamps Program in Missouri) in 2008. Income is a primary eligibility requirement; the formula begins by considering all households earning 130% or less than the poverty threshold². Trend is based on comparison of figures for 2005 and 2008. Source: American Community Survey, for some counties modeled by Office of Social and Economic Data Analysis (MU).

Food Stamp Program	
Mission	To improve the diets of low-income households by increasing food access and food purchasing ability
Constituencies	All ages
Eligibility	Primarily household-level income \leq 130 percent of poverty levels plus restrictions based on immigrant status in U.S. and household asset levels
Resources provided	Direct food payments using an Electronic Benefit Transfer card
State lead	Missouri Department of Social Services, Family Support Division



² The program has other eligibility requirements that modify the number of households eligible. Although there are various ways to estimate these additional restrictions, the data needed to approximate these adjustments are not currently available at the county level.

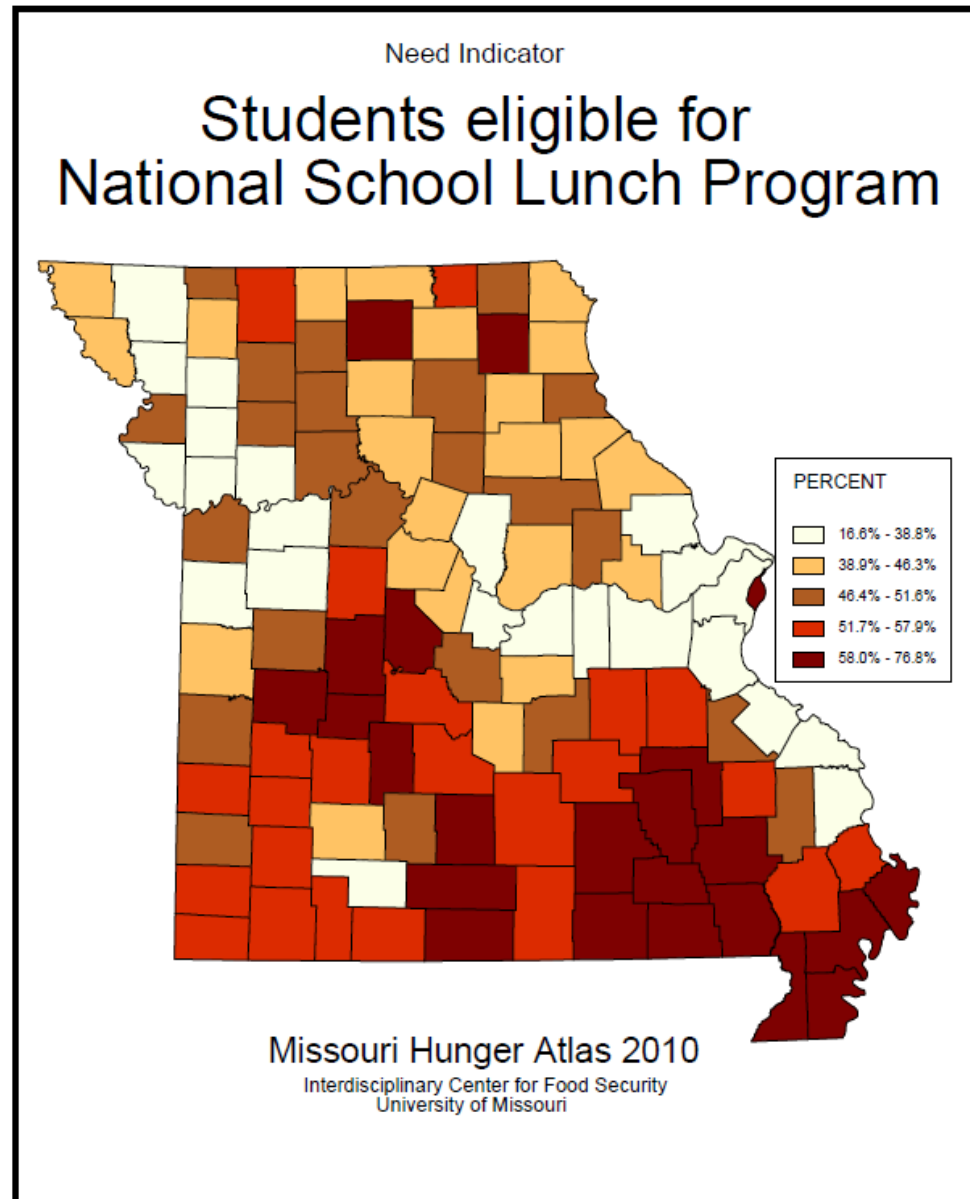
% <18 yrs income eligible

Estimated percent of total population less than 18 years of age income eligible for participation in the Food Stamps Program in 2008. Income eligibility is the primary eligibility requirement of the Food Stamp Program, a formula which starts by considering all households earning 130% or less than the poverty threshold. Trend is based on comparison of figures for 2005 and 2008. Source: American Community Survey, for some counties modeled by Office of Social and Economic Data Analysis (MU).

National School Lunch Program

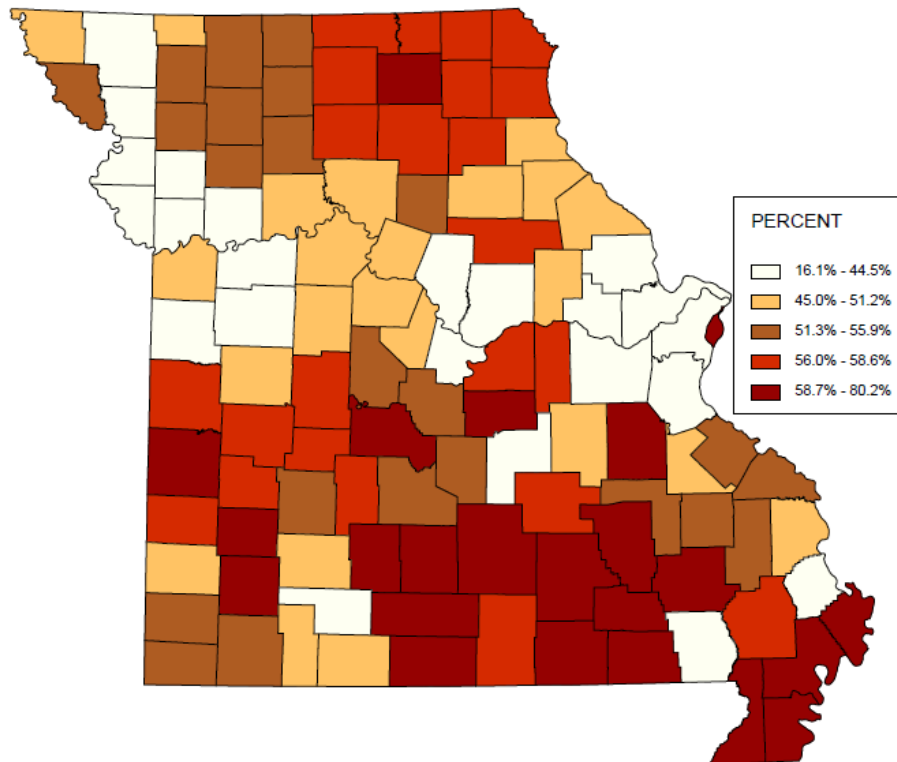
% students eligible (MAP)

Percent of students enrolled in the county's public and private schools eligible for free or reduced price lunches in the National School Lunch Program in October of the 2008-2009 school year. Trend is based on comparison of eligibility in the 2005-2006 and 2008-2009 school years. Only schools participating in the program are included in the data. Source: Department of Elementary and Secondary Education



Need Indicator

Under 5 eligible for WIC program



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Women, Infants and Children Program

% of < 5 income eligible for WIC Program

Percent of total infants and children under 5 years of age in the county eligible to receive WIC benefits in 2008. Trend is based on comparison of percents eligible in 2005 and 2008. Source: American Community Survey, for some counties modeled by Office of Social and Economic Data Analysis (MU).

Women, Infants and Children Program

Mission

To safeguard the health of low-income women, and infants and children younger than 5 years who are at nutritional risk

Constituencies

Pregnant women, nonbreastfeeding women up to 6 months postpartum, breastfeeding women up to one year postpartum, infants, and children up to fifth birthday

Eligibility

Categorical, residential, income and nutrition risk eligibility requirements. ≤ 185 percent of federal poverty level

Resources provided

Food, nutrition education, and referrals to health care and social service providers

State lead

Missouri Department of Health and Senior Services

Overall Need Rank

The overall need rank is a single composite measure of food insecurity needs for each county. While seven need indicators are listed in each county table, we chose four of these to establish a composite measure of need. The four variables, which include overall measures of food uncertainty as well as county-level eligibility for participation in the primary public food assistance programs, are:

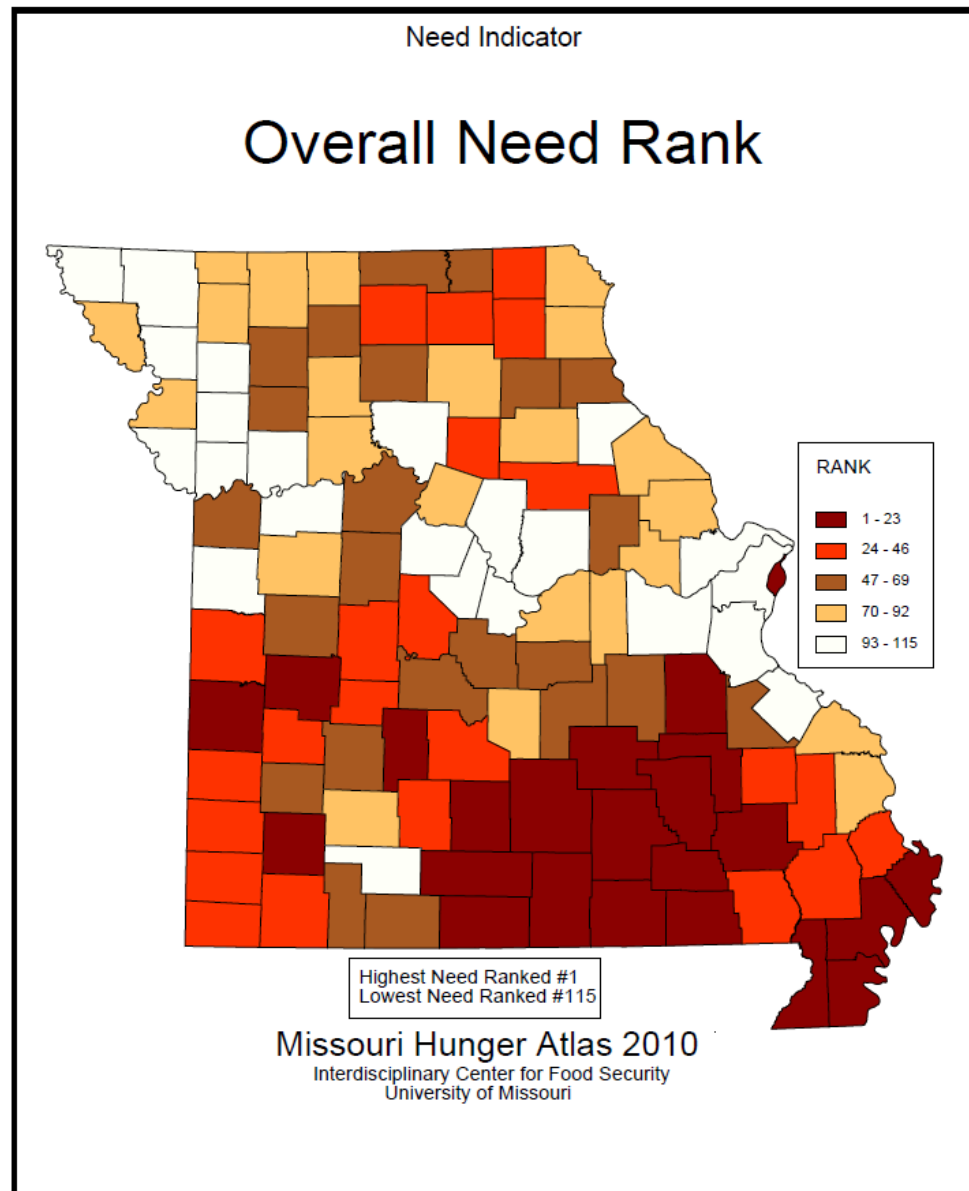
Percent of population food uncertain – percent of total population that is food uncertain in 2008

Percent of total population eligible for SNAP/food stamps – percent of county residents eligible for SNAP/food stamps in 2008

Percent of K-12 school enrollment eligible for free or reduced lunches – percent of K-12 students enrolled in schools (public and private) eligible for free and reduced lunches in the National School Lunch Program during the 2008-2009 school year

Percent of < 5 population WIC eligible – percent of infants and children under 5 years of age in the county eligible to receive WIC benefits in 2008

Beginning with the individual county rankings for each of these four variables, we use two steps to establish a county's overall need rank. First, we combined the four variable ranks to establish a composite score. Rather than use a simple average of



the four variable ranks, we assigned a weight to each rank in the construction of the composite score. In brief, the weighting model we use assigns 30 percent of the composite score to each of the measures of (1) Percent of population food uncertain and (2) Percent of total population eligible for Food Stamps; and 20 percent of the composite score to both (3) Percent of K-12 school enrollment eligible for FRLP and (4) Under 5 years eligible for WIC. We place more weight on the food uncertainty and Food Stamps program variables as these measures address all ages of the population. For example, Adair County had ranks of 41, 12, 75 and 2 for these four variables. The county's composite score, based on the weighted model and rounded off to the nearest whole number, is 31. The second step of the process is an overall

state ranking of the composite scores in which the composite scores of the 115 locations are compared to each other. In keeping with our ranking scale, in which 1=highest need and 115=lowest need, the county with the lowest numerical composite score is assigned 1 in the overall need ranking, which suggest the highest overall need in that county. Similarly, the county with the highest composite score is assigned number 115, which signifies the lowest average need. In the case of Adair County, the composite score of 31 ranks as the 25th highest in the state, which places the county in the second highest quintile (labeled "high") for Missouri. The individual ranks for the four indicators, composite score and overall need ranks for each county are in Appendix 1 of this atlas.

Performance Indicators

Food Stamp Program Participation

Monthly participants

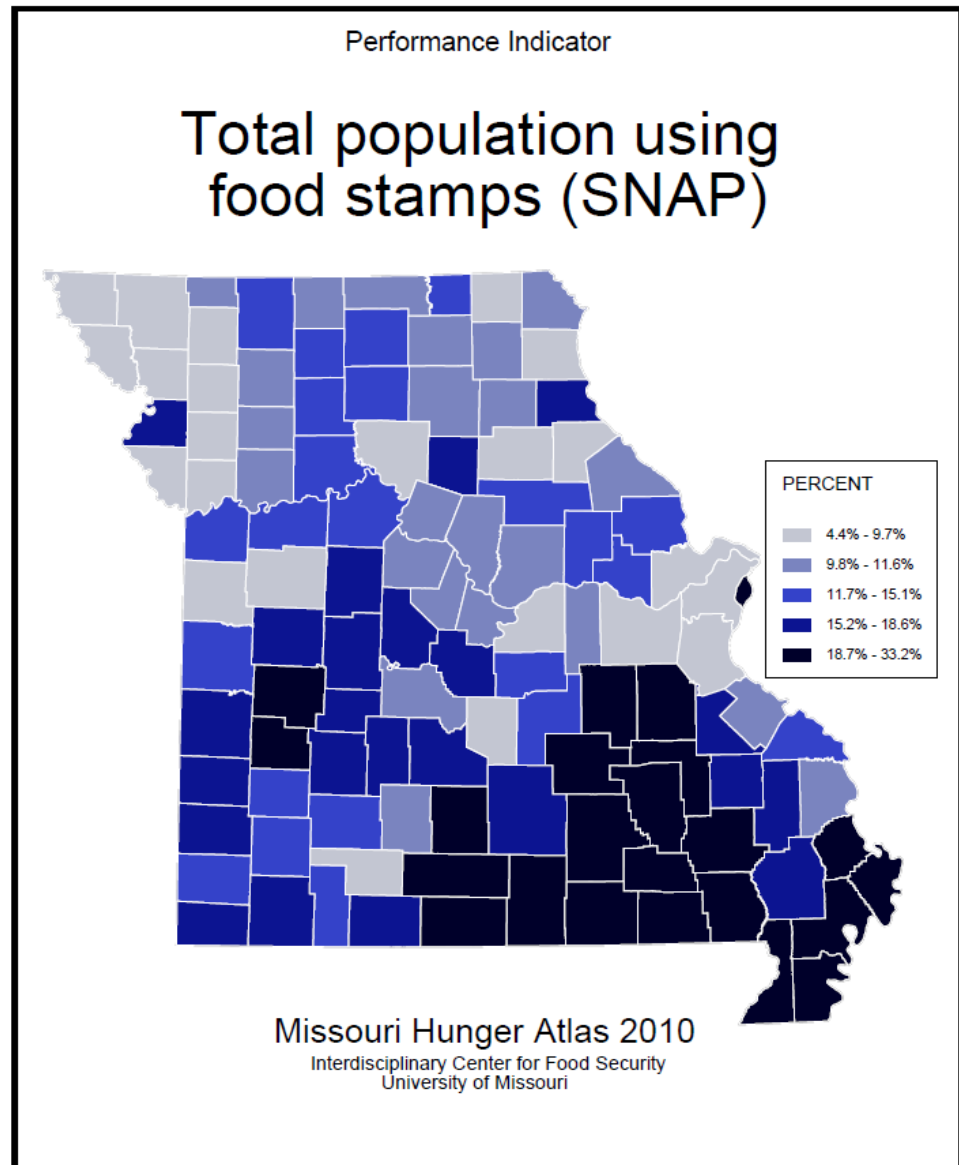
Average number of total county residents who used food stamps each month in Missouri FY2009 (July 1, 2008 – June 30, 2009). Trend is based on comparison of figures for FY2005 and FY2009. Source: Missouri Department of Social Services

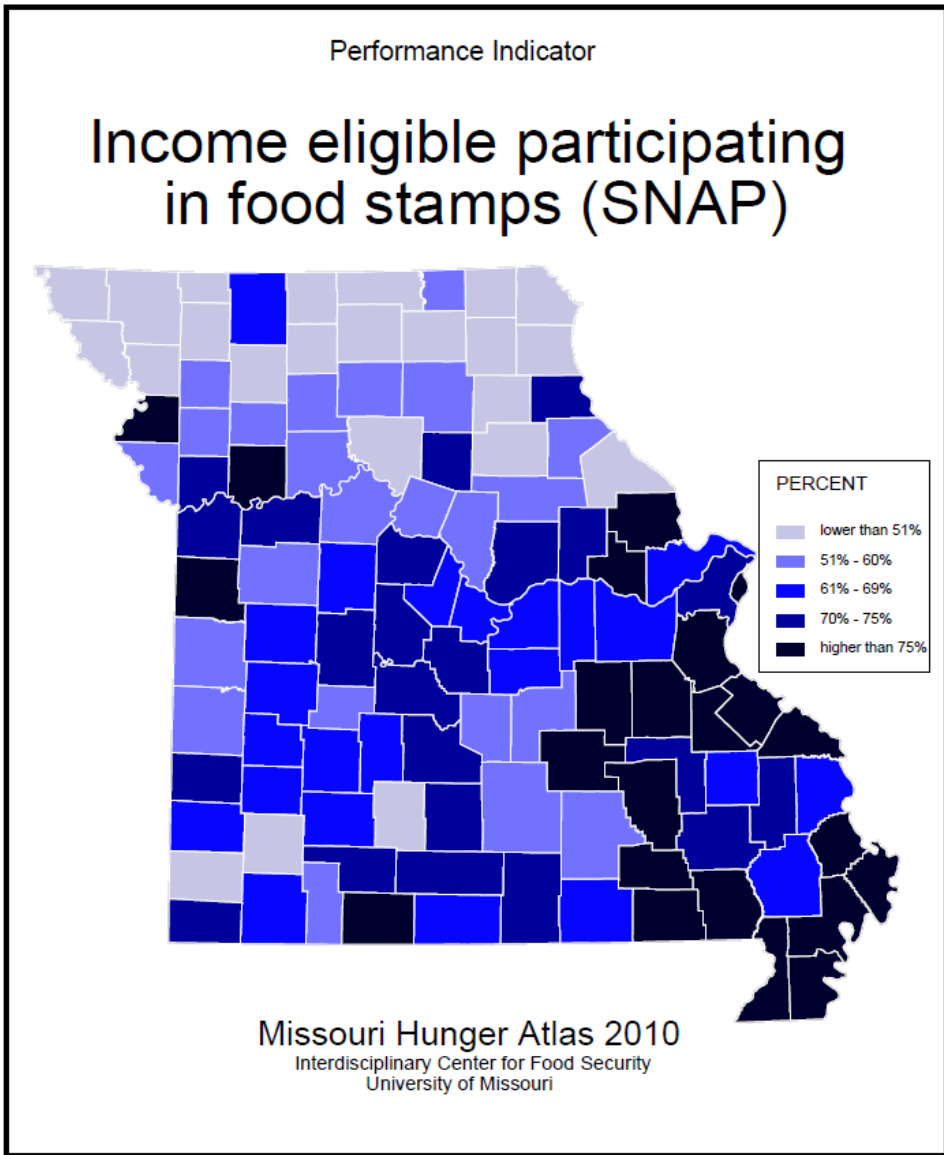
% of total population (MAP)

Average percent of total county population that used food stamps each month in FY2009. Trend is based on comparison of figures for FY2005 and FY2009. Source: Missouri Department of Social Services and U.S. Census Bureau

% of income eligible population (MAP, p. 17)

Percent of county residents eligible for food stamps in FY2009 who participated in the program. Trend is based on comparison of participation rates in FY2005 and FY2009. Sources: Missouri Department of Social Services and American Community Survey, for some counties modeled by Office of Social and Economic Data Analysis (MU).





Monthly participants <18 yrs

Average number of county residents < 18 years of age who used food stamps each month in FY2009. Trend is based on comparison of average monthly usage from FY2005 and FY2009. Source: Missouri Department of Social Services and Missouri Census Data Center

% of <18 yrs population

Average percent of county population under 18 years of age that used food stamps each month in FY2009. Trend is based on comparison of figures for FY2005 and FY2009. Sources: Missouri Department of Social Services and U.S. Census Bureau

% of pop <18 income eligible and participating

Percent of county residents under 18 years of age and income eligible for Food Stamps in FY2009 who participated in the program. Sources: Missouri Department of Social Services and American Community Survey, for some counties modeled by Office of Social and Economic Data Analysis (MU)

Monthly benefits

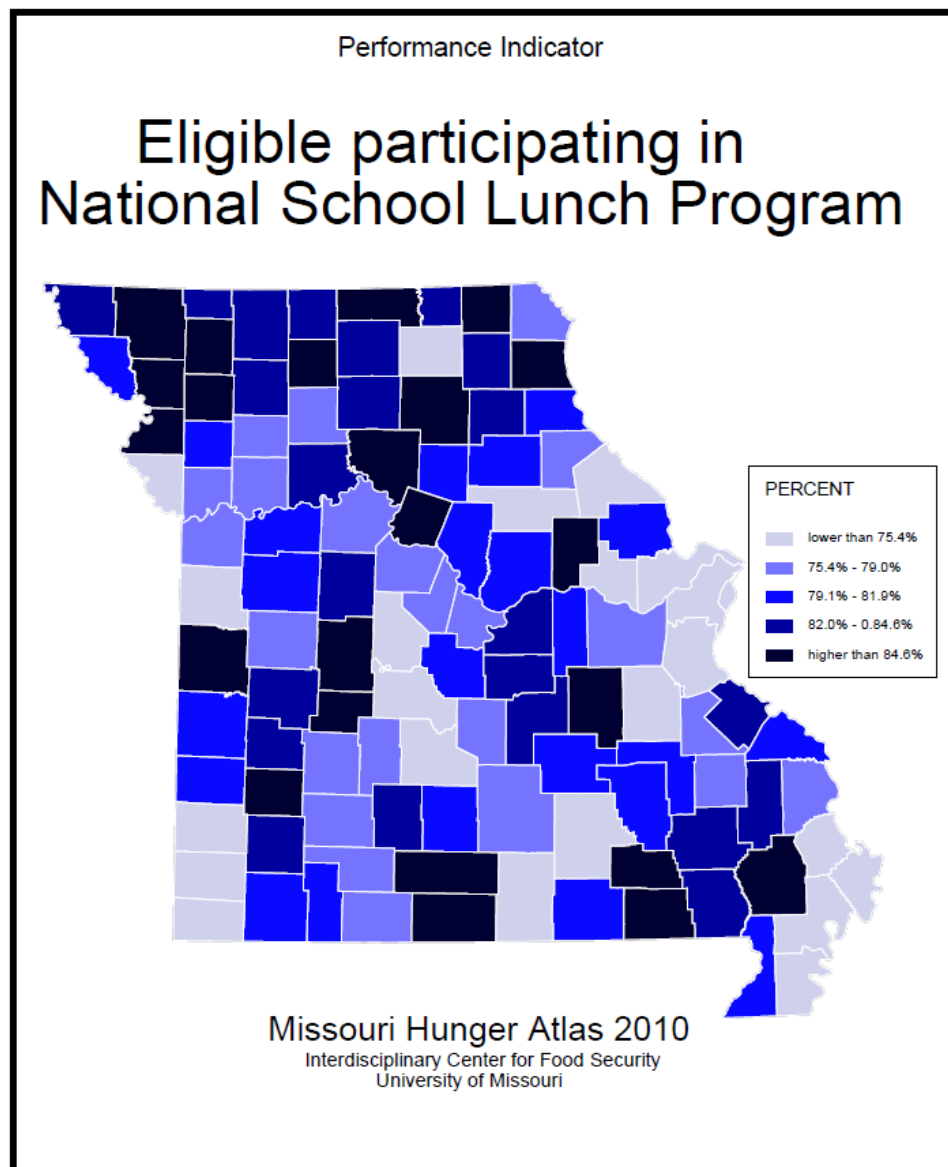
Average value of food stamp benefits each month in 2008. Trend is based on comparison of average monthly benefits for FY2005 and 2008. Sources: Missouri Department of Social Services and U.S. Bureau of Economic Analysis

National School Lunch Program Participation

% eligible participating (MAP)

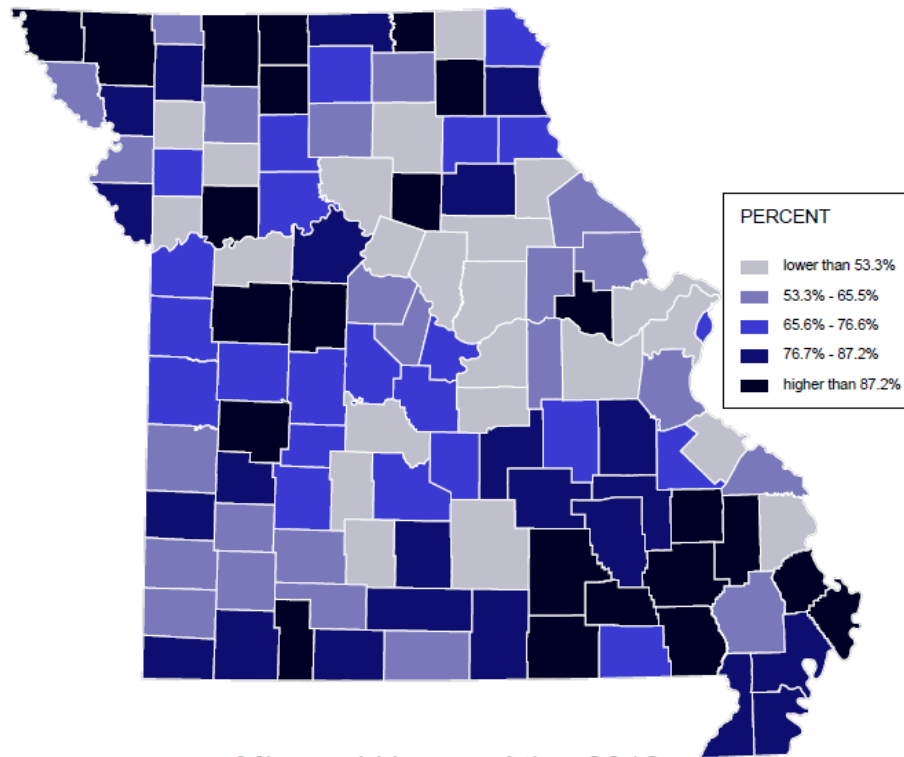
Percent of students eligible for free or reduced lunches who participated in the program in October, 2008. Trend is based on comparison of participation rates in 2005 and 2008. Source: Missouri Department of Elementary and Secondary Education

National School Lunch/Breakfast Programs	
Mission	To provide nutritionally balanced, low cost or free lunches or breakfasts to school children
Constituencies	Public and nonprofit private school children, K-12
Eligibility	Household income \leq 130% of federal poverty level for free meals; between 130-85% for reduced price meals.
Resources provided	Breakfast and lunch
State lead	Missouri Department of Elementary and Secondary Education



Performance Indicator

Under 5 eligible participating in WIC program



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Summer Food Service Program

Sites

Number of locations in county participating in 2008. Source: Missouri Department of Health and Senior Services

Total reimbursements

Total reimbursements to county for 2008 programs. Source: Missouri Department of Health and Senior Services

Women, Infants and Children Program

monthly participants

Average monthly number of women, infants and children enrolled in program during 2008. Source: Missouri Department of Health and Senior Services

monthly infants and children

Average monthly number of infants and children enrolled in program during 2008. Source: Missouri Department of Health and Senior Services

% of eligible population <5 participating (MAP)

Percent of total population of infants and children under 5 years of age in the county receiving WIC benefits per month in 2008. Trend is based on

comparison of percents of the under 5 population enrolled in 2005 and 2008. Source: Missouri Department of Health and Senior Services and American Community Survey, for some counties modeled by Office of Social and Economic Data Analysis (MU)

Child & Adult Care Food Program

Total Reimbursements

Total amount of funds reimbursed in 2009 to child and adult care facilities in county. Trend is based on comparison of reimbursements in 2005 and 2009. Source: Missouri Department of Health and Senior Services

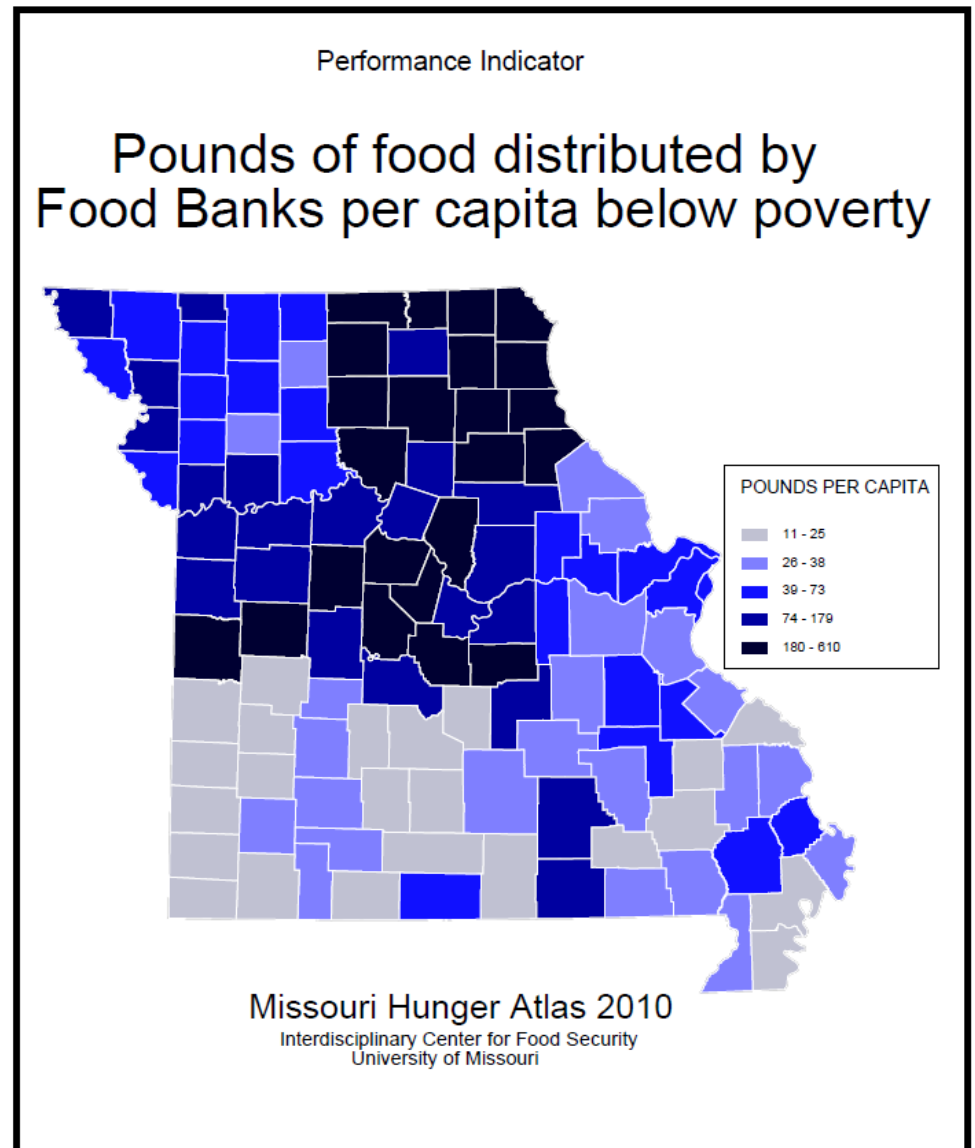
Food Bank Distributions

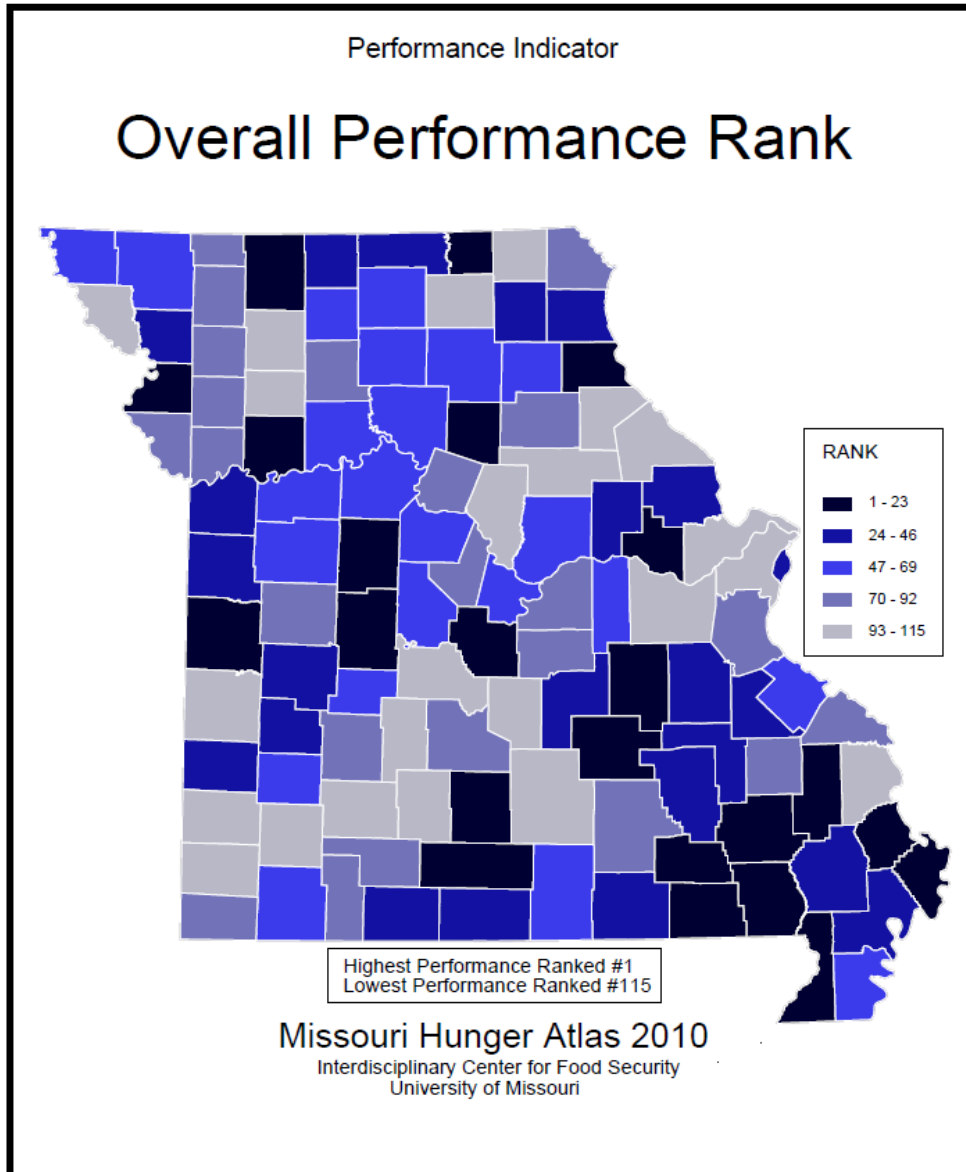
Total pounds in county

Total amount of pounds of food (including USDA commodity foods) distributed from regional food banks to food pantries in the county. Source: Six regional food banks in Missouri

Pound (lbs) per capita < 100% poverty

Number of pounds of food distributed per capita of individuals with income below 100 percent of the poverty level to food pantries in the county by regional food banks in 2009. Trend based on comparison of 2005 and 2009. Sources: Six regional food banks in Missouri and U.S. Census Bureau Small Area Income and Poverty Estimates





Overall Performance Rank

We constructed an overall performance rank for each county. We selected four indicators (from the 15 performance measures included for each county) to establish a composite measure of performance. The four variables include participation rates for three primary public programs and one measure of private program activity:

- **Percent of eligible residents who received food stamps** – estimated percent of total population with incomes at 130% or less than federal poverty thresholds who participated in this program in FY2009
- **Percent of eligible students who received free or reduced lunches** – percent of students eligible for free or reduced lunches who participated in the program in October 2008
- **Percent of income eligible infants and children receiving WIC benefits** – percent of income eligible infants and children under 5 years of age in 2008 who were enrolled in the Special Supplemental Nutrition Program for Women, Infants and Children
- **Pounds of food distributed per capita < 100% poverty** – Number of pounds of food per capita under 100 percent poverty level in the county distributed by the regional food banks in 2008

First, we combined the four variable ranks to establish a composite rank score. Rather than use a simple average of the four variable ranks, we assigned a weight to each rank in constructing the composite rank score. In brief, the weighting model we used assigns 35 percent of the composite rank to the measure of (1) Food Stamp participation as percent of total population eligible; 25 percent each to the variables of (2) FRLP participation as a percent of total school population eligible and 3) WIC participation as percent of the eligible under 5 years old population; and, 15 percent to 4) regional food bank distributions to the county in terms of pounds per capita of food insecure individuals. We place the most weight on the Food Stamps variable as this program is by far the most extensive in the state and addresses all age groups. We place lower emphasis on the food bank distributions because the food banks are only one source of supply for local food pantries and on-site meal providers and we have no comprehensive measure of total private assistance in the state. Again using Adair County for an example, the county had

ranks of 113, 102, 86, and 38 for these four variables. The county's composite score, based on the weighted model and rounded off to the nearest whole number, is 92. The second step of the process is an overall state ranking of the composite performance scores in which the composite scores of the 115 locations are compared to each other. In keeping with our performance rank scale, where 1=highest performance and 115=lowest performance, the county with the best, or lowest, numerical composite score is assigned 1 in the overall performance rank, which suggest the highest overall performance in that county. Similarly, the county with the highest average composite score is assigned 115, which signifies the lowest overall performance. In the case of Adair County, the composite score of 92 ranks as the 114th highest in the state, and so it is ranked in the lowest, or "very low," quintile. The individual ranks for the four indicators, composite score and overall performance ranks for each county are in Appendix 2 of this atlas.

Comparing individual county-level composite rankings on need and performance

Having compiled county-level composite ranks in the areas of food insecurity and hunger need and program performance, a final and useful step is to compare how each county ranks in terms of the combination of their ranks on need *and* performance. In essence, we can ask whether counties that have high need are doing comparatively well or comparatively poorly in addressing those needs. Counties with high needs that have high performance rankings, for example, are likely more successful in serving the needs of their food insecure populations while counties with high needs but low performance are potential target locations for increased public and private sector attention.

We used several steps to perform this analysis. First, we labeled counties as “high need” if their composite need rank fell in the upper two quintiles (“very high” or “high”) of need. We designated counties as “low need” if their composite need rank fell in the lowest two quintiles (“low” or “very low”) of need. Similarly, we labeled counties as “high performance” if their composite performance ranks fell in the upper two quintiles (“very high” or “high”) of performance. We designated counties as “low performance” if their composite performance ranks fell in the lowest two quintiles (“low” or “very low”) of performance. We did not include counties that scored in the “average”, or middle, quintile in either of these composite ranks in this analysis.

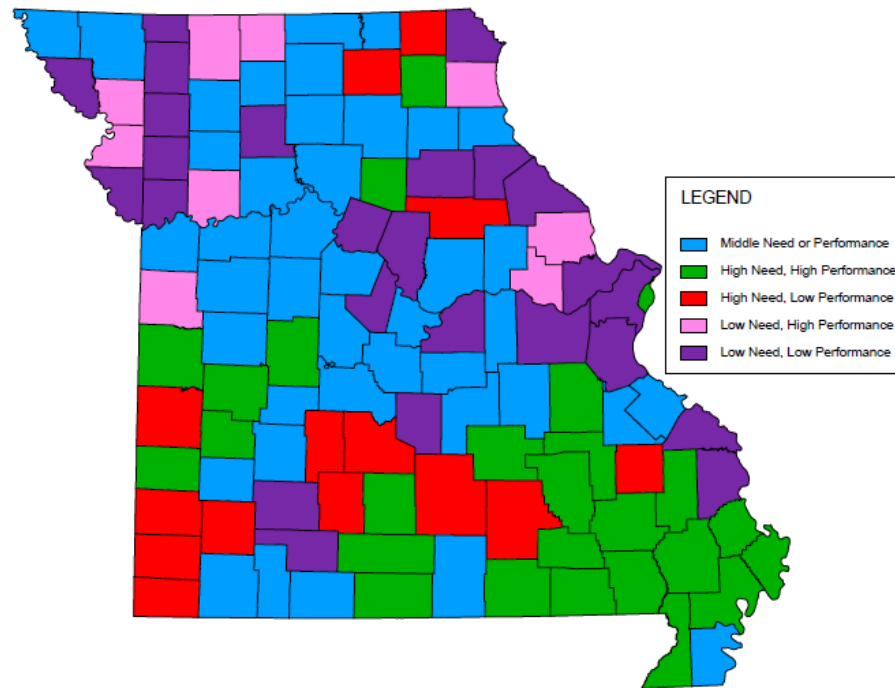
The designation of counties as either “high need” or “low need”, and as either “high performance” or “low performance” offers the possibility of counties falling into one of four categories:

- High need and high performance
- High need and low performance
- Low need and high performance
- Low need and low performance

As shown in the map and table on the following pages, this analysis yielded some interesting results. Twenty-five counties and St. Louis City have both high need and high performance. The fact that more than half of the counties with high need also rate high in performance suggests that services are well provided and used in places that have the highest need for them. We have no way of knowing whether public and private agencies specifically target resources to these counties, but this trend reveals positive outcomes for the food insecure in these regions.

More problematic are the fourteen counties identified as high need and low performance. Most of these counties are located south of the Missouri River and a cluster is dispersed throughout the southwest quarter of the state. We note that many of the high need, high performing counties are interspersed with these high need, low performing counties. This could suggest focusing more individual attention on service delivery in these particular counties.

Need vs. Performance



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We found nine counties qualifying as low need and high performance. In these areas, the results suggest that service providers are adequately handling food insecurity and hunger needs in their regions.

At the other end of the spectrum are 25 counties that have comparatively low percents of populations with hunger needs but that also doing comparatively worse in meeting the requirements of these populations. Many of these counties are in relatively affluent regions near all of Missouri's major cities. Although the percent in need is relatively low in these areas, in many cases the low percents denote relatively large numbers of people because the base populations are often quite high. In fact, seven of the ten most populated counties in the state (St. Louis, St. Charles, Greene, Jefferson, Clay, Boone, and Franklin) fall into this category. While the Missouri Hunger Atlas cannot scientifically prove why these counties are subject to low performance, we can offer a couple of explanations that could be tested with more research. First, residents living in regions with high levels of need and visible public programs might experience less social shame or stigma as participants in public programs. If one lives in a region in which sizeable proportions of a population regularly participate in public programs, an individual or family's choice to similarly participate would be in line with others' decisions and be subject to less social angst or difference. On the other hand, residents of regions with high levels of

social and economic inequality and smaller percentages of program participation might face social discomfort or ostracism related to participation. A student who is one of a limited number of persons qualifying for free lunches or a shopper who is one of a small group that separates items at a supermarket for WIC participation would be required to demonstrate a lower economic status in a public context in which such status contrasts with that of the

majority. A second possible explanation is that public and private agencies have made logical decisions to focus scarce human, technical and financial resources in high-need areas. As a consequence, programs in low-need areas have a more difficult time conducting the type of outreach and education to attract high participation rates among eligible residents in their counties.

	High need	Low need
High performance	Barton, Bates, Benton, Bollinger, Butler, Carter, Cedar, Dent, Douglas, Dunklin, Iron, Knox, Mississippi, New Madrid, Oregon, Ozark, Randolph, Reynolds, Ripley, Scott, St. Clair, Stoddard, Washington, Wayne, Wright Counties, and St. Louis City	Andrew, Buchanan, Cass, Harrison, Lewis, Lincoln, Mercer, Ray, and Warren Counties
Low performance	Adair, Audrain, Dallas, Jasper, Laclede, Lawrence, Madison, McDonald, Newton, Scotland, Shannon, Texas, Vernon, and Webster Counties	Boone, Cape Girardeau, Christian, Clark, Clay, Clinton, DeKalb, Franklin, Gentry, Greene, Holt, Howard, Jefferson, Livingston, Moniteau, Monroe, Osage Perry, Pike, Platte, Pulaski, Ralls, St. Charles, St. Louis, and Worth Counties.

Concluding remarks

Food insecurity and hunger are facts of life for far too many Missourians. The USDA's assessment that 15.8 percent of Missourians were food insecure in 2008 applied to the mid-year estimated population of 5,911,605 suggests that 934,034 residents faced uncertainty in acquiring sufficient food for their household. Further, of people who were food insecure in 2008, the USDA estimates that roughly 37 percent had "very low food security" (prior to 2007 labeled as "food insecure with hunger"), or 5.8 percent of the total population. This translates into roughly 343,000 Missourians experiencing hunger. Regretfully, trends in food insecurity and hunger are not positive ones for our state, as current averages for both reflect a trend that has continuously increased over the first decade of this century.

The best predictor of food insecurity and hunger in Missouri, and throughout the United States, is poverty. Further, income level is typically the primary eligibility criteria for participation in all public food assistance programs. Thus economic, labor and income trends are most significant in the spatial distribution of need and program entitlement. The deterioration of the state (and national) economic picture over the past three years parallels our findings and suggests that the situation in 2010 is most likely worse than the levels documented in this atlas. Reports for food banks and pantries reveal continued increases in numbers of clients (at a time when USDA contributions through commodity and other programs are flat or decreasing). Participation in WIC, Food Stamps and other programs also continues to grow. For example, trends in Food Stamp Program numbers almost always rise and fall following changes in unemployment

rates, and US and Missouri levels of participation are both the highest in the history of the program. It follows from this that the most direct route to alleviating hunger is to develop successful strategies for raising the income of the poor. Reversing poverty is more difficult, however, if not impossible, for individuals and households in which adult members are elderly or disabled or who, for various reasons, are unable to seek salaries and wages for food purchases.

The establishment of public and private programs and activities is a necessary "safety net" response to meeting the short-term needs of the food insecure and hungry citizens who inhabit every county and corner of our state. These programs do not provide a long-term solution to the factors that lead to hunger, but they are critical to ameliorating the day-to-day struggles of hundreds of thousands of Missourians. Well over 1.4 billion dollars was spent in this state in 2008 to help people have enough to eat, and hopefully enough nutritious food to lead healthy and active lives.

It is not our goal to editorialize on whether or not public and private support for food assistance programs is too high or too low. Certainly we know that the 1.4 billion dollar figure underestimates the costs of this social problem in at least three important ways.

- The programs included in this atlas are not comprehensive of the financial and human resources being brought to bear on hunger and food insecurity. It is especially difficult to comprehensively document contributions from the private sector. While food banks, for example, contribute over 55 million pounds a year to food pantries and other facilities, many of these locations rely on food banks for only a minor

portion of the food they provide to clients. And certainly there are hundreds, if not thousands, of faith-based organizations, civic groups, and other organizations that provide food for residents who need help without using food banks at all.

- The financial numbers presented here do not include the administrative and organizational costs of operating these programs. We document the amount of benefits provided through the Food Stamp Program and the reimbursements given to schools for free and reduced lunches; however, we do not include the hundreds of positions at state agencies and in county governments that are necessary to operate these efforts, monitor participation, solicit and evaluate perspective participants, and to conduct the dozens of other tasks necessary for their operation.
- Most significantly, the costs of food insecurity and hunger are critically underestimated if these are understood solely as the costs of providing assistance directly related to the acquisition of sufficient amounts of food. The cost of hunger extends far beyond the cost of having food. The costs of hunger should properly include the health care costs incurred because children and adults are more susceptible to, and recover more slowly from, disease and illness. It should include the healthcare costs for the management of chronic diseases, such as diabetes and hypertension, which are brought on in part by the reliance on high calorie, high fat and low nutrient-dense foods. The costs of hunger extend to the costs of lower work productivity and missed days of work. And the costs of hunger include the social and psychological angst of not having sufficient and nutritious foods and the mental stress and discord that results for individuals and households. As

much as poverty is a leading cause of food insecurity, so too are food insecurity and hunger leading causes of continued poverty.

Importantly, the figures on food insecurity and hunger in Missouri remain high, and are not declining in spite of the myriad of mostly federally-originated public programs and locally-initiated private programs. Food insecurity and hunger continue to affect all regions of the state. Generally, one can point to larger proportions of counties with high need in the southern half of the state, but needs are also high in counties near the Iowa border in north central and northeast regions, and in St. Louis City. In general, the clustering of high need quintiles is similar to the grouping of counties with high and persistent poverty levels. County-level performance is more variable and high and low performance counties are more dispersed throughout the state. On a positive note, a majority of counties characterized as “high need” are also “high performance” in contrast to a much lower number of high need/low performance, in terms of participation measures and other indicators of successful interventions. This result suggests that programs are effectively targeting high need areas. On the other hand, there is general “low performance” in all metro and suburban areas, with the notable exception of St. Louis City.

The data reported in this atlas suggests the following future needs:

- Targeted assessments of program implementation in counties characterized by high need and low performance, with particular attention to the southwest corner of Missouri.

- Increased recognition of the importance of the public and private programs that provide food assistance – they are the barrier between hunger and non-hunger for probably hundreds of thousands of Missourians.
- Focus on improving understanding of patterns of low performance in all metro areas (except St. Louis City) and most suburban counties. Greater knowledge of reasons for lower program participation rates in these regions should result in the implementation of new program and outreach strategies.
- Greater emphasis on the nutritional and health impacts of food choices among staff and clients of all public and private programs. Research has demonstrated that poverty is positively correlated both with food insecurity and with chronic diseases such as diabetes, obesity and hypertension. Foods that tend to be cheaper and more widely available are also typically high in calories and low in nutrition and this contributes to levels of health vulnerabilities. Many of the counties that have the highest food insecurity and hunger in Missouri also have the highest levels of residents with these

poor health conditions. While educational activities exist as part of most public and private programs, these need to be strengthened and invigorated with innovative designs and implementation. Recent changes in school meal programs in some districts towards more nutritious menus is an example of a positive trend that needs to be broadened both in this program and throughout the public sector. For the same reasons, we highly encourage state participation in the WIC and Senior Farmers' Market Nutrition program.

- Strengthened linkages between private sector temporary food assistance programs (e.g., food pantries) and local food systems. The demand for the goods and services provided by private programs continues to grow. Creative efforts can link local food systems (e.g., community gardens) with these programs
- Assessments of community food security as a core local need, alongside such social concerns as education and health. In addition, technical support should be given to communities committed to developing action plans to address the results of community food security assessments.