



Missouri Hunger Atlas 2016



Interdisciplinary Center
for Food Security

Missouri Hunger Atlas 2016

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Acknowledgements

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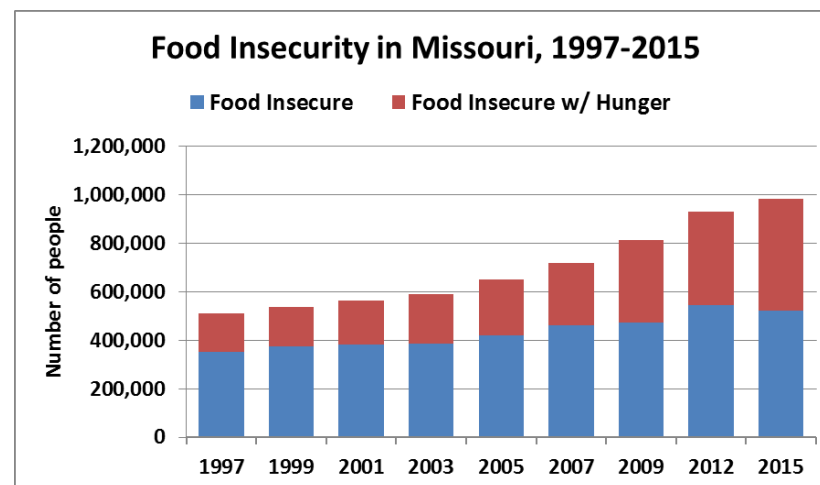
Background

This atlas assesses the extent of food insecurity in the state of Missouri. It also gauges 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. In 2015, 14% of all Americans, or more than 48 million people, lived in food insecure households. Nineteen percent of all households with children experienced food insecurity. Households experiencing “very low food security,” formerly labeled as food insecure with hunger, accounted for 5.6% of households, 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

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

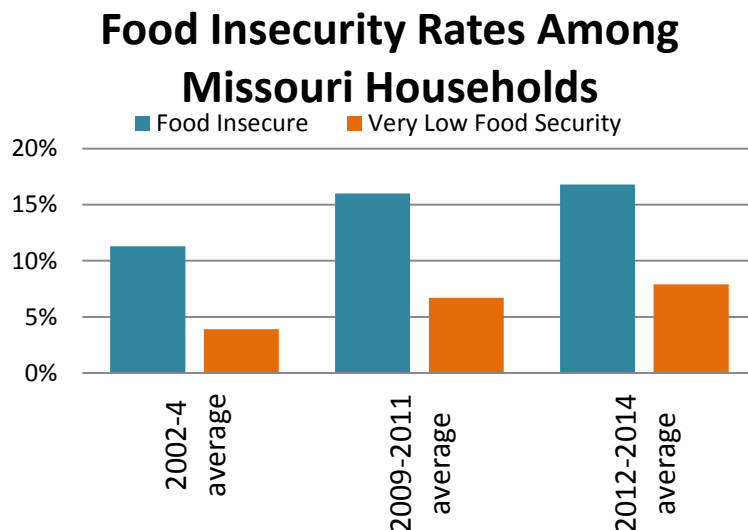
¹ Prior to 2005, the USDA described households with “very low food security” as “food insecure with hunger” and those with “low food security” as “food insecure”. The labels changed at the recommendation of the Committee on National Statistics (National Research Council,

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.



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”.

The statistics from Missouri are alarming and continue to grow worse. Over the last three years, the state has averaged 16.8% food insecurity and 7.9 percent very low food security. 2015 estimates for food insecurity suggest that close to 400,000 households experience food insecurity. Given Missouri's average household size of 2.45 persons, this translates into roughly 980,000 Missourians experiencing food insecurity at some point during the year. Of these households, nearly half experience very low food security, or hunger. The math is unfortunately simple . . . basically almost half a million Missourians experience hunger at some point over the calendar year. Missouri ranks among the top ten states with the highest percentage of households classified as food insecure or having very low food security



Source: USDA ERS

As the table on the proceeding page shows, the news in Missouri continues to get worse. In fact the state's increase in the percentage of the population food insecure between the period of 2002-04 and 2012-14 is among the highest in the country. And the state's increase in the average percentage of households with very low food security *is the highest in the country*. In brief, the percentage of households experiencing hunger in our state has more than doubled in the last decade.

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 (*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.

GOALS

- 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 or three 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 2014 or 2015 calendar year, the state fiscal year 2015 (July 1, 2014 - June 30, 2015), or federal fiscal year 2015 (October 1, 2014 - September 30, 2015). In the county pages which make up the bulk of this report, readers will find county-level information on (A) demographic, health, and economic indicators, (B) need indicators, and (C) performance indicators.

The next few pages of this atlas provide an overview of these three 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 Profile Indicators

At the bottom of each county page are three types of indicators: demographic, health, and economic. 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. Within the economic indicators are included three poverty measures as poverty is the best predictor of food insecurity in the United States.

Median household income, unemployment rate, percent of female headed households, and food affordability are additional measures of economic well-being included among profile indicators.

Need and Performance Indicators

The purpose of the “Need Indicators” is to provide measures of the extent of food insecurity and hunger in each Missouri County. 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 can examine the success of programs established to addresses those needs.

How to read the Need and Performance Indicator Tables

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

| NEED INDICATORS | COUNTY | STATE | RANK |
|------------------------------|--------|-------|-----------|
| % Individuals Food Uncertain | 17.8 | 16.4 | VERY HIGH |

- The *first column*, “County,” reports the result for the county on this indicator; in this case, 17.8 percent of Adair County’s total population is food uncertain.
- The *second column*, “State,” shows the average across all counties and St. Louis City for the indicator, in this case 16.4 percent.
- The *third column* is labeled “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 or performance is in the top 20%, second highest 20%, and so on. The labels under “county rank” indicate the following groups:

- Very High: 80th to 100th percentile
- High: 60th to 79th percentile
- Average: 40th to 59th percentile
- Low: 20th to 39th percentile
- Very Low: 1st-19th percentile

The example on page 30 shows the level in Adair County, in comparison to other counties, is in the highest quintile of percent of individuals that are food uncertain.

NOTE: County rankings are not compiled (shown by – in the ranking column) for county data more dependent on population size (e.g., total population eligible for SNAP) than on percentage of population.

State Maps

For some indicators of hunger need and performance we provide maps to visually show 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 includes one-fifth, or 23, of the counties in the state.

The quintiles on each need and performance indicator map are arranged from very low (the 23 counties with lowest need or performance on that measure) to very high (the 23 counties with highest need or performance). For example the percent of individuals food uncertain in the county ranges from a state low of 11.8 percent (St. Charles County) to a high of 25.8 percent (St. Louis City). To make the state map of Food Uncertainty for the total population for example, the 23 counties with the lowest levels of food uncertainty (11.8 – 14.5 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 14.6 to 15.6 percent. This pattern continues to the fifth quintile or highest need group, which includes 23 counties with food uncertainty rates from 17.3 to 25.8 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 uncertain, 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 three sections of the report present the indicators readers will find on the county pages. These are the county profile, 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

Demographic

Total Population

Number of people of all ages living in the county in 2014.

Source: U.S. Census Bureau

Population Under 18 Years

Percent of population in county under 18 years of age in

2014. Source: U.S. Census Bureau

Population Over 64 Years

Percent of population in county 65 years of age and older in

2014. Source: U.S. Census Bureau

Health

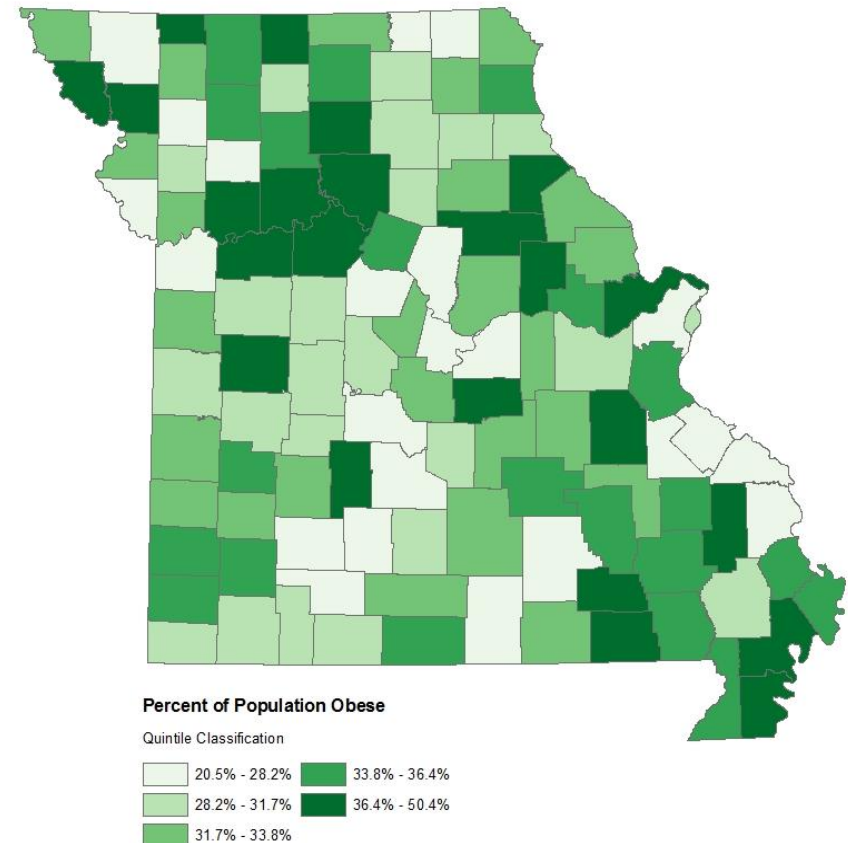
Obesity (MAP)

Percent of the population 18 years of age and older in 2011 that is obese (Body Mass Index equal to or greater than 30).

Source: Behavioral Risk Factor Surveillance Survey, Missouri Department of Health and Senior Services.

Prevalence of Obesity

Data Source: Missouri Department of Health and Senior Services, 2011

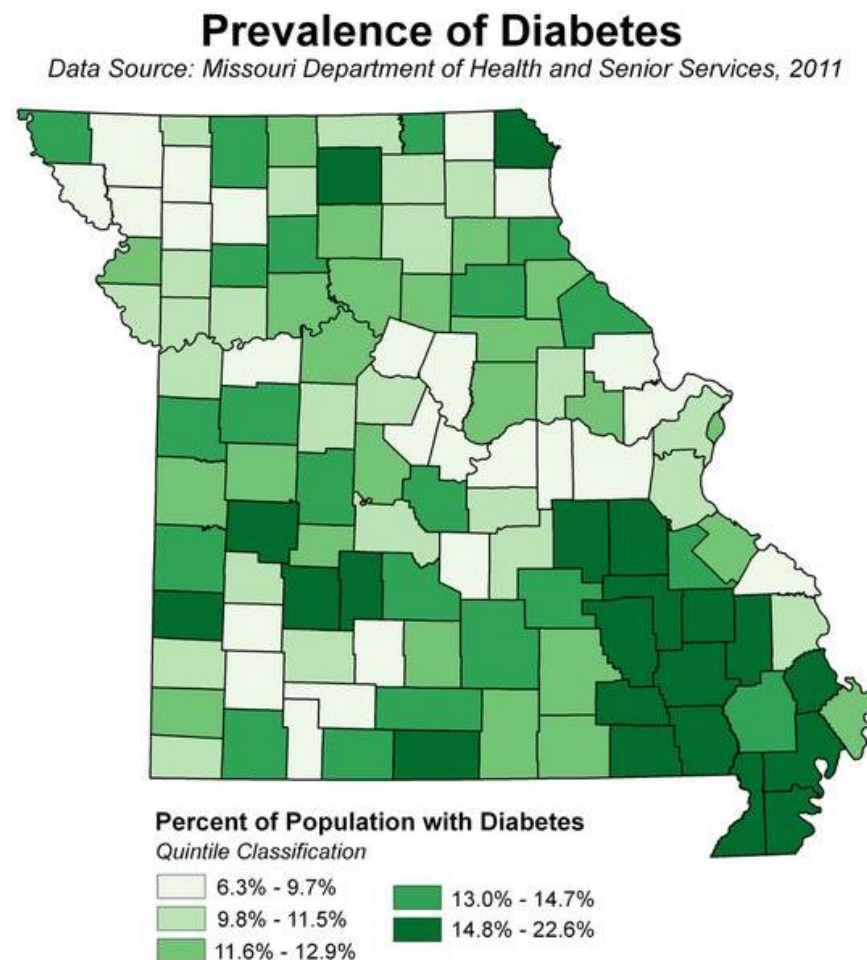


Diabetes (MAP)

Percent of the population 18 years of age and older in 2011 that has had their blood glucose levels checked by a health professional and been told that they have diabetes. *Source: Behavioral Risk Factor Surveillance Survey, Missouri Department of Health and Senior Services.*

Hypertension

Percent of the population 18 years of age and older in 2011 that has been told by a doctor, nurse, or other health professional that they have high blood pressure. *Source: Behavioral Risk Factor Surveillance Survey, Missouri Department of Health and Senior Services.*



Economic Indicators

Population Below Poverty (MAP)

Percent of the county's total population living at or below 100 percent of the poverty rate in 2014. *Source: U.S. Census Bureau Small Area Income and Poverty Estimates*

Under 18 years below poverty

Percent of the county's population under 18 years of age living at or below 100 percent of the poverty rate in 2014. *Source: U.S. Census Bureau Small Area Income and Poverty Estimates*

Over 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 2014. *Source: U.S. Census Bureau Small Area Income and Poverty Estimates*

Median Household Income

Average household income in county in 2014. *Source: U.S. Census Bureau Small Area Income and Poverty Estimates*

Unemployment Rate

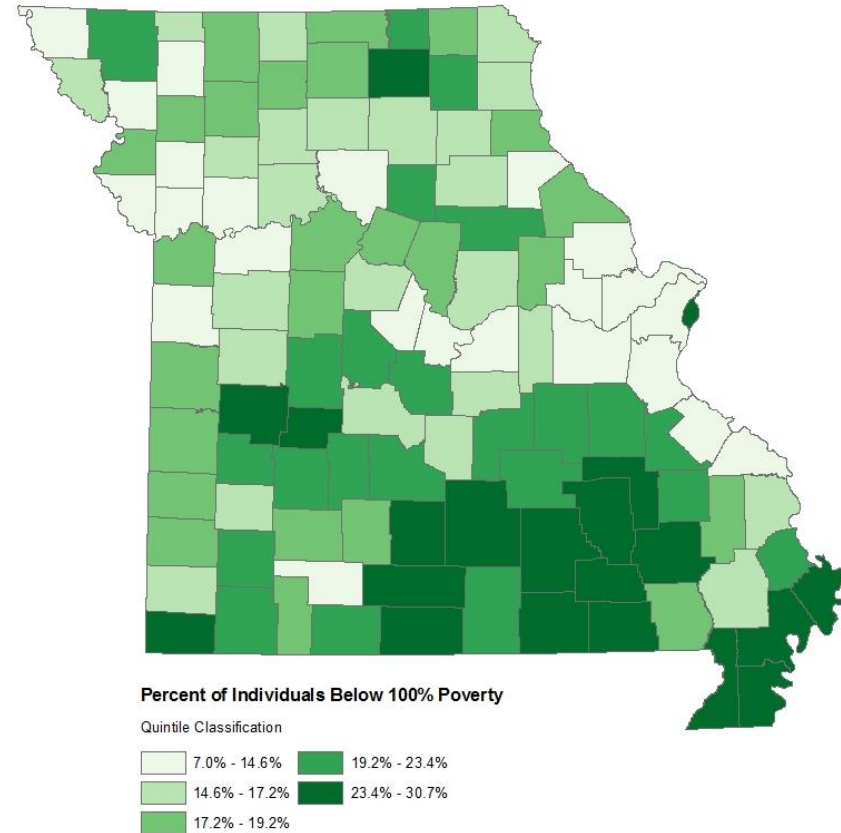
A county's average unemployment rate over 2014. *Source: U.S. Bureau of Labor Statistics*

Single Parent Households

The percent of households in a county headed by a single parent not currently married or living with a spouse in 2014. *Source: American Community Survey data modeled by Office of Social and Economic Data Analysis (MU)*

Population Below Poverty

Data Source: US Census Bureau Small Area Income and Poverty Estimates



Food Affordability (MAP)

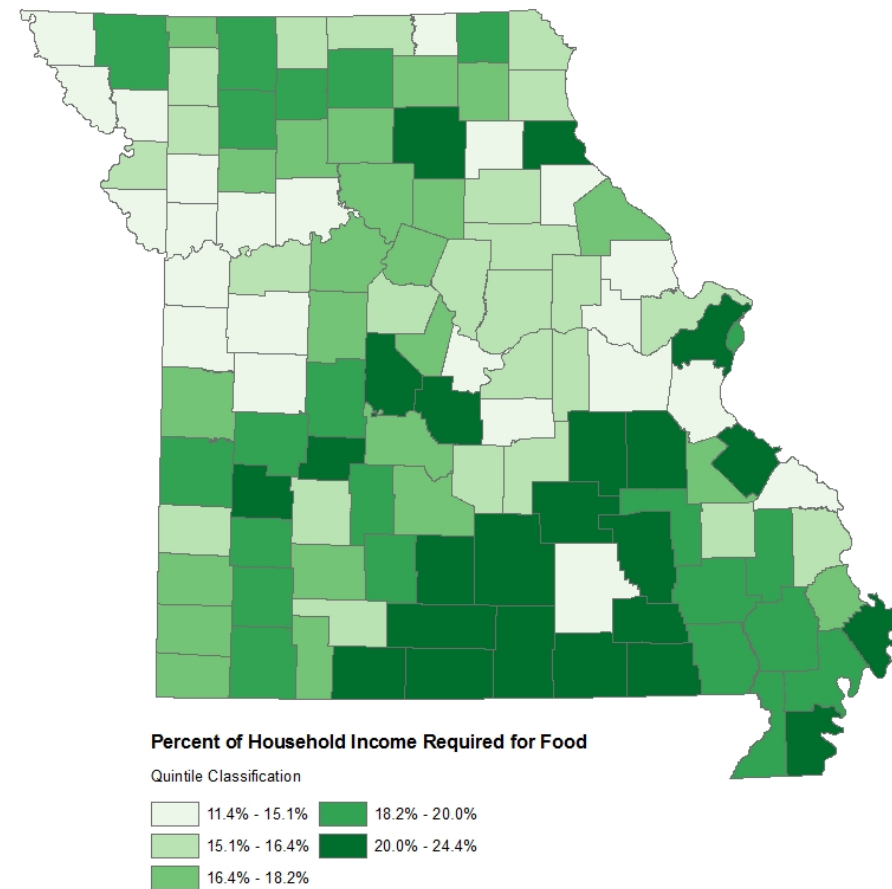
An estimate of the percent of income required each week by households in 2014 to meet average expenditures on food for that county. This indicator was calculated using the average weekly median household income and the average cost of meals as calculated by Feeding America.

Sources: American Community Survey, U.S. Census Quick Facts, Feeding America's Map the Meal Gap

In order to better understand the context of rising food insecurity in Missouri a new economic indicator, food affordability, was introduced in the 2013 edition of the Missouri Hunger Atlas. The percent of income needed to meet basic household food needs is an important determining factor in the quantity, quality, and types of food families purchase because low-income households often have to make tough choices about how to spend their money, which may ultimately lead to smaller amounts of household funds available for food expenditures. Higher food costs significantly limit household food choices. The food affordability indicator is a county-level estimate of the percent of income required for food each week. It was calculated using the median household income divided by the average household size and then divided by 52 to obtain the average weekly median household income. The average costs of meals, obtained from Feeding America, were multiplied by 21 meals each week, assuming three meals each day. This number was then divided by the average weekly median household income and multiplied by 100 to obtain a percent of weekly income used to purchase food.

Food Affordability

Data Sources: Feeding America; US Census Bureau, Small Area Income and Poverty Estimates



Need Indicators

Food Uncertainty

% Individuals Food Uncertain (MAP)

Estimated percent of the total population food uncertain in 2014 in a county, based on modeling of variables related to citizenship, age, mobility, race, female headed households, poverty, median household income, and unemployment. For more information on the modeling, please contact atlas authors. *Sources: American Community Survey, US Census Bureau, and Small Area Income and Poverty Estimates US Department of Labor, Bureau of Labor Statistics.*

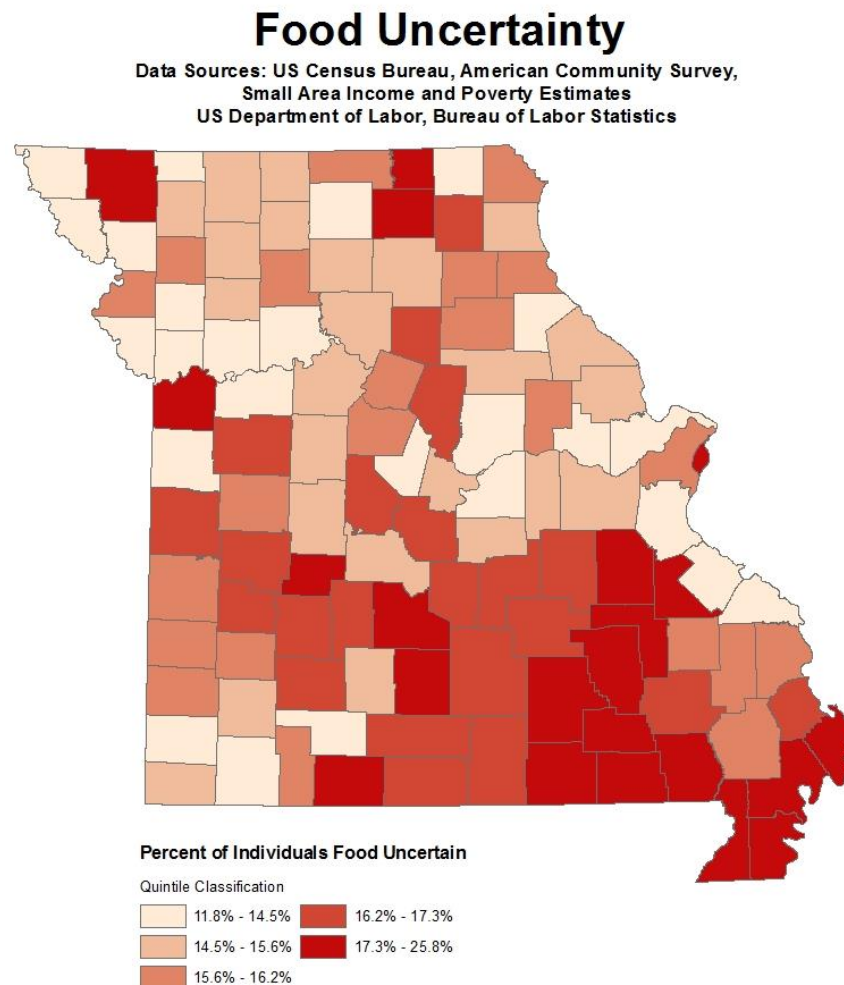
NOTE: Our use of food “uncertain” is not coterminous with the USDA’s use of food “insecure.” Because there is no empirical count of county-level food insecurity by the government, we model a roughly equivalent, but not identical measure, of “uncertainty.”

% Individuals <18 Food Uncertain (MAP, next page)

Estimated percent of the total population under the age of 18 food uncertain in 2014 in county, based on methods, variables and sources described above. *Sources: American Community Survey, US Census Bureau, and Small Area Income and Poverty Estimates US Department of Labor, Bureau of Labor Statistics.*

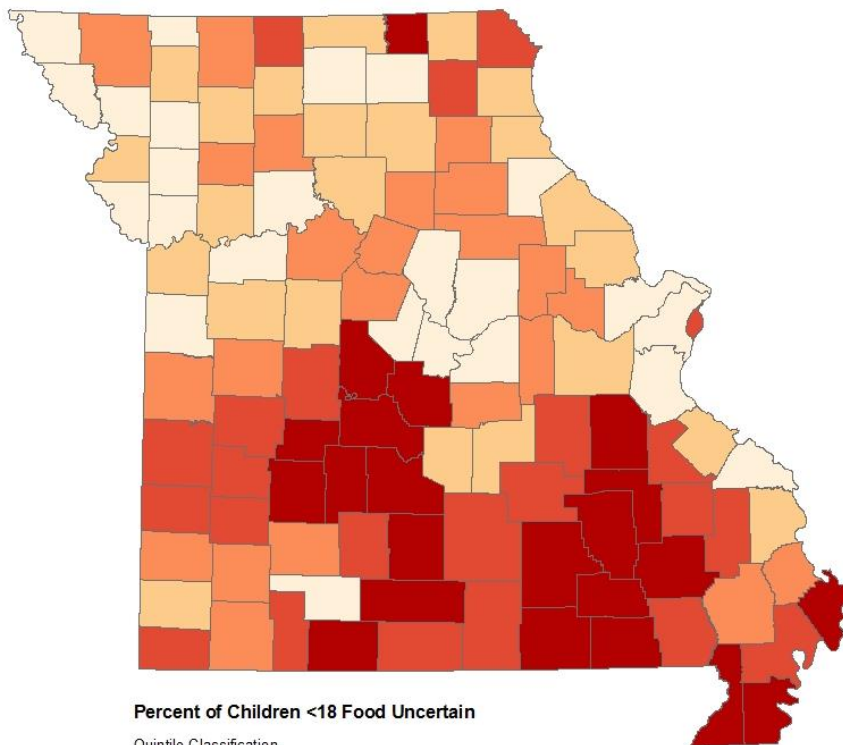
% Individuals Food Uncertain with Hunger (MAP, next page)

Estimated percent of the total population food uncertain with hunger in 2014 in county, based on methods, variables and sources described for “Households food uncertain.” *Sources: American Community Survey, US Census Bureau, and Small Area Income and Poverty Estimates US Dept. of Labor, Bureau of Labor Statistics.*



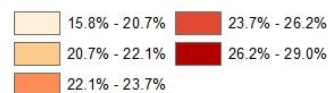
Children <18 Food Uncertain

Data Sources: US Census Bureau, American Community Survey,
Small Area Income and Poverty Estimates,
US Department of Labor, Bureau of Labor Statistics



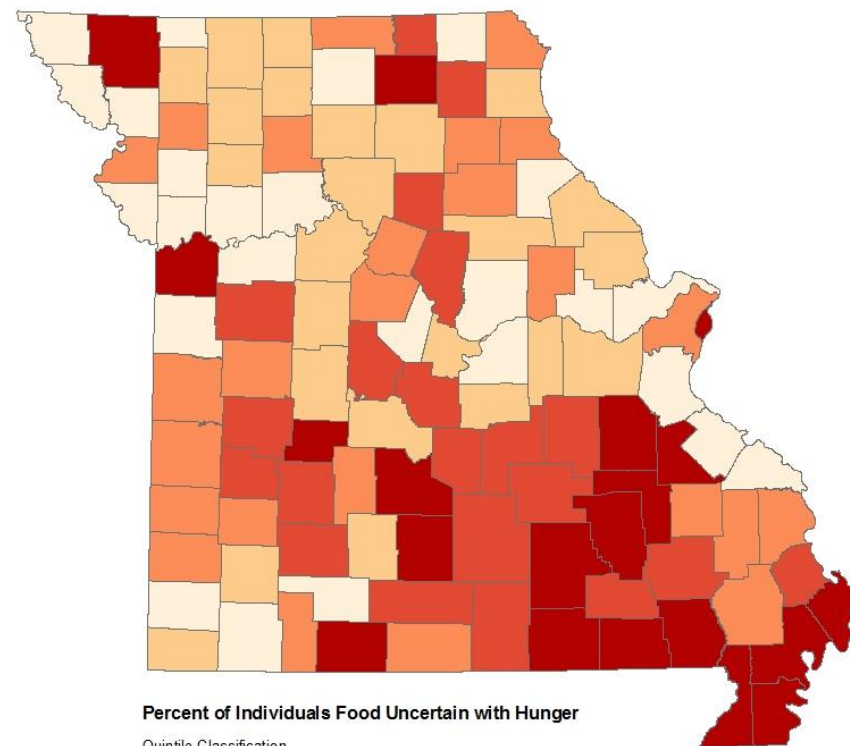
Percent of Children <18 Food Uncertain

Quintile Classification



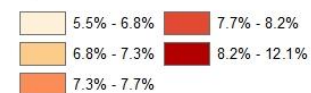
Food Uncertainty with Hunger

Data Sources: US Census Bureau, American Community Survey,
Small Area Income and Poverty Estimates,
US Department of Labor, Bureau of Labor Statistics



Percent of Individuals Food Uncertain with Hunger

Quintile Classification



SNAP (Food Stamp) Program

Percent Total Population Income Eligible (MAP)

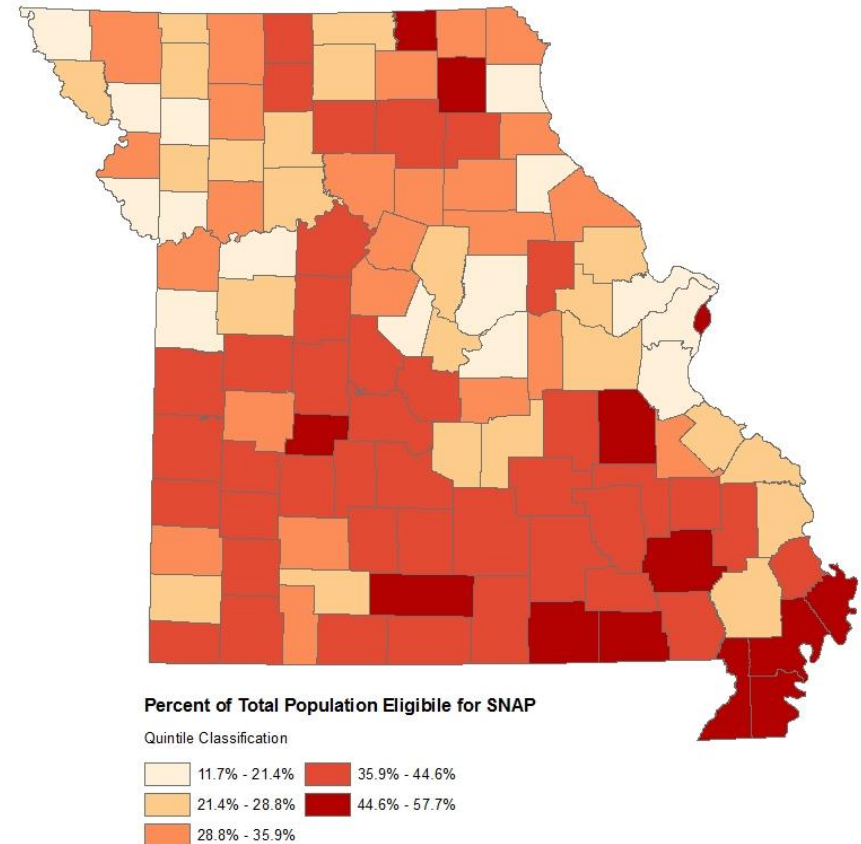
Estimated percent of total population income eligible for participation in the Supplemental Nutrition Assistance Program (formerly Food Stamps Program) in 2014. Income is the primary eligibility requirement; the formula begins by considering all households earning less than 130% of the poverty threshold². *Source: American Community Survey, for some counties modeled by Office of Social and Economic Data Analysis (MU).*

| SNAP (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

SNAP (Food Stamp) Eligibility

Data Sources: US Census Bureau, American Community Survey



additional restrictions, the data needed to approximate these adjustments are not currently available at the county level.

Percent Under 18 Years Income Eligible (SNAP)

Estimated percentage of total population less than 18 years of age income eligible for participation in the Food Stamps Program in 2014. Income eligibility is the primary eligibility requirement of the Food Stamp Program, a formula which starts by considering all households earning less than 130% of the poverty threshold. *Source: American Community Survey, for some counties modeled by Office of Social and Economic Data Analysis (MU).*

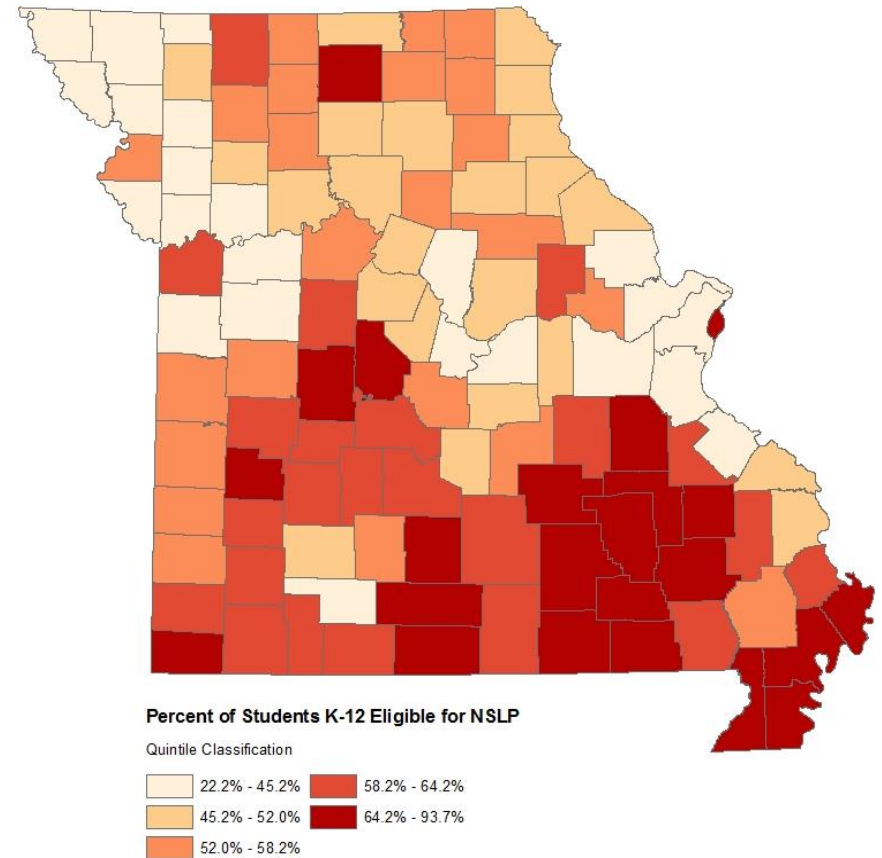
National School Lunch Program

Percent of K-12 Students Eligible

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 2015-2016 school year. Only schools participating in the program are included in the data. *Source: Department of Elementary and Secondary Education.*

National School Lunch Program (NSLP) Eligibility

Data Source: Missouri Department of Elementary & Secondary Education



Women, Infants and Children Program

Percent of Children Under 5 Income Eligible

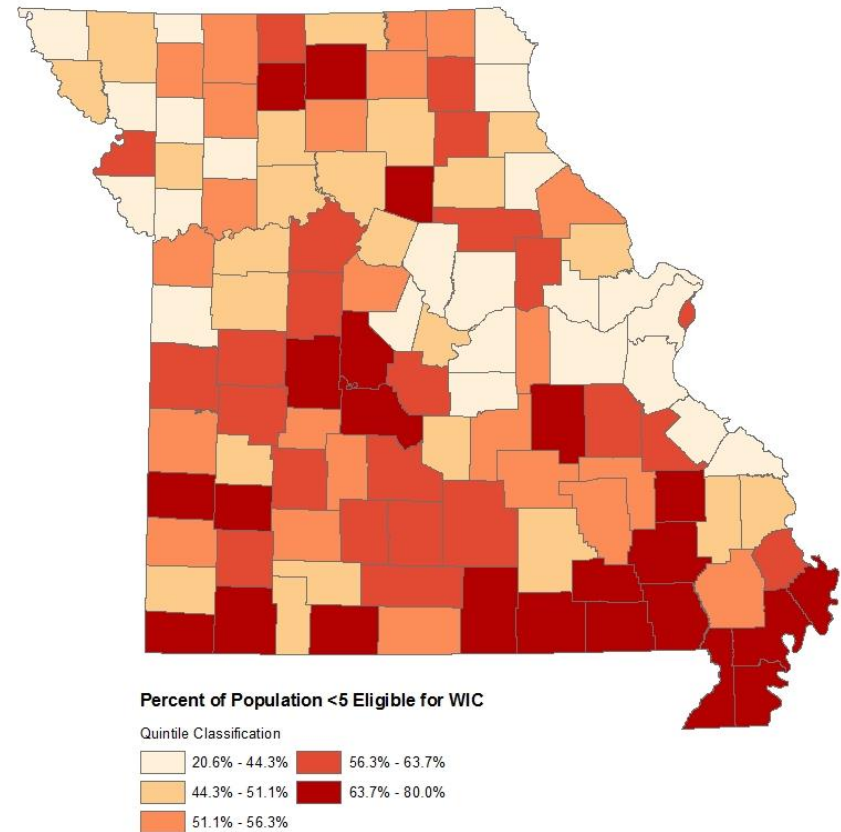
Percent of total infants and children under 5 years of age in the county eligible to receive WIC benefits in FY2015.

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, non-breastfeeding 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 |

Population Under Five Eligible for WIC

Data Sources: US Census Bureau, American Community Survey



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 2014.

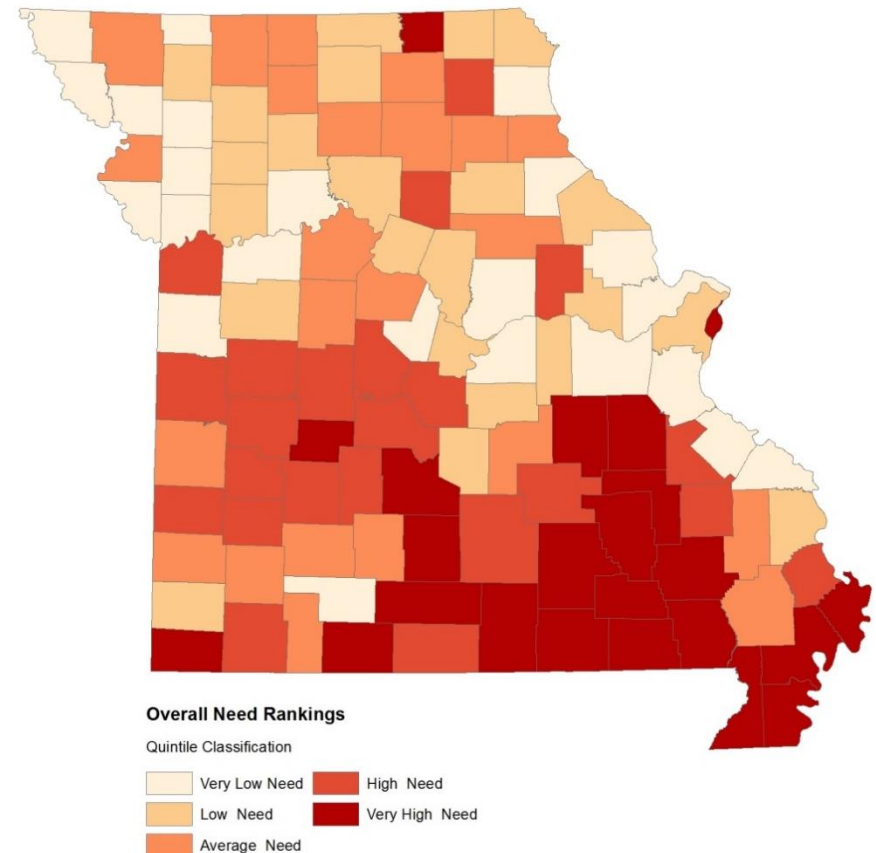
Percent of Total Population Eligible for SNAP/Food Stamps – percent of county residents eligible for SNAP/food stamps in FY2015.

Percent of K-12 School Enrollment Eligible for Free or Reduced Lunches (NSLP) – percent of K-12 students enrolled in schools (public and private) eligible for free and reduced lunches in the National School Lunch Program in October, 2015.

Percent of Population Under 5 WIC Eligible – percent of infants and children under 5 years of age in the county eligible to receive WIC benefits in FY2015.

Overall Need Rankings

Calculated From 2016 Hunger Atlas Data



Beginning with the individual county rankings for food uncertainty, SNAP eligibility, NSLP eligibility, and WIC under 5 eligibility, 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. Variables of percent of population food uncertain and percent of population income eligible for SNAP benefits were assigned higher weights due to the greater percentage of population affected by these variables.

In brief, the weighting model we use assigns

- 30 percent of the composite score to each of the measures of
 - Percent of households food uncertain and
 - Percent of total population eligible for Food Stamps;
- 20 percent of the composite score to both
 - Percent of K-12 school enrollment eligible for NSLP and
 - Under 5 years eligible for WIC.

For example, suppose a county had ranks of 17, 19, 91, and 22 for these four variables. The county's composite score, based on the weighted model and rounded off to the nearest whole number, would be 33. 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 our example case, the composite score of 33 ranks as the 28th highest in the state, which places the county in the second highest quintile (labeled "high") for Missouri.

Performance Indicators

SNAP (Food Stamp Program) Participation

Average Number of Monthly Participants

Average number of total county residents who used food stamps each month in Missouri FY2015 (July 1, 2014 – June 30, 2015). *Source: Missouri Department of Social Services*

Percent of Total Population Using SNAP

Average percent of total county population that used food stamps each month in FY2015. *Source: Missouri Department of Social Services and U.S. Census Bureau*

Percent of Eligible Population Participating (MAP)

Percent of county residents eligible for food stamps in FY2015 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).

Number of Monthly Participants Under 18 Years

Average number of county residents < 18 years of age who used food stamps each month in FY2015.

Source: Missouri Department of Social Services and Missouri Census Data Center

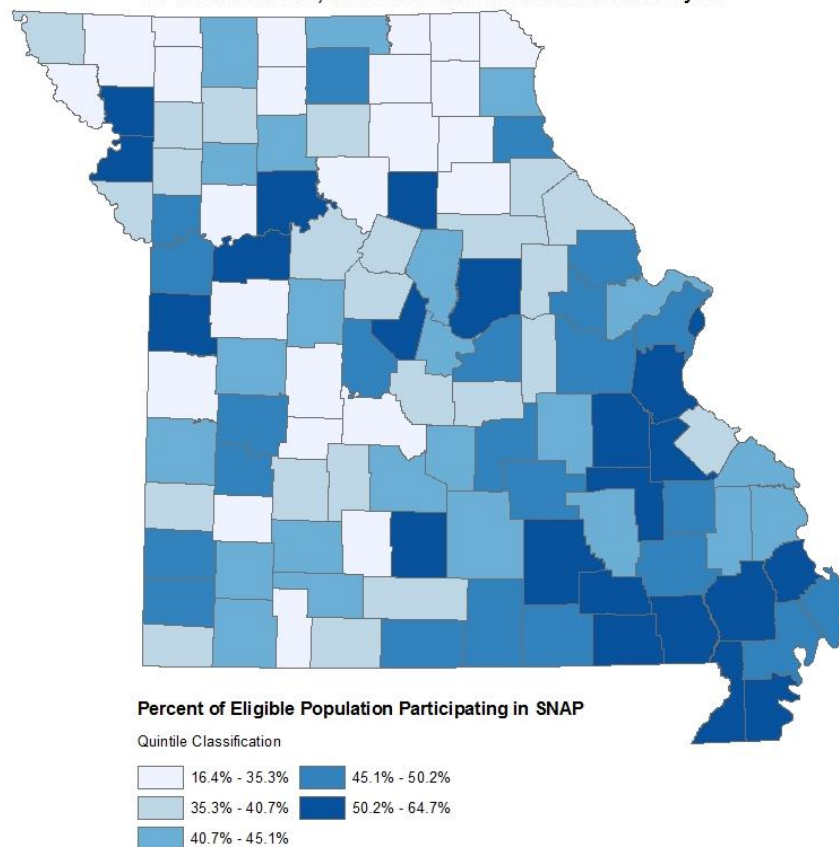
Percent of Under 18 Population Participating

Average percent of county population under 18 years of age that used food stamps each month in FY2015.

Sources: Missouri Department of Social Services and U.S. Census Bureau

Percent of Eligible Population Participating in SNAP (Food Stamps)

Data Sources: Missouri Department of Social Services
US Census Bureau, Office of Social & Economic Data Analysis



National School Lunch Program Participation

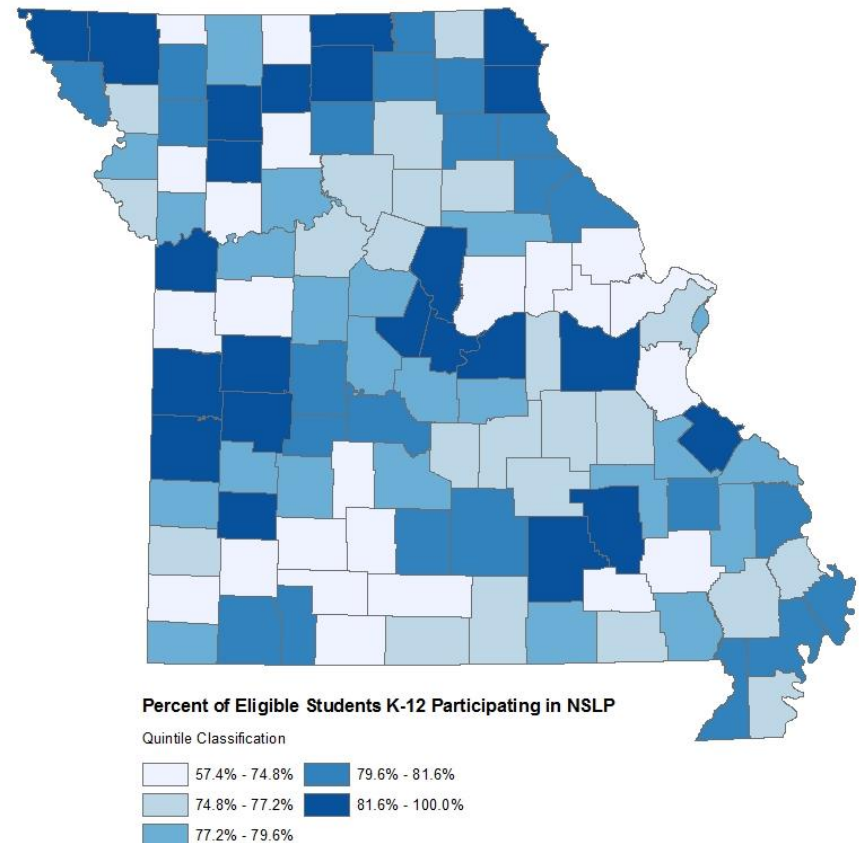
Percent Eligible and Participating (MAP)

Percent of students eligible for free or reduced lunches who participated in the program in October, 2015.

Source: Missouri Department of Elementary and Secondary Education

Percent of Eligible Students K-12 Participating in NSLP

Data Source: Missouri Department of Elementary & Secondary Education



Women, Infants and Children Program

Number of Monthly Participants

Average monthly number of women, infants and children enrolled in program during FY2015. *Source: Missouri Department of Health and Senior Services*

Number Monthly Infants and Children

Average monthly number of infants and children enrolled in program during FY2015. *Source: Missouri Department of Health and Senior Services*

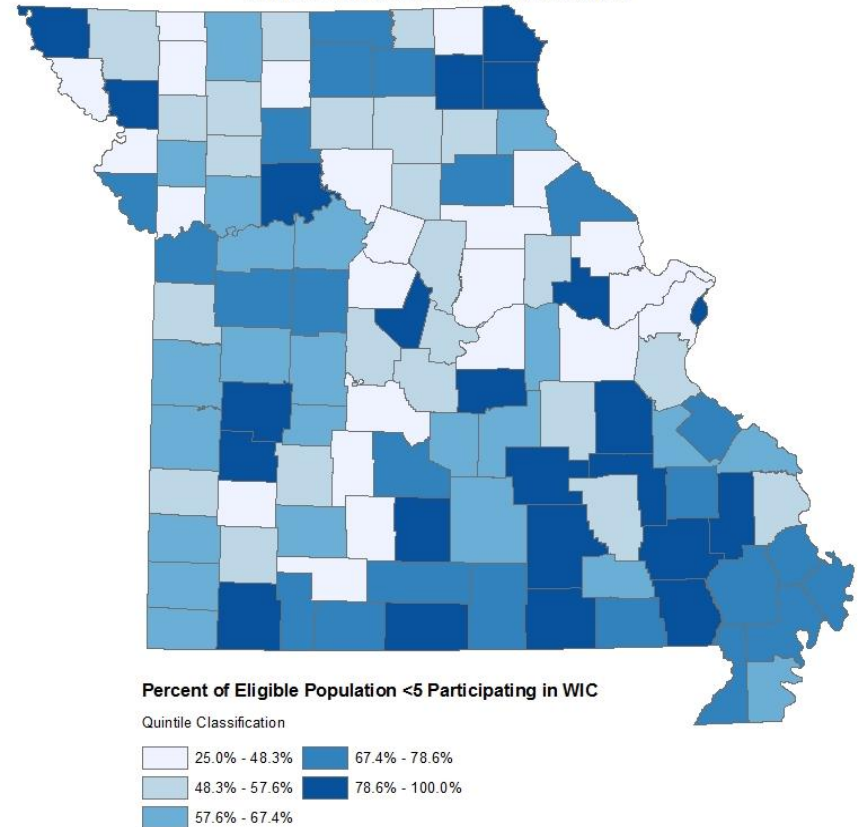
Percent of Eligible Population Under 5 Participating

(MAP) Percent of infants and children under 5 years of age in the county receiving WIC benefits per month in FY2015.

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)

Percent of Eligible Population <5 Participating in WIC

Data Sources: US Census, American Community Survey,
Missouri Department of Health and Senior Services
Office of Social & Economic Data Analysis



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 during 2015. *Source: Food Bank of Central and Northeast Missouri, Harvesters: The Community Food Network, Ozarks Food Harvest, Saint Louis Area Food Bank, Second Harvest Community Food Bank, Southeast Missouri Food Bank*

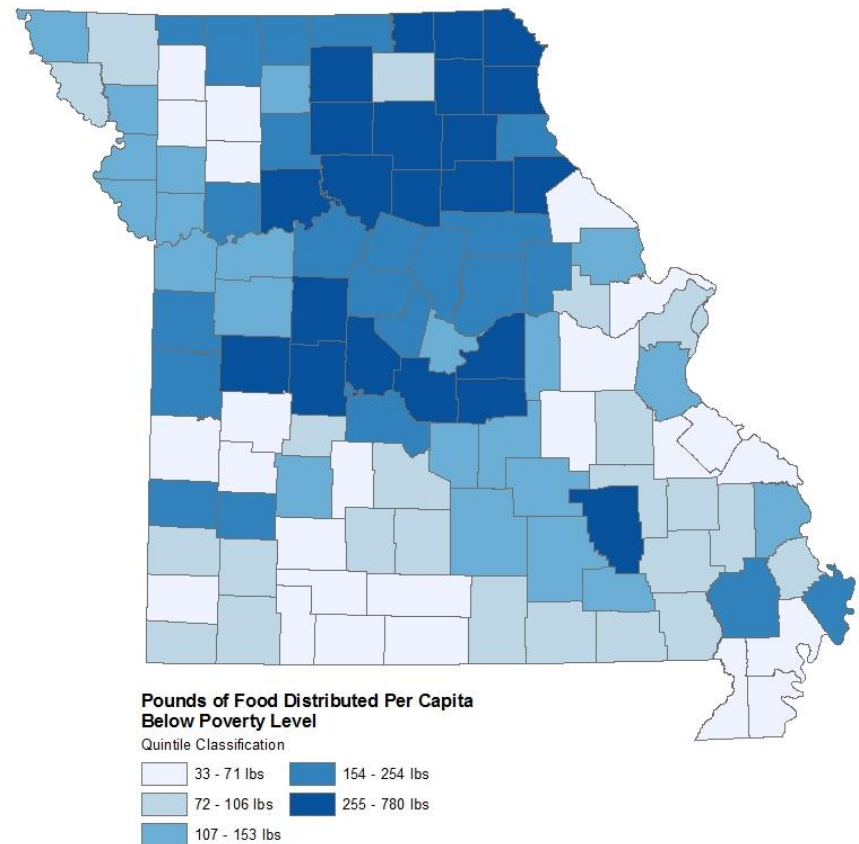
Pounds of Food Distributed per Capita Below Poverty Level (MAP)

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 2015.

Source: Central Missouri Food Bank, Harvesters: The Community Food Network, Ozarks Food Harvest, Saint Louis Area Food Bank, Second Harvest Community Food Bank, Southeast Missouri Food Bank and U.S. Census Bureau Small Area Income and Poverty Estimates

Pounds of Food Distributed by Food Banks Per Capita Below Poverty Level

Data Sources: Regional Food Banks of Missouri
US Census Bureau



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 FY2015.

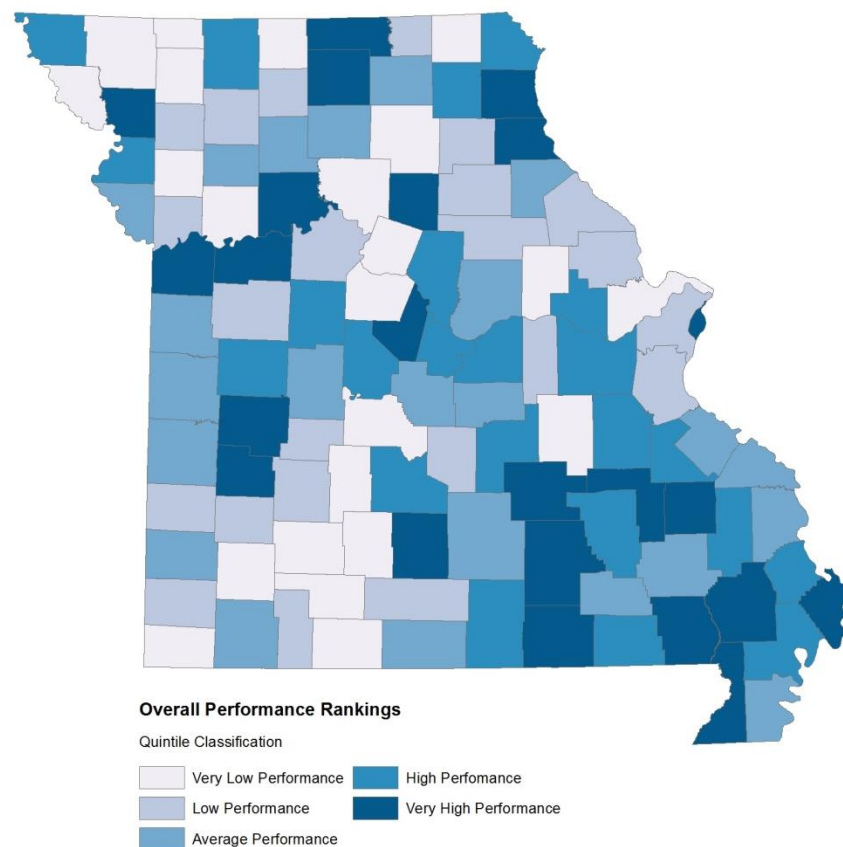
Percent of eligible students who received free or reduced lunches – percent of students eligible for free or reduced lunches who participated in the program in October 2015.

Percent of income eligible infants and children receiving WIC benefits – percent of income eligible infants and children under 5 years of age in FY2015 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 2015.

Overall Performance Rankings

Calculated From 2016 Hunger Atlas Data



We use the individual county rankings for SNAP participation, NSLP participation, WIC participation, and pounds of food distributed per capita below 100% poverty level to establish a composite rank score. As with the overall need ranks, rather than use a simple average of the four variable ranks, we assigned a weight to each rank in constructing the composite rank score. SNAP participation is weighted the most because it affects the largest population group; food bank distributions are given the lowest weight in our formula because emergency food distribution sources are dependent on a variety of input sources other than food banks.

In brief, the weighting model we used assigns

- 35 percent of the composite rank to the measure of
 - SNAP (Food Stamp) participation as percent of total population eligible;
- 25 percent each to the variables of
 - NSLP participation as a percent of total school population eligible and
 - WIC participation as percent of the eligible under 5 years old population; and,
- 15 percent to
 - 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 a hypothetical case, suppose the county had ranks of 106, 64, 64, and 48 respectively for these four variables. The county's composite score, based on the weighted model and rounded off to the nearest whole number, is 77. 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 this case, the composite score of 77 would rank as the 98th highest in the state, and so it is ranked in the lowest, or —very low, quintile.

Comparing 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 but they are included in the map.

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:

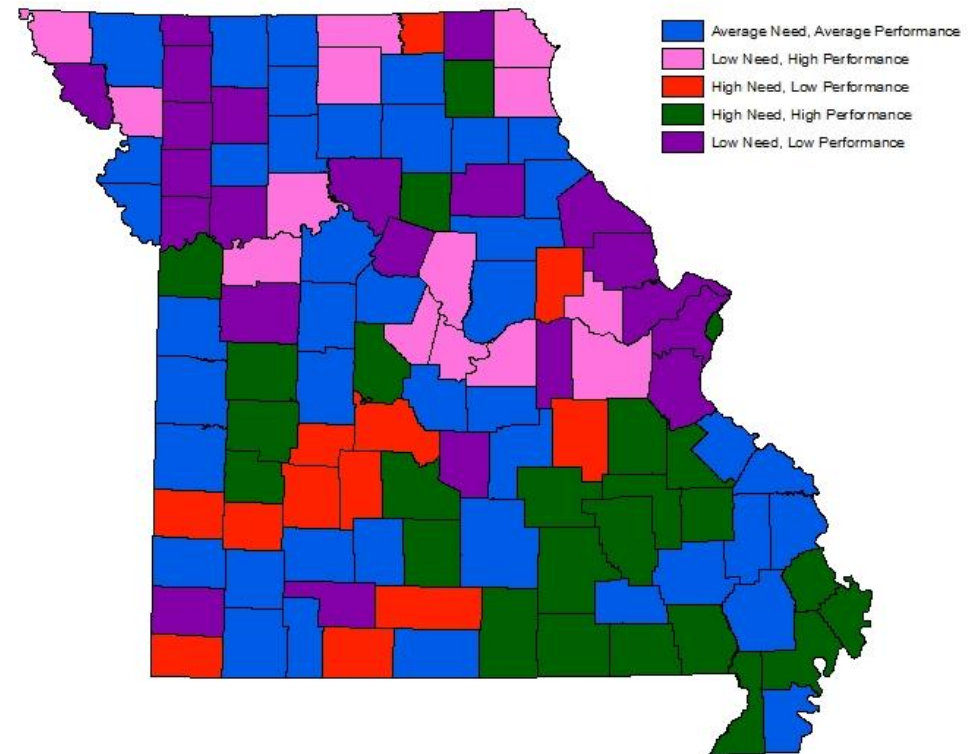
- (1) high need/high performance
- (2) high need/low performance
- (3) low need/high performance
- (4) low need/low performance

As shown in the map and table on the following page, this analysis yielded some interesting results. Twenty-four counties and St. Louis City have both high need and high performance. However, twelve counties were labeled high need and low performance. We have no way of knowing whether public and private agencies are having difficulty targeting resources to these high need/low performing counties, but trends reveal that recent economic conditions have taken their toll on Missouri counties. 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 concentrated adjacent to these high need, low performing counties, in the southeast quarter of the state. This could suggest focusing more individual attention on service delivery in these particular counties.

We found fourteen 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.

| High Need/High Performance | | High Need/Low Performance | |
|----------------------------|----------------|---------------------------|-------------|
| Butler | New Madrid | Barton | |
| Cedar | Oregon | Camden | |
| Dent | Randolph | Crawford | |
| Dunklin | Reynolds | Dade | |
| Henry | Ripley | Dallas | |
| Howell | St. Clair | Douglas | |
| Iron | St. Francois | Hickory | |
| Jackson | Scott | McDonald | |
| Knox | Shannon | Montgomery | |
| Laclede | Washington | Polk | |
| Madison | Wright | Schuyler | |
| Mississippi | St. Louis City | Taney | |
| Morgan | | | |
| Low Need/High Performance | | Low Need/Low Performance | |
| Andrew | Moniteau | Chariton | Johnson |
| Atchison | Osage | Christian | Lincoln |
| Boone | Putnam | Clay | Monroe |
| Carroll | Sullivan | Clinton | Newton |
| Clark | Warren | Daviess | Pike |
| Cole | | DeKalb | Pulaski |
| Franklin | | Gasconade | Ray |
| Lafayette | | Gentry | St. Charles |
| Lewis | | Holt | St. Louis |
| | | Howard | Scotland |
| | | Jefferson | Worth |

Need Vs. Performance



Missouri Hunger Atlas 2016
Interdisciplinary Center for Food Security
University of Missouri

At the other end of the spectrum are twenty-two counties that have comparatively low percentages of populations with hunger needs but are 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 percentages denote relatively large numbers of people because the base populations are often quite high (e.g. St. Charles and St. Louis County).

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.

Concluding Remarks

Food insecurity and hunger are facts of life for far too many Missourians. The USDA's assessment that nearly 17 percent of Missouri households were food insecure in 2015 applied to the mid-year estimated number of households (2,536,000) suggests that 409,760 households faced uncertainty in acquiring sufficient food for their household. Further, the USDA estimated that nearly 7 percent of households in Missouri experienced very low food security (prior to 2007 labeled as —food insecure with hunger), or roughly 166,877 households. This translates into roughly 400,000 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 several years parallels our findings and suggests that residual economic fallout has had a negative impact on households' abilities to access food or resources.

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 first step 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 2012 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 90 million pounds a year to food pantries and other facilities, many of these locations rely on food banks for only a 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 SNAP (Food Stamp Program) and the reimbursements given to schools for NSLP (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 somber note, a majority of counties characterized as —high need are also —low performance in contrast to a much lower number of high need/high performance counties. This result suggests programs are could be more effective in targeting high need areas. Generally there is —low performance in all metro and suburban areas, with the notable exception of St. Louis City, which means a larger number of people are at risk of hunger, even if their need is relatively low.

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 north/central region and 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.