

# Access to Affordable and Nutritious Food: Measuring and Understanding Food Deserts and Their Consequences

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# Why might food deserts matter?

- Related to diet and health outcomes such as obesity and diet-related diseases
- Related to health disparities across race/ethnicity and income levels
- May be related to food insecurity
- SNAP benefits can be stretched farther if participants can access lower prices

# Farm Bill food deserts definition

“Areas in the U.S. with limited access to affordable and nutritious food, particularly such an area composed of predominantly low-income neighborhoods and communities.”

# Methods

- Proximity to supermarkets and large grocery stores.
  - SNAP authorized store directory merged with TDLinx directory
- Individual characteristics
  - Low-income individuals (income  $\leq$  200% poverty)
  - Households without access to a vehicle
- Area characteristics
  - Areas where more than 40% of the population has income below 200% of poverty

# Methods

- Continental U.S. divided into 1 kilometer square grids.
  - Socioeconomic Data and Applications Center data from 2000 Census of Population.
- Distance from grid center to nearest supermarket or large grocery store.
- Overall and separately by urbanicity.

# Caveats

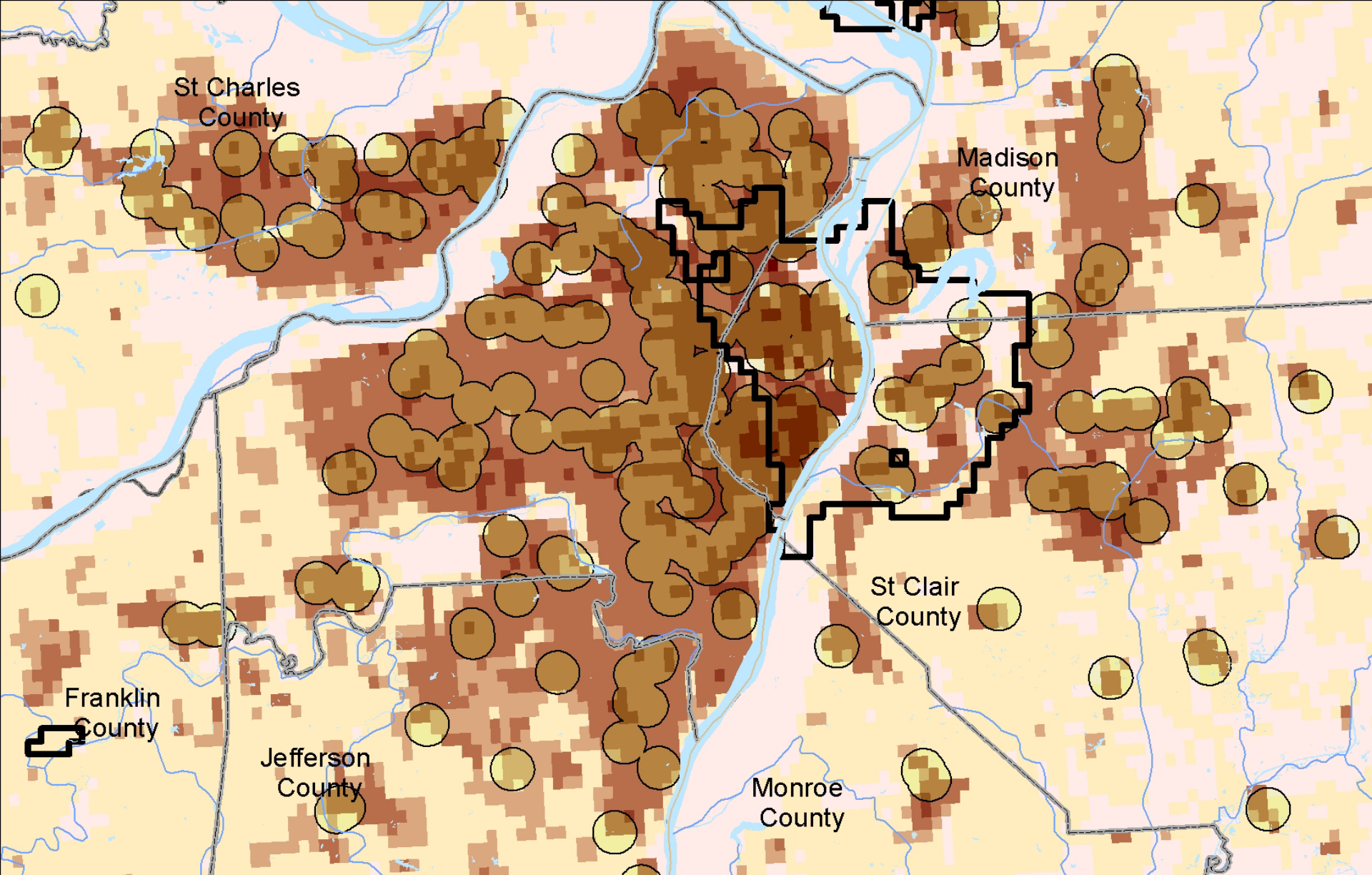
- Overestimate the extent of food deserts?
  - Excludes smaller and non-traditional stores, farmers markets, and mobile markets.
  - Home to store measure; not travel pattern measure.
- Underestimate the extent of food deserts?
  - Definition of ‘large’ grocery store is old.
  - No indication of quality, quantity or price in these supermarkets and large grocery stores.
- Relative access of healthy to unhealthy food may be as important – “food swamps”
- Poverty measure not geographically adjusted

# Overview of results

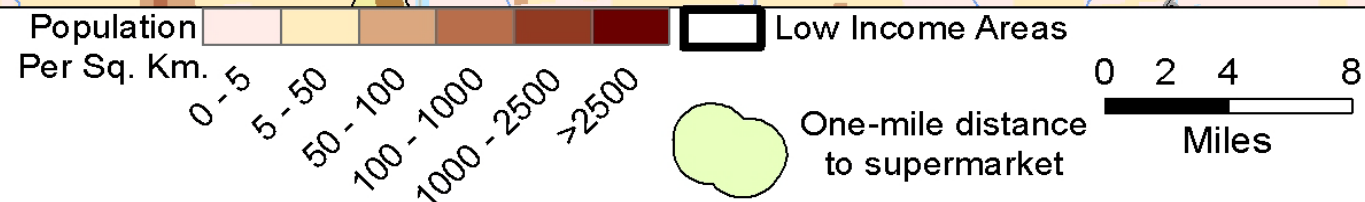
- Access to a supermarket or large grocery store is a problem for a small percentage of the population,
- Depending on which measure is used, limited access to a supermarket or large grocery store impacts between 2 – 8 percent of the population.

# Area-based Results

- 23.5 million people live in low income areas 1+ mile from a supermarket (8.4%).
- But only half of those who live in low-income areas have low income.
- If consider only those with low incomes in low-income areas, then 11.5 million (4.1%) are more than 1 mile from a supermarket.



# Saint Louis, MO Food Deserts



# Supermarket Access and Vehicle Access

- More than a mile from a supermarket and no vehicle:
  - 2.4 million households (2.3%)
- Between  $\frac{1}{2}$  and 1 mile without a vehicle:
  - An additional 3.4 million households (3.3%)

# Corroborating evidence

## 2001 Current Population Survey

- 5.1% of all households did not always have the kinds of foods they wanted and said it was too hard to get to the store or to a store that carries the kinds of foods they wanted.
- 0.6% of all households did not have enough to eat and said it was too hard to get to the store.
- A total of 5.7% of all households sometimes do not have enough to eat or enough of the foods they want because of access problems.

# Average time spent traveling to grocery stores (shortest one-way)

- Total population: 15.0 minutes

- Low-income areas

< 0.5 miles:	15.5
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0.5 – 1.0 miles:	14.1
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1.0+ miles:	19.5
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- Higher-income areas

< 0.5 miles:	13.3
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0.5 – 1.0 miles:	12.5
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1.0+ miles:	15.9
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Source: ERS, Census, BLS estimates using 2003-2007 ATUS.

# Price differences across store format and income

We used Nielsen Homescan data on food purchases to understand prices paid by consumers.

- Examined prices paid across store formats (supermarkets, convenience stores, club stores, and other retailers) for 3 goods .
  - Milk
  - Ready-to-eat cereal
  - Bread
- Examined the prices paid for the same UPC-coded food item across consumer income levels.  
(Brouda, Leibtag, Weinstein, *JPE*, 2009)

# Convenience store prices are higher than supermarket prices

- Milk – 5% higher
- Cereal – 25% higher
- Bread – 10% higher
- On sale purchases and coupon use are frequently reported at convenience stores and can offset the price premium.

# Low-income consumers shop for the best prices when they can

- Convenience store purchases make up only 2-3% of low-income consumers' total food spending.
- Low-income shoppers are more likely to purchase food at supercenters, which offer the lowest prices.

# Low-income consumers shop for the best prices when they can

- Consumers with annual incomes between \$8,000 – \$30,000 pay the least.
- Consumers with the lowest incomes (less than \$8,000) pay slightly more (0.5 – 1.3 percent more).
- Higher income consumers (\$100,000 or more) pay the most (2 – 3 percent more).

# What are the effects of limited access on diet and health?

- Many studies show correlation between limited access and lower consumption of fruits and vegetables, poor diet, and BMI/obesity.
- Few studies show causal relationships.
  - U.K. pre/post-store opening studies
  - Spatial econometric approach  
Chen, Florax, & Snyder (2009)

# What are the implications for public policy?

- Supply (e.g. store development costs) or demand conditions (consumer income, knowledge and preferences) could contribute to differences in access to stores.
- Public policy may need to address both supply and demand side concerns.

# Examples of public interventions to increase access

- Healthy Bodegas, Health Bucks and Green Carts in NYC
- Pennsylvania Fresh Food Financing Initiative

# Healthy Food Financing Initiative

- President's proposed FY2011 budget calls for \$400 million to encourage financing of healthy food options in distressed urban and rural communities.
  - Funding through USDA, Treasury, and HHS.
- Many types of projects may be considered (e.g. supermarkets, farmers markets, reconfigured small stores)

# U.S. Food Environment Atlas

- Publicly available mapping tool to show variation in food environment indicators.
- Assembles statistics on 3 broad categories:
  - Food choices
  - Health and well-being
  - Community characteristics
- About 90 indicators
  - Most at the county level

# Food Environment Atlas

[Food Environment Atlas](http://www.ers.usda.gov/foodatlas/)

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Report website:

<http://www.ers.usda.gov/Publications/AP/AP036/>

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# Additional information about study

- National Poverty Center (NPC) commissioned papers on Economic Concepts and Characteristics of Food Access (6 case studies)

<http://www.npc.umich.edu/>

- IOM/NRC Workshop on the Public Health Effects of Food Deserts

*The Public Health Effects of Food Deserts:  
Workshop Summary*

<http://www.iom.edu/CMS/3788/59640/70463.aspx>