Delineating Urban Food Deserts and Associated Health Impacts - Nashville, Tennessee

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Overview

- Introduction
- Background and Significance
- Objectives
- Methodology
- ArcGIS Maps
- Ongoing Research
Have you ever noticed, depending on where in Nashville, that you may not be able to find a Kroger or Publix?

Did it bother you that you had to drive across town to find a certain food item that was not at your nearest grocery store?

Now imagine these same scenarios, but with 2 kids and a spouse to cook for that night and/or not having a car.

Also keeping in mind that Popeye’s is a block away and can feed a family of four for 20 bucks.
**Food Deserts**

- **Definition:** An area with little, if any, access to the types of nutritious foods needed to maintain a healthy diet.
  - Areas are usually overpopulated with convenience stores and/or fast food restaurants.
  - Area residents typically lack private automobiles and/or are dependent upon public transportation.

- **Food choices that could be healthy end up costing more.**
East Charlotte Avenue "Food Desert"
Nashville/Davidson County, Tennessee

Circle represents a one mile radius around John Henry Hale Homes. Note that Harvey's Bi-Rite is only a corner market. Also note that the community's access to Kroger is cut off by Interstate highways.

Legend
- Street Grid
- Interstate 40/65
- Grocery Stores
- Public Housing
- Renters With No Cars
- Owners With No Cars

TSU GISc Lab
October 2004
Edgehill "Food Desert"
Nashville/Davidson County, Tennessee

Legend
- Interstate 40/65
- Grocery Stores
  - 1 Dot = 1
- Renters With No Cars
  - 1 Dot = 1
- Owners With No Cars
- Edgehill Homes

Circle represents a radius of approximately 1 mile around the Edgehill Homes public housing complex.

TSU GISc Lab
October 2004
"Captive" Grocery Store Clientelle
Nashville/Davidson County, Tennessee

Each circle represents about a half-mile radius around grocery stores available to non-vehicle owning households. Residents essentially have only one option for food purchases.

Legend
- Interstate 24/40/65
- Grocery Stores
- Street Grid
- 1 Dot = 1
- Renters With No Cars
- 1 Dot = 1
- Owners With No Cars
- Public Housing
- Interstate 24

Public Housing
1 = Tony Sudikum Homes
2 = J.C. Napier Homes
3 = Edgefield Manor
4 = James A. Cayce Homes

A - Eddie's Cee Bee Market
B - Piggly Wiggly
A relationship between socioeconomic status and diet quality

- High SES → higher quality diets
- Low SES → nutrient poor

Healthy foods are out of economic reach

- Tend to go for cheaper, faster, unhealthy options
  - Fast food

Families that chose fast food options ≥ 3 times per week were more likely to have junk food in their home
African Americans eating fast food was associated with higher fat and lower vegetable intake
- Trend was seen in younger, never married, obese, physically inactive and multivitamin non-users

An increase in the number of fast food restaurants will beget an increase in the number of obese individuals
- 70% of the total variance in obesity rates were explained by persons per fast food restaurants
Distance to supermarkets affects healthy eating habits

- Spatial accessibility to supermarkets may have a racial component
Obesity as defined by the CDC

- Body Mass Index (BMI) > 30
  - Measurement of weight in kg / (height in m)^2
- 2007 - 30 states had an obesity prevalence of greater than or equal to 25%
  - Alabama, Mississippi and Tennessee
  - Greater than or equal to 30%
Breakdown from 2004 in the United States

- 30% of non-Hispanic whites
- 36.8% of Mexican Americans
- 45% of non-Hispanic blacks
- Women > men
- Projected increase to >75% of the population being obese by 2015
Background and Significance

- Comorbidities associated with obesity
  - Hypertension
  - Diabetes
  - Cerebrovascular Accident
  - Cardiovascular Disease
  - Cancer

- Cost of obesity
  - 2002 data suggests > $92.6 billion

- There is a need to prevent and treat obesity
Objectives

- To assess the distribution of quality grocery stores in Nashville, TN Davidson County
- To determine if there is a relative over-representation of fast food restaurants in low-income areas
- To assess the accessibility of quality grocery stores in comparison with fast food restaurants in selected low-income communities
- To compare Body Mass Indices (BMI) by zip code with the percent of quality grocery stores and percent of fast food restaurants
- To develop specific spatial and public health-based criteria for defining urban “food deserts.”
Methodology

- Secondary Data Set
  - Nashville, TN Davidson County
  - Food Security Partners of Middle Tennessee
  - U.S. Census Bureau
  - Metro Public Health Department of Nashville, TN Davidson County
Methodology

- Geographic Information Systems Mapping
  - Food Inspection Database obtained from Nashville Metropolitan Health Department
  - Retail food sources separated by types based on inspection criteria for retail food markets
  - “Supermarkets” layer created by combining several retail food types of commonly known chain grocery stores (i.e. Kroger, Publix, Harris Teeter, etc.)
    - Addresses of each retail site were geocoded onto Nashville 2009 street shapefile
  - “Fast food” layer created by geocoding commonly recognized franchises (i.e. McDonald’s, KFC, Burger King, etc.)
Nashville-Davidson County, Tennessee
Supermarkets and Households in Poverty by
U.S. Census Block Group

Legend
- Supermarkets

HOUSEHOLDS IN POVERTY
- 0 - 68
- 69 - 213
- 214 - 408
- 409 - 777
- 778 - 1262

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Ongoing Research

- Incorporating racial group and BMI data by U.S. Census Block and zip code area, respectively, into current maps

- Assessing obesity rates against the access to fast food restaurants vs supermarkets

- Developing specific spatial and public health-based criteria for defining urban “food deserts”
References


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