

The background is a dark blue gradient. It is decorated with various geometric elements: small squares in white, pink, orange, and teal, and thin white vertical lines of varying lengths. These elements are scattered across the slide, creating a modern, minimalist aesthetic.

FOOD ACCESS IN THE MIDWEST VS. NORTHEAST

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Background

54.4 million Americans live in low-income areas with poor access to healthy food (USDA ERS (2021))

- Food security: “When all people at all times have access to sufficient, safe, and nutritious food”
- Food access: Spatial accessibility and affordability of food retails
- Physical environment, economic environment, and sociocultural environment
- Race and income are highly correlated with healthy food access

Data

US Department of Agriculture's Economic Research
Service 2010 Census Data



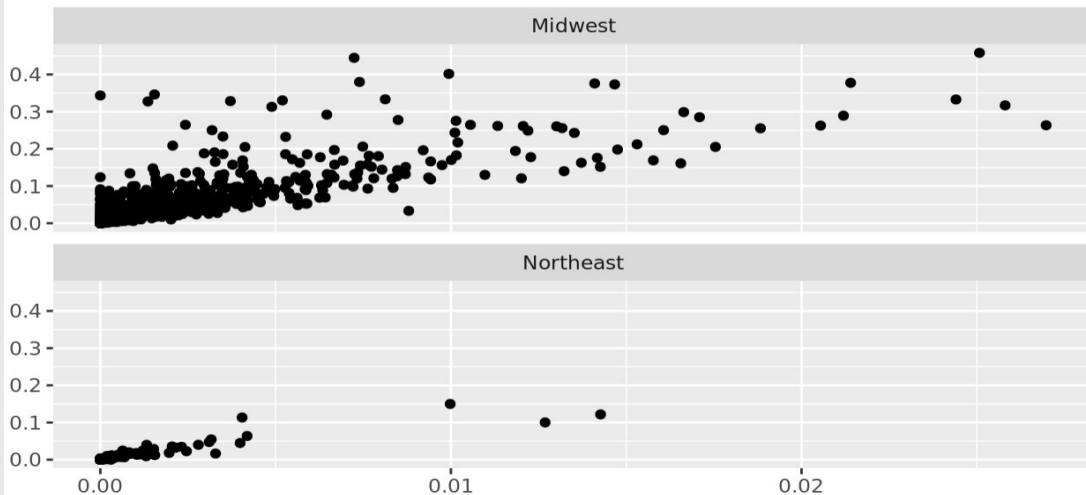
Research Question: For those classified as low income and beyond 10 miles away from a supermarket, does the Midwest or Northeast have a higher mean proportion of individuals? What variables contribute to this difference?

Variables

- Examples of qualitative:
County, State
- Examples of quantitative:
Population count, occupied housing unit count, population count beyond 10 mi from supermarket (senior, low-income, kids)

Highlights from EDA

Relationship between proportion of no vehicle access and being 10 miles away from supermarkets versus proportion of low-income individuals who are 10 miles away



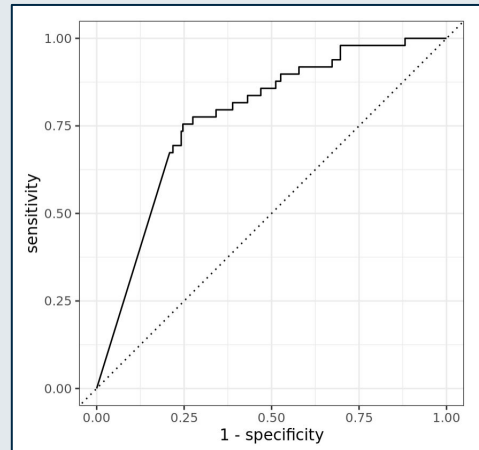
X = Proportion of seniors being 10 miles away from supermarkets/ population

Y = Proportion of 10 miles away from \n supermarkets and low-income/ population

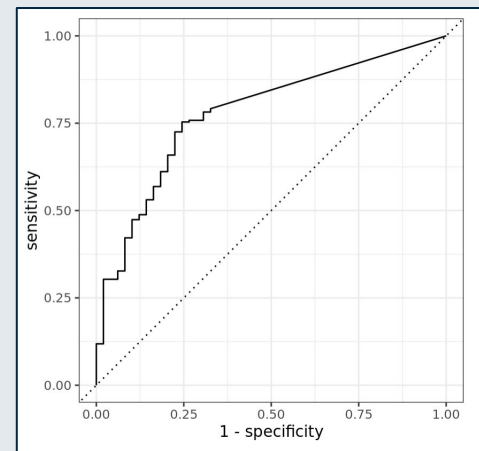
- Positive relationship

- ↑ No vehicle access
- ↑ Low income and 10 miles away from supermarket

Northeast



Midwest

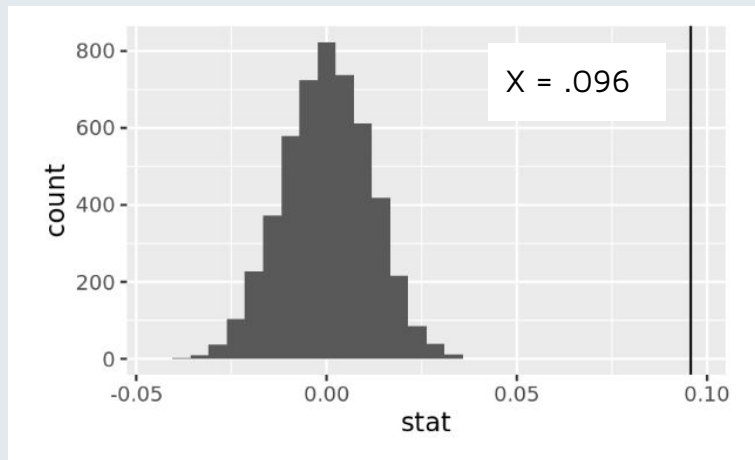


Inference Analysis

Hypothesis Test

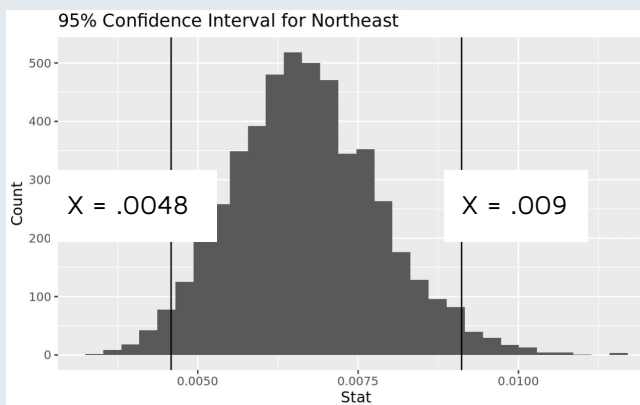
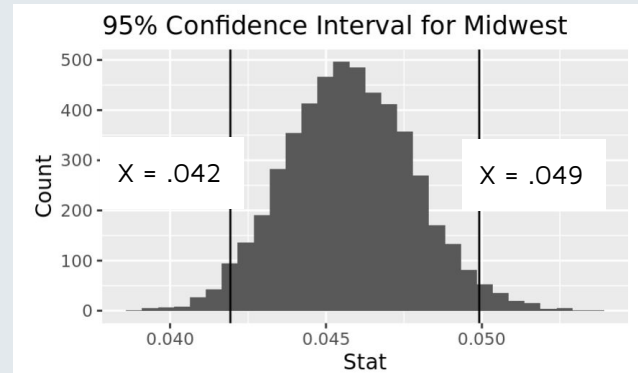
Null: The true mean proportional difference for low income and beyond 10 miles from the supermarket between the Midwest and northeast is equal to 0.

Alternate: The true mean proportional difference for low income and beyond 10 miles from the supermarket between the Midwest and northeast is greater than 0



- $p = \sim 0 < \alpha = 0.5$

95 percent CI- True mean proportion for low income and being 10 miles away from supermarket



Linear regression

Best model:

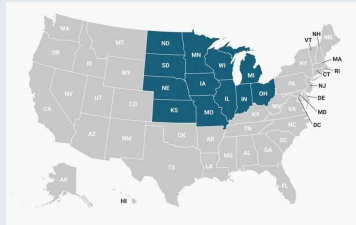
Explanatory = proportion of seniors who are 10 miles from a supermarket * proportion of no vehicle access being 10 miles away from a supermarket

$$R^2 = .885$$

Conclusions and Future Work

Conclusion

- Midwest has significantly lower access to food due to no vehicle access beyond 10 miles to supermarkets and seniors status compared to the Northeast
- Limitation: Data leaving out farmer's markets and local shops



The Future

- Backing the Centers of Disease and Control
- Recommend states in the Midwest to provide incentives