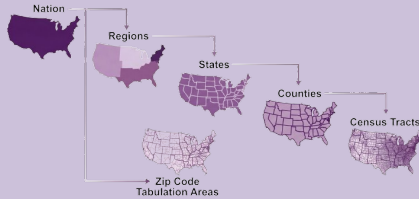


Introduction

Cultivate Food Rescue, a non-profit in South Bend, Indiana has the mission of ending hunger in Northern Indiana. This is done by rescuing excess food and redistributing it to food pantries in the region. Our cohort was assigned to help them accomplish their mission with these **objectives**:

- Develop a model to estimate the pounds of food needed to end hunger
- Use maps to assess pantry deserts in St. Joseph, Elkhart, and Marshall counties
- Explore food flooding with a trial and questionnaire for different tracts



Source: GAO adaptation of Census Bureau figure | GAO-23-518

Modeling Food Insecurity

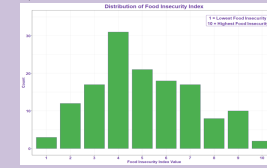
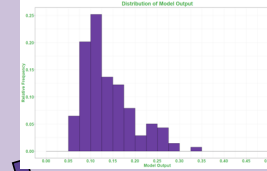
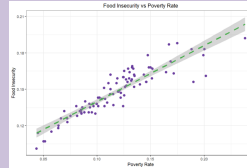
$$FI_{ct} = 0.091 + 0.337 \cdot POV_{ct} + .478 \cdot UN_{ct} - 0.001 \cdot MI_{ct} - 0.001 \cdot HISP_{ct} - 0.078 \cdot BLACK_{ct} - 0.059 \cdot OWN_{ct} + .19 \cdot DIS_{ct}$$

ct indicates rates were for 2024 census data at the census tract level

FI is our food insecurity rate, **POV** is the poverty rate, **UN** is the unemployment rate, **MI** is median income (normalized with min-max scaling), **HISP** is the Hispanic population percentage, **BLACK** is the estimated African American population percentage, **OWN** is the rate of individuals who are homeowners, **DIS** is the disability rate.

*variable weights were provided from Feeding America's Map The Meal Gap 2024 Technical Brief

- Pounds to end hunger estimation model designed using previously designed models, and later validating it
- Questionnaire developed to assess security of pantry attendees
- Correlation between food insecurity and poverty researched at county level inside of Indiana



Conclusions

- 20 tracts assessed as being seriously food insecure on Food Insecurity Index
- Questionnaire developed with questions assessing food security of food-flooded pantry attendees in a specific tract
- Interactive map used to visualize patterns and provide context to Cultivate
- Poverty and food insecurity are similar, not interchangeable

Cultivate Intercept Survey

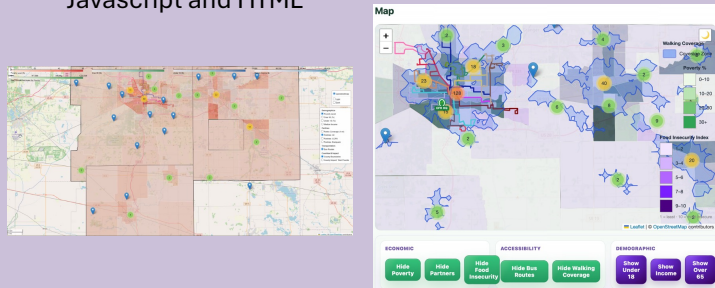
- How often do you receive food assistance?
 - Weekly
 - Monthly
 - A few times a year
 - Never
- Do you regularly have access to a free food source?
 - Yes
 - No
- In the past 30 days, have you worried whether you would run out of food?
 - Yes
 - No
- In a regular week, how many meals do you skip?
 - 0
 - 1-2
 - 3-5
 - More than 5

17-22 million pounds

of food needed to end hunger in St. Joseph, Elkhart, and Marshall Counties (2025)

Developing a Map

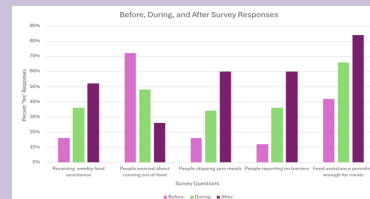
- Converted the map developed by the 24'-25 Cultivate Food Rescue team from R to Python, then from Python to Javascript and HTML
- Created multiple layers for food-insecurity analysis
- Deployed on Cultivate's website for ease of use



** Based on Census data; subject to change in 2030 - tracts won't look the same, updates of yearly estimates

Future goals

- Collecting data from the pantries to specifically analyze the needs in St. Joseph, Elkhart, and Marshall counties
- A model that estimates the percent of households who are food insecure at the tract level that can be adjusted year-to-year
- Explore modeling at other levels such as by zip code or township
- Implementing other food assistance programs into a model, such as WIC, SNAP, and school programs
- Update map with days/hours of availability and conditions for aid of food partners



** This figure is prospective. Due to limited data, survey responses to the questionnaire were determined using simulated data.

Cultivate's Impact

- **3,367,345 pounds of food** distributed by Cultivate in 2024
- **192 organizations and 71 schools** supported in 2024
- **~14,834 people** brought to food security in 2024



Acknowledgements

- Dr. Mark Ward
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- Cai Chen
- Jim Conklin
- Timothy Perez (TA)

Scan QR Code for More Information!

