

ROLE OF FARMERS' MARKETS ON FOOD INSECURITY IN THE UNITED STATES

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CONCLUSIONS

- ✓ Counties with farmers' markets experience **less** food insecurity
- ✓ Counties with higher population but not higher median income are more likely to participate in food stamps programs
- ✓ Recommend counties with high probability of having a market

BACKGROUND

Estimated **1 in 8 Americans** are affected by food insecurity ("a lack of consistent access to enough food") by the USDA. The number of farmers' markets grew by 372% from 1994-2014. With farmers' markets expanding the participation in federal nutrition assistance programs (FNAPs), *we aim to understand the role of farmers' markets on **food insecurity** and to **recommend new places to start a farmers' market**.*

DATA

USDA Local Food Directories for Farmers Markets/CSA/On-Farm Market – Count of farmers' markets, location

Food Access Research Atlas 2019 – Food access indicators, such as supermarket accessibility, income and SNAP benefits

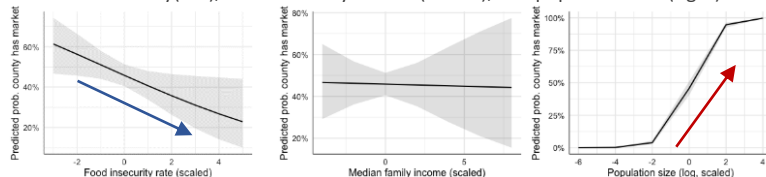
Food Insecurity by Feeding America - Food insecurity indicators, such as food insecurity rate, num. of food insecure persons.

2020 Census Data – County characteristics, such as estimated population, median family income, GDP, etc.

Cleaned the dataset by dropping rows with N/A values.

INFERENCE MODELS

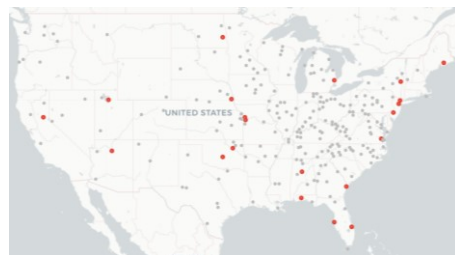
QUESTION What are the relationships between the presence of farmers' markets and food insecurity(left), median family income(center), and population size(right)?



- **Negative** relationship between the presence of farmers' markets and **food insecurity**
- **Non-significant** relationship between the presence of farmers' markets and **median family income**
- **Positive** relationship between the presence of farmers' markets and **population size**

With **generalized linear models**, markets in counties **with higher populations but not higher incomes** are more likely to participate in **SNAP**.

PREDICTIVE MODELS



^ Counties **highlighted in red** of probability higher than 80% to have a market but currently without any from **XGBoost** ensemble models. Other counties without a market are dots in gray.

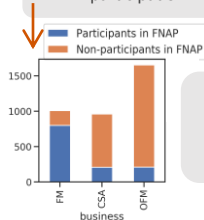
OBJECTIVE Build a classifier to predict the probability of a county to have any kind of market without one currently

Top 5

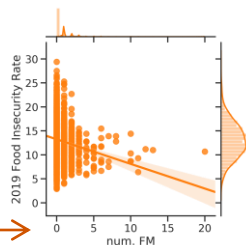
Union County, New Jersey	90.4%
Cass County, North Dakota	90.2%
Camden County, New Jersey	89.6%
Pinellas County, Florida	88.5%
Bergen County, New Jersey	87.2%

EXPLORATORY DATA ANALYSIS

Farmers' markets have the **most** FNAP participation.



Food insecurity rate **decreases** with number of farmers' markets



DASHBOARD INTERFACE

Come on and see the data interactively with Tableau Public!

 <https://tinyurl.com/ds4a-team20>

