Take-Home Data Challenge

Goal: Analyze food access disparities across U.S. counties and estimate the impact of intervention programs

Datasets Used:

- **Census Data:** Population demographics, food insecurity, health indicators
  [Source]

- **USDA Food Environment Atlas:** Access to grocery stores, participation in SNAP (food stamps), free lunch programs, and poverty rates.
  [Source]

Data Preprocessing & Merging

Steps Taken:

✔ **Feature Selection:** Key variables related to food insecurity & access.

PCT_LACCESS_POP10 , PCT_LACCESS_LOWI10 , PCT_SNAP17 , PCT_WIC17 , PCT_FREE_LUNCH15 ,

SUPERCPTH16 , FFRPTH16 , FSRPTH16

Population2010 , FOODINSEC_15_17 , POVRATE15 , CHILDPOVRATE15 , PCT_18YOUNGER10 ,

PCT_65OLDER10 , OBESITY_CrudePrev , DIABETES_CrudePrev , PHLTH_CrudePrev

✔ **FIPS Standardization:** Unified county-level data.

✔ **Missing Data Handling:** Imputed missing PCT_FREE_LUNCH15 values.

✔ **Final Merged Dataset:** Unified dataset combining **Census & Food Atlas** metrics.

Where Should We Deploy a Food Access Program?

✔ Identified counties where:

- **≥30% population has low food access** *(USDA threshold)*
- **≥15% food insecurity rate** *(Feeding America threshold)*

✔ Priority Areas Identified:

- **Counties from New York, Alabama, Missouri, Louisiana as top need areas.**

New York (NY): FIPS 36093: Schenectady County

FIPS 36055: Monroe County

Louisiana (LA): FIPS 22017: Caddo Parish

Missouri (MO): FIPS 29165: Platte County
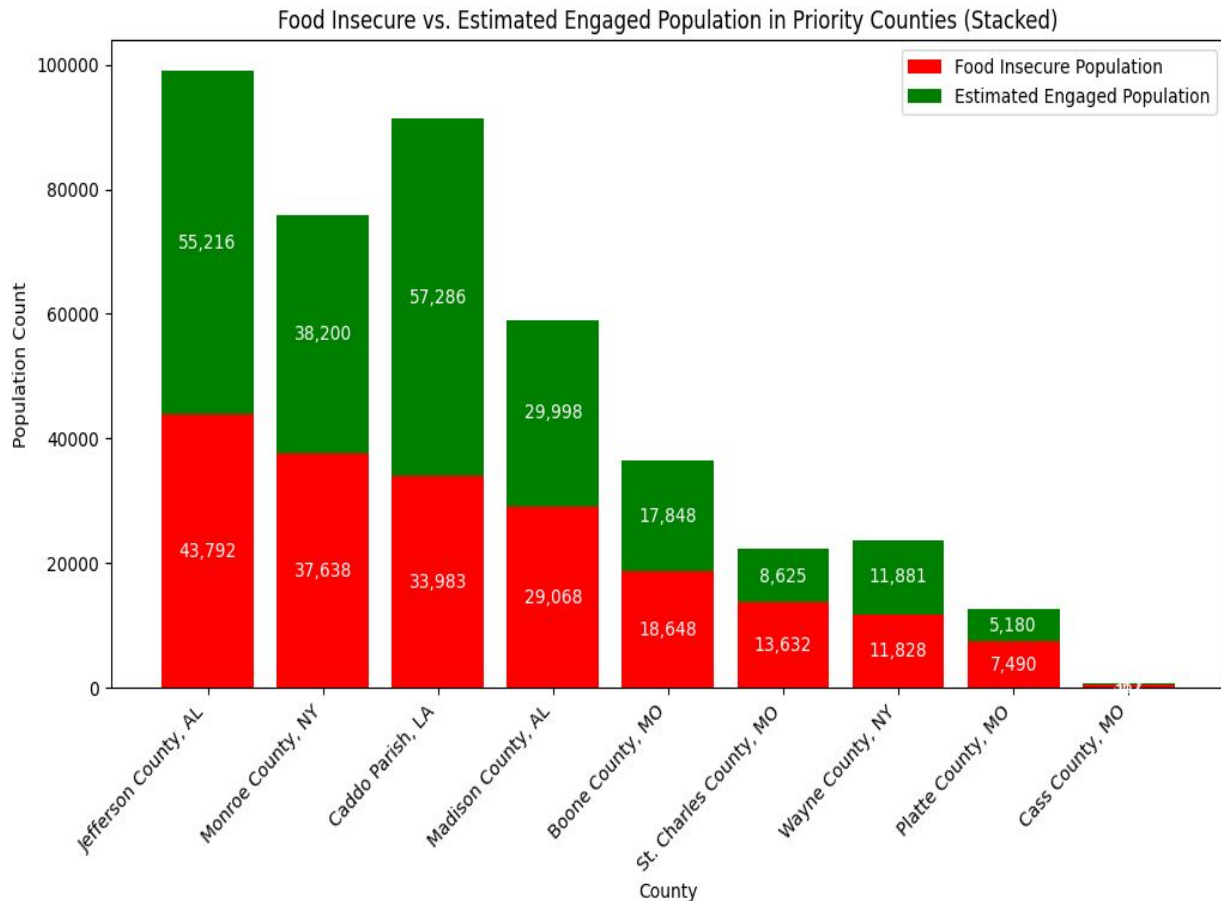
FIPS 29183: St. Charles County

FIPS 29019: Boone County

FIPS 29037: Cass County
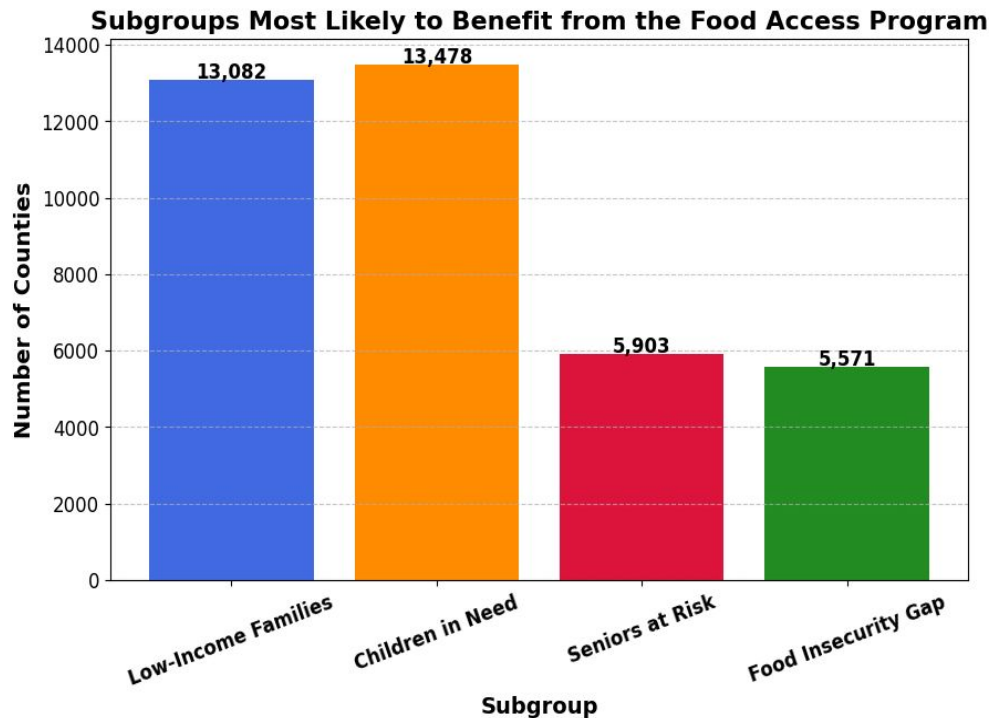
Alabama (AL): FIPS 01073: Jefferson County

FIPS 01089: Madison County

How many people will be included? How many might be successfully engaged?

Food Insecure vs. Estimated Engaged Population in Priority Counties (Stacked)

- Increase outreach in **Boone County, MO,** where food insecurity is high but engagement remains low.

- Focus intervention efforts on **Jefferson County, AL, Monroe County, NY, and Caddo Parish, LA,** where the largest populations face food insecurity.

- Enhance engagement strategies in **St. Charles County, MO, and Wayne County, NY**, to close the gap between food insecurity and program participation.
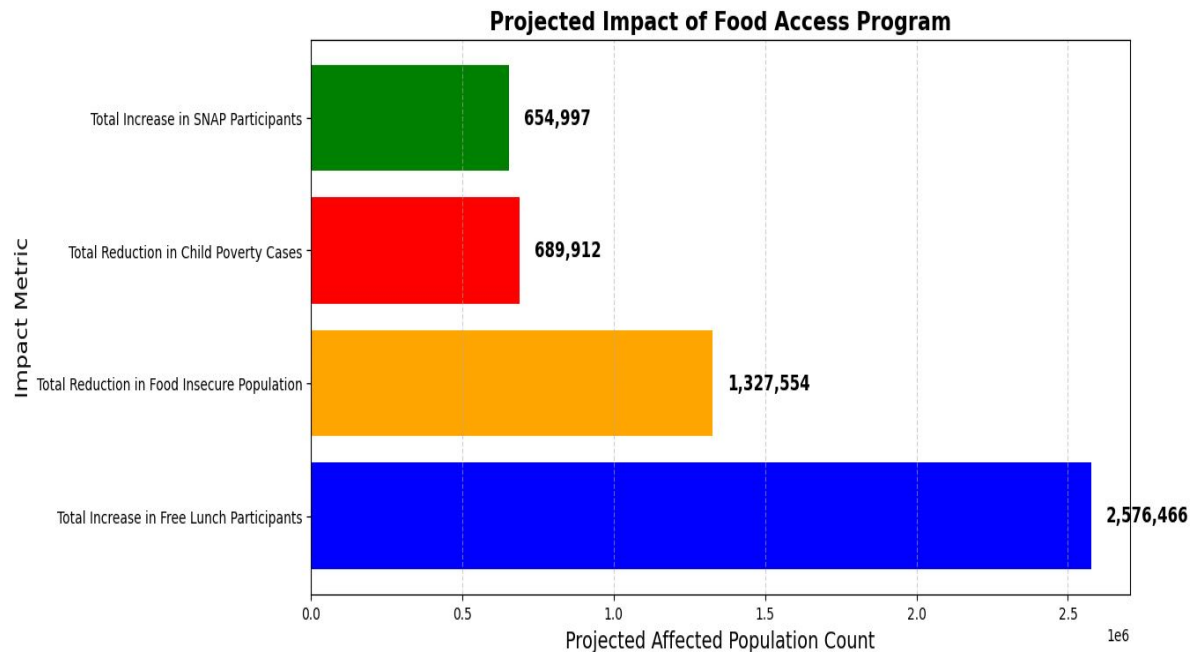
Who Benefits the Most? Identifying Subgroups

Subgroups Most Likely to Benefit from the Food Access Program

- **Children in Need: 13,478 counties** – Highest priority group. Expanding food programs in schools is crucial.
- **Low-Income Families: 13,082 counties** – Strong need for SNAP and food assistance expansion.
- **Seniors at Risk: 5,903 counties** – Limited SNAP access. Targeted outreach required.
- **Food Insecurity Gap: 5,571 counties** – High food insecurity but low aid coverage. Increase program awareness.

Action: Prioritize children and low-income families while bridging gaps for seniors and under-supported areas.

What is the projected impact of this program?

Projected Benefits:

- **1.3M** fewer food-insecure people
- **650K** more SNAP participants
- **2.5M** additional free lunch participants
- **690K** fewer children in poverty