

Milestone 1: Team Formation

[Process Book Link](#)

Team Members:

Dani Ebaseh-Onofa

debasehonofa@college.harvard.edu

Oscar Boccelli

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Garland Catlette

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Milestone 2: Team Agreement

Roles and Responsibilities:

- Coordinator: Oscar (Team Meeting Scheduling/Weekly Check Ins)
- Storyteller: Dani (Creating Narratives/Documenting Story)
- Researcher: Garland (Sourcing Data/Information)
- Coder: All

Communication Protocols:

- Text Message/Zoom if necessary

Working Arrangements:

- Currier Dining Hall/Quad
- Meet Twice a Week To Progress but Flexible

Work Allocation:

- Context Dependent/Flexible
- Tasks divided as indicated above

Accountability:

- Open Communication
- Come to our meetings prepared with at least one insight or something to discuss

Signed Off:

Oscar Boccelli

Dani Ebaseh-Onofa

Garland Catlette

Milestone 3: Project Proposal

Basic Information

- **Project Title:** A Spatial Analysis of Food Deserts & Mental Health Outcomes
 - Mental Health
 - Drug Usage **
 - Obesity **
 - Life Expectancy **
- **Team Name:** TEAM DOG COB

Abstract

In this project, we seek to explore the implications of food deserts on several health outcomes, including diabetes, drug use, depression, obesity, etc. We will reference data from the US Department of Agriculture (USDA), more specifically, the Food Access Research Atlas, Drug Use Data from the National Survey on Drug Use and Health (NSDUH), and disease prevalence data from the Center for Disease Control (CDC). We've linked the data sources below. We plan to convey our narrative by constructing a storyboard with dashboards that feature interactive maps, graphs, and charts depicting the spatial prevalence of food deserts and associated health outcomes.

Background and Motivation

Given our team's collective experiences with food deserts, we wanted to dive deeper into their impacts that are not typically studied, namely the effects of food deserts on individual and collective mental health. Oscar has had prior experience working at the EMPOWER Mental Health for All Lab at Harvard Medical School, where we saw firsthand how pervasive the negative effects of mental health disorders are in disenfranchised communities. Dani has prior research experience in public health in topics ranging from social determinants of health and complications due to obesity to the opioid epidemic. Garland has conducted prior research experience in the severity of food deserts across the United States to illustrate the underlying connections to broader socioeconomic disparities. Ultimately, we want to bring these previous experiences together to help convey the importance of highlighting how food deserts and mental health work in tandem.

Data

Food Desert Data

- Overviews food access geographically across the USA

*Drug Use Data

- Overviews drug use data geographically throughout the USA

Health Data

- Overviews the prevalence of disease throughout the USA

In regards to preprocessing, we plan to handle any missing or null values in our data sets using imputation or removal depending on the type of missingness we encounter. We will also correct any data imbalances by location or time that we notice during the data exploration phase of our project.

Milestone 4: Map

Potential Target Audiences

- Communities in food deserts (potentially community activists)
- Urban planners, city officials/policymakers
- Food policy councils
- USDA, HHS representatives
- Public health researchers
- Mental health

Final Target Audience: Policymakers working in Food Security & Mental Health

Our audience is aware of the prevalence of food deserts as an issue, but they lack the empirical evidence substantiating the consequences of the issue. They are interested in fostering equity in their respective communities by passing certain policies and regulations, and are looking for the data to support their decisionmaking. Our audience has a high level understanding of data visualization literacy, i.e. bar charts, pie charts, line graphs etc, therefore we will construct visualizations that are digestible for them. We will present details/visuals at both a high level and granular level, we'd begin with the high level to communicate in a broad sense what the prevalence of the issue is and get more granular as we aim to target specific policymakers operating in certain areas.

Potential Audience Data Questions

1. In which areas of the United States are food deserts most prevalent?
2. Where is depression most prevalent in the US?
3. What is the correlation between food deserts prevalence and depression prevalence?
4. What are some concrete things we can do in terms of nutrition to address the mental health issues of our community?
5. Which aspects of mental health are most impacted by lack of food and/or inadequate nutrition?
6. What does geographic prevalence look like for drug usage in the US?
7. What is the relationship between life expectancy and areas where food deserts are prevalent?

8. Has the prevalence of food deserts changed in recent years, and how does this relate to trends in mental health disorders?
9. What do suicide rates look like in areas where food deserts are prevalent?
10. What is the relationship between food deserts and the rate of obesity?

Data Description

From the Food Access Research Atlas:

- State County Data (Entire USA)
 - Poverty Rate (Quantitative)
 - Median Family Income (Quantitative)
 - Demographics Data (Categorical)
 - SNAP Benefits (Quantitative)
 - Relative Distance (1 mile, 10 miles, beyond 20 miles, etc.) (Quantitative)

From Drug Use Data:

- State County Data (Entire USA)
 - Marijuana Usage %
 - Cocaine Use %
 - Methamphetamine Use %
 - Binge Alcohol %
 - Cigarette %
 - Tobacco %
 - Major Depressive Episode %

From Health Data:

- State County Data (Entire USA)
 - Population (Quantitative)
 - Lack of health insurance prevalence %
 - High blood pressure prevalence %
 - Asthma prevalence %
 - Coronary heart disease prevalence %
 - Diabetes prevalence %

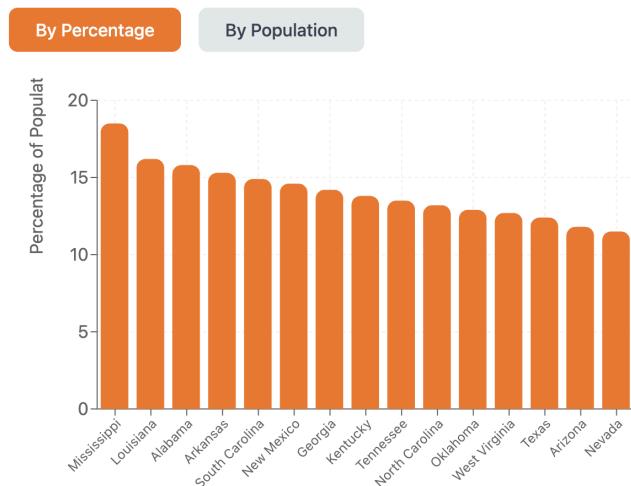
Individual Visualizations

Oscar:

Question 1: In which areas of the United States are food deserts most prevalent?

Food Deserts in the United States

States with highest prevalence of low-income, low-access areas to healthy food

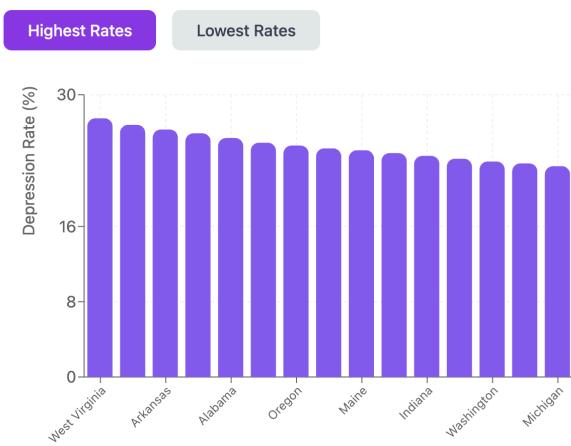


<https://claude.ai/public/artifacts/22a084d5-8c0e-459d-bada-b152806ecfb2>

Question 2: Where is depression most prevalent in the US?

Depression Prevalence in the United States

Percentage of adults reporting depression by state (CDC data)



<https://claude.ai/public/artifacts/fe498c4e-2a0d-42aa-8c17-01779e146fe9>

Question 3: What is the correlation between food deserts prevalence and depression prevalence?



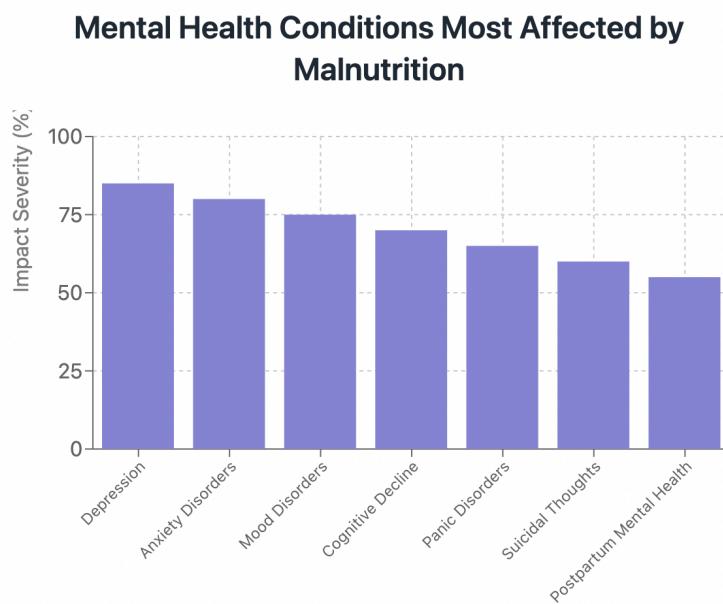
<https://claude.ai/public/artifacts/f96f0896-fc4d-4c93-8bc2-ebb5063f37fa>

Reflection:

The questions addressed in my sketches are more granular than what I had asked in my original questions. Rather than looking at Food Desert data on aggregate, my sketches hone in on specific states and localize the visualization to showing the most prevalent states/areas, which fails to reflect the gap between states where Food Deserts are more prevalent relative to those where they are less relevant. Questions that rely on geographic prevalence create more insightful visualizations relative to a correlation because correlations aren't super digestible for the average user, and ultimately we are aiming to craft visualizations that serve policymakers. We decided to stay with the original questions because we felt that they were the most insightful and relevant to our objective of creating both high level and granular visualizations.

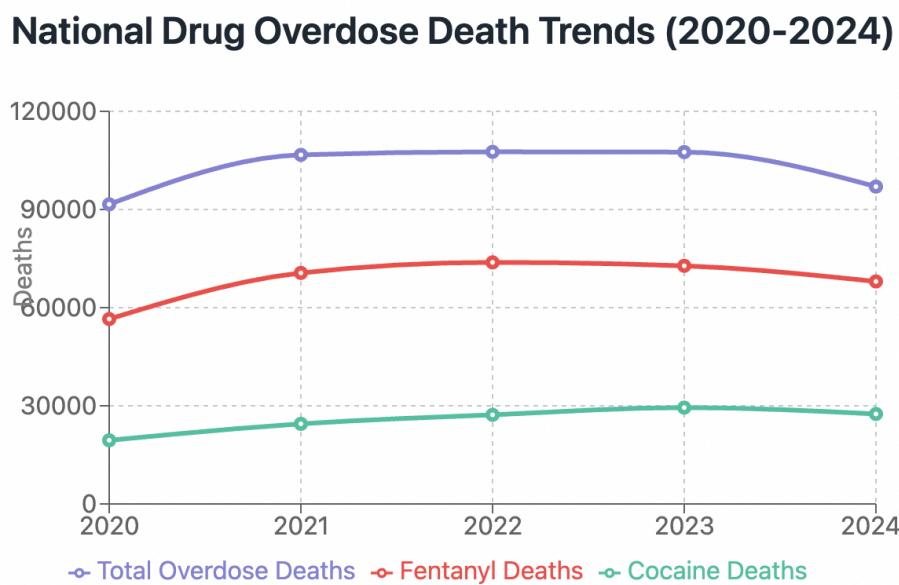
Dani:

Question 5: Which aspects of mental health are most impacted by lack of food and/or inadequate nutrition?



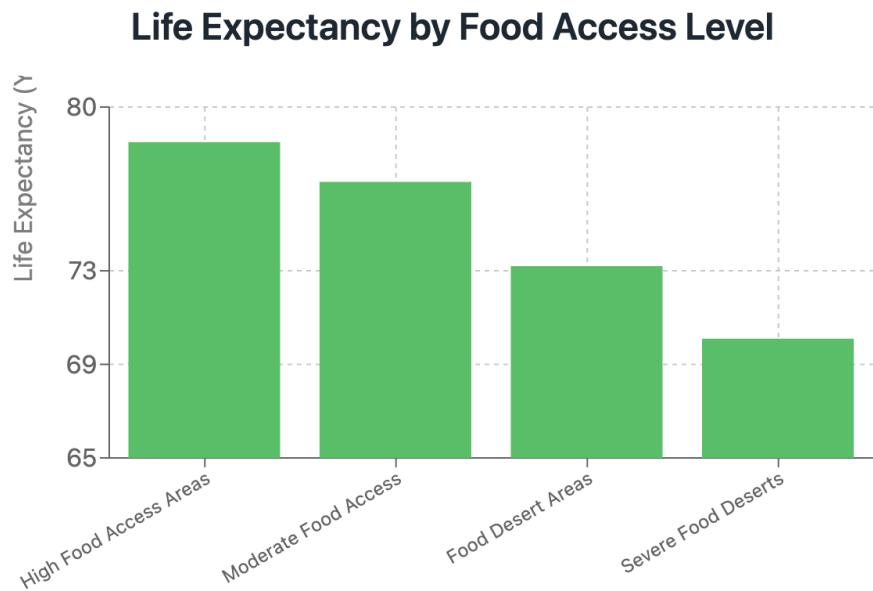
<https://claude.ai/public/artifacts/96bf476f-f646-4b68-b843-9088a7a6d4e2>

Question 6: What does geographic prevalence look like for drug usage in the U.S.?



<https://claude.ai/public/artifacts/b78281df-f5bc-4902-a5bc-b74a68a64881>

Question 7: What is the relationship between life expectancy and areas where food deserts are prevalent?



<https://claude.ai/public/artifacts/9f13515c-ef71-4fa7-8304-9f255e680842>

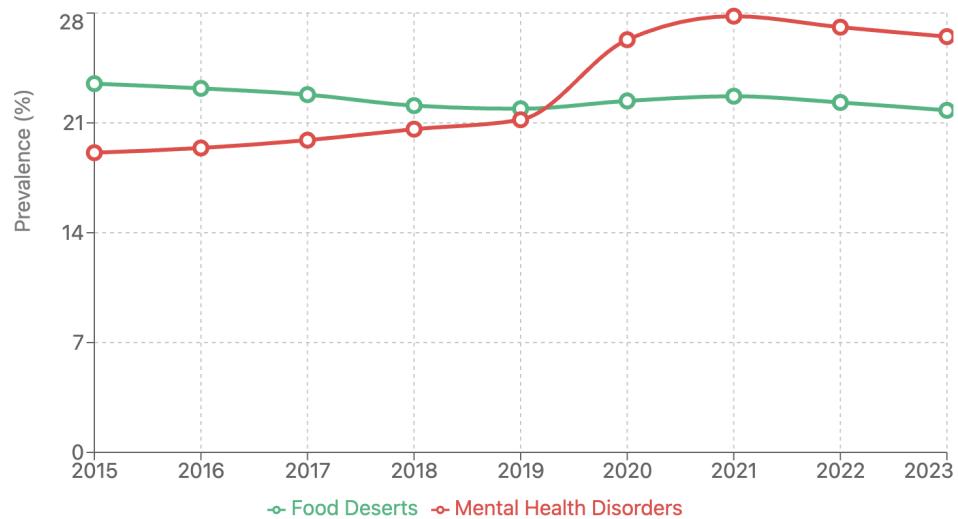
Reflection:

My sketches relate to our questions regarding which aspects of mental health are most impacted by inadequate nutrition, the geographic prevalence of drug usage in the U.S., and the relationship between life expectancy and areas where food deserts are most prevalent. The questions addressed in my sketches are similar to the original questions, but they go beyond what my team and I originally envisioned when writing the questions by including more complexity in their analysis. For instance, the sketch relating to the geographic prevalence of drug usage in the U.S. is interesting because of the breakdown of overdose deaths from cocaine and fentanyl over time which is a unique way of visualizing a seemingly simple question while including a large portion of data. I would categorize this sketch and question as better than the others because of its complexity and granularity.

Garland:

Question 8: Has the prevalence of food deserts changed in recent years, and how does this relate to trends in mental health disorders?

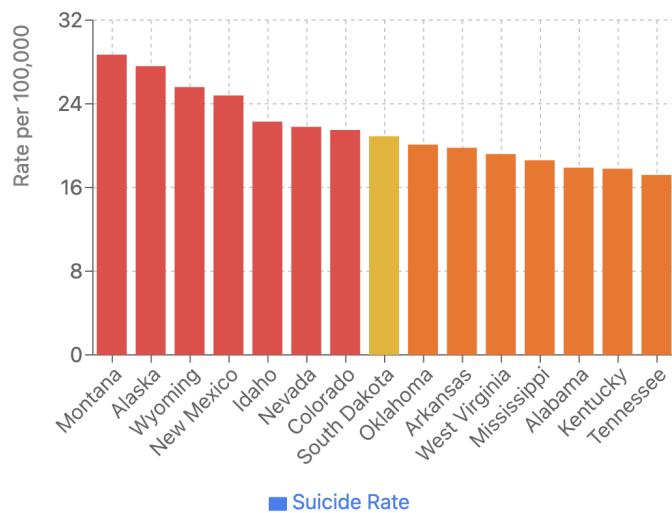
Food Desert vs Mental Health Prevalence Over Time



<https://claude.ai/chat/2bdb8f96-f8f8-4056-b13b-cad42e53ee6e>

Question 9: What do suicide rates look like in areas where food deserts are prevalent?

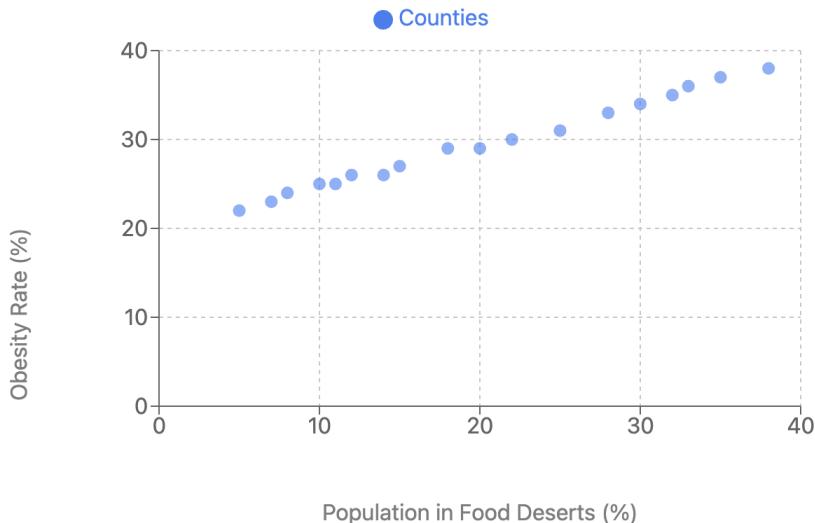
Top 15 States by Suicide Rate



<https://claude.ai/chat/2ca12c55-8b3a-4f57-8911-62456cf2cc0c>

Question 10: What is the relationship between food deserts and the rate of obesity?

Correlation Between Food Desert Prevalence and Obesity



<https://claude.ai/chat/8c7cb92f-f3eb-4676-b4fa-d69404de13a0>

Reflection:

The questions addressed in my sketches align closely with the team's original questions but demonstrate important refinements in scope and specificity. While the team originally asked about the changing prevalence of food deserts and their relationship to mental health trends over time, my first sketch directly visualized this temporal relationship, making it more concrete and answerable with available data. The second sketch maintained the team's geographic focus on suicide rates but shifted from examining "areas where food deserts are prevalent" to simply ranking states by suicide rate, which is more straightforward but loses the direct connection to food desert prevalence that made the original question compelling. The third sketch stayed true to the team's obesity question but transformed it into a correlation analysis that provides clearer visual evidence of the relationship. Overall, the original questions were stronger in their integrative approach—explicitly linking food deserts to health outcomes—whereas my sketches sometimes sacrificed this connection for visual clarity and data availability. The temporal mental health question proved most successful because it preserved both variables in a single visualization, while the suicide rate sketch would have been stronger had it maintained the geographic overlay with food desert data as originally envisioned.

Milestone 5: Data

Our final two datasets, both of which are in CSV format, are the [USDA Food Access Research Atlas](#), detailing information on food access geographically across the United States and the [Census Tract Data](#) from the U.S. Department of Health and Human Services, detailing information on disease prevalence geographically across the United States. We decided against using the [Drug Use Data](#) from the National Survey on Drug Use and Health because the location data is encoded more vaguely than the other two datasets which have a 1:1 encoding of State-County location data.

We have included our data inventories for the two datasets on separate documents for cleanliness. The links can be found below.

[Food Access Data Inventory](#)

[Health Data Inventory](#)

```
1 df = pd.read_csv("PLACES__Census_Tract_Data__GIS_Friendly_Format___2024_release.csv")
2 df.describe()
```

 Visualize

We used the describe function on pandas to get statistical summaries for our data. The summaries are included in the links below.

[Food Access Data Summary](#)

[Health Data Summary](#)

Data Exploration

Food Access Data:

The list below shows the columns that had missing values along with the number of missing values in each column.

- NUMGQTRS: 25
- PCTGQTRS: 25
- PovertyRate: 3
- MedianFamilyIncome: 748
- LAPOP1_10: 29957
- LAPOP05_10: 14540
- LAPOP1_20: 35914
- LALOWI1_10: 29957
- LALOWI05_10: 14540
- LALOWI1_20: 35914
- lapophalf: 4568
- lapophalfshare: 4568
- lalowihalf: 4568
- lalowihalfshare: 4568
- lakidshalf: 4568
- lakidshalfshare: 4568
- laseniorshalf: 4568
- laseniorshalfshare: 4568
- lawhitehalf: 4568
- lawhitehalfshare: 4568
- lablackhalf: 4568
- lablackhalfshare: 4568
- laasianhalf: 4568
- laasianhalfshare: 4568
- lanhopihalf: 4568
- lanhopihalfshare: 4568
- laaianhalf: 4568
- laaianhalfshare: 4568
- laomultirhalf: 4568
- laomultirhalfshare: 4568
- lahisphalf: 4568
- lahisphalfshare: 4568
- lahunvhalf: 4568
- lahunvhalfshare: 4562
- lasnaphalf: 4568

- lasnaphalfshare: 4562
- lapop1: 19989
- lapop1share: 19989
- lalowi1: 19989
- lalowi1share: 19989
- lakids1: 19989
- lakids1share: 19989
- laseniors1: 19989
- laseniors1share: 19989
- lawhite1: 19989
- lawhite1share: 19989
- lablack1: 19989
- lablack1share: 19989
- laasian1: 19989
- laasian1share: 19989
- lanhop1: 19989
- lanhop1share: 19989
- laaian1: 19989
- laaian1share: 19989
- laomultir1: 19989
- laomultir1share: 19989
- lahispl: 19989
- lahisplshare: 19989
- lahunv1: 19989
- lahunv1share: 19966
- lasnap1: 19989
- lasnap1share: 19966
- lapop10: 64765
- lapop10share: 64765
- lalowi10: 64765
- lalowi10share: 64765
- lakids10: 64765
- lakids10share: 64765
- laseniors10: 64765
- laseniors10share: 64765
- lawhite10: 64765
- lawhite10share: 64765
- lablack10: 64765
- lablack10share: 64765
- laasian10: 64765

- laasian10share: 64765
- lanhopi10: 64765
- lanhopi10share: 64765
- laaian10: 64765
- laaian10share: 64765
- laomultir10: 64765
- laomultir10share: 64765
- lahisp10: 64765
- lahisp10share: 64765
- lahunv10: 64765
- lahunv10share: 64666
- lasnap10: 64765
- lasnap10share: 64666
- lapop20: 71025
- lapop20share: 71025
- lalowi20: 71025
- lalowi20share: 71025
- lakids20: 71025
- lakids20share: 71025
- laseniors20: 71025
- laseniors20share: 71025
- lawhite20: 71025
- lawhite20share: 71025
- lablack20: 71025
- lablack20share: 71025
- laasian20: 71025
- laasian20share: 71025
- lanhopi20: 71025
- lanhopi20share: 71025
- laaian20: 71025
- laaian20share: 71025
- laomultir20: 71025
- laomultir20share: 71025
- lahisp20: 71025
- lahisp20share: 71025
- lahunv20: 71025
- lahunv20share: 70920
- lasnap20: 71025
- lasnap20share: 70920
- TractLOWI: 4

- TractKids: 4
- TractSeniors: 4
- TractWhite: 4
- TractBlack: 4
- TractAsian: 4
- TractNHOPI: 4
- TractAIAN: 4
- TractOMultir: 4
- TractHispanic: 4
- TractHUNV: 4
- TractSNAP: 4

Health Data

The list below shows the columns that had missing values along with the number of missing values in each column.

- BPHIGH_CrudePrev: 5077
- BPHIGH_Crude95CI: 5077
- BPMED_CrudePrev: 5077
- BPMED_Crude95CI: 5077
- CHOLSCREEN_CrudePrev: 5077
- CHOLSCREEN_Crude95CI: 5077
- COLON_SCREEN_CrudePrev: 3
- COLON_SCREEN_Crude95CI: 3
- HIGHCHOL_CrudePrev: 5077
- HIGHCHOL_Crude95CI: 5077
- MAMMOUSE_CrudePrev: 42
- MAMMOUSE_Crude95CI: 42
- TEETHLOST_CrudePrev: 34
- TEETHLOST_Crude95CI: 34
- ISOLATION_CrudePrev: 19635
- ISOLATION_Crude95CI: 19635
- FOODSTAMP_CrudePrev: 19635
- FOODSTAMP_Crude95CI: 19635
- FOODINSECU_CrudePrev: 19635
- FOODINSECU_Crude95CI: 19635
- HOUSINSECU_CrudePrev: 19635
- HOUSINSECU_Crude95CI: 19635
- SHUTUTILITY_CrudePrev: 19635
- SHUTUTILITY_Crude95CI: 19635
- LACKTRPT_CrudePrev: 19635

- LACKTRPT_Crude95CI: 19635
- EMOTIONSPT_CrudePrev: 19635
- EMOTIONSPT_Crude95CI: 19635

Data Cleaning

Food Atlas Data

```

1 threshold = 30
2 rows_to_drop = food_access_df[cols_with_missing].isnull().sum(axis=1) < threshold
3 food_access_df = food_access_df.loc[~rows_to_drop].copy()

```

- We removed rows for which the columns had a small proportion of missing values (<30 missing values)

```

1 county_col = 'County'
2 state_col = 'State'
3 cols = cols_with_missing
4
5 imputed_df = food_access_df.copy()
6
7 county_means = imputed_df.groupby(county_col)[cols].transform('mean')
8 imputed_df[cols] = imputed_df[cols].fillna(county_means)
9
10 if state_col in imputed_df.columns:
11     state_means = imputed_df.groupby(state_col)[cols].transform('mean')
12     imputed_df[cols] = imputed_df[cols].fillna(state_means)
13
14 imputed_df[cols] = imputed_df[cols].fillna(imputed_df[cols].mean())
15
16 print(imputed_df.isnull().sum())

```

- We imputed by mean by county for columns that had large proportions of missing values to still maintain our data and not needlessly remove large sets of observations
- There were no duplicates:

```

Number of duplicate rows (exact matches): 0
Total rows involved in duplicates: 0

✓ No exact duplicate rows found!

=====
NOTE: Individual column duplicates are EXPECTED
(e.g., observation values can repeat across rows)
=====

This script only flags rows where ALL columns are identical.

=====

REMOVING DUPLICATES:

=====
Rows after removing duplicates: 72533
Removed 0 duplicate rows
dhcp-10-250-161-252:CS 171 oscarboccelli$ █

```

Health Data

- We removed columns with missing values (prevalence of arthritis, high blood pressure, cancer, asthma, heart disease, cholesterol, dentist visits, mammography, stroke, and teeth loss), because there are several other outcomes that we are interested in from the health data set that don't have missing values, i.e. Obesity, Short Sleep Duration, etc. using the same strategy as above
- We also removed confidence interval columns due to their lack of interpretability for the sake of our creation of a visualization

```
Number of duplicate rows (exact matches): 0
Total rows involved in duplicates: 0

✓ No exact duplicate rows found!

=====
NOTE: Individual column duplicates are EXPECTED
(e.g., observation values can repeat across rows)
=====

This script only flags rows where ALL columns are identical.

=====
REMOVING DUPLICATES:
=====

Rows after removing duplicates: 83522
Removed 0 duplicate rows
○ dhcp-10-250-161-252:CS 171 oscarboccelli$ ◻
```

Reflection

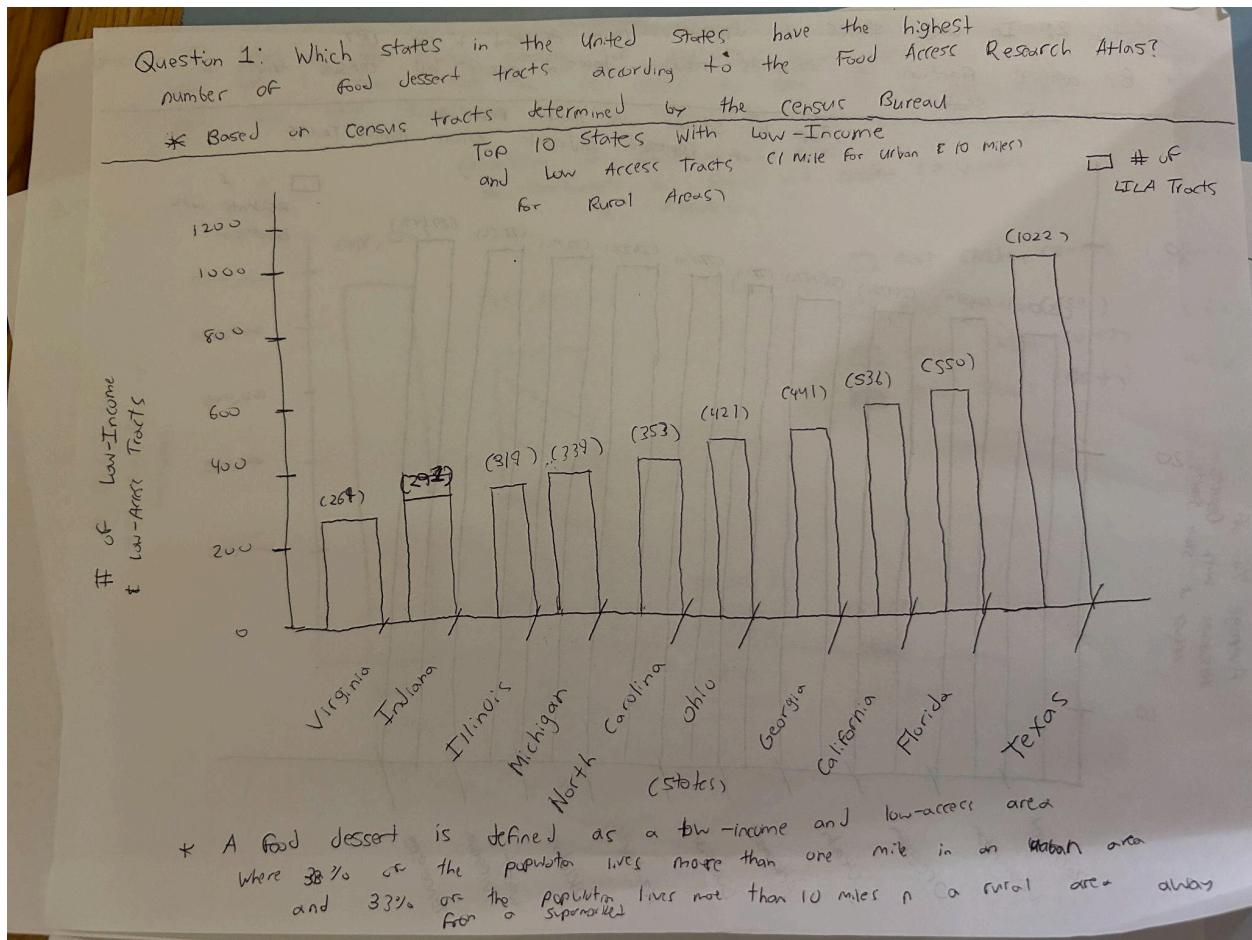
In comparison to our original vision, our actual data is thorough enough to support our initial goal of deriving and illustrating insights pertaining to the correlation between food insecurity and mental health conditions. Furthermore, both of our data sources contain observations for counties in each state, allowing us to utilize county-specific data across various regions in the United States to build the credibility of our conclusions. With this, we can answer our initial question about where depression is most prevalent in the United States. Additionally, we can answer our initial question about the relationship between obesity and food deserts.

However, with our current data, we are unable to describe the correlation between food deserts and life expectancy. Secondly, we are unable to specify which aspects of mental health are exacerbated by food insecurity. Given that our data contains columns with missing values, we utilized county averages that could potentially misrepresent trends, as averages are sensitive to outliers. Another apparent yet reparable issue regarding our data quality would entail the transformation of numerous relevant categorical values within our data to build quantitative models.

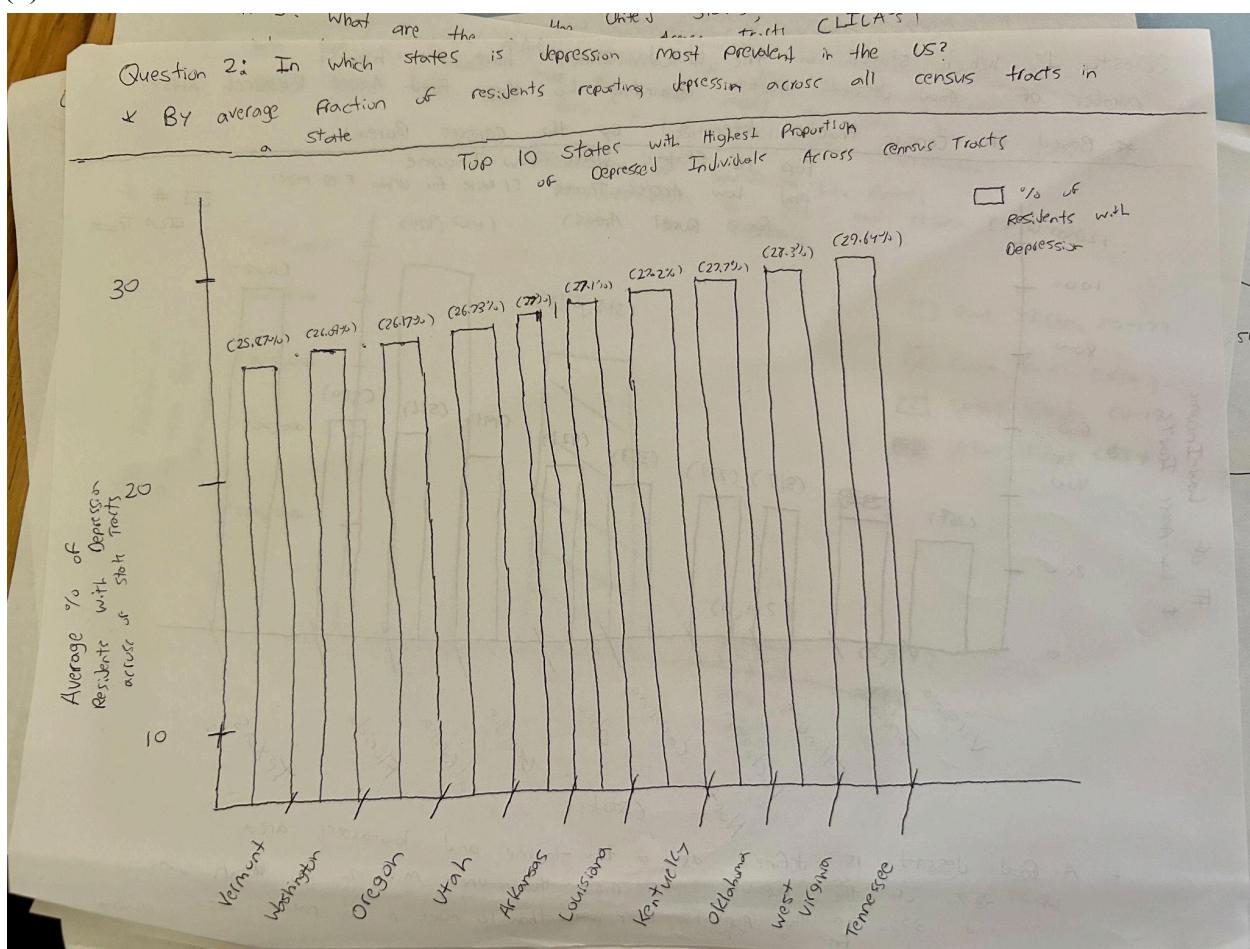
Milestone 6: Sketch

Oscar's Sketches

(1)



(2)



(3)

Question 3: Of the Census Tracts in the United States, what are the relative number of Urban/Rural Low-Income, Low-Access tracts (LILAs)?

Urban/Rural LILAs Tracts
in the United States

72,531 Census Tracts

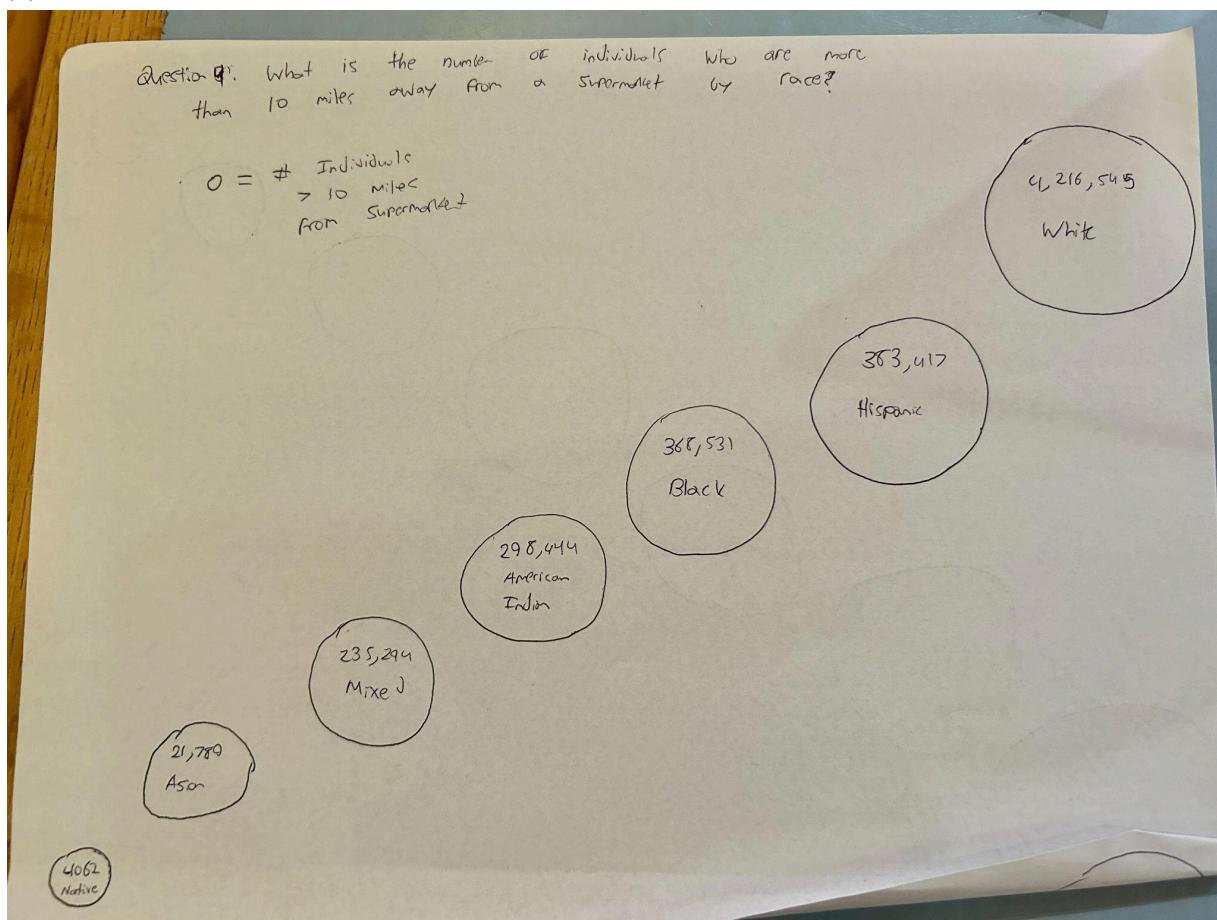
Rural LILAs

Urban LILAs

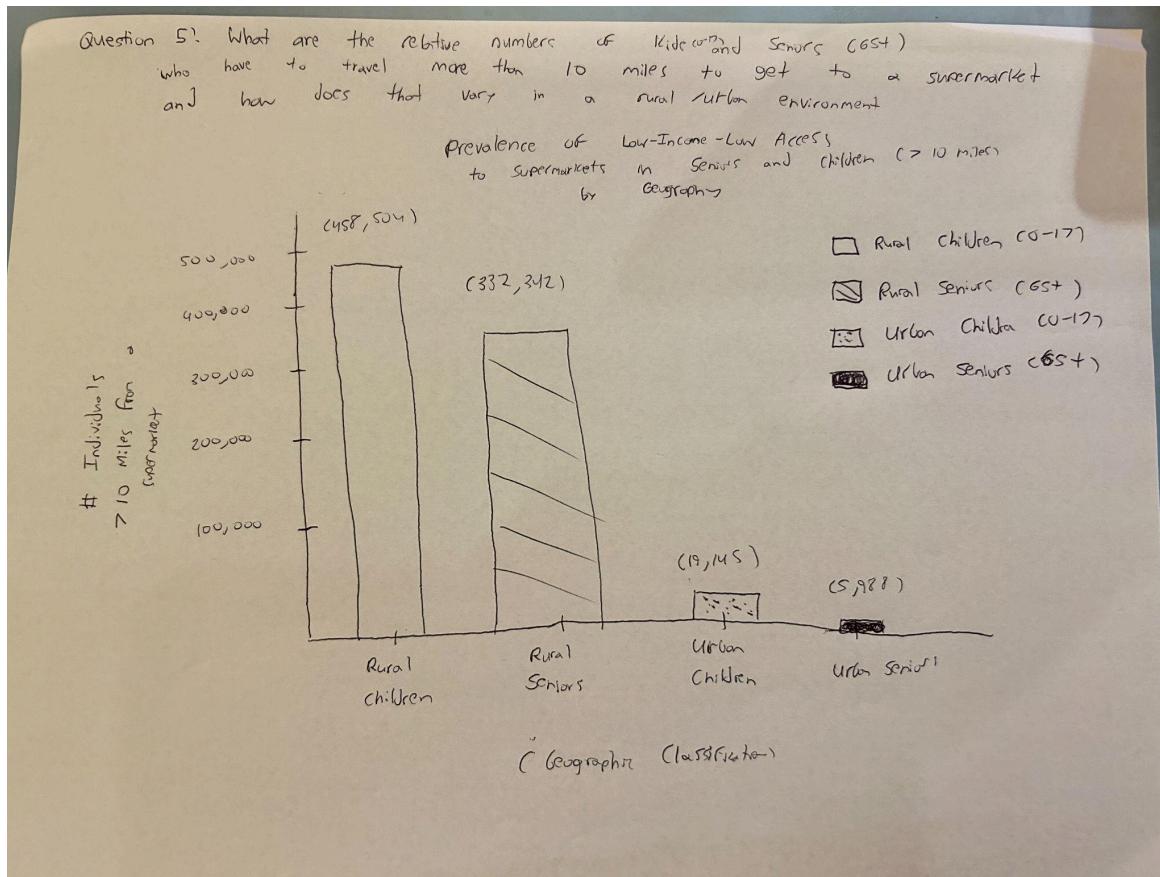
1352
Rural: Low-Income
Low Access Tracts
(~2%) Total

7941
Urban Low-Income
Low Access Tracts
(~11%) Total

(4)

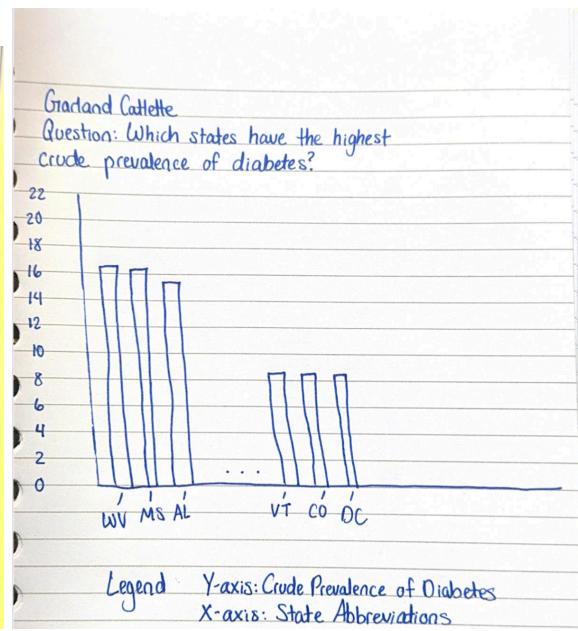
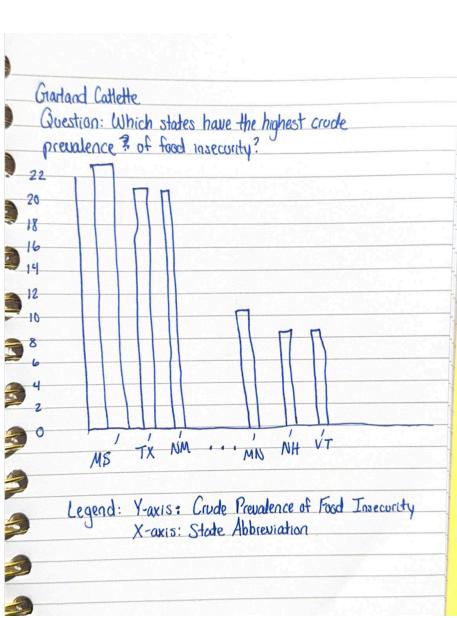
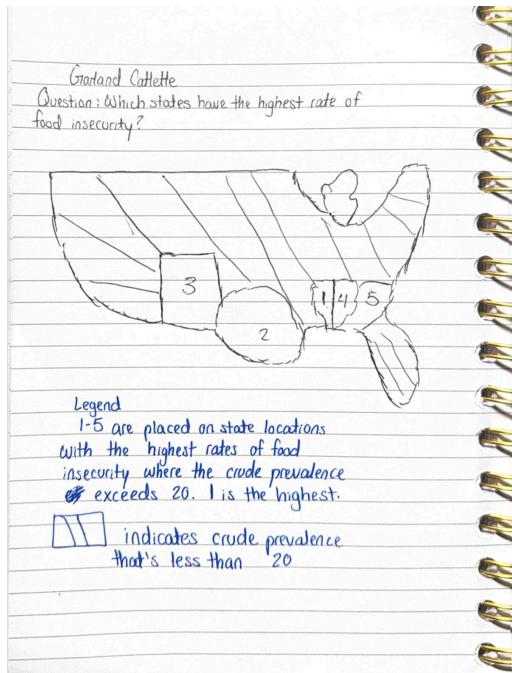
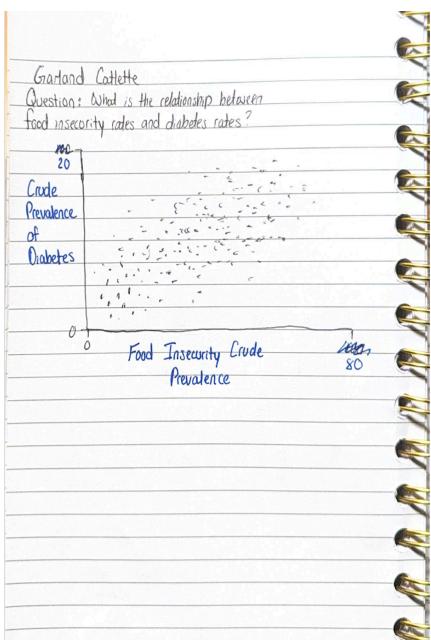


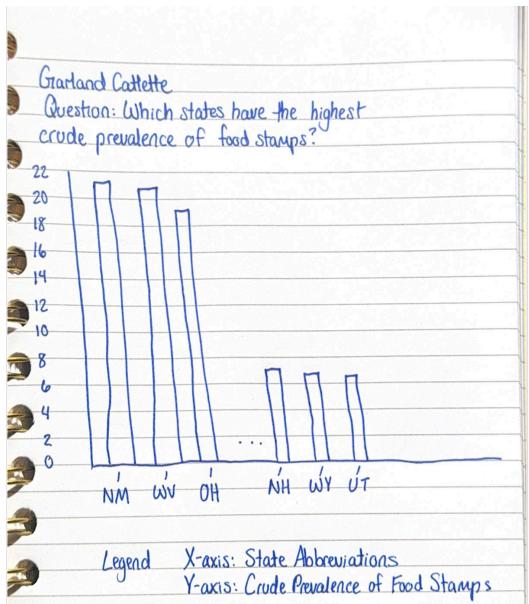
(5)



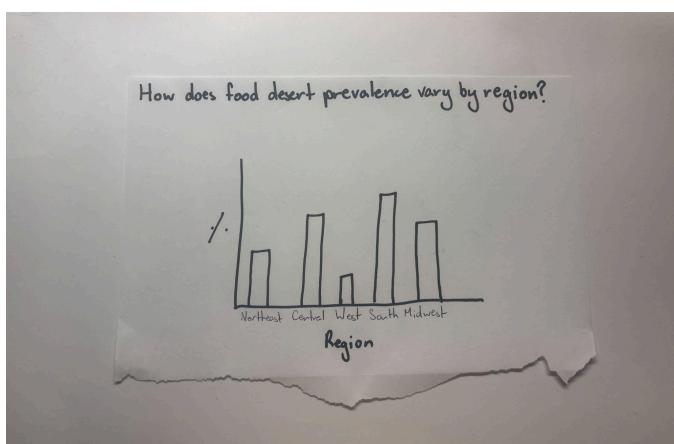
Garland's Sketches

(6 Scatterplot, 7 Map, 8 Food Insecurity Bar Graph, 9 Diabetes Bar Graph, 10 Food Stamps Bar Graph)

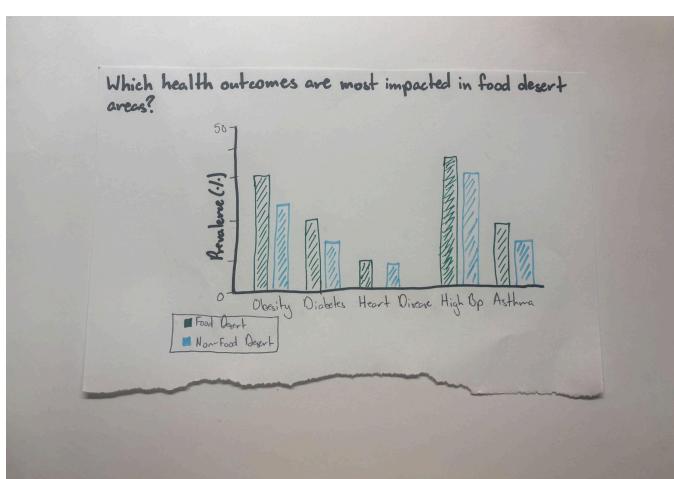




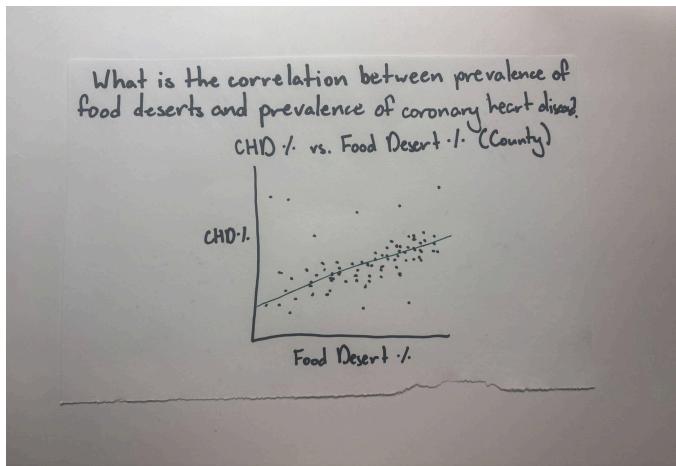
Dani



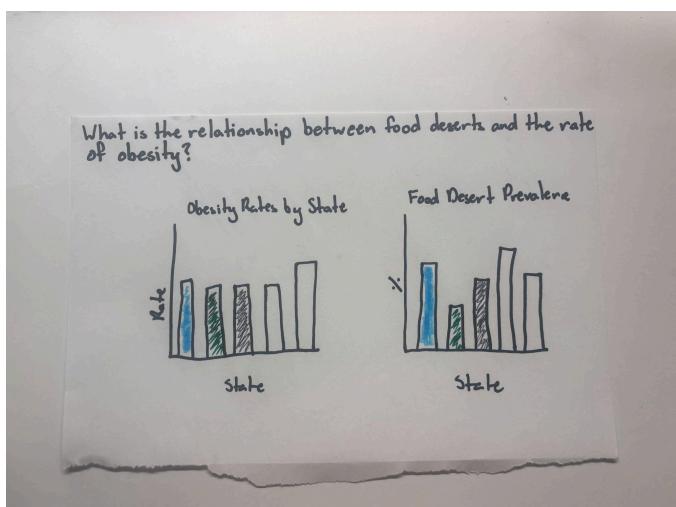
11



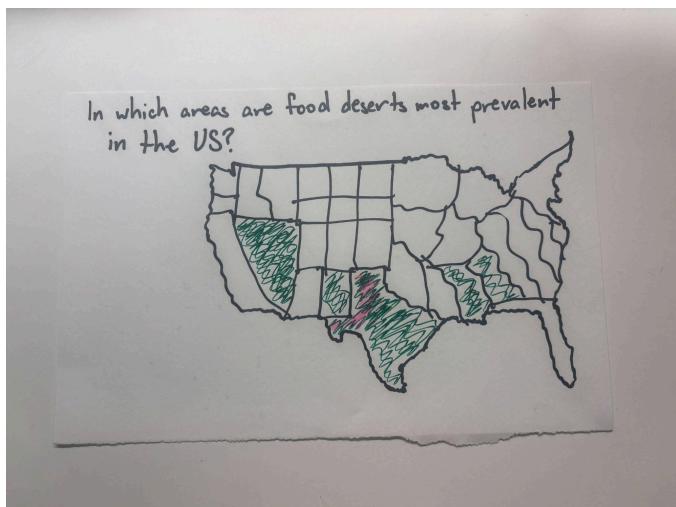
12



13



14



15

Milestone 7: Decide

Question IDs

1. Which states in the US have the highest number of US food desert tracts according to the Food Access Research Atlas?
2. In which states is depression most prevalent in the US?
3. Of the Census Tracts in the United States what are the relative number of urban and rural low-income & low-access tracts (LILA's)
4. What is the number of individuals who are more than 10 miles away from a supermarket by race?
5. What are the relative numbers of kids (0-17) and seniors (65+) who have to travel more than 10 miles to get to a supermarket and how does that vary in a rural/urban environment?
6. How does food desert prevalence vary by region?
7. Which health outcomes are most impacted in food desert areas?
8. What is the correlation between the prevalence of food deserts and prevalence of coronary heart disease?
9. What is the relationship between food deserts and the rate of obesity?
10. In which areas are food deserts most prevalent in the US?
11. Which states have the highest food insecurity rates?
12. Which states have the highest crude prevalence of food stamps?
13. Which states have the highest crude prevalence of diabetes?
14. Which states have the highest crude prevalence of food insecurity?
15. Is there a correlation between the crude prevalence of diabetes and the crude prevalence of food insecurity?

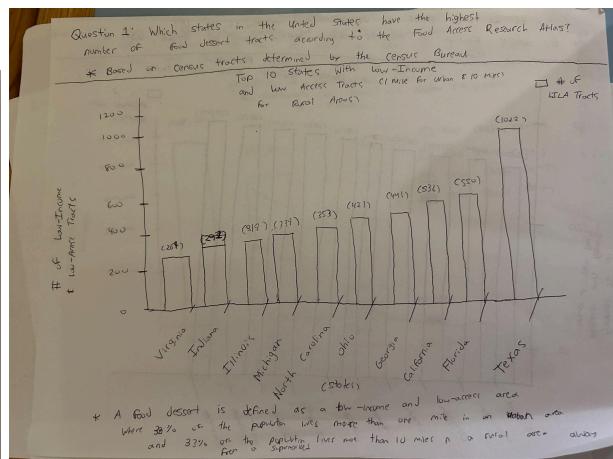
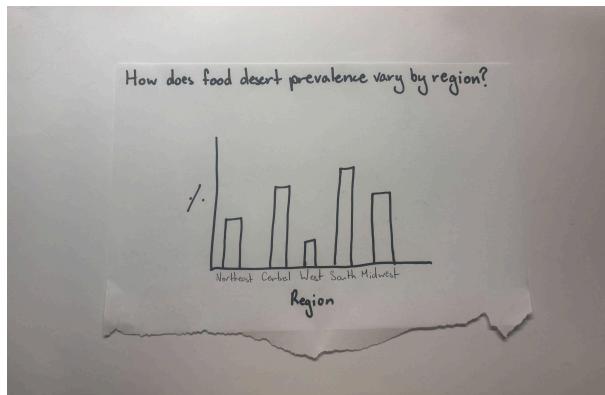
Voting Process

Sketch ID	Question ID	Author	Number of Votes
1, 11	1, 6	OB, DO	3
2	2	OB	0
3	3	OB	0
4	4	OB	2
5	5	OB	2
6	15	GC	1
10	12	GC	2

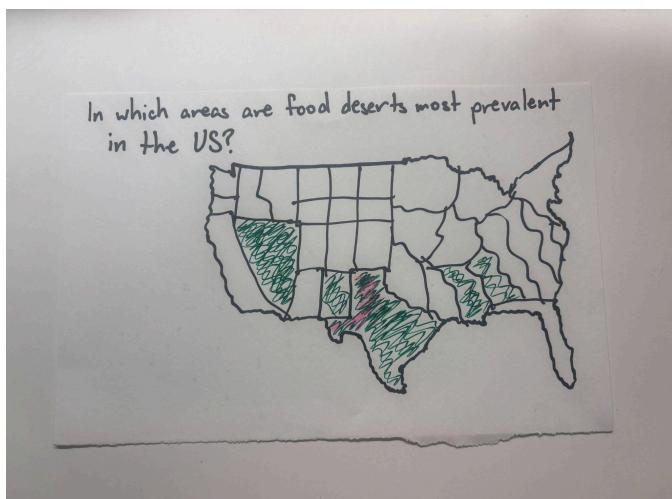
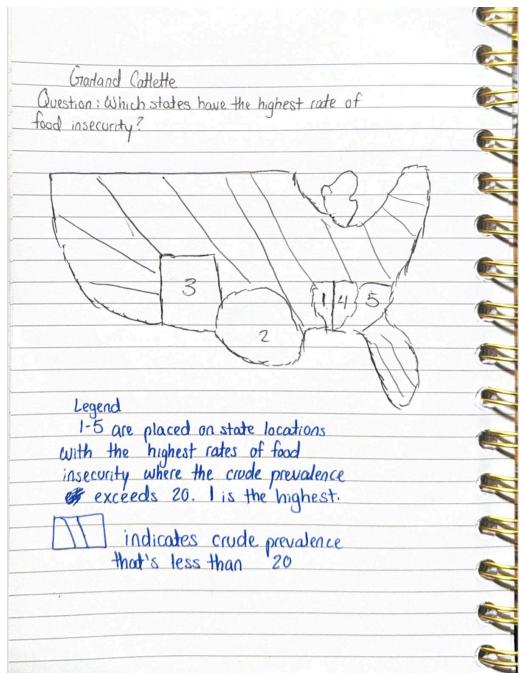
8	14	GC	0
9	13	GC	0
7, 15	10, 11	GC, DO	3
12	7	DO	2
13	8	DO	0
14	9	DO	0

Selected Sketches

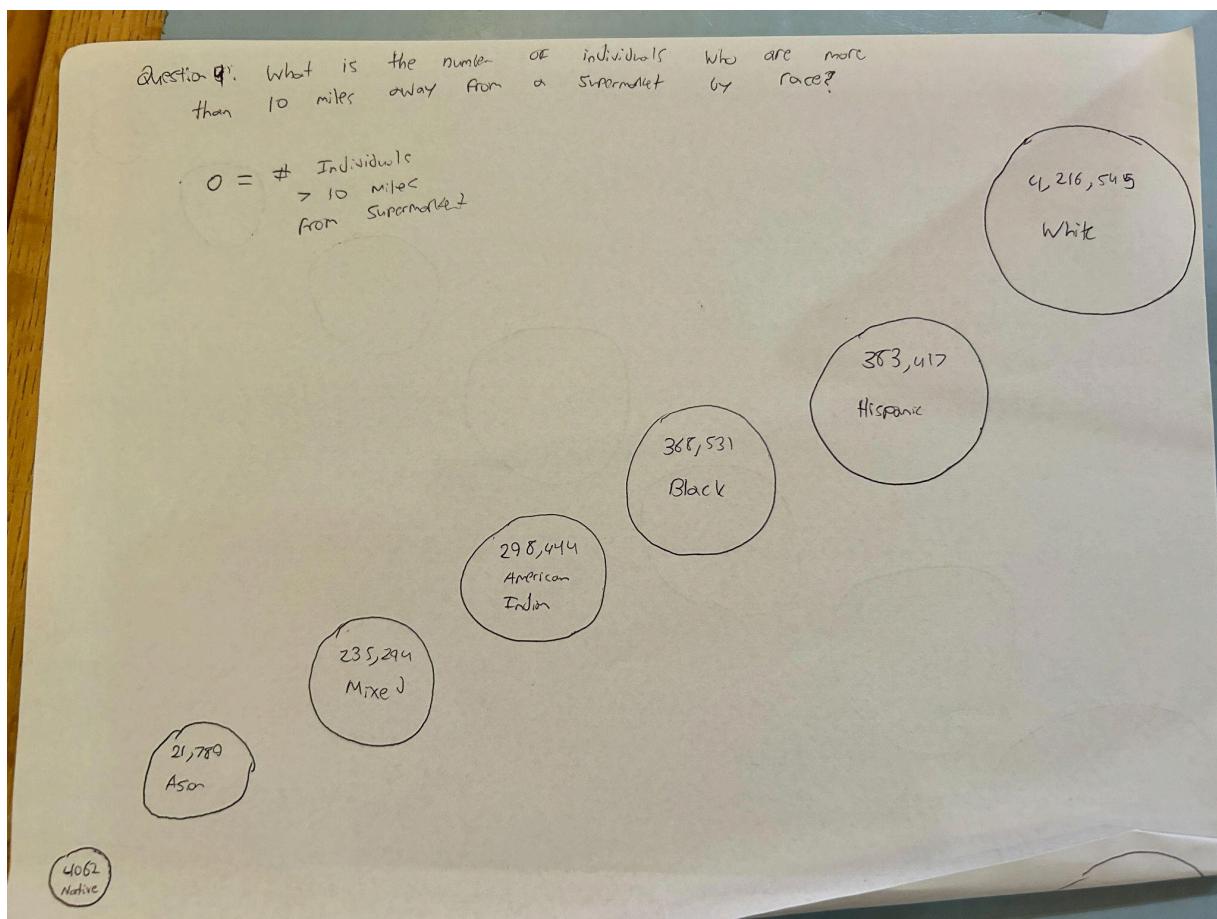
Sketch 1/11:



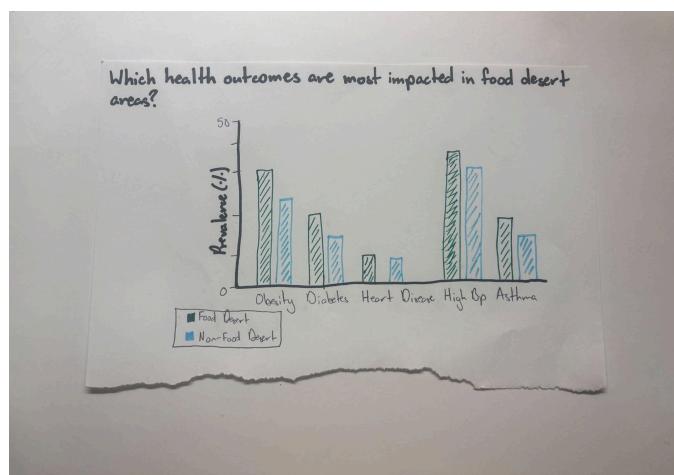
Sketch 7/15:



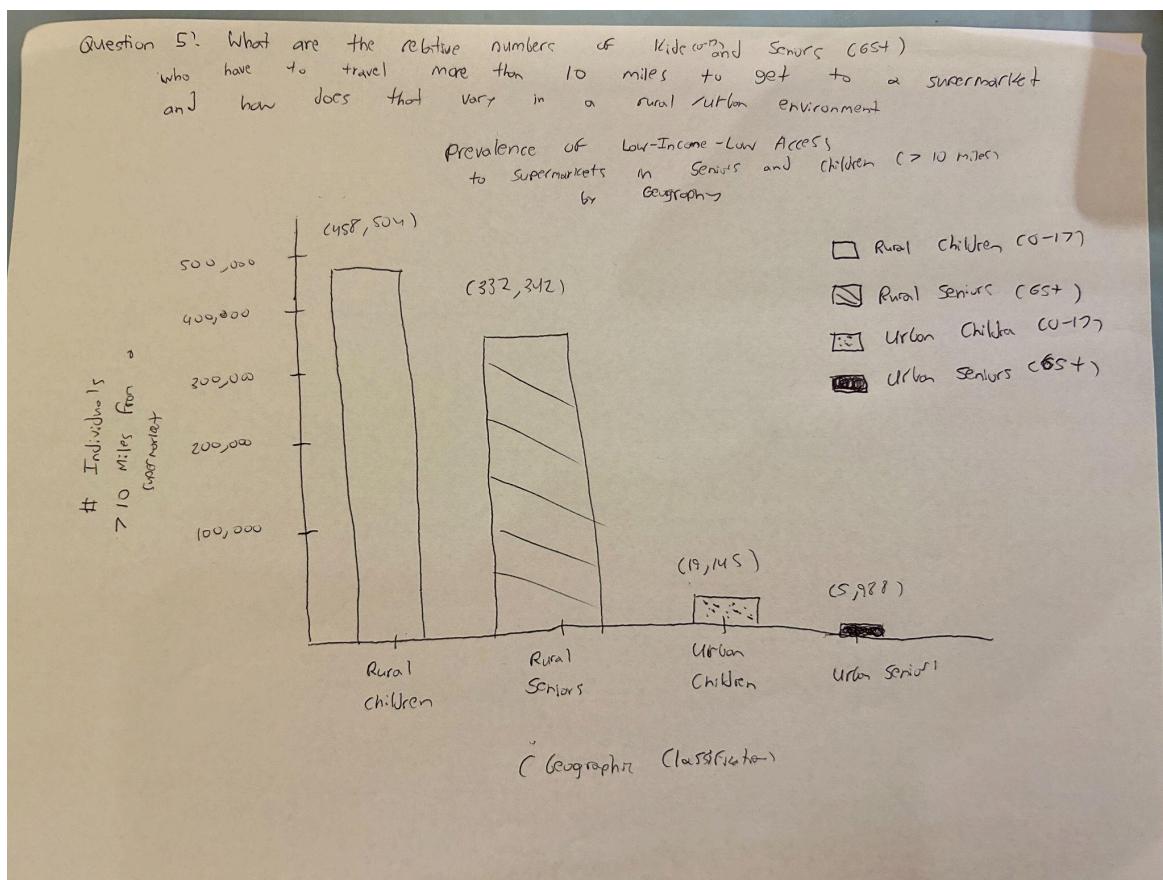
Sketch 4:



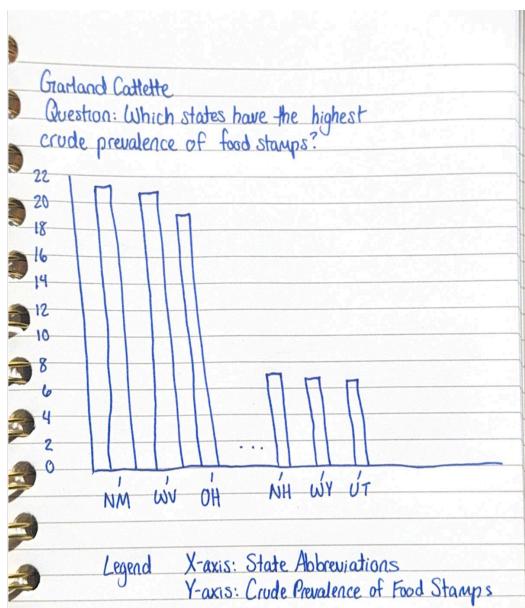
Sketch 12:



Sketch 5:



Sketch 10:



Reflection

We chose to implement these sketches because they provide a full picture on food deserts in the U.S., showing both geographic and demographic variations. Sketches 1/11 and 7/15 visualize the regional and state-level prevalence of food deserts which will allow for spatial trends in food access to be very clear. Sketches 4 and 5 highlight disparities by race, age, and rurality which will show a unique view on the social and structural factors contributing to food access inequities. Sketch 12 is an example of a sketch that will connect these general trends to concrete health outcomes and Sketch 10 complements this by showing the connection of these trends to economic aspects. The sketches together show what we believe to be a complete view of our topic.

Milestone 8: Storyboard

Main Message Identification

Oscar

- Rural Children (0-17 Years of Age) and Rural Seniors (65+) are 24x more likely and 55x more likely to have to travel more than 10 miles to get to a Supermarket relative to Urban Children and Urban Seniors respectively
- Southern and Midwestern States (with the exclusion of California) have the highest prevalence of Food Desert (Low-Income, Low-Access) Tracts with 5 Southern States and 4 Midwestern States respectively
- Among the Top 10 States with the largest proportion of individuals reporting depression, 6 out of the 10 are Southern States

Dani

- Of the 72,531 Census Tracts in the US, 13% of Tracts are in a Food Desert (Low-Income Low-Access Area), 11% of these Food Desert Tracts are from Urban Tracts and the other 2% are Rural Tracts
- Food desert prevalence is strongly linked to poverty and health outcomes with strong correlations specifically between poverty rate, obesity rate, and diabetes rate
- Urban tracts show a higher proportion of low-access tracts ($\approx 14\%$ vs. 8%), but rural tracts experience higher obesity and diabetes rates. This implies that while urban residents may face more localized food inaccessibility, rural populations suffer more severe health consequences from those access limitations—possibly due to transportation barriers and fewer healthcare options.

Garland

- Mississippi and Alabama are both among the 5 states with the highest food insecurity crude prevalence, diabetes crude prevalence, high blood pressure crude prevalence, and obesity crude prevalence.
- Mississippi, Texas, New Mexico, Alabama, and Georgia are the states with the highest average food insecurity crude prevalence of 23.03, 21.61, 20.88, 20.08, and 18.3 respectively.

Final Main Insight: Food deserts reveal an overlapping geography of poverty, poor health, and mental distress that is concentrated in the Rural South and Midwest.

[Digital Storyboard](#)

[Figjam](#)

Hook

Rising Insights

Distance Slider (1, 10, 20) miles to a supermarket showing the amount of people in both rural and urban census tracts that have to travel for distances

Oscar Boccelli

- Rural & Urban Prevalence of Kids/Seniors in Food Deserts

Oscar Boccelli

- contrasting side-by-side charts of different regions in the US

Dani Eiseleh-Drofa

- deep-dive by county for states with the highest correlations between food desert prevalence and health outcomes

Dani Eiseleh-Drofa

Correlation between food insecurity and prevalence of chronic conditions like obesity, hypertension, and diabetes.

Gatland Catlett

Geographic Choropleth map indicating states with highest overlap in high poverty, depression, and food desert tracts

Oscar Boccelli

Main Message

- overall map of food deserts in the US; the data will show more severe food desert prevalence in the South & Midwest

Dani Eiseleh-Drofa

- call-out boxes on certain states with particularly severe health outcomes

Oscar Boccelli

Solution

- Supporting local food production through urban gardens, community farms, and regional agriculture reduces transportation costs and increases fresh food availability. Improving food distribution networks also helps. Reducing waste helps redirect surplus from retailers and restaurants to those in need. Investing in infrastructure for food storage and transportation is particularly important in rural regions.

Gatland Catlett

- Emergency food assistance through food banks, pantries, and meal programs provides critical short-term support. School meal programs (breakfast and lunch) helps ensure children have consistent access to nutrition. Direct food assistance programs like SNAP (Food stamps) help low-income families afford groceries.

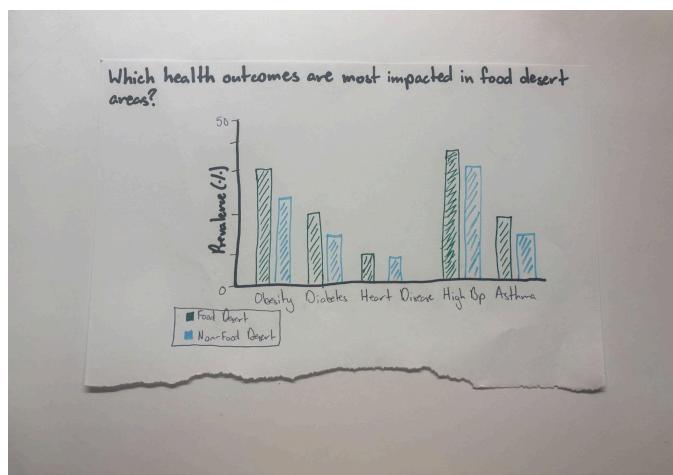
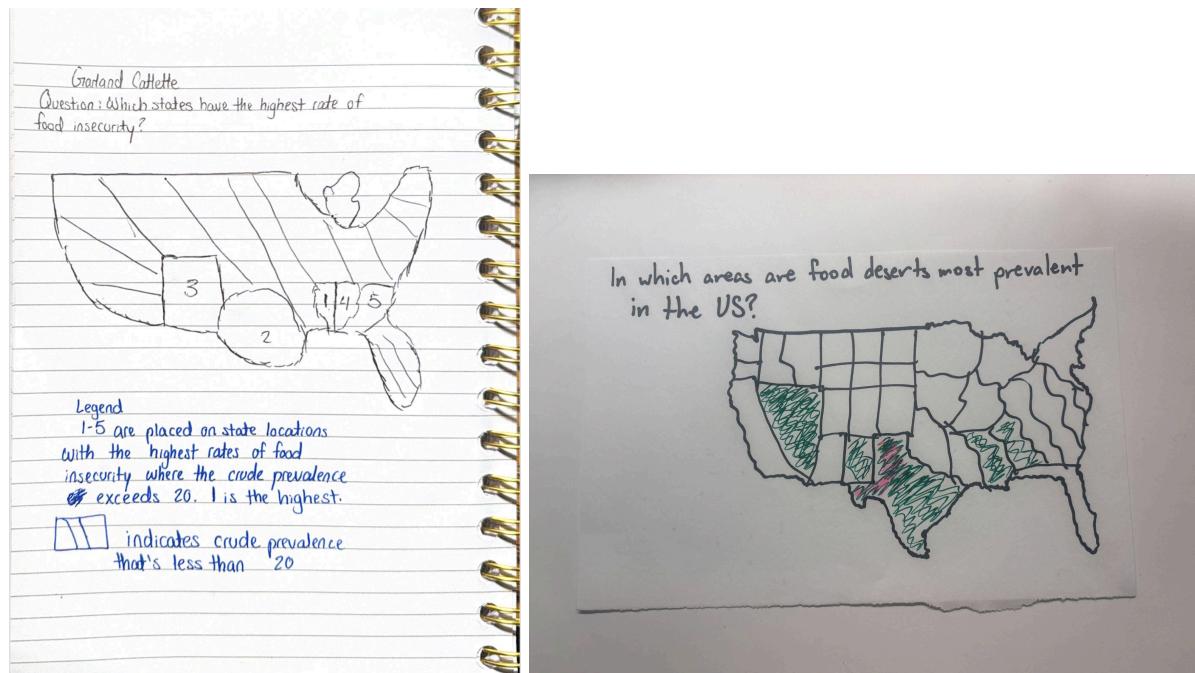
Gatland Catlett

Milestone 9: Prototype 1

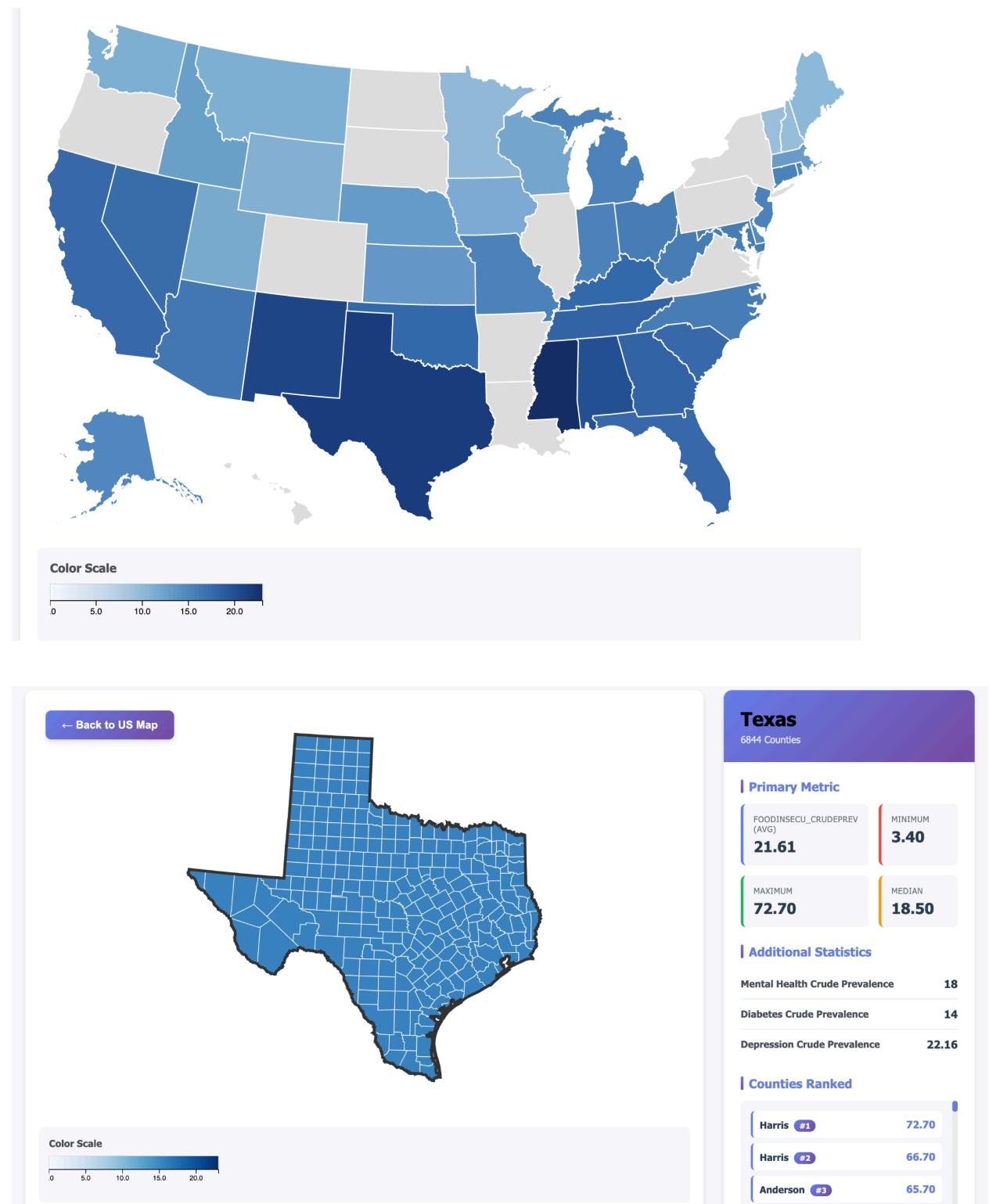
Food deserts reveal an overlapping geography of poverty, poor health, and mental distress that is concentrated in the Rural South and Midwest.

Two D3 Visualizations

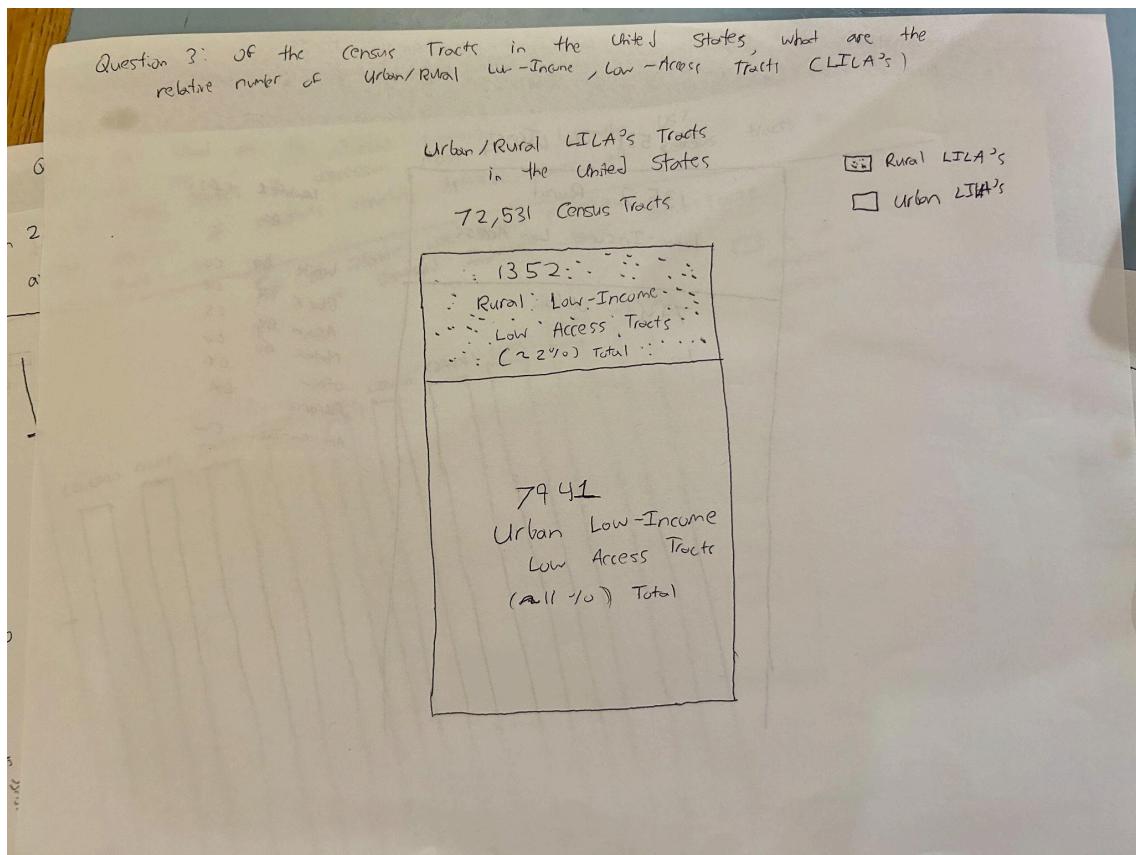
Sketch 7/15 (Combined with Sketch 12, Map Visualization):



Visualization:



Sketch 3: Slider (conducted further data analysis resulting in adjusted numbers, accounted for rural/urban food desert definition distinctions)



Visualization:

From Half a Mile to Twenty: How Geography Expands the Distance to Fresh Food

Both Urban Rural

24,006

TRACTS
tracts at 1 mile from food access

1/2 mi 1 mi 10 mi 20 mi

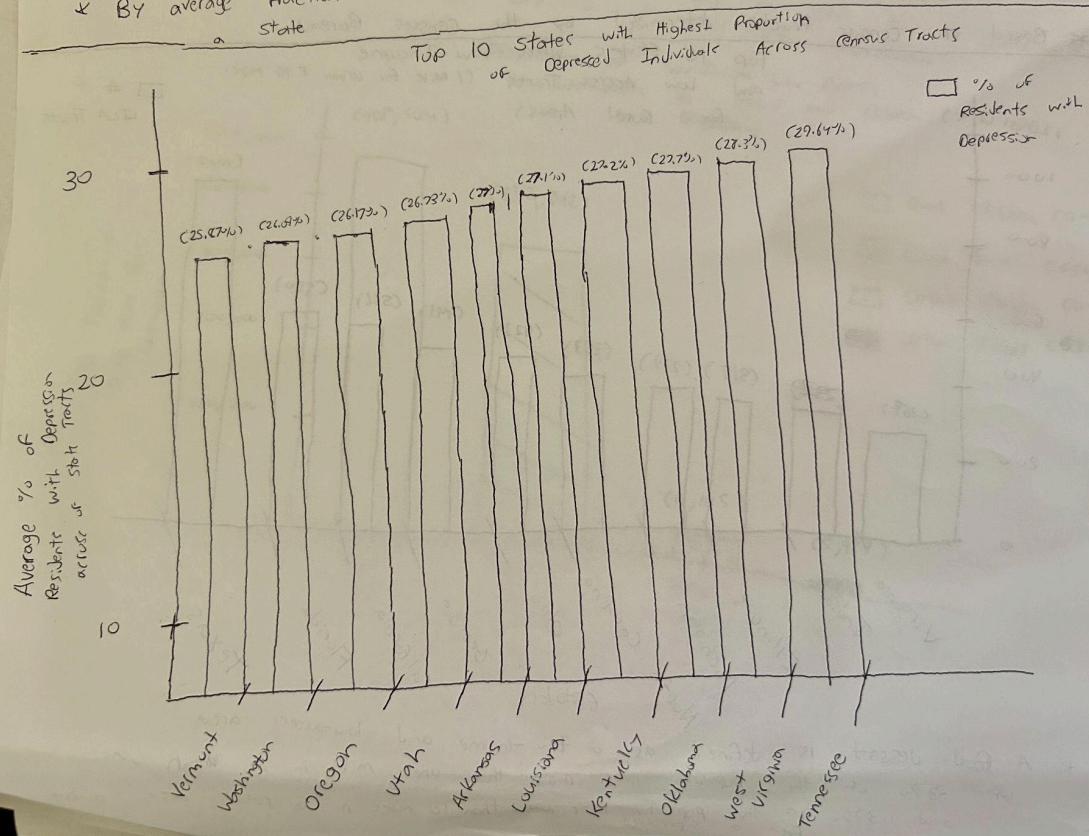
Additional Visualization Drafts:

Sketch 2 (Food Desert Regional Distribution):

What are the top 10 states with the highest proportion of residents reporting depression across all census tracts in the US? CLICAS!

Question 2: In which states is depression most prevalent in the US?

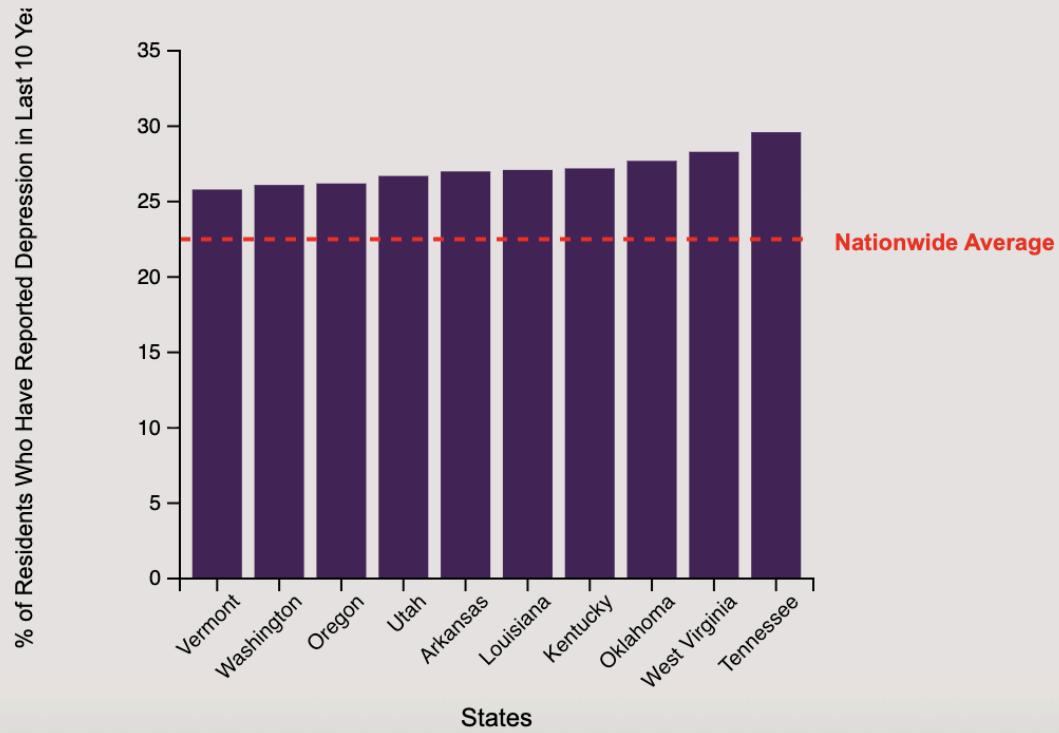
By average fraction of residents reporting depression across all census tracts in state



Implementation:

The Depression Landscape: America's Most Vulnerable States

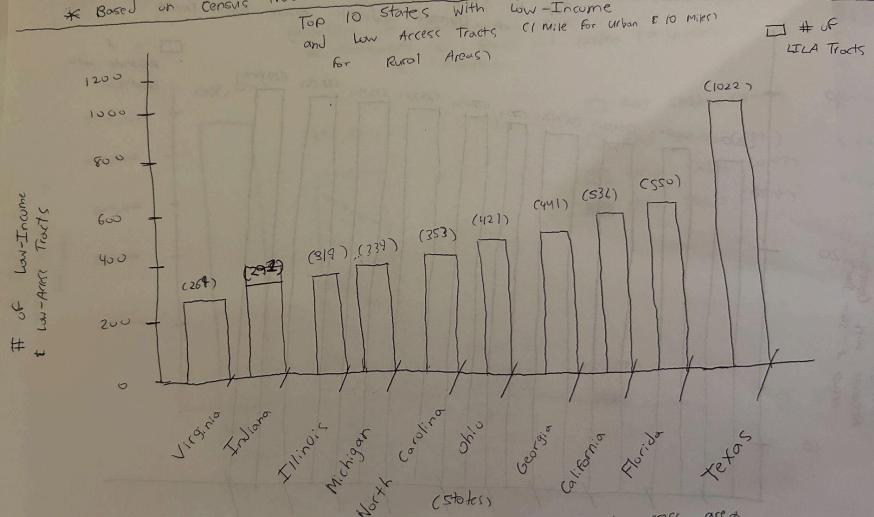
Top 10 States with Highest Proportion of Depressed Individuals



Sketch 1 (Top 10 States with Low Income Low Access Tracts):

Question 1: Which states in the United States have the highest number of food desert tracts according to the Food Access Research Atlas?

* Based on census tracts determined by the Census Bureau

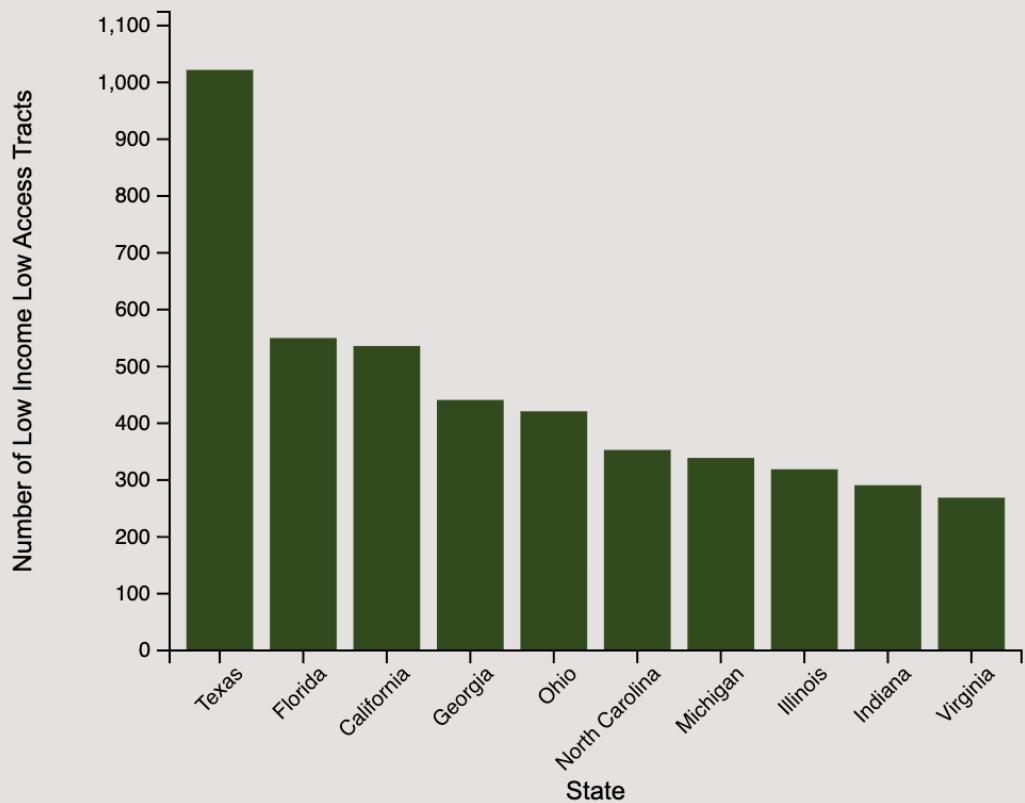


+ A food desert is defined as a low-income and low-access area where 30% or the population lives more than one mile in an urban area and 33% of the population lives more than 10 miles in a rural area away from a supermarket.

Implementation:

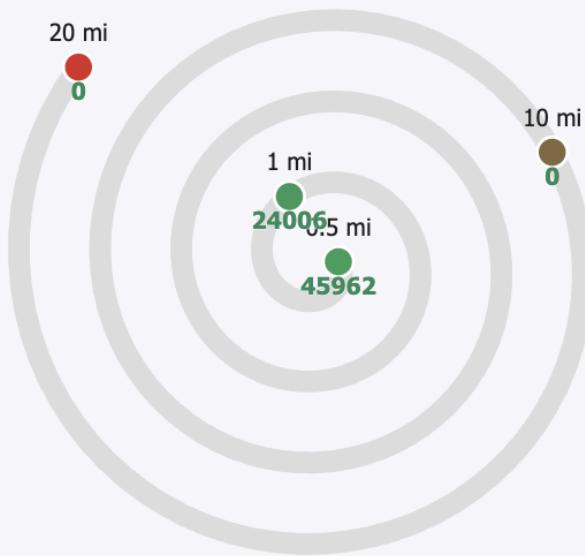
The Epicenters of Food Insecurity

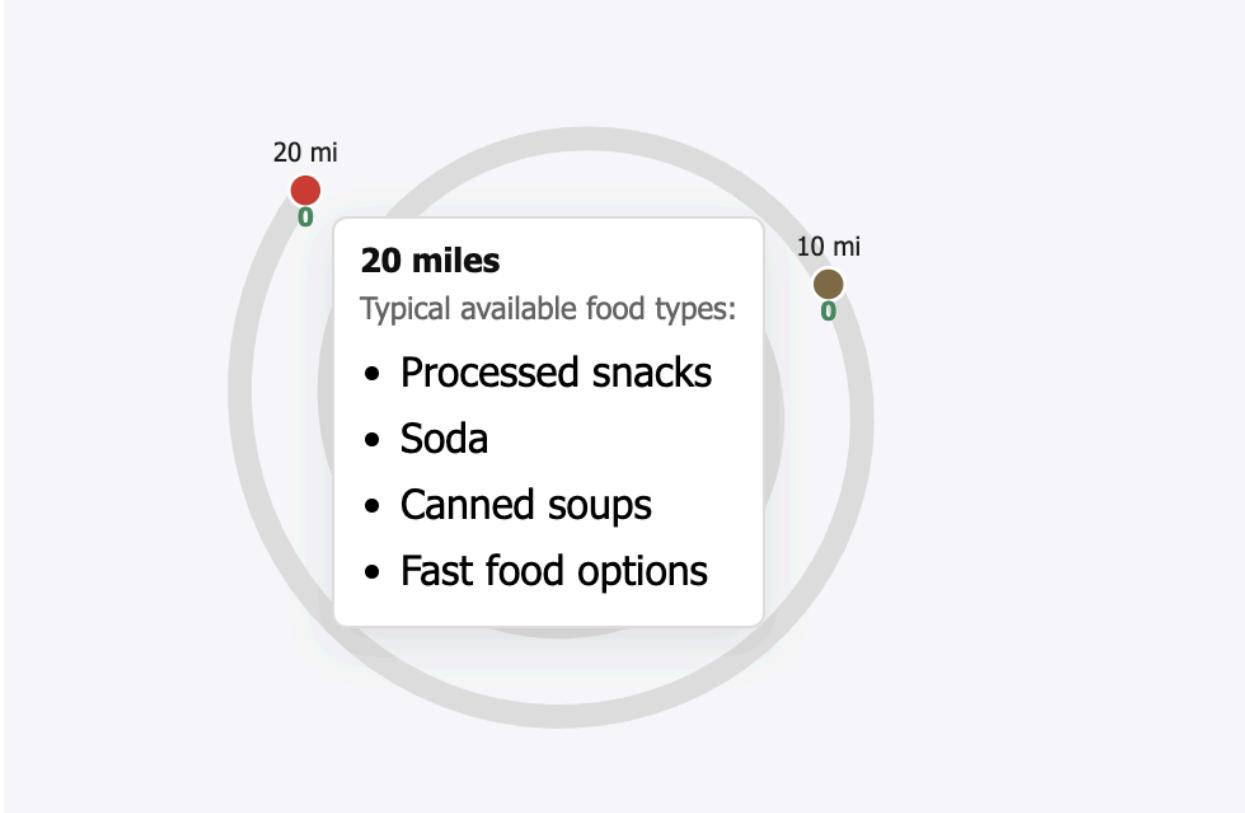
Top 10 States with the Highest Number of Low-Income Low Access Tracts



Innovative Visualization (Roadmap):

Living on What's Left: The Everyday Reality of Food Deserts





20 mi

20 miles

Typical available food types:

- Processed snacks
- Soda
- Canned soups
- Fast food options

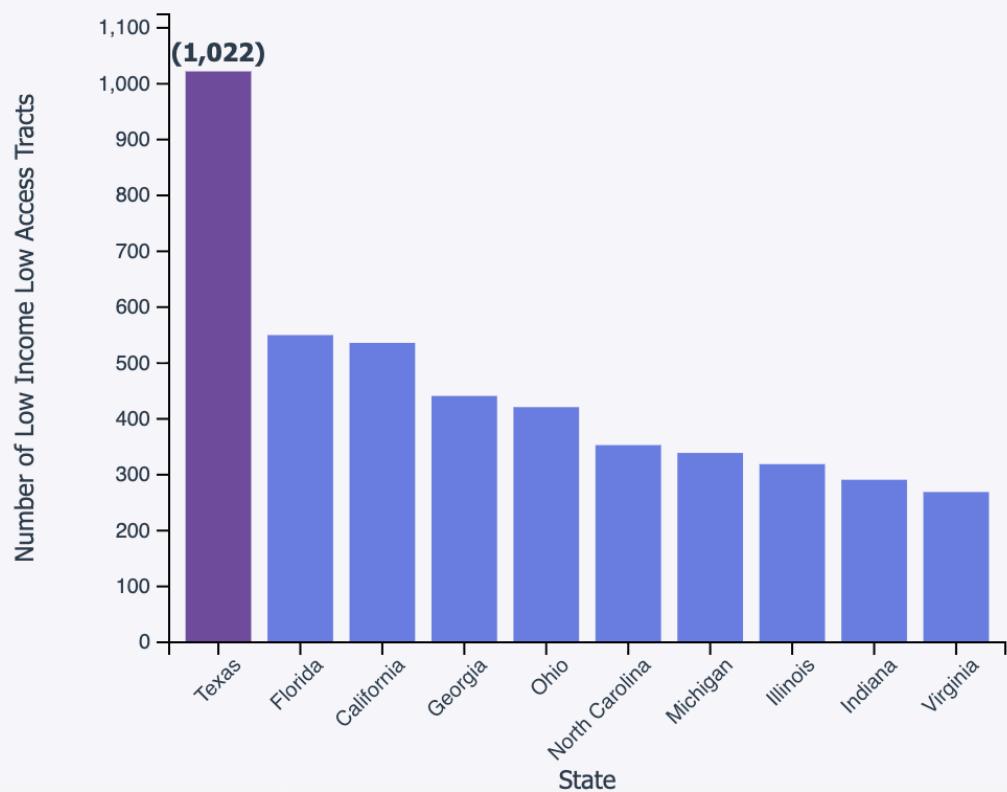
10 mi

Milestone 10: Prototype 2

*We employed a new blue/purple theme for the website layout
First Changes (All Bar Graphs now D3)

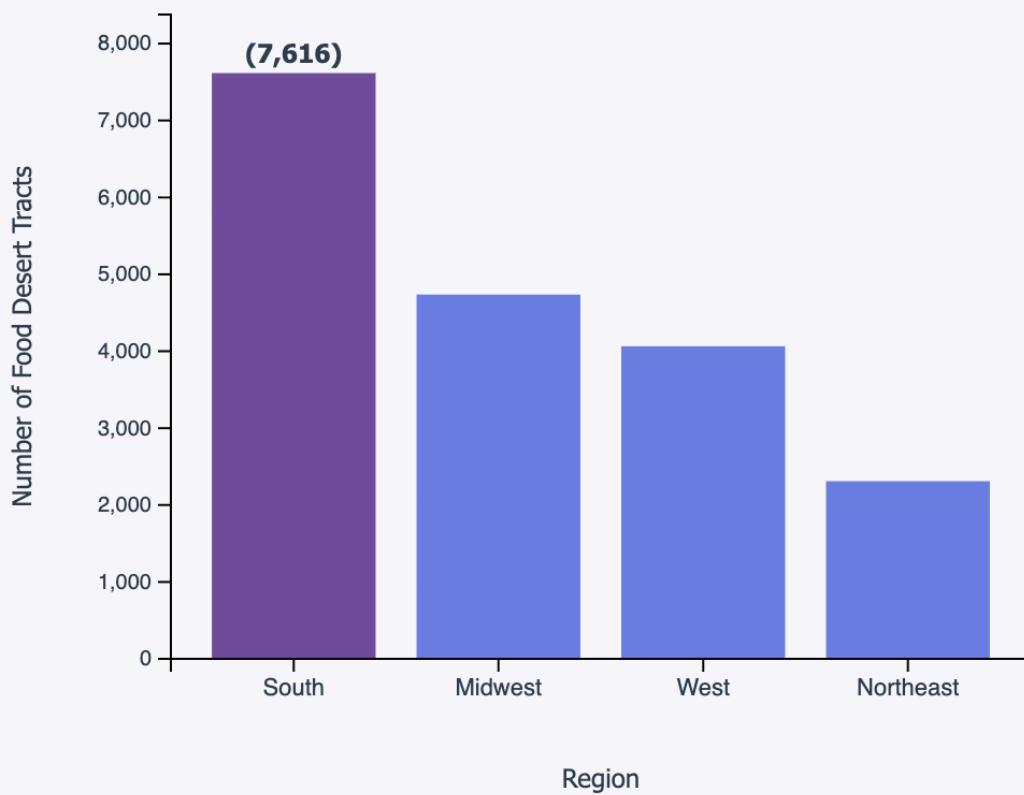
The Epicenters of Food Insecurity

Top 10 States with the Highest Number of Low-Income Low Access Tracts



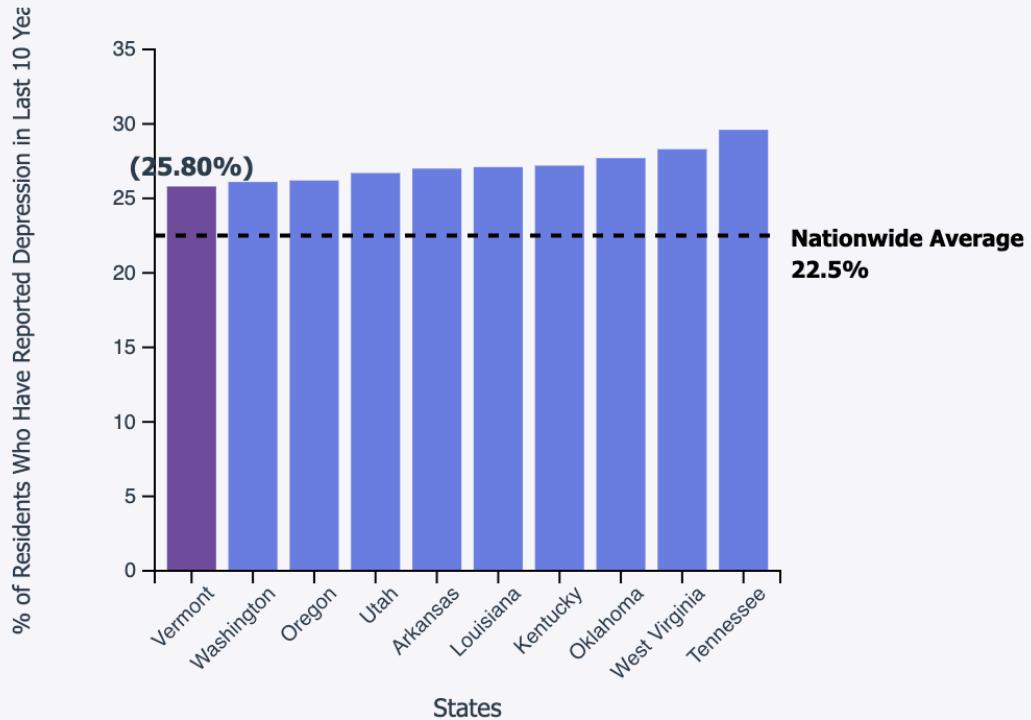
The Regional Prevalence of Scarcity

Regional Distribution of Food Desert Tracts



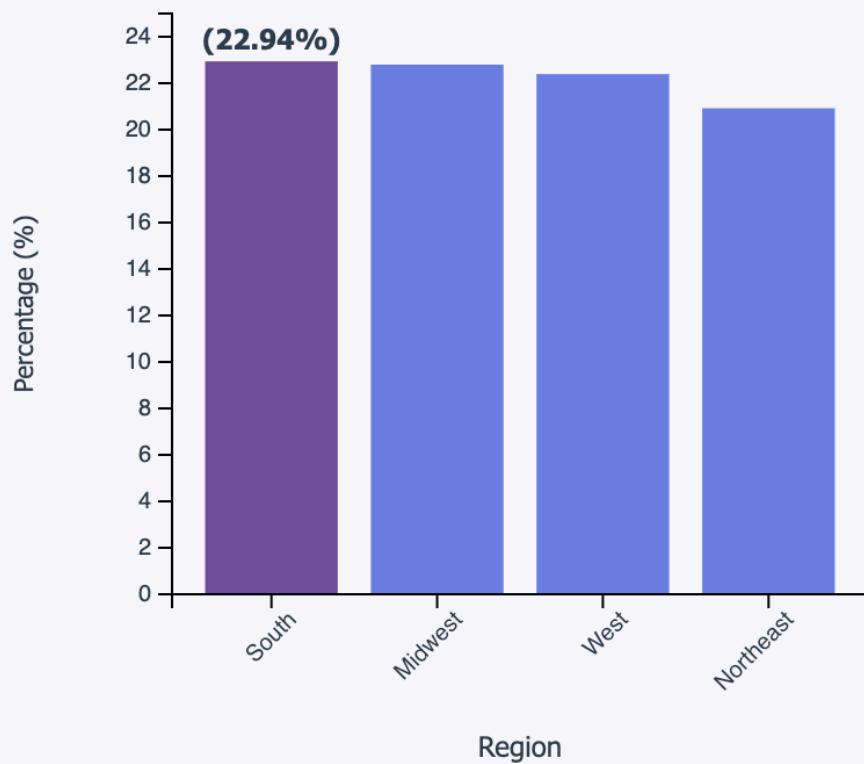
The Depression Landscape: America's Most Vulnerable States

Top 10 States with Highest Proportion of Depressed Individuals



Regional Patterns of Strain

Regional Distribution of Depression Prevalence



Updated Spiral/Slider Numbers

Both

Urban

Rural

46,335

TRACTS

tracts at 1/2 mile from food access

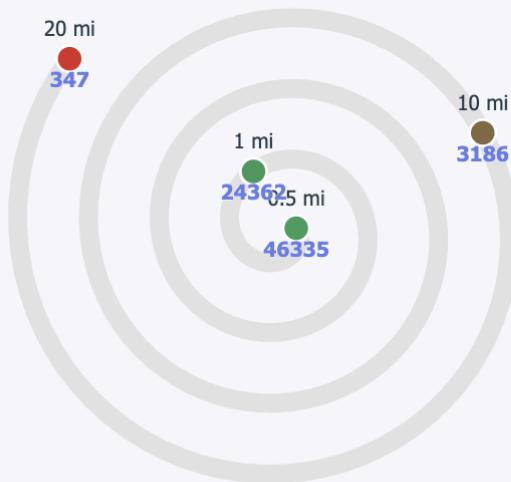
1/2
mi

1 mi

10 mi

20 mi

Living on What's Left: The Everyday Reality of Food Deserts



Milestone 11: Prototype 3

Updated Narrative: Included Images to add to narrative/theme of Food Deserts

What is a Food Desert?

USDA Definition: A census tract qualifies as a food desert if it meets low-income criteria and has limited access to supermarkets—defined as being more than **1 mile** from a supermarket in urban areas, or more than **10 miles** in most rural areas, with up to **20 miles** in particularly remote or sparsely populated rural tracts.



Living on What's Left: The Everyday Reality of Food Deserts

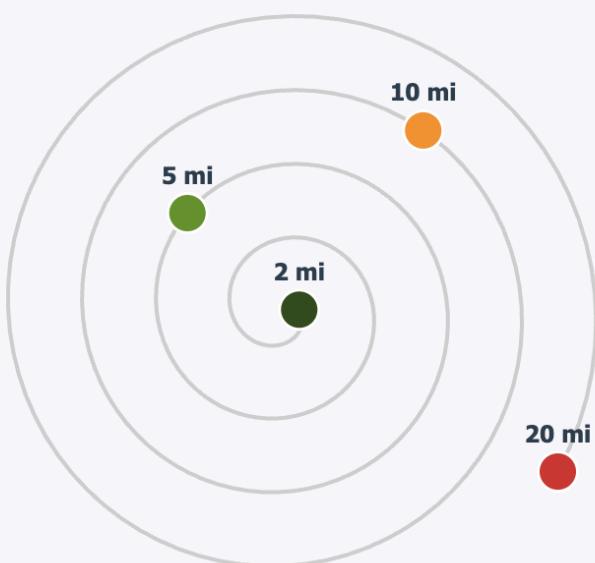
Hover over each distance to uncover food quality in rural and urban food deserts



Innovative Visualization (Introduced toggle on spiral, updated distances, introduced hover functionality on each distance to convey how food nutrition decreases with distance):

Living on What's Left: The Everyday Reality of Food Deserts

Hover over each distance to uncover food quality in rural and urban food deserts



Urban

Rural

USDA Definition: A census tract qualifies as a food desert if it meets low-income criteria and has little or no access to supermarkets—defined as being more than one-half mile away or more than 10 miles in rural areas.

deserts

Food options 2 miles away



Urban

What is a Food Desert?

USDA Definition: A census tract in which residents have limited access to affordable healthy food options.

Food options 20 miles away

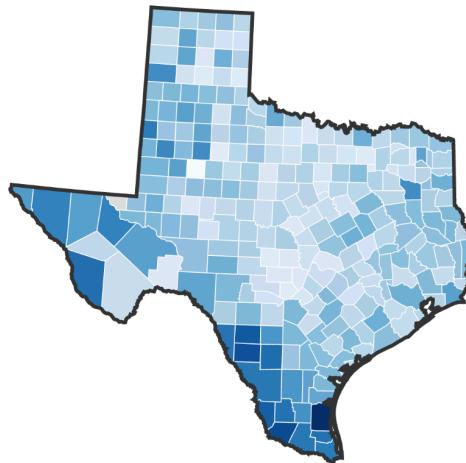


LIVING ON WHAT'S LEFT: The everyday reality of Food Deserts

Hover over each dot to discover food quality in rural and urban Food Deserts.

Additional Update (Map Visualization): Provided more context on numbers/metrics in sidebar, integrated health data that adjusts the map depending on the selected health metric), provides county level distributions

[← Back to US Map](#)



Unadjusted Rate of Food Insecurity (%)



Texas

253 Counties

Select Health Metric:

Unadjusted Rate of Food Insecurity (%)

Selected Metric Statistics

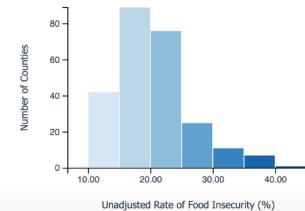
AVERAGE
20.63

MINIMUM
6.70

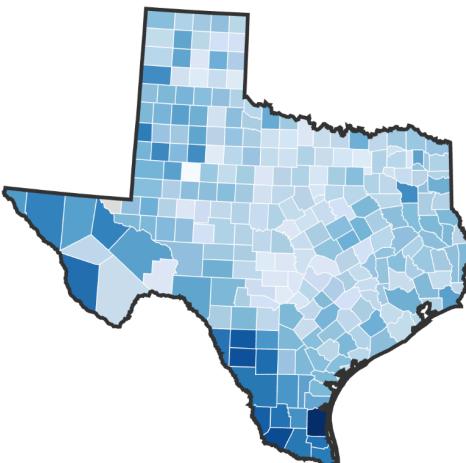
MAXIMUM
45.30

MEDIAN
19.66

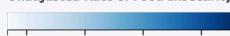
County Distribution



[← Back to US Map](#)



Unadjusted Rate of Food Insecurity (%)



Texas

253 Counties

Select Health Metric:

✓ Unadjusted Rate of Food Insecurity (%)
Unadjusted Rate of Diabetes (%)
Unadjusted Rate of Depression (%)
Unadjusted Rate of Mental Illness (%)

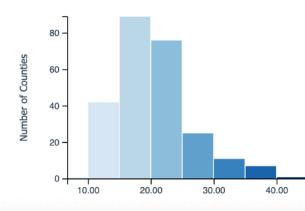
AVERAGE
20.63

MINIMUM
6.70

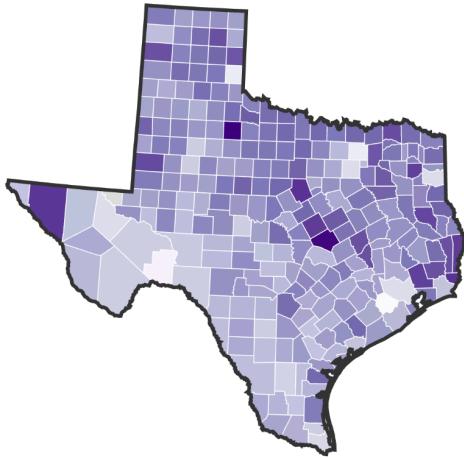
MAXIMUM
45.30

MEDIAN
19.66

County Distribution



[← Back to US Map](#)



Unadjusted Rate of Depression (%)



Texas

253 Counties

Select Health Metric:

Unadjusted Rate of Depression (%)

Selected Metric Statistics

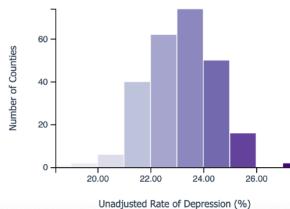
AVERAGE
23.15

MINIMUM
18.41

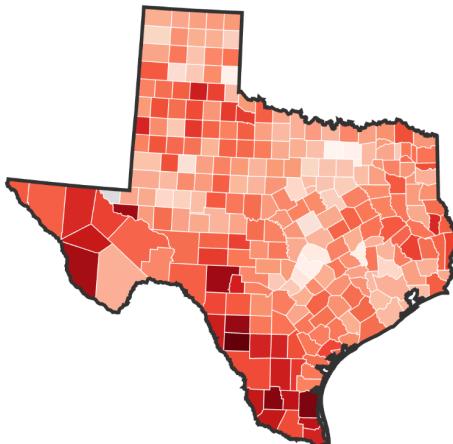
MAXIMUM
27.40

MEDIAN
23.13

County Distribution



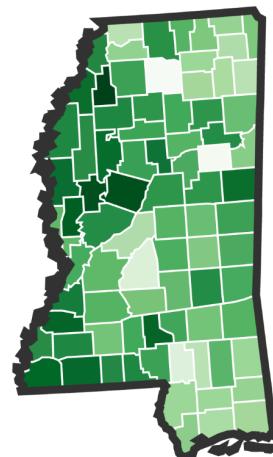
[← Back to US Map](#)



Unadjusted Rate of Diabetes (%)



[← Back to US Map](#)



Unadjusted Rate of High Blood Pressure (%)



Texas

253 Counties

Select Health Metric:

Unadjusted Rate of Diabetes (%)

Selected Metric Statistics

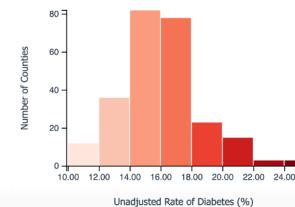
AVERAGE
16.06

MINIMUM
9.90

MAXIMUM
25.03

MEDIAN
15.85

County Distribution



Mississippi

82 Counties

Select Health Metric:

Unadjusted Rate of High Blood Pressure (%)

Selected Metric Statistics

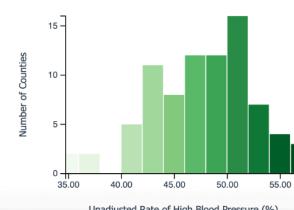
AVERAGE
47.73

MINIMUM
34.72

MAXIMUM
57.00

MEDIAN
48.11

County Distribution



Updated Distance Slider to incorporate low-income distinction between tracts, logarithmic scale for clarity, and updated distances for Urban & Rural toggles to match with USDA definition

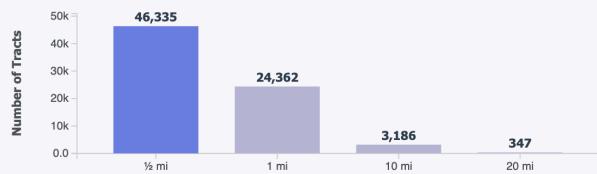
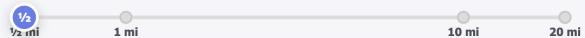
From Half a Mile to Twenty: How Geography Expands the Distance to Fresh Food

Both Urban Rural

All Income Levels Low-Income Only

46,335

tracts
tracts with low access at $\frac{1}{2}$ mile



■ Urban ♀ Rural
46,335 0

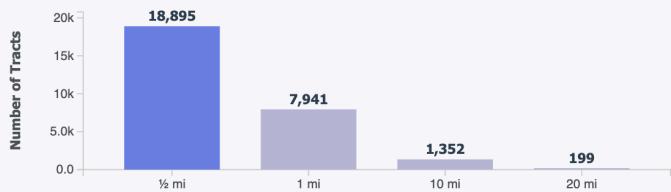
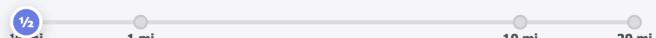
From Half a Mile to Twenty: How Geography Expands the Distance to Fresh Food

Both Urban Rural

All Income Levels Low-Income Only

18,895

tracts
low-income tracts with low access at $\frac{1}{2}$ mile



■ Urban ♀ Rural
18,895 0

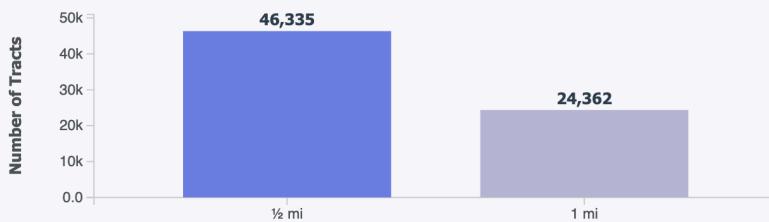
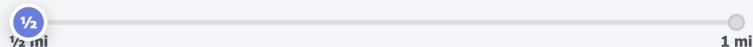
From Half a Mile to Twenty: How Geography Expands the Distance to Fresh Food

Both Urban Rural

All Income Levels Low-Income Only

46,335

tracts
urban tracts with low access at ½ mile



From Half a Mile to Twenty: How Geography Expands the Distance to Fresh Food

Both Urban Rural

All Income Levels Low-Income Only

3,186

tracts
rural tracts with low access at 10 miles

