**Project 2 (Robert’s Data)**

**Q1. Most important parts of EDA.**

Besides reading the file, food\_access\_research\_atlas\_csv, and seeing over 7,000 observations and 147 variables with a number of different data attributes, we realized that we have a pretty good variety of data types, such as number/floats (num), integers and other column variables to continue to work on the Food Deserts for Project 2. The major parts of EDA were identifying the statistics by converting some factor variables, such as Total Low Income population (LowIncomeTracts), Low Income Low Access at one mile and ten miles population (LILIATracts\_1And10), with the as.factor function to see the different attributes. Then we selected a number of appropriate variables (TractSeniors, TractSNAP, MedianFamilyIncome, TractKids, PovertyRate) to work with our SMART questions to see if we can select and determine the correct model for our questions.

**Q2. How did you select and determine the correct model to answer your question?**

Based on the SMART questions below we select the following variables:

* Can a certain level of income contribute to food insecurity in a given area?
* What are the income levels of the populations that SNAP may help eradicate food insecurity?

***Selected Variables***

LILATracts\_1And10 - Low Income Low Access at 1 mile and 10 miles population

LowIncomeTract – Low Income population

PovertyRate – Poverty Rate numbers

MedianFamilyIncome – Median Family Income population

TractLOWI – Low Income numbers

TractSeniors – Total Seniors population

laseniors1 – Low Access Seniors at 1 mile

laseniors10 - Low Access Seniors at 10 miles

TractKids – Total Kids population

lakids1 – Total Kids at 1 mile population

lakids10 - Total Kids at 10 miles population

TractSNAP – Total SNAP population

lasnap1 – Low Access SNAP at 1 mile population

lasnap10 – Low Access SNAP at 10 miles population

Then, we determine the plots, correlation and ggplot, and geom\_boxplot and ANOVA testing for analysis to determine the linear models for a couple of our questions.

**Q3. Is your SMART question more about inference or prediction? If inference, how do you interpret your model results? If prediction, how good are your predictions?**

The following questions were based on inference:

* Can a certain level of income contribute to a Food Insecurity in a given area?

I reviewed the p-value from the ANOVA analysis, and it was below .05, where the Total Low Income population with Low Income Low Access at 1 mile and 10 miles population had very little difference. Therefore, the low income populations did not eradicate a food insecurity, but it appeared that the low incomes may be eligible for food assistance program, such as Supplement Nutrient Assistance Program (SNAP).

A screenshot of a computer

Description automatically generated

* What are the income levels of the populations that SNAP may help eradicate a food insecurity?

We also reviewed the p-value, 2e-16, was below .05 from the ANOVA analysis, where the Total Low Income population with Poverty Rate had some difference. Therefore, the Low Income population was close to or in line with Poverty Rate where the Low Income population may be eligible for the SNAP Program.

A graph with a pink line

Description automatically generated with medium confidence

**Q4. What interesting interpretations or predictions can you make with your model?**

The linear models in question 3 (above) for the Total Low Income food deserts with Low Income and Low Access, and Poverty Rate for SNAP with different Low Income were similar with income levels.

**Q5. How good is your model?**

We think that the linear models for low income population levels contribute to food insecurities as well as certain levels of income may be eligible for the SNAP Program to mitigate/alleviate food insecurity in certain food desert areas within the United States.

**Q6. How reliable are your results?**

We think that our results from the Linear Models are reliable based on the variables selected within our dataset for food insecurities with the food desert areas.

**Q7. What additional information or analysis might improve your model results or work to control limitations?**

We think that Supplement Nutrient Assistant Program appears to be in line with the selected variables, such as TractSeniors, TractSNAP, MedianFamilyIncome, TractKids, PovertyRate, LowIncomeTracts, LILIATracts\_1And10. The SNAP variable along with the other variables indicated how certain attrbutes were used as requirements to qualify for the SANP Program and temporarily eradicate food insecurity in a food desert area.

Historically, the Agricultural Adjustment Act (AAA) of 1933 laid the groundwork for the creation of SNAP. To assist farmers who were impacted by the Great Depression, the Federal Surplus Relief Corporation program purchased essential agricultural products at a reduced cost and sent them to hunger relief organizations throughout the country.

In 1964, the Food Stamp Act was passed as part of President Lyndon Johnson’s Great Society Program. The [goal of the program](https://www.snaptohealth.org/snap/the-history-of-snap/) was to achieve a more effective way of strengthening agricultural economy, reduce over production, and improve levels of nutrition among individuals with low incomes.

**Policy**

SNAP saw a major improvement when the Family Security and Rural Investment Act was passed in 2002 under George W. Bush. The modifications significantly increased the number of participants with the replacement pf food stamps with The Electronic Benefits Transfer (EBT) card to purchase food, and eligibility of immigrants and children ages 18 and under. SNAP achieved a new high of 28.2 million participants in 2008.

The Agricultural Act of 2014, or the Farm Bill, was ratified by President Obama in 2014. The USDA awarded $31.5 million in funding to national, state, and local groups to promote initiatives that encourage Supplemental Nutrition Assistance Program (SNAP) participants to boost their purchases of fruits and vegetables.

According to the Center on Budget and Policy Priorities (2022), the households with the least amount of resources to buy food are the primary target of SNAP. Households with incomes at or below the federal poverty line receive roughly 92% of SNAP payments, while households at or below half of the federal poverty threshold receive 54%, see Figure 1.

A table with numbers and text

Description automatically generated

Figure 1. 48 Contiguous States Federal Poverty Level in 2021 Based on Annual Income.

As earnings rise, benefits are gradually phased down under the SNAP formulary by only 24 to 36 cents for every additional dollar earned, see Figure 2. Consequently, even as most SNAP households earn more and strive toward financial stability, the program still acts as an economic supplement, making it simpler for families to buy food. SNAP participants who lose their employment can apply for benefits and receive them swiftly. The SNAP Employment and Training program, which provides funding for job training and activities to unemployed individuals who receive SNAP, is another way that states encourage work.

A graph of a graph with blue and yellow bars

Description automatically generated

Figure 2. SNAP Benefits Phase Out as Earnings Rise.

For example, two young Black farmers, Jeremy Peaches of Fresh Life Organics and Ivy Walls of Ivy Leaf Farms, have developed what they believe might become a sustainable and fair model to help feed and revitalize food desert neighborhoods in Sunnyside, a historically Black neighborhood in south Houston (Kehr, 2021).

After moving to Sunnyside in early 2020, Walls quickly discovered that the 20,000 residents of the neighborhood only had access to one large grocery shop, and the quality of the food was poor. Growing up in a suburban area of Pearland, Walls said, "moving from a food oasis to a food desert was very shocking for me."

Walls began sharing the vegetables she was growing for her family and herself with her Sunnyside neighbors. "I would just ask people, 'Hey, would you like a cucumber?'" Hello, what do you want to eat? Do you want some watermelon, please? And everybody was just nodding," she remarked.

Demand for the food that Walls was growing persisted, and Ivy Leaf Farms was established in response. Walls raised money for the farm so she wouldn't have to charge for vegetables by holding pop-up events, selling home plants, and launching her own seed business. She quit her public health position in August to take care of the farm, and to continue her efforts, the NAACP and Beyoncé's Beygood Foundation awarded her a grant. But Walls and Peaches realized that one person cannot feed a community on their own, so they collaborated to develop a system that they hope, together with other farmers, will assist in doing so.

"Our goal was to create a fair and sustainable food system that would benefit not only our communities but also African American and minority farmers who lack access to traditional markets for selling their goods," stated Peaches.

Peaches stated, "We've been talking about food deserts for ten to fifteen years." How come they are food deserts? Grocery stores located in places where customers can afford to purchase their goods. A grocery store won't come to areas where the median household income is between $20,000 and $30,000, which are known as food deserts. It is imperative that we approach the growing and planting of food from a commercial or socioeconomic standpoint, as this is the only way to turn the tide and restore vibrancy to a community.

Walls just leased an extra 2.5 acres to increase the amount of food produced for Fresh Life Organics and Ivy Leaf Farms thanks to a grant she received from Kellogg's. Additionally, the two collaborated with Cropswap, an app developed in California that links customers and sustainable farms, to assist with the logistical aspects of box distribution. Customers use the app to place orders, make payments, and decide whether to have the box delivered to them or picked up at a predetermined location. Walls and Peaches have an additional chance to generate employment in the community through the relationship, as they are able to employ their own delivery drivers.

Walls and Peaches want to see Black Farmer Box become a model that other food desert communities can adopt. However, even with their combined efforts, they are aware that they cannot feed the entire Sunnyside community, so their main objective is to draw attention to the area in the hopes that a grocery store will be built there. Walls declared, "This shouldn't be our reality." "Believing that there can be only one grocery store serving more than 20,000 people is absurd."

People may help them in the interim by supporting the farmers in their local food desert communities and raising awareness of the issue. It will also help a great deal if consumers purchase 10% to 15% of their produce from urban farmers and gardeners.

**References**

SNAP, Explained. (2023). Move For Hunger. Retrieved December 09, 2023, from <https://moveforhunger.org/snap-explained>

Center on Budget and Policy Priorities (2022, June 09). Policy Basics: The Supplemental Nutrition Assistance Program (SNAP). Center on Budget and Policy Priorities. [**https://www.cbpp.org/research/policy-basics-the-supplemental-nutrition-assistance-program-snap**](https://www.cbpp.org/research/policy-basics-the-supplemental-nutrition-assistance-program-snap)

Kehr, P.A. (2021, July 07). Two Young Black Farmers Work to Feed and Reinvigorate a Houston Community. Edible Houston. <https://ediblehouston.ediblecommunities.com/shop/two-young-black-farmers-work-feed-and-reinvigorate-houston-community?fbclid=IwAR1t0OYSCG0jYfCI3K0RsYa5xAu48v0ZEtc0_JRpBTJR9EEDHzn-v8TaNzQ>