**Identifying Food Deserts in Roanoke VA**

**Hypothesis: do food deserts exist within Roanoke City?**

**Data and Methodology:**

Using neighborhood location information for Roanoke City and Foursquare data for grocery stores and supermarkets, I looked at neighborhoods that have few grocery stores or supermarkets, following the commonly accepted ".5-mile" rule for food access from the center of a neighborhood. Critically, the USDA data used to calculate "food desert" status is lacking, as it is frequently missing the on-the-ground insight provided only by someone living here (example: new grocery stores, ethnic stores, etc.). Originally, the data pull was supposed to include convenience stores; unfortunately, it was discovered that convenience stores are often too expensive for consistent nutritional use within many neighborhoods and do not help reclassify a neighborhood or area away from "food desert" status. Additionally, I had intended to add bus stops and other transportation routes to the map, but the data was incomplete and generally inaccurate. Last, poverty data was pulled from ZipAtlas and laid onto the folium map to show any linkages between overall community wealth and grocery access.

The first map created shows the centers of all of the neighborhoods that the local government defines for the area, which were pulled from Wikipedia (https://en.wikipedia.org/wiki/List\_of\_neighborhoods\_in\_Roanoke,\_Virginia"). Lat/long data was identified using Google, and filled on a .csv sheet imported into the notebook. The lat/long list was checked against the Wikipedia scrape to ensure all neighborhoods were captured. The neighborhood centers are marked with a green circle on the map below:

Map

Description automatically generated

To populate the list of grocery stores and supermarkets, a Foursquare API URL was generated, specifying the categories (Grocery Store, Supermarket) that were needed to build the clusters, with a radius of approximately one-half mile, the accepted distance used in the "food desert" definition for lower-income urban areas. The list of venues (only a little over 20 at a distance of less than 0.5 miles from each neighborhood center) was built, and neighborhoods were clustered based on their availability of stores. Critical to note, and clearly visible in the map below, are an absence of dots for several neighborhoods that had zero stores enabling them to be clustered; in the end, only around 15 neighborhoods went onto this map:

Map

Description automatically generated

Finally, data from ZipAtlas was scraped, showing percentage poverty levels in the area. To better visualize the data, location centers with a poverty level below the national average (9.2%) were dropped, leaving only Roanoke's four worst "centers of poverty" on the map. As expected, these centers of poverty fall where neighborhoods have few or no grocery stores or supermarkets nearby. The map is below:

Map

Description automatically generated

**Results:**

Food deserts do exist in Roanoke, and an absence of grocery stores and supermarkets appears to be amplified in the city's poorest communities. Interestingly, as research was being done, it was noted that the city overall has very few outlets for retail grocery purchases- often only one or two per neighborhood.

**Recommendation:**

I would recommend that data could be used by local food access non-profits to further "prove their case" to donors and in grant applications. It could also be used by local government officials to entice new grocery store openings (as has been done very recently with the new *Roanoke Grocery Market* within one of these poverty centers). The data could also be used to understand how a lack of accessible food creates other conditions for crime, drug use, etc.

**Conclusion:**

Food deserts in the city of Roanoke are a reality, and from this research it appears that the challenges are worse than was first believed. Food accessibility is vital for a growing and prosperous city, and using research like this is how we best target the places that need support the most.