# Combating Food Insecurity

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# Background

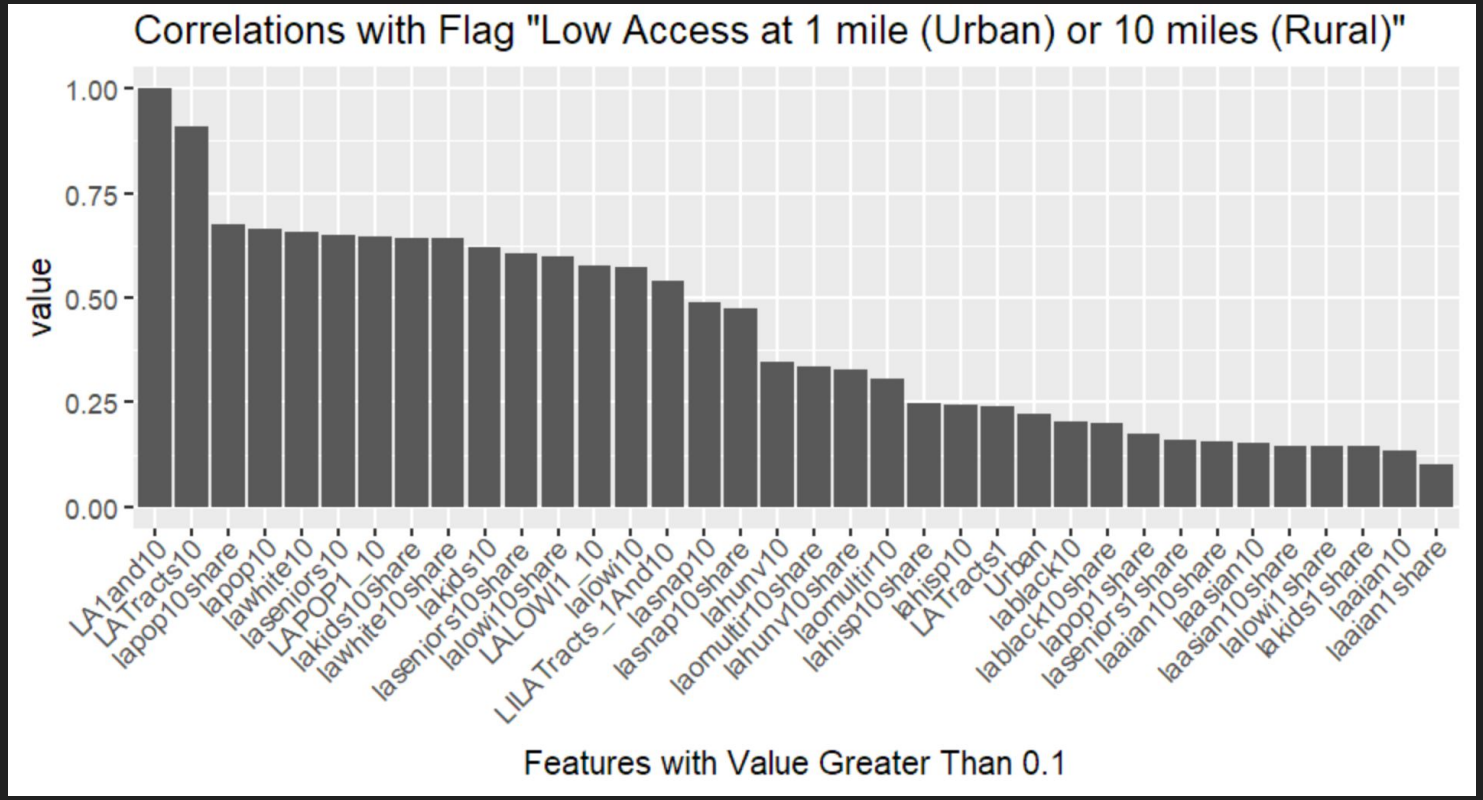
**Food Insecurity**: The USDA defines food insecurity as having reduced quality, variety, or desirability of diet. This can also result in disrupted eating patterns and reduced food intake.

**Food Desert**: The USDA defines food deserts as areas where people live more than 1 mile from a supermarket in urban areas, or ten miles away in rural areas. This can also include areas where the only access to food comes from corner/convenience stores without many healthy food options.

**Using data from the USDA Economic Research Service's Food Access Research Atlas, we focused on asking the question:**

**What factors contribute to a higher likelihood of living in a food desert? Our recommendations are aimed at increasing food access; we are assuming that food deserts are a proxy for food insecurity.**

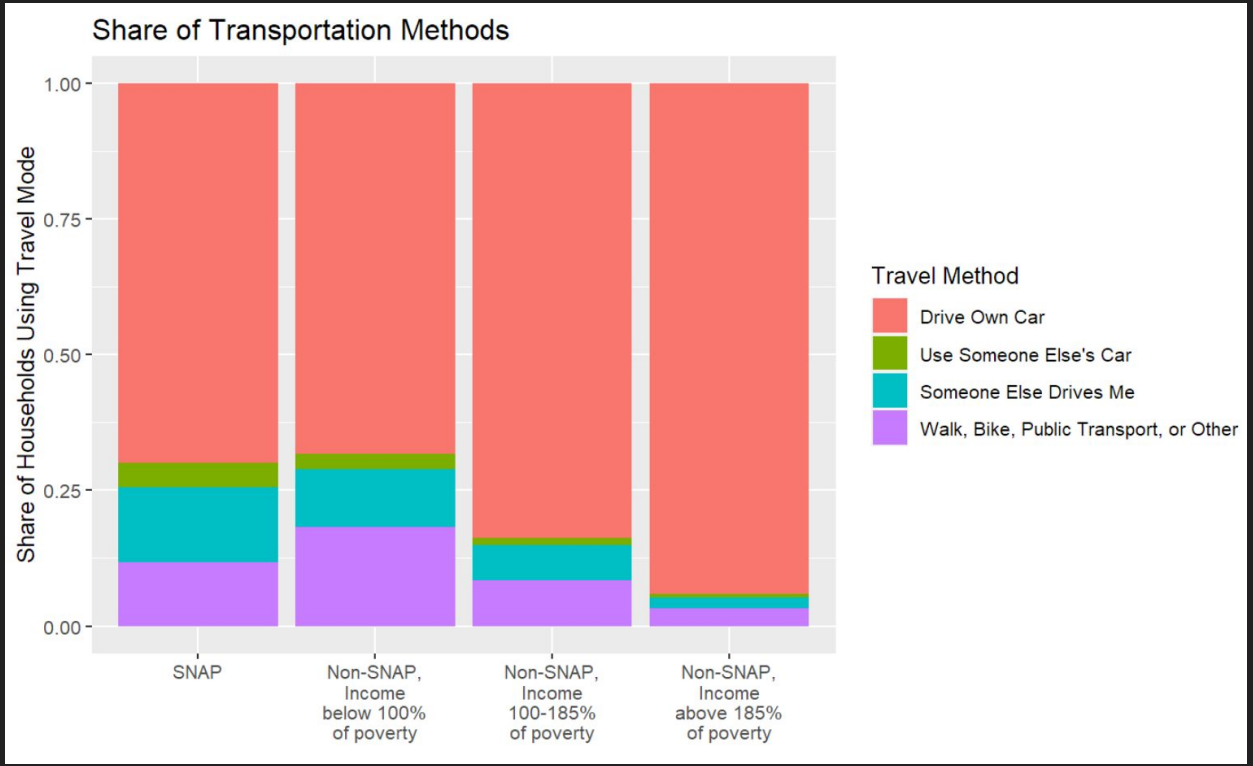
# Intro




This plot is showing features of the data set which highly correlate to a census tract being labeled “Low Access” to food stores

The Food Access Research Atlas defines “Low Access” the same as areas that are food deserts. Using Pearson’s correlation coefficient, we see that factors related to age (laseniors10, lakids10), race (lawhite10, lahisp10), and access to a vehicle (lahunv10), have high correlation with census tracts that are labeled as “Low Access”. We also investigated if there was a trend related to education level.

# Transportation

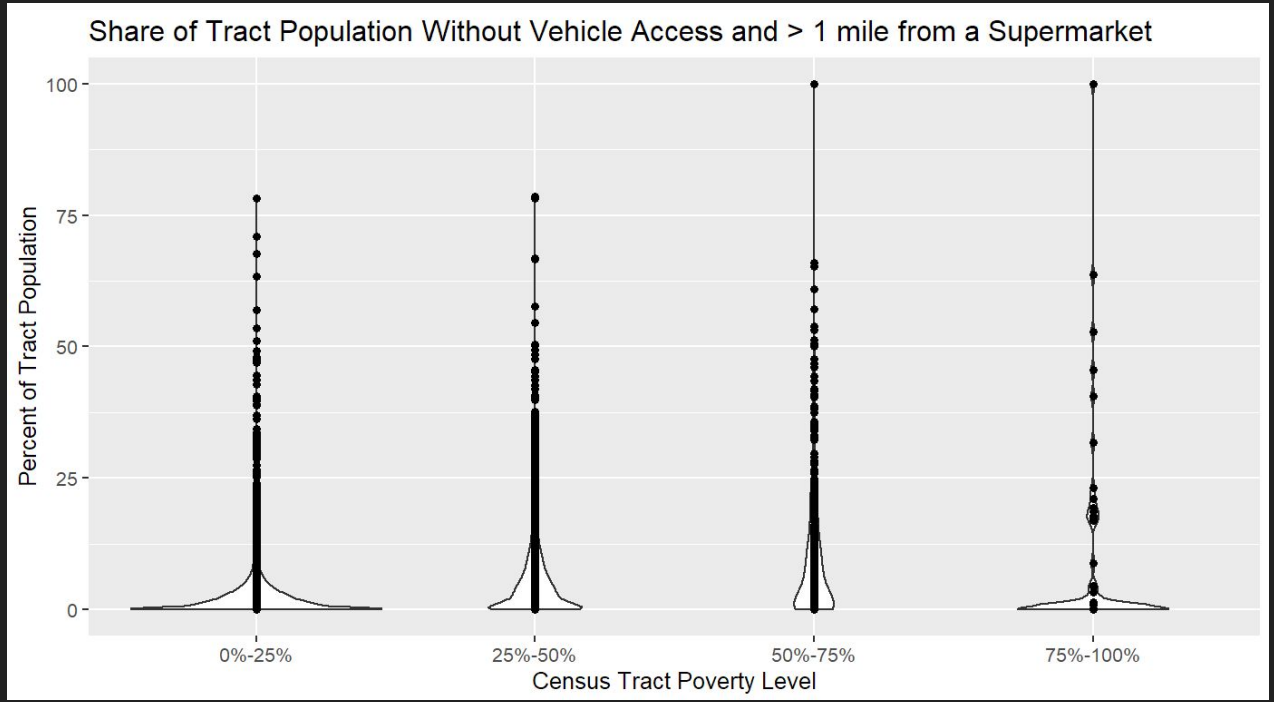



Data Source: USDA, Economic Research Service using data from the National Household Food Acquisition and Purchase Survey collected April 2012-January 2013

- **Most US households** use their own vehicle to go grocery shopping
- **Nearly one third of SNAP** participants use transportation other than their own car for grocery shopping
- The same trend is seen for households **not participating in SNAP, but are below the poverty level**

- People living without the convenience of their own car may not be able to shop as frequently or at times when food supplies are running low

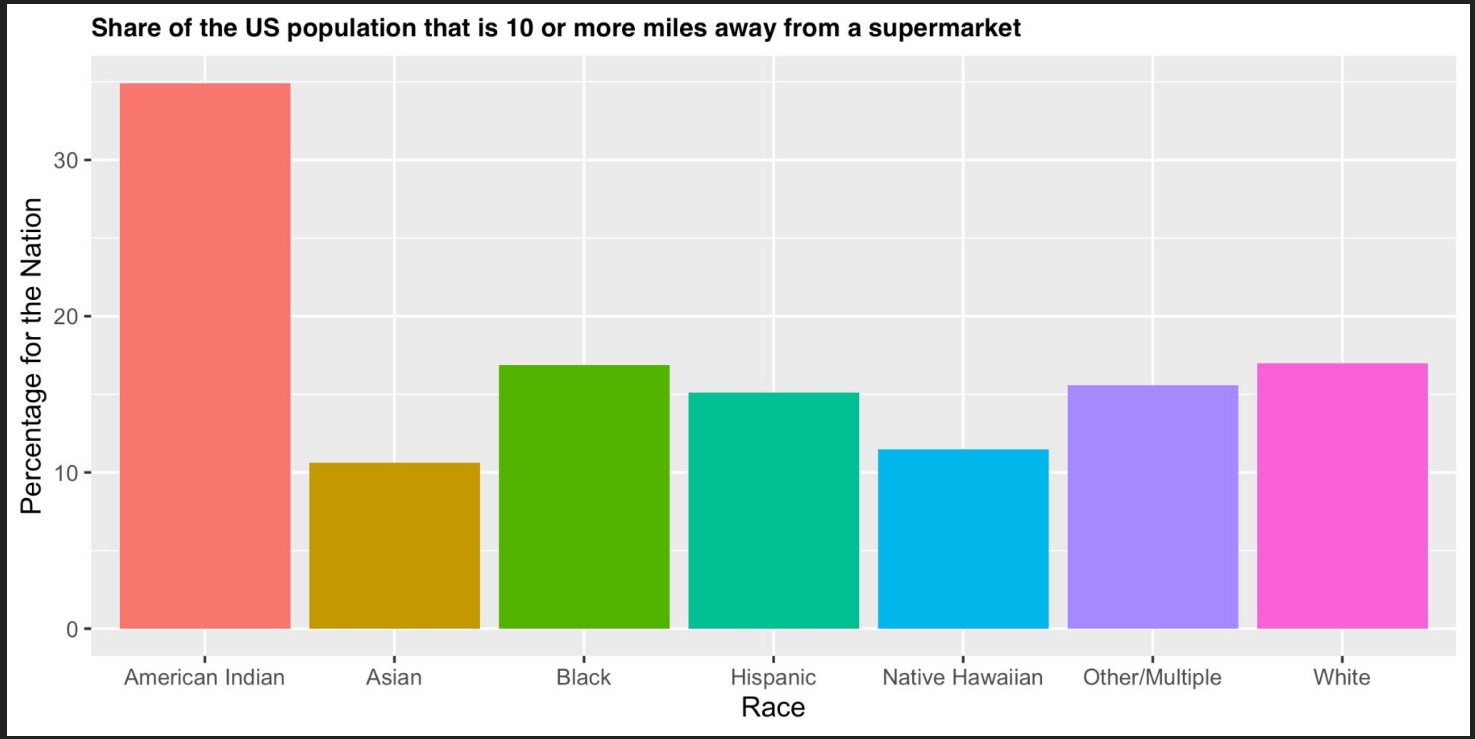
# Vehicle Access




- Census tracts with a higher average poverty level are more likely to have a large percent of the population within the tract living without access to a vehicle and more than one mile from the supermarket
- Possible solutions can focus on benefiting communities where many people do not have transportation to a food store

# Race

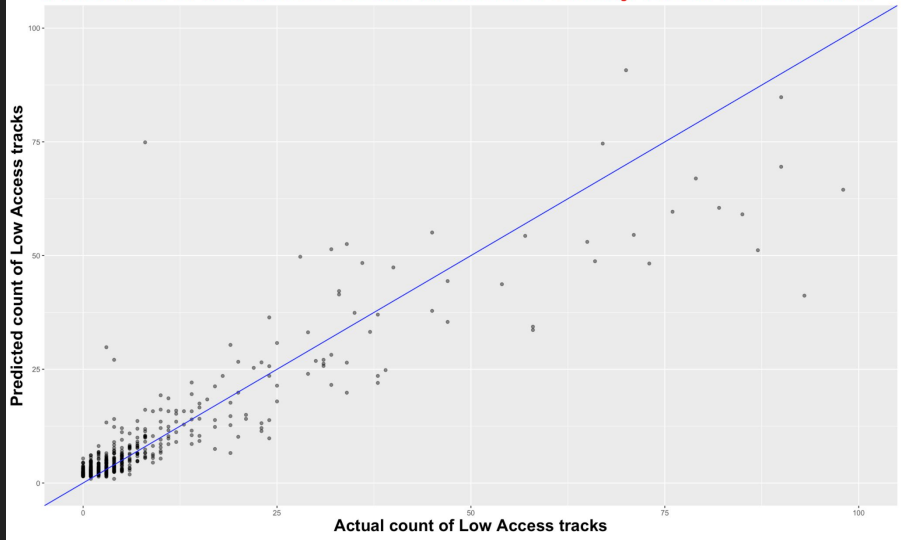

Rhode Island shows the highest percentage in White, Hispanic, Black, Asian and Other with over 75 % of the population being in low access and living over 10 miles away from a supermarket.



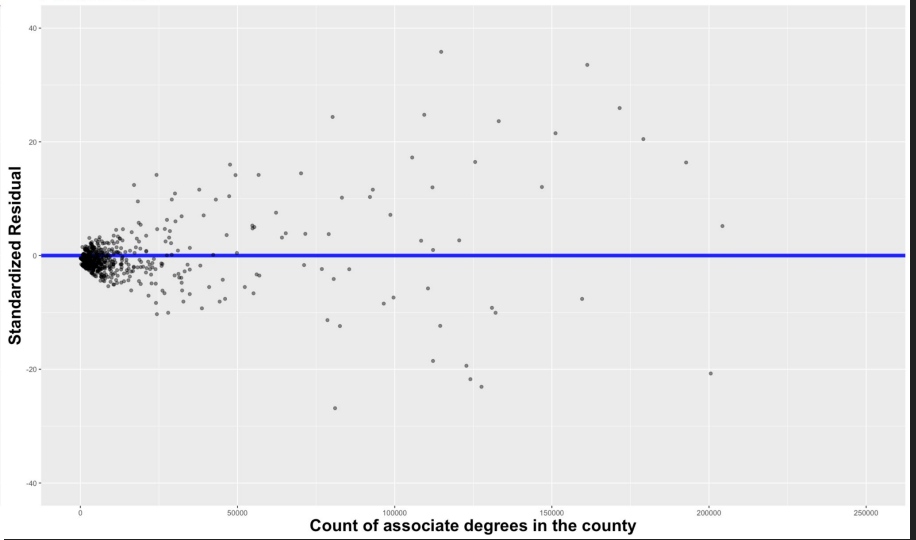

Overall throughout the state, American Indians are the ethnic group with a majority that has low access to food, therefore we should focus on helping this ethnic group by creating a supermarket near them.

# The Correlation Between Education and Low Access

***Prediction of low access tracks inside of a County based on education***




***Residuals***




```
Coefficients:
                                          Estimate Std. Error t value Pr(>|t|)
(Intercept)                              1.416e+00  2.153e-01   6.577 6.22e-11 ***
`Less than a high school diploma, 2015-19`  -4.295e-04  2.252e-05 -19.067  < 2e-16 ***
`High school diploma only, 2015-19`          4.248e-05  2.175e-05   1.953 0.050964 .
`Some college or associate's degree, 2015-19`  5.360e-04  1.941e-05  27.621  < 2e-16 ***
`Bachelor's degree or higher, 2015-19`      -2.937e-05  7.639e-06  -3.844 0.000125 ***
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Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 8.307 on 1880 degrees of freedom
Multiple R-squared:  0.7903,    Adjusted R-squared:  0.7899
F-statistic:  1772 on 4 and 1880 DF,  p-value: < 2.2e-16
```
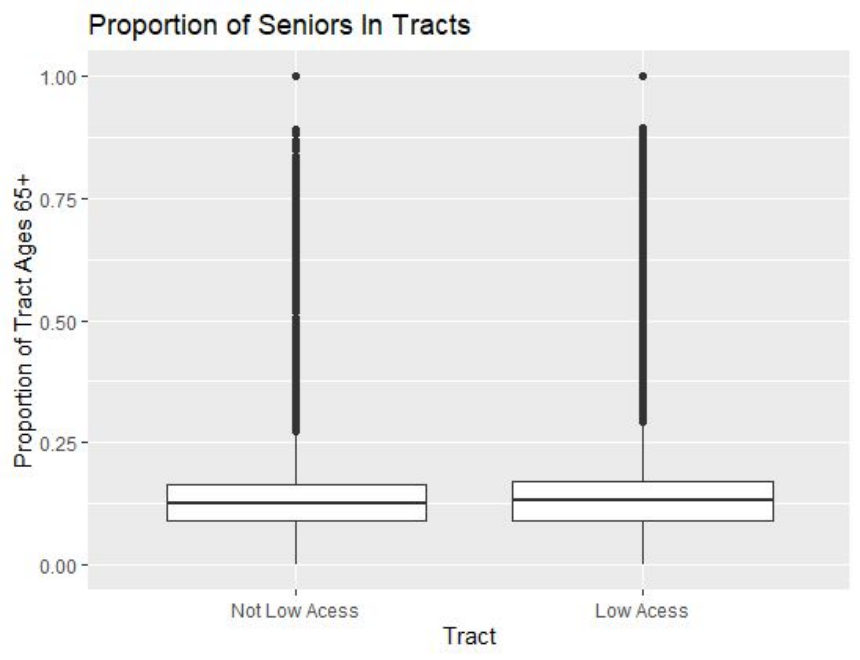
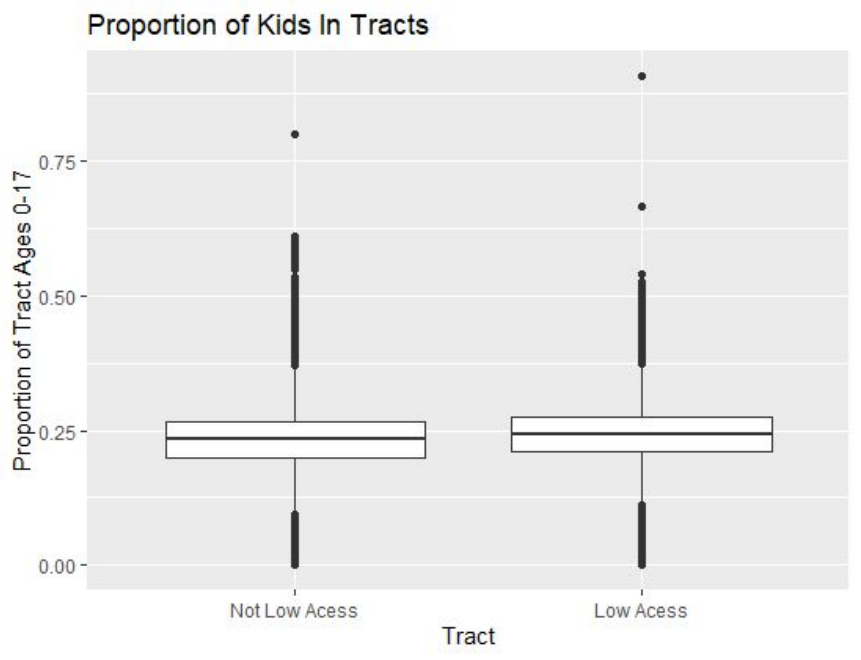

Conclusion: Counties with a high population that either have no degree or only have an associate degree are at the mostly likely to be part of a food desert. Therefore, we should invest in educational services that help support people in their pursuit to get their high school degree and that help overall college success rate so more people can achieve a bachelor's degree.

# Age




The distribution of ages between tracts classified as low access (at 1 mile for urban areas and 10 miles for rural areas) and tracts without that classification is statistically significant, but the actual percent difference is not a lot. We are 95% confident that the true difference in proportion of seniors between low access tracts and non low access tracts is between 0.657% and 0.886%. For the proportion of kids, at the same confidence level, the true difference in proportion is between 0.984% and 1.176%. Given that, we do not recommend policies solely targeting age groups as a way to increase food access.

# Recommendations

- Large food companies could create a service to send specific food orders to communities with low food access and without transportation
- Provide incentives to encourage people to complete their GED
- Provide food literacy family education and resources to all members of food desert communities to help make healthier food purchasing choices in a retail setting
- Build supermarkets that service American Indians communities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