**Northern California Food Desert Analysis**

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Summary:

Food deserts are regions where people have limited access to healthful and affordable food. This may be due to having a low income or having to travel farther to find healthful food options. The Food Access Research Atlas, which we used for our analysis, ‘maps food access indicators for census tracts using ½-mile and 1-mile demarcations to the nearest supermarket for urban areas, 10-mile and 20-mile demarcations to the nearest supermarket for rural areas, and vehicle availability for all tracts.’[[1]](#footnote-1) In this report, we examine the socioeconomic and demographic characteristics of these tracts to see how they differ from county to county in Northern California.

In our analysis, high food desert scores in Northern California tend to come from counties with smaller populations, are more rural, from counties with population loss, and lower incomes.

Census tracts with higher poverty rates are more likely to be food deserts but, in our analysis, otherwise similar low-income census counties in rural areas had higher low access scores than counties with very dense and highly populated urban areas. Further, counties with smaller populations and/or with population loss, saw on average, higher decreases of access to healthy food options.

Overall, of the 25 counties on which we focused, there were only 5 counties that saw a significant decrease in access, most of them rural.

[Map of Deserts](https://github.com/PsCushman/project-1/blob/psc/Outputs_psc/map_of_deserts.png)

Limitations:

First, the figures we used provided data at the county level, so this does not preclude areas with otherwise “good” food desert scores from having multiple areas or tracts where food deserts are present. Also, we focused our analysis Northern California. Consequently, while there may be moderate or even high correlations between, for example low access scores and low-income population, p-values tended to be high as well. For that reason, the scope may be a little too focused to draw any concrete conclusions without further analysis.

Evidence:

*Access, Groceries, and Ronald*

The presence of grocery store and superstore access are two of the most important indicators of low access to healthy food options. We also saw, that as grocery store decreased, so did specialty stores such as butcher shops, vegetables stands, or bakeries. So, when grocery stores decrease, it tends to come along with decreases in other healthy options. [(see fig….)](https://github.com/PsCushman/project-1/blob/psc/Outputs_psc/Change%20in%20Grocery%20vs.%20Change%20in%20Specailty%20Stores.png)

For California overall, there was a strong correlation between increases in grocery, full-service restaurants and increases in fast food. At the same time, fast food options stayed more constant in Northern CA even as other options, grocery stores for example, decreased, leaving counties with low access scores, higher access to fast food in comparison to other healthy option. ([see fig\_1…)](https://github.com/PsCushman/project-1/blob/psc/Outputs_psc/Change%20in%20Grocery%20vs.%20Change%20in%20Fast%20Food%20Restaurants.png), ([see fig\_2…)](https://github.com/PsCushman/project-1/blob/psc/Outputs_psc/Change%20in%20Low%20Access%20vs.%20Change%20In%20Fast%20Food.png)

*Demographics*

Expectedly, low-income populations were not mostly likely to correspond with low access. (Pie charts from Mina.)

In addition, while rural communities saw the greatest increases in low access, there was also evidence that as the percent of minority community increased, low access increased as well.

Overall, we found a moderate negative correlation between the percentage of White residents and low access scores. While communities with a larger percentage of Black, Asian, and Hispanic communities saw lower access to healthy food options in 2015 and their respective populations increased. (Drea figs)

That said, the median percentage of access by race was highest in White communities and Latino populations, implying that while low access my increase as communities include more minorities, Whites and Latinos see the least amount of access that other groups on average in Northern California. [(see fig…)](https://github.com/PsCushman/project-1/blob/psc/Outputs_psc/Median%20Percentage%20Low%20Access%20by%20Race.png)

Communities with a larger share of seniors had a negative correlation with low access, which is a positive sign. However, communities with a higher concentration of children (under 18) had a moderate positive correlation to low access with an even more pronounced relationship in low-income areas, which is scary. (drea figs)

Where were found a very strong correlation is when we looked at change in access and change in low-income population. As the percentage of low access population increased, so did the population of low-income communities with low access. While this may seem obvious, it is important to point out that the changes are strongest in in places where money is in shorter supply. It is noteworthy that access to healthy food is poorest in areas with the highest income security, which underscores the need for policy interventions aimed at improving access to healthy food for all. [(see fig…)](https://github.com/PsCushman/project-1/blob/psc/Outputs_psc/Change%20in%20Low%20Access%20vs.%20Low%20Income%20Change%20in%20Access.png)

*Health*

Interestingly, we did not see much of a correlation between health indicators such as obesity and diabetes and low access. The regions in Northern California compare favorably to access able data for the US, where low access is linked to increases in those indicators.[[2]](#footnote-2)

While there was some moderate correlation between household income and diabetes, our analysis did not find a strong or even moderate correlation between access to healthy food and other health indicators in Northern California.

*Rural v. Metro*

We found a moderate correlation between counties with population loss and an increase in low access scores. In addition, a moderate correlation between the population totals and change in low access. This suggests, that while there are still plenty of communities facing low access to healthy foods in metro areas, rural areas have tended to see the greatest negative impacts of changes over the past decades. [(see fig\_1…),](https://github.com/PsCushman/project-1/blob/psc/Outputs_psc/Change%20in%20Low%20Access%20Northen%20CA%20vs.%20Population.png) [(see fig\_2)](https://github.com/PsCushman/project-1/blob/psc/Outputs_psc/Change%20in%20Low%20Access%20Northen%20CA%20vs.%20Population%20Change.png)

We found that over the 5 years from 2010 to 2015, the region did better and had a lower population that lived in areas with low access. The Sacramento region showed almost no change, but the other two regions, particularly the bay area, had a smaller population with low access. Mina’s Pie charts.

In rural counties, grocery stores tended to be clustered around populated areas and resulted in long drives for people living off less populated roads. In Calaveras, where we saw the greatest increase in low access, you can see this illustrated in the two maps below.

[Map 1](https://github.com/PsCushman/project-1/blob/psc/Outputs_psc/Calaveras_desert.png)

[Map 2](https://github.com/PsCushman/project-1/blob/psc/Outputs_psc/calaveras_desert_w_border.png)

You can clearly see large chunks of Calaveras County where there are roads, even relatively well traveled roads, and no grocery stores.

Conclusion:

In conclusion, while the Northern California regions explored in our analysis has seen gains in access to healthy option, most of the gains have been see in more metropolitan areas. San Francisco County for example has seen a monster increase in access, so much so that in much of our analysis we had to remove it as an outlier. Alameda County, which has a large minority population, saw gains in access as well. In counties with increasing populations and higher incomes, we see that Northern California is doing quite well on a county level increasing the access to healthy food options.

Where we see the most worrying data is in low-income rural populations. Here there has been frightening decreases in access to healthy options. Even more disturbing is that children under 18 are affected disproportionally.

While it is not surprising, it is important to stress that in almost all the data, low-income populations of the same cohorts, whether by race, age or geography, tended to see lower access to healthy food options than those with higher incomes. While the limitations of this data have been addressed earlier in this summary, Northern California’s policy makers should do more to increase access to healthy food options for the populations where economic insecurity (and consequently food insecurity) are at there highest.

1. https://www.ers.usda.gov/data-products/food-access-research-atlas/about-the-atlas/ [↑](#footnote-ref-1)
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4218969/ [↑](#footnote-ref-2)