PROJECT MOVAT

BACKGROUND

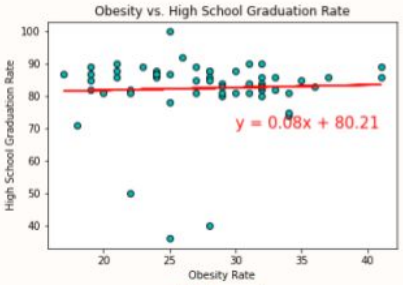
The obesity epidemic in the United States is an open secret; and an ongoing issue throughout the country. The issue has become increasingly worse over the years resulting in American food companies exporting the health crisis to development nations such as countries in Asia. With the advent of government-subsidized health insurance and the costs associated with commodities exacerbated by the condition, obesity can no longer be simply dismissed as merely a personal problem; it is now imperative to treat it as a public-health issue. Based on a series of discussions about the existing data sources, the project focused on six variables as predictors for obesity rates at the county level:

1. Median household income
2. Percent of adults with access to exercise opportunities
3. Percent of adults who are physically inactive
4. High school graduation rate
5. Primary care physician rate
6. Unemployment rate

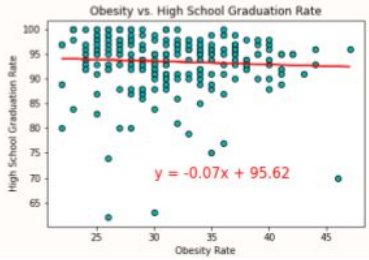
SCOPE AND LIMITATIONS

In using the above variables to model obesity data in the United States, the Movat team made the following assumptions: a) the predictors of interest had direct and consistent relationships with the criterion variable; b) the predictors of interest varied sufficiently enough to make their relationships with the criterion meaningful; c) county-level data would be a valid proxy for individual data that wasn't available; d) the variables above would be valid representations of the phenomena that they were being used as proxies for (e,g. BMI classification for obesity rates, high school graduation rate for education, etc.); e.) relationships with respect to statistical variability point to, if not necessarily prove, valid causal relationships. Should any of these assumptions be proven false, it would severely limit the validity of this analysis.

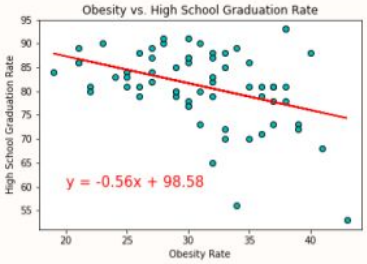
Obesity Rate vs. % High School Graduation



California



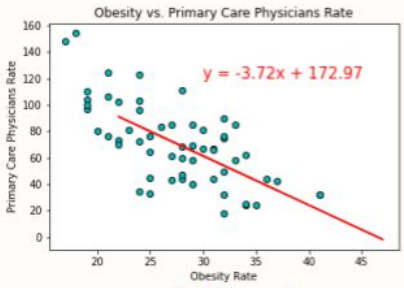
Texas



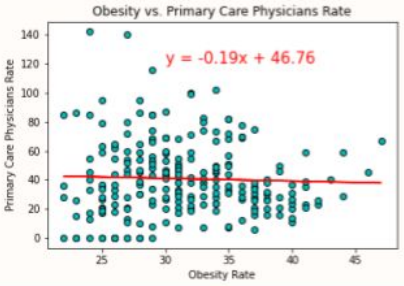
Florida

We explored the relationship between obesity rate and percentage of high school graduation and saw that there was weak to almost no correlation. This tells us that maybe having a high school diploma may not really influence your choices in terms of diet and exercise and that it may not be a good predictor.

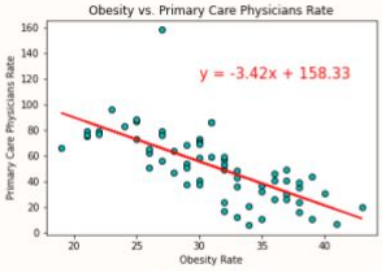
Obesity Rate vs. % Access to Primary Care Physicians



California

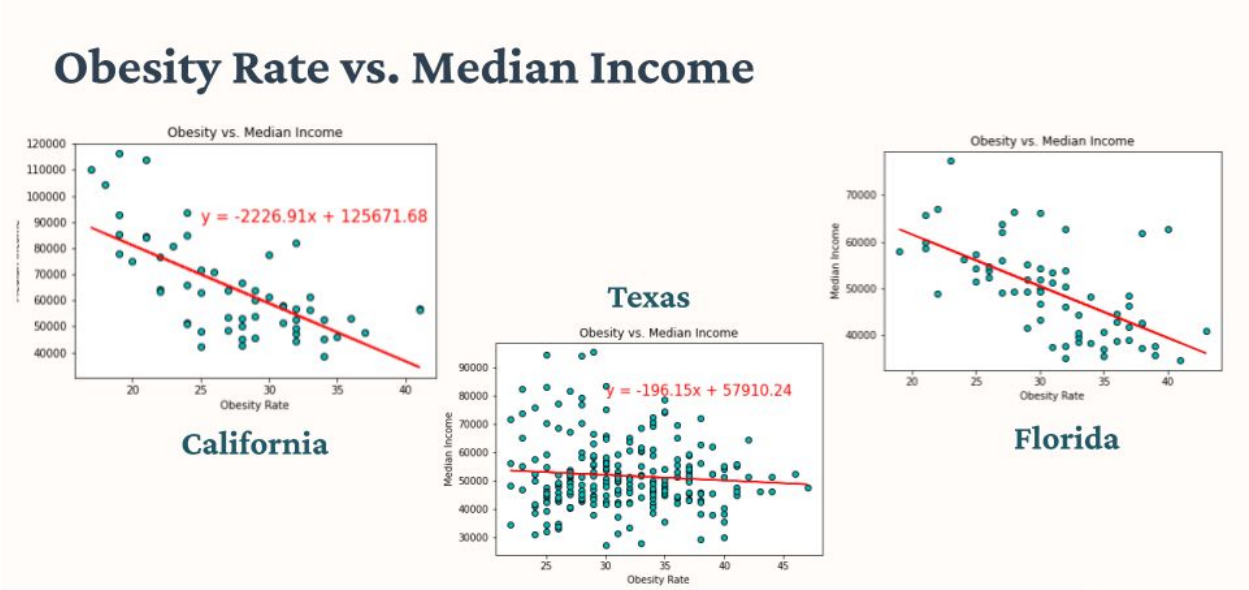


Texas

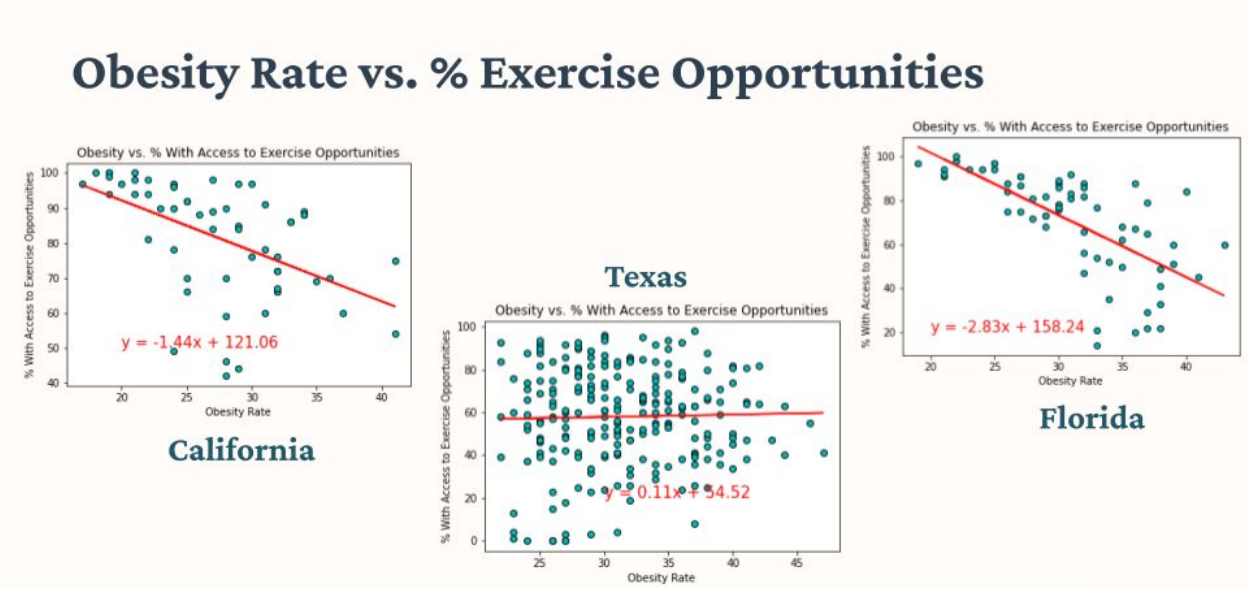


Florida

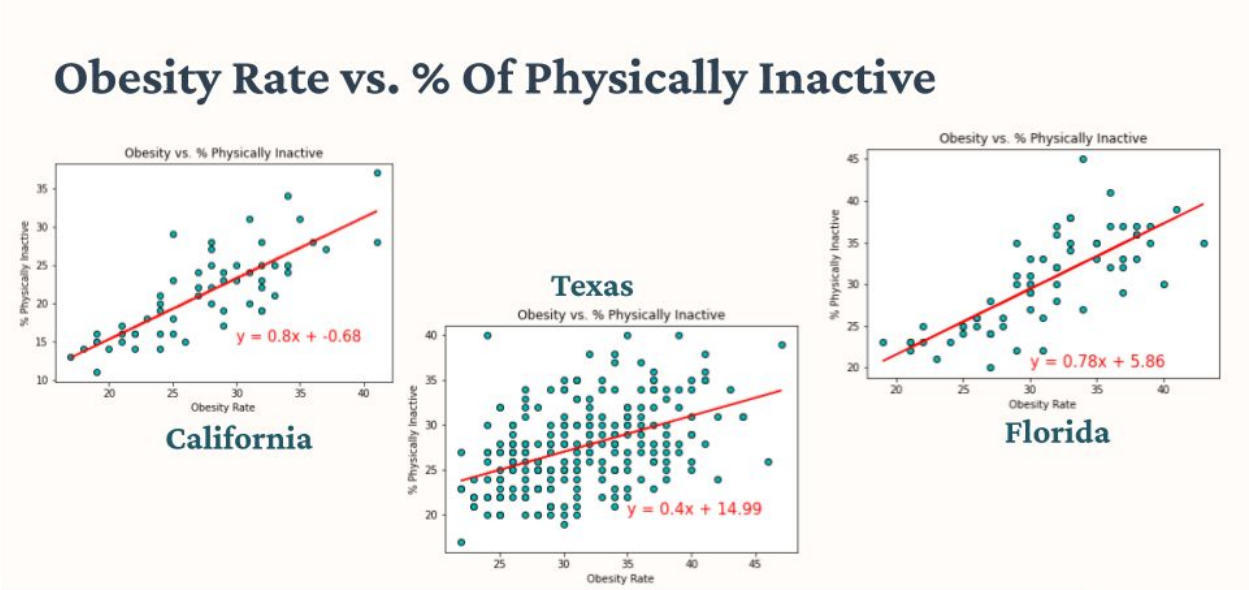
There is a negative moderate to strong correlation between having access to primary care physicians to obesity rate with Texas having almost none. This shows us that having access to primary care matters in most states and that having a doctor keep you on track can influence obesity rates as long as the individual is willing to listen.



There is a strong correlation between median income and obesity rate, with Texas being a state that has almost no correlation. This tells us that while median income matters a lot, it's not true in all states.

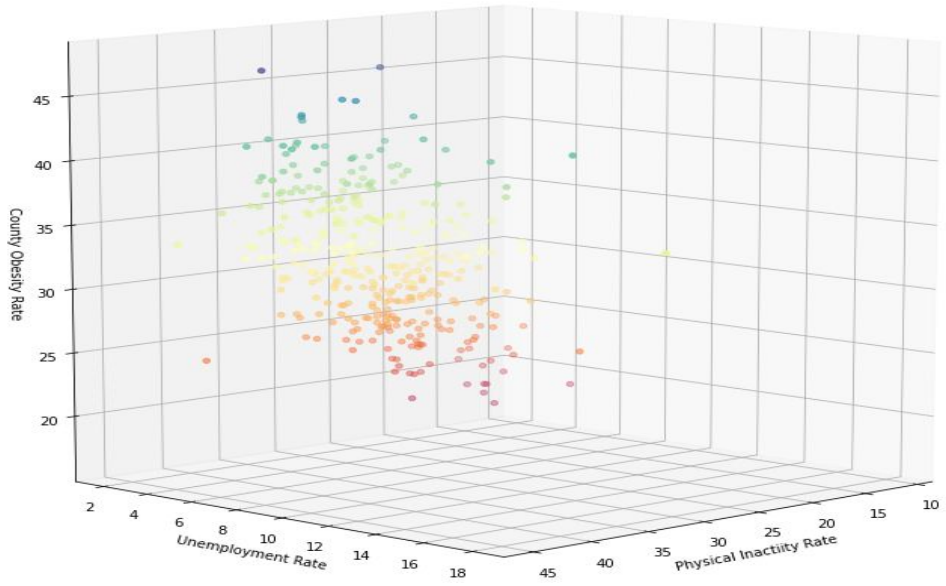


There is a moderate correlation between exercise opportunities and obesity rate with the exception to Texas. This shows us that for the most part having access to exercise has an influence on obesity rates.

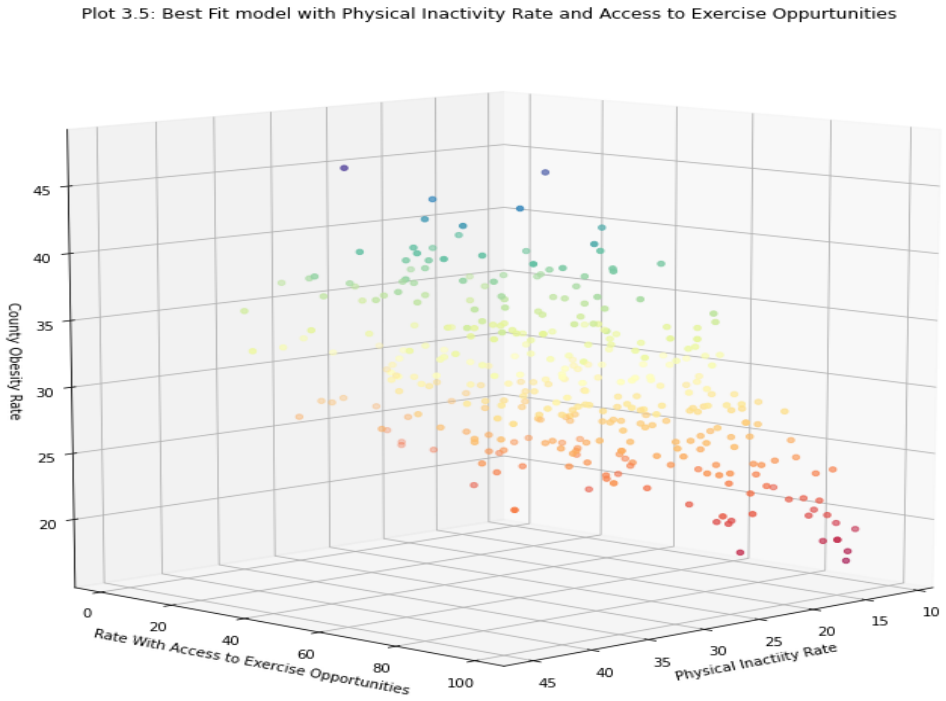


The correlation between obesity and physically inactive shows a strong correlation in all 3 states as expected. This tells us that being physically active does have a strong influence on obesity rates.

Plot 2.3: Best Fit model withPhysical Inactivity Rate and Unemployment Rate for Selected states

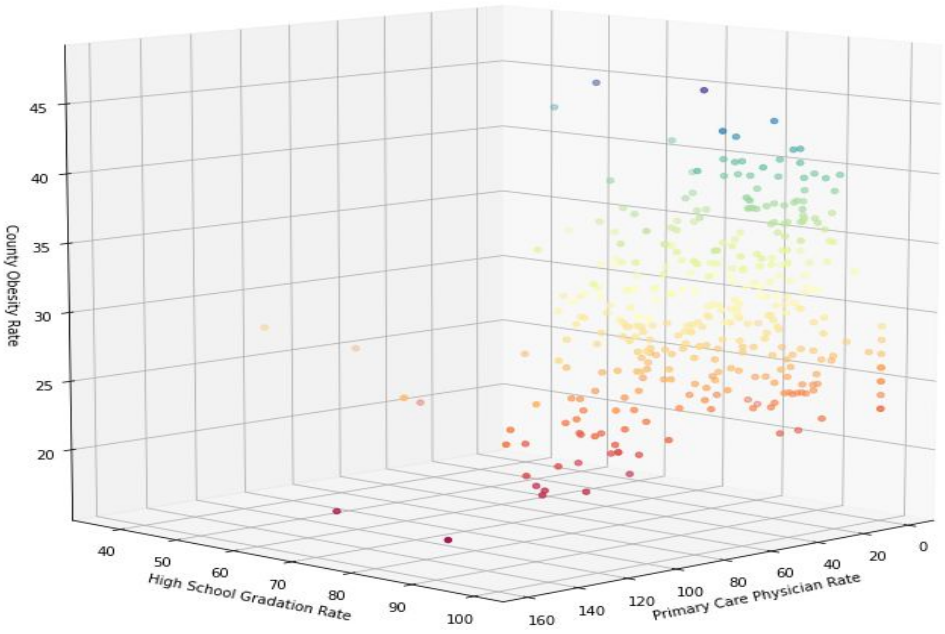


Plot 2.3: When one predictor has low variability in a multi-variate model, the other predictor have more explanatory power on the criterion.

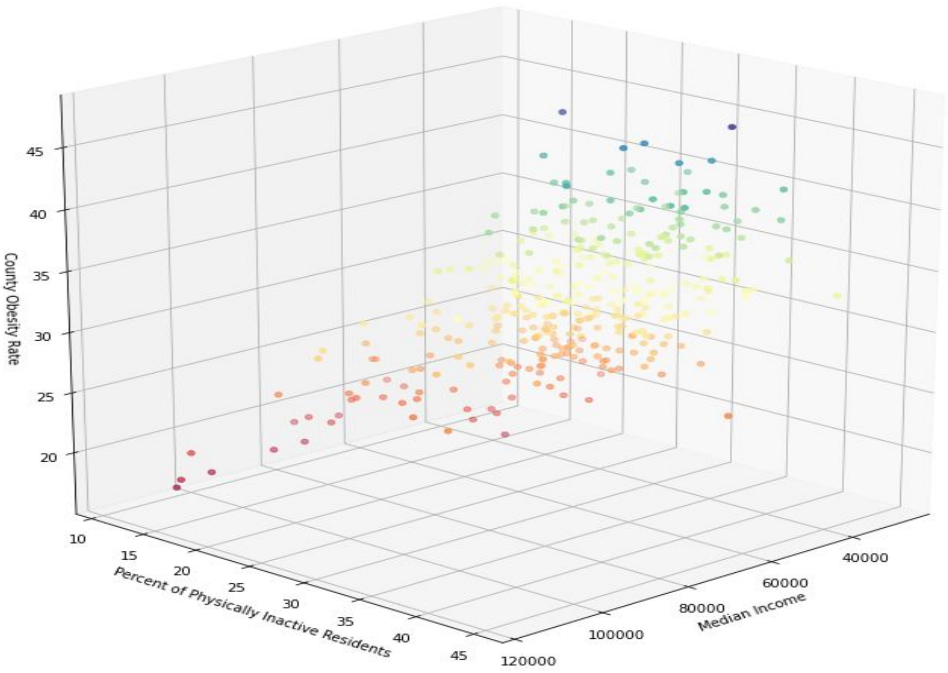


Plot 3.5: The Interaction between Physical inactivity and access to exercise opportunities suggests that exercise opportunities are less influential on obesity rates when people are less likely to use them.

Plot 3.2: Best Fit model with High School Graduation Rate and Primary Care Physician Access for Selected states



Plot 3.1: Best Fit model with Median Income and Primary Care Physician Access for Selected states



Plot 3.2: Both Physician access and high school graduation rates have good predictive relationships when the influence of other predictors are controlled for.

Interestingly, high school graduation rates re more influential predictors when primary care access rates are low.

Plot 3.1: Median Income in a county has a good predictive relationship with obesity rates.; but the predictive relationship between physical inactivity and obesity rates is less important in higher income counties

General Findings

From our data, we found that 33% of adults were considered to be obese in 2016. We also saw that 27% of adults reported no leisure time physical activity. Additionally, when we sorted the 100 counties with the highest obesity rates, we saw that 15% of those counties were located in Mississippi, making it the state with the highest levels of beauty rate.

Conclusions

Obesity is not necessarily a personal failure. While the best predictors for obesity are wellness indicators like Physical Inactivity; social indicators appear to have significant influence on the outcome as well even when we control for wellness indicators. Physical inactivity matters; but substantially less in counties with high median incomes. Exercise opportunities and being physically inactive have some the highest correlation, so increasing exercise opportunity can be one solution in the fight against obesity; but only if combined with campaigns to encourage less inactivity.

The layman's understanding of the obesity epidemic is an oversimplified abstraction. Obesity cannot be simply associated with one factor or another, whether social or health related. It may turn out that solutions to the obesity epidemic require a nuanced understanding of the interactions that occur between multiple contributory variables. While access to exercise opportunities was found to have consistently robust predictive relationships with obesity rates(around a .5 percent decrease in obesity for every additional percentage with access to exercise opportunities once other predictors are controlled for.), this relationship is also mediated by the inactivity rates of adults in a county. Similar interactions were plotted for various combinations of predictors.

RECOMMENDATIONS

A government committed to fighting the obesity epidemic may ask how to best combat this public health crisis. The truth is that Project Movat cannot answer this question definitively. The best that can be said is that this project has laid out a map for which variables have strong correlations with obesity rates; and that more dedicated

researchers might examine whether these correlations translate to causal relationships. Without proper research on causality, Project Movat will sadly not be helpful in informing public policy. For everything that has been said, any effort to parse conclusions out of regressions that display substantial interaction effects should approach these findings. with appropriate caution. The same must be said of any effort to use an analysis of county-level data to prescribe interventions for individuals.