Is Adult Obesity rate affected by Median Income?

Introduction

Our project examines the effect of obesity rate state wise in the United States in relation with the median income, minimum wage, race, education rate in the years following 2012 up to 2021.

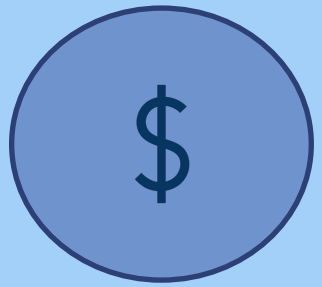
Why should we adapt data driven approach?

- **Obesity is a clear global health priority, 1 in 3 adults struggle with obesity in the US**
- **Understanding the many factors that underpin obesity is of vital importance**
- **Using a data-driven approach will give us a comprehensive understanding on the different factors that influence obesity**
- **It tells us the amount of influence each factor has and how they vary in different populations like countries and states over the years**

Ideal Experiment

For the ideal experiment, we shall consider a sample of people belonging to the same age group, same state, same income, education qualifications, possessing similar genetic characteristics and eating habits

Group A

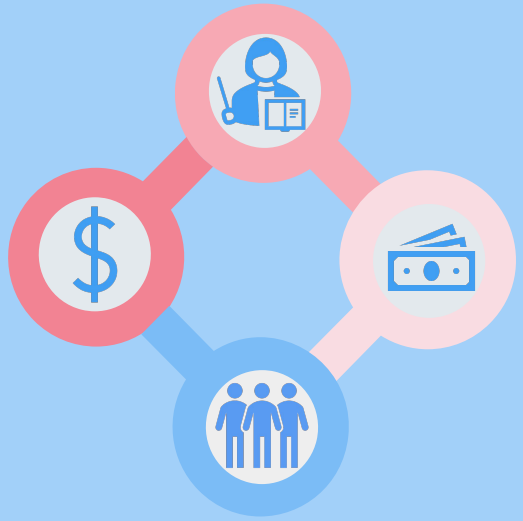


Group B

Independent Variables

Education Rate

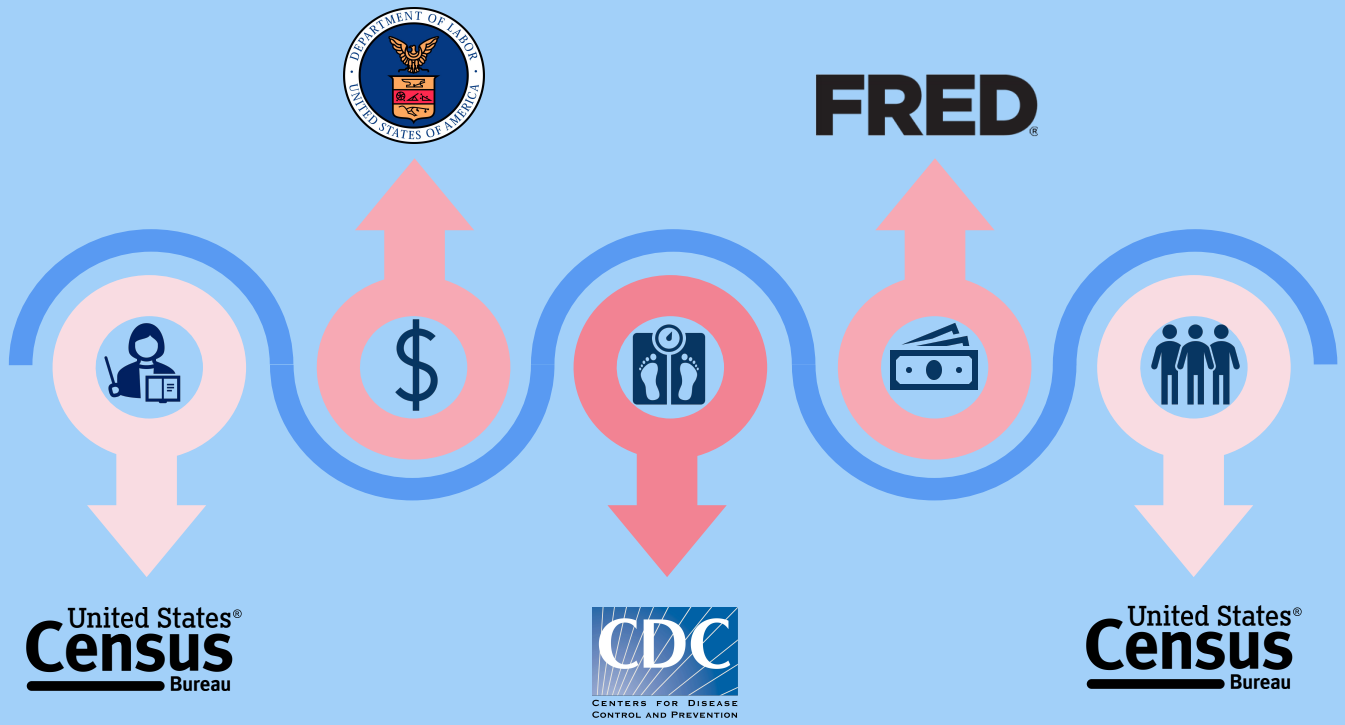
Minimum Wage



Median Income

Race

Data Sources



Process

Research

1 CDC Papers on Obesity

Data Collection

2 Web scraping, APIs, Manual

Data Structuring

3 Python, Tableau, Excel

Hypothesis

4 Does median income affect obesity

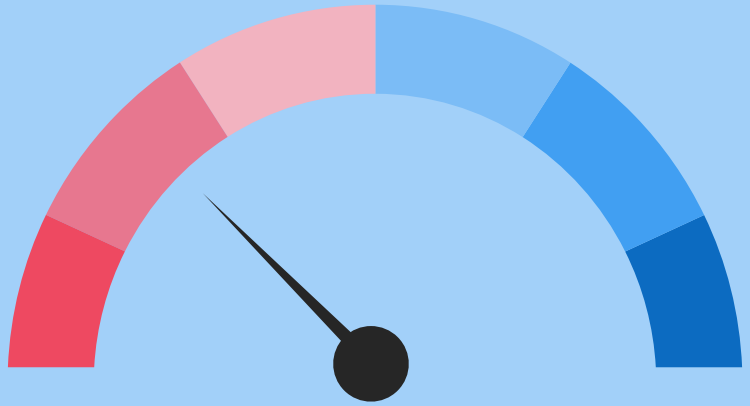
Experimentation

5 Linear Regression

Report

6 Median Income and Obesity are negatively correlated

Hypothesis



Null Hypothesis

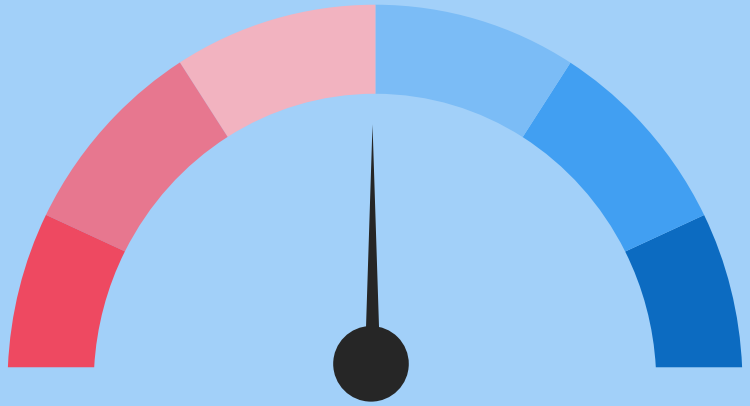
Socio-economic factors do not affect Obesity Rate

Alternate Hypothesis

Socio-economic factors affect Obesity Rate

Education Rate

Alpha: 0.05
P- value: <0.001
Yes, it is statistically significant



Null Hypothesis

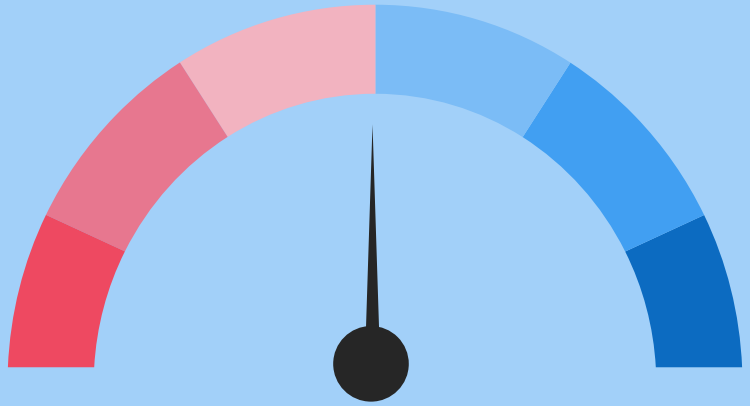
Education rate does not affect Obesity Rate

Alternate Hypothesis

Education rate does affect Obesity Rate

Minimum Wage

Alpha: 0.05
P- value: <0.001
Yes, it is statistically significant



Null Hypothesis

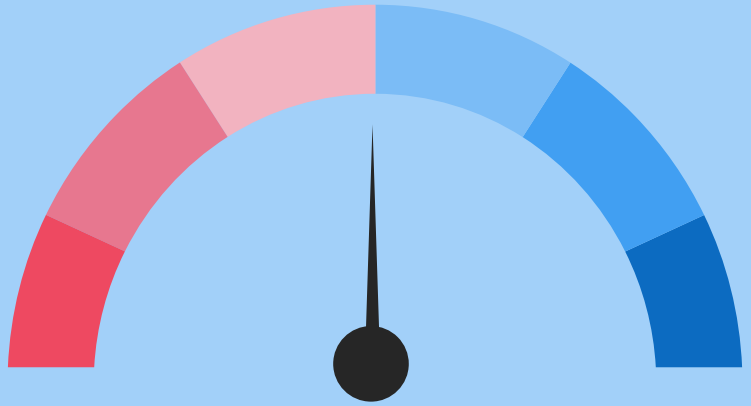
Minimum Wage does not affect Obesity Rate

Alternate Hypothesis

Minimum Wage does affect Obesity Rate

Race: African American

Alpha: 0.05
P- value: <0.001
Yes, it is statistically significant



Null Hypothesis

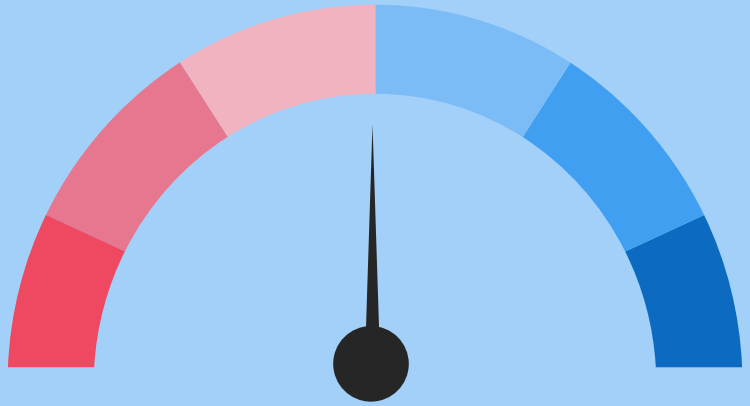
African American population percentage in a state does not affect Obesity Rate

Alternate Hypothesis

African American population percentage in a state does affect Obesity Rate

Race: White

Alpha: 0.05
P- value: <0.001
Yes, it is statistically significant



Null Hypothesis

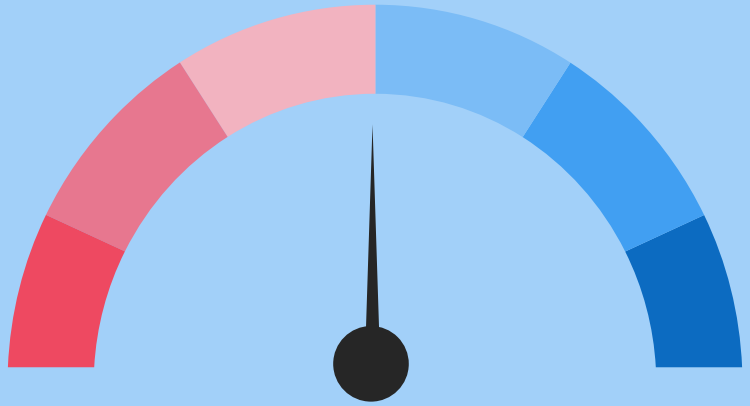
White population percentage in a state does not affect Obesity Rate

Alternate Hypothesis

White population percentage in a state does affect Obesity Rate

Median Income

Alpha: 0.05
P- value: <0.001
Yes, it is statistically significant



Null Hypothesis

Median Income does not affect Obesity Rate

Alternate Hypothesis

Median Income does affect Obesity Rate

Regression table

OLS Regression Results

Dep. Variable:	rate	R-squared:	0.617
Model:	OLS	Adj. R-squared:	0.612
Method:	Least Squares	F-statistic:	121.0
Date:	Sat, 03 Dec 2022	Prob (F-statistic):	1.07e-90
Time:	18:15:50	Log-Likelihood:	-1058.6
No. Observations:	458	AIC:	2131.
Df Residuals:	451	BIC:	2160.
Df Model:	6		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	-1592.9313	95.067	-16.756	0.000	-1779.760	-1406.103
year	0.8095	0.047	17.109	0.000	0.717	0.903
White	0.0750	0.012	6.491	0.000	0.052	0.098
Black or African American	0.1311	0.015	8.847	0.000	0.102	0.160
median_income	-0.1017	0.014	-7.162	0.000	-0.130	-0.074
% educated	-0.1124	0.020	-5.503	0.000	-0.153	-0.072
modified_wage	-0.7261	0.098	-7.387	0.000	-0.919	-0.533

Omnibus:	8.406	Durbin-Watson:	1.366
Prob(Omnibus):	0.015	Jarque-Bera (JB):	8.461
Skew:	-0.332	Prob(JB):	0.0145
Kurtosis:	3.049	Cond. No.	1.67e+06

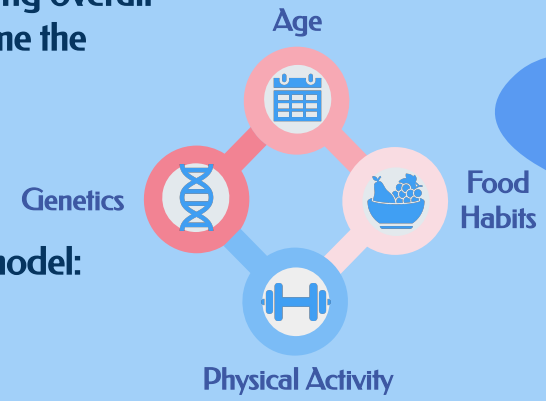
Notes:
[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.
[2] The condition number is large, 1.67e+06. This might indicate that there are strong multicollinearity or other numerical problems.

Conclusions and Limitations

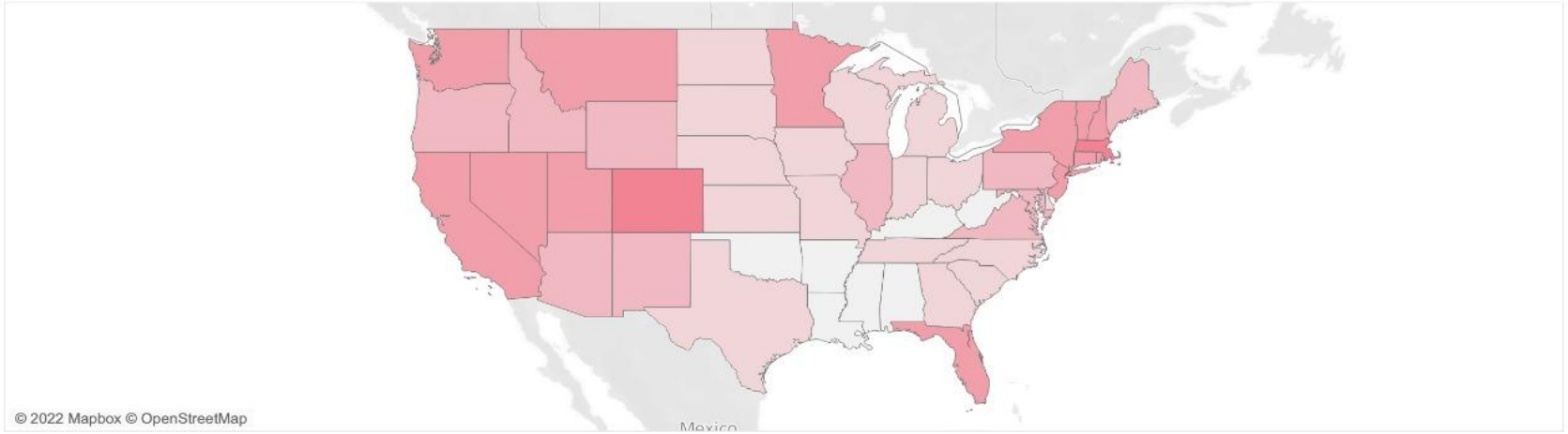
Over the years we observe that the obesity rate is increasing overall in the US, however among states with lower median income the obesity rate is higher

Limitations:

There are some factors that we did not consider for our model:
a. Number of fast-food joints in a particular state
b. Lack of physical activity
c. Access to gyms and parks
d. Access to healthy food within 1 mile of the households



Obesity Rate



Avg. Rate 22.03 36.80 Avg. Media.. 45,528 88,759

Median Income