DATA

US_

CENSUS

POPULATION GROWTH

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An Analysis of Population data from The US Census

A look at population growth and shifts and its effect on health insurance, poverty, unemployment, and earnings in the United States.

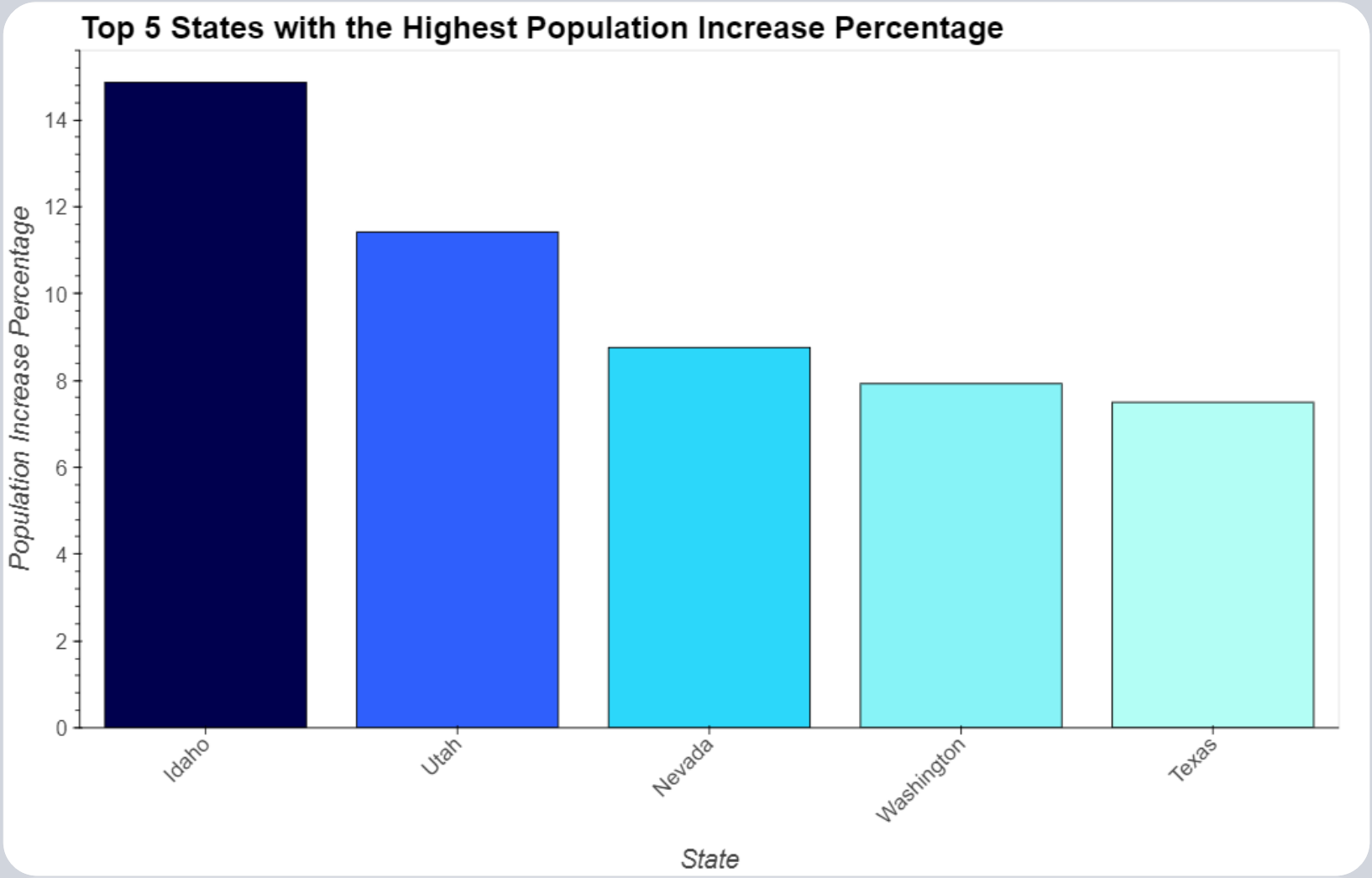
api.census.gov

Highest Population Increases **And Decreases.**

States with the highest population percentage increase & total population growth.

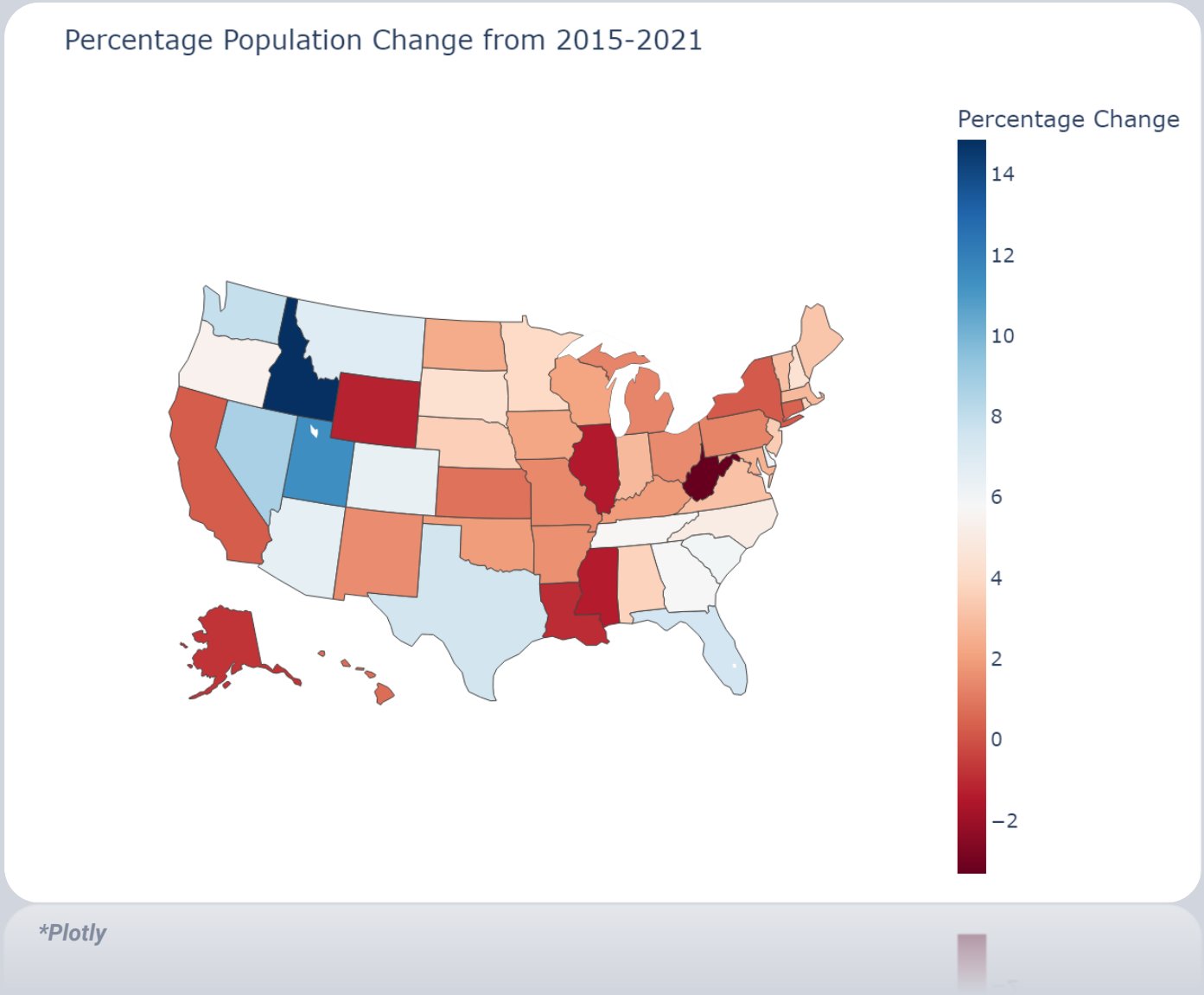
*Numbers based on estimates from US Census

*HvPlot



Top 5 States with Highest Percentage Population Increase 2015-2021

1. Idaho – **14.9%**
2. Utah – **11.4%**
3. Nevada – **8.8%**
4. Washington – **7.9%**
5. Texas – **7.5%**



All States Color Coded by Percentage Population Increase 2015-2021

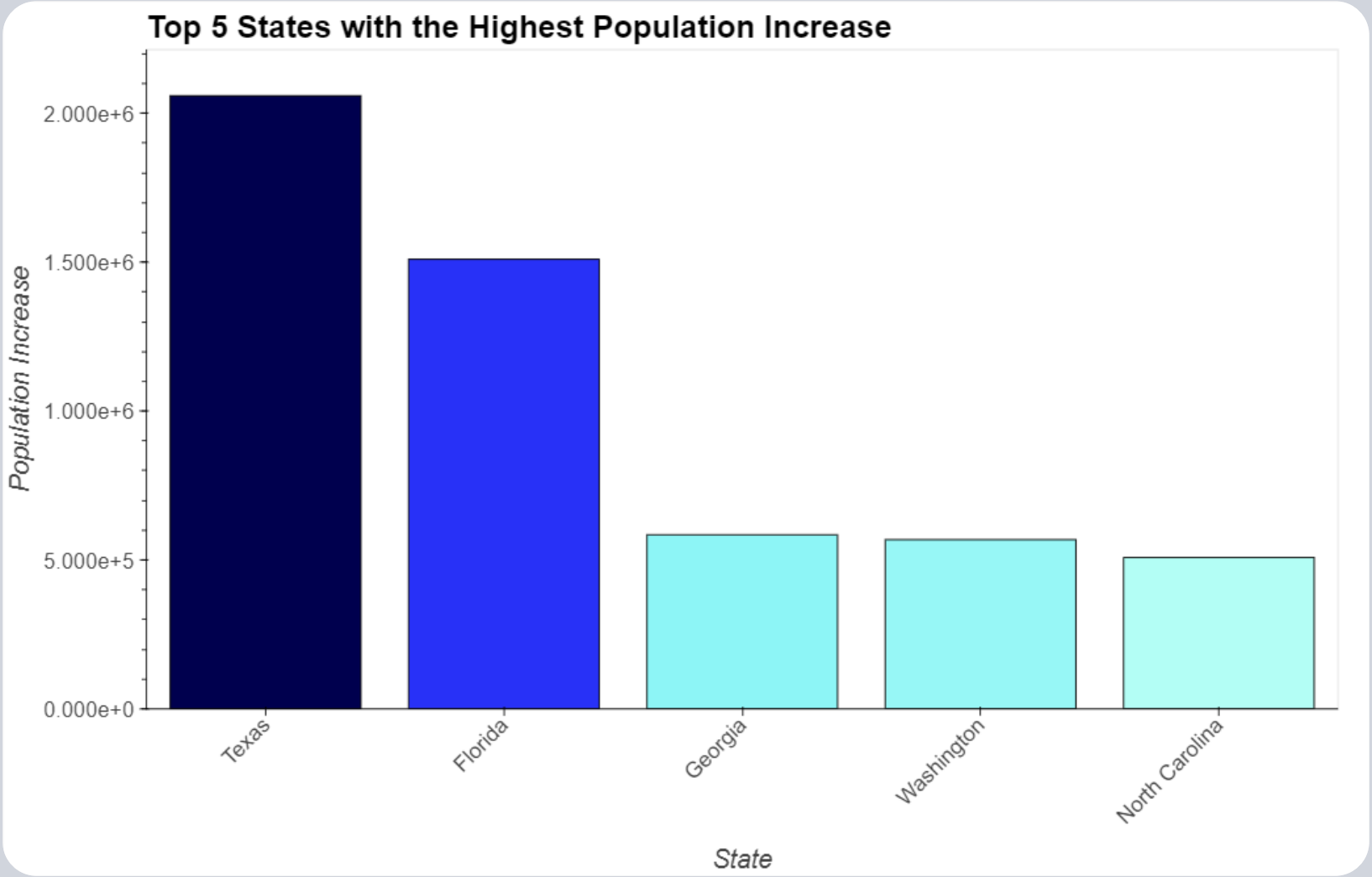
5 States with lowest growth:

1. West Virginia – **-3.32%**
2. Illinois – **-1.47%**
3. Mississippi – **-1.42%**
4. Wyoming – **-1.25%**
5. Louisiana – **-1%**

Top 5 States with Highest Total Population Increase 2015-2021

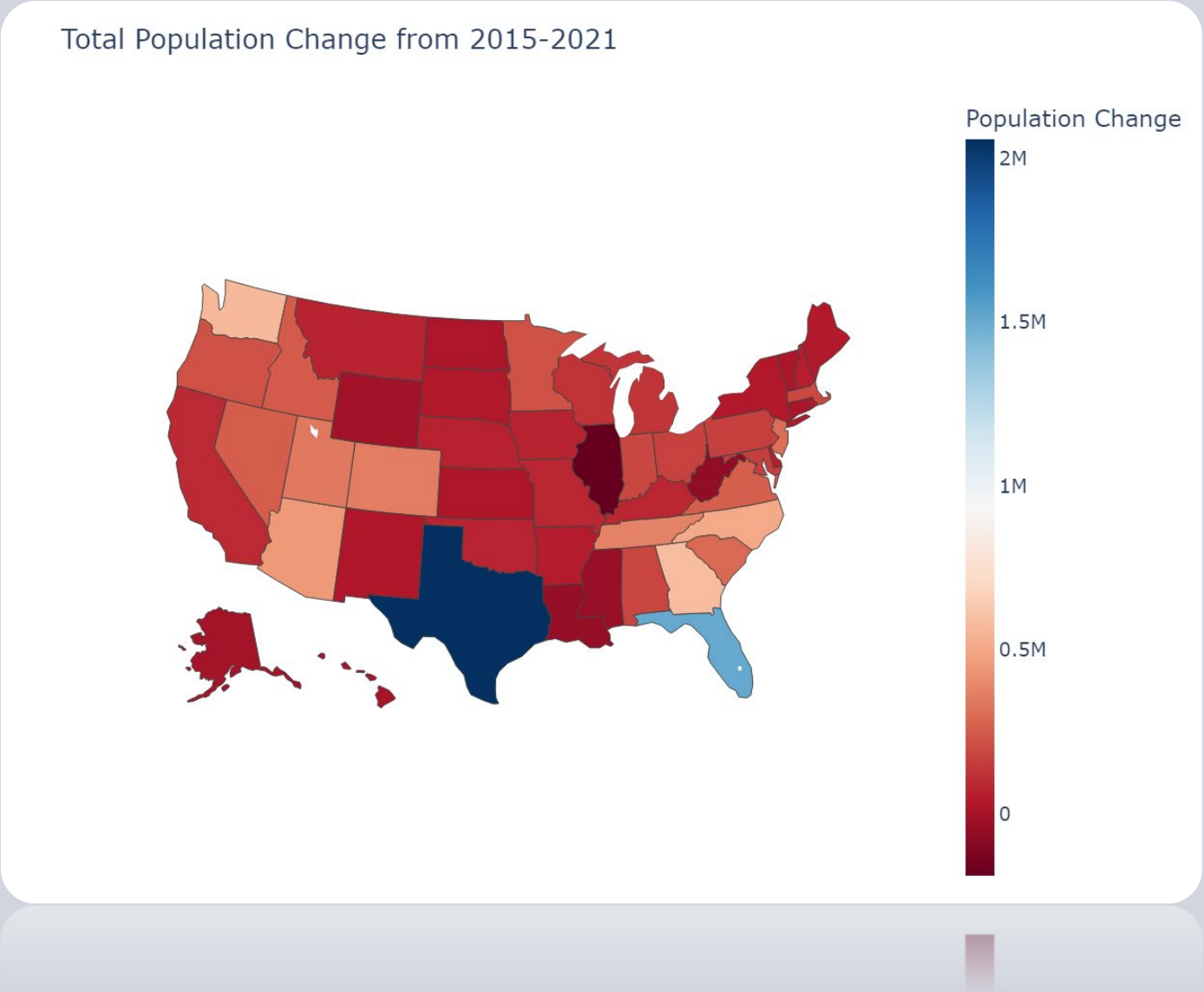
1. Texas – **2,058,827**
2. Florida – **1,509,856**
3. Georgia – **584,706**
4. Washington – **568,341**
5. North Carolina – **508,360**

*HvPlot



All States Color Coded by Total Population Increase

*Plotly



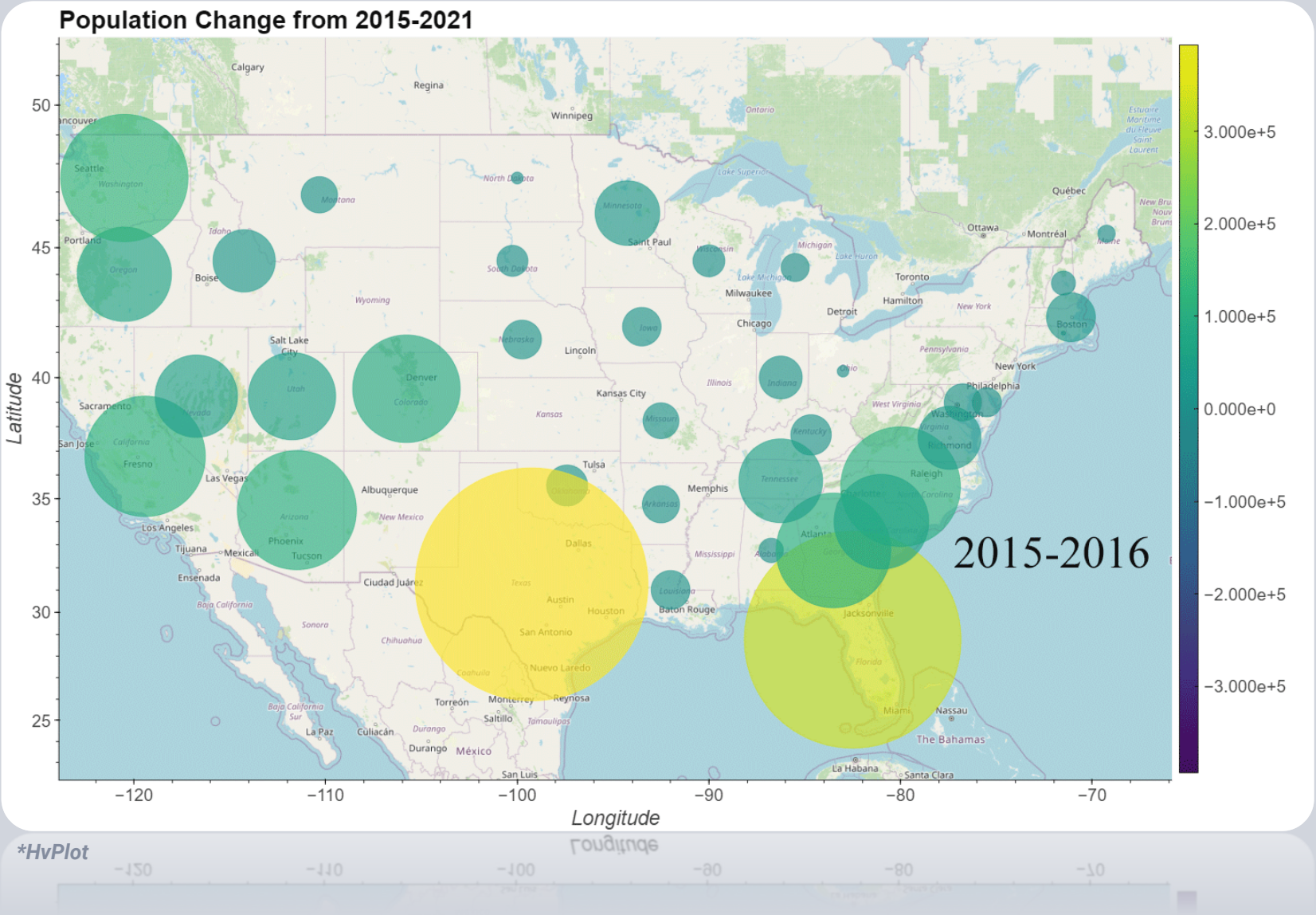
5 States with lowest growth:

1. Illinois– **-188,526**
2. West Virginia – **-61,169**
3. Louisiana – **-46,677**
4. Mississippi – **-42,368**
5. Wyoming – **-7,304**

Population Shifts by State **2015-2021.**

How Population growth changed in the Unites States from 2015-2021.

*Numbers based on estimates from US Census



*HvPlot

Total Population increases by State from year-to-year from 2015-2021

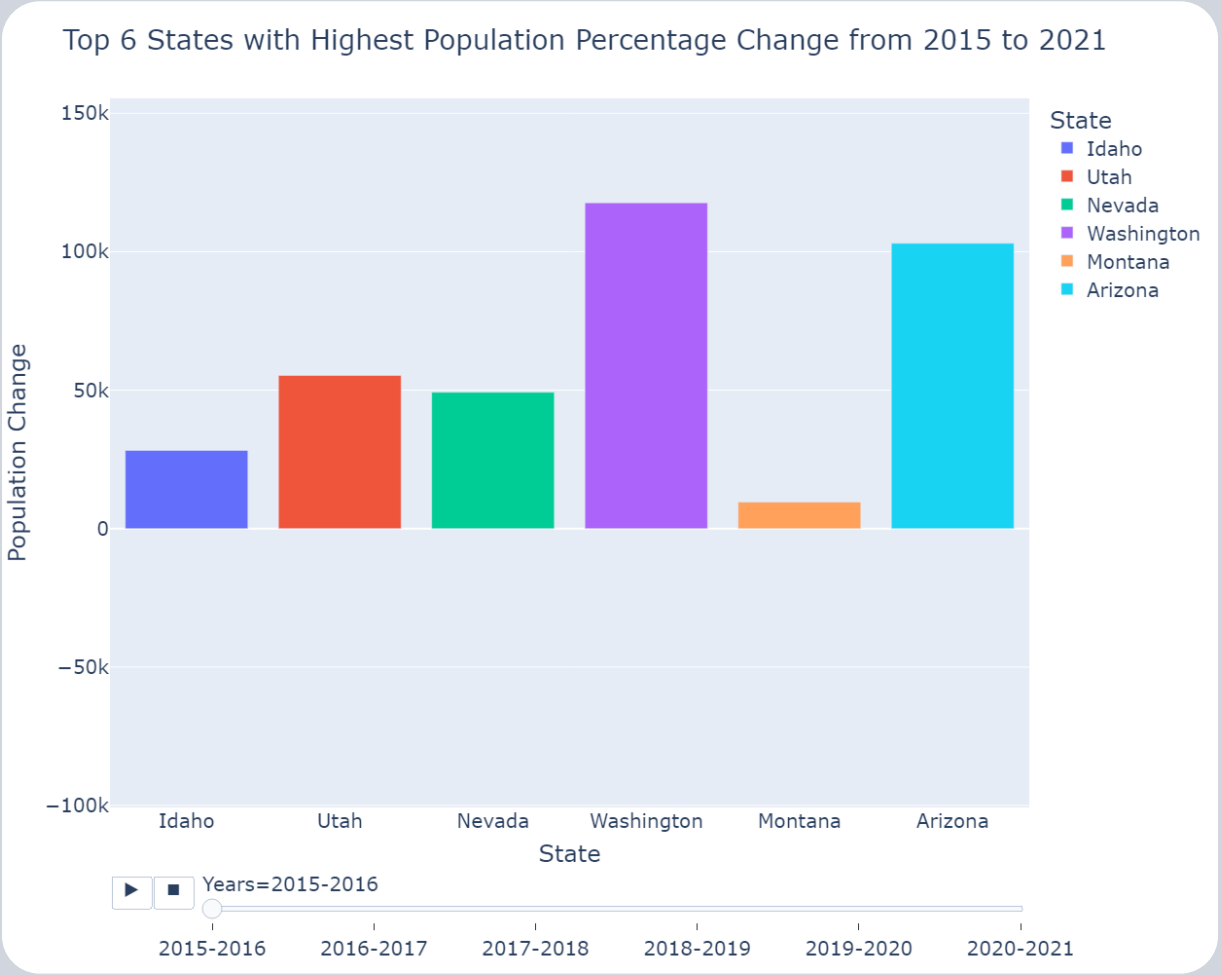
Plot is only showing increases by state represented by the size and color of the points. Here you can observe the 2019-2020 numbers and see a significant spike in many northeastern states (particularly New York, New Jersey, and Pennsylvania) while the rest of the country seem to level out.

3 States with 2019-2020 Population Spikes:

1. New York– **701,372**
2. New Jersey – **397,553**
3. Pennsylvania – **187,636**

Top 6 States with Highest Population % Increase 2015-2021

Year-to-Year Total Population with Texas and Florida removed



Plot is only showing population growth as a percentage of total population estimates in 2021 compared to total population estimates in 2015 with higher populated states removed (Texas and Florida). Here you can see that Arizona experienced a drastic decline from 2019-2020 with a reduction in total population of 100,731.

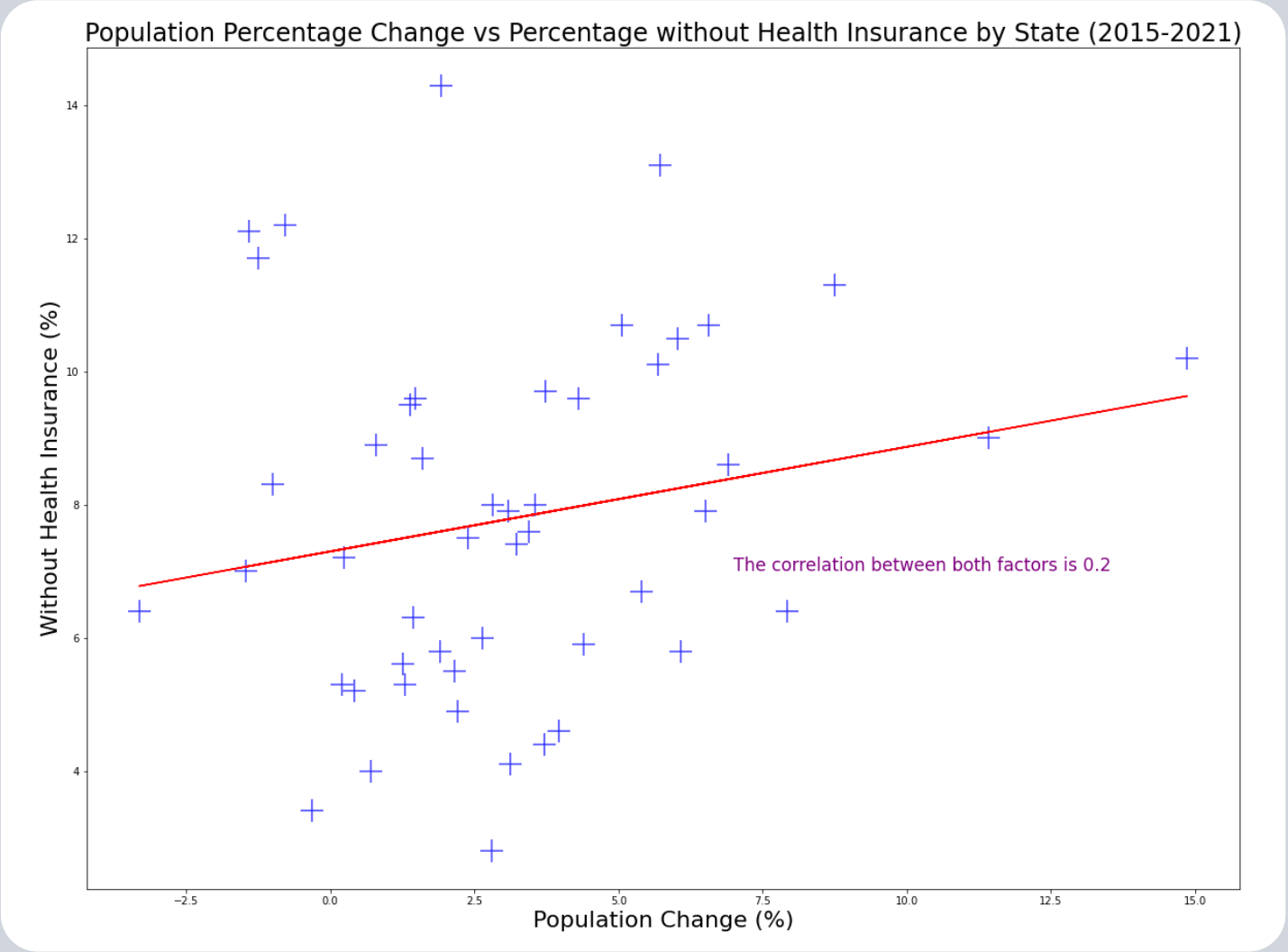
Population Growth and **Health Insurance.**

3

Effect Population growth had on the percentage of people with Health Insurance in the Unites States from 2015-2021.

*Numbers based on estimates from US Census

Population % v. Health Insurance %



*matplotlib

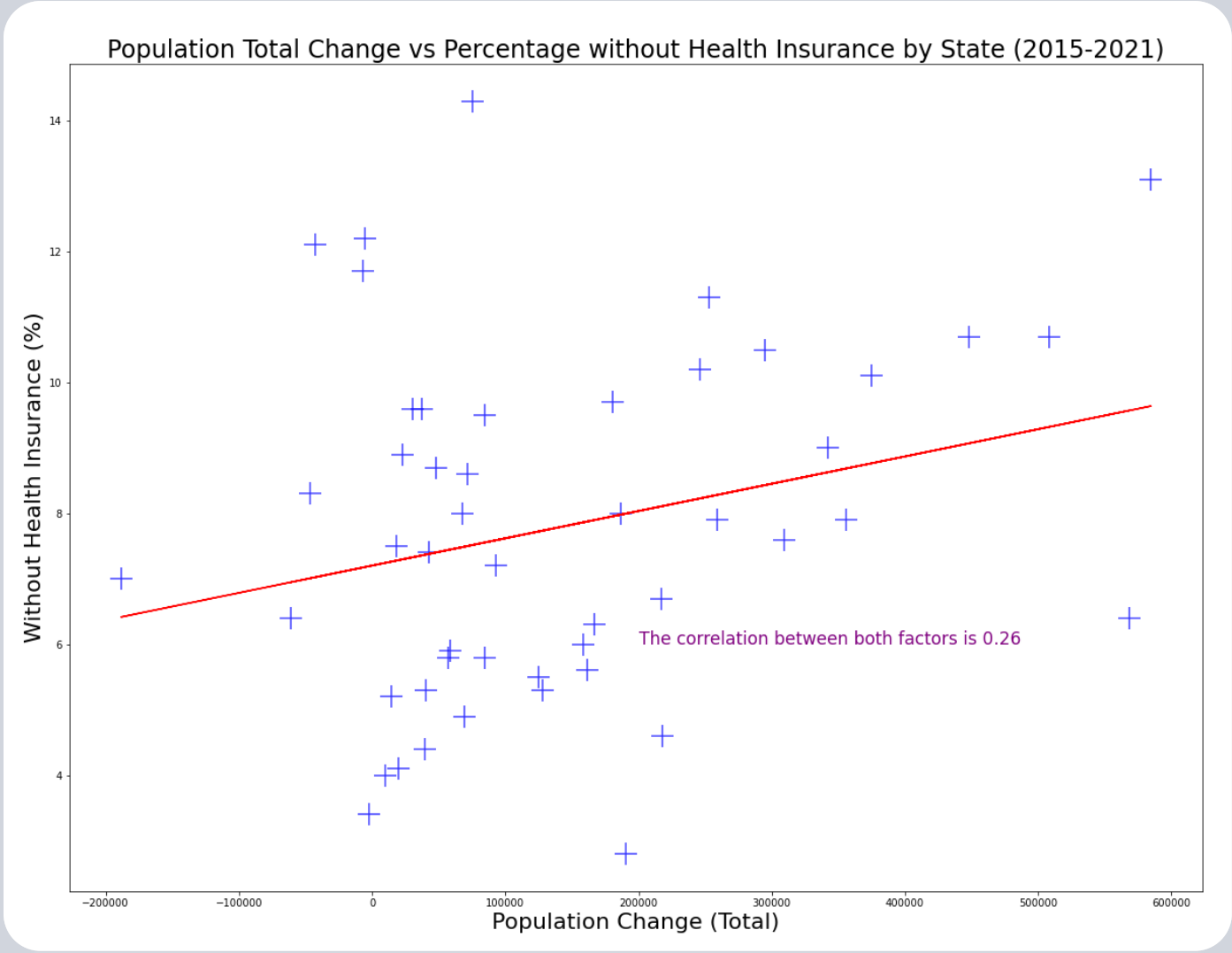
Notes on correlation coefficient and linear regression model:

1. The correlation between both factors is 0.2
2. The line equation is y = 0.16x + 7.3
3. These factors show that as population increases, the percentage of the population without heath insurance increases, though this correlation is too weak to definitively say there's a connection

Population Totals v. Health Insurance %

Notes on correlation coefficient and linear regression model:

1. The correlation between both factors is 0.26
2. The line equation is y = 0.0x + 7.2
3. These factors show that as total population increases, the percentage of the population without heath insurance increases, though this correlation is too weak to definitively say there's a connection



*matplotlib

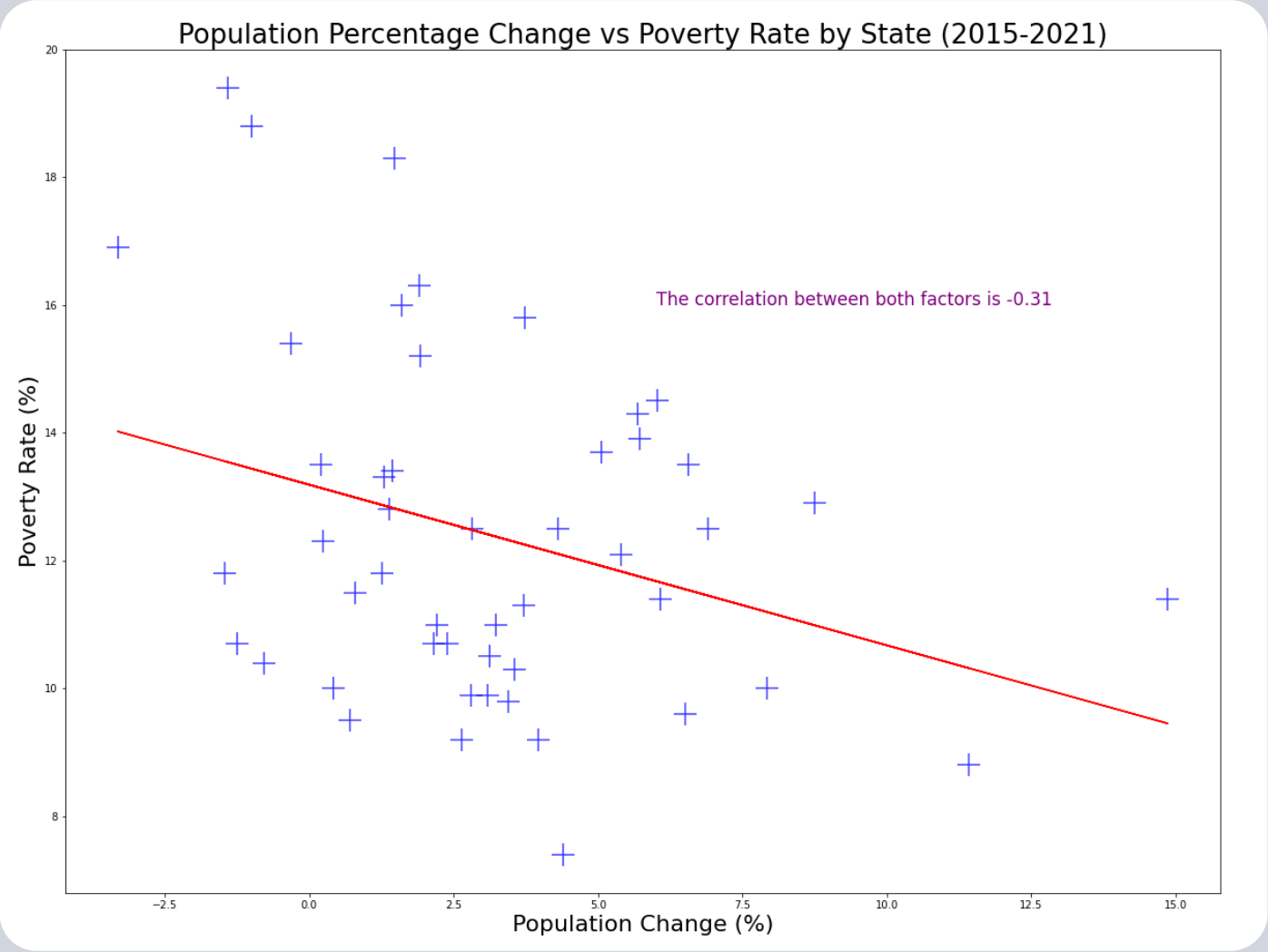
Poverty and **Unemployment.**

4

Effect Population growth had on Poverty and Unemployment rates in the Unites States from 2015-2021.

*Numbers based on estimates from US Census

Population % v. Poverty Rates



*matplotlib

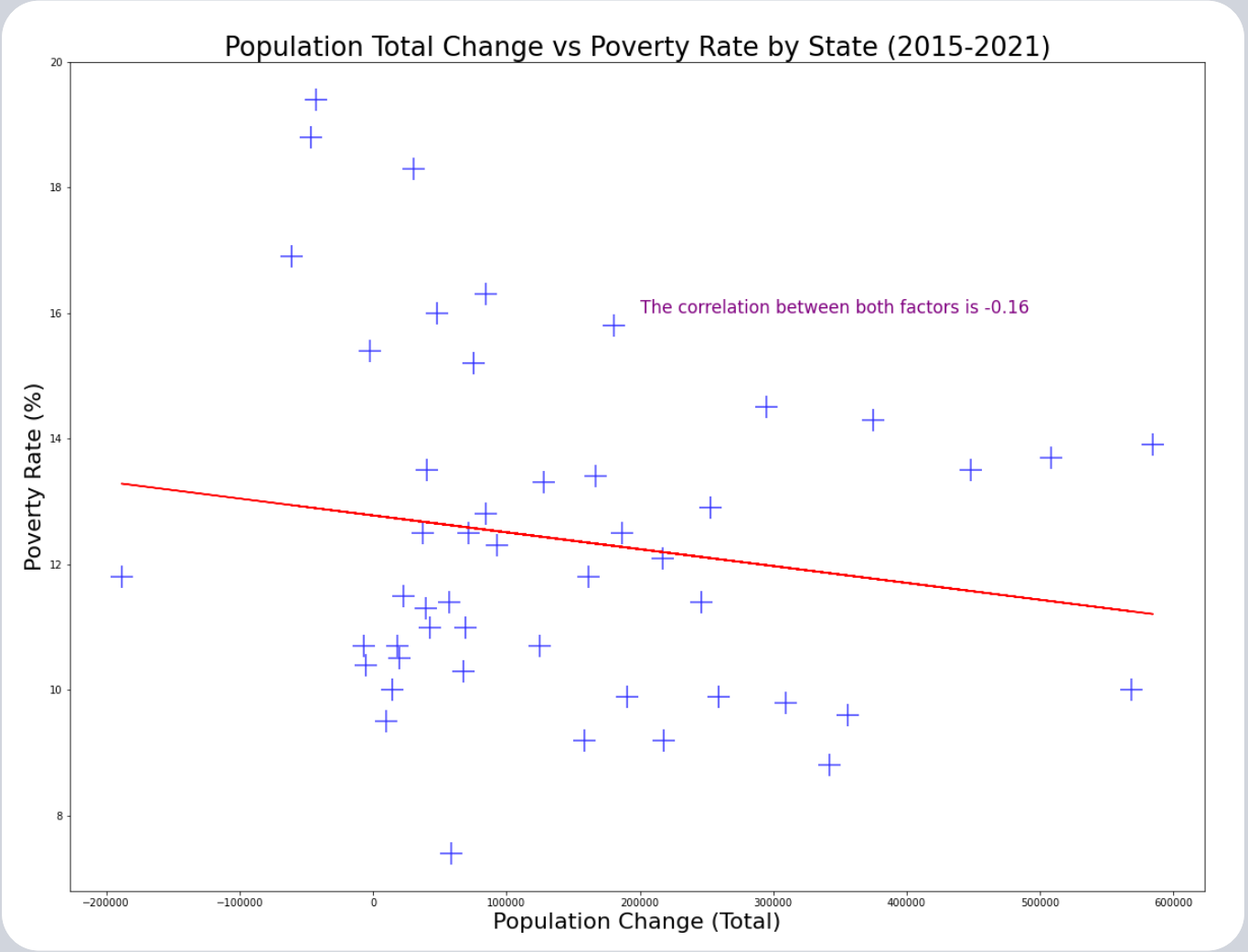
Notes on correlation coefficient and linear regression model:

1. The correlation between both factors is -0.31
2. The line equation is y = -0.25x + 13.19
3. These factors show that as population decreases, the percentage of the population below the poverty line decreases, though this correlation is too weak to definitively say there's a connection

Population Totals v. Poverty Rates

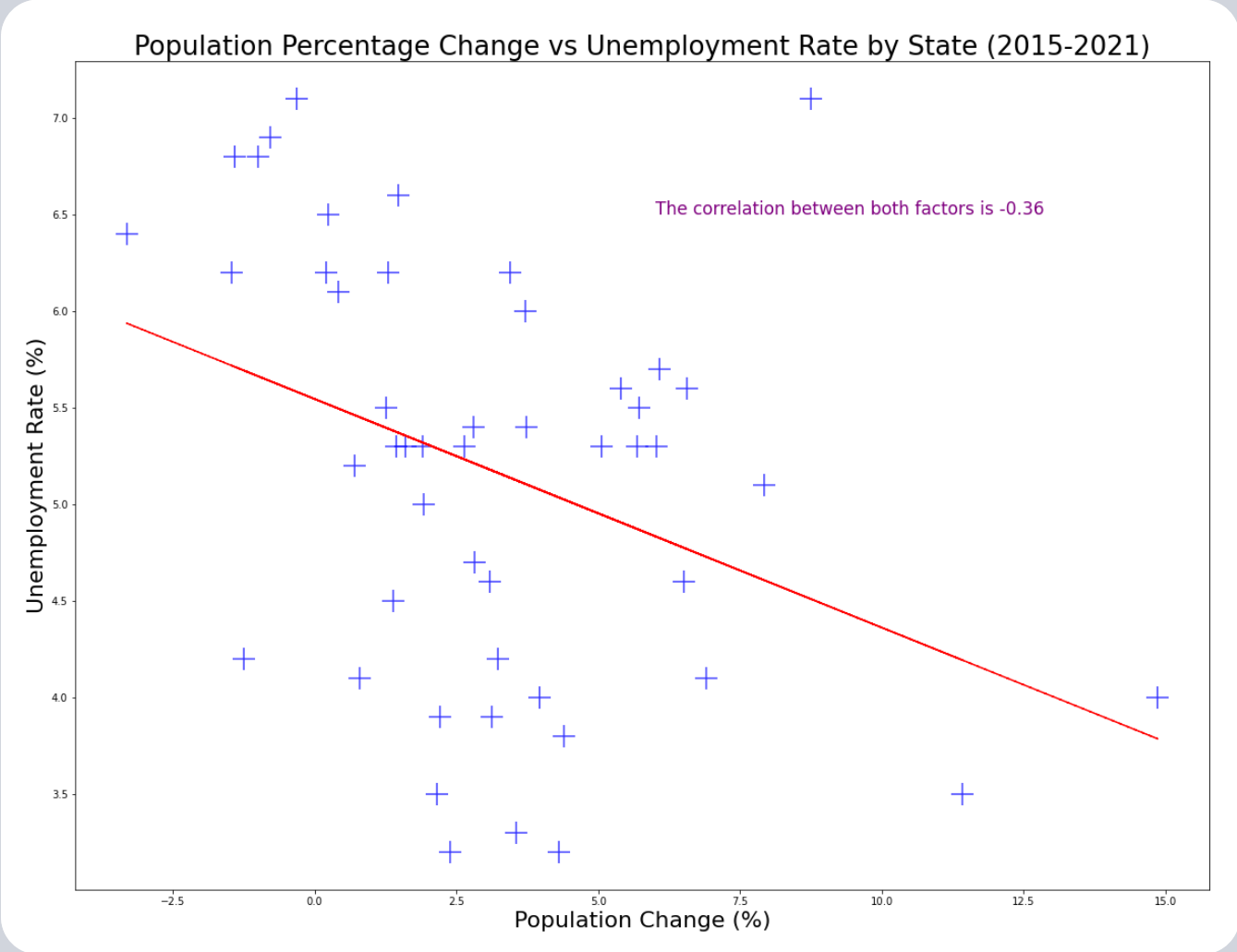
Notes on correlation coefficient and linear regression model:

1. The correlation between both factors is -0.16
2. The line equation is y = -0.0x + 12.78
3. These factors show that the total population numbers seemingly have no effect on the percentage of the population below the poverty line.



*matplotlib

Population % v. Unemployment Rates



*matplotlib

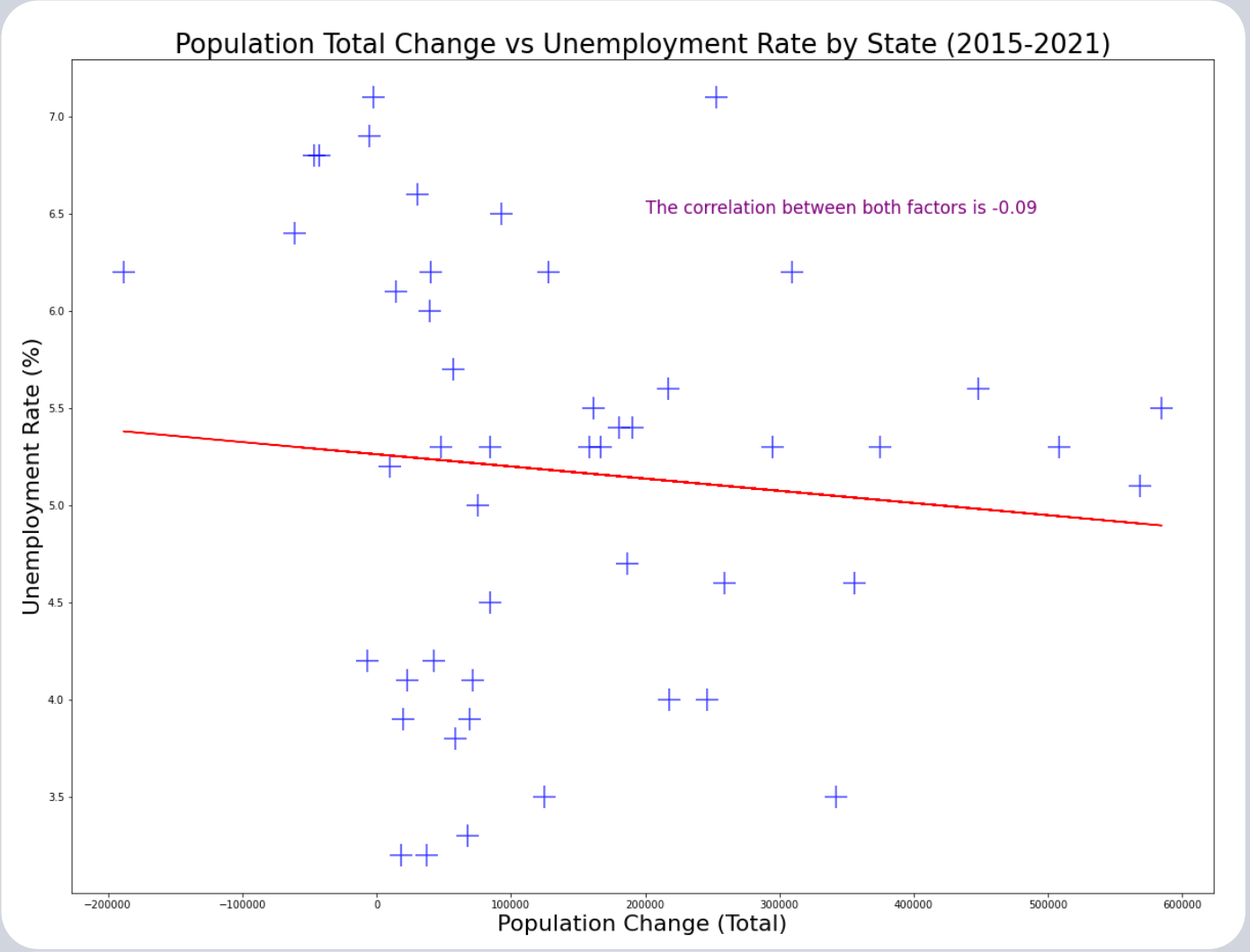
Notes on correlation coefficient and linear regression model:

1. The correlation between both factors is -0.36
2. The line equation is y = -0.12x + 5.54
3. These factors show that as population decreases, the percentage of the population who are unemployed decreases, though this correlation is too weak to definitively say there's a connection

Population Totals v. Unemployment Rates

Notes on correlation coefficient and linear regression model:

1. The correlation between both factors is -0.09
2. The line equation is y = -0.0x + 5.26
3. These factors show that the total population numbers seemingly have no effect on the percentage of the population who are unemployed.



*matplotlib

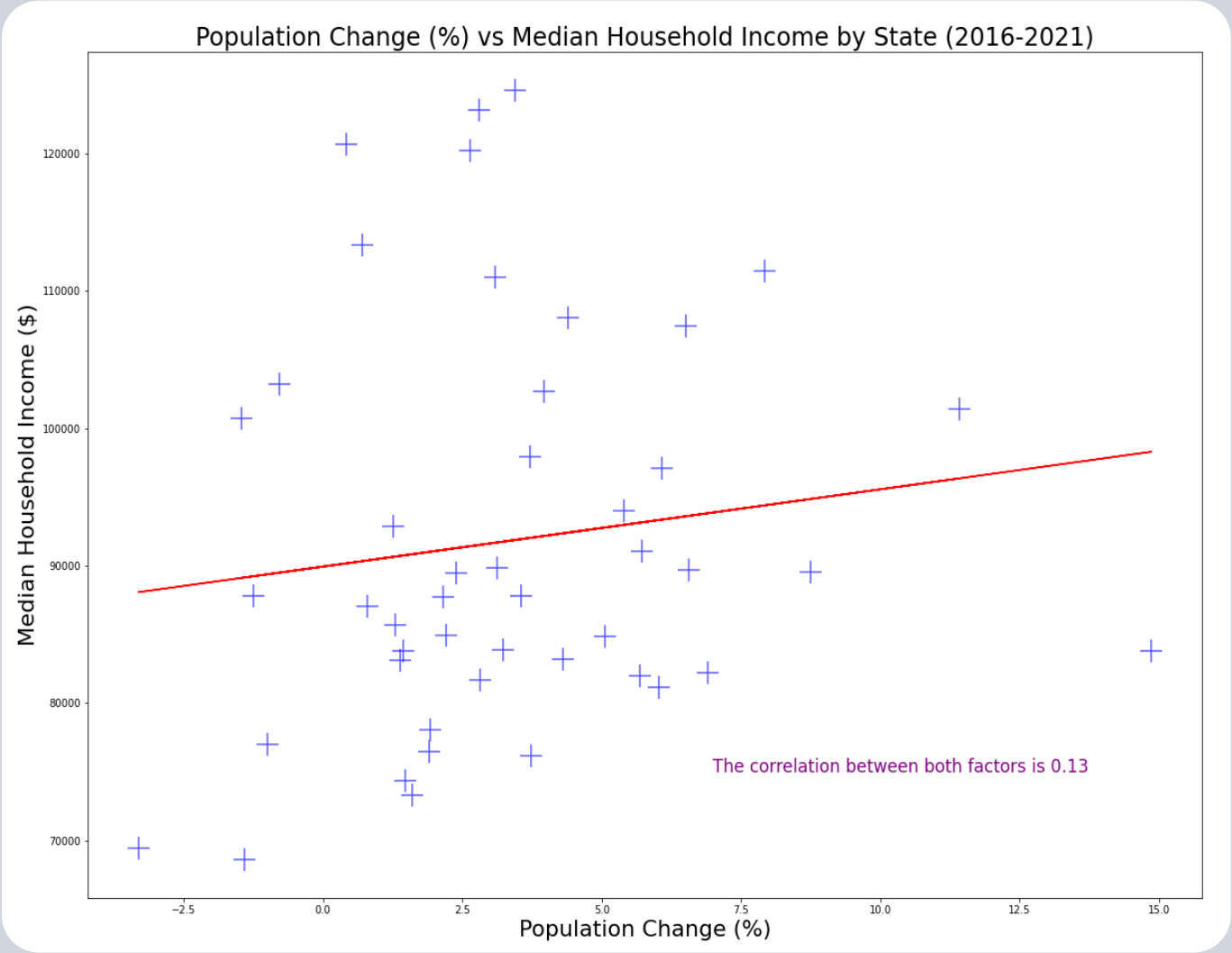
Population Growth and **Earnings.**

5

Effect Population growth had on average annual household income in the Unites States from 2016-2021.

*Numbers based on estimates from US Census

Population % v. Median Income



*matplotlib

Notes on correlation coefficient and linear regression model:

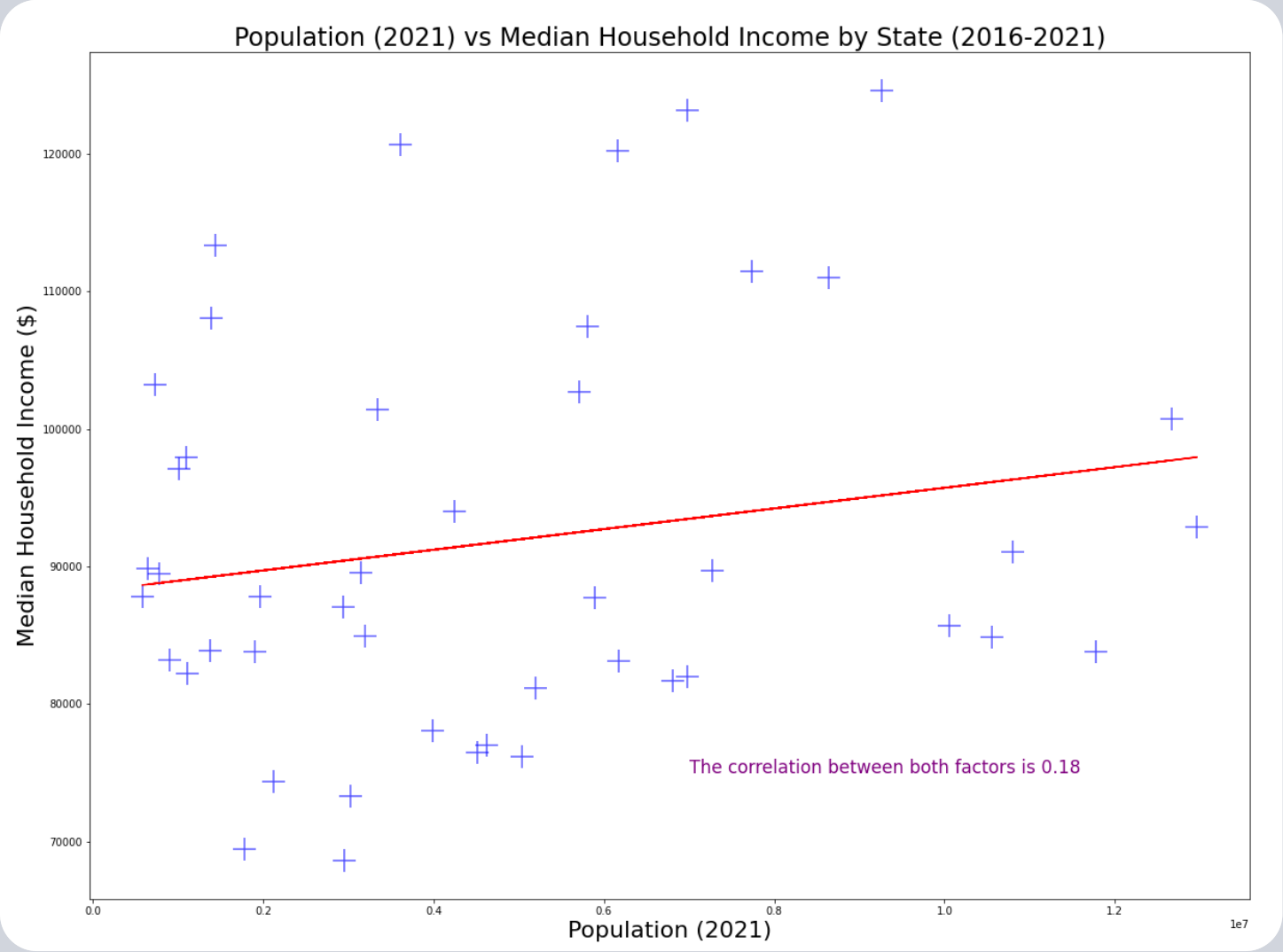
1. The correlation between both factors is 0.13
2. The line equation is y = 562.18x + 89948.73
3. These factors show that the population percentage growth seemingly has little to no effect on the Median Household Income by State.

Population Totals v. Median Income

Notes on correlation coefficient and linear regression model:

1. The correlation between both factors is 0.21
2. The line equation is y = 0.02x + 89119.46
3. These factors show that as the total population grows, the median household income also increases. Though, this correlation isn't strong enough to say there's a definitive connection.

Population 2021 v. Median Income

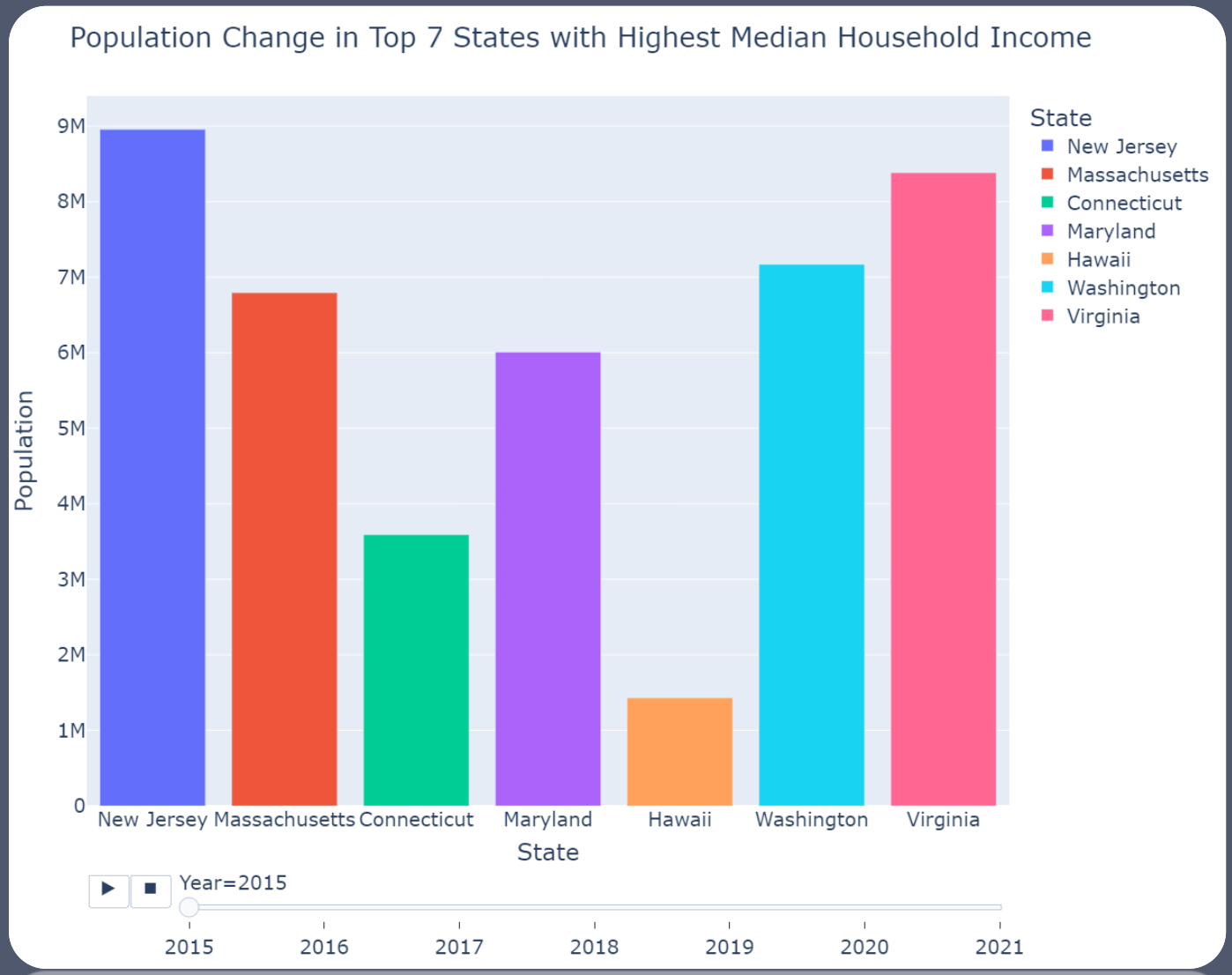


*matplotlib

Notes on correlation coefficient and linear regression model:

1. The correlation between both factors is 0.18
2. The line equation is `y = 0.0x + 88219.63`
3. These factors show that for states with higher populations the median household income is higher, though the correlation isn't strong enough to definitively say there's a connection.

Populations (2015-2021)



Noteworthy items

2020 Spike

We see a rise in population for all states in the top 7 highest median household incomes in 2020

Lower Populated States

Though Connecticut and Hawaii are lower in population compared to the others, their population density is comparable due to their smaller geographical sizes.
Connecticut: 14,360 km^2
Hawaii: 28,311 km^2

Outlier Removal

Four States with the largest total populations have been removed: California, Texas, Florida and New York.

Populations (2015-2021)

Noteworthy items

2020 Shift

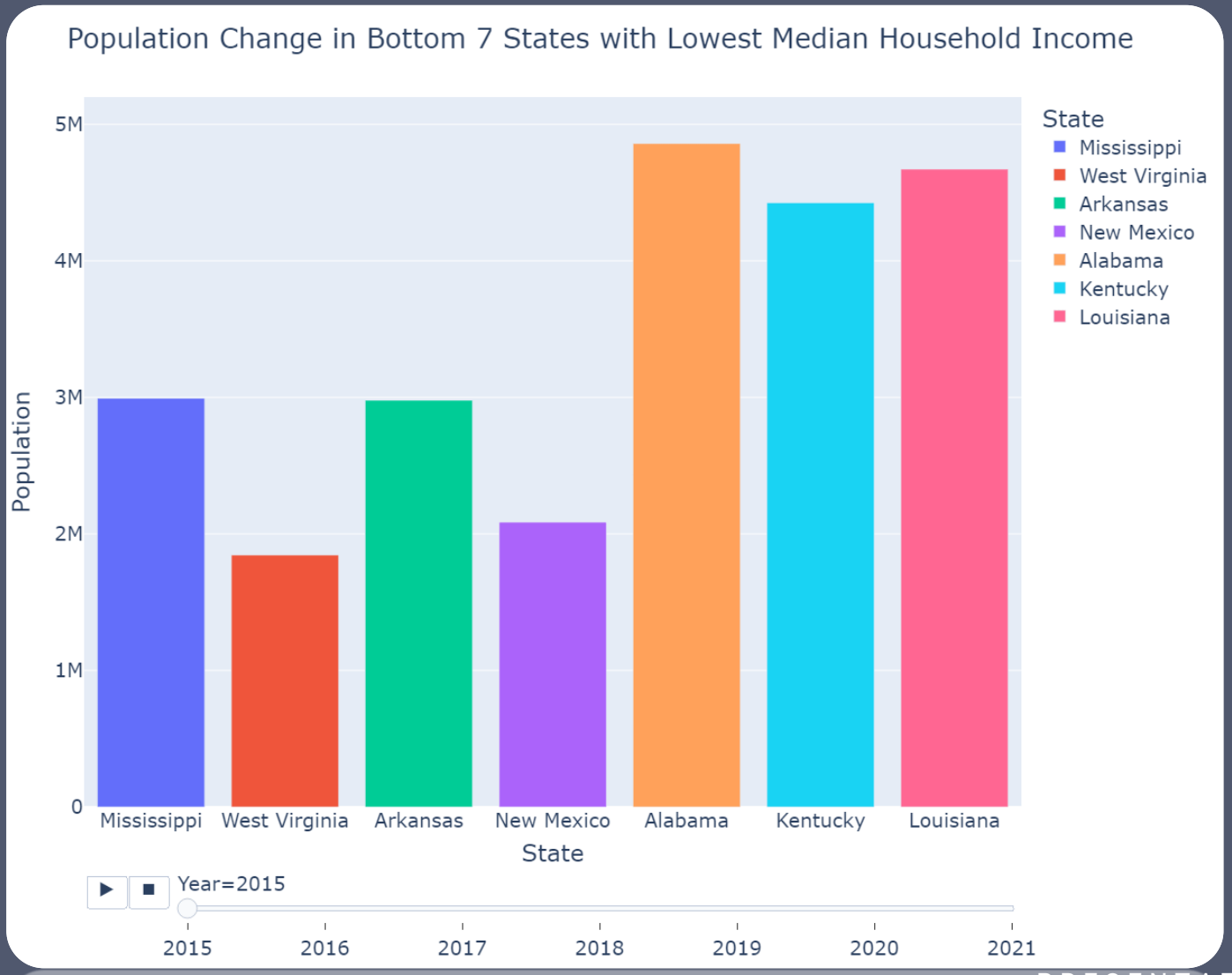
As with the Top 7 median income states we do see a couple of lower income states experiencing the 2020 increase: Alabama(121,618) and Kentucky(36,285)

Lower Total Populations

We see a trend in the bottom 7 states for median household income that their populations are significantly lower especially when taking density into consideration

Outlier Removal

Four States with the largest total populations have been removed: California, Texas, Florida and New York.



Final **Analysis.**

Closing thoughts on our findings from the US Census Data Population Growth analysis.

Final Analysis

Though our findings are largely inconclusive in many ways, we did garner one takeaway: Based on our findings and given the way we viewed the data, population growth in the US doesn't pose a negative impact from an economic standpoint. However, if we looked at the data differently it may show varying results. We could, for instance, compare data based on pure population density rather than on the broader state by state basis. Even in our analysis we found that it played a role in how results were reflected. Another approach that could affect the outcome would be to go farther and compare variables on a global scale. Population growth is likely impacting other countries in a far more significant way. The analysis by state approach we took is simultaneously broad and isolated.

Other questions for future research

1. How does the US compare globally in population growth?
2. How are the same variables impacted by population density?
3. What is the environmental impact of population growth?
4. What areas are experiencing population decline and what are the ramifications?

Resources

Python

Libraries used:

pandas

matplotlib

hvplot

plotly.express

plotly.graph_objects

requests

census

scipy.stats

APIs:

api.census.gov

api.openweathermap.org