

ABSTRACT

Access to health care impacts many people throughout the United States, as it restricts their ability to solve their health concerns. People who have the highest risk of a lack of access include people who are uninsured, people a part of a specific social class, or people belonging to a specific political party. In a particular geographical region, these factors could lead to groups of people suffering because of circumstances that they cannot control in their region. In my project, I determine how better access to healthcare and the percentage of people insured are affected by a measurement of the percentage of black people, percentage of democratic party votes, and median household income in all Illinois counties. For my original hypothesis, I tested this using regression analysis and expected that there would be a positive relationship between the percentage of black people, democratic votes, and median household income and the percentage of people insured in Illinois counties. The most significant variable when I tested my hypothesis turned out to be the percentage of black people in the counties. This relationship between the percentage of black people and people insured in Illinois counties concludes that counties that contain a larger black population have a lower percentage of people insured than counties that have a smaller black population. Although the other factors that I tested did not have as much of a significant result, these factors come into play when dealing with healthcare access. If I had more time to research this, I would like to find the correlation between other minority groups and percentage of people insured in other state counties. My results from my study can help Illinois lawmakers in creating changes in certain counties, so that healthcare can be more equal across all of Illinois, regardless of these factors.

INTRODUCTION

Access to healthcare is a recurring issue that continues to impact countries around the world, but especially the United States. In the United States, the cost of healthcare is one of the biggest factors as to why people are not receiving the immediate care that they need and are suffering. Other factors that result in access to healthcare are race and ethnicity. Depending on the state in the United States, the percent of a certain race in a population can affect how much access people have. Another factor is the result of a state being more democratic or republican. If a state is more republican, there is a greater chance that that state will have a better access to healthcare. This is due to more white Americans being republicans than black Americans. If a state is more democratic, the state might suffer due to its larger black population size and have less access. Finally, another important factor is median household income. If a state's median household income is less than average, the healthcare opportunities are going to be less. Inspired by seeing these almost direct results of these factors, I wanted to investigate access to healthcare in the 102 counties in Illinois to see if there was still a correlation. My study uses data that presents the percentage of black people in each county, the percentage of democratic votes in each county, and the median household income in each county. My research will then assess which one of the variables of data that I collected is the most significant. After I find out which variable is the most significant, my research will then show how this affect the percentage of people insured in each county.

METHODOLOGY

To gather and conduct the research materials that I needed for my project, I had to collect data from the County Health Rankings and Roadmaps datasets. The data that I gathered from the percentage of black people in each county in 2010 was also from the County Health Rankings and Roadmaps datasets. The percentage of Democratic votes from the 2020 presidential election was collected from Polotico.com, a website that also shared the percentage of Republican party votes in contrast. The data from the median household income by county was found in a dataset by the US Census Bureau. After I collected all of my datasets, I then used the object oriented program called R to merge my datasets into one collective dataset. Using R, I was able to organize all my information by all 102 counties in Illinois by my factors. I analyzed my data by using ordinary least squares regression analysis through R as well. From my dataset I was also able to conduct a linear regression model that shows the relationship between my x-variables (Percentage of Black People, Percentage of Democratic Vote, and Income) and my y-variables (Percentage of people insured). This information is shown by my Figures 1 and 2. After seeing that the percentage of black people was the most significant, I then created an effect plot, which shows the relationship between percentage of people insured and percentage of black people.

Figure 1: The linear regression data results are shown on this table. This table is specific only to one of my factors, which is the percentage of democratic party votes in Illinois counties. By using R, this table shows the statistical significance degree that the percentage of democratic party votes per 193,000 residents has on the people insured in each county in Illinois. The stars in Figure 1 signify the statistical significance degree in my data.

Figure 2: My second linear regression data results are shown on this table. This table contains the rest of my factors, which are the percentage of black people and income in Illinois counties. By using R, this table shows the statistical significance degree that income and the percentage of black people per 193,000 residents has on the people insured in each county in Illinois. The stars in Figure 2 signify the statistical significance degree in my data.

Figure 3: From my dataset, I was able to use the program R to create an effect plot that shows how the amount of black people (in percentages) affect the people insured (in percentages). Although I only used the most significant variable, this graph also includes the data from income and the percent of democratic party vote. This effect graph shows a positive relationship between black people and people insured, as the slope of the line in my graph is positive and has an upward trend. The line that is shown in my graph is the line of best fit, which equals 1.52 (as shown in Figure 2).

Regression Results: Access to Healthcare

Predictors	Model 1 Estimate (S.E.)
Intercept	4.89 * (1.98)
Pct. Democratic Vote	0.90 *** (0.03)
Observations	193
R ² / R ² adjusted	0.817 / 0.816

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Figure 1

Regression Results: Access to Healthcare

Predictors	Model 2 Estimate (S.E.)
Intercept	6.69 *** (1.97)
Pct. Black	1.52 *** (0.16)
Income	-0.64 *** (0.17)
Observations	193
R ² / R ² adjusted	0.831 / 0.829

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Figure 2

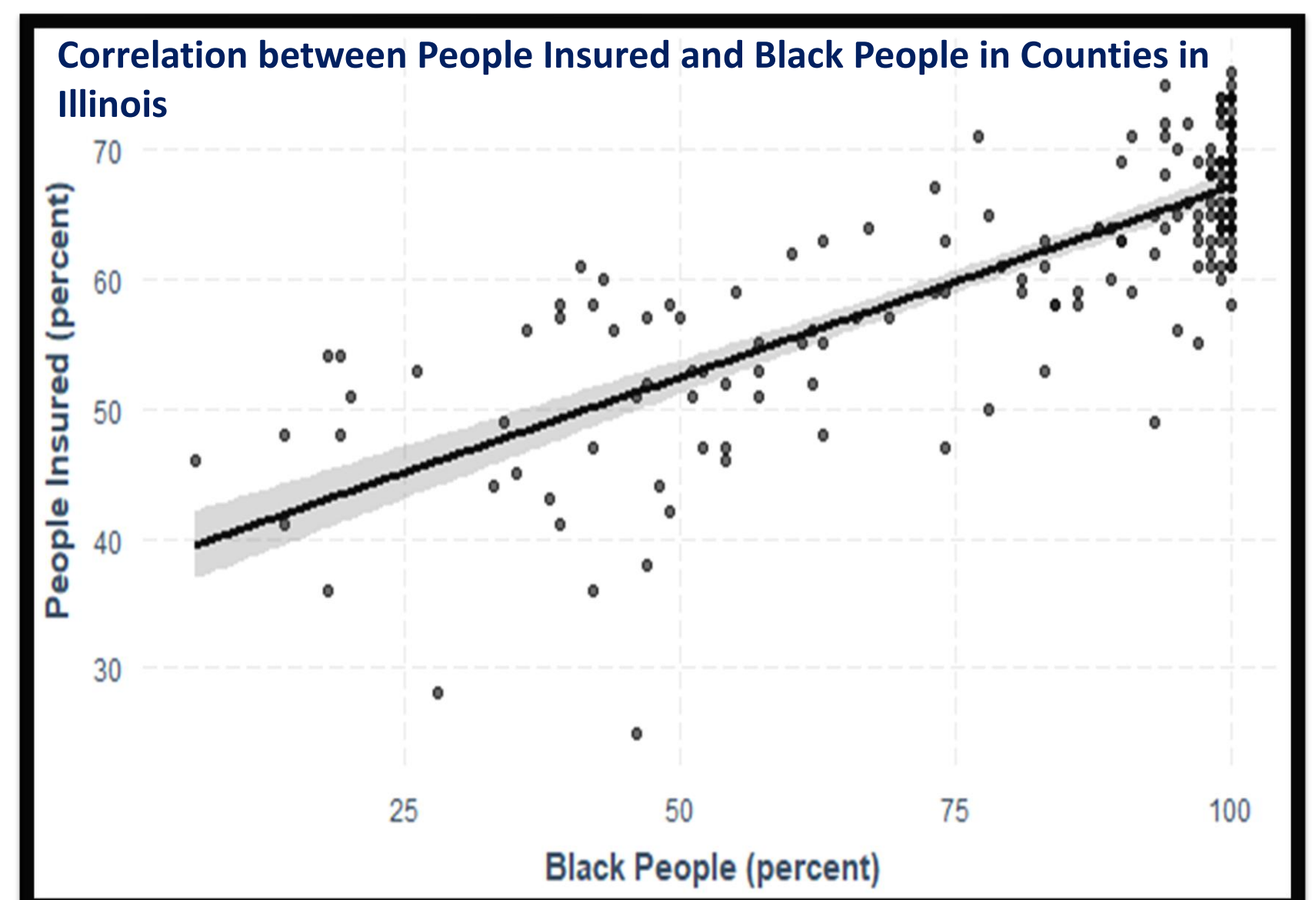


Figure 3

CONCLUSIONS

After using the object oriented programming application R, I was able to find that the percentage of black people in each Illinois county was the most significant out of all of my variables that I used. The percentage of democratic votes and the median household income were important factors, but did not end up having as much a significance as the percentage of black people had. In Figure 2, my linear regression model showed that the percent of black people had a value of 1.52. What this value means is that when there is an increase that results in 152,000 black residents in a county, then the percent of people insured goes up by 1 whole percent. What my study concluded is found in many other scientific studies that show disparities in healthcare. Many studies show that when there is a higher percentage of black people in a region, the percentage of people insured is very low. Although this is just one factor, there are other ones that also contribute as to why black people have a lower percentage than other races. The results that my data presents shows that this is a very drastic amount, as it takes more than 150,000 black people to change a county's percentage of people insured. In the future, I want to implement more factors regarding healthcare into my project. Some of these factors would include, occupation, education, and results from the U.S. Congress election to see if there is a significance in more democratic and republican votes. With my research, and others conducting similar experiments, lawmakers are able to see the drastic changes in counties across the state of Illinois, and can use this as a chance to better the lives of people who need it the most.

REFERENCES

- County Health Rankings and Roadmaps. (2021). 2021 Illinois Data. [Data File]. Retrieved from <https://www.countyhealthrankings.org/sites/default/files/media/document/2021%20County%20Health%20Rankings%20Illinois%20Data%20-%20v1.xlsx>
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