



# Finding the Significance of Current Community Health Problems and the Effect it has on COVID-19 Resilience.

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## Abstract

The ever-growing COVID-19 pandemic in America has given rise to many different social issues such as homelessness, health problems, and economic inequality. Past research has found that community resilience is a complex idea stretching across many different disciplines. The question the study aims to answer is what is the size of impact that current personal health/community health has on the resilience of the community? We already know of the impact that things such as infrastructure or economic stability has on community resilience. However, what is less studied is the impact of personal health issues such as obesity or smoking rate on community resilience. To test the hypothesis that counties with lower health face more severe impacts from COVID-19, information was gathered from counties across the upper Midwest from different CDC and state health department's recorded data. The findings are then compared with the metrics of how each county is affected by the current pandemic. Using different time frames from the beginning of the pandemic, it is clear to see and chart how well a county is responding to the pandemic. The results from the study and the metrics comparisons show that there is a possible correlation between the percentage of people who smoke and increased numbers of severe covid cases. The findings for the poor health percentages and obesity, however, were lackluster and did not support the hypothesis.

## Hypothesis

Community health trends such as obesity and adult smoking rates are a significant factor in how many hospitalizations and deaths a county will have due to COVID-19

## Methods

18 counties were collected, 6 from each state (Michigan, Minnesota and Wisconsin) and 2 from each size group based off population (Small counties ranged from 0-90,000, medium sized counties ranged from 90,001-150,000 while large counties were 150,000 and upwards).

Data for each county was also collected, such as COVID-19 cases, hospitalizations and deaths (per 100,000 rates), along with health statistics for each county such as obesity rates, smoking rates and percentage of population with poor or fair health.

This data was compared and analyzed with Z scores to find a significance of community health in relation to COVID-19 resilience.

## Results

### Smoking Data

Figure 1

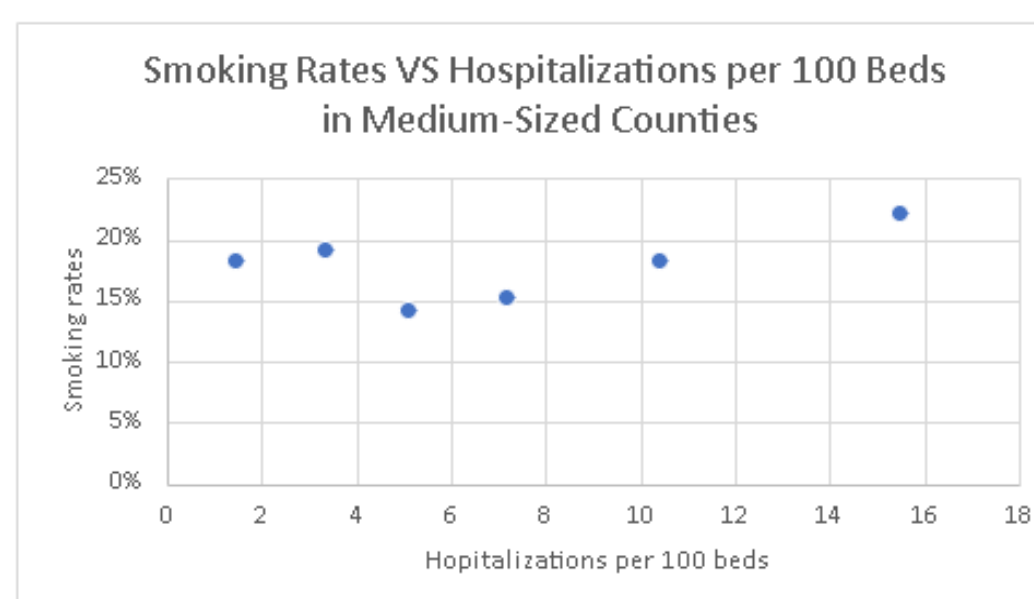


Chart 1 (Figure 1 chart)

Medium sized counties (90,000 – 150,000 in population)

County	Hospitalizations per 100 beds	Smoking rate
Washington County	2.45	13%
Walworth County	3.49	15%
Carver County	14	16%
Scott County	19.41	19%
Calhoun County	10.35	19%
Eaton County	37.14	22%

Chart 2 (Figure 2 chart)

Large counties (150,000 + in population)

County	Hospitalizations per 100 beds	Smoking rates
Dakota County	5.16	14%
Anoka County	7.23	15%
Dane County	1.49	18%
Kalamazoo County	10.45	18%
Brown County	3.39	19%
Macomb County	15.52	22%

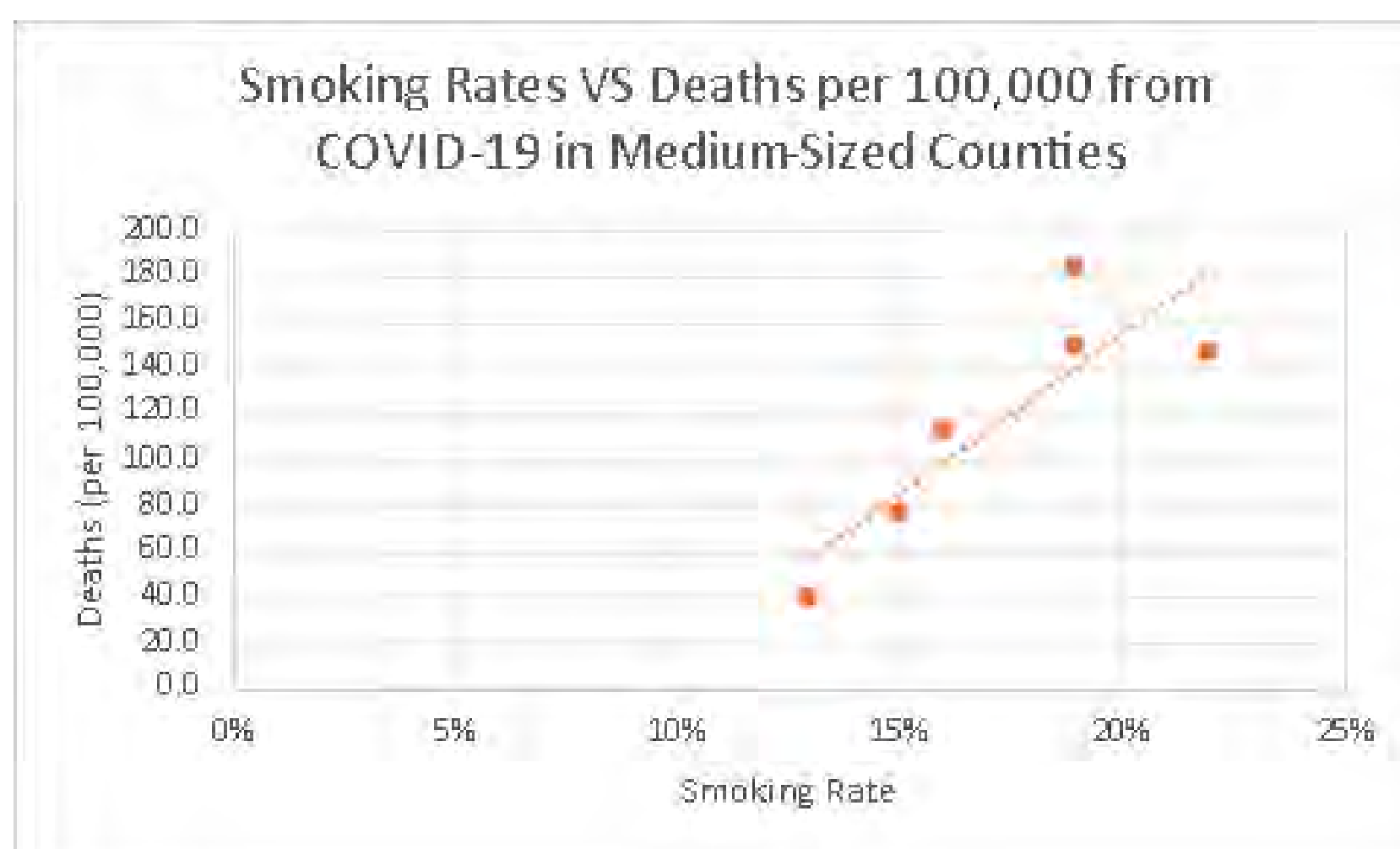


Figure 3

Medium sized counties (90,000 – 150,000 in population)

County	Smoking rate	Deaths (per 100,000)
Carver County	13%	39.0
Scott County	15%	75.2
Washington County	16%	111.0
Calhoun County	19%	183.4
Walworth County	19%	149.2
Eaton County	22%	146.0

Chart 3 (Figure 3 chart)

## Discussion

The data in this study suggests a strong correlation between higher smoking percentage and hospitalization rates in large-sized counties as well as a strong correlation between higher smoking percentages and deaths in medium-sized counties due to COVID-19. The data also suggests a correlation between obesity rate and death rate per 100,000. This data shows possible correlations between community health trends such as obesity and smoking rates with severe COVID-19 cases. The results align with other studies regarding COVID-19 and smoking, which is expected because of the effects that smoking has on pulmonary immune function. A study on how smoking is associated with COVID-19 progression concluded that, "Smoking is a risk factor for progression of COVID-19, with smokers having higher odds of COVID-19 progression than never smokers," (Roengrudee Patanavich, Stanton A Glantz). The sample size of counties that were assessed is limited, therefore limiting the conclusions that can be made from this study.

### Percentage of Population with Poor or Low Health Data

Figure 4

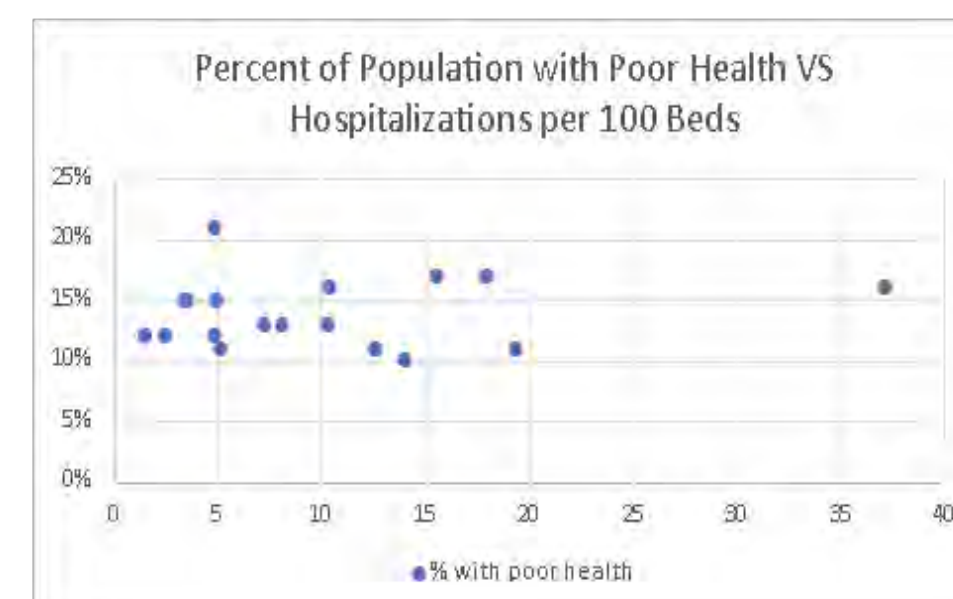
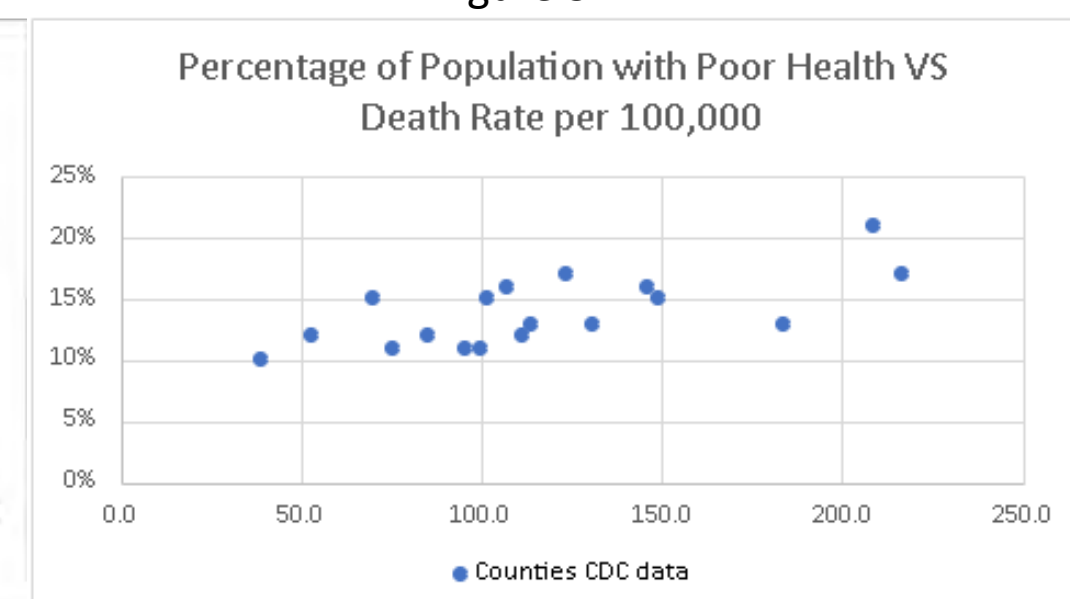


Figure 5



### Obesity Rate Data

Figure 6

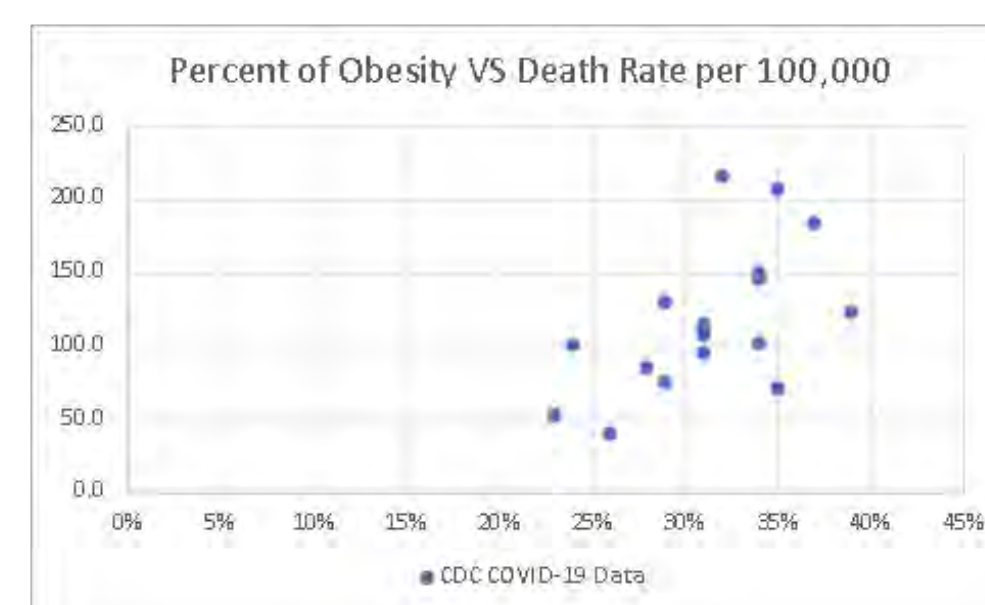
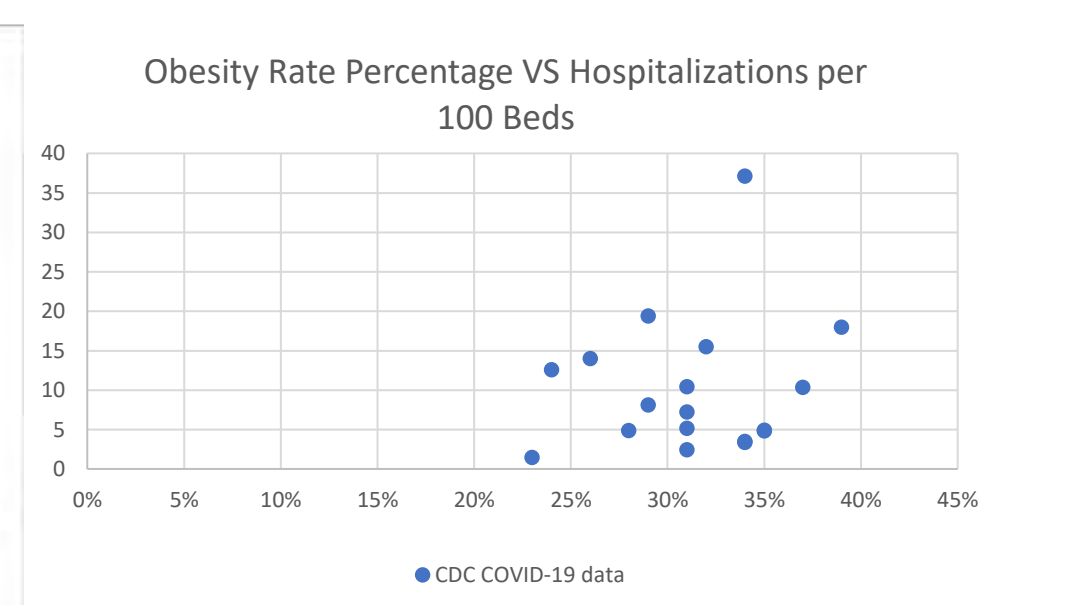


Figure 7



## Conclusion

In conclusion, the 18 counties throughout Minnesota, Wisconsin and Michigan showed there was a possible positive relationship between smoking percentages within the populations and COVID-19 severe cases and deaths. This relationship goes along with the hypothesis we created. The Z scores for smoking rates and severe COVID-19 cases / deaths show confidence in the findings except for 2 scores of 2.0 and 3.2 for Brown county Wisconsin and Eaton County Michigan, respectively. Findings for the Obesity and Low health percentage however do not support our hypothesis of being a significant factor or cause of higher rates of severe cases and deaths. Obesity rates compared to death rates did show a positive correlation however, the data does not have enough confidence to prove a significant effect on a counties' COVID-19 data. Along with the obesity rates in a population, the "Low to fair health" percentage data from the UW population health institute shows very low correlation to the hospitalization and death per 100,000 data. Due to the failure to find significant relevance between the low health, obesity stats and COVID-19 data, we reject the hypothesis as it is written. The reasons for the inconclusive results can range from possible incorrect hypothesis, too small of a study or incorrect data.

## References and Sources

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