RESEARCH ARTICLE

Politics and the Spread of COVID-19 in the United States

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Abstract

Analysis of U.S. counties revealed that political views were strongly related to COVID-19 deaths per 100,000 residents. Death rates were much higher in counties that strongly supported Trump in the 2020 presidential election than in counties where he received a lower proportion of the vote. The relationship between political views and COVID-19 deaths remained strong in regression models after other relevant variables were statistically controlled. The relationship between political views and COVID-19 deaths rates was especially strong after vaccines were generally available to the general public. Results from this study indicate that persons in Trump leaning counties tended to not follow the advice of health experts, including wearing masks, social distancing, and getting vaccinated against the COVID-19 virus. Such actions resulted in thousands of unnecessary deaths.

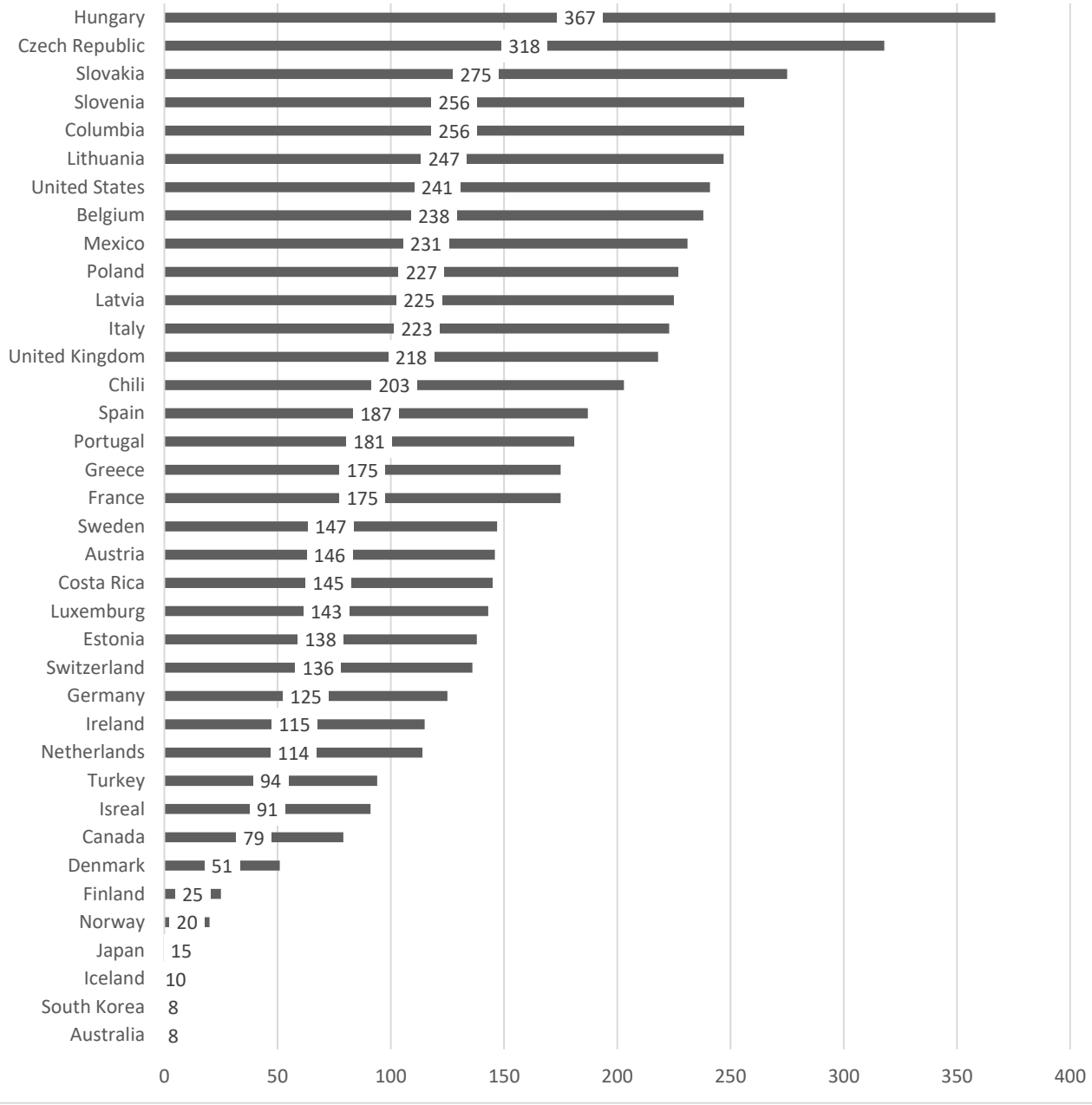
Introduction

Throughout human history, infectious diseases have periodically devasted human communities. Among the many possible examples that could be provided of devastating pandemics that killed millions of people are the Bubonic Plague in Europe in the 14th Century (1,2), and the Spanish Flu Pandemic of 1918 (3). For decades, scientists and health experts have been concerned that another pandemic could occur where a new disease emerges for which humans have little or no defense (e.g.,4,5,6,7,8,9). Public health officials have hoped that if or when this new disease emerges, it could be contained more quickly and with less severe outcomes than previous pandemics because of our vastly improved medical knowledge and the capacity of health experts to quickly communicate accurate and timely information to the general public.

Pandemic concerns became reality in December 2019 with the emergence of COVID-19. Despite containment efforts, the disease quickly spread around the world with severe consequences. By December 2021, the worldwide death toll from COVID-19 was about 5.3 million people. Disease impacts, however, have been far worse in some places than others. In Figure 1, data are presented showing the number of COVID-19 deaths per 100,000 residents for the 38 OECD (Organization for Economic Cooperation and Development) nations as of December 7, 2021. This Figure shows COVID-19 deaths per 100,000 ranged from 367 in Hungary to 8 in Australia and South Korea. Since OECD nations are all reasonably advanced and have somewhat capable health care sectors, these huge variations in death rates are likely to be largely a function of non-medical factors. Specifically, there is no question that which health policies were implemented, when they were implemented, and the extent to which individuals followed policies and recommended health practices varied widely. Policies and individual behaviors then strongly influenced disease spread. For example, the nations that have done relatively well during the pandemic have had clear policies that made sense scientifically, the nation stayed with the policy consistently, and the general public tended to follow policies and recommended practices. For example, throughout the pandemic, South Korea tested widely, Australia locked down, and people in Japan followed recommendations to wear masks and social distance. In countries that did not do as well, policies were inconsistent, were sometimes changed for political rather than scientific reasons and significant segments of the population did not follow recommended practices often because of misinformation and conspiracy theories. In many countries, hope that accurate information could be shared quickly was overwhelmed by misinformation typically shared via social media. In Hungary, for example, policies that were inconsistent and often lacked scientific merit were made worse by a lack of confidence in information the government provided and crumbling medical infrastructure where investments have been inadequate for years.

In this manuscript, a more in-depth exploration is made of a nation that has done relatively poorly during the COVID-19 pandemic, the United States of America. Specifically, analysis is conducted to explore the impacts of political views on per capita COVID-19 deaths that vary extensively across the more than 3,000 U.S. counties. This is done by breaking the pandemic into three distinct time periods and then examining the relationship of political views on disease impacts across these different time periods. Political views are measured by the percent of voters that cast their ballot for Donald Trump in the 2020 presidential election. In the data analysis, additional variables that could explain the relationship between political views and COVID-19 outcomes are statistically controlled.

Figure 1. Covid-19 Deaths per 100,000 Residents Across OECD Nations, December 7, 2021



COVID-19 in the U.S.

The first known case of COVID-19 in the United States was in January 2020 (10). By March 2020, COVID-19 cases were found throughout the country (5,11). By December 2021, the U.S. death toll from the disease was approaching 800,000. Within the U.S., virus impacts have varied greatly from one location to another. In some counties there have been no COVID-19 deaths, while in other counties deaths per 100,000 residents exceeds 1,000.

It is hypothesized in this study that political views are related to disease outcomes. Reactions to COVID-19 in the U.S. have been

very political from the outset. Throughout the pandemic, Democrats have been much more likely than Republicans to take the threat of the virus seriously, to take personal precautions and to support policy efforts to control virus spread. Republicans, in contrast, tend to express greater concern for the economic and other impacts of health safety policies, and place more emphasis on individual freedoms (12,13). The relationship between attitudes about COVID-19 and political views is similar to responses to many other issues. Research shows that Democrats consistently have greater trust in science than Republicans on a variety of issues (14,15,16,17,18,19,20,21,22). This greater trust in science and health experts extended to COVID-19 (23).

Certainly, other variables in addition to political views may be related to disease impacts. Relevant variables will be statistically controlled in the data analysis. The three time periods to be explored in this analysis include (1) Initial Emergence; (2) Pre-Vaccine; and (3) Vaccine Era. Each period and the role of political views in disease outcomes during the period are briefly described below.

Initial Emergence - During early months of the pandemic, data showed that residents of cities, especially large cities, were much more likely to test positive for and die from the virus than residents of rural areas (24). Metropolitan areas are home to people who travel all over the world and who may have brought the disease to their community from elsewhere. Once the disease is in a community, cities provide prime conditions for the virus to spread. In cities people live and work in close proximity to one another and are more dependent upon mass transit, all of which makes social distancing more difficult. In contrast, in rural areas there are fewer people, and these people are more widely dispersed, making it easier for people to remain apart slowing virus spread (25).

During the initial emergence period, policy makers and the general public were confronted with a situation completely different from anything they had ever faced before. Decision makers often responded with confusion and uncertainty, and the policies implemented were often too little and too late to keep the virus from spreading. Under these circumstances, COVID-19 impacts are likely to be more extensive in urban than in rural communities during the Initial Emergence era because of inherit structural disadvantages. From a political perspective, large cities tend to be dominated by Democrat voters, while Republicans generally control rural areas (26). Thus, counties where Trump received a smaller percentage of votes were likely hit hard by the virus during the Initial Emergence period. For purposes of this manuscript, the Initial Emergence period is defined as from the beginning of the pandemic until May 1, 2020.

Pre-Vaccine - By the late spring of 2020, the virus had reached all corners of the country. During the pre-vaccine period, the only way for people to protect themselves from the virus was to personally follow guidelines suggested by health professionals – to wear masks, social distance and wash hands often while awaiting vaccine development. Additionally, by May 2020, decisions makers had time to implement policies to keep people in their community safe if they wished to do so.

The U.S. is a large country where many of the policies with respect to COVID-19 are made by state and local governments. Not surprisingly, policies varied widely, largely based on who was in control politically. State and local governments under Republican control were less likely to implement policies such as closing businesses and schools, and enforcing mask mandates (27). Personal behavior also tended to vary along these same lines by political views. Early research found that counties with a higher share of Trump voters tended to have lower perceptions of the

dangers of COVID-19, and these perceptions led to riskier behavior (28). States with more Trump voters were more resistant to stay-at-home orders (29). In more religious states, which tend to be more Republican, people were found to be more mobile during the pandemic despite recommendations to stay home (30). Perry et al. (31) found Christian Nationalism, which has strong ties to the Republican Party, was related to many of the far-right responses to COVID-19.

Policies and behaviors have impacts. Research found that it was during the pre-vaccine era that COVID-19 cases and deaths began increasing much more rapidly in Trump leaning counties compared to counties more likely to vote for Democrat Joe Biden (25). For purposes of this manuscript, the pre-vaccine period is defined as the ten months from May 1, 2020 to March 1, 2021.

Vaccine Era – The development of vaccines to combat COVID-19 represents a clear path to bring the pandemic under control. Prior to COVID-19, the time needed to develop safe and effective vaccines was measured in decades (32). However, resulting from years of basic scientific research that led to a greater understanding of human cells, how viruses attack these cells, and how defenses to the virus can be implemented (33), safe and effective vaccines were developed in record time. The genetic sequence of the virus causing COVID-19 was published on January 11, 2020, and by March 16, 2020 human clinical testing of a vaccine began (34). Nine months later, in December 2020, the first vaccines were being delivered. Results clearly show COVID-19 vaccines to be very safe and effective (35,36). Harris (37) found that incidence and hospitalization rates were inversely related to vaccination rates, while Gupta et al. (38) found that vaccinations averted thousands of deaths.

Even after months of vaccine availability, however, the disease continued to rage in the U.S. and throughout much of the world. This is primarily because the number of people vaccinated remained inadequate to prevent the virus from spreading. No question, political views played an important role in many people choosing not to be vaccinated. Almost from the moment it was announced that COVID-19 vaccine developments were under way, opposition emerged. Social media posts presented a range of falsehoods about the vaccines, including claims that COVID vaccines would alter DNA, negatively affect fertility, that the government was injecting microchips into people so that their behavior could be monitored, or any number of other untruths or conspiracy theories (39). Many people maintained that whether or not they were vaccinated was a personal choice and should not be mandated by the government. For these and other reasons, large numbers of people had not received the COVID-19 vaccination even months after it was available to them.

There is no question that political views are an important factor in determining whether or not people choose to be vaccinated. Republicans are much less likely to be vaccinated than Democrats (40) and vaccination levels are lower in Republican dominated counties than in Democrat dominated counties (41). Vaccination levels are also influenced by vaccination policies, which are related to the political leanings of elected officials. For example, vaccination mandates by schools or either public or private employers have been found to influence vaccination levels (42). Monetary incentives from state and local governments have also been found to impact vaccination rates (43).

It was several months from the time vaccines were approved before they were available to all who wished to receive them. It was several months after that before vaccines were approved for children. For this manuscript March 1, 2021 was chosen as the date for the beginning of Vaccine Era because by that time most adults wishing to be

vaccinated were able to do so. For this study, the vaccine era is defined as March 1, 2021 until December 1, 2021.

Control Variables

In this manuscript, COVID-19 deaths per 100,000 residents is the dependent variable, while the percent voting for Donald Trump in the 2020 presidential election is the primary independent variable. It is essential that other variables that could impact the relationship between political views and COVID-19 impacts be statistically controlled. In this analysis, three additional variables are utilized as control variables including race/ethnicity, educational attainment and poverty levels. All of these variables have been found to be strongly related to political views and are independently related to COVID-19 impacts. Thus, for race/ethnicity, non-Hispanic whites were much more likely to vote for Trump (44), but also tended to be safer from COVID-19 than minorities (25). Communities with higher levels of educational attainment were less likely to vote for Trump (26,45), and tended to be safer from the COVID-19 virus (46). Finally, persons in poverty were less likely to vote for Trump (26), and also tended to be in greater danger from COVID-19 (47).

Methods

The county is the unit of analysis for this study. Counties are relatively small geographic units for which data are available for all of the variables utilized. The analysis is based on 3,112 counties for which data are available on all of the variables used in the analysis. The dependent variables are the number of COVID-19 deaths per 100,000 residents by county. To measure the dependent variable, county level data were obtained from the New York Times dataset (48). This dataset provides the cumulative number of COVID-19 cases and deaths for each county in the U.S. on a daily basis. New York Times data is obtained from state, regional and county sources on a continual basis. New York Times data is virtually identical to data from other sources since all data providers get their information from the same places. The advantage of the New York Times dataset is that it is available to the general public and can be easily downloaded. For this study, the total number of COVID-19 deaths in each county was downloaded on three different dates - May 1, 2020, March 1, 2021 and December 1, 2021. COVID-19 deaths per 100,000 residents as of May 1, 2020 are used for the Initial Emergence era. COVID-19 deaths per 100,000 residents that occurred between May 1, 2020 and March 1, 2021 are used for the Pre-Vaccine Era, and COVID-19 deaths per 100,000 residents that occurred between March 1, 2021 to December 1, 2021 are used for the Vaccine Era. For each time period, the total number of COVID-19 deaths in each county is divided by the total population of that county as reported by the 2014-2018 American Community Survey and then multiplied by 100,000.

The primary independent variable is political views which is measured by the percent of votes for Donald Trump in each county in the 2020 presidential election. County level voting data were downloaded from the New York Times (49) and determination was made of the percent of voters in each county that cast their ballot for Donald Trump in the 2020 presidential election. Data for the three control variables were obtained from the 2014-2018 American Community Survey. Race/ethnicity is measured by the percent of residents in each county that are non-Hispanic white; educational attainment is determined by the percent of persons aged 25 and older in each county with a college degree; and poverty is measured by the percent of person in each county living below the census defined poverty line. The analysis consists of an overview of COVID-19 deaths per 100,000 residents by political views for each time period. This is followed by a set of regression models where COVID-19 deaths per 100,000

residents for each of the three time periods is the dependent variable, and political views, race/ethnicity, educational attainment, and poverty levels are used as independent variables.

Findings

Figures 2-4 show the relationships between political views and deaths per 100,000 residents for each of the three time periods analyzed in this study. For these graphs, counties are divided into 5 categories relative to the percent of voters who cast their ballot for Donald Trump in the 2020 presidential election. These categories are: 1) counties where Trump received less than 25 percent of the vote; 2) counties where Trump received from 25 to less than 45 percent of the vote; 3) counties where Trump received from 45 to less than 55 percent of the vote; 4) counties where Trump received from 55 to less than 75 percent of the vote; and 5) counties where Trump received 75 percent or more of the vote. Table 1 provides this same information in more detail, along with more information about how the other independent variables used in the study are related to percent voting for Trump.

Figure 2. Covid-19 Deaths per 100,000 Residents by Percent Voting for Trump on May 1, 2020

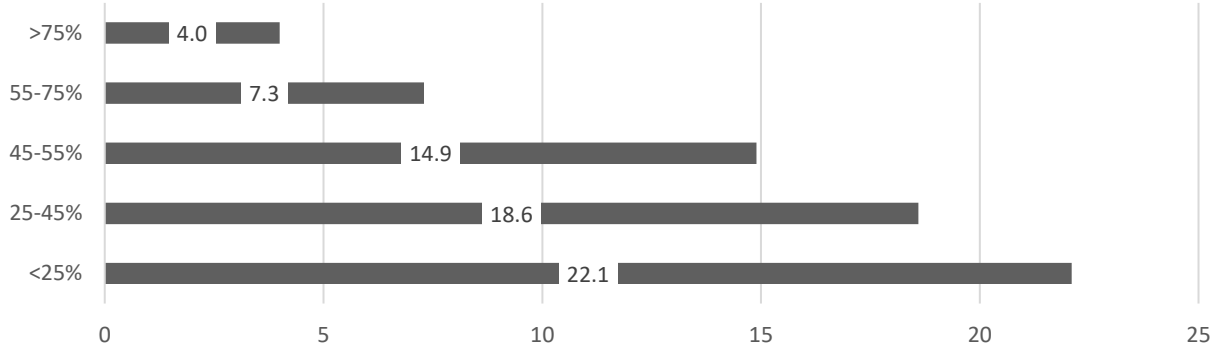


Figure 3. Covid-19 Deaths Per 100,000 Residents From May 1, 2020 to March 1, 2021 By Percent Voting for Trump

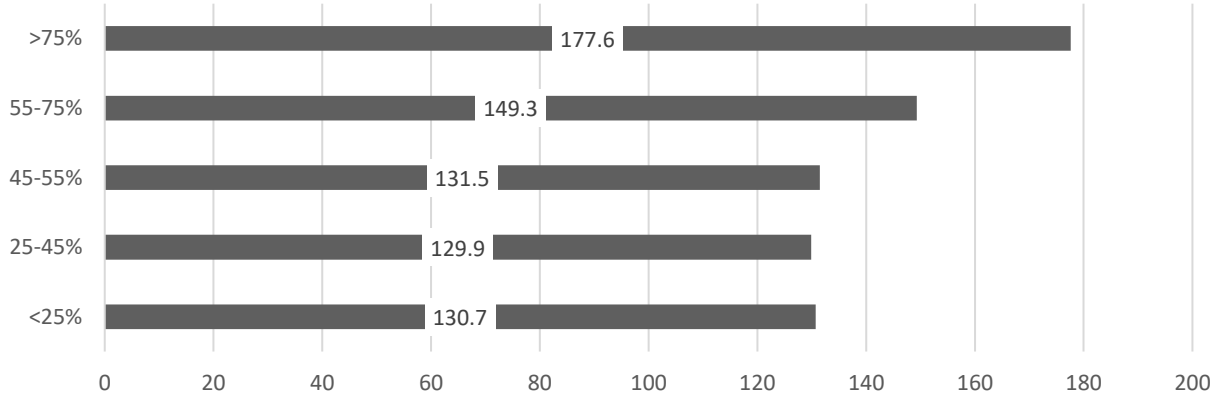


Figure 4. Covid-19 Deaths per 100,000 Residents from March 1, 2021 to December 1, 2021 by Percent Voting for Trump

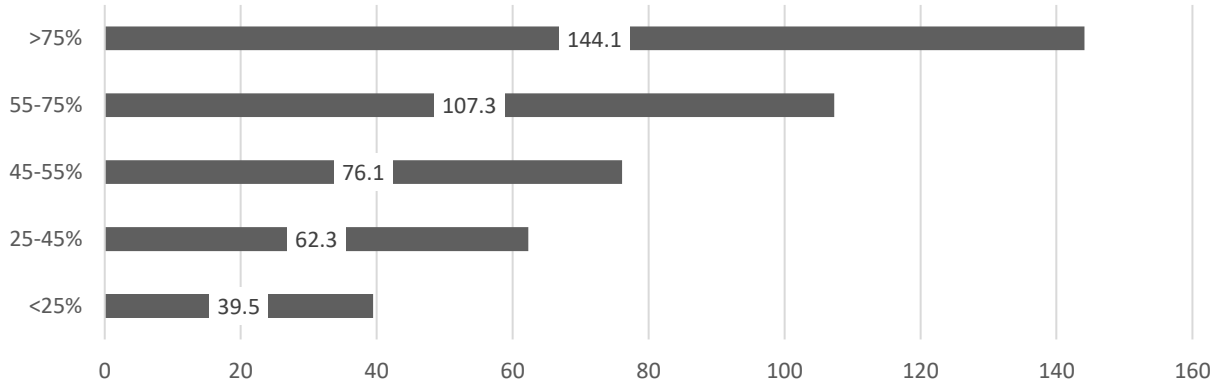


Table 1

Table 1. Covid-19 Deaths and Other Independent Variables by Percent Voting for Trump

Date & Variable	Percent Voting for Trump					
	Less than 25% (N=54)	25-45% (N=328)	45-55% (N=1,310)	55-75% (N=1,103	Greater than 75% (N=1,103	Total (N=3,112)
May 1, 2020						
Total Covid-19 Deaths	6,593	22,810	9,975	6,239	928	46,545
Deaths Per 100,000	22.1	18.6	14.9	7.3	4.0	14.2
March 1, 2021						
Total Covid-19 Deaths	45,514	182,121	97,774	133,636	41,841	500,886
Deaths Per 100,000	152.8	148.5	146.4	156.6	181.6	152.9
Pre-Vaccine Era	130.7	129.9	131.5	149.3	177.6	138.7
December 1, 2021						
Total Covid-19 Deaths	57,284	258,334	148,630	225,159	75,037	764,444
Deaths Per 100,000	192,3	210.8	222.5	263.9	325.7	233.4
Vaccine Era	39.5	62.3	76.1	107.3	144.1	80.5
Percent Non-Hispanic White	43.5	56.7	68.4	79.6	85.6	77.6
Percent with College Degree	37.3	29.7	25.5	19.7	16.2	20.4
Percent in Poverty	21.5	18.4	17.2	16.1	16.6	16.7
Total Population	29,778,394	122,572,718	66,801,292	85,319,109	23,036,379	327,507,892

In Figure 2, the data show that during the Initial Emergence period, COVID-19 deaths per 100,000 residents were more extensive in counties where Trump received a smaller proportion of the vote than in counties where Trump received a higher percent of the vote. In counties where Trump received less than 25 percent of the vote, there were 22.1 COVID-19 deaths per 100,000 residents, compared to only 4.0 in counties where Trump received more than 75 percent of the vote. As noted earlier, the primary reason for this is that the disease was more extensive in large cities where Trump did poorly during the Initial Emergence period. From Figure 3 it is apparent during the Pre-Vaccine period, death rates from COVID-19 were increasing more rapidly in Trump leaning counties compared to counties where Trump received a lower proportion of the vote. During this 10-month period, the death rate per 100,000 residents increased by 130.7 in counties where Trump received less than 25 percent of the vote compared to 177.6 in counties where Trump

received more than 75 percent of the vote. The impact of political views on COVID-19 death rates is vividly apparent in Figure 4 that examines the Vaccine Era time period. During this period, the number of deaths per 100,000 residents increased by 39.5 in counties where Trump received less than 25 percent of the vote, compared to 144.1 in counties where Trump received 75 percent or more of the vote. Thus, deaths per 100,000 residents was more than 3.5 times greater in strong Trump leaning counties than in strong Biden leaning counties.

In Table 2, data are presented showing regression models for each of the study time periods. Of greatest significance is the changing impact of political views when controlling for the effects of the other independent variables. During the Initial Emergence period, percent voting for Trump was negatively related to the COVID-19 death rate; during the Pre-Vaccine era, the relationship between political views and the COVID-19 death rate was positive but weak. Then during the Vaccine Era, the percent voting for Trump was very strongly related to COVID-19 deaths per 100,000 residents. Additionally, and as expected, death rates were lower in counties with a lower percentage of minority residents, where educational attainment levels are higher, and where poverty rates are lower

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Table 2

Table 2. Regression Models Showing Relationship Between Independent Variables and Covid-19 Deaths During Three Pandemic Period (N=3,112)

Independent Variables	Initial Emergencies		Pre-Vaccine		Vaccine Era		Total	
	Parameter Estimate	Standardized Beta	Parameter Estimate	Standardized Beta	Parameter Estimate	Standardized Beta	Parameter Estimate	Standardized Beta
Percent Voting For Trump	-0.415*	-0.284	0.456*	0.118	1.610*	0.580	1.650*	0.301
Percent Non-Hispanic White	0.054	0.047	-0.616*	-0.203	-0.332*	-0.151	-0.893*	-0.206
Percent With college Degree	-0.065	-0.028	-1.810*	-0.291	-0.766*	-0.170	-2.640*	-0.298
Percent in Poverty	-0.740*	-0.160	2.120*	0.174	2.230*	0.253	3.610*	0.208
Intercept	0.440*	0	1.770*	0	0.127	0	2.340*	0
F-value	69.03*	-	250.71*	-	847.26*	-	463.6*	-
Model R^2	0.082*	-	0.244*	-	0.522*	-	0.374*	-
*Statistically significant at the .01 level								

Conclusions

With the emergence of the COVID-19 pandemic, health experts had the knowledge to prevent the disease from becoming the disaster that actually unfolded where in two years more than 5 million people have died. In the U.S., disease impacts were strongly influenced by political views. During the Initial Emergence era, Trump leaning counties were safer from the virus because of their structural advantages as smaller and more isolated communities. During the Pre-Vaccine era, the death rate began rising in Trump leaning counties where it was evident that people were tending not to wear masks and social distance as advised by health experts. Finally, during the Vaccine Era, death rates were much greater in Trump leaning counties where people were less likely to be vaccinated or take other recommended precautions.

Discussion

A vital factor in the spread of COVID-19 was unrelated to the expertise of scientists and health experts. Rather, political views strongly influenced which policies were implemented locally and the extent to which people followed the recommendations of health experts. In counties where people failed to follow the advice of health experts, which tended to be Trump leaning counties, the consequences were severe as the virus continued to spread and people continued to die. Misinformation about COVID-19 had disastrous effects. In the years and decades to come, the world will be confronted with other serious concerns. Another disease may emerge,

or some of the impacts resulting from climate change will become progressively more disastrous. To effectively address these issues, it is critical that experts be able to effectively communicate scientifically sound information to the general public, and policy makers use the best information available to develop sound policy. Rebuilding trust in science and experts is vital for this to happen. This is a goal for which we must all work towards.

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