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The Political Pandemic: The Relationship Between Political Leanings, COVID-19, and the Economy in 2020

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Abstract

The effect of political leanings on the pandemic outcomes, both in terms of the COVID-19 cases and death totals and the extent that the pandemic affected the economy, is the analysis of interest. The literature indicates a relationship between political leanings and the COVID-19 response. Data is gathered from a variety of sources, and a series of regressions are performed to analyze several control variables and determine their significance. The results indicate a relationship between political leanings and COVID-19 outcomes. However, results regarding the effects of politics on the economy are less clear. Possible explanations are provided for the results.

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Introduction

Politics, the COVID-19 pandemic, and the economy are variables extensively discussed in the literature. However, further research is needed on how these variables relate to each other. Specifically, the precise role politics played in the spread of COVID-19 and in the pandemic effects on the economy still must be examined. While the literature discusses the relationship between politics and COVID-19 response, it is still lacking on how political influences affected COVID-19's outcomes and the economy.

The hypothesis to be analyzed is the following: Democratic party leanings lowered the number of COVID-19 cases and deaths at the expense of worsening the economy, while Republican party leanings caused a state to have higher COVID-19 cases and death totals but also a lessened impact on the economy.

A literature review is provided for context and to inform data decisions. Data selection is explained, followed by a description of the methodological process for developing the empirical models. Results of the final models are presented and subsequently discussed.

Literature Review

On March 11th, 2020, the World Health Organization declared that COVID-19 was a pandemic. Cucinotta and Vanelli (2020) discuss the beginning of the Pandemic and provide insights over what was known at that time. The authors report that:

> At a news briefing, WHO Director-General, Dr. Tedros Adhanom Ghebreyesus, noted that over the past 2 weeks, the number of cases outside China increased 13-fold and the number of countries with cases increased threefold. Further increases are expected. He

> said that the WHO is "deeply concerned both by the alarming levels of spread and severity and by the alarming levels of inaction," and he called on countries to take action now to contain the virus. "We should double down," he said. "We should be more aggressive (Cucinotta and Vanelli, 2020, page 1)."

This is an important recommendation from Director-General Ghebreyesus because he is urging not only action against COVID-19's spread but also policy directives. According to the same authors, "Risk factors for severe illness remains uncertain (although older age and comorbidity have emerged as likely important factors)," and there are "no proven effective specific treatments (Cucinotta and Vanelli, 2020, page 1). This point is important because it identifies age as a potential risk factor for COVID-19, which means that the population's age in an area should be considered as a control variable for regressions where COVID-19 deaths are the dependent variable. This contribution to the literature demonstrates two important aspects of the early pandemic: the uncertainty surrounding the virus itself and the call for countries to take action to prevent the spread of COVID-19.

Schneider (2020) discusses knowledge about COVID-19 and policies to combat it. The author begins by discussing the lockdown policies aimed at preventing the spread of COVID-19 and notes that "Only astute early interventions in Seattle and the San Francisco Bay Area seem to have stemmed a potential tide of cases and deaths (page 299)." This is only a brief mention about interventions but it makes note that policies appear to be able to affect COVID-19 results. Upon discussing the United States' COVID-19 cases and deaths, he ponders that "one key answer is testing (page 300)." He further explains that, in the United States, testing was "slow to start and to this day not sufficiently ramped up (page 300)." This failure to test and contain outbreaks led to the fast-tracking of vaccines and the "unprecedented strategy of nonpharmacologic interventions (NPIs) involving draconian school and business closures, stay-at-home orders, and physical distancing (page 300)." The author also expresses concern over the NPIs' economic ramifications and health detriments associated both with mental health and the inability to receive care. However, if more testing was present, he poses the question: "What decisions are the results meant to inform? (page 301)" He provides forecasting models as an example, which allow for insight into "future demand for care." The author elaborates on models further:

> During this pandemic, model forecasts have ranged from tens of thousands to more than 2 million deaths during the initial months of the U.S. epidemic. This variation is not surprising. Modeling is difficult, and a paucity of the facts required to inform models is problematic. Precise facts about the virus, its transmissibility, clinical course, and lethality are only just beginning to emerge. Few facts are known about the effectiveness of physical distancing and other NPIs, which depend on unpredictable human behavior. Modelers make up for missing facts by including assumptions. Critiques of the models have centered on the assumptions used and their influence on results: as the refrain goes, models are only as good as their assumptions (Schneider, 2020, page 301).

This shows the importance of data gathering for the pandemic and how the lack of data created uncertainty and a wide range of estimations. Schneider (2020) and Cucinotta and Vanelli (2020) demonstrate the uncertainty around the early pandemic and how this uncertainty informed policy directives such as the NPIs.

Jenson (2020) discusses the early pandemic lockdown decisions, the rationale behind them, and their cost relating to the economy. Interestingly, although this author is concerned with the economy, his paper was published in the Asian Journal of Psychiatry, a medical journal.

The first few paragraphs to Jenson's article discuss the rationale behind "flattening the curve," explained as:

> A high peak that exceeded capacity, specifically the availability of intensive care beds and ventilators, would limit access to appropriate healthcare and result in otherwise preventable deaths. The steps to "flatten the curve" are intended to slow viral transmission in order to *delay* the onset of enough cases to lower the peak and spread the distribution of cases over time, not specifically to *prevent* the overall incidence of cases during the pandemic (Jenson, 2020, page 1)."

This is an important clarification because it informs that the policies are not aimed at minimizing cases, but rather minimizing deaths by allowing the healthcare system to take on fewer cases at once over a longer time period. Jenson then discusses these measures in more detail: "state authorities have closed schools and universities, closed non-essential businesses, and enacted stay-at-home policies requiring sheltering-in-place of the general populace at home (page 1)." He also states that these actions "undoubtedly reduced COVID-19 associated mortality," but that in some areas which met the needs of COVID-19 many hospitals became "severely challenged financially, some to the point of viability (page 2)." Furthermore, he discusses: "Though the results are multifactorial and cannot be simplified, currently there is not consistent evidence that countries or states that have been strictly locked down are uniformly faring better than states that have not (page 2)," later adding that "Some states in the United States are taking far less draconian measures and have fared better than some states taking extreme restrictions (page 3)." Doubting the policy directives, the author ponders: "Have the decisions made by state governors been based in science or do they reflect a herd mentality? Fear *is* contagious. A reality is that we do not have scientific evidence as the basis for many of these actions (page 3)." This article is an important contribution to the literature because it provides a medical perspective which is critical of the lockdown policies. The indication that there are instances of states which directed fewer policies against COVID-19 but did not do worse with the pandemic is an important note because it explains how the policies may not necessarily be a positive influence. Furthermore, this contribution to the literature exposes how there is a trade-off between COVID-19 policy and the economy.

To pivot to a more political perspective, Baccini and Brodeur (2020) discuss a partisan role in pandemic policies. The authors explain their findings:

> we found that Democratic governors were significantly more likely to implement a statewide order. In our most conservative estimate, being a Democratic governor increased the probability of implementing a stay-at-home order by more than 50%. Furthermore, states with Democratic governors were quicker to implement statewide orders than states with Republican governors (Baccini and Brodeur, 2020, page 215).

Similarly, they claim that their "results seem to indicate that Democratic governors place special emphasis on health and safety, whereas Republican governors are particularly concerned about the economic costs of stay-at-home measures (page 216)." The main takeaway from this article is that a state's governor policy directives affected both the economy of a state and the state's COVID-19 situation.

Another contribution to the literature, by Goolsby et al. (2020), finds a further link between political leanings and COVID-19 policy. The authors claim that "local policies were prevalent and their timing differed from the more widely used state-level policies. Locations that adopted policies before their state did tend to be larger, have higher COVID caseloads, and a smaller GOP vote share in 2016 (page 3)." This paper is relevant because it provides further evidence for a link between COVID-19 response and political leanings. It also shows that the political leanings of localities influence COVID-19 policy outside of the statewide government's political leanings, which means that the state government's partisan composition is not the only political variable relevant to COVID-19. Adolph et al. (2020) also look at which factors predicted COVID-19 response, only the authors examine re-opening policies rather than closure policies. Their analysis indicates that "The most important single variable predicting easing was straightforward: states with more dispersed populations were 2.02 times more likely to ease on a given day (page 8)." In addition, "higher COVID-19 deaths rates were the second most powerful predictor of delayed U-turns (page 8)," and "The third most important single predictor of easing was the party of the governor (page 9)." Finally, "The fourth most powerful predictor of easing was race (page 9)." This analysis provides insight into which factors are both relevant to political variables and COVID-19, which make for insights into control variables. This piece in the literature contributes further evidence of the partisan divide in COVID-19 response.

The mask mandates in different states served as a natural experiment, according to Lyu and Wehby (2020). Their main findings are:

> There was a significant decline in daily COVID-19 growth rate after the mandating of face covers in public, with the effect increasing over time after the orders were signed. Specifically, the daily case rate declined by 0.9, 1.1, 1.4, 1.7, and 2.0 percentage points within 1–5, 6–10, 11–15, 16–20, and 21 or more days after signing, respectively. All of these declines were statistically significant ($p<0.05$ or less). In contrast, the pre-event trends in COVID-19 case growth rates were small and statistically insignificant (Lyu and Wehby, 2020, page 1422).

The reason why this is important is because it provides evidence that policies aimed at preventing the spread of COVID-19 can have an effect on slowing it.

Hao et al., (2021) discuss factors in the decision to social distance. They cite many different papers finding factors for compliance with social distancing. Notably for the topic of interest, "sociodemographic background and political orientation (page 1)," were factors towards pandemic response. A further political find is that "faith in President Trump is a strong predictor in refusal to social distance (page 1)." They also present another factor in the decision to social distance, which is that Catholics were more likely to practice it. Additional evidence from the literature is provided on the idea that Republican and Democratic governors had different COVID-19 responses with Democratic governors being more concerned with COVID-19 and Republicans having less concern.

After providing a literature review, they begin to work on their hypothesis regarding the role of political leanings in COVID-19 response. Specifically, they posit that: "People from states with Democratic Party controlled government are more likely to wear face masks in response to COVID–19 than people from other states (page 3)." Their findings support their hypothesis. This is an important contribution to the literature because it provides the evidence suggesting a link between political leanings and compliance with COVID-19 policy, which compliments the literature finding links between partisanship and COVID-19 outcomes. Furthermore, their literature review also provides insights into other factors which influenced COVID-19 not outlined in other literature reviews, such as Catholics social distancing more.

According to an article in Environmental Challenges by Alam and Sultana (2021), several climatic factors contributed to the COVID spread, including air temperature, humidity, rainfall, wind speed, and air pollution. However, they do note that the research on humidity and rainfall is conflicting, but it is worthwhile to assess them as control variables. Meanwhile the non-climatic factors are population density, household size, social/physical distancing and isolation/quarantine, socioeconomic conditions, awareness level, lifestyle, host immunity, personal hygiene practice, healthcare facilities, public misinformation, and migratory flow. This is an important contribution because it outlines the factors that influences COVID-19 and provides insights into variables which could be valuable as controls for regressions.

Risk factors for severe illness also play a role in the context behind COVID-19. To investigate this topic, Rod et al., (2020) review 17 studies. Age, diabetes, smoking, cancer, and cardiovascular disease are indicated as some of the many factors contributing to severe illness. This is an important review of the literature because it outlines possible factors for which it is prudent to include as potential control variables.

Methodology

The main variable of interest are political variables as an independent variable and COVID-19 and economic indicators as dependent variables, where separate models will be estimated for each dependent variable. Political variables were gathered from two sources, the first is the National Conference of State Legislatures (NCSL, 2022) which provided the information on which party controlled each states' legislature and the party of the governor in 2020. They also provided the overall control of the state but that could've been calculated from the legislative and governor's political parties. One part of this data was altered, because the Alaska State House had a nonpartisan Speaker of the House during 2020, according to the

Alaska state legislature's website (The Alaska State Legislature, 2022) page for the 2019-2020 congress, and so Alaska was assigned to have a divided legislature and divided government. Other political data comes from the MIT election lab, which is a part of the Harvard Dataverse (MIT Election Data and Science Lab, 2021). The data in question tracks the results for each presidential election since 1976. The 2016 United States Presidential Election was the most recent election preceding the onset of the pandemic, and so it is the most accurate measure of overall political leaning independent of state government composition of a state going into the pandemic. The margin by which the Democratic party nominee won or lost a state was calculated from the results into a variable called Democratic Margin. COVID-19 and Economic data was the next crucial step in gathering data. The COVID Tracking Project of the Atlantic contains data about COVID-19 by state from the beginning of the Pandemic until March of 2021 (The COVID Tracking Project, 2021). This is a panel dataset which is tracked daily. For regression purposes COVID-19 total cases and deaths reported by the end of 2020 adjusted for population will be used alongside a variable which was computed to measure the death rate from COVID-19. This variable was created by dividing the deaths by the cases. The COVID-19 cases and deaths per one hundred thousand people were calculated based on population data from the Decennial Census, (United States Census Bureau, 2021). These variables are the totals divided by time rather than the totals divided by the population. The Bureau of Economic Analysis contains economic data for Real Gross Domestic Product and Personal Income Per Capita by state (Bureau of Economic Analysis, 2022). These variables are in panel datasets which are tracked quarterly. The total change from the first quarter to the fourth quarter was computed, both in terms of the raw total and the percentage change. The geometric mean was also computed because it could possibly yield some information but it is not a primary variable of interest.

The literature informed several of the data sources which were required to analyze the effect that a State Government's political leanings had on COVID-19 and on how the pandemic affected the State's economy. The article from Adolph at al. (2021), looking at factors which played a role in policies to re-open, played a strong role in informing data decisions. Population density is a crucial a factor in COVID-19 spread and informed policy decisions, therefore population data was taken by state from the Decennial Census (United States Census Bureau, 2021). Urban and rural populations of a state were also included as control variables from a separate dataset from the Census (United States Census Bureau, 2021). This dataset also contains the urban and rural area and densities in addition to population. The dataset in question tracks historical populations and population densities, as well as congressional districts, by state. The only variables that will be used or considered for controls will be population density and total population, and the only year considered is 2020. However, the state area was also calculated from the population and population density. Another factor indicated by Adolph et al. (2021) is race. This variable is also controlled for, with the data coming from Kaiser Family Foundation (Kaiser Family Foundation, 2021). Adolph et al. indicates that the Black and Hispanic populations of a state were the important factors so those two variables along with the White population are the variables which will be used for regressions. However, multiple other variables were included for the state's population percentage for many other racial groups.

Climatic and Non-Climatic factors, without political consideration, were included as suggested by Alam and Sultana (2021). Temperature was controlled for because it was indicated as a factor effecting COVID-19, and whether or not it is related to political variables will be assessed. Temperature Data was gathered from the National Oceanic and Atmospheric Administration (NOAA National Centers for Environmental Information, 2022). The NOAA also had data over precipitation available so that was also gathered and cleaned on the basis that it was related to COVID-19. The temperature data is a statewide average for each state except Hawaii. The reason why Hawaii does not have an average statewide temperature computed is that, according to NOAA (personal communication, March 7th, 2022), the presence of Microclimates and the distribution of weather stations in Hawaii prevents the statewide averages from being calculated. However, the NOAA does have data from different cities in Hawaii. Thus, a placeholder average temperature was calculated from the averages provided for the cities. There was a similar situation for precipitation in Hawaii, and a similar solution was implemented. Alam and Sultana (2021) indicate other climatic factors as humidity, wind speed, and air pollution. Humidity and precipitation would likely incur a multicollinearity issue and so humidity did not need inclusion. Wind speed data by state was hard to encounter, so installed wind power capacity was taken as a variable which could approximate wind speed. The data comes from the Office of Energy Efficiency and Renewable Energy (WINDExchange, 2022). However, another variable was calculated manually to adjust for the wind energy by size of the state, the variable was called Area Adjusted Wind Power. Ozone and PM2.5 concentrations were two of the pollutants indicated by Alam and Sultana (2021), they can be obtained from the CDC's National Environmental Public Health Tracking Network (National Environmental Public Health Tracking Network, 2022). Data over the third pollutant, NO2 did not appear to be available by state.

Non-Climatic factors, as indicated by Alam and Sultana (2021), are household size, socioeconomic conditions, awareness levels, and others. Fertility rate data for each state was gathered from the CDC in addition to this because, while not explicitly indicated as a COVID-19 factor, is a possible way to account for household size (National Center for Health Statistics, 2022). The dataset for fertility was a panel data tracking fertility over time, since fertility rates years ago could still be relevant to COVID-19 cases, and the over-time average fertility was computed for each state.

Economic indicators, included as dependent variables in some regressions, were also included as controls in regressions where COVID-19 is the dependent variable given the possibility of a relationship between them and the political variables. They correspond to the first quarter of 2020 because the first quarter ends with March and the Pandemic began on March 11th. The lockdowns quickly followed, so the first quarter numbers mostly measure pre-pandemic levels and indicate the pre-pandemic socio-economic variables. First quarter observations could also measure the resources of an economy which could be used to combat COVID-19 going into the pandemic. For awareness levels, Alam and Sultana (2021) note that educated people are more aware of COVID-19, and so education was also included as a control variable. College completion rates were gathered from the Economic Research Service of the United States Department of Agriculture (Economic Research Service, 2021). They are both percentage variables tracked by state. College completion is measured only for the adult population of a state. There are other non-climatic factors of note listed by Alam and Sultana (2021) which are lifestyles, personal hygiene, and misinformation. It isn’t apparent if those factors are related to politics, but if they are then it would cause omitted variable bias. However, these factors are also likely to be correlated with education like awareness levels and so there isn’t any additional need to control for them. Alam and Sultana (2021) note that social distancing played a role, however they also note that that is related to population density, which is already being controlled for and so a multicollinearity issue is likely. Healthcare facilities also played a role in COVID-19 but, as noted by Alam and Sultana (2021), they are related to socioeconomic factors and would likely cause multicollinearity issues as well.

Other controls included in the regressions are the following. The census contains a dataset which estimated the amount of people at each age for each state (United States Census Bureau, 2019). This dataset was used to manually calculate the senior population percentage of each state by adding together the totals for each age 65 and above for each state. That data was divided by the total population to calculate the percentage of the elderly population. Early in the pandemic age was indicated as a potential risk factor for severe illness with COVID-19 (Cucinotta and Vanelli, 2020). Thus, senior population will be controlled for in regressions involving deaths from COVID-19 as a dependent variable. There are several other variables indicated by Rod et al., (2020) as risk factors for severe illness but only a few of them are included. Those are: smoking, cancer, cardiovascular disease, diabetes, chronic kidney disease, and lower respiratory disease. All of these variables come from the CDC (National Center for Health Statistics, 2022). The smoking variable comes from the STATE system of the CDC (State Tobacco Activities Tracking and Evaluation System, 2021). The dataset did not contain the value for New Jersey so the 2018 value was taken from the New Jersey Department of Health (New Jersey Department of Health, 2021). All of the other variables indicated by Rod et al., (2020) come from the CDC as well and track mortality rates and total mortality from those causes.

The percentage of a state's population which is Catholic is another control because, according to Hao et al. (2021), Catholics tended to social distance more. The data to control for this factor was taken from the Association of Religious Databases Archives (ARDA, 2010). The data is outdated, but it appears to be the most recent by state dataset for Catholic population.

Table 1 presents the list of variables included and their descriptive statistics.

Table 1- Data Descriptions

Statistic	N	Mean	St. Dev.	Min	Median	Max
Democratic Legislature	50	0.380	0.490	0	0	1
Republican Legislature	50	0.560	0.501	0	1	1
Democratic Governor	50	0.480	0.505	0	0	1
Fully Democratic Government	50	0.300	0.463	0	0	1
Fully Republican Government	50	0.400	0.495	0	0	1
2016 Trump Percentage	50	0.491	0.104	0.294	0.488	0.686
2016 Clinton Percentage	50	0.436	0.102	0.216	0.459	0.617
2016 Democratic Margin	50	-5.476	20.185	-45.770	-3.600	31.541
COVID-19 Death Rate	50	1.622	0.663	0.453	1.471	3.613
Population Density	50	206.508	274.917	1.300	108.300	1,263.000
COVID-19 Cases Per 100,000	50	6,239.325	2,125.881	1,152.584	6,210.170	11,872.120
COVID-19 Deaths Per 100,000	50	98.029	44.448	19.790	93.839	204.995
Urban Population Percentage	50	73.582	14.565	38.660	73.735	94.950
Urban Population Density	50	2,149.674	665.372	1,232.600	2,042.050	4,303.700
Urban Area Percentage	50	7.413	10.393	0.050	3.520	39.700
Rural Population Percentage	50	26.418	14.565	5.050	26.265	61.340
Rural Population Density	50	38.742	36.626	0.400	29.050	154.000
Rural Area Percent	50	92.587	10.393	60.300	96.480	99.950
Change in GDP	50	-3,715.798	7,521.225	-40,459.500	-1,708.550	6,736.200
Percentage GDP Change	50	-1.031	2.443	-9.734	-0.478	3.937
Geometric Mean of GDP	50	361,902.400	471,684.600	28,618.920	210,521.700	2,661,805.000
First Quarter GDP Per Capita	50	0.054	0.010	0.035	0.052	0.073
First Quarter Personal Income Per Capita	50	54,601.140	7,947.148	40,120	53,829	75,754

Change in Personal Income Per Capita	50	1,824.180	907.776	-220	1,899.5	4,423
Percentage PIPC Change	50	3.327	1.503	-0.413	3.232	7.250
Geometric Mean of PIPC	50	56,685.030	8,100.306	42,207.320	55,510.480	77,584.270
Precipitation	50	38.702	18.772	5.860	41.215	68.840
Average Temperature	50	53.820	9.028	27.500	53.150	74.780
Area Adjusted Wind Power	50	0.023	0.028	0	0.01	0
Ozone Concentration	50	1.644	3.457	0.000	0.431	21.531
PM2.5 Concentration	50	7.602	1.902	3.625	7.656	13.880
College Completion Rate	50	31.235	5.220	20.615	30.686	43.689
White Population Percentage	50	68.300	15.940	20.400	70.500	93.200
Black Population Percentage	50	10.244	9.461	0.600	6.950	37.600
Hispanic Population Percentage	50	12.214	10.564	1.400	9.700	49.500
Asian Population Percentage	50	4.318	5.779	0.600	2.750	39.400
Native Population Percentage	50	1.508	2.914	0.000	0.400	15.100
Pacific Population Percentage	50	0.312	1.452	0	0	10
Multiple Races Population Percentage	50	3.076	2.518	1.400	2.550	18.400
Catholic Population Percentage	50	16.925	10.490	3.510	15.545	44.900
Senior Population Percentage	50	16.781	1.903	11.183	16.716	20.939
Smoking Rate	50	16.266	3.279	7.900	15.950	23.800
Cancer Mortality Rates	50	147.128	13.820	119.500	147.100	177.300
Heart Disease Mortality Rates	50	169.000	31.482	118.100	162.450	245.600
Diabetes Mortality Rates	50	25.216	5.153	17.000	24.250	41.300
Kidney Disease Mortality Rates	50	12.402	4.382	2.700	11.600	22.200
Lower Respiratory Disease Mortality Rates	50	39.234	10.176	17.800	37.950	60.400
Fertility Rate	50	61.746	5.829	49.112	61.838	74.775

In developing models, it appears that for COVID-19 cases per one hundred thousand, the strongest variables are: Democratic margin, Black population percentage, White Population Percentage, Hispanic Population Percentage, Catholic population percentage, and the fertility rate. Meanwhile, COVID-19 deaths per one hundred thousand held Democratic margin, a fully Republican government, urban area percentage, rural population density, Black population percentage, and Catholic population percentage. The COVID-19 death rate for a state was influenced by different factors: Democratic margin, urban area percent, Catholic population percent, Black population percent, White population percent, heart disease mortality, cancer mortality, and smoking rate. The percentage change in real GDP and COVID-19 cases per one hundred thousand were broadly associated with the same factors: Democratic margin, Black population percentage, White Population Percentage, Hispanic Population Percentage, Catholic population percentage. However, the real GDP change had one additional covariate which was strongly linked to it which was a Democratic legislature. Percentage change in Personal Income Per Capita was influenced by a Republican Legislature, COVID-19 cases per Hundred Thousand, urban population density, urban population percentage, and college completion rate. Democratic margin was not significant at a ninety-percent or above level, however if it is excluded from the model, several additional variables are no longer significant at a ninety-percent or more. The p-value for Democratic margin in the PIPC model indicates a significance level above eighty percent, which isn't low enough to exclude it from the model given that other variables are more significant when it is included.

In order to check for potential obscured issues, robustness checks were performed for multicollinearity and heteroscedasticity. None of the initial results appeared to indicate issues with either multicollinearity or heteroscedasticity. Multicollinearity tests were performed first.

The variance inflation factor was calculated for each of these models, and it indicated that there were no multicollinearity issues as no factor showed a value above ten.

Table 2 shows the variance inflation factor for each covariate in each model.

Table 2- Variance Inflation Factors

	Cases Per HT Model (1)	Deaths Per HT Model (2)	Death Rate Model (3)	Real GDP Change Percentage Model (4)	Personal Income Per Capita Change Percentage Model (5)
Democratic Margin	3.90	2.20	3.50	3.99	4.59
Fully Republican Government		1.99			
Urban Area Percent		8.37	2.24		
Rural Population Density		6.91			
Democratic Legislature					
Catholic Population Percent	1.73	2.70	2.71	1.73	
Black Population Percent	2.00	1.46	2.40	1.69	
White Population Percent	5.14		2.36	3.47	
Hispanic Population Percent	2.95			2.74	
Fertility Rate	2.53				
Heart Disease Mortality			3.55		
Cancer Mortality			6.89		
Smoking Rate			5.66		
Republican Legislature					2.63
COVID-19 Cases Per Hundred Thousand					2.63

Urban Population Density	1.99
Urban Population Percent	2.58
College Completion Rate	2.33

White's tests were performed for each of the regressions. A second regression follows the White's test which uses White's standard errors to provide insight into how a variable's significance changes. For the model with COVID-19 cases per one hundred thousand as a dependent variable, the White's test indicated no heteroscedasticity issues with any of the covariates. Furthermore, the White's test indicated no heteroscedasticity issues associated with the variables included in the COVID-19 deaths per one hundred thousand model. The death rate model indicated heteroscedasticity issues for several variables in the model. Every variable was significant in the white's test with the exception of urban area percent, Catholic population percent, and heart disease mortality. However, when using White's standard errors in a regression, only the smoking rate variable loses its significance making heteroscedasticity a minimal issue for most variables. If smoking rate is excluded from the regression, several other variables lose their significance. Thus, smoking rate was included in the model. Furthermore, when using White's standard errors, the p-value indicates a significance level above eighty-eight percent, which isn't low enough for exclusion to be prudent when other variables lose significance without it. The percentage change in real GDP's test for heteroscedasticity showed that the cross product between Democratic margin and Democratic legislature was significance. When using White's standard errors Democratic margin loses its significance, but the p-value indicates a significance level above eighty-nine percent. This is still significant enough for inclusion, and the White's test only indicated that one cross product and no other variable was heteroscedastic. The final White's test for PIPC showed significance for the cross product between COVID-19 cases per one hundred thousand and the college completion rate. However, when using White's standard errors, every variable except for urban population percent and college completion rate loses their significance. The only variable to both be indicated by the White's test as heteroscedastic and lose its significance was COVID-19 cases per hundred thousand. However, the significance level is above eighty-eight percent and the heteroscedasticity was indicated for a single cross product and no other variables in the White's text, the COVID-19 cases per one hundred thousand variables did not need exclusion.

Results

Table 3- Final Models

	Cases Per HT Model	Deaths Per HT Model	Death Rate Model	Real GDP Change Percentage Model	PIPC Change Percentage Model
	(1)	(2)	(3)	(4)	(5)
Democratic Margin	-45.000***	-0.958***	0.012**	0.070**	0.027
	(16.308)	(0.240)	(0.005)	(0.026)	(0.020)
Fully Republican Government		22.423**			
		(9.295)			
Urban Area Percent		1.997**	0.023***		
		(0.909)	(0.008)		
Rural Density		-0.485**			
		(0.234)			
Democratic Legislature				-2.054**	
				(0.939)	

Catholic Population Percentage	101.038***	3.875***	0.025***	-0.078**	
	(20.898)	(0.512)	(0.009)	(0.033)	
Black Population Percentage	85.302***	2.484***	0.019**	0.103***	
	(24.897)	(0.416)	(0.009)	(0.036)	
White Population Percent	61.954**		0.010*	0.179***	
	(23.709)		(0.005)	(0.031)	
Hispanic Population Percentage	79.281***			0.164***	
	(27.084)			(0.041)	
Fertility Rate	235.731***				
	(45.446)				
Heart Disease Mortality			0.007**		
			(0.003)		
Cancer Mortality			-0.022**		
			(0.010)		
Smoking Rate			0.080**		
			(0.040)		
Republican Legislature					1.250**
					(0.619)
COVID-19 Cases Per One Hundred Thousand					0.0002456*
					(0.0001269)
Urban Density					0.0010371**
					(0.0004279)
Urban Percent					-0.063***
					(0.021)
College Completion Rate					0.137**
					(0.056)
Constant	-16,346.260***	-3.224	0.990	-13.862***	-0.631
	(4,208.956)	(11.704)	(0.823)	(2.651)	(2.124)

Akaike Inf. Crit.	856.565	463.2377	55.68189	211.023	179.479
Bayesian Inf. Crit.	871.861	478.5339	74.80212	226.3192	194.7752
Adjusted R-squared	0.6987	0.7358	0.6684	0.4362	0.207

Notes: ***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

In the model for Cases per one hundred thousand, the results indicate that for every one percentage point increase in the 2016 presidential election Democratic margin, there was an average case decrease of 45 in COVID-19 cases per one hundred thousand, all else equal. For every one percentage point increase in a state's Catholic population percentage, there is a 101.038 case increase in the number of COVID-19 cases on average all else equal. A percentage point increase in the Black population percentage of a state led to an average increase of 85.302 cases per hundred thousand, all else equal. For every additional percentage point increase in the White population percentage, there were 62.954 additional cases per hundred thousand, all else equal. Increases in the Hispanic population percentage increased the number of COVID-19 cases per one hundred thousand by an average of 79.281 cases all else equal. The last variable in the model for cases is the fertility rate. A one-unit increase in the fertility rate led to an average increase of 235.731 COVID-19 cases, all else equal.

A one percentage point increase in the democratic margin indicates an average decrease in the COVID-19 deaths per one hundred thousand of 0.958, all else equal. A fully Republican government led to an average increase of 22.423 COVID-19 deaths per hundred thousand, all else equal. For every one percentage point increase in the urban area percentage of a state, that state had on average 1.997 more cases, all else equal. A one-unit increase in rural density led to an average decrease in the number of COVD-19 deaths of 0.485, all else equal. States with higher Black population percentages saw higher COVID-19 deaths per one hundred thousand of on average 2.484 for every one percentage point increase in the Black population, all else equal. Additional COVID-19 deaths per one hundred thousand are also associated with a higher Catholic population percentage. The results show for every one percentage point increase in the Catholic population, there were 3.875 additional deaths, on average all else equal.

The death rate was increased by an average of 0.012 percentage points for every one percentage point increase in the Democratic margin, all else equal. Urban area percentage increases of one percentage point contributed an average of 0.023 percentage points to the COVID-19 death rate in a state, all else equal. A one percentage point increase in the Smoking rate led to an average 0.080 percentage point increase in the COVID-19 death rate, all else equal. Each unit increase in the cancer mortality led to a decrease in the COVID-19 death rate of an average of 0.022 percentage points, all else equal. The heart disease mortality unit increases led to a 0.007 percentage point increase, on average, all else equal. Increases in the White population led to an average increase in the COVID-19 death rate of 0.010 all else equal. A unit increase in the Black population percentage led to an increase of 0.019 percentage points in the death rate, on average all else equal.

A percentage point increase in the Democratic margin led to a 0.070 increase in the real GDP change percentage, on average all else equal, as indicated by the real GDP change percentage model. A state having a Democratic legislature was associated with an average decrease in GDP of 2.054 percentage points, on average all else equal. The Black population percentage of a state increased the real GDP change percentage. Each percentage point increase in the Black population led to an average 0.103 percentage point increase in real GDP, all else equal. For each one percentage point increase in the white population, there was an average of a 0.179 percentage point increase in the change in real GDP, all else equal. For each one percentage point increase in the Hispanic population, there was a 0.164 percentage point increase in the change in real GDP, on average all else equal. Higher Catholic populations were associated with a GDP decrease of 0.078 percentage points, on average all else equal.

Each additional percentage point increase in the Democratic margin, led to an increase in the PIPC change of 0.027, on average, all else equal, but is not significant. Republican legislatures were associated with a Personal Income per capita increase of 1.25 percentage points, on average all else equal. For every one case increase in the number of COVID-19 cases per one hundred thousand, there was an average increase in PIPC of 0.0002456 percentage points, all else equal. Urban density was associated with an average of 0.0010371 percentage point increase in personal income per capita for every one unit increase in urban density, all else equal. Urban population percentage point increases were associated with a 0.063 percentage point increase in the change in personal income per capita. For every additional percentage point that a state saw higher college completion, there was a corresponding 0.137 percentage point increase in the change in PIPC.

Discussion

The results indicate that a higher democratic margin was a statistically significant factor for COVID-19 cases per one hundred thousand. This aligns with what the literature indicates about political leanings playing a role in COVID-19. Goolsby et al. (2020), found that local level leanings played a role in COVID-19 policies and found that counties that social distanced earlier had lower GOP vote shares in 2016. Thus, the significance of the statewide Democratic margin on COVID-19 cases per hundred thousand is understandable. Hao et al. (2021) indicated that Catholics tended to social distance more often. The results here are that states with higher Catholic populations have more cases, which goes contrary to the expectation based on the literature. The reason for this is not apparent, but a possible explanation would be that a higher Catholic population could be associated with some other factor which increases the number of cases not being controlled for, causing omitted variable bias. Another possible explanation is that there is some characteristic within Catholic populations that, despite social distancing protocols, may increase their risk of COVID-19 exposure. It is also possible that there is some factor of states with high Catholic populations having this unobserved characteristic, rather than the Catholic population itself. All three racial/ethnic variables included in the model were associated with an increase in the number of COVID-19 cases. However, the coefficients are different. This follows from the fact that the racial variables are proportions measuring a state's demography, so each racial/ethnic variable having a different coefficient with the same sign accounts for the relative differences. The results indicate that states with a higher Black population percentage saw increases in cases that were higher relative to the increases in cases from states with higher Hispanic or White population proportions. States with higher White population percentages saw lower increases in COVID-19 cases relative to the increases associated with Hispanic or Black populations. These results align with the findings expressed by Adolph et al. (2021). Fertility rates were the final factor associated with an increase in COVID-19 cases per hundred thousand. This variable was included to control for household size, which was indicated by Alam and Sultana (2021) to be a factor in COVID-19 spread. Vogl and Freese (2020) discuss the relationship between conservatism and fertility. One of their findings is that: "High school dropouts average 5.8 siblings, whereas postgraduate degree holders average 2.5 (page 7697)." That indicates a relationship between family size and education, which may be having an uncontrolled influence on the results since college completion was the only control included. The same authors report that: "In our sample, non-Hispanic blacks have

2.0 more siblings than whites on average, while Hispanics have 1.9 more (page 7697)." This could be another possible explanation for why there are higher cases in states with higher Black or Hispanic populations, but that is provided the sample is representative of the population.

Democratic margin was associated with a decrease in COVID-19 deaths per one hundred thousand. The rationale behind these variables decreasing the number of deaths adjusted for the population would be similar to the rationale as to why they decrease cases per hundred thousand. A fully Republican government was a significant factor in COVID-19 deaths per hundred thousand, the results indicating that states with Republican governments saw higher COVID-19 deaths per one hundred thousand. The fact that it is only a fully Republican government and not the governor's party appears to imply the earlier idea that Republican governors without republican legislatures may be more moderate or more aggressive with COVID-19 policy than the average Republican governor. That is just one possible explanation for this occurrence. The other factors are: urban area percent, rural density, Black population percentage, and Catholic population percentage. It is not apparent why urban area percent is more significant than urban density or urban population percent. One explanation is that states with higher urban area percentages may have some characteristic which is also a COVID-19 risk factor. This explanation accounts for the fact that urban area percent is not significant for the number of COVID-19 cases and only the deaths. Higher rural densities were associated with fewer deaths. A possible reason why is that higher rural densities mean that more proportionately people are living outside of an urban area, thus not being included in the unobserved characteristic of urban areas which increase severe illness risk. Another possibility which takes that into effect is that rural areas also have some characteristic that reduces risk for COVID-19 severe illness. Adolph et al., (2021) found that states with higher Black populations re-opened sooner than average, despite Black populations being more susceptible to COVID-19. The model indicates that states with higher Black populations saw more deaths. The findings of Adolph et al., (2021) could serve as a possible explanation. However, it is also possible there are unobserved characteristics of Black communities that are not being captured. Catholic population percentage increases the number of deaths per one hundred thousand and a possible explanation is that Catholic populations or states with high Catholic populations have some unobserved characteristic which increases risk of severe illness.

The effect of Democratic margin on the COVID-19 death rate was small but significant. The results indicate that a higher Democratic margin increased the death rate. This means that the decrease in COVID-19 cases associated with higher Democratic margins was proportionately lower than the decrease in deaths. There may be some unobserved characteristics of Democratic leaning states which made the deaths increase more than the cases. Urban area percentage is a factor which increases the death rate. One rationale for this relationship is that the urban area percentage is making the death rate higher due to an unobserved characteristic of urban areas which increases the risk of severe illness for COVID-19. The smoking rate and heart disease mortality are associated with more Republican leaning states and increase the death rate. Those variables were included as controls for severe illness so no further explanation is necessary. However, a peculiar result is within this model, cancer mortality decreased the COVID-19 death rate. The most apparent explanation for what is occurring with this is that when there are more deaths from cancer there are proportionately fewer deaths for COVID-19. Black population percentage and White population percentage were both associated with death rate increases; however, the coefficients are once again different due to these variables making up different proportions of state’s overall demography. Similar explanations as to the higher number of deaths per one hundred thousand associated with the Black population percent would explain why the Black population percentage of a state is associated with increasing the death rate more than the White population percentage increases the death rate. A higher Catholic population is associated with a higher death rate. This implies that the unobserved characteristic contributing to states with higher Catholic populations being at greater risk of severe illness is greater than the unobserved characteristic of Catholic communities or states with high Catholic populations which increases the risk of exposure.

Democratic margin was associated with a positive percentage change in real GDP, while states with Democratic legislatures saw decreases in GDP, on average when everything else is held constant. Jenson (2020) indicates that the lockdown policies aimed at slowing the spread of COVID-19 also inhibited the economy. Baccini and Brodeur (2020) indicate that Democratic governors were more likely to implement COVID-19 policies. However, the regressions concerning the change in real GDP indicate that the decrease in GDP was more associated with Democratic legislatures. The ideology of a governor is not controlled for so the governor variable only measures party, but does not measure the possibility of the governor being more moderate than other governors of the same party. On this basis, it may be possible that governors in states with Democratic legislatures were more likely to implement lockdown policies than governors in states with Republican legislatures because a mismatch in the governor and legislature's party could be cases of more moderate governors. This explanation would imply that Republican governors with Democratic legislatures were more likely than the average Republican governor to enact lockdown policies against COVID-19 while Democratic governors with Republican legislatures were less likely than the average Democratic governor to enact lockdowns. There is likely some unobserved characteristic about Democratic margin which led to GDP increases, on average all else equal. It could be the case that a higher Democratic margin led to a state government having policy directives aimed at mitigating the effect of lockdown policies on the economy, however, this explanation is purely speculative and nothing has been encountered in the literature which suggests this is the case. Each of the three racial and ethnic variables also increased the real GDP change percentage. This is a similar case as with the mean new deaths. Differences in the coefficients inform that different racial populations for a state saw statewide differences in the change in real GDP. This could be related to states with higher white population being more Republican leaning. It may also be related to states with higher Black and Hispanic populations being impacted more by COVID-19 and that is leading to lower increases in GDP relative to states with higher white populations. Catholic population percentage was associated with a decrease in real GDP. One explanation is that there is some unobserved characteristic of Catholic populations or states with higher Catholic population percentages which is contributing to a decrease in GDP. However, Hao et al. (2021) found that Catholics were more likely to social distance, and that could be another possible explanation.

Democratic margin saw a positive relationship with the PIPC percentage change. The best explanation is the same as the explanation why Democratic margin saw positive GDP changes. A Republican legislature was associated with a positive percentage point change in PIPC. This may be a case where Democratic governors in states with republican legislatures are more moderate than the average Democratic governor, and so is formulating fewer COVID-19 policies. A higher number of COVID-19 cases per one hundred thousand was associated with increased income. What may be occurring with this relationship is that states with fewer COVID-19 cases per one hundred thousand may have fewer lockdown policies and could have higher incomes on that basis. Higher urban densities were associated with small but significant increases in the change in PIPC. The reason why is not apparent, likely being due to some unobserved economic characteristic of urban density which is causing income to recover more in states with higher urban densities. Higher urban population percentages were associated with a decrease in the change in PIPC. This is also likely due to some unobserved characteristics of states with higher urban populations. Increases in college completion rates were associated with an increase in PIPC. A possible explanation is that states with higher college completion may have some unobserved characteristics related to income recovery and college completion.

Conclusion

The effect of politics on COVID-19 is indicated as Democratic leanings decreased the number of COVID-19 cases and deaths per one hundred thousand but saw increases in the death rate. One explanation is that Democratic leaning states decreased the cases relatively more than the decreases in the deaths when adjusted for population. Democratic leanings had conflicting results for the economy, and it is not apparent why Democratic margin increased the economic variables while states with Democratic legislatures had negative associations with GDP change and states with Republican legislatures were positively associated with PIPC. Possible future research could look further into indexing each governor by ideology, as that was a key point of speculation behind some of the discussion. Other control variables which could not be included or were somewhat outdated would be another avenue for future research. Another possible path for future research could be to look into characteristics behind some variables, such as Catholic population percent, which increased COVID-19 exposure or COVID-19 severe illness risk.

Bibliography

Adolph, C., Amano, K., Bang-Jensen, B., Fullman, N., Magistro, B., Reinke, G., . . . Wilkerson, J. (2021). The Pandemic Policy U-Turn: Partisanship, Public Health, and Race in Decisions to Ease COVID-19 Social Distancing Policies in the United States. Perspectives on Politics, 1-23. doi:10.1017/S1537592721002036

Alam, M. S., & Sultana, R. (2021). Influences of climatic and non-climatic factors on COVID-19 outbreak: A review of existing literature. Environmental Challenges, 5, 100255.

Baccini, L., & Brodeur, A. (2020). Explaining governors' response to the COVID-19 pandemic in the United States. American Politics Research, 49(2), 215-220.

Bureau of Economic Analysis, (2022, March 23rd, *SQINC1 Personal Income Summary: Personal Income, Population, Per Capita Personal Income*, [Data Set], https://apps.bea.gov/itable/iTable.cfm?ReqID=70&step=1

Bureau of Economic Analysis, (2022, March 31st, *SQGDP1 Gross Domestic Product (GDP) summary, quarterly by state*, [Data Set], https://apps.bea.gov/itable/iTable.cfm?ReqID=70&step=1

Complete Health Indicator Report of Cigarette Smoking Among Adults, Retrieved April 17th 2022 from New Jersey Department of Health, New Jersey State Health Assessment Data website: https://www-doh.state.nj.us/doh-shad/indicator/complete_profile/CigSmokAdlt.html

Cucinotta, D., & Vanelli, M. (2020). WHO Declares COVID-19 a Pandemic. Acta bio-medica: Atenei Parmensis, 91(1), 157–160. https://doi.org/10.23750/abm.v91i1.9397

Economic Research Service, (2021, February 24th) *College Completion Rates, 2015-2019 (Completing College, Adults 25 and Older)*, [Data Set], United States Department of Agriculture, https://data.ers.usda.gov/reports.aspx?ID=17829

Goolsbee, A., Luo, N. B., Nesbitt, R., & Syverson, C. (2020). COVID-19 lockdown policies at the state and local level. University of Chicago, Becker Friedman Institute for Economics Working Paper, (2020-116).

Hao, F., Shao, W., & Huang, W. (2021). Understanding the influence of contextual factors and individual social capital on American public mask wearing in response to COVID–19. Health & Place, 68, 102537.

Jenson, H. B. (2020). How did "flatten the curve" become "flatten the economy?" A perspective from the United States of America. Asian journal of psychiatry, 51, 102165.

Kaiser Family Foundation, (2021), *Population Distribution by Race/Ethnicity (CPS)*, [Data Set], https://www.kff.org/other/state-indicator/population-distribution-by-race-ethnicity-cps/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D#notes

Lyu, W., & Wehby, G. L. (2020). Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In The US: Study examines impact on COVID-19 growth rates associated with state government mandates requiring face mask use in public. Health affairs, 39(8), 1419-1425.

MIT Election Data and Science Lab, 2021, "U.S. President 1976-2020", https://doi.org/10.7910/DVN/42MVDX, Harvard Dataverse, V6, UNF:6:4KoNz9KgTkZy0BZxJ9ZkOw==[filteUNF]

National Center for Health Statistics, (2022, February 25th), *Heart Disease Mortality by State*, [Data Set], Centers for Disease Control, https://www.cdc.gov/nchs/pressroom/sosmap/heart_disease_mortality/heart_disease.htm

National Center for Health Statistics, (2022, February 28th), *Cancer Mortality by State*, [Data Set], Centers for Disease Control, https://www.cdc.gov/nchs/pressroom/sosmap/cancer_mortality/cancer.htm

National Center for Health Statistics, (2022, February 28th), *Chronic Lower Respiratory Disease Mortality by State,* [Data Set], Centers for Disease Control, https://www.cdc.gov/nchs/pressroom/sosmap/lung_disease_mortality/lung_disease.htm

National Center for Health Statistics, (2022, January 19th), *Fertility Rates by State,* [Data Set], Centers for Disease Control, https://www.cdc.gov/nchs/pressroom/sosmap/fertility_rate/fertility_rates.htm

National Center for Health Statistics, (2022, March 1st), *Diabetes Mortality Rates by State,* [Data Set], Centers for Disease Control, https://www.cdc.gov/nchs/pressroom/sosmap/diabetes_mortality/diabetes.htm

National Center for Health Statistics, (2022, March 1st), *Kidney Disease Mortality Rates by State,* [Data Set], Centers for Disease Control, https://www.cdc.gov/nchs/pressroom/sosmap/kidney_disease_mortality/kidney_disease.htm

National Conference of State Legislatures, (2022, February), *Legis_Control_2020_April 1*, [Data set], https://www.ncsl.org/research/about-state-legislatures/partisan-composition.aspx#

National Environmental Public Heatlh Tracking Nework, (2022), *AIR QUALITY | OZONE - DAYS ABOVE REGULATORY STANDARD (MONITOR ONLY) | NUMBER OF DAYS WITH MAXIMUM 8-HOUR AVERAGE OZONE CONCENTRATION OVER THE NATIONAL AMBIENT AIR QUALITY STANDARD | ALL COUNTIES*, [Data Set], Centers for Disease Control, Accessed From: https://ephtracking.cdc.gov/DataExplorer. Accessed on 04/18/2022

National Environmental Public Heatlh Tracking Nework, (2022), *AIR QUALITY | ANNUAL PM2.5 LEVEL (MONITOR ONLY) | ANNUAL AVERAGE AMBIENT CONCENTRATIONS OF PM2.5 IN MICROGRAMS PER CUBIC METER (BASED ON SEASONAL AVERAGES AND*

DAILY MEASUREMENT) | ALL COUNTIES, [Data Set], Centers for Disease Control, Accessed From: https://ephtracking.cdc.gov/DataExplorer. Accessed on 04/18/2022

NOAA National Centers for Environmental information, Climate at a Glance: Statewide Mapping, published March 2022, retrieved on March 5, 2022 from https://www.ncdc.noaa.gov/cag/

NOAA National Centers for Environmental information, Climate at a Glance: Statewide Mapping, published March 2022, retrieved on March 7, 2022 from https://www.ncdc.noaa.gov/cag/

Rod, J. E., Oviedo-Trespalacios, O., & Cortes-Ramirez, J. (2020). A brief-review of the risk factors for covid-19 severity. Revista de saude publica, 54.

Schneider, E. C. (2020). Failing the test—the tragic data gap undermining the US pandemic response. New England Journal of Medicine, 383(4), 299-302.

State Tobacco Activities Tracking and Evaluation System (2021, October 22nd), *Current Cigarette Use Among Adults (Behavior Risk Factor Surveillance System) 2019*, [Data Set], Centers for Disease Control, https://www.cdc.gov/statesystem/cigaretteuseadult.html

The Alaska State Legislature, (2022), *Committee/Member Information 31st Legislature*, [Data Set] https://www.akleg.gov/basis/mbr_info.asp?session=31

The Association of Religious Databases Archives (2010), *Catholic States (2010)*, [Data Set], https://www.thearda.com/ql2010/QL_S_2010_1_26c.asp, The data were downloaded from the Association of Religion Data Archives, www.theARDA.com, and were collected by Association of Statisticians of American Religious Bodies (ASARB)

The COVID Tracking Project, (2021, March, 7th), *all-states-history*, [Data Set], *The Atlantic* https://covidtracking.com/data/download, CC BY 4.0

United States Census Bureau, (2019, July 1st), *Estimates of Total Resident Population and Resident Population Age 18 Years and Older for the United States, States, and Puerto Rico: July 1st, 2019* , [Data Set], https://www.census.gov/data/tables/time-series/demo/popest/2010s-state-detail.html#par_textimage_673542126

United States Census Bureau, (2021, April 26th), *apportionment*, [Data Set], https://www.census.gov/data/tables/time-series/dec/density-data-text.html

United States Census Bureau, (2021, October 8th, *Percent Urban and Rural in 2010 by State*, [Data Set], https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural/2010-urban-rural.html

Vogl, T. S., & Freese, J. (2020). Differential fertility makes society more conservative on family values. *Proceedings of the National Academy of Sciences*, *117*(14), 7696-7701.

WINDExchange, (2022), *installed_wind_capacity_by_state*, [Data Set], Office of Energy Efficiency and Renewable Energy, https://windexchange.energy.gov/maps-data/321