5-6-2021

Does Public Health Policy Matter?: Explaining Variation in COVID-19 Outcomes Across the 50 States

Charlotte Cheng
Loyola Marymount University, ccheng11@lion.lmu.edu

Richard L. Fox
Loyola Marymount University

Loyola Marymount University
University Honors Program

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A thesis submitted in partial satisfaction

of the requirements of the University Honors Program

of Loyola Marymount University

by

Charlotte Cheng

Richard Fox

May 6, 2021

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Abstract

The Covid-19 pandemic has prompted debate about what factors cause wide variations in mortality and infection rates across the United States and raised questions about what can be done to limit the spread of future outbreaks. In the comparative international politics literature, there are four explanations that determine how well a country can contain outbreaks: leadership, state capacity, demographics, and state culture. Currently, there are no studies that show a comprehensive evaluation of what has caused variations in mortality rate among the fifty states. This study aims to examine state variation among the 50 states in the U.S. and its influence on Covid-19 infection and mortality rate. The study will utilize a mixed-method approach to determine which factors have the most impact on mortality and infection rate. Using a multivariate and case study analysis, I aim to show how the four explanations predicted the pandemic case and death rates. In the findings of this study, I found that several factors, including Republican party control, urbanization, and race, predicted a state's Covid-19 outcomes. The purpose of this study is to urge states to repair weaknesses in pandemic response plans, address structural discrimination within the healthcare system, and facilitate national cooperation that will better equip states with the ability to contain an outbreak.

I. What Matters Most in a Pandemic: Four Explanations

In response to the SARS-CoV-2, a coronavirus similar to Covid-19 and transmitted by direct contact, the U.S. declared an emergency public health response two days after the World Health Organization (WHO) issued a global alert on the outbreak (Schrag et al. 2004). The SARS outbreak had a significant psychological and economic impact that suggests community wide problems could have been avoided with better correspondence from public health officials (Blendon et al. 2020). The lack of guidance raised doubt over whether the U.S. health care facilities had the resources to manage a significant SARS outbreak. In a survey, 90% of infectious disease consultants responded that their hospital or medical center had a plan to address SARS, yet more than half (61%) expressed concerns about the ability of their facility to detect, diagnose, and triage SARS cases (Srinivasan 2004). This uncertainty led people to believe that the government was less capable of containing the disease.

Successful containment also depends on how the infected country perceives the biological threat. For instance, China's initial response to the epidemic was not to view it as a public health threat but as a potential threat to political and social stability. Ignoring the public health dimensions of a pandemic potentially results in potentially dangerous response actions by the government. At the beginning of the SARS outbreak, public health officials disagreed on the best response due to competing agendas and varying rationales on how to best approach the issue. (Christensen and Painter 2004). It was only near the end of the outbreak that responses to isolate SARS cases were identical, which includes public health officials seeking WHO approval with transparent and quick responses.

Similarly to SARS, the recent Covid-19 pandemic caused public health officials around the world to scramble in implementing effective containment policies. A wide body of literature

covers cross country policy comparisons and investigates the determinants of Covid-19 mortality rate. From these analyses, the most common explanation of varying death and infection outcomes were economic factors, political institutions, and government interventions that have led to various responses among the international sphere. The handling of the Covid-19 pandemic in the United States mainly relied on state governor decisions. The United States contracted its first Covid-19 case almost one year ago and has since placed the responsibility of controlling the pandemic to state and local governments. Many governors not only implemented various approaches but also enacted them at different points of infection in the country. The more successful policies enacted to contain the pandemic are unclear. For instance, Governor Newsom from California was the first governor to implement a lockdown order, yet later in the crisis California had one of the highest mortality and infection rates in the country. These high rates may be attributed to state population density, as some smaller states such as Vermont have done relatively well in keeping death cases low. Generally, mortality and infection rates are still rising in the United States and there are multiple theories on what influences these statistics the most. The first theory is whether or not democracies outperform other forms of government in managing a pandemic. Stephan Haggard (2000), professor of Korea-Pacific Studies at UC San Diego, wrote about the East Asian financial crisis of 1997 and concluded that democracies manage economic and financial crises better. Haggard argues that the advantage democracies have over autocracies to vote incumbents out of office allows the new government to use pre-existing ties to the business sectors to coordinate decisive responses to manage economic crises. Semi-authoritarian or dictatorships took inconsistent, yet quick actions in managing financial crises (Guillén 2001). While democracies have been shown to manage financial crises

successfully, a pandemic induced crisis may elicit different sacrifices the population will need to make to contain it.

Public discourse regarding the impact of the Covid-19 pandemic has circulated around political systems, leadership characteristics, and state capacity. A large portion of the literature indicates that democracy has a positive impact on public health and results in greater health policy interventions (Besley and Kudamatsu 2006; Fujiwara 2015; Justesen 2012). For instance, Cronert (2020) shows that democratic countries implemented school closure faster than authoritarian regimes in response to the Covid-19 pandemic and countries with a lower state capacity were quicker to do so. However, the disproportionate Covid-19 mortality and infection rates in Europe and the United States suggest that such democracies are less equipped to handle pandemics and epidemics due to polarization, inequality, and declining government trust (Berengaut 2020; Bieber 2020; Kleinfeld 2020; Cepaluni 2020). The informed policy making process of democratic countries are the same features that slow down decision making (Weeks 2008) and cause democracies to be at a disadvantage in quickly responding to pandemics (Cepaluni 2020). Political features that perpetuate ongoing epidemics and pandemics demonstrate that democratic or non-democratic regimes have no significant effects on the occurrence of epidemics (Guillen 2020). This debate on whether democratic regimes respond better is unclear.Although the United States is a democracy that has not fared well during the Covid-19 pandemic, governance at the state-level has shown how some states can be successful in containing the pandemic.

Since the pandemic has emerged as a threat to global and national security, U.S. media and public health researchers have scrutinized the federal government for the lack of rapid response in the pandemic's early stages. The most common policy response in the U.S. and

Europe was the implementation of stay-at-home orders which required citizens to remain in their residences with very few exceptions. These were ordered by the states along with school closures, mass gathering bans, and non-essential business closures. Although these policies have been associated with a reduction in mobility, considerations for why similar containment responses have resulted in varying mortality and infection rates may boil down to four major types of explanations: governance and leadership, state capacity, contextual factors such as geography and economic inequality, and state culture. The literature of cross-country comparisons of the Covid-19 pandemic suggests that state capacity, political institutions, political priorities, and social structures are the common political factors that explain the variation in a society's ability to respond (Bosancianu 2020; Guillen 2020).

In the United States, however, there is widespread uncertainty on what protective measures or factors matter most in controlling the spread. Not all states that implemented strict protective measures had low case rates and not all states that lifted restrictions had high case rates. The efficacy of CDC recommendations have been doubted by state leaders such as Governor DeSantis of Florida who have eased restrictions without severe rises in Covid-19 rates. However, policies may be not the only factor predicting pandemic outcomes. Although the policies may be important, state demographics and culture may also influence case and death rates. Using the four pertinent explanations suggested by the literature, this paper aims to investigate how state variations across the United States have influenced pandemic outcomes or infection and mortality rates. We will apply these four political explanations to that of the 50 states to determine which factors explain differences in Covid-19 outcomes. This study will incorporate two methodological approaches to examine patterns in state responses and which of these factors best predict Covid-19 infection and mortality rates. The paper will begin with

definitions and descriptions of the four explanations, discuss the design and result of the empirical approaches, and end with the social and political implications of these findings.

Literature Review: What Might Explain State Variation in COVID Outcomes

Leadership in a Pandemic

Political leaders who emanate a serious consideration of expert opinion or crisis prompts similar responses from citizens. For instance, an ethic of compassion emerged within U.S. political discourse on the HIV/ AIDS pandemic due to President Bush's leadership and the administration's rationale for implementing the President's Emergency Plan for AIDS Relief (PEPFAR) (Boyd 2015). While PEPFAR drove American global aid programs, Bush's compassionate sentiment resonated with American Christians and encouraged the American conservative to embrace AIDS relief efforts (Boyd 2015). During a crisis such as a pandemic, the opinions of political leaders can clearly influence the political culture toward a crisis, especially when individual actions can impact their own health and that of others.

In the midst of the global Covid-19 pandemic, many have speculated that not only a leader's actions but also their identity are reasons why a country succeeds in containment efforts. Major news publications have noticed that women-led nations were better at handling the Covid-19 pandemic. For instance, the New York Times praised the efforts of Jacinda Ardern, Prime Minister of New Zealand, for successfully eradicating and controlling Covid-19 outbreaks (Taub 2020). Angela Merkel Chancellor of Germany had lower death rates than Britain, France, or Spain (Taub 2020). Most notably, Tsai Ing-Wen, the president of Taiwan, has led one of the most successful efforts in the world in containing the virus due to contact tracing and isolation measures (Taub 2020). However, these are only speculations. Bosancianu (2020) did not find any significant associations between mortality rates and women-led governments. The conclusion

that women-led nations have better contained the Covid-19 virus may be under exceptional circumstances.

While women-led nations seem to be faring well in responding to the pandemic, the question that arises is whether this is true for local government. In the United States, for example, Ruth Carlitz, a professor at Tulane University analyzed the time that it took governors of the United States to impose lockdown and found that women did not impose quicker lockdowns to fight the virus (Working paper- Taub 2020). She suggests that any effect that can be made by gender has been dampened by political partisanship. This is because Carlitz found that Republican governors in the United States of both genders, delayed stay-at-home orders while Democrats imposed them earlier (Working paper-Taub 2020).

These examples evidently show that crisis requires effective leadership. During the Covid-19 crisis, Presidential leadership of the United States was heavily scrutinized. The President of the United States is granted a wide range of powers (Genovese 1986). According to Genovese (1986), the President must consider the pressures and problems they are likely to face and what can be done to navigate them (Genovese 1986). The development of a Leader Capital Index (LCI) by Bennister, Hart, and Worthy was used to examine the premiership of Japan's prime ministers. This study revealed that Japanese leaders who lacked policy vision and were unable to communicate clearly were less successful in deploying power (Burrett 2016). Dealing with crises in the present age requires anticipating problems and setting up of procedures to reduce the likelihood of emergency policy decisions (Genovese 1986). A distinction that Genovese draws that will be helpful in defining leadership later on is his definition of crisis management, which is the attempt to mitigate tension and allow the other side to evaluate the conditions and reconsider its options (Genovese 1986). Crisis management is aimed at avoiding

mistakes and reaching agreements that will reduce the risk of conflict (Genovese 1986). Some of the relevant pressures that a President may have to face during Covid-19 that Genovese theorizes are the shortness of time to act, seriousness of a consequence and the reliability and timeliness of information (Genovese 1986; Kaul 2020). One of the examples Genovese uses to illustrate good leadership is President Kennedy during the Cuban Missile Crisis. During this time, President Kennedy created the Executive Committee of the NSC (ExCom), which was a group of advisors and military personnel who Kennedy decided could advise him in handling the Missile Crisis. The formation of ExCom exemplified Kennedy's determination to gather and process information due to the high uncertainty and limitations of the situation. This story of history further emphasizes the importance of a leader who is aware of political perils and determined to know reliable and legitimate information to mitigate risks.

Given the broad considerations of leadership, the leadership in a pandemic specific crisis suggests that coordinated US efforts could improve public health policy. A study on major pandemics including AIDS, TB, and malaria show that these biological phenomena can be controlled with policy making and efficient resource allocation (Kavanagh et al. 2019). For instance, President Reagan's inaction during the global AIDS pandemic contributed to its growth while President Obama's intervention during the Ebola crisis inspired international cooperation to control the epidemic (Kavanagh et al. 2019). This study concluded that U.S. leadership could help reduce pandemics, prevent future outbreak, and reduce climate-change related risks (Kavanagh 2019).

While the investment of such health policies can have a beneficial outcome in a country, the funding for these programs have not increased significantly since then. The Trump administration requested less funds than what Congress appropriated which shows that White

House leadership and support could have allowed greater financial investments (Kavanagh 2019). During a crisis such as a pandemic, the opinions of political leaders can clearly influence the political culture toward a crisis, especially when individual actions can impact their own health and that of others.

Personal attributes of leaders are why some leaders are theorized to be exemplary in containing the pandemic. Huang (2020) considers "three examples of leadership: New Zealand prime minister Jacinda Arden, Melissa DeRosa Secretary to the Governor of New York, and New York state governor Andrew Cuomo" (Huang 2020). New York governor Andrew Cuomo has been praised for his example of displaying American leadership for providing "compassionate, courageous, data-driven, decisive, and mindful leadership" (Huang 2020). Specific leadership characteristics and practices such as these are argued to make effective leaders during a crisis such as the Covid-19 pandemic. Recent research has organized these qualities into six categories: communication, decision making, humanism, innovation, realism, and core values (Kaul 2020). If a leader embodied most of these categories, then they were likely to create several opportunities to mitigate risk that were missed in the initial stages of the pandemic such as the use of face coverings, cancelling travel, and screening employees and patients (Kaul 2020).

Policy Intervention to Crises

During the 1918 influenza pandemic, Philadelphia held a parade welcoming soldiers home from World War I, while St. Louis decided to cancel its parade. As a result, St. Louis experienced one eighth as many deaths per capita in that wave of the pandemic and a far lower infection rate than Philadelphia (Adolph 2020). These two instances were used by policy makers to encourage states to implement mandates that would limit infectious outbreaks. The public health literature suggests that governments play an important role in supporting public health, yet

disasters of large and small scales have revealed weaknesses in the public health infrastructure that require economic and sociopolitical interventions (Burkle 2006).

Covid-19 has generated a wide range of governmental responses to prevent disease spread. On the one hand, the effectiveness of government implemented mandates are dependent on citizen responsiveness. For instance, public compliance to public policies indicates that voters in U.S. presidential elections tend to make voting choices based on a candidate's performance rather than their policies (Lenz 2013) Citizens are also more likely to disregard expert opinion when the candidate they prefer also disagrees with the opinion (Darmofal 2005). During the initial outbreak of the virus, medical experts, epidemiologists and public health professionals were fundamental to suggesting policies to counteract the spread of Covid-19 (Lavazza and Farina 2020). Yet, in the U.S. for example, the need of state authorities to show that they had full control over the situation resulted in the lack of preventive measures. In the attempt to not induce panic, many countries have failed to implement clear advice on limiting gatherings, cancelling crowded events, and postponing travel (Lavazza and Farina 2020). Donald Trump's dismissal of the pandemic by labelling it a "Democratic hoax" did not garner nationwide compliance with the WHO recommendations (Lavazza and Farina 2020). Studies on the relationship between political ideology and perceptions of the threat of Covid-19 reveal that conservatives perceived the virus as less threatening, less severe, and more exaggerated by the media (Calvillo 2020). The same study also revealed that conservatism had fewer accurate responses to Covid-19 knowledge tests. People from varying political ideologies perceived the severity of Covid-19 differently depending on how political leaders and media framed political issues.

Social distancing and mask mandates were the two primary strategies aimed to reduce the spread of Covid-19 and number of infected individuals. A survey conducted among adults in

New York City and Los Angeles found that stay-at-home orders, closures of nonessential businesses, and adherence to Covid-19 mitigation guidelines were supported (Czeisler 2020). Unlike that during Covid-19, the benefits of wearing masks during SARS were uncertain but may have symbolized the individual and collective determination to contain the disease control global spread (Syed 2003). A recent study by Adolph et al. (2020) shows how political factors have influenced responses to implement social distancing measures. The most relevant finding of this study was that states with Republican governors and more Trump supporters were slower to adhere to social distancing policies (Adolph et al. 2020). In the U.S., residents of Democratic leaning counties showed a greater reduction in mobility and Republicans practiced less social distancing (Grossman et al. 2020; Allcott 2020). Tracking data from mobile phones showed a partisan response to Covid-19 recommendations among individuals. Additionally, residents with political leaders who recommended them to stay at home led to a decrease in mobility compared to the effect of the Stay-At-Home orders themselves (Grossman et al 2020). Despite the expert opinion to put in place strict measures, public compliance to the containment recommendations across the country has not been successful.

State Capacity

As indicated by Bosancianu and Guillen's studies, the first factor that most affects epidemic frequency and mortality rate are state capacity and economic inequality (2020). State capacity refers to the availability of the government's resources to handle a crisis. The organizational capacity of a state is imperative to effective policy making and implementation (Guillen 2020). This development of state capacity explains why some countries performed better in the long run during the outbreak (Guillen 2020). The lack of healthcare resources is positively related to mortality rates (Ji and Ma 2020). This finding shows that pandemics will

disproportionately affect countries with greater health disparities. However, Vietnam is an authoritarian country with limited resources that has responded effectively to the Covid-19 pandemic (Klinger et al. 2020). Due to Vietnam's ability to quickly mobilize their army, implement a quarantine center, mass surveillance, and effective updates on public databases. Vietnam has also efficiently produced accurate test kits faster than most developed countries at the beginning of the outbreak. Vietnam's containment response heavily suggests that the major determinant of a country's ability to mitigate the pandemic is through mobilization of the country's resources and society.

Similar to the situation in Italy as the outbreak surged, hospitalizations in the United States have been exceedingly high. On November 1, hospitalizations in the U.S. hit a record high of 62,000 (Stone 2020). At a national level, waves give a legitimate reason to be concerned about the health system. Hospital surge capacity has been more seriously managed and the possibility of epicenters concerns public health specialists about the risk of maxing out and limiting the possibility of reallocating resources (Stone 2020). The federal department of Health and Human Services have gauged the burden on U.S. healthcare systems by tracking the number of beds utilized by Covid-19 patients (Stone 2020). The usage of bed capacity significantly associated with an increase of Covid-19 mortality rate. However, some hospitals have been able to expand their bed capacity in the past couple of months (Karaca-Mandic 2020). A closer look at hospitalizations across the states captures the impact of Covid-19 on U.S. healthcare systems.

In addition to hospital capacity, U.S. state capacity to handle pandemic also includes testing capabilities. In the early stages of the pandemic, testing operations in the U.S. were delayed after tests developed by the Centers for Disease Control and Prevention were unreliable. Since then, testing capacity has increased nationwide but many states continue to struggle in

managing new outbreaks and tracking the virus. Testing facilities were also being overwhelmed by processing delays and the shortage of testing supplies. South Korea took an international cooperation approach in containing Covid-19 by sending test kits to the United States (Nirappil, Cox and Schneider 2020). The $9 million dollar shipment was sent to Maryland where "public and private labs had administered 71, 397 coronavirus tests" (Nirappil, Cox and Schneider 2020). South Korean and Maryland state officials collaborated, negotiated, and discussed protocols with scientists and physicians in an attempt to contain Covid-19 (Nirappil, Cox and Schneider 2020). As exemplified by Vietnam and South Korea, testing capacities in the United States may have been a determining factor of varying Covid-19 mortality and infection rates.

Inequality and Demographics

In addition to state capacity, economic inequality also plays a role in the severity of pandemics. In studies across countries, researchers argued that economic inequality polarized the economy and prevented the ability to adapt to evolving circumstances during a crisis (Guillen 2020). Since the pandemic spread across the United States, there has been a focus on how crises often negatively impact disadvantaged communities, namely Black, Latinx, and Native American. In the United States, the Covid-19 pandemic has worsened existing racial and socioeconomic health inequalities (Wang 2020). For instance, Black Americans make up less than half of the population in Louisiana, Michigan, and Illinois, yet in these regions 70% of the Covid-19 related deaths are among the Black population (Wang 2020). Low-income communities have also been disproportionately affected by the virus. For instance, New York zip codes in the "bottom quartile of average incomes make up 36% of Covid-19 cases compared to less than 10% for the wealthiest quartile" (Wang 2020). A similar trend was also found in Arizona, Illinois, Maryland, North Carolina, and South Carolina (Hatef 2020). Health issues are

exacerbated among these communities due to the lack of healthcare resources and access. Underrepresented and lower income communities suffer disproportionately from underlying health conditions such as respiratory illnesses that worsen Covid-19 (Wang 2020). Under the recommended guidelines for prevention of Covid-19 such as washing hands and use of hand sanitizer, low-income families are more likely to have limited access to these resources (Wang 2020). Socioeconomic inequities make the prioritization of health and access to health care difficult. Due to these disparities, not all Americans are at an equal risk on contracting Covid-19.

Due to the lack of urgency in the U.S. response, disease disparities among communities of color were accentuated. The inequities in mortality rates from the Covid-19 pandemic have emphasized the enduring racial and ethnic inequalities in respiratory health in the United States (Thakur et al. 2020). The recent death of George Floyd and the protests that followed highlight the role of structural racism that resulted in the unequal exposure of Covid-19 across Black and Brown communities (Thakur et al. 2020). Racially based policies have been detrimental to minority groups and further accentuates racism in health care services.

State Culture

In order to mitigate a pandemic, cooperation is vital. Stopping a highly infectious disease from spreading within a state requires cooperation among residents. The ability of residents to abide by recommended guidelines that experts and leaders believe will mitigate the spread of a virus depends on state culture. The most famous measure of state culture is Elazar's measures of State Culture that groups states into three categories: moralistic, individualistic, and traditionalistic (Morgan & Watson 1991, p. 40). Elazar emphasized that political culture was grounded in a state's history and traditions, both of which influenced government action within that state (Morgan & Watson 1991, p. 32-33). A brief description of Elazar's measures of state

culture are given: “The individualistic culture conceives of the political system as a marketplace, in which individuals and groups advance their self-interests through political action... The moralistic culture views government… as a vital force in the search for the good life… and the traditionalistic culture allows an active role for government [while maintaining] old social order” (Morgan & Watson 1991, p. 33). These three descriptions of political cultures reflect the religious migration across the states, dispersing various traditions. In relation to the Covid-19 pandemic, Elazar’s measures could reveal if a state’s cultural values influenced their case and death rates.

Theoretical Arguments: Four Explanations

Leadership & Implementing State Mandates

President Trump declared the Covid-19 pandemic in March months after the virus had been reported to the WHO. The delayed response of the United States to track the movement of the virus has resulted in growing cases today. Despite this, some states have minimal mortality and infection rates while some have cases that continue to increase. For this reason, it is important to examine individual state factors to determine why some states are doing better than others. Instead of placing blame on the lackluster motivation for the Trump Administration to contain the Covid-19 pandemic in the United States, we will look at the leadership of state governors and the qualities of those states to find an explanation for why mortality and infection rates drastically vary across the U.S. In many ways, the impact of Covid-19 was heavily reliant on local politics. State governors are being held responsible for state-level consequences. It is uncertain which qualities of a leader make them better than the next. The first quality that seems to influence mortality and infection rate is the political party of the Governors.

As established by the literature, Republican Governors have been speculated to be more resistant to implementing social distancing and other protective measures. Additionally, residents of these states are less likely to follow them. To investigate whether states with Republican governors were more likely to also have higher rates of cases and deaths, Republican party control will be examined under the leadership explanation. In addition to the political identification of leaders, previous studies have speculated that the gender identity of a leader may play a larger role. The next section theorizes why the gender identity may result in differences in Covid-19 mortality and infection rates in each state.

At first glance, women leaders appeared to handle the Covid-19 pandemic better. Out of the fifty states, there were only nine led by women at the height of the pandemic (Kayla and Stajkovic 2020). The debate on the efficacy of women leaders during the pandemic suggests that leadership identity was a defining factor in containment. During times of uncertainty, women leaders are preferred across professions (Adams, Gupta, & Leeth, 2009; Ashby, Ryan, & Haslam, 2007). Qualities that make an effective leader during unprecedented times are "creativity, improvisation, and intuition" (Kayla and Stajkovic 2020). Women tend to exhibit more of these qualities (Hausmann & Güntürkün, 1999; Pagnani, 2011) which are important to diffusing unfamiliar and life and death scenarios. In order to successfully do so, leaders have to be willing to collaborate and share information. Women tend to have democratic leadership styles that foster information sharing, brainstorming and cooperation (Bartunek, Walsh, & Lacey, 2000). Women are also more likely to focus on health and security and utilize emotion-focused coping. Harnessing a sense of psychological safety was not only a challenge for all leaders during the pandemic but also a priority for women leaders. In stressful situations, men turn to problem-solving coping (Ptacek, Smith, & Dodge, 1994). Gender differences are speculated to

result in citizens responding differently to messages from women leaders compared to men. For these reasons:

H1: States with Republican governors had higher mortality and infection rates

H2: States with women governors had lower mortality and infection rates.

In addition to the effect of gender, the timing of the implementation of stay-at-home orders are also attributed to mortality and infection rate outcomes. Government issued "stay-at-home" orders reduce the spread of contagious diseases, but the impact and effectiveness of these orders remains unclear. In the United States, containment responses were highly dependent on state and local governmental efforts (Fowler et al. 2020). Since containment responses such as the "stay-at-home" orders were not organized at the national level, this creates an opportunity for spatial and temporal divergences to measure policy efficacy with greater accuracy. Based on the distribution of stay-at-home orders, the county-level growth rate of Covid-19 cases changed relative to the day of the implementation of the stay-at-home order (Fowler et al. 2020). The highest level of growth was three days before the state orders went into effect (Fowler et al. 2020). Although it appears that state orders may decrease Covid-19 growth, the data is uncertain due to the how many days infected individuals are contagious before and after the onset of symptoms. This makes the efforts to generate an estimate of the effects of policies that were implemented within days of each other difficult.

The impact of the stay-at-home order has been measured using publicly accessible location data to analyze how population movement relative to stay-at-home orders changed. Population movements will also depend on rural and urban areas due to varying population sizes (Moreland et al. 2020). During the 14-day period after the first stay-at-home order was issued in the US, there was a significant decrease in movement among the states and territories relative to

movement in the period before the state mandates (Moreland et al. 2020). A reduction in population movement could potentially prevent person-to-person contact and limit Covid-19 exposure to those outside of the household. However, among counties nationwide in jurisdictions where stay-at-home orders were lifted, population movement increased. Reduction of population movement may suggest that the implementation of lockdowns and stay-at-home orders can protect the public community by minimizing the transmission of Covid-19 and maximizing containment efforts. On the other hand, it is possible that decreases in population movement were attributed to national and state declarations of emergencies, gathering bans, school and business closures, and sporting event cancellations (Moreland et al. 2020). The preliminary analysis of population movements and mandatory stay-at-home orders suggests that the early relaxation of these orders may have resulted in the continuous rise of Covid-19 mortality and infection cases in the United States. Therefore, I expect:

H3: States with Governors that implemented stricter protective measures had lower mortality and infection rates.

Economic Measures: State Capacity

The overwhelming panic that spread across the country about the lack of consistent information about the novelty coronavirus was due to mixed messages from health officials with testing. In the beginning, health officials suggested that we shouldn't get tested for the virus unless people were showing symptoms (Cramer 2020). The message then shifted to say that mass testing was essential to trace and contain the pandemic (Cramer 2020). Further confusion ensued as public health officials warned of shortages of testing supplies and dealing with increasing demand and long wait times for results. The lack of preparedness of the United States thwarted contact-tracing efforts in locations with heavy outbreaks. At the same time, politicians

in states where cases had fallen have urged people to get tested, whether they had symptoms or not (Cramer 2020). The virus has been difficult to control in large part because many infected people without symptoms have unknowingly spread it. More testing would have helped identify cases early on and possibly prevented Covid-19 cases now. However, in the early stages of the pandemic testing operations in the United States were delayed after tests developed by the Centers for Disease Control and Prevention (CDC) were found to be unreliable. Since then, testing capacity has increased nationwide but many of the states have struggled to manage new outbreaks and track the virus as testing facilities were being overwhelmed by processing delays and the shortage of testing supplies. The backlog left sick people undiagnosed, with the potential to further increase the transmission of the virus as states opened. Better state capacity reduced the frequency of epidemics (Guillen 2020). Thus, I expect:

> ***H4***: States with greater state capacity, such as testing, doctors, and health spending, had lower mortality and infection rates.

Economic measure: Inequality and Demographics

Widespread testing capabilities could have also been essential in helping low-income communities combat the virus. Covid-19 devastated disadvantaged communities (Clark et al. 2020). For instance, vulnerable immigrant communities in the US are at a high risk of contracting and developing serious Covid-19 cases due to intricacies of poverty, limited access to healthcare, and fear of legal consequences (Clark et al.). Sociodemographic differences also impact the distribution of chronic diseases (Oates 2017). The “social determinants of health” are described as “fundamental causes of disease”, which include income and education (Oates 2017). Adults living under the poverty line are five times as likely to disclose “fair or poor” health as compared to adults whose incomes are four times the poverty line (Oates 2017). Another

predictor of variations in health is race. In comparison to whites, minorities face illnesses earlier in life with greater severity and poorer survival (Oates 2017). The prominence of underlying conditions among low-income and minority communities highlights inequities that the healthcare system could work to improve. The lack of accessible and affordable health care options has significantly increased Covid-19 cases in these communities. Focusing on the health status of people in disadvantaged communities would be better for protecting the general population from infectious outbreaks such as Covid-19. For these reasons:

H5: States with greater urbanization, poverty, and vulnerable communities to disease such as immigrants and people of color had higher mortality and infection rates.

State Culture

In the prior section, state culture was defined by Elazar's measures of state culture. While this may be a prominent variable to investigate, another important factor to consider is conservatism within a state. A state with a higher number of conservatives may influence pandemic outcomes. There are many factors that suggest that conservatives respond differently from liberal during Covid-19. In the United States, polling suggests that conservatives are not as concerned as liberals about the pandemic (Brownstein, 2020). These differences in attitudes may be attributed to different news sources that both groups consume. Conservatives trust different sources of information than liberals do (Rodriguez et al., 2017, p. 259). Being unable to distinguish between real and fake Covid-19 headlines would also lead to misinformation on the virus and incorrect recommendations for mitigation (Calvillo et al., 2020, p. 1119). This would explain why they have different perceptions on the threat of the Covid-19 virus. Conservatives may also be downplaying the threat because they do not want government restrictions to be implemented. From a psychological standpoint, acknowledging the threat makes the possible

implementation of restrictions less plausible (Conway et al., 2020, p. 19). One example of the avoidance of state restrictions on protective measures is evidently shown in studies on geo tracking data. When the tracking data of 15 million smartphones were collected, US counties that voted for Donald Trump in the 2016 elections were 14% less socially distanced between March and May 2020 (Gollwitzer et al. 2020). The differences in distancing between pro-Trump counties and pro-Hillary counties not only suggest that case and death rates may be higher in these states, but also that the partisan divide has affected the behavior of U.S. citizens toward the pandemic.

H6: States with more conservative citizens will have higher infection and death rates. The hypothesis of the four explanations will be examined using the two methodological approaches: multivariate and case study analysis.

Methodology and Empirical Approaches

While there has been substantial attention paid to variations in Covid-19 infection and mortality rates across countries, substantial research within the U.S. is scant. U.S. Covid-19 studies have also highlighted how state-imposed mandates and timing of these recommendations are correlated with population mobility. Additionally, the containment efforts of state governors have not only indicated differences in how Democratic and Republican leaders impose mandates but also how contrasting policies resulted in similar rates. This raises doubt on whether implementing protective measures actually mattered and suggests that other state factors may be at play. In order to determine why some states performed better than others, I examined how state variations predict Covid-19 infection and mortality rates using the four explanations I outlined in previous sections. By delving into these state-level factors, I am hoping to determine which states have handled the pandemic better and how they were able to do so. I also hope to

establish commonalities between states in which measures were common and resulted in successful containment. These analyses will be used to justify how a state's containment successes could guide the handling of infectious outbreaks and crises in the future.

This study analyzed how the four explanations, leadership, state capacity, demographics and other contextual factors, and state culture, predicted pandemic outcomes in the United States. Using a mixed-method approach, I measured the four explanations (independent variable) against case and death rates (dependent variable). The study will test the impact of the measures against mortality and infection rates beginning with the month of March, the first month Covid-19 cases began to increase in the nation. March was also chosen because leadership decisions including the implementation of containment responses for Covid-19 did not begin until former President Trump declared a national emergency on March 13. California imposed the first stay-at-home order days later on March 19 (KFF 2020). Mortality and infection rates were recorded at the end of each month until the end of 2020 in December. In doing so, we are hoping to examine how state variations among the four explanations influenced cases and deaths throughout the states. I constructed a data set of the 50 states of leadership, state capacity, demographics, and state political culture and the dependent variables, mortality and infection rate. In total, there were 41 independent variables analyzed. I determined that there were fourteen variables that most influenced rates and analyzed them with a multivariate analysis. The second approach included an analysis of two case studies comparing state variation. The first case study compared California and Florida because of similar pandemic outcomes despite contrasting policy differences. The second case study compared South Dakota and Vermont because of their similar demographic features and contrasting policy approaches. We are hoping that both of these approaches will reveal which measure or combination of measures were most effective in

containing Covid-19 in the U.S. and comparing states to one another allows us to gain deeper insight in what the country can do better in the future to control the pandemic.

Conclusion

Covid-19 presented the world with numerous obstacles and opportunities for people to individually and cooperatively overcome. In order to better contain infectious outbreaks in the future, state leaders need to work together to address the unequal ability of the population to protect themselves from disease. This approach would encourage quicker production of medical equipment and strive to help vulnerable communities in the long term. The creation of a joint plan to share information and facilitate cooperative testing capabilities is why governmental cooperation is critical to defeat a virus that is incurable. The pandemic has urged individuals to think about the humanity of others and reconsider the importance of thoughtful leadership. The importance of knowing which leadership actions and state factors were most impactful would provide guidance on how to mitigate future pandemics. The following sections will describe the empirical approach taken to examine the influence of state variations on pandemic infection and mortality rates. The methodological approaches revealed that some determinants of state success are more prominent and influential than others in controlling Covid-19. This methodology also includes the analysis of two pairs of states that were chosen as case studies to weigh the importance of policy implementation and demographics. Finally, the study discusses the social and political implications these findings have on U.S. leadership, race, and state culture in a pandemic.

2. Determining State Success in Controlling Covid-19

Tennessee and Kentucky already have a long standing sport rivalry and Covid-19 appears to have heightened tensions between the two states. The Governor of Kentucky Andy Beshear acted a week earlier than the Governor of Tennessee Bill Lee to declare a state of emergency, encourage social distancing, and implement business and school closures (Mattingly, 2020). The decision of the Kentucky Governor to implement mandates and recommended protective measures early appeared to lower infection rates in the first month of the pandemic. The introduction of early intervention methods appeared matter in the case of Kentucky, but this approach may not apply to every state that acts quickly in mitigating Covid-19. The following section investigates whether or not early intervention strategies impacted pandemic outcomes over time and how these outcomes have been influenced by state variations. Results of the multivariate analysis show how the four explanations predict infection and case rates. The last portion of this chapter covers the case study analysis of California v. Florida and South Dakota v. Vermont.

Overall Mortality and Infection Rates: What Matters?

We begin our examination of state variation in Covid-19 outcomes by looking at how the independent variables - leadership, capacity, contextual factors, and culture of a state - predict the overall infection and mortality rates, our dependent variables. After determining the variables that best explain the four explanations, we ran a multivariate analysis to see which were more likely to influence outcomes which is presented in Table 2.1. From the multivariate analysis on overall infection and death rates, we gather that there are five variables that predicted a state's Covid-19 outcomes, which are travel restrictions, doctors per capita, percent uninsured, urbanization, and conservatism.

Table 2.1. Models predicting Covid-19 Infection and Mortality Rates across the 50 states.

Variables	**Infection Rate**	**Mortality Rate**
Governance and Leadership		
Republican Party Control	-75.164	-9.471
	(829.173)	(28.302)
Mask Mandates December	-559.185	-13.319
	(382.085)	(13.041)
Travel Restrictions	**-1330.138****	-25.573
	(513.387)	(17.523)
Women Governor	-70.870	1.746
	(660.182)	(22.533)
State Capacity		
Doctors per capita	8.302	**0.897****
	(9.974)	(0.340)
Total Health Spending per capita	-0.008	0.017
	(.578)	(.020)
Demographics and Context		
Percent Uninsured	**-485.370****	-7.971
	(157.884)	(5.389)
Urbanization Index	**879.812****	**33.343***
	(488.408)	(16.670)
Percent Under Poverty	-125.291	9.083
	(163.451)	(5.579)
Percent African American	-14.286	0.174
	(43.200)	(1.474)
Percent Latino	66.052	0.984
	(45.108)	(1.540)
Percent Native American	145.334	1.094
	(90.661)	(3.094)
State Culture		
Conservative Advantage	**220.030****	**3.393***
	(58.315)	(1.990)
Trust in Government	383.616	26.766
	(520.868)	(17.778)
Constant	0.731	**0.023****
	(-2670.584)	(-626.552)
R-Squared	0.624	0.45
Observations	50	50

Note: Statistical significance is noted as ** $p < .05$, * $p < .10$

Under the leadership explanation, the implementation of strict travel restrictions seemed to influence overall infection rate. Although there were a variety of travel restrictions implemented by states, this was not a surprising finding because health experts warned that more traveling would cause a spike in cases. Some of these restrictions include the requirement that mandated travelers to have a negative Covid-19 test three days prior to arriving and filling out surveys that acknowledged the traveler's responsibility to quarantine. Some states did not implement travel rules at all. While this is an important result that indicates that overall cases were affected by summer and holiday traveling, it was surprising that none of the other leadership variables predicted rates. In the overall rates model, the majority of the hypotheses were rejected. We expected mask mandates to be significant because of its strong recommendation by health experts. We also expected states with Republican Party Control and women governors to also have more influence in overall rates.

The second explanation of state capacity also produced an interesting finding. The only measure of state capacity that predicted overall mortality was doctors per capita. The model suggested that a greater number of doctors per capita in the state was linked to greater mortality rates. This finding could be explained by the relative number of doctors working in urban areas, which would explain why there are more deaths in these states.

The third explanation, demographics and contextual factors, also produced unexpected findings. Surprisingly, in places where a greater number of persons without health care insurance resided, there were lower infections. Those without health insurance are less likely to go to hospitals of their own conviction unless the situation was an emergency (Hadley, 2004, p.1527). For this reason, uninsured persons may be less likely to get regular Covid-19 tests due to less access to health care compared to insured persons. This would lower the overall infection rate, as

those who are uninsured are less likely to obtain a Covid-19 test and therefore will not be counted. This was the only measure of social inequality that mattered. I predicted that communities with more people of color would be disproportionately affected by the Covid-19 pandemic; however, this is not what the results suggest. My hypothesis that states with more people of color would have higher overall rates was rejected.

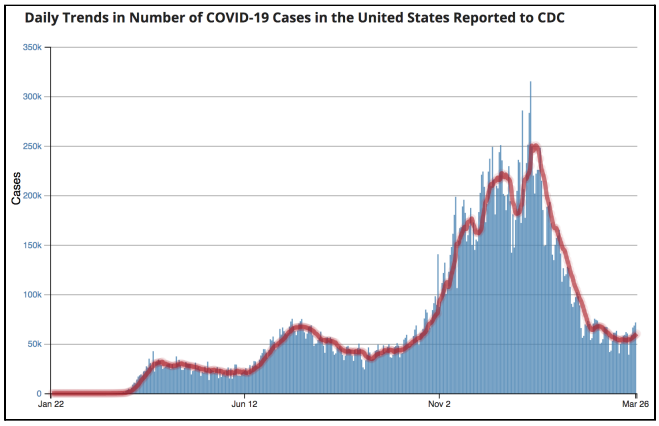
In explaining overall death and infection rates, two consistent findings emerged. These common drivers of per capita rates are urbanization and conservatism, which is presented in Table 2.1. A state with more urbanization was also more likely to have greater infections and mortalities than rural states (Table 2.1). The same trend was found in states with greater conservatism (Table 2.1). Some of these findings are not surprising. Urbanization results in greater human interactions and more opportunities for the spread of the Covid-19 virus. We expected that states with more conservatism would have higher overall rates. There are several reasons that explain this finding. Data from News Gallup 2018 points out that conservatives greatly outnumber liberals in the United States. There are only six states in which liberals outnumber conservatives. Media politicization of Covid-19 may have consequently caused conservatives to overlook the severity of the virus leading them to ignore social distancing recommendations and protocols. The lackluster attitudes of conservatives across the nation may explain its link to greater infections and deaths.

The overall model indicated that there was at least one variable from each explanation that mattered in predicting Covid-19 outcomes. From this, we can conclude that overall rates were influenced by a combination of explanations and not just one major determinant. The next section investigates how examining pandemic outcomes change when analyzed over time and across the various surges.

Flattening the curve: For Better or Worse?

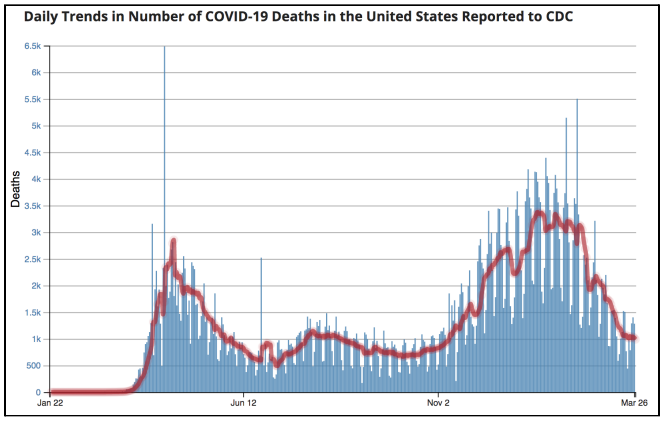
Throughout 2020, governors were extending lockdowns, reopening, and re-implementing closures. At the beginning of the pandemic, all states had implemented a lockdown - some months later than others. In the months to follow, state governors were calling for citizens to "stop the spread" while some were doubting the efficacy of CDC recommended containment measures. The aftermath of these decisions is evident in Figure 2, as various surges of Covid-19 infections and deaths spread across the nation. Although there was evidence of some flattening, the summer months and holiday seasons tempted many citizens to gather with their friends and families. For the rest of 2020, infection and mortality rates in the United States shot up.

Figure 2a. The daily and weekly trends of Covid-19 infections since March 2020.



Data provided by the CDC.

Figure 2b. The daily and weekly trends of Covid-19 deaths since March 2020.



Data provided by the CDC.

In the chart above, the blue bars represent the daily cases and the red line indicates the weekly average. Figure 2a and 2b indicate that throughout 2020 there were three surges of Covid-19. The dependent variables were studied over three periods for both cases and deaths that correspond to these surges during the pandemic. Trends on how state variations impacted pandemic outcomes would not appear in one moment in time. As policies were changed, so did case and death rates. Examining how pandemic outcomes evolved over time may reveal that there were more variables of state variation at play that did not seem significant at one moment in time.

In the models analyzing the pandemic over time, more measures were significant predictors. The second model looked at infections over three periods and the third model looked at mortality over the same three periods which were classified as one of the three surges in 2020. The surges were defined by the time before and after a "peak" in the case and death data which can be seen in Figure 2a and 2b above. Therefore, the first surge occurred between March and April. The second surge occurred between May and September. The third surge occurred between October and December. For the two models measuring the dependent variables over time, the fourteen independent variables analyzed were the same as those analyzed in the overall model. Results from the multivariate analysis revealed that when the pandemic was examined over time, more of the four explanations were significant predictors. Unlike those in the overall model, there were more variables within the explanations that predicted Covid-19 infections and deaths. The significant predictors of infection and mortality rate over time is shown in Table 2.2 and 2.3, respectively.

Table 2.2. Models predicting Covid-19 Infection Rates over time across the 50 states.

Variables	**March to April**	**May to September**	**October to December**
Governance and Leadership			
Republican Party Control	-120.564	**555.930****	-221.398
	(157.070)	(236.038)	(479.799)
Mask Mandates December	-32.613	-163.842	-203.796
	(72.378)	(108.767)	(221.093)
Travel Restrictions	-86.148	-183.432	**-599.699***
	(97.251)	(146.144)	(297.070)
Women Governor	-11.945	54.881	-146.193
	(125.058)	(187.932)	(382.013)
State Capacity			
Doctors per capita	**5.540****	**-7.782****	5.225
	(1.889)	(2.839)	(5.772)
Total Health Spending per capita	0.179	-0.247	0.194
	(.110)	(.165)	(0.335)
Demographics and Context			
Percent Uninsured	-14.046	-47.059	**-312.973****
	(29.908)	(44.944)	(91.359)
Urbanization Index	**258.136****	29.891	394.321
	(92.519)	(139.034)	(282.617)
Percent Under Poverty	51.730	-6.279	-132.036
	(30.963)	(46.529)	(94.581)
Percent African American	-3.329	**33.484****	-38.701
	(8.183)	(12.298)	(24.997)
Percent Latino	-4.416	17.563	**53.371****
	(8.545)	(12.841)	(26.101)
Percent Native American	9.623	8.091	79.916
	(17.174)	(25.808)	(52.461)
State Culture			
Conservative Advantage	12.367	-0.406	**147.947****
	(11.047)	(16.600)	(33.744)
Trust in Government	155.133	-112.531	72.675
	(98.668)	(148.274)	(301.399)
Constant	0.002**	0.103	0.961
	(-4873.774)	(3674.052)	(222.296)
R-Squared	0.52	0.766	0.622
Observations	50	50	50

Note: Statistical significance is noted as ** $p < .05$, * $p < .10$

Table 2.3. Models predicting Covid-19 Mortality Rates over time across the 50 states.

Variables	**March to April**	**May to September**	**October to December**
Governance and Leadership			
Republican Party Control	-10.695	**9.019***	-3.078
	(16.004)	(5.215)	(8.810)
Mask Mandates December	-3.849	-2.156	-5.112
	(7.375)	(2.403)	(4.060)
Travel Restrictions	-9.709	0.021	**-11.404****
	(9.909)	(3.229)	(5.455)
Women Governor	-7.778	-0.754	10.100
	(12.743)	(4.152)	(7.015)
State Capacity			
Doctors per capita	**0.495****	**0.011****	0.138
	(0.193)	(0.063)	(0.106)
Total Health Spending per capita	**0.025****	-0.005	-0.006
	(0.011)	(0.004)	(.006)
Demographics and Context			
Percent Uninsured	-0.497	-0.265	**-5.106****
	(3.047)	(0.993)	(1.678)
Urbanization Index	**24.666****	1.953	-2.803
	(9.427)	(3.072)	(5.189)
Percent Under Poverty	**6.868****	**2.116****	-1.257
	(3.155)	(1.028)	(1.737)
Percent African American	-0.782	**0.964****	-0.171
	(0.834)	(0.272)	(0.459)
Percent Latino	-0.768	**0.581****	**1.040****
	(0.871)	(0.284)	(0.479)
Percent Native American	1.241	-0.651	0.125
	(1.750)	(0.570)	(0.963)
State Culture			
Conservative Advantage	0.595	-0.105	**1.948****
	(1.126)	(0.367)	(0.620)
Trust in Government	12.911	3.704	3.028
	(10.054)	(3.276)	(5.534)
Constant	**0.003****	0.434	0.45
	(-479.182)	(-38.42)	(62.7)
R-Squared	0.471	0.732	0.549
Observations	50	50	50

Note: Statistical significance is noted as ** $p < .05$, * $p < .10$

Leadership Matters

Although the overall model provided some insight in how leadership and governance measures predict the rates at one moment in time, the effects of the pandemic may have evolved over the course of 2020. For instance, many people have speculated whether Republican led states or Democrat led states do better during a pandemic. While the overall model does not show that Republican party control was a significant predictor, the models indicating how the pandemic has evolved over time indicate differently. During the first couple of months of the pandemic, Covid-19 cases and deaths were not driven by party control until the summer months. During the second surge of the pandemic, from May to September, states with Republican party control were more likely to have greater infections and mortality. According to a study done by researchers at Johns Hopkins, Democrat-led states had higher per-capita infections and deaths in the beginning of the pandemic (Neelon, 2021, p.7). Similar to the findings of this research, by mid-summer Republican-led states had much higher rates, which they suggest may be due to policy differences (Neelon, 2021, p.7). The two policies that this study observed are noted in Table 2.2. Those include the implementation of a statewide mask mandate and travel restrictions. While the enforcement of a statewide mask mandate was not a significant driver, this finding does not undervalue the importance of masks as a tool for mitigating spread. Rather, this finding should indicate that while there may have been the implementation of a statewide mandate, it is not a guarantee that people will follow the proper protocol for wearing masks. Thus, there are other state level factors that drive infection and mortality rates. The policy that seemed to drive cases and deaths are the level of travel restrictions. States with leaders who implemented stricter travel restrictions were more likely to have less infections and mortality. At the time the data was collected in January, there were only a handful of states that implemented strict restrictions.

While there many more states that implemented statewide travel rules, most of them had little to no enforcement. The states that were coded with strict travel restrictions were also states that closely enforced them. For example, Hawaii and Alaska required a negative Covid-19 test within 72 hours of arrival. Without a clear indication that the person traveling was not infected with Covid-19, the state would not allow that person to cross into its borders. While some states decided to implement stringent rules, there were many more states that implemented rules that had a facade of strictness. For example, California and New York required travelers to fill out forms mandating that they would abide by the state's quarantine rules. Yet, these rules were not enforced and were based on the honor code and morale of the traveler. These findings seem to suggest that states that held travelers more accountable as an infected person of Covid-19 were more likely to control the spread of the virus in their state.

In addition to the speculations of whether or not political party affiliation mattered in predicting how well a state's pandemic outcomes were going to be, there were also many speculations about whether women governors led states with lower infection and mortality rates. While this study suggests that there is no link between women-led states and cases and deaths, others suggest there are less Covid-19 deaths in states with women governors (Sergeant and Stajkovic, 2020, p.6). Reasons why the findings of our study may not match that of Sergeant and Stajkovic could be that their data collection covered an earlier period of the pandemic whereas our study covered the later end of the pandemic. Their study examined death rates from Covid-19 from January 2020 to May 2020 whereas ours examined death rates from March to December. How the pandemic had changed from its beginning to the end may explain the difference in these findings. The difference between these two studies suggests that gender may have been a more significant predictor at the beginning of the pandemic but not towards the end.

State Capacity

The capacity or ability of the state to control the pandemic through protective policy measures also varied over the three surges. During the first surge from March to April, states with more doctors per capita were more likely to have greater infections and mortality. However, infections decreased in states with greater numbers of doctors per capita during the second surge whereas mortalities continued to show an increase. The difference between the infection and death rate trends may be due to how state capacity influences the two rates. Doctors per capita may be more likely to influence mortality rates as they have more control over patient care when severe Covid-19 patients come into the hospitals. The lack of a Covid-19 cure or effective treatment plan for infected persons suggests that doctors could not do any more than providing supportive care. The options for treating Covid-19 were limited at the time, especially with a nationwide ventilator shortage. The most effective determinant of lowering mortality rate was to not get infected. Doctors per capita may have less influence over infection rates as they have less control on the behavior of state residents. However, lower infection rates could be reflective of a deeper understanding of Covid-19 and its remedies. Doctors could have advised their Covid-19 infected patients a treatment plan that prevented them from spreading the virus, such as rest and staying home. Unlike that of the first surge, this finding suggests that more knowledge of how to better control contagious spread across states helped mitigate the pandemic.

The second significant predictor under state capacity was total health spending. This variable was only significant for mortality during the first surge from March to April. The multivariate analysis indicated that states that spent more on health care had higher death rates. This was a surprising finding as we expected the opposite trend to occur. As a nation, the United States is known for its high healthcare spending, much of which is not due to better healthcare

services (Anderson, 2019, p. 87). Higher costs of healthcare spending in the United States is mainly distributed to administrative resources (Anderson, 2019, p. 87). Greater health care spending by states reflects the general trend of healthcare spending in the nation. This measure of state capacity reveals that states that had high healthcare spending were also more likely to have high mortality rates because the funding may not be going to bolstering direct health care services that could have treated sick patients. States that have spent more on healthcare did not help in controlling the pandemic.

Demographics and Contextual factors

The Covid-19 virus struck hard and early in the urban states of New York, New Jersey and Connecticut. Early on, New York became the epicenter of the Covid-19 pandemic and Governor Andrew Cuomo implemented a shelter-in-place order ordering all residents to limit non-essential travel and work remotely (Deerwester, 2020). The urgency to shut down in urban areas was a good call as the Covid-19 virus was known to be extremely contagious through air droplets. Additionally, there was widespread concern that the virus was disproportionately affecting low-income people and people of color. Public health officials focused their attention on addressing these disparities in order to better protect all communities (Godoy and Wood, 2020). The findings of demographic features, such as urbanization and race and ethnicity, on infection and mortality rate reveal that vulnerable communities should be better protected during a pandemic.

During the first surge, urban states were more likely to have greater infection and mortality rate. Over time, the pandemic outcomes also revealed that the virus had disproportionately affected the African American and Latinx populations. During the second surge, states with a greater percentage of these communities were more likely to have greater

infections and mortalities. These findings not only support the hypothesis that Covid-19 disproportionately affects ethnic minorities but also suggests that the pandemic has affected them to different extents. For instance, the Latinx population continued to be significantly affected during the third surge. The disproportionate effect of Covid-19 on communities of color reflect the reality of pre-pandemic structural discrimination, which includes less access to quality health care and jobs that were considered essential during the pandemic (Godoy and Wood, 2020). African Americans also face more health risks and underlying conditions such as diabetes, heart disease, and lung disease, all of which would be exacerbated by Covid-19 (Godoy and Wood, 2020). In this pandemic, African Americans were hit harder (Godoy and Wood, 2020). Nevertheless, Latinos and Hispanics were also testing positive for Covid-19 at high rates (Godoy and Wood, 2020). Several explanations for why we might have observed that the Latino population was more affected by the pandemic than African Americans in the third surge may be because they are more likely to live multi-generational households, over-representation as essential workers, and high rates of poverty (Godoy and Wood, 2020). There may also be more distrust among the Latino community in contact tracing due to their undocumented status, which hinders them from saying who they have been in contact with and leads to the inability to trace infections (Godoy and Wood, 2020). The Covid-19 has highlighted racial inequalities that urgently need to be addressed.

When comparing what affected infections and mortalities, there were more economic disparities that were correlated with mortalities. States with a greater percentage of those living under poverty were more likely to have greater mortality rates, but not infections. Several factors explain this finding. People of lower socio-ecnomic status are more likely to live in overcrowded places (Patel, 2020, p. 110). States implementing lockdowns disregarded that not every person

has the luxury of being able to live spaciously. One consistent driving factor of infections and mortality is that during the third surge, findings revealed that a state with a greater percentage of those without health insurance were also states with fewer infections and mortalities. While this may seem counterintuitive, this finding makes sense if we consider how those who are without health insurance are more likely to get tested and go to the hospital for any treatments unless it is an emergency. They may have avoided getting tested and receiving necessary care if they also did not know about the U.S. Department Health and Human Services reimbursement program for uninsured persons (Schwartx and Tolbert, 2020). Health care providers were not mandated to participate in the program, which further decreases its accessibility (Schwartx and Tolbert, 2020). People who were uninsured during the pandemic were also not guaranteed to receive a full reimbursement as the program only runs on contingent funding (Schwartx and Tolbert, 2020). Both of these demographic groups - people living under poverty and/ or living without health insurance - were potentially put under exacerbated stress due to the pandemic. Consistently living in financial uncertainty negatively impacts mental health and worsens stress, which weakens the immune system (Patel, 2020, p.110). This increases this demographic's susceptibility to a range of diseases (Patel, 2020, p. 110) and puts them more at risk of contracting Covid-19. The pandemic has pinpointed that the economically disadvantaged are physically vulnerable to disease and suggests that policymakers should address social welfare issues to improve public health.

State Culture

The Covid-19 pandemic has been politicised in the United States causing varying responses from the public. Under the explanation of state culture, the attitudes and behaviors of citizens within a state affect pandemic outcomes. In the models that predict pandemic outcomes

over time, conservatism or states with more conservative citizens was a significant predictor in the third surge. By the time of the third surge from October to December, protective policies began to relax and the behaviors of state citizens toward Covid-19 began to reveal itself. This finding is consistent with a study done by researchers Kerr, Panagopoulos, and Linden who found that liberals, as opposed to conservatives, were more likely to perceive Covid-19 as a higher risk, trust health experts, and criticize governors and the federal government in their response (2020). This polarization extends beyond differing attitudes and also applies to the level of engagement in various protective behaviors such as social distancing, wearing face masks, and staying home during lockdowns (Kerr, Panagopoulos, Linden, 2020). Since liberals appear to take the Covid-19 pandemic more seriously, they may also be more likely to adhere to containment measures and proper use of personal protective equipment. Conservatives may not take these recommendations as seriously, which would suggest why states with more conservative people would also have higher infection and mortality rate. The debate on the efficacy of these Covid-19 mandates has evolved from a health issue to a political issue. In reality, conservatives have a disadvantage when it comes to overcoming Covid-19.

Qualitative Approach: Case Study of California v. Florida

Moving beyond general predictors, we also conducted two case studies. The two case studies are pairs of states that we have chosen based on the four explanations. The first pair that we compare is California and Florida. The second pair that we compare is South Dakota and Vermont. This will allow us to gain a comprehensive insight into which state variations were better in containing Covid-19. This will also allow us to compare leadership choices of each governor and whether each one's approach and attitude toward Covid-19 affected the state's outcomes. To begin, we will first begin the case study analysis with California and Florida.

The significance of Covid-19 policy approaches between California and Florida reflects the politicization of the pandemic across the nation. California and Florida are led by governors from opposite parties, both of which implemented drastically different Covid-19 policies, yet resulted in similar pandemic outcomes. California is led by Governor Gavin Newsom who was the leading state to implement a statewide lockdown and strict protective measures in an attempt to mitigate Covid-19 (Table 3.1). On the other hand, Florida Governor Ron DeSantis not only ordered a stay-at-home order roughly two weeks after Newsom but also eased Florida's restrictions much quicker. Despite these very different policy approaches, Table 3.1 suggests that the differences reveal that California's strict responses did not significantly lower its infection and mortality rates. This is because California and Florida's cases and death rates are similar. However, Florida's death rate has consistently been higher than California's.

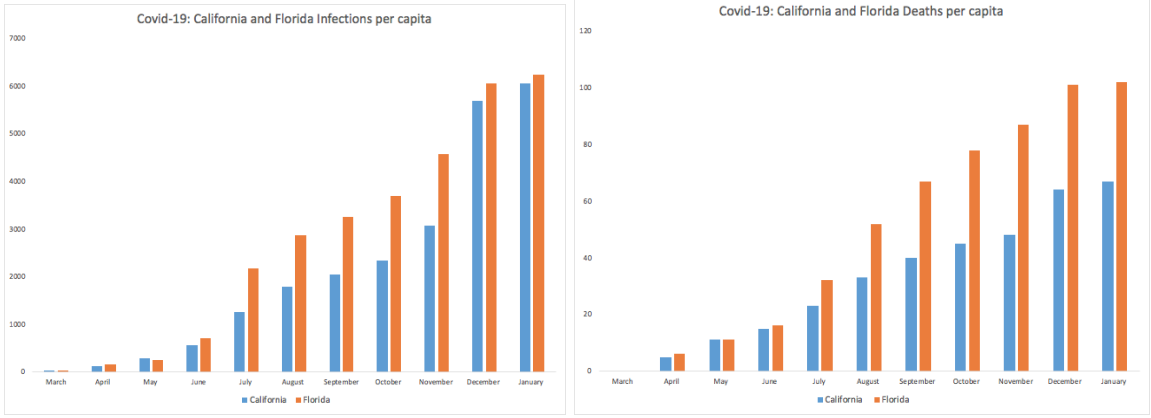
Table 3.1. Covid-19 containment measures in California and Florida.

	California	**Florida**
Infection per 100,000 (March 13)	8918	9018
Mortality per 100,000 (March 13)	139	150
Total Party Control	Democrat	Republican
Mask Mandates December	Statewide mandates	No statewide mandates
Travel	Loose travel restrictions	No travel restrictions
Restaurant Closures (Jan. 21)	Take-out & Delivery only	No restaurant occupancy enforcements
School closures: 2019-2020 year	Recommended closure	Recommended closure
School closures: 2020-2021 year	Partial closure in effect	Ordered open

Doctors per capita	279.6	265.2
Total health spending per capita	1355	728
Urbanization index	12.19	11.46
Conservative advantage	0	14
Trust in government	Below average trust	Below average trust

During the second surge, California and Florida's difference in infection rate was highest by the end of September with California's rate at 2052 per 100K and Florida at 3250 per 100K. Only in the winter did the rate begin inching closer together. At the beginning of January, California's rate was 6052 per 100 K and Florida's was 6245 per 100K. Figure (number) represents the trends of California and Florida's infection and death rate over the course of 2020.

Figure 3a and 3b. Comparison chart of California and Florida's infection and death rates, respectively.



During the period of time that California and Florida rates began to become more similar (Figure 3a), there are three possibilities that could explain what occurred. The first possibility is that California's strict policy implementation is what prevented their death rate from climbing like that of Florida's. The second possibility is a delayed onset of demographic differences that caused similarities in infection rates. The third possibility is that both policy implementation and demographic features influenced cases and deaths. After reviewing the demographic data

collected in Table 3.2, California does have some disadvantages that may explain why the rates inched closer to Florida's as the year progressed. These demographic differences may have contributed to why the significantly different policy approaches resulted in similar infection and mortality rates of California and Florida.

Table 3.2 Demographic Differences of California and Florida.

	California	**Florida**
Total Population Estimates	39,512, 223	21, 447, 737
Population Density	256	410
Percent African American	5.3	15
Percent Latino	39.5	26.6
Percent Native American	1.9	0.77
Percent with disabilities, under age 65 years	6.7	8.6
Percent Uninsured	7.8	13.1
Percent of persons over age 65 years	14.8	16.5
Nursing home deaths per 100 residents	2.27	0.72
Percent in poverty	11.8	12.7
Unemployment Rate (%)	9	6.1

California has higher levels of Latinos, which were shown to be consistently affected by the pandemic in the second and third surges. Additionally, "55% of California residents live in counties with a high "social vulnerability score" which is an estimated measure of the severity of a disease outbreak affecting that region (Karlamangla and Lin II, 2021). On the other hand, only 25% of Florida residents live in counties with high vulnerability scores (Karlamangla and Lin II,

2021). In comparison to Florida, California also has a more persistent flu and pneumonia season (Karlamangla and Lin II, 2021). There is also speculation that the climate can impact the longevity of droplets staying in the air (Karlamangla and Lin II, 2021). In humid areas such as Florida, climate experts suggested that Covid-19 droplets are more likely to fall faster than in locations with less humidity (Karlamangla and Lin II, 2021). All of these factors combined, suggest that California is more susceptible to disease spread than Florida. If Newsom's policies were similar to that of DeSantos, California's case and death rates may have been worse. Additionally, California was not only the first state to lockdown at the beginning of the pandemic, but was one of the states that implemented among the most restrictive policies in the nation. California was also among the states that implemented contradictory policies in closing down schools yet opening up restaurants and bars.

Florida's Republican Governor DeSantis is taking advantage of the situation in promoting his status for the upcoming election. DeSantis is the youngest governor in the nation at 42 years old and has been garnering attention from his peers due to Florida's apparent success in managing the Covid-19 pandemic. In an interview he stated: "Everyone told me I was wrong… I faced continued pressure from radical Democrats and the liberal media, but I refused to back down. It's clear: Florida got it right" (Zeleny, 2021). Although Florida's relaxed policies resulted in similar case and death rates as California, DeSantis is receiving praise whereas California's Governor, Gavin Newsom is receiving backlash on his Covid-19 policy.

Although Florida decided to take a relaxed policy approach in controlling the pandemic, the state is still doing better than half the nation. Along with California, Florida falls into the center of state rankings on Covid-19 metrics. The situation in Florida and California has highlighted how politics of the pandemic has and will influence future governor elections. For

instance, the implementation of pandemic policies such as lockdowns and school reopenings are going to be a measure for constituents in holding their governor accountable in mitigating the pandemic (Zeleny, 2021). DeStantis is in a good position on being re-elected in comparison to Newsom, who took more restrictive measures. Many Californians were angered by Newsom's approach to contain Covid-19 (Reston, 2021). Newsom implemented a restrictive lockdown during the winter holiday season with the intention that this would control the spread as cases were increasing and hospitals were reaching capacity (Reston, 2021). Although DeSantis decided to lockdown within the first months of the outbreak, he did not enforce statewide masks mandates, travel restrictions, or business closures (Table 3.1). Florida's unemployment rate is also lower than that of California's, which makes Newsom's enforcement of restrictive policies appear less effective and DeSantis' decision to stay open more effective. DeSantis restricted cities and counties from fining residents who choose not to wear masks and is facing pushback from local officials who believe that their local authority is being taken away (Zeleny, 2021). All governors in the nation were responsible for balancing the protection of residents while maintaining the economy. DeSantis' decision to fully reopen the economy didn't result in the spike in deaths and infections that occurred in other states.

According to the CDC data in Figure 3b, Florida's rates were always higher than that of California's. California's rates were significantly lower for much of the pandemic until after the winter surge, when California's rates inched closer to that of Florida's. By the Fall of 2020, Florida was fully open with most districts urged to open up schools and indoor operations. Florida's summer surge was a lot worse, which makes sense as people flock inside to avoid the hot sun. California's rates were less severe during the summer. As time passed, California's most vulnerable spots were taking big hits of Covid-19. In Southern California, communities are more

likely to be overcrowded, contain more essential workers, and less compliance with health restrictions (Hwang and Massa, 2021). The "social vulnerability index" is a scale used by the CDC to estimate how a disease outbreak will affect a region. Los Angeles in particular has a high social vulnerability index (Hwang and Massa, 2021). Florida's Miami-Dade county also ranks high on the vulnerability index and has demographic features, such as high tourism and immigrtion rates, that drive Covid-19 rates up. The CDC reported that there are nearly two times more cases of new variants found in Florida than in California. The lack of statewide protection measures such as masks and restricted business operations seem to attest to the efficacy of these measures that aim to contain the pandemic.

Qualitative Approach: Case Study of South Dakota v. Vermont

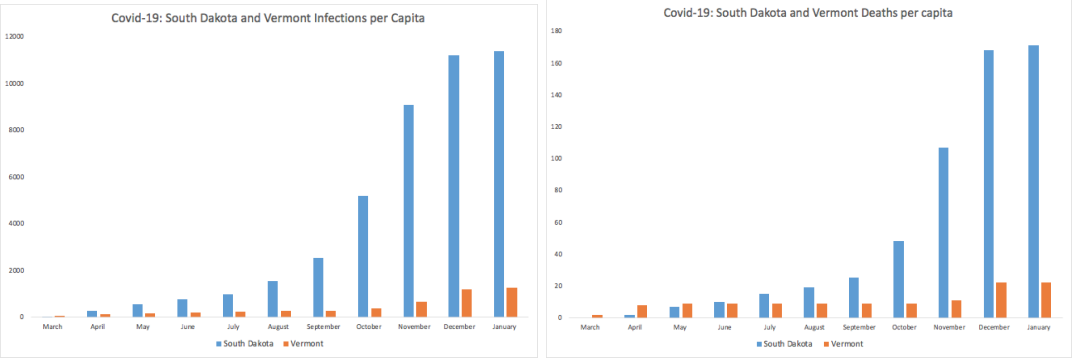
A state by state comparison of South Dakota and Vermont reveal that although they were demographically similar and both are led GOP governors, the dramatically different policy approaches resulted in different pandemic outcomes. This comparison will allow us to control for demographic features and observe if taking certain policy approaches mattered. Both states have less than 1 million residents, who mostly reside in rural neighborhoods. South Dakota Governor Kristi Noem is one of the most skeptical leaders of Covid-19 (Tupper, 2020). Differences between the approaches of Noem and Scott can be observed in Table 2.5. Noem did not impose statewide mask mandates and has one of the nation's worst infection rates. On the other hand, Vermont's Governor Phil Scott implemented safety measures and has one of the lowest infection and mortality rates in the country (Table 2.5). Scott listened to the advice of the CDC and implemented a statewide lockdown and mask mandate. Scott also strategically balanced the economic recovery of Vermont while protecting the health of state residents.

Table 2.5 State Containment Measures in Vermont and South Dakota

	Vermont	**South Dakota**
Infection per 100,000 (January 4)	1249	11346
Mortality per 100,000 (January 4)	22	171
Total Party Control	Split	Republican
Mask Mandates December	Statewide mandates	No statewide mandates
Travel	Strict restrictions	No travel restrictions
Restaurant Closures (Jan. 21)	Variation of restricted dine-in occupancy and take-out	No restaurant occupancy enforcements
School closures: 2019-2020 year	Closed for academic year	Recommended closure for 2019-2020 school year
School closures: 2020-2021 year	No order in effect	No order in effect
Doctors per capita	367.1	240.4
Total health spending per capita	639	379
Urbanization index	8.84	8.73
Conservative advantage	-4	31
Trust in government	Average trust	Above average trust

At the beginning of the pandemic, every state had implemented a statewide lockdown. The case and death rates of South Dakota and Vermont in Figure 4 were relatively similar. Both states had low numbers at the beginning of the pandemic. During the summer months, the numbers of South Dakota were rising more quickly than that of Vermont's.

Figure 4a and 4b. Comparison of South Dakota and Vermont infection and death rates, respectively.



These trends reflect Governor Noem's skepticism of Covid-19 protection measures. Over the course of the second surge (May to September), Noem doubted whether or not masks actually prevented the spread of the virus and appeared to ignore CDC advice on limiting social gatherings outside of the household. Noem invited former President Donald Trump to a Fourth of July celebration at Mount Rushmore and 7,000 people attended. The following month, hundreds of thousands of people gathered at the annual Sturgis motorcycle rally in South Dakota (Tupper, 2020). These celebrations appeared to be super spreader events as the number of infections and deaths increased significantly than in the month prior. While Noem was hosting rallies, Scott implemented a statewide mask mandate and handed out 300,000 cloth coverings to residents (Tupper, 2020). When cases were surging nationally during the winter holiday, Scott noticed that Vermont's cases rose to 100 for the first time. He responded with new protective measures including limiting social gatherings, restricting business operations and mandating teleworking (Tupper, 2020).

Although the demographics between South Dakota and Vermont are relatively similar, their pandemic outcomes are different. Demographically, Vermont would appear to have been more severely affected by Covid-19, but the state has shown its resiliency against the virus. Vermont is near Massachusetts and New York, two states that had high numbers of cases in the beginning of the pandemic. Vermont also has a higher population density than South Dakota

(Table 3.2). In the comparison of California and Florida, population density and urbanization were driving factors of infections and cases. However, between Vermont and South Dakota, Vermont fared better in the pandemic despite having a significantly higher population density. This may suggest that there are multiple factors at play when predicting what drives infection and death rates.

Table 2.5. State profile of Vermont and South Dakota

	Vermont	**South Dakota**
Total Population Estimates	623, 989	884, 659
Population Density	68	12
Percent African American	1.1	2.2
Percent Latino	1.8	3.7
Percent Native American	1.3	9.9
Percent with disabilities, under age 65 years	10.6	8.1
Percent uninsured	4.4	9.6
Percent of persons over age 65 years	20	17.2
Percent in poverty	10.2	11.9
Unemployment Rate (%)	3.1	3.7

Noem did not implement a stay-at-home order like many other states and did not require business closures and bragged about not doing so: “South Dakota is the only state in America that never ordered a single business or church to close… South Dakota never instituted shelter in place, never mandated people to wear masks” (Cillizza, 2021). Despite the rising numbers, Noem still continued to claim that the virus was “under control” (Cohen, 2020). Noem stated: “There are many others who question the effectiveness of masks, and South Dakotans should

take the time to read this information so they can make informed decisions for themselves and their families. If folks want to wear a mask, they should be free to do so. Similarly, those who don't want to wear a mask shouldn't be shamed into wearing one. And the government should not mandate it" (Cohen, 2020). The pandemic outcomes of South Dakota reflects the relaxed policy approach of allowing people to choose what makes them feel safest, but the outcomes do not reflect the confidence of Noem in containing the pandemic.

Vermont's approach was drastically different. In March, Scott issued a lockdown of non-essential businesses and gradually opened the economy back up. The state embraced physical distancing and limiting social gathering sizes. The state's Department of Health also introduced a test and contact trace system that aimed to contain outbreaks (Cohen, 2020). These strategies seem to have worked against the spread of the Covid-19 virus. Unlike the GOP governor of South Dakota, Scott embraced CDC's recommendations and trusted the data: "Based on national and regional data on how the virus is spreading - and rather than waiting like other states have - I feel we need to act now to protect our gains, which have allowed us to reopen much of our economy.. That's why today I signed an order, which will strengthen our current mask mandates, so that we do not take steps backwards and we can stay open into the fall as people move more interactions indoors" (Cohen, 2020). While the majority of Republican states are more likely to also have greater infection and mortality rate, Vermont is an exception and example to the nation that indicates that one's party affiliation does not have to dictate how they implement Covid-19 containment measures.

Conclusion

Examining state variation through qualitative and quantitative approaches allows us to look at pandemic outcomes from various perspectives. The multivariate analysis pinpointed

certain variables for moments in time and painted a picture of how the pandemic evolved during the course of 2020. From the results of the quantitative analysis, we found that leadership matters in mitigating the pandemic. We also found that the pandemic has disproportionately hit people of color and public health policies need to address pre-existing discrimination that prevent these communities from accessing quality health care. Furthermore, the case studies allowed us to look into the attitudes and rhetoric of leaders toward the pandemic. Results of the case study complemented the results of the multivariate analysis. The next section will determine what these results mean and discuss social and political implications of these findings.

3. The Future of Pandemics: Where We Go From Here

Since the Covid-19 pandemic overtook the United States in March 2020, public health officials have a better understanding of how to control the spread of the Covid-19 virus. Due to the lack of a federally coordinated response in containing the pandemic, each state government implemented policies they thought would work best in mitigating the spread of a highly contagious virus. Various policy approaches led to many variations in pandemic outcomes within states. In order to determine what the main drivers of pandemic outcomes are, I conducted a multivariate analysis and compared two case studies of state-by-state metrics. I examined 41 independent variables falling under one of the four explanations, including leadership, state capacity, demographics, and state culture, against two dependent variables, infection and mortality rate, over the course of the year 2020. The dependent variables were analyzed over three different periods of time between March and December that marked the three surges of the pandemic. In contribution to the body of knowledge that already exists, this study has pinpointed the explanations that more likely predict the severity of case and death rates within a state. The following section will describe a summary of the findings, political implications, and the potential influence this study has on planning for future outbreaks and public policy.

Summary of findings

The mixed-method approach determined how state variations have influenced pandemic outcomes. Beginning with the multivariate analysis, results suggested that there were certain variables that predicted case and death rates more than others. For the multivariate analysis, I hypothesized which explanations would matter in influencing infections and deaths. Beginning with leadership and governance, I hypothesized:

H1: States with Republican governors had higher mortality and infection rates

H2: States with women governors had lower mortality and infection rates.

H3: States with Governors that implemented stricter protective measures had lower mortality and infection rates.

The analysis suggested that party affiliation of the governors and how strict policy approaches mattered in containing the pandemic. Between the months of May and September, states with Republican governors had high infection and mortality rates. Governors who also implemented strict travel restrictions were more likely to have lower rates, which were both consistent with my predictions. On the other hand, there was no correlation between women governors and the dependent variables during any period during the pandemic. Unlike my predictions, the results did not suggest that states led by women governors influenced pandemic outcomes. Gender did not predict how well a state would perform during the Covid-19 pandemic.

Under the second explanation of state capacity, I hypothesized:

H4: States with greater state capacity, such as testing, doctors, and health spending, had lower mortality and infection rates.

Other variables that appeared to predict how well a state would perform was doctors per capita. The results suggested that states with more doctors per capita were more likely to have higher infection and mortality rate, which can be attributed to urban areas containing more hospitals and more doctors overall. States that spent more on health care were more likely to have higher mortalities during the first surge of the pandemic which may suggest that funding is not going toward direct health services.

Findings of the third explanation of demographics and contextual factors indicate that these factors may have influenced the rates of infection and mortality within a state. I hypothesized:

> ***H5***: States with greater urbanization, poverty, and vulnerable communities to disease such as immigrants, uninsured persons, and people of color had higher mortality and infection rates.

We found that states with a larger percentage of African Americans and Latinos had greater infection and mortality rates which supports my hypothesis. Communities vulnerable to disease are people of color which the results indicate drive the case and death rates. For mortality in particular, states with a higher percentage of those living in poverty had a higher rate. Other findings that supported my hypothesis was that the amount of urbanization within a state influenced rates. For both dependent variables, states with more urban areas were more likely to have higher rates. The last notable finding within demographic explanations is that the more uninsured persons residing in the state, the less infection and mortality rates there are. This finding was unexpected and rejected my original hypothesis.

Findings of state culture, the last explanation, suggested that conservatism plays a role in how well states perform during Covid-19. I hypothesized:

H6: States with more conservative citizens will have higher infection and death rates. States with higher conservatism were predicted to have higher infection and mortality rates. This finding supported my hypothesis and indicating that states with more conservative people were less likely to have better outcomes.

The multivariate analysis indicated that many determinants of pandemic outcomes. Understanding the reasons why these state variations may have predicted Covid-19 infection and mortality rates can help plan state specific policies for the future.

Results from the multivariate analysis suggest that the variations that led to various pandemic outcomes within a state were driven by a mix of policy approaches and demographic advantages and disadvantages. Through a closer look at the variations in the case studies of California and Florida, both of which had very different policy approaches but similar pandemic outcomes, the demographic features of the state mattered more in regards to how well the state performed. For instance, California has many demographic disadvantages such as overcrowding and a large number of communities of people of color. The example of California indicated that the demographic disadvantages outweigh the strict policies that Newsom put into place. On the other hand, Florida has some advantages such as having less nursing home deaths relative to California, humid climate, and slightly less urbanized areas. The comparison of Vermont and South Dakota indicate similar lines of reasoning. Although Vermont and South Dakota are demographically similar, this indicates that both states had demographic advantages that could have helped in mitigating the pandemic alongside strict policy implementation. For instance, Vermont's governor Phil Scott had demographically advantageous qualities that contained the pandemic alongside his decision to implement strict policies such as statewide mask mandates and lockdowns. On the other hand, South Dakota's governors Kristi Noem did not act as Scott did and her state resulted in having high rates of infections and mortality. Noem allowed large social gatherings and did not impose any mask mandates or advise business closures. Through these demographically similar states, this comparison indicates that strict policy implementation by Noem may have aided her in containing the pandemic as it did in Vermont. This second case

study shows that having demographic advantages does not aid in mitigating the pandemic alone, but that in combination with strategic policy approaches, Covid-19 rates can be controlled. Overall, the case study state-by-state comparisons suggest that states that are demographically disadvantageous such as California may need to implement better strategies for mitigating future outbreaks and not through strict policy implementation alone.

Social and Political Implications

State variations resulting in various Covid-19 outcomes did not fall under any particular explanation. The success of a state in mitigating the pandemic appeared to be the result of a combination of factors. The four explanations -- leadership, state capacity, demographics and contextual factors, state culture -- vary in degree of importance in determining pandemic outcomes. These explanations have also highlighted many social implications of the Covid-19 pandemic that could aid policymakers in how to contain future outbreaks within their state or nation.

Public Policy and Society

Facilitating national cooperation in the United States among Democrats and Republican governors and leaders can maximize efforts in protecting citizens from infectious diseases. Rhetoric of many governors urged people to collaborate and work together on stopping the spread of Covid-19. Collaboration could have been focused on wearing masks in order to protect others and following lockdown rules to protect immunocompromised individuals. The pandemic which presented an opportunity for residents and leaders to work together, has only aggravated increasing political polarization. Mitigating the pandemic in the United States was not focused on the health and well-being of others as it was in other countries. One’s behavior and attitude about containing the pandemic appeared to depend on the political affiliation of the person and

was independent of one's age group or health status. In theory, public health should not be driven by politics but by scientific evidence. As one of the countries with the most severe Covid-19 cases in the world, the United States and its leaders allowed themselves to be distracted by polarization which has cost hundreds of thousands of lives. Although state leaders worked individually to contain the pandemic within their own state, they missed the opportunity to come together to implement statewide masks mandates, limit social gatherings, and allow safe business operations as a nation in order to combat the pandemic. Moving forward, political polarization that will arise from future crises should be addressed in order to maximize the ability of the United States to create a solution to a national problem.

A main driver of polarization was rooted in a leader's decision to implement protective measures such as mask mandates and stay-at-home orders. Although the findings of this study suggests that success in mitigating the pandemic is a combination of demographic advantages as well as adopting an effective policy approach, the decision on whether or not to implement protective measures were not based on science. Many notable governors took the advice of the CDC and implemented policies recommended by disease experts. As shown by the case study comparing South Dakota and Vermont, Republican affiliation does not necessarily mean that the leader cannot embrace scientific expert opinions. On the other hand, some leaders were skeptical about the efficacy of masks despite its strong evidence and recommendations in containing the spread of the pandemic. The use of masks was scientifically proven to contain air droplets, a main transmission method of Covid-19. The decision to not implement masks began to be associated with Republican leadership and politics, rather than based on the evidence.

In addition to speculations about how political parties may have predicted pandemic outcomes, there was also speculation on how gender may have influenced case and death rates.

Gender did not appear to drive rates which suggests that feminine leadership styles did not have a significant impact on how well a state contained the pandemic. Gendered notions of what makes an effective leader during a crisis should be given a second-thought. At the time of the pandemic there were only 9 women governors. The small sample size of women leaders may have contributed to this finding. Nonetheless, this finding suggests that there are other factors and variations at play in determining how well a state contained the Covid-19 virus.

The second explanation, state capacity, included some measures that explain how state variations resulted in various pandemic outcomes. The first variable to suggest correlation to infection and death rates was doctors per capita. Doctors tend to be more concentrated in urban areas than rural ones. This indicates that physicians residing in urban areas are also at risk, potentially a higher risk, of contracting Covid-19 and are counted in the death toll. Hundreds of physicians across the nation died due to Covid-19 while attempting to heal those with the virus in hospitals. Many more health workers died due to Covid-19 as well and were counted in the death tolls. The suggested correlation between doctors per capita and mortality rates suggests that the effects of the pandemic impacted infections and deaths among essential workers. Essential workers were particularly vulnerable at the beginning of the pandemic when states did not have enough personal protective equipment (PPE) to hand out. Additionally, the correlation between doctors per capita and pandemic outcomes may have also been due to these areas being overwhelmed by Covid-19 patients. According to the multivariate analysis, doctors may have gotten a better grasp on how to better organize hospital flow of patients, secured more equipment, and better understood the risks of Covid-19 in order to prevent its spread among health care workers. Many essential workers did not have the luxury of being able to lockdown. In theory, more urban states would also have more essential workers. State leaders should have

thought about how to best protect this working class while not making them sacrifice their own lives for the sake of the economy. Although there were little measures of state capacity that were significant, the doctors per capita variable suggests that protecting essential workers is vital to not only lower case and death rates among themselves but also among others.

The third explanation, demographics and contextual factors, revealed systemic inequities in the U.S. that have resulted in disproportionate pandemic outcomes affecting certain populations, particularly African American and Latinx. The spread of the disease is not only a threat to national and international security, but also a universal threat because anybody has the capacity to develop sickness. The threat of a disease grows exponentially larger if the novel disease emerges and it is incurable and potentially contagious. Although the spread of highly infectious diseases can be a major threat to humans due to its ability to spread across borders, diseases do not affect everyone equally due to socioeconomic status and access to quality care. Communities that have limited access to quality health care, sanitary resources, and the financial means to purchase protective equipment will be more susceptible to diseases. Preventively increasing access to health resources, not just during a pandemic, should in theory improve public health overall. These communities are not only vulnerable to disease but other injustices as well including racial discrimination. The combination of a Black Lives Matter protest during the summer of 2020 also highlighted the perpetuating injustices that BIPOC continue to face which have only been exacerbated by Covid-19. In the future, the realm of public health will have to include more perspectives from people of color and how these disparities can be addressed.

The findings of the fourth explanation, state culture, has some political implications. Conservatism was a main driver of outbreaks and mortalities during the pandemic. Similarly to

the reasoning behind why Republican-led states have higher rates, states with more conservatism did not appear to contain the pandemic as well as less conservative states. The political implication of this finding is how to engage with more conservative states on issues considering the polarized state of the nation. This finding suggests that within conservatism are sentiments that prevent people from wanting to mitigate the pandemic, which could include refusals to wear masks and social distance. This finding also suggests that pandemic outcomes depend on individuals' attitudes on the pandemic and how one's behaviors have had consequences. More conservative states also may also implement less Covid-19 policies. In doing so, the burden fo Covid-19 differs between states which does not aid the national effort to contain the virus. These unintended consequences of conservatism on pandemic outcomes suggests that a shift in how conservative states implement policies for the benefit of the nation should be considered.

Future Research

A cross state comparison on policies on Covid-19 could be expanded to analyze other prior and future pandemics. The examination of Covid-19 policies in this study could be applied to analyze the impact of other policies that are specifically implemented during crises. For pandemics, these policies include masks and stay-at-home orders. For other crises, these could include policies mandated to rebuild infrastructure or provide financial relief for affected communities. More specific analysis of leadership actions during crises can also be more deeply explored. This study's contributions include how party affiliation influences infections and deaths and how gender does not. This research could be expanded with more detailed descriptions of leadership by including governor rhetoric on the enforcement of policies and attitudes on Covid-19. Language and rhetoric from national and state leaders may have attributed to how citizens perceived the threat of the virus and influenced their behavior. For state capacity,

future research can include the impact of all health care workers on Covid-19 success rather than just doctors. An analysis of how all health workers have influenced pandemic outcomes may have provided a more expansive analysis on state capacity and its impact on infection rates and death. More specific descriptions of the four explanations could provide a broader understanding of state variations on Covid-19 pandemic outcomes.

Conclusion

Understanding how state variations influenced Covid-19 infection and mortality rates can help policy makers navigate future pandemics. Covid-19 has provided an opportunity for U.S. leaders to learn about how to best contain disease outbreaks. The lack of a federally led response in the beginning of the outbreak increased the severity of the outbreak in the U.S. Due to various responses from states with different demographic pressures, the Covid-19 pandemic suggests that state successes on mitigating the pandemic is a combination of policy approaches and demographic advantages. According to the case studies, demographic pressures drive infection and mortality rates despite policy implementations (i.e. California). Vermont performed well due to strict Covid-19 policy in addition to demographic advantages. One lesson that governors can take away from the pandemic is recognizing their state's demographic advantages and weaknesses. In doing so, they may be better prepared for preparing for future crises that may be unique to that state. Similarly to how diseases affect communities differently, diseases also affect states differently. Each governor should be familiar with what their state's weaknesses are in order to contain the spread of a novel virus as much as possible in the future. Being aware of demographic disadvantages and implementing the recommended pandemic policy can ultimately prepare a state for containing and mitigating future infectious outbreaks.

Appendices

Appendix A. Sources and Codes of Variables (Variable descriptions pending)

Variable	Source	Column1
Dependent Variables		
Infection rates	CDC 2020	Raw Numbers
Mortality rates	CDC 2020	Raw Numbers
Independent Variables - Governance and Leadership		
Party Control of Government	Ballotpedia 2020	0: Democrat/ Split; 1: Republican
State Restrictions	NPR 2020	0: No; 1: Statewide; 2: Varies
Mask requirements statewide	National Academy for State Health Policy 2020	0: no masks; 1: masks required
Travel restrictions statewide	National Academy for State Health Policy 2020	0: no travel restrictions; 1: loose travel restrictions; 2: strict travel restrictions
Restaurant enforcements	NPR 2020	0: Dine-in allowed; 1: varies; 2: takeout/delivery only

School closures	Education Week 2020	0: Varies by school district; 1: Closed for academic year; 2: Closed until further notice; 3: Recommended closure
Identity of Leaders: Women leaders	Center for American Women and Politics 2020	0: Woman; 1: Man
Upcoming governor elections	Ballotpedia 2020	0: No; 1: Yes
Upcoming legislative elections	Ballotpedia 2020	0: No; 1: Yes
Governor approval ratings	Ballotpedia 2020	Raw Numbers
Independent Variables - State Capacity		
Doctors per capita	AAMC 2020	Raw numbers
Hospitals per capita	American Hospital Directory 2020	Raw Numbers
Staffed beds per capita	American Hospital Directory 2020	Raw Numbers
Health spending per capita	Business Insider 2017	Raw Numbers
People without health insurance	U.S. Census 2019 (p.14)	Raw Numbers

Daily testing (7-day average) by population	Johns Hopkins: Coronavirus Resource Center 2020	Raw Numbers
Investment in contact tracing	NPR 2020	0: currently meets estimated need; 1: will meet estimated need; 2: does not meet estimated need; 3: no data available
Independent Variables - Contextual Factors		
Level of urbanization	FiveThirtyEight 2020	Raw Numbers
Population: people in poverty	U.S. Census 2019	Raw Numbers
Household income	World Population Review 2020	Raw Numbers
Population density	World Population Review 2020	Raw Numbers
Total population	World Population Review 2020	Raw Numbers
Population: African American	Kaiser Family Foundation 2019	Raw Numbers
Population: Latino	Kaiser Family Foundation 2019	Raw Numbers
Population: Native American	World Population Review 2020	Raw Numbers

Independent Variables - Social Structures		
Political Ideology by State	News Gallup 2019	Raw Numbers (Pct. Pts)
State culture (Elazar)	Morgan, D., & Watson, S. (1991)	0: moralistic; 1: individualistic; 2: traditionalistic
Trust in government	Gallup 2013	0: no data; 1: below average trust; 2: Average trust: 3: Above average trust
Creation of racial task forces	National Academy for State Health Policy 2020	0: no task force; 1: task force implemented

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