

Prioritizing Lives and Economic Livelihood: A Case for Stringent Health Policy During the
COVID-19 Pandemic in the United States

By

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Thesis

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INTRODUCTION

As of June 2021, the COVID-19 pandemic had cost over 600,000 lives in the United States and sent the economy spiraling, with unemployment skyrocketing and businesses across the country failing. In the initial months of the pandemic, many U.S. policymakers discussed how to best save both lives and the economy. Many called for businesses to reopen in order to save the economy, even though reopening measures greatly increased the public's chance of contracting COVID-19. In May of 2020, President Donald Trump stated in a press conference to defend his plan to reopen the economy before states had met their infection thresholds in an attempt to save the economy, "Will some people be affected? Yes. Will some people be affected badly? Yes. But we have to get our country open, and we have to get it open soon" (Shapiro). This statement from the former President shows that he was accepting of the fact that lives will have to be lost in order to save the economy, ignoring the advice of both the World Health Organization and his own health advisors ("Coronavirus Disease (COVID-19)"). On the left side of the American political spectrum, policymakers were more willing to enforce lockdowns, believing that containing the virus was the best way to save the economy. California Governor Gavin Newsom defended his decision to reinstate a lockdown in December of 2020 after COVID-19 cases surged due to the holidays, stating, "If we stay home as much as possible, and wear masks when we have to go to the doctor, shop for groceries or go for a hike, California can come out of this in a way that saves lives and puts us on a path toward economic recovery" ("California Health"). These two statements represent the opposing political viewpoints regarding COVID-19 health policies in the United States. Furthermore, they demonstrate that depending on their political leaders, states had very different policy responses to COVID-19.

Comparing the neighboring states of Tennessee and North Carolina, it is clear how the state's political affiliation can affect state policy. Tennessee has a Republican governor and predominantly Republican state officials. North Carolina, on the other hand, has a Democratic governor and a mix of political affiliations among state officials. To better understand the health policy divide, Oxford University has calculated a measure of policy stringency, which measures COVID-19 policies on a scale of least to most restrictive on a scale of 0 to 100. From March 2020 to March 2021, the average stringency index for Tennessee was 47.2 and the average stringency index for North Carolina was 58.0 ("Coronavirus Government Response Tracker"). This statistic shows that over the pandemic, North Carolina was frequently choosing more restrictive policies. For example, Tennessee never adopted a statewide mask mandate while North Carolina had a mask mandate for 6 months of the pandemic, from November to April. North Carolina also maintained a statewide stay at home order until a vaccine was widely distributed, adjusting the curfew based on case counts ("COVID-19 Orders and Directives"). Throughout the pandemic, Tennessee left the response to individual counties, simply encouraging personal responsibility ("Tennessee"). As a result of these differences, I wanted to see how different responses affected state-level economic indicators. I will demonstrate that the different policy responses between Tennessee and North Carolina have had varying effects on their economies.

Multiple studies have already considered the impact of COVID-19 health policies on the economy. Economic models have predicted that in the United States, prioritizing saving lives is the best way to save the economy (Bethune and Korinek 33). One study looking at European policy responses to the pandemic found that stricter policy, such as lockdowns, business closures and mask mandates, while initially causing worse economic outcomes, allowed the economy to

recover quicker and did not overwhelm the healthcare system (Sheridan et al. 2016). As a result of these findings, I wanted to research how the different policy responses across the United States have affected economic outcomes by state. While current research has focused on national policies, variation in state-level policies could provide a more nuanced view of the economic impact of COVID-19 health policies. I designed a quantitative study that models how policy responses among different states have affected three primary measures of the health of the economy, unemployment as well as income and GDP growth, in order to determine what policies resulted in better economic outcomes in the short-, medium-, and long-run. Consistent with national-level research in Europe, I expected to find that more stringent policies produced better economic outcomes in the long-run but may have had more varied effects in the short-run. Furthermore, I investigated if the political affiliation of each state's governor affects the policies states have adopted in order to determine if politicization was the determinant of health policies adopted during the pandemic. Specifically, I will address the research question: how have Trump-era health policy decisions during the COVID-19 pandemic affected key state-level economic indicators?

The remainder of this thesis is organized as follows. First, I review present research from Europe that looked at economic outcomes from similar countries with different policy responses to COVID-19. I then describe the effect of the COVID-19 pandemic on both policy and the economy by outlining how partisanship affects policy, closing with a comparison to the HIV/AIDS epidemic. As a quantitative analysis, my methodology outlines the variables in multivariate regressions. For my results and discussion, I outline the effect of stringency on key state-level economic indicators as well as explore the relationship between stringency and the political affiliation of each state's governor. I conclude by evaluating the effectiveness of Trump

COVID-19 policies and calling for future health policies to prioritize the health of citizens rather than the economy.

LITERATURE REVIEW

At the beginning of the coronavirus pandemic in March 2020, Sweden pursued a policy of natural herd immunity in an attempt to protect their economy. Herd immunity occurs when a high percentage of a population is immune from a disease, thus protecting “those who are not immune to the disease by acting as a bulwark against further population infection surges” (Orlowski and Goldsmith 292). While they still tried to shield their elderly and immunocompromised population from the virus by recommending that the rest of the population avoid high-risk individuals, Sweden did not take measures to prevent their healthy population from getting COVID-19. They believed that the healthy population would get the virus, survive because they are healthy, and then become immune to the virus, thus achieving herd immunity in their country and protecting their high-risk population (Sheridan et al. 20468). Sweden pursued this policy because they had “real doubt whether any population or economy could sustain a protracted lockdown, or repeated cycles of lockdown and relaxation” (Orlowski and Goldsmith 293). However, they eventually had to abandon this policy because their healthcare system was becoming overwhelmed. Since the abandonment of herd immunity in Sweden, many studies have compared economic outcomes in Sweden and Denmark, a neighboring country who did enact strict lockdown policies at the beginning of the pandemic. These studies have found that not only has Sweden experienced a greater number of COVID-19 deaths, but it has also not experienced better economic outcomes. In fact, multiple studies have found that Sweden’s economy is actually having a harder time recovering from the pandemic, both in terms of consumer spending and unemployment (Sheridan et al. 20468). As a result of these findings, I wanted to research the effectiveness of various COVID-19 health policy measures taken in the

United States in helping the economy recover from the pandemic in order to see if states taking a more lenient response to the pandemic, as in Sweden, have had similar economic outcomes.

The Swedish example offers valuable insight into the need to enact effective COVID-19 policy. In November of 2020, Sweden was forced to impose its strictest COVID-19 restrictions of the entire pandemic. This was because their lenient model was costing a significant number of lives. However, their Prime Minister still made a point as cases were skyrocketing in Sweden, to state, “We don’t believe in total lockdown” (Schaverien). Politicians and citizens in America have repeatedly displayed attitudes that align with this belief as well. However, Denmark economists, comparing their country to Sweden, found that social distancing laws result in better economic outcomes because they “reduce the economic activity of the low-risk population and can thus protect those with the greatest risk of mortality from also bearing the greatest burden in terms of reduced spending” (Sheridan et al. 20468). To reach this conclusion, the authors use quantitative data of spending during the pandemic to build a model to compare spending in Denmark and Sweden. This piece makes a case for policymakers to listen to medical authorities and create social distancing laws. Although Sweden has since abandoned their herd immunity policy, it has produced long-lasting negative effects. A collaborative study from an anthropologist and epidemiologist found that in Sweden:

“Not only are the rates of viral infection, hospitalisation and mortality (per million population) much higher than those seen in neighbouring Scandinavian countries, but also that the time-course of the epidemic in Sweden is different, with continued persistence of higher infection and mortality... well beyond the few critical weeks period seen in Denmark, Finland and Norway, whose rapid lock-down measures seem to have

been initially more successful in curtailing the infection surge” (Orlowski and Goldsmith 295).

This evidence shows that not only does policy promoting herd immunity not provide the intended economic benefits, but it also risks significantly more lives and makes it more difficult to slow the spread of the virus even once stricter policy is adopted.

While there have been few studies published measuring the effects of COVID-19 health policies on the economy in the United States, there have been economic models measuring the projected effects of these policies. University of Virginia Economists Bethune and Korinek provide evidence as to why loss of lives hurts the economy in their piece about COVID-19 in the United States. The authors make an economic argument for stringent COVID-19 policy, contrasting the Trump administration’s argument to relax COVID-19 restrictions in order to help the economy a few months after the pandemic began. Their piece uses quantitative data and economic models and analyses to show that saving lives benefits the economy. Through a cost-benefit analysis, the authors found that policy should aim to “aggressively contain and eliminate the disease,” calculating the social cost of extra infection to be \$586,000 (Bethune and Korinek 1). The authors recognized that strict COVID-19 policies will have a large “initial economic cost,” but the cost of significant losses of life is greater (Bethune and Korinek 33). Additionally, the authors made the case that economic consequences from policy will be short-lived, but economic losses through a large number of lost lives will be long-lasting. They found that “agents who behave individually rationally generate large externalities because they do not internalize the effects of their economic and social activities on the infection risk of others and therefore engage in inadequate social distancing” (Bethune and Korinek 33). This finding suggests that policy and consistent information coming from the government is key in containing

the disease, because individuals will not engage in social distancing without measures in place requiring them to. The authors concluded by arguing that the economy will not fully recover until herd immunity is achieved but trying to achieve herd immunity through risking lives will hurt the economy significantly. They stated that full recovery would not occur until a vaccine is successfully distributed.

The World Health Organization (WHO), as well as medical experts from a variety of nations, have stated that lenient COVID-19 policy with the goal of trying to achieve natural herd immunity is “scientifically problematic and unethical,” primarily because scientists did not know enough about the virus to fully understand the length of immunity once an individual was infected with COVID-19 when the pandemic first began (“Coronavirus Disease (COVID-19)”). In a WHO article, they state that a policy of natural herd immunity would lead to “unnecessary infections, suffering and death” (“Coronavirus Disease (COVID-19)”). When national leaders ignore this advice, they challenge medical authority, which is the likelihood of following instructions from a medical expert. Medical authority has been increasingly challenged in recent years as public distrust in the medical community grows. This has been exemplified by the Trump Administration’s unwillingness to follow medical advice. President Trump said in a press conference on December 8, 2020, "You do develop an immunity over time, and I hear we're close to 15 percent... And that is terrific. That's a very powerful vaccine, in itself" (Blake). While this statement is riddled with inaccuracies such as his understanding of immunity and the unsubstantiated statistic he provided, it shows that the President was still suggesting this idea of natural herd immunity even after a vaccine was developed. It is apparent that he was doing so in order to save the economy. Despite the Trump Administration pushing lenient policy until the day he left office and many states avoiding lockdowns, curfews, or even mask mandates before a

vaccine was widely available, studies from Europe have shown that stricter policy actually benefits the economy, creating a question as to why there is still this phenomenon of states and countries pursuing natural herd immunity to just have to abandon it as their healthcare systems become overwhelmed.

The effects of former President Trump's push for herd immunity and lenient COVID-19 policies are worsened when you consider the effect that partisanship has had on COVID-19 policies and attitudes. A 2021 study found "that partisan elites politicized COVID-19 from the very onset of the pandemic in early 2020," concluding that "an effective public health response must confront the deeply rooted partisan politics of the crisis" (Gadarian et al. 10). The researchers additionally found that there were stark divides in health attitudes and behaviors among those that identified as either a Democrat or Republican. Republicans, when compared to Democrats, were significantly less likely to follow CDC recommendations and were less concerned about the pandemic, reflecting President Trump's attitude towards the pandemic. They further concluded that a federal response that addresses partisanship is the only way to effectively address this deep divide and that messaging to try to get around partisanship from either celebrities or health experts will not be able to enact significant change in COVID-19 behaviors or attitudes. (Gadarian et al. 10). Another study on the willingness of individuals to reduce their mobility during the pandemic concluded that, "the COVID-19 pandemic in the United States is currently as much a political problem as it is a public health problem" (Clinton et al. 6). The researchers on this study found that individual's unwillingness to stay home was due to partisanship and that partisanship, especially among Republicans, has increased over the course of the pandemic. Furthermore, they found that this divide in attitudes between different political party affiliations persisted regardless of location or media consumption, suggesting that

national stimuli was causing this party divide to deepen. They further suggested that the national stimuli were most likely messaging from national partisan leaders, such as President Trump (Clinton et al. 6). These two studies show that it is inadequate to discuss COVID-19 health policies without discussing the effect partisanship has on those policies. It shows that there is a significant divide among individual beliefs related to the pandemic. As a result, I wanted to research how the partisan divide has affected policies, leading to my investigation on how the political affiliation of each state's governor affected the level of policy stringency throughout the pandemic.

Regardless of political affiliation, the economic outcomes from the pandemic have been bleak for a significant percentage of Americans. Economist Fabio Milani from the University of Florida found that in a study comparing economic outcomes in 41 countries, unemployment has been particularly responsive to health shocks in the United States (Milani 223). While it is suggested that this is due to the smaller social safety net in the United States as compared to many European countries, it is important to note that the lockdowns in the United States at the beginning of the pandemic resulted in significant increases in unemployment, from 4.5 percent in March of 2020 to 14.7% in April of 2020 to 6.3% in January of 2021 ("Unemployment Rate"). Furthermore, economists Deb et al. found that among "high-frequency" indicators of economic activity, measures to contain the spread of the virus have resulted in "large short-term economic losses" worldwide (Deb et al. 26). While the authors note that these measures were necessary to control the spread of the disease and save lives, they noted significant decreases in "Nitrogen Dioxide (NO₂) emissions, international and domestic flights, energy consumption, maritime trade, and retail mobility indices" (Deb et al. 27). The authors additionally found that re-openings after a period of lockdown resulted in increased economic activity, but this effect is

significantly lower in absolute value from the tightening of containment measures. This finding suggests that the virus itself is causing decreases in economic activity, regardless of policy measures. Additionally, these findings show that stringent COVID-19 health policies do have significant negative economic outcomes. Through my study, I want to find if these decreases in economic activity are long-lasting in the United States or, like Denmark, stricter policies will make it easier for the economy to recover.

The pandemic has also increased economic inequality and insecurity in the United States. A study from Mann et al. found an increase in economic anxiety arose in adults in the United States as a result of the pandemic. This anxiety was higher among younger Americans and African Americans. This data shows the individual impact of an economic decline; people were having trouble paying their bills, many were losing their jobs, and this decline disproportionately affected people of color. Furthermore, studies have found that states with higher income inequality are experiencing a greater number of deaths due to COVID-19 (Oronce et al. 2791). A study from the Brookings Institute found that “The COVID-19 recession is the most unequal in modern U.S. history,” noting that “the costs of the pandemic are being borne disproportionately by poorer segments of society” (Qureshi).

The importance from learning from COVID-19 policy failures is highlighted when considering that this pandemic is unlikely to be the last health crisis the United States will face. COVID-19 was not the first time that the economy was threatened by a virus. The HIV/AIDS epidemic also had significant economic consequences in the United States and worldwide. Similar to the present-day pandemic, these economic consequences ultimately led to discussions and policies that weighed the impact of prioritizing the economy or the epidemic. Human Immunodeficiency Virus (HIV) was first discovered at the beginning of the 1980s among gay

men in California. As a result of its large gay population, San Francisco became a center of the HIV/AIDS epidemic, providing a model for AIDS activism, policy, treatment, and research. By the time an effective treatment was developed, half of the city's gay male population had died of Acquired Immunodeficiency Syndrome (AIDS), a deadly condition caused by HIV that still does not have a cure (Zonana and Morain). HIV took a significant economic toll on the city of San Francisco, requiring them to spend \$90 million in 1988 alone to provide hospital beds and stays to HIV/AIDS patients (Zonana and Morain). Similar to COVID-19 across the country in 2020, the hospitals in San Francisco were becoming overwhelmed with HIV/AIDS patients and the city had to enact policy that both controlled the spread of the virus and lessened the economic burden created by an illness affecting a large percentage of their population.

Related to lockdowns and business closures during the COVID-19 pandemic, an economic and civil rights discussion arose in the mid-1980s in San Francisco around bathhouse policy. Bathhouses were common meeting places for gay men to have sex in San Francisco as well as a significant source of economic activity in the city (Disman 74). These bathhouses were suspected to be the center of HIV transmission in the city, causing many local officials to propose legislation to shut them down. The gay community had mixed reactions to the call to shut down bathhouses in the city. For a community surrounded by stigma and judgment that already had so few rights, many saw this as an infringement on their way of life, another way to suppress their community that they fought so hard to form. Additionally, the bathhouses brought in revenue to the city and shutting them down would cost the business owners significantly. Ultimately, the virus burden got too large, and the bathhouses were ordered to be shut down in the mid-1980s. By the mid-1990s, an effective treatment had been developed to control the viral load and save the lives of people infected with HIV/AIDS, but almost 20,000 primarily gay San

Franciscans had died (Zonana and Morain). The impact from HIV on San Francisco draws a clear parallel to the impact of COVID-19 on the world. They are both immense economic burdens, and in both cases, closing certain businesses would slow the spread of the virus but hurt the economy. In both cases, there were communities that felt their rights were taken away, although it should be noted that the often white, privileged conservative groups of today demanding COVID-19 is violating their rights cannot make the same claim as the oppressed LGBTQ+ community of the HIV/AIDS epidemic. San Francisco is often praised for their response to HIV, frequently choosing lives over the cost (Zonana and Morain). The United States has had a mixed response to COVID-19, choosing policies that both prioritize health or the economy at different times and different locations during the pandemic. The HIV response in San Francisco shows that that these discussions around policy responses to an epidemic are not new. However, they also show that there are ways to distribute funds and create effective policy that saves lives.

DATA AND METHODS

By comparing states with varying responses to the COVID-19 pandemic, I aim to answer this research question: how have Trump-era health policy decisions during the COVID-19 pandemic affected key state-level economic indicators? To answer this question, I designed a quantitative study using multivariate regressions. I used STATA in order to perform these regressions and create graphs displaying my findings.

COVID-19 Stringency Index

A majority of my data comes from the COVID-19 Government Response Tracker, a database created by researchers at the University of Oxford to study COVID-19-related public health measures and policies in the United States (“Coronavirus Government Response Tracker”). My independent variable is the COVID-19 Policy Stringency Index calculated by these researchers by state. This Stringency Index is calculated using nine key policy indicators: school closings, workplace closings, cancelling public events, restrictions on gathering size, closing public transport, stay at home requirements, restrictions on internal movement, restrictions on international travel, and public information campaigns. The index is calculated daily and is the average of the nine sub-indices pertaining to the individual policy indicators, each taking a value between 0 and 100. As a result, the COVID-19 Policy Stringency Index is on a scale of 0 to 100 from less to more stringent policy. I chose to study policy stringency rather than individual policies because states adopted many policies at once, so it would be difficult to distinguish the effect of one policy from another. Additionally, states generally adopted similar policies and tended to only differ in length a policy was in effect or how restrictive a policy was, and the stringency index is able to capture these differences.

Dependent Variables

My dependent variables were the unemployment rate, percent change in real GDP (Gross Domestic Product), and percent change in personal income by state.

Unemployment

I gathered data on unemployment from the Bureau of Labor Statistics, which publishes both national and state-level official unemployment rates each month. The unemployment rate is calculated by dividing the total number of people that are officially receiving unemployment benefits by the total number of people in the labor force and converting the result to a percentage. Because unemployment rate is a monthly measure and the stringency index was a daily measure, I used the same unemployment rate for each day of the month in my regression.

GDP

Data on percent change in real GDP and personal income came from the Bureau of Economic Analysis. Real GDP is a quarterly measure and represents the total economic output for a state adjusted for inflation. The total economic output is found by adding the monetary value of personal consumption expenditures, business investment, government spending, and imports subtracted from exports. That result is then divided by the GDP deflator, which is a value calculated by the Bureau of Economic analysis to represent inflation or deflation for that period. Real GDP percent change is then calculated by subtracting the Real GDP from the previous quarter from the current real GDP and dividing that result by the previous real GDP.

Income

Personal income percent change is also a quarterly measure. Personal income represents all income received by individuals in each state, including wages, proprietors' income,

dividends, interest, rents, and government benefits. It is important to note that personal income will include the government stimulus checks issued in quarter 2 of 2020 and quarter 1 of 2021. Personal income percent change is then calculated by subtracting the average personal income from the previous quarter from the current average personal income and dividing that result by the previous average personal income. Because real GDP percent change and personal income percent change are monthly measures and the stringency index was a daily measure, I used the same real GDP percent change and personal income percent change for each day of the quarter in my regression.

Covariates

My control variables were total population by quarter and daily cumulative COVID-19 cases, COVID-19 deaths, and mobility by state. For the regressions for real GDP and personal income, I also included averages for the poverty rate, percentage of households with kids, and percentage of population with a bachelor's degree all by state. I included population as a control variable, because more populous states had more COVID-19 cases, which affected both their policy responses and their economy. I included this variable to try to control for more rural states that did not have to take as strict responses to the pandemic because their case count was not as high. I got this data from the Bureau of Economic Analysis, along with my personal income data. I chose cumulative COVID-19 cases as a control variable, because states have adopted policy as a result of their case count, which will affect both their stringency index and economy. This case data came from the University of Oxford database on the pandemic. Also from this database, I used a measure of cumulative COVID-19 deaths. I used this measure in addition to COVID-19 cases because it measures the effect on the healthcare system. Even if case counts are lower in one state than another but the healthcare system in the first state is being overwhelmed and more

people are dying, the state will have to adopt stricter COVID-19 measures. Lastly, for all regressions, I used mobility data as a control. I included this as a control because it is a measure as to whether the policy is effective. If people are not staying home when it is mandated, there will be more COVID-19 cases, which will both result in stricter policies and could affect unemployment rates. The mobility data comes from Google and uses the location tracker in Google Maps to track people's movements. It only tracks people that have the application and have turned on a setting that shares their data with Google. The data is anonymized and only will be available during the pandemic to try to help with COVID-19 research. This dataset compares daily mobility per state to an average mobility they calculated during a 5-week period: January 3rd to February 6th, 2020. I took an average of the mobility change for retail and recreational purposes, public transportation, and workplace-related mobility. This dataset also included data on mobility to parks, groceries or pharmacies, or to residences. I excluded this data because this mobility was allowed under state laws throughout the pandemic.

I decided to additionally include the poverty rate, percentage of households with kids, and percentage of population with a bachelor's degree as control variables for the personal income and real GDP regressions in order to control for other factors that cause these indicators to be different between states regardless of COVID-19. Data on the poverty rate comes from the United States Census Bureau and is from 2019. The poverty rate is the ratio of people whose income falls below the poverty line, which is half of the median household income for the total population. This indicator is useful to include because states that have more individuals living in poverty could have lower GDP and personal income levels. Data on the percentage of households with kids and the percentage of the population with bachelor's degrees also come from the United State Census Bureau through the American Community Survey. The percentage

of households with kids represents the proportion of husband-wife households with their own children under 18 years old living in their household, and this data is from 2018. A household includes all of the people living in a unit of housing (“Percentage of Households”). I included this statistic because this affects government benefits, which could in turn affect real GDP and personal income. The percentage of the population with bachelor’s degrees represents the proportion of the population, 25 years old or older, who have completed a bachelor’s degree in each state, and this data is from 2019. I included this control variable because higher levels of education are generally associated with higher levels of income, and higher incomes could result in higher levels of GDP.

Analyses

I conducted regression analyses predicting the effects of policy stringency on unemployment rate at both a 3-month, 6-month and 9-month lead, starting March 13, 2020, through the end of March 2021. I chose March 13, 2020, because that is the day that President Trump declared a national emergency for COVID-19 and states began locking down. Similarly, I decided to measure the effect on real GDP percent change and personal income percent change at a one-, two- and three-quarter lead beginning March 13, 2020 through the end of March 2021. I chose to look at the effect of policy with a lead because studies from Sweden have shown that lenient policy initially benefitted the country, but then they had a slower recovery. I wanted to see if there is a similar effect in the United States, and at the time of this research, there was not enough data available to calculate the effects of a longer time lead.

Additionally, I conducted a regression using a dummy variable representing the political affiliation of the governor of the state as the dependent variable and the stringency index as the independent variable, using the same controls as above. I chose to run this regression in order to

determine the factors that cause states to adopt different policies, and if it is predominantly for political reasons. Lastly, I used GIS datasets in order to create a map that displayed my findings, showing policy stringency from March 13, 2020 through March 31, 2021 by state and displaying political affiliation by state.

RESULTS

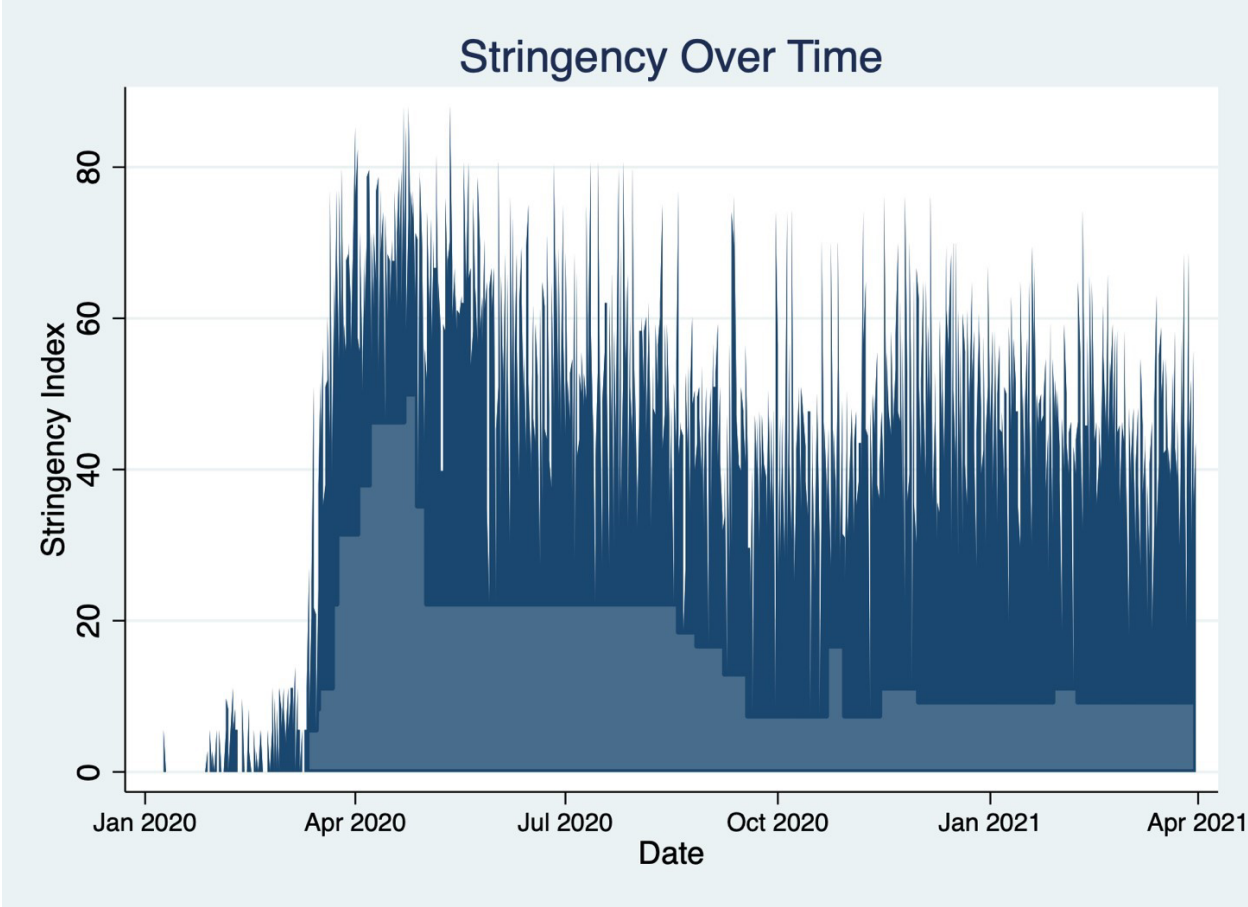
Table 1 contains descriptive statistics for my independent and dependent variables. This table shows that my outcome variables, unemployment rate, real GDP percent change and personal income percent change, experienced significant change across states over the course of 2020 due to the high levels of variance between months. Table 1 displays that the average unemployment rate across states for March 2020 was 3.91%, but by June, unemployment had jumped to 9.83% and declined going forward, decreasing to 5.51% by March 2021. These findings show that during the pandemic states maintained a somewhat high level of unemployment when comparing to unemployment rates around 4-5% that defined the previous quarters of the Trump administration (“State Employment and Unemployment”). It also shows that the pandemic had severe initial effects on unemployment, but states, on average, experienced improvements in unemployment as the pandemic progressed. Table 1 also shows that COVID-19 policy stringency was moderate among all states throughout the year with notable increases in June and December 2020. Additionally, table 1 shows that states experienced significant losses in real GDP at the beginning of the pandemic but were able to recover at the end of 2020 and going into 2021. Table 1 additionally shows that individuals experienced significant gains in relation to the release of stimulus checks in quarter 2 of 2020, following June 2020 in the table, and quarter 1 of 2021, following March 2021 in the table. However, Personal Income appears to decrease in quarters without stimulus checks.

Table 1: Descriptive Statistics

Month	Average Unemployment Rate	Average Real GDP Percent Change	Average Personal Income Percent Change	Average Stringency
March 2020	3.91	-5.1	4.04	32.3
June 2020	9.83	-31.3	39.88	53.3
September 2020	7.21	34.2	-15.53	45.4
December 2020	5.95	4.4	-1.27	48.4
March 2021	5.51	6.4	63.74	42.0

Figure 1 displays trends in policy stringency over time by state. Each line represents a state's stringency level on a certain date. This graph shows that few states adopted high levels of COVID-19 policy stringency until March of 2020, which is when I begin my analysis. It also shows that policy stringency generally declined going into fall 2020 with a very modest increase in stringency at the end of 2020 and beginning of 2021. It also shows that states varied in levels of stringency throughout the pandemic, with notable peaks, valleys, and massing. In other words, while some states maintained high levels of stringency, others adopted lower levels of stringency as the pandemic progressed.

Figure 1: Histogram Displaying Stringency Trends



Unemployment

Figures 2 through 5 show the relationship between policy stringency and the unemployment rate by state at no lead as well as a 3, 6, and 9-month leads. These graphs show the slope decreasing as the time lead increases. This demonstrates that the relationship between policy and stringency weakens over time. Figure 2 displays that more stringent policies such as lockdowns, stay at home orders, and restrictions on gathering, result in a notable increase in the unemployment rate at the time of measurement. This result demonstrates that stringent policy is associated with an immediate increase in unemployment. This effect persists at the 3-month mark but is more variable 6 and 9 months after the policies have been enacted. These figures additionally show that unemployment decreased in general across all states as the pandemic progressed.

The weakening of these effects over time may be due to differences across states in how their responses align with other aspects of their economies and pandemic trajectories. To assess this, I include the covariates identified above in a series of multivariate regression models.

Figure 2: Policy Stringency and Unemployment Rate without a lead

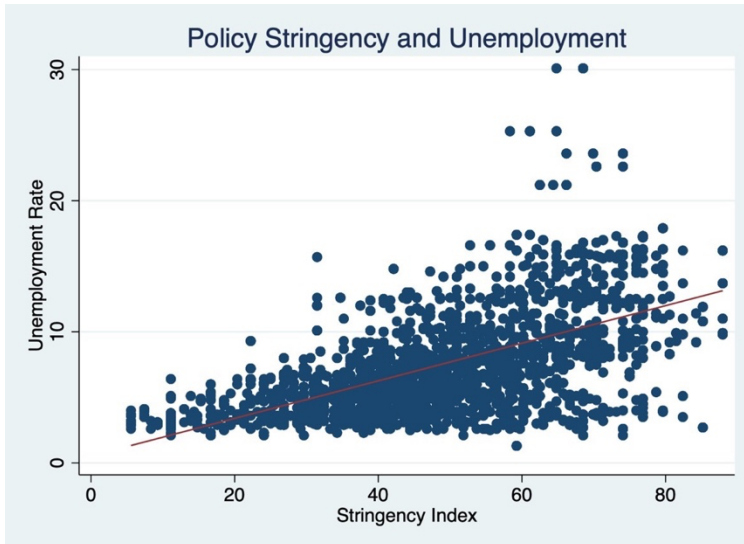


Figure 4: Policy Stringency and Unemployment Rate with a 6-month lead

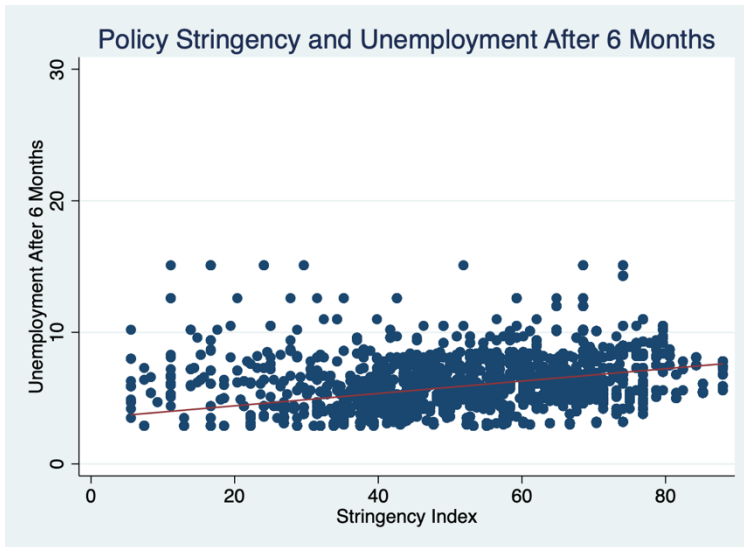


Figure 3: Policy Stringency and Unemployment Rate with a 3-month lead

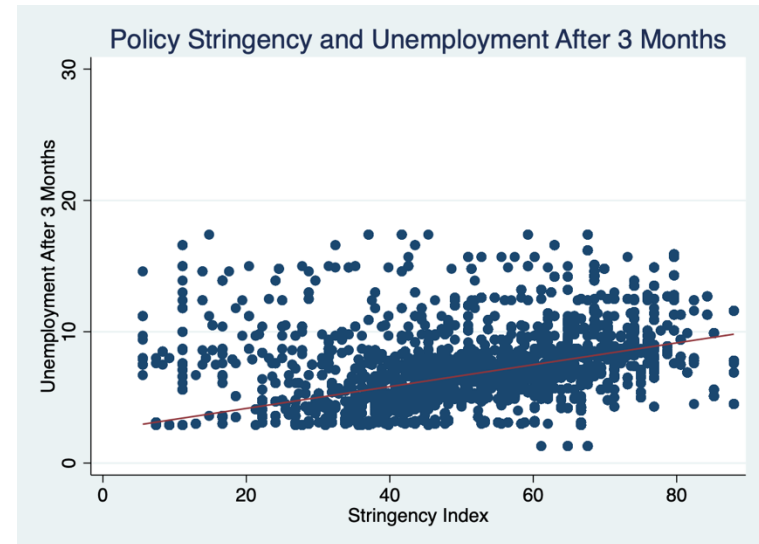
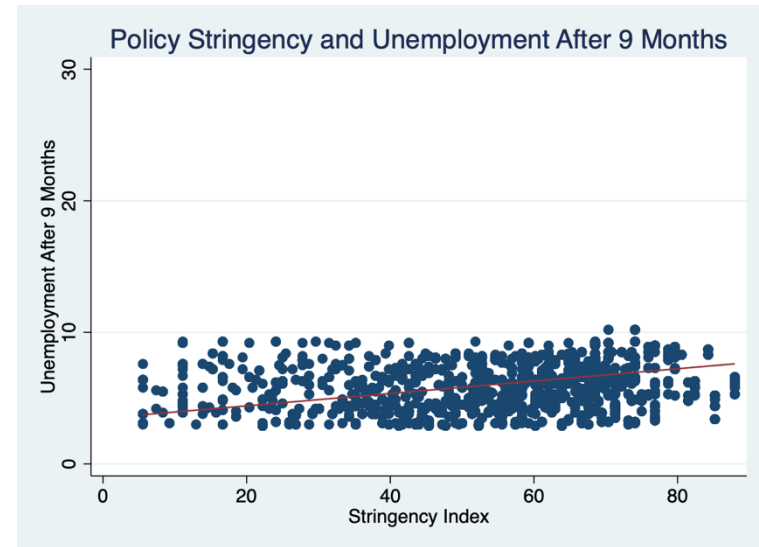


Figure 5: Policy Stringency and Unemployment Rate with a 9-month lead



The multivariate regressions shown in Table 2 show the effect of COVID-19 Policy Stringency on the Unemployment Rate at no lead as well as a 3, 6, and 9-month lead, once cumulative COVID-19 cases, cumulative COVID-19 deaths, quarterly population and mobility all by state are controlled for. These tables reveal the trends in Figures 2 through 5 after controlling for other state and time varying effects on the relationship between the stringency index and unemployment rate. Table 2 reveals that a one-point increase in stringency was associated with a 0.15 percentage-point increase in unemployment, holding all else constant. This result is both statistically and economically significant, demonstrating that more stringent COVID-19 policy measures were associated with immediate higher levels of unemployment.

As an extension of the above finding, table 2 also reveals that after three months, a one-point increase in stringency was associated with a 0.02 percentage-point increase in unemployment, holding all else constant. This result is both statistically and economically significant, showing that stringent COVID-19 policies were associated with an increase in unemployment that remained significant for three months after the stringent policy was enacted. Furthermore, table 2 reveals a one-point increase in stringency is associated with a 0.01 percentage-point decrease in unemployment after 6 months, holding all else constant. Table 2 also reveals that a one-point increase in stringency is associated with a 0.002 percentage-point decrease in unemployment after 9 months, holding all else constant. These findings are also statistically significant but no longer economically significant. These findings demonstrate that stringent policy at the start of the pandemic had a weak relationship with unemployment after 6 months and an even weaker relationship after 9 months, after controlling for variables that may influence the outcome.

Table 2: Multivariate Regression with Unemployment Rate at no lead and a 3-, 6-, and 9-month lead as the Dependent Variable and Stringency Index as the key Independent Variable, controlling for population, COVID-19 cases, COVID-19 deaths, and mobility

	Unemployment Rate No Lead	Unemployment After 3 Months	Unemployment After 6 Months	Unemployment After 9 Months
Stringency Coefficient	0.1466113	0.0198425	-0.0104553	-0.0028462
P-value	p<0.01	p<0.01	p<0.01	p<0.01

GDP

Figures 6-9 display the relationship between the Stringency Index and Real GDP Percent Change at no lead as well as a 1-, 2- and 3-quarter lead. Figure 6 displays that as states adopted more stringent policy, the percent change in Real GDP from the previous quarter decreased, indicating a drop in Real GDP for the state. After 1-quarter, figure 7 displays that more stringent policy was associated with an increase in the percent change in Real GDP from the previous quarter, indicating an increase in Real GDP for the state. These results are visibly skewed because every state experienced significant loss in real GDP in the second quarter of 2020 as the pandemic began and significant gain in real GDP in the third quarter of 2020 as businesses were bailed out and states began to re-open. Figure 8 displays that after two quarters the effect of policy stringency was more stagnant, with only a slightly negative relationship between the stringency index and real GDP percent change. Figure 9 displays that after three quarters, there is no relationship between the stringency index and real GDP percent change with the higher levels of stringency not appearing to have an association with real GDP percent change.

Figure 6: Policy Stringency and Real GDP Percent Change with no lead

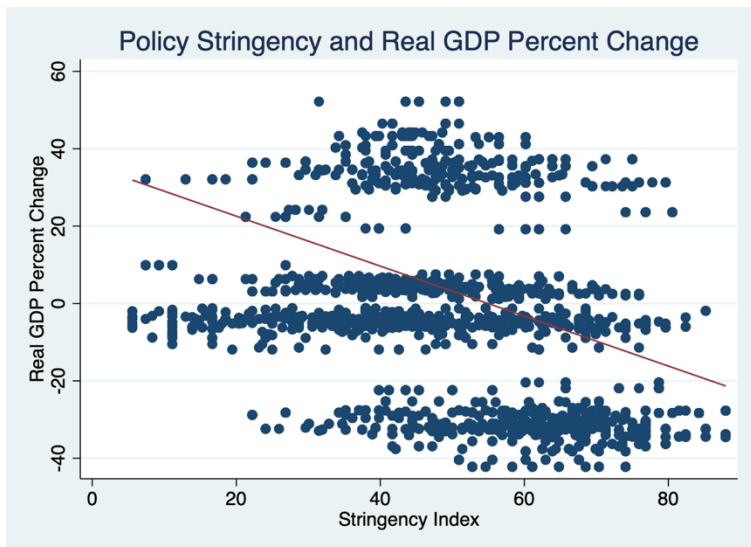


Figure 7: Policy Stringency and Real GDP Percent Change with a 1-quarter lead

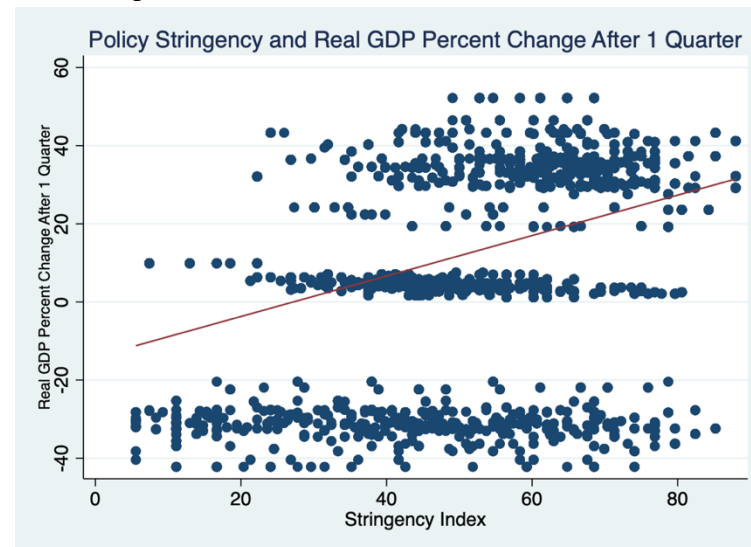


Figure 8: Policy Stringency and Real GDP Percent Change with a 2-quarter lead

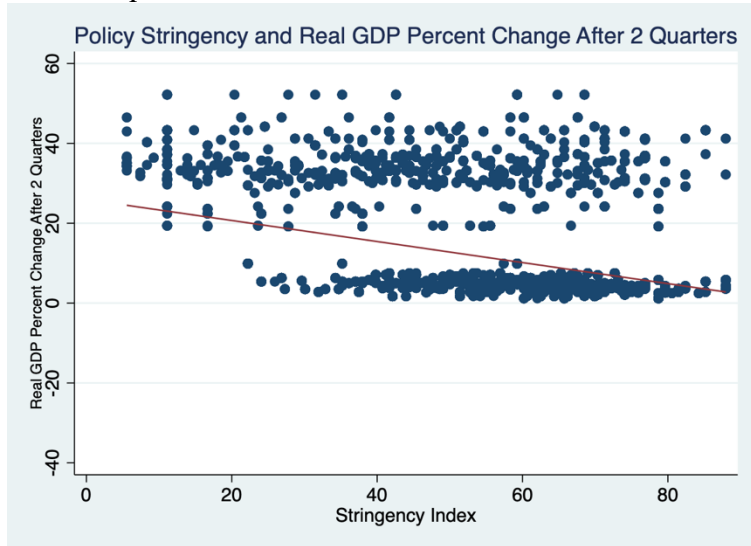
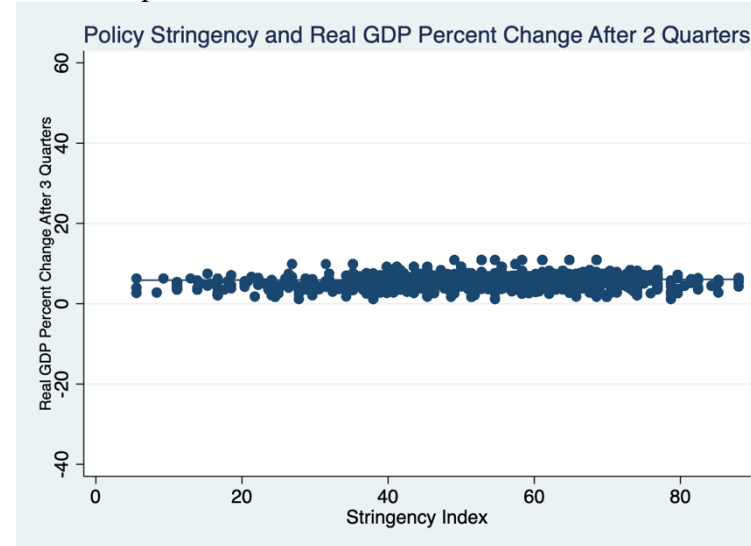


Figure 9: Policy Stringency and Real GDP Percent Change with a 3-quarter lead



The multivariate regressions shown in table 3 show the effect of COVID-19 Policy Stringency on real GDP percent change at no lead as well as a 1-, 2- and 3-quarter lead, once cumulative COVID-19 cases, cumulative COVID-19 deaths, quarterly population, mobility, poverty rate, percentage of households with kids, and percentage of population with a bachelor's degree all by state are controlled for. Table 3 reveals that with no lead, a one-point increase in stringency was associated with a 0.6 percentage-point decrease in the real GDP percent change from the previous quarter, holding all else constant. This result is both statistically and economically significant, demonstrating that stringent COVID-19 policy was associated with an immediate decrease in real GDP. Table 3 reveals that after one quarter, a one-point increase in stringency was associated with a 0.8 percentage-point increase in the real GDP percent change from the previous quarter, holding all else constant. This result is both statistically and economically significant, demonstrating that stringent COVID-19 policy is associated with an increase in real GDP after one quarter. Table 3 additionally reveals that after two quarters, a one-point increase in stringency was associated with a 0.4 percentage-point decrease in the real GDP percent change from the previous quarter, holding all else constant. This result is both statistically and economically significant, displaying that after two quarters, states that adopted more stringent COVID-19 policies were associated with greater losses in Real GDP. Lastly, table 3 reveals that after three quarters, a one-point increase in stringency was associated with a 0.03 percentage-point increase in the real GDP percent change from the previous quarter, holding all else constant. This result is both statistically and economically significant, displaying that after two quarters, states that adopted more stringent COVID-19 policies were associated with greater gains in Real GDP. These findings demonstrate that the effect of stringency on Real GDP varies over time and further data may be required to see how the trend continues.

Table 3: Multivariate Regression with Real GDP Percent Change at no lead and a 1-, 2-, and 3-quarter lead as the Dependent Variable and Stringency Index as the key Independent Variable, controlling for population, COVID-19 cases, COVID-19 deaths, mobility, poverty rate, percentage of households with kids, and percentage of population with a bachelor's degree

	Real GDP Percent Change No Lead	Real GDP Percent Change After 1 Quarter	Real GDP Percent Change After 2 Quarters	Real GDP Percent Change After 2 Quarters
Stringency Coefficient	-0.6135642	0.7833476	-0.3599919	0.0333996
P-value	p<0.01	p<0.01	p<0.01	p<0.01

Income

Figures 10-13 display the relationship between personal income percent change with no lead as well as a 1-, 2- and 3-quarter lead. Figure 10 displays a weak, positive relationship between personal income percent change and the stringency index. This shows that higher levels of stringency are associated with higher levels of personal income percent change. Figures 11 and 12 display a negative relationship between personal income percent change and the stringency index. This demonstrates that higher levels of stringency are associated with lower levels of personal income percent change after both one and two quarters. Figure 13 displays a positive relationship between personal income percent change and the stringency index, demonstrating that after three quarters higher levels of stringency were associated with higher levels of personal income percent change.

Figure 10: Policy Stringency and Personal Income Percent Change with no lead

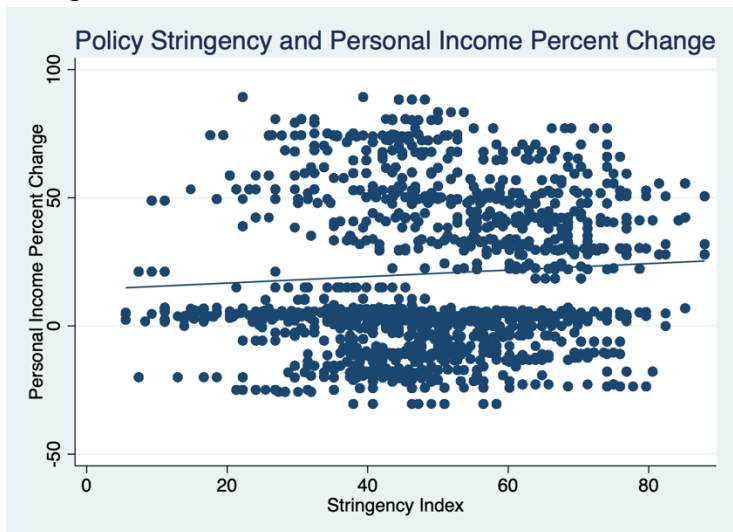


Figure 11: Policy Stringency and Personal Income Percent Change with a 1-quarter lead

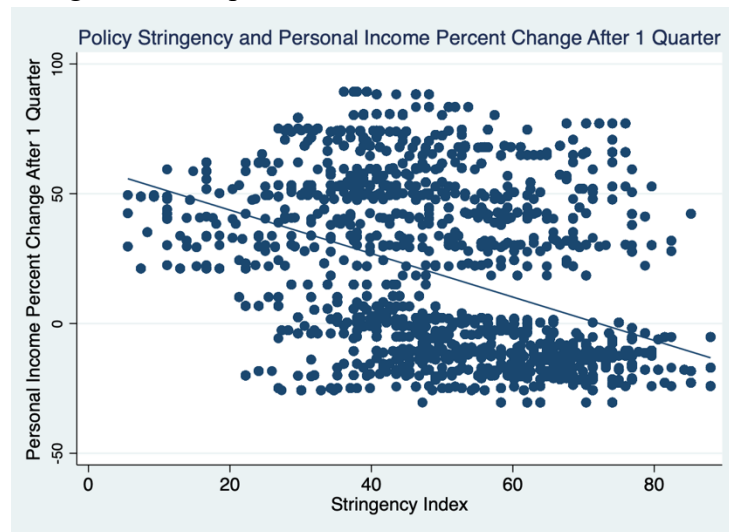


Figure 12: Policy Stringency and Personal Income Percent Change with a 2-quarter lead

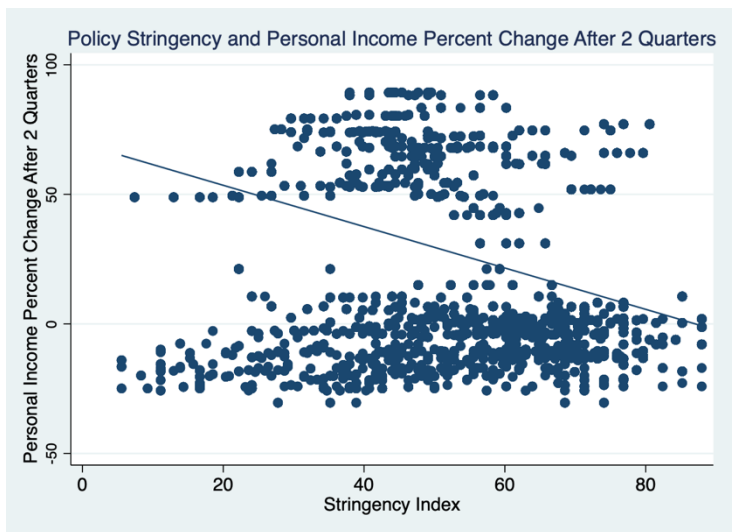
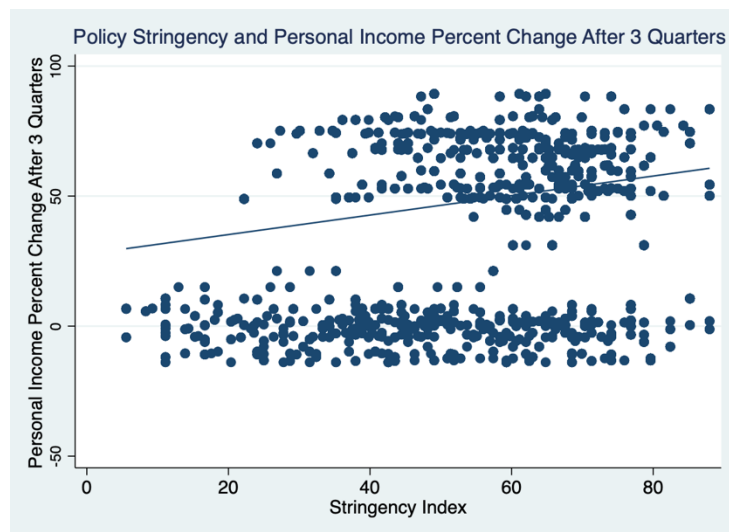


Figure 13: Policy Stringency and Personal Income Percent Change with a 3-quarter lead



The multivariate regressions shown in Table 4 display the effect of COVID-19 Policy Stringency on personal income percent change at no lead as well as a 1-, 2- and 3-quarter lead, once cumulative COVID-19 cases, cumulative COVID-19 deaths, quarterly population, mobility, poverty rate, percentage of households with kids, and percentage of population with a bachelor's degree all by state are controlled for. Table 4 reveals that a one-point increase in stringency was associated with a 0.4 percentage-point increase in the personal income percent change from the previous quarter, holding all else constant. This result is both statistically and economically significant, demonstrating that stringent COVID-19 policy was associated with an immediate increase in personal income. Table 4 reveals that after one quarter, a one-point increase in stringency was associated with a 1.2 percentage-point decrease in the real GDP percent change from the previous quarter, holding all else constant. This result is both statistically and economically significant, demonstrating that stringent COVID-19 policy is associated with a decrease in personal income after one quarter. Table 4 additionally reveals that after two quarters, a one-point increase in stringency was associated with a 0.5 percentage-point decrease in the real GDP percent change from the previous quarter, holding all else constant. This result is both statistically and economically significant, displaying that after two quarters, states that adopted more stringent COVID-19 policies were associated with greater losses in Personal Income. Lastly, table 4 reveals that after three quarters, a one-point increase in stringency was associated with a 1.1 percentage-point increase in the real GDP percent change from the previous quarter, holding all else constant. This result is both statistically and economically significant, displaying that after three quarters, states that adopted more stringent COVID-19 policies were associated with greater gains in Personal Income. These

findings demonstrate that the effect of stringency on Personal Income varies over time and could be influenced by varying levels of government benefits by state.

Table 4: Multivariate Regression with Personal Income Percent Change at no lead and a 1-, 2-, and 3-quarter lead as the Dependent Variable and Stringency Index as the key Independent Variable, controlling for population, COVID-19 cases, COVID-19 deaths, mobility, poverty rate, percentage of households with kids, and percentage of population with a bachelor's degree

	Personal Income Percent Change No Lead	Personal Income Percent Change After 1 Quarter	Personal Income Percent Change After 2 Quarters	Personal Income Percent Change After 2 Quarters
Stringency Coefficient	0.3891742	-1.162133	-0.4962209	1.057081
P-value	p<0.01	p<0.01	p<0.01	p<0.01

Partisanship

Figure 14 and Table 5 represent the relationship between the political affiliation of each state's governor and the stringency index. These findings reveal whether political party influenced states' decisions to adopt certain types of policies. Figure 14 reveals that, on average, states with a Democratic governor had a higher stringency index from March 2020 to March 2021. This finding shows that democratic states had a propensity for more stringent policies, favoring more restrictive COVID-19 policies. The multivariate regression shown in table 5 displays the effect of political affiliation of the state's governor on COVID-19 Policy Stringency, once cumulative COVID-19 cases, cumulative COVID-19 deaths, quarterly population and mobility all by state are controlled for. This table reveals that when comparing democratic and republican governors, we would expect, on average, the stringency index for democratic governors to be 9.2 points greater. This finding is statistically significant. It demonstrates that political party had significant influence over each state's decision to adopt certain policies, displaying that democratic governors favored more stringent COVID-19 policies.

Figure 14: Average Policy Stringency Index by Political Affiliation of Each State’s Governor

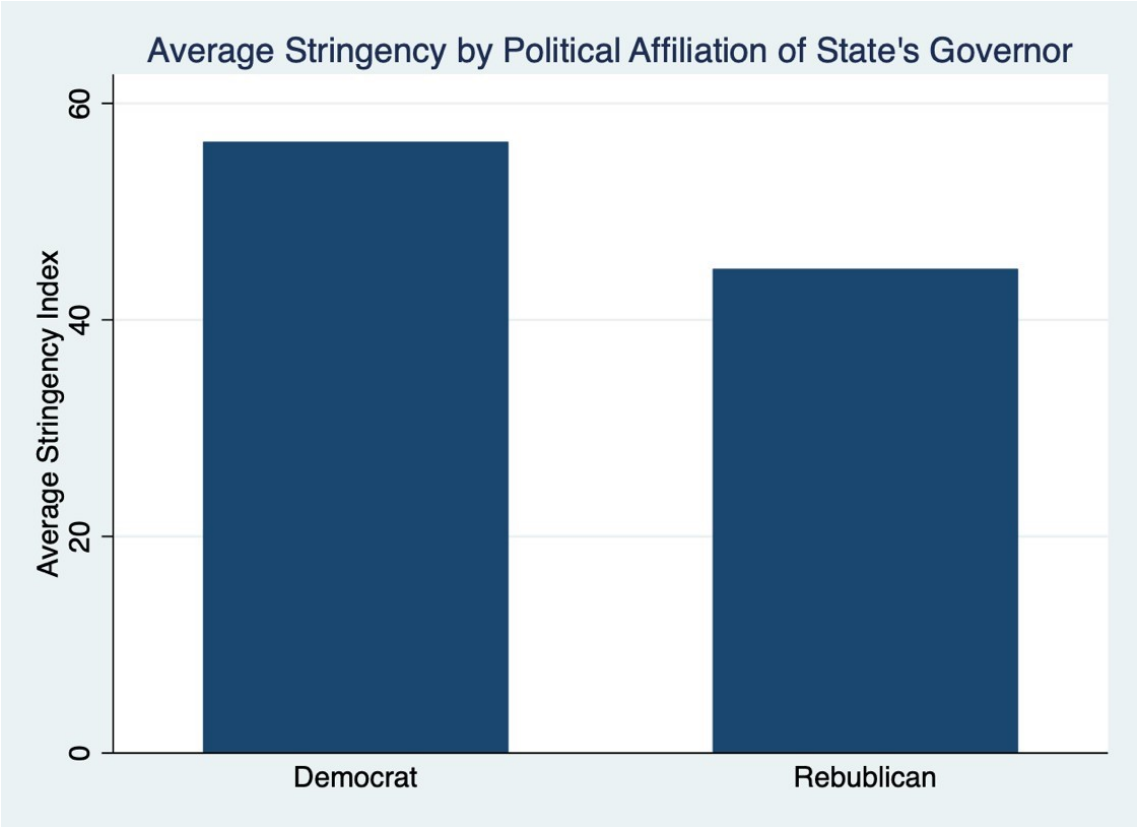


Table 5: Multivariate Regression with the Stringency Index as the Dependent Variable and a binary variable for representing if the Political Affiliation of each State’s Governor is Democratic as the key Independent Variable, controlling for population, COVID-19 cases, COVID-19 deaths, and mobility

	Democratic Governor
Regression Coefficient	9.220257
P-value	p<0.01

Figures 15 and 16 display policy stringency and political affiliation for the contiguous United States. These maps depict the relationship between partisanship and health policy adoption during the first year of the COVID-19 pandemic. These findings display that red states, which are Republican states, are more likely to have low levels of policy stringency. While there are some exceptions, which could be due to other variables affecting policy, blue, democratic states tend to have higher levels of policy stringency. Notably, states with lower levels of stringency tend to be located in the south or the middle of the country, which tend to be Republican-leaning states.

State Governor Political Affiliation

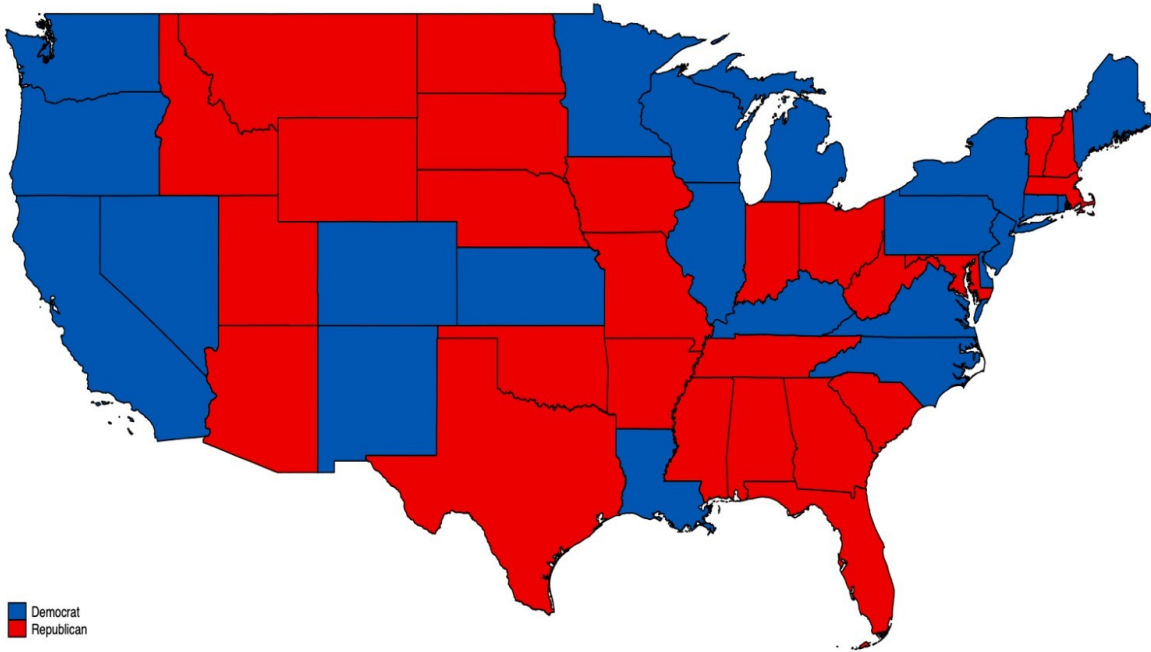


Figure 15: Governor Political Affiliation by State as of March 2020

Policy Stringency Level by State

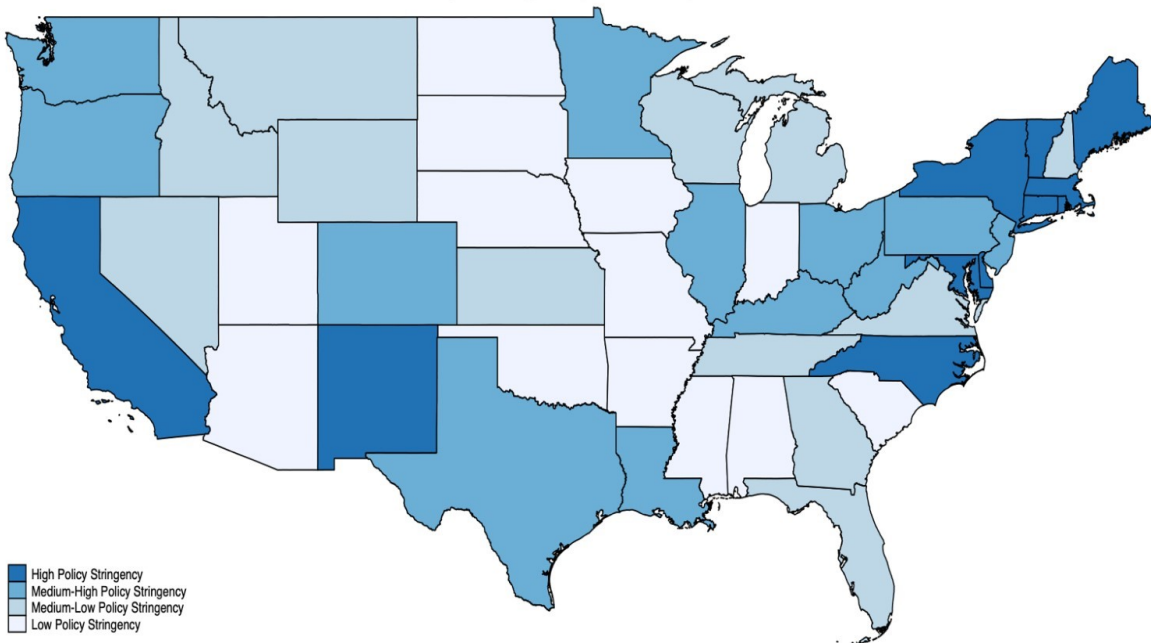


Figure 16: Policy Stringency Level by State from March 13, 2020 to March 31, 2020

DISCUSSION

The findings above reveal both that restrictive COVID-19 policies did not cause long-lasting negative economic effects and that health policy decisions were politicized during the COVID-19 pandemic in the United States. In fact, these findings reveal that more stringent policies may have enabled the economy to recover faster from the devastating economic effects of the pandemic. These findings confirmed my hypothesis that policy in the United States would follow similar trends to Europe in terms of their effect on the economy. Like Sweden, states that adopted more lenient COVID-19 policies initially experienced less severe negative economic effects. However, over time these economic effects were more long lasting. These findings suggest that policies that prioritize health during a public health crisis will benefit the economy in the long run. Additionally, these findings show that COVID-19 policies have generally been adopted along party lines. This suggests that Trump-era policies were generally ineffective as Republican governors tended to adopt more lenient COVID-19 policies aiming to save the economy, but in reality, they did not result in any better economic outcomes.

As of June 2021, the United States is ending a period of restrictions and lockdowns across the country as vaccines become more widely available and case counts fall. As a result, it is difficult to definitively say how the pandemic will affect both our lives and the economy, because it is not yet clear how many Americans will get vaccinated and how long the pandemic will last. However, the results in this paper offer some hope. My findings show that prioritizing health through restrictive policies, such as stay at home orders, curfews and restrictions on gathering, will benefit the economy in the long run. Stricter COVID-19 policies do not mean that the economy will suffer long-term and more people will become jobless. In fact, it may even mean the opposite if the data continues to follow current trends. If there is a future need for more

COVID-19 restrictions, my findings suggest that stringent COVID-19 policy is the best course of action.

These findings are additionally important because economic security is a social determinant of health. Studies have shown strong associations between financial health and physical health outcomes (Weida et al.) Additionally, economic security and employment have strong ties to mental health. (Benach et al.) These findings suggest that policies that benefit the economy also benefit an individual's health. As presented above, the main motivation for the Trump administration to reopen the country was to save the economy. A common theme in the media throughout the pandemic is often deciding whether policies should prioritize lives or prioritize the economy. However, it is important to note that the economy does affect lives. If COVID-19 health policies allowed the economy to suffer immensely, individuals could lose their homes and their livelihood, which could potentially have as disastrous effects as a deadly virus. However, my research shows the more restrictive policies enacted during the COVID-19 pandemic did not cause disastrous economic effects, revealing that the Trump administration was not justified in their suggestion to reopen the country. I argue that both economic and health policies need to continually focus on benefitting individual's health. During the COVID-19 pandemic, policies that aimed to control the spread of the virus benefitted both the economy and the healthcare system.

In addition to finding support for stringent policy, my findings also suggest that natural herd immunity is not an effective policy as presented by the Trump Administration. Costing a significant number of lives does not appear to benefit the economy as my results show. As Sweden has seen and as the United States is starting to see once again, when there are not effective policies preventing the virus from spreading, the healthcare system becomes

overwhelmed, and people die. Even after Sweden abandoned their policy of herd immunity, their COVID-19 infection and mortality rates remained much higher than their neighboring Scandinavian countries (Orlowski and Goldsmith 295). With natural herd immunity not appearing to offer any economic benefit, there is no reason to risk lives through more lenient policy.

Throughout 2020, former President Donald Trump dictated the country's response to the COVID-19 pandemic and chose to leave key policy decisions to the states. In April of 2020, President Trump explained on a conference call with every state's governor, "You're going to call your own shots." He further explained that the federal government would support states in the process of fighting the virus (Dawsey et al.). However, the federal government continually failed to provide adequate testing and healthcare supplies in order to enable the states to combat COVID-19. This response from the Trump administration, or lack thereof, left states generally unprepared to both fight the virus and provide economic support for their citizens. As a result, we see this clear divide in policy and economic effects among party lines. The Trump Administration additionally failed to provide consistent messaging or guidelines. They initially recommended that states have decreasing COVID-19 cases for 14 days before they begin to re-open businesses. However, when few states were achieving this threshold, they just recommended that it was time for the entire country to re-open as the death toll rose countrywide (Dawsey et al.). My findings demonstrate that forcing re-openings did not have the intended economic consequences. These findings suggest that rather than adopting policies based on political affiliation, states needed to consider policy that would best benefit their citizens.

To expand on my example of Tennessee and North Carolina that began my thesis, based on my economic models, it would be expected that North Carolina would be slightly

economically better off than Tennessee by the first quarter of 2021. At the start of 2020, North Carolina had an unemployment rate of 3.6%, while Tennessee had an unemployment rate of 3.3%. By March 2021, North Carolina had an unemployment rate of 5.2% and Tennessee had an unemployment rate of 5.0%. This shows that during the course of the pandemic, North Carolina experienced a 1.6 percentage-point increase in unemployment, while Tennessee experienced a 1.7 percentage-point increase in unemployment (“State Employment and Unemployment”). This suggests in terms of unemployment, North Carolina has been able to recover slightly faster than Tennessee. For the second quarter of 2020, North Carolina experienced a 3.5% decrease in Real GDP and by the first quarter of 2021 North Carolina experienced a 6.5% increase in Real GDP. Tennessee experienced a 3.9% decrease in the second quarter of 2020 and a 7.4% increase in Real GDP in the first quarter of 2021. While not explicitly following the trends that I observed in terms of Real GDP, suggesting other factors are influencing this result, these findings do show that despite North Carolina’s decision to consistently choose more restrictive policies than Tennessee, North Carolina’s economy was able to recover similarly to Tennessee’s economy. Furthermore, Tennessee experienced 1174.7 COVID-19 cases and 17.2 COVID-19 deaths per 10,000 people and North Carolina experienced 859.1 COVID-19 cases and 11.4 COVID-19 deaths per 10,000 people by March 2021 (“Coronavirus Government Response Tracker”). This finding shows that North Carolina’s more stringent policy was more effective in saving lives and controlling the virus without their economy suffering from these policies. This example shows that effective COVID-19 health policies were able to prioritize both lives and livelihood.

A likely explanation of states with more stringent policy being no worse off economically from the pandemic is that more stringent states tended to have democratic leadership which offered more benefits and relief to those struggling during the pandemic.

Because government spending is included in real GDP and government benefits are included in personal income, this could explain my findings related to these indicators and could be a potential limitation of my study. A study from Reuters found that the relief from the American Rescue Plan, the 2021 COVID-19 relief package, would heavily favor Democratic states with 61% of the aid going to states that voted for Joe Biden in the 2020 election (Sullivan and Lange). This is due to the fact that Republican politicians have resisted providing aid to citizens throughout the pandemic, citing ideological opposition. This does suggest that governmental benefits in stringent states could be a significant factor in maintaining their economy.

My study was additionally limited by the changing nature of the pandemic and time frame. Because GDP and Personal Income are quarterly measures, the results for Real GDP and Personal Income appear to be somewhat skewed because every state was experiencing significant changes between quarters for these indicators. This was due to the fact that across the country, COVID-19 cases decreased for the third quarter of 2020 and then increased for the 4th quarter of 2020. When cases increased, more stringent policy was enacted which had its own immediate economic effects. For future research, it would be beneficial to see if the current trends I observed continued. Additionally, as a result of my study being observational, there is a possibility of residual confounding. However, I aimed to control for any other factor that could influence the relationship between the key variables. Lastly, because I chose to focus on state-level indicators, I was not able to conclude how policy affected individual's economic outcomes.

CONCLUSION

The COVID-19 pandemic caused significant damage to both the economy and the healthcare system in the United States. Throughout 2020 and 2021, many lost work, loved ones, and the ability to engage in many of the activities they once loved. Many suffered with their mental health, and many struggled to pay rent and keep food on the table. Healthcare workers continually risked their lives as our government often failed to give them the tools they needed to succeed. In total, this pandemic taught that healthcare policies had the power to save both lives and livelihood as well as cost lives and hinder economic progress.

As of June 2021, the COVID-19 pandemic is far from over worldwide. Even as the United States starts to inch toward normalcy, low vaccination rates and the risk of new COVID-19 variants continue to unsettle progress. Additionally, as we have learned from history, this is not going to be the last health crisis that our country will face. However, if our future leaders can learn from policy failures that occurred early in this pandemic, our country will be better equipped to deal with future COVID-19 hurdles as well as the next virus that comes our way. The results of this paper have shown that in times of crisis the health of citizens must be prioritized. Significant loss of life has both societal and economic consequences. If health is prioritized and the virus can be controlled, the economy will be able to recover faster than if more citizens are allowed to fall ill. While restrictive health policies may initially cause greater economic losses, they will allow the economy to recover quicker in the long run and prevent significant loss of life.

Economics was frequently the reason cited by the Trump Administration and the Republican party for forcing businesses to re-open. As evidenced above, many right-wing politicians were accepting of the fact that lives would have to be lost in order to save the economy. They decided that allowing citizens to potentially contract the virus was the lesser of

two evils when facing potential economic collapse. However, not only is risking lives immoral and painful for many citizens, but my findings also show that it did not help the economy. For future health policy decisions, it is vital that leaders look back to the COVID-19 pandemic and choose policy that most benefits their citizens as a whole and not just their wallet.

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