ABSTRACT

Containing COVID-19: A Case Study on the Oregonian and Texan Government Responses to the Coronavirus Pandemic

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The American political response to the SARS-CoV-2 pandemic varied greatly based on state policies and procedures. There has been very little federal intervention in terms of coronavirus-related policies, leading to a disjointed effort to slow the spread of the disease. The states of Oregon and Texas chose opposing requirements in terms of mask mandates and social distancing guidelines, allowing for a comparison of the impacts of certain policy changes implemented for the COVID-19 pandemic. Despite the ongoing nature of the pandemic, the effects of these differing policies have produced observable variation in confirmed case number in each state. While there are demographic differences between these two states, the impact of the state government responses should not be understated. Understanding the ways in which state policies affected the spread of SARS-CoV-2 can serve to assist governments in future pandemics.

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CONTAINING COVID-19: A CASE STUDY ON THE OREGONIAN AND TEXAN GOVERNMENT RESPONSES TO THE CORONAVIRUS PANDEMIC

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By

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

PREFACE

When I first came up with the idea for this thesis, I naively assumed that by its completion I would be writing about something long in the past. Despite my wishful thinking, my process of researching and writing this paper has been largely spent with a thin piece of cloth covering my mouth and nose as I try to forget about the pandemic raging around me by… writing about that pandemic. Not so good for escapism, I must say.

It hasn't been all too bad. I spent almost exactly as many months home in Oregon as I did in Texas during the course of the last year, which would not have been possible if not for the virus. My own observations are a testament to the incredible variation I see in the behavior of the humans in the two states I call home. Witnessing firsthand the ways in which people live during a pandemic when their states give them almost entirely opposing recommendations is an experience I hope to carry into a lifetime of work in public health.

I wrote this thesis to educate the people around me. I want it to be accessible to those who lack understanding of this disease so they may know

why we must make sacrifices in order to protect the most vulnerable. However, more importantly, I wrote it for myself. I pray to God that I will never be on the front line of another public health emergency quite of this scale. However, if I must, I'll always have a reminder of why I got into this field in the first place.

ACKNOWLEDGEMENTS

The completion of this thesis would never have been possible without assistance from the incredible people I am blessed to have in my life. Without your ceaseless encouragement I would have undoubtedly lost my way long ago.

Thank you to my parents for reading this document when I'm sure it was incredibly boring. More than that, thank you for getting me through these last four years. Thank you for your unceasing love and commitment, for your dedication to your family, and for your unwavering support when I needed it most. I love you a lot.

Thank you, Dr. K. I can say with complete certainty if it were not for your dedication to me throughout my college years I would not have made it this far. The fact that your name is on the cover of this document is a testament to the absolute ferocity with which you care for your students. Thank you for being my mentor, my advisor, my teacher, and my friend. I owe my success to you.

CHAPTER ONE

An Introduction to SARS-CoV-2 and COVID-19

A History of COVID-19

A novel coronavirus (CoV) first appeared in Wuhan, China in December 2019.[1] When this pneumonia-like disease was initially announced by the World Health Organization on January 9, 2020, there were only 59 recorded cases.[2] By January 21, 2020, scientists had confirmed the novel coronavirus was capable of horizontal transmission. Dubbed severe acute respiratory syndrome coronavirus 2, (SARS-CoV-2) the World Health Organization declared the outbreak of this virus a Public Health Emergency of International Concern on January 30, 2020, and a pandemic on March 11, 2020.[3] [4] SARS-CoV-2 has since traveled to every continent and infected over 100 million people, causing the serious and sometimes fatal illness, corona virus disease 2019, better known as COVID-19.[5] As of

March 15, 2021, there have been 2.65 million deaths worldwide from COVID-19 alone.[6]

Evidence suggests SARS-CoV-2 jumped to humans from bats, but little is known regarding this initial transition.[7] [8] One theory suggested the Wuhan Institute of Virology may have been the source of the virus, but WHO researchers have refuted this claim, suggesting it is "highly unlikely" to have been the case.[9] Any environment in which humans, animals, and animal products are in contact is more likely to allow for zoonotic jumps of pathogens from animals to humans. For this reason, China's 'wet markets' were at one point considered to be the origin of the virus, but this theory has since been dismissed. Identifying the initial source of SARS-CoV-2 is important as it may provide a means to stop the next pandemic before it even starts.

Coronavirus Classification

Coronaviruses have long been known to cause disease in humans. The term "corona" was first used to describe them in 1968 upon the discovery of their unique "crown" of protein spikes.[10] While the coronavirus family is particularly diverse, all viruses in this grouping contain an enveloped structure with positive-sense, single-stranded RNA. Of the four types, alpha, beta, delta, and gamma, only alphacoronaviruses

and betacoronaviruses have infected people, and only 7 of the 45 currently identified species have been observed to cause disease in humans.[11] Severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) – major outbreaks within the last two decades – are caused by two betacoronaviruses, as is COVID-19.[12] It is important to note that as of March 17, 2021 there are at least five SARS-CoV-2 variants of concern known worldwide.[13] However, as there is little currently known about these variations and information continues to grow, these variants lie outside the scope of this paper and will not be considered further.

COVID-19 Signs and Symptoms

Common signs and symptoms of COVID-19 include fever or chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body aches, headache, new loss of taste or smell, sore throat, congestion or runny nose, nausea or vomiting, and diarrhea.[14] The largely nonspecific signs and symptoms of COVID-19 mean that initial cases likely went unnoticed, as people may have assumed they had a cold or the flu. While most symptoms appear within 2-14 days, the most concerning aspect of COVID-19 is that a significant proportion of infected individuals will remain asymptomatic throughout their entire infection period yet can still pass the virus on to others.[15] Obviously, it can be difficult to ascertain exactly what percentage

of carriers are asymptomatic, as individuals with no symptoms are unlikely to go to the doctor or take a COVID-19 viral test. In addition, scientists are still unsure just how infectious asymptomatic individuals may be.[16] The role of asymptomatic carriers has made managing the COVID-19 pandemic particularly complicated, and researchers may not know the true effects of carriers until long after the emergency is over.

COVID-19 in the United States

The first confirmed case of COVID-19 in the United Sates occurred on January 21 from an individual who had traveled to the U.S. from Wuhan only six days prior.[17] Due to the disease's nonspecific symptoms, however, it is possible there had been other cases previously which had gone unnoticed. The virus spread rapidly throughout the continental United States and was present in all fifty states by March 17, though the true arrival may have been earlier than that.[18] The number of confirmed cases nationwide has increased exponentially as the virus has run rampant throughout the nation (Chart 1).[19]

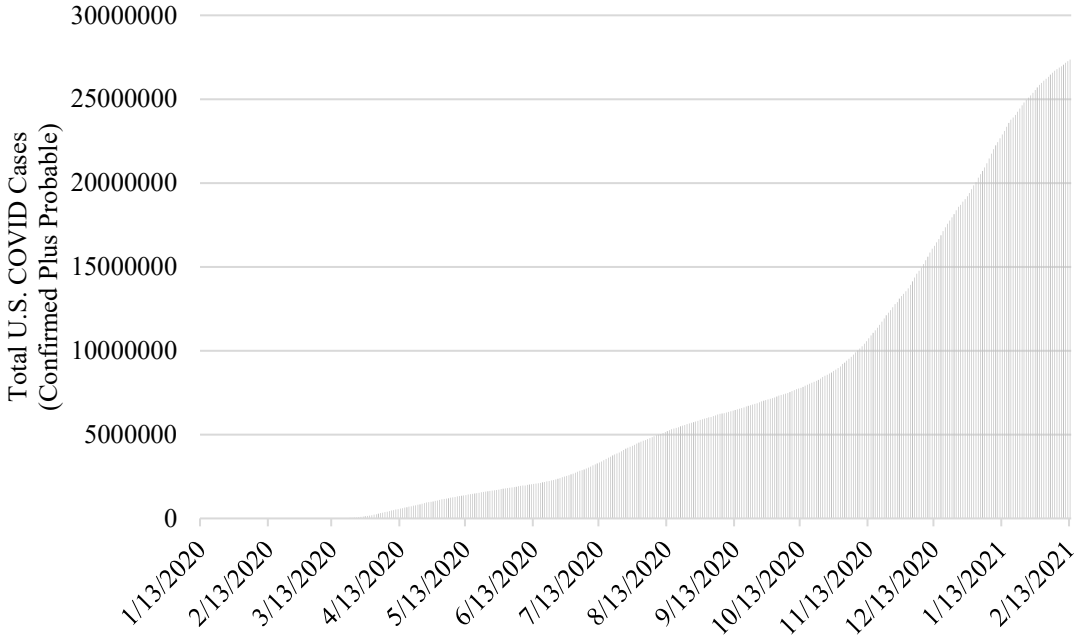

Chart 1: Total U.S. COVID-19 Cases Confirmed Plus Probable; January 13, 2020 to February 13, 2021.

COVID Conspiracy

When SARS-CoV-2 first appeared in the United States, very little was known regarding its transmissibility. This apparent lack of transparency was augmented by a divided response from the American federal government, leading to an overwhelming amount of misinformation, deliberate and not, being spread. This boom in false information created an environment in which conspiracy theories could run rampant. In the words of WHO Director-General Tedros Adhanom Ghebreyesus, “We’re not just fighting an epidemic; we’re fighting an infodemic”.[20]

In addition, anti-vaccination ("anti-vaxx") movements have posed a significant threat to COVID-19 vaccine distribution schedule, particularly in the United States. The anti-vaxx movement is highly organized, well-funded, and tightly run and is attempting to utilize the COVID-19 pandemic as an opportunity to further misinformation regarding all vaccines.[21] The relatively fast development and production of all three approved COVID-19 vaccines is a scientific marvel, yet pockets of skeptics question the rigorousness of the FDA approval process, citing theories of microchip implantation, 5G radiation, and harmful chemicals.[22]

To further complicate matters, the largely nonspecific signs and symptoms of COVID-19 led many people to assume it was just 'another flu'. There are a number of risk factors that can lead to an increased chance of contracting severe COVID-19, including cancer, certain heart conditions, asthma, hypertension, immunocompromised state, obesity or severe obesity, pregnancy, or diabetes.[23] In addition, the risk of death due to COVID-19 is significantly higher for older adults. People between 65 and 74 years of age are 1100 times more likely to die of COVID-19 than a 5–17-year-old, and people older than 85 are 7900 times more likely.[24] For this reason, the CDC has defined adults over 65 years to be at risk of severe COVID-19. Considering both age and health risk factors, there are approximately 92.6 million people in the U.S. at risk for severe illness should they contract coronavirus – roughly one of every four adults in the

United States.[25] Despite this apparent health emergency, many state leaders chose to ignore CDC guidelines on social distancing and mask wearing.

Federal Actions

On January 20, 2020, the Centers for Disease Control announced they would conduct health screenings on passengers arriving at JFK International, San Francisco International, and Los Angeles International airports.[26] This behavior first indicated the CDC's high level of concern regarding the outbreak. One week later, then-President Donald Trump announced the formation of the White House Coronavirus Task Force.[27] This team, headed by then-Vice President Mike Pence, was intended to "coordinate and oversee the administration's efforts to monitor, prevent, contain, and mitigate the spread" of SARS-CoV-2. However, the Task Force proceeded to oppose the Centers of Disease control in many ways, including pressuring the organization to weaken testing guidelines.[28]

Amidst the economic downturn that came with the SARS-CoV-2 pandemic, the federal government did step in to implement some financial assistance to those in need. On March 27, 2020, President Trump signed the Coronavirus Aid, Relief, and Economic Security Act (CARES Act). This holistic aid package gave targeted relief to families and individuals, small

businesses, corporations, and state and local governments.[29] The $2.2 trillion stimulus was valued at approximately 10% of the nation's 2020 GDP yet passed with bipartisan support due to severe economic distress resulting from the pandemic.[30]

Some policy decisions made by the Trump Administration have been criticized for having been too little, too late. Even before the pandemic, President Trump disbanded the Global Health Security and Biodefense unit in 2018, well before the first case of COVID-19. This pandemic response team is designed to act as a 'smoke alarm' for potential outbreaks and could have acted as an early warning system for SARS-CoV-2.[31] On May 29, 2020, Donald Trump announced the USA would be leaving the World Health Organization, a decision the *Lancet* calls not only unlawful, but a threat to global and U.S. health and security.[32] On January 21, 2021, President Joe Biden announced that the United States would rejoin the WHO, one day after taking office.[33]

An Issue of Presidential Proportions

In addition to some highly critiqued administrative choices, President Trump appears to have played a significant role in the coronavirus misinformation problem. A Cornell University study found 38% of COVID-related misinformation published between January 1 and May 26,

2020 came directly from the U.S. leader, calling him likely “the largest driver of the COVID-19 misinformation ‘infodemic.’”[34] He perpetuated the myth that COVID-19 is equivalent to influenza, claiming, “This is a flu. This is like a flu. It's a little like a regular flu that we have flu shots for. And we'll essentially have a flu shot for this in a fairly quick manner."[35] This statement comes only a few weeks after Trump had already admitted he knew COVID-19 was “also more deadly than even your strenuous flus” and was easily transmissible through droplets in the air.[36]

President Trump also supported claims for potential miracle cures, despite varying evidence to support such medicines. He tweeted support for hydroxychloroquine, despite there having been no evidence at the time that it decreased mortality rates or severity of disease of COVID-19. In February 2021, a Cochrane study announced hydroxychloroquine does not reduce deaths from COVID-19, and “probably does not reduce the number of people needing mechanical ventilation”.[37] In addition to hydroxychloroquine, Trump also suggested injecting disinfectant into one’s lungs, or utilizing particularly strong ultraviolet light as a means of killing the virus.[38] While bleach or UV radiation may be successful ways to decontaminate nonporous surfaces, neither of these are recommended for use on living beings.

Vaccine Development and Distribution

The race for a COVID-19 vaccine has been one of the 21st century's greatest scientific achievements. As of February 2021, three vaccines have been given FDA emergency use authorization in the United States: the Pfizer-BioNTech COVID-19 vaccine, the Moderna COVID-19 vaccine, and the Johnson and Johnson COVID-19 vaccine.[39] The J&J product is a more traditional shot, based on an altered adenovirus which has been modified to present SARS-CoV-2 spike proteins.[40]

The Pfizer and Moderna vaccines, in contrast, are mRNA based and are the beginning of a new and exciting expansion in vaccine development. mRNA vaccines provide the genetic code for human cells to produce virus particles on their own in order to then build immunity and create a faster, better immune response if the body were to later become infected with SARS-CoV-2.[41] There are many advantages of using mRNA vaccines instead of traditional methods. Because the vaccine contains no viral particles, there is no possible risk of infection associated with the injection. In addition, development of mRNA vaccines can be much faster than traditional methods due to the relatively simple nature of the components. However, there have been significant drawbacks to using mRNA vaccines throughout the COVID-19 pandemic. mRNA vaccines are extremely fragile compared to their hardier DNA cousins and require extremely cold temperatures for shipping and storage. Once a vaccine has been thawed for

use, that unit must be used quickly according to CDC guidelines: Pfizer-BioNTech doses within 6 hours of refrigeration, and Moderna doses within 30 days.[42] [43] These requirements mean vaccinations are frequently wasted despite skyrocketing demand.[44]

CHAPTER TWO

Methods

Justification for State Choice

Because the American response to COVID was so diverse, it was important for this study to focus only on two states in order to go fully into the details of those states' policies. Oregon and Texas implemented wildly different mandates in response to the SARS-CoV-2 pandemic, so taking a closer look at the outcomes of these two states could provide some additional insights into the impacts of their COVID-19 policies. In addition, these two states have some political differences. Oregon is led by a governor in the Democratic Party, whereas Texas has a Republican leader. This may play a role in which COVID-19 policies were put into place by each state and provides a compelling argument for choosing states with differing political ideologies.

State and Federal Policy Data Collection

A timeline of coronavirus-related events in the United States was collected from the American Journal of Managed Care. Each of these dates and statistics provides a larger context for the state policies and procedures and the meaning behind those decisions. The information regarding the mask mandates in each state was ascertained from the AARP State-by-State Guide to Face Mask Requirements and confirmed by regional news sources. The timelines for Oregon and Texas' coronavirus guidelines were originally compiled by the Husch Blackwell law firm and verified with additional reporting. The information was organized into relevant categories to discuss K-12 school impacts, social distancing measures, COVID-19 testing availability, and economic implementations. The information was sorted and divided in order to better compare the two states' pandemic responses directly. Policies which only affected one or a few counties, rather than the entire state, were not included.

Coronavirus Case Information Collection

The earliest cases of COVID-19 in each state were recorded by each state's public health department, each of which produced statements regarding the incident. Confirmed coronavirus case statistics came from

datasets collated by the Oxford Coronavirus Government Response Tracker team from publicly available sources. COVID-19 data including probable cases was sourced from The COVID Tracking Project. This information was pulled directly from state public health authorities and is all freely available.

Oxford Coronavirus Government Response Tracker Methods

The Oxford Coronavirus Government Response Tracker compiles and publishes a holistic and detailed analysis of individual countries' government responses to the COVID-19 pandemic.[45] This tool identifies data from more than 180 countries and all 50 U.S. states and creates a cohesive understanding of whether or not regions should implement more stringent requirements in an attempt to minimize coronavirus infections. These statistics are compiled from numerous sources, including news articles and government reports. The CGRT team has designated a coding index which scores individual nations based on their federal and regional responses to the pandemic. This ranking system compares statistics on containment and closure policies, economic policies, and health system policies. Each state is graded based on the above factors and given scores between 0 and 100 where 0 is considered a poor response and 100 is an excellent response. The average of each contributing factor is considered

when calculating the index score. Tables 1 and 2 explain which policy types are included in each index.

Table 1: Factors Considered in Oxford Coronavirus Government Response Index Ratings. H4 and H5 are not considered in the indices explored in this study.

Index name	**C 1**	**C 2**	**C 3**	**C 4**	**C 5**	**C 6**	**C 7**	**C 8**	**E 1**	**E 2**	**H 1**	**H 2**	**H 3**	**H 6**	**H 7**	**H 8**
Government response index	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Containment and health index	x	x	x	x	x	x	x	x			x	x	x	x	x	x
Economic support index									x	x						

Table 2: Explanations of Factors Considered in Coronavirus Government Response Tracker Ratings.

Index Name	**Policy Considered**
C1	Closing of schools and universities
C2	Closing of workplaces
C3	Cancelling of public events
C4	Restrictions of gatherings
C5	Closing of public transport
C6	Stay at home requirements
C7	Restrictions on internal movement
C8	Restrictions on interstate/international movement
E1	Income support for households
E2	Debt relief for households
H1	Public health information campaigns
H2	COVID-19 testing policies
H3	COVID-19 contact tracing
H6	Facial coverings outside the household
H7	COVID-19 vaccine availability
H8	Protection of people in long-term care facilities

CHAPTER THREE

State and Federal Mandates

Face Covering Requirements by State

By leaving the COVID-19 response largely up to the states, the federal government implemented very few regulations on social distancing or face coverings prior to 2021. Many states chose to create their own mandates regarding mask wearing in public places, but enforcement has varied widely. Of the 50 U.S. states, 37 had active, enforceable, universal mask mandates on as of March 15, 2021.[46] Universal mask mandates require face coverings to be worn in all indoor public spaces where social distancing (approximately six feet or more) is not possible. Some states, including California, Colorado, Delaware, Hawaii, Indiana, Kansas, Maine, Maryland, Michigan, Minnesota, Nevada, New Hampshire, New Jersey,

New Mexico, North Carolina, Ohio, Oregon, Pennsylvania, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming require masks at all times in enclosed public spaces, even when social distancing is feasible.[47 - 72] Others expanded their requirements to include outdoor spaces where social distancing is not possible, such as Alabama, Arkansas, California, Connecticut, Delaware, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Michigan, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, Utah, Vermont, Virginia, Washington, and Wisconsin.[73 - 78] Massachusetts has gone as far as to require masks at all times in public spaces, indoors or out, whether social distancing is possible or not.[79] Several states have allowed counties with low positivity rates to opt out of required mask wearing, such as Colorado and Kansas.

Thirty-nine states have implemented statewide universal mask mandates at some point during the coronavirus pandemic, but several have since removed the requirements. The sixteen states without active mask mandates as of March 2021 include Alaska, Arizona, Florida, Georgia, Idaho, Iowa, Missouri, Mississippi, Montana, Nebraska, North Dakota, Oklahoma, South Carolina, South Dakota, Tennessee, and Texas. Iowa required mask wearing from November 2020 through February 2021, but Governor Kim Reynolds lifted the requirement, claiming Iowans "don't need a government order to protect themselves from the coronavirus".[80] Mississippi Governor Tate Reeves previously ordered face coverings to be

worn from August to September 2020, but later adjusted the requirement to only be in counties with relatively high positivity rates of COVID-19.[81] This accounts for 75 of Mississippi's 82 counties, as of February 3, 2021.[82] Montana previously issued a statewide face covering mandate in July 2020, but Governor Greg Gianforte rescinded the decision, citing vaccine development and a need to "protect businesses, nonprofits, places of worship, and health care providers," instead moving towards an incentive-based program.[83] Some Nebraska city and county officials have implemented their own mask mandates, but the state has not created such guidelines other than requiring clients and staff at barbershops, salons and other personal-care businesses to wear masks while utilizing such locations.[84] North Dakota Governor Doug Burgum did order a statewide mask mandate in November 2020, but the policy expired in January 2021 and was not renewed.[85] In Oklahoma, South Carolina, and Tennessee, state officials have refrained from creating face covering requirements, but some individual cities done so independently. Texas governor Greg Abbott originally implemented a universal mask mandate in June 2020, but removed the rule in March 2021, citing, "people and businesses don't need the state telling them how to operate".[86] Political influences seemingly play a large role in the way lawmakers chose to implement mask mandates and social distancing guidelines. All sixteen states without universal mask mandates are led by governors affiliated with the Republican Party.[87] Table

3 shows which states have implemented mask mandates and the extent of those requirements.

Of the 39 states that implemented statewide mask mandates at some point, only seven did so within 100 days of the first confirmed case of COVID-19 in the United States (Chart 2). The first state to confirm infection with SARS-CoV-2 was Washington, yet this state did not impose a universal mask mandate until June 26, 2020 – 157 days after its initial case. The first state to require masks indoors was Kansas, which did so on April 3, 2020, only 73 days after first U.S. case and a mere 27 days after the first Kansan fell ill with COVID-19.[88] The latest state to order a mask mandate is Wyoming, on December 9, 2020 – 323 days after the first American had tested positive for SARS-CoV-2 and 273 days after the virus was first discovered in the state. While the rest of this study will focus solely on the COVID policies of Oregon and Texas, the above information provides additional context for those policies.

A Timeline of Oregon's COVID-19 Government Response

The first confirmed case of COVID-19 in Oregon occurred on February 28, 2020.[89] Oregon Governor Kate Brown announced a state of emergency on March 8, 2020, in order to provide the Oregon Health Authority with additional resources, including healthcare personnel.[90] On

the day the state of emergency was announced, Oregon had a total of 14 confirmed or presumptive cases of COVID-19.[91] As of March 1, 2021, the state has confirmed over 150,000 total cases, including over 2000 deaths.[92]

COVID-19 K-12 School Impacts

On March 12, 2020, K-12 schools closed from March 16 through March 31. They have not since returned fully, with public and charter schools being in-person or online based on COVID-19 statistics in their associated districts. Private schools may choose independently whether or not to incorporate distance learning but must implement some disease-fighting measures such as increased hand washing and providing hand sanitizer. Mask mearing is still required in all indoor public spaces in accordance with Oregon Executive Order No. 20-66.[93] In the 2020-2021 academic year, in order for public or charter schools to reopen the county case rate must be ≤10 cases per 100,000 population in the preceding 7 days and the state must have ≤5% positivity rate in COVID-19 testing in the preceding 7 days.[94] However, in December 2020 these policies were reduced from mandatory to recommended, allowing school districts to make their own decisions regarding reopening. This is contrasted by a March 8 executive order where Governor Brown required all districts to have either hybrid or fully in-person teaching by March 29 for grades K-5 and by April

19 for grades 6-12.[95] This is likely due to concerns regarding students' academic progress, as it was followed by a March 11 announcement about a $325 million plan to catch students up on academic materials over summer 2021.[96]

Social Distancing Measures

Social distancing guidelines were first implemented in Oregon beginning March 16, 2020 when all events containing 25 or more people were canceled and restaurants were converted to take-out only.[97] On March 23, stay at home guidelines were released which encouraged all individuals to remain at home to the fullest extent possible to avoid contracting or spreading SARS-CoV-2. Non-urgent healthcare procedures were halted on March 19 but resumed on May 1 in health care settings which established safety measures to prevent the spread of disease.[98] Beginning in May 2020 counties could apply for Phase I status given a decline in COVID-19 cases, sufficient testing and contact tracing capabilities, and a surplus of hospital beds and PPE for healthcare workers. Phase I allows individual counties to open restaurants and bars for sit-down service, as well as barbershops and salons, and allows for in-person gatherings of up to 25 people.[99] On June 29, a universal mask mandate took effect in Oregon which required masks to be worn at all times when in indoor public places. A campaign to educate

citizens on the importance of mask wearing began the next week. This initial requirement later included outdoor spaces where social distancing cannot be maintained and was expanded on July 15, 2020. In addition, gatherings of 10 or more people indoors not relating to religious services or business operation were prohibited.[100] Houses of worship or businesses were limited to 100 people indoors. On November 13, 2020, Governor Brown announced a statewide Two-Week Freeze designed to limit gatherings in preparation for the holiday season. This shutdown reduced gathering sizes for families, businesses, and places of worship. In addition, Oregon, California, and Washington announced travel advisories for individuals visiting the West Coast from other states, including a 14-day quarantine period for anyone crossing state lines.[101] Despite the added social distancing measures, 25 Oregon counties were classified as extreme risk – the highest level of concern – at the conclusion of the Two-Week Freeze.

COVID-19 Testing

Testing for SARS-CoV-2 in Oregon started small but was quickly escalated in April with the announcement of Governor Brown's reopening plan for the state. The Western States Pact, of which Oregon is a founding member, is a coalition of five western U.S. states with a common goal to increase testing, prioritize the health of vulnerable populations, and

appropriately prepare for hospital and ICU surges due to COVID-19.[102] On May 3, 2020, COVID-19 testing and contact tracing was expanded in Oregon in conjunction with Oregon Health Sciences University and all hospital labs in the state.[103]

Economic Measures

Financial support for Oregonians impacted by the pandemic first went into action in March 2020. On March 22, Executive Order No. 20-11 placed a 90-day hold on evictions for failure to pay.[104] This hold was renewed in the beginning of 2021 and has continued as of this writing.[105] In addition, a nonpayment eviction moratorium was imposed for commercial buildings on April 3, 2020, as well as the Coronavirus Small Business Resource Navigator which gave small business owners a comprehensive resource for their COVID-19 questions.[106] In March 2020 the Oregon Department of Consumer and Business Services ordered insurance companies to extend grace periods for premium payments, postpone policy cancellations and non-renewals, and extend deadlines for reporting claims.[107] This policy has remained in effect as of this writing. On March 31, 2020, the federal government accepted Oregon's Major Disaster Declaration, allowing the state to receive benefits in accordance with the Federal Emergency Management Agency's Public Assistance program.[108]

On September 16, 2020, Oregon employees gained access to the COVID-19 Temporary Paid Leave Program which pays eligible workers $120 each day they are required to quarantine.[109] In addition, the Oregon Worker Quarantine Fund will provide up to two weeks of financial relief (up to $860) to agricultural workers 18 and older, regardless of immigration status, if they are required to quarantine.[110] On November 18 Governor Kate Brown announced the Coronavirus Relief Fund would provide $55 million to local businesses that had been affected by the pandemic. This was then followed by a December 14 declaration that 2019 income tax would be waived for small businesses. Small businesses benefitted again in March 2021 with the announcement of a commercial rent relief application for businesses with 100 or fewer employees.[111]

Vaccine Distribution

The Oregon Health Authority first introduced its COVID-19 vaccine plan on December 18, 2020. The first Oregonians to receive COVID-19 vaccines were health care personnel who have direct or indirect exposure to patients or infectious materials and residents of long-term care facilities. On February 8, 2021 vaccine eligibility was expanded to all adults over 80 and then re-expanded to include adults over 70 starting on February 22. The original vaccine distribution plan was altered on March 1 to include

vaccinations for the following groups starting March 29, 2021: adults 45 – 64 with at least one underlying health risk, migrants and seasonal farm workers, seafood, agricultural, and food processing workers, people living in shared common areas, people experiencing homelessness, people displaced by the Oregon wildfires, and pregnant people over the age of 16.[112] In addition, starting on April 5th, all adults with underlying health conditions, as well as those living in multigenerational households will become eligible. By May 1st, 2021, Oregon plans to open vaccination eligibility to all adults who are 16 and older. This is likely due to the federal request that all adult Americans become eligible for COVID-19 vaccines by May 1.[113]

A Timeline of Texas' COVID-19 Government Response

The first case of COVID-19 was discovered in Texas on March 3, 2020. Sixteen days later, on March 19, the Texas Department of State Health Services declared COVID-19 to be a public health disaster.[114] That same day, Governor Greg Abbott issued an executive order to restrict certain social activities including eating and drinking in public places, visiting gyms and salons, and visiting nursing homes or long-term care facilities.[115] Texas had 306 confirmed cases of COVID-19 on the day the public health disaster was declared. As of March 1, 2021, Texas reached 2.7

million confirmed cases with over 46,000 deaths due to the pandemic. Texas Governor Abbott issued a proclamation declaring the SARS-CoV-2 outbreak to be a Disaster on March 12 and renewed it through March 2021.[116] The Texan response to the pandemic was much more disjointed than Oregon's. Very few counties or cities in Oregon chose to act independently of state policies, yet in Texas such decisions were commonplace. However, on May 13, 2020, Texas Attorney General Ken Paxton informed some major Texas cities that local stay-at-home orders, public mask requirements, shelter in place notices, and business restrictions were unenforceable in the state.[i] This prohibited Texas cities and counties from creating their own COVID-19 policies that were more restrictive than that of the State.

COVID-19 K-12 School Impacts

Texas schools closed statewide due to the coronavirus pandemic on March 20, 2020.[117] On June 1 schools could begin to offer summer school. All K-12 schools could resume in-person teaching in Texas, but some chose to continue online instruction. The schools which did opt in to in-person

[i] Before Governor Abbott's April 2 stay-at-home order, 50 of Texas' 254 counties and a dozen cities enacted their own stay-at-home orders. At least 184 counties published some sort of COVID-related declaration or procedure. In addition, several counties began to require face coverings beginning in April 2020.

classes mandated face coverings while on school property and enforced social distancing policies.[118]

Social Distancing Measures

On March 22, 2020, Governor Abbott signed an executive order expanding the capacity of Texas hospitals and halting all non-urgent medical procedures.[119] This was reduced on April 17 when some elective surgeries were permitted if they did not reduce the amount of PPE or hospital beds available.[120] On March 27 Governor Abbott introduced a mandatory quarantine for anyone traveling to Texas from New Orleans or the New York Tri-State area. Quarantined individuals could have no visitors and were prohibited from going to public places or face a $1000 fine or 180 days in jail.[121] Three days after the mandatory quarantine was announced it was expanded to include individuals traveling from California, Connecticut, Louisiana, Washington, and the cities of Atlanta, Chicago, Detroit, and Miami. The required quarantine period ended for all travelers on May 26.[122] [123] On the second day of April, the Governor clarified a previous executive order requiring all Texans to remain at home unless required for essential activities until April 30.[124] However, on April 27 Abbott released the Governor's Report to Open Texas and announced he would allow the stay-at-home order to expire. In addition, on May 1, all retail stores, restaurants,

movie theaters, and malls could reopen, but with only up to 25% occupancy.[125] Restaurants were increased to 75% on June 12 but then returned to 50% on June 29.[126] [127] Beginning May 8, salons and barber shops may open, but must ensure at least 6 feet of social distancing. Gyms, exercise facilities, and exercise classes may open on May 18 but must operate at 25% occupancy. Despite limitations on business capacity, it was announced on May 7 that no person can be placed in jail for refusing to follow local jurisdiction social distancing requirements.[128] Childcare facilities and youth club services reopened on May 18 under Executive Order GA-21.[129] Professional sporting events could admit up to 25% of normal operating limits beginning May 31.[130] In June 2020, emergency safety rules for childcare facilities were removed, but they were reestablished one week later. Texas' mandatory face covering order was introduced on July 2, 2020. The 50% occupancy limit for restaurants, stores, office buildings, manufacturing facilities, gyms, museums, and libraries – but not bars – was increased to 75% on September 17.[131] Bars were allowed to reach 50% capacity beginning October 14, but no dancing was allowed, and masks were required unless eating or drinking.[132]

COVID-19 Testing

Beginning October 14, 2020, the COVID-19 Rapid Testing Pilot Program for Texas school systems assisted school districts with conducting tests for SARS-CoV-2 for students and staff.[133]

Economic Measures

Certain individuals could qualify for unemployment claims under a new guidance released from the Texas Workforce Commission on May 1, 2020. Workers can refuse rehire due to age, risk of severe COVID-19, quarantine, or lack of childcare and still qualify for state unemployment benefits.[134] On September 25, 2020, Governor Abbott announced the allocation of more than $171 million dollars in federal aid from the CARES to rental assistance for Texans at risk for eviction.

Vaccine Distribution

On October 7, 2020, health care workers in Texas could enroll in the Texas Department of State Health Services' Immunization Program to be eligible to administer COVID-19 vaccines as they become available. In

November 2020, the Department of State Health Services announced their Vaccine Distribution Plan in accordance with the newly formed Expert Vaccine Allocation Panel.[135] Healthcare workers, people over the age of 65, and people at high risk for severe COVID-19 became eligible to receive the COVID-19 vaccine on January 6, 2021.[136]

Quantifying State COVID-19 Government Responses

Chart 3 visualizes Oregon's containment and closure and economic health ratings over time, both of which contribute to its overall government response index rating. The same information for Texas can be seen in Chart 4. The two states' government response rankings over time can be seen in Chart 5.

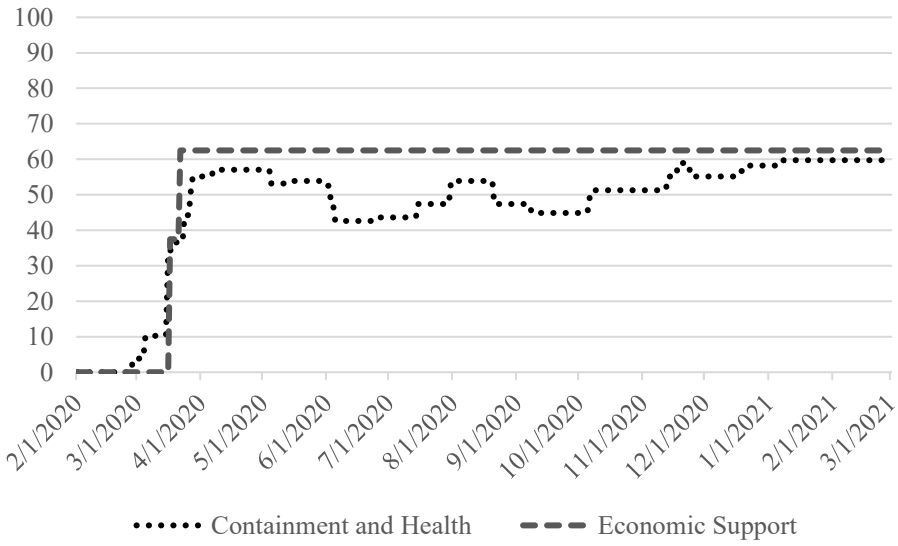

Chart 3: Oregon Coronavirus Government Response Ratings by Index; February 2020 to March 2021. Each index is rated on a scale of 0 – 100 with 100 indicating either the highest level of containment and closure or the maximum amount of economic support.

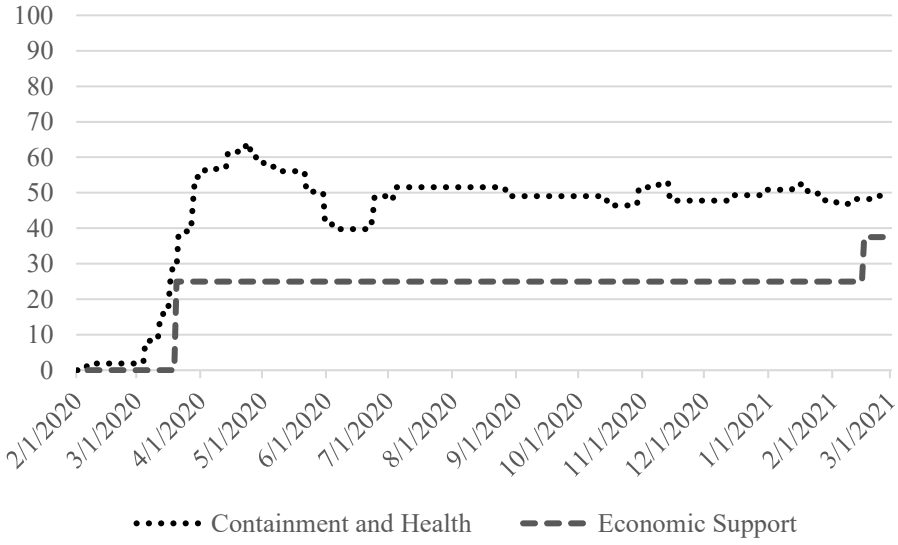

Chart 4: Texas Coronavirus Government Response Ratings by Index; February 2020 to March 2021. Each index is rated on a scale of 0 – 100 with 100 indicating either the highest level of containment and closure or the maximum amount of economic support.

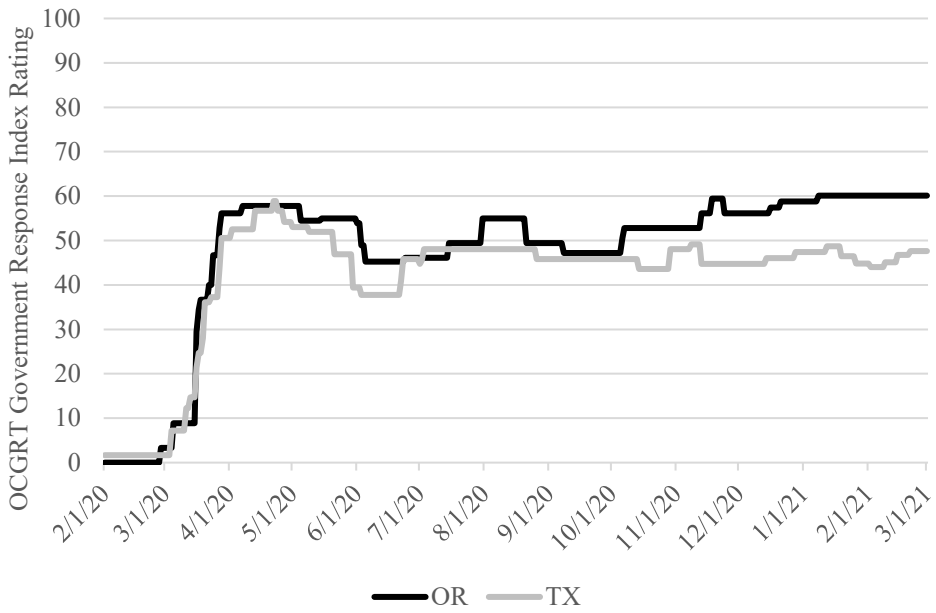

Chart 5: Oregon vs Texas Government Response Index by Day; February 2020 to March 2021. Each index is rated on a scale of 0 – 100 with 100 indicating either the highest level of containment and closure or the maximum amount of economic support.

CHAPTER FOUR

COVID-19 Case Statistics in Oregon and Texas

While the SARS-CoV-2 outbreak began in the United States in January 2020, the first cases of COVID-19 in Oregon and Texas were announced later that year. The initial case in Oregon was confirmed February 28 and the first case in Texas was announced March 4. Since then, both states have seen rapid increases in case numbers per capita, despite taking very different policy approaches. As of March 1, 2021, there have been a total of 155,787 coronavirus cases in Oregon, leading to a total of 3709 cases per 100,000 people.[137] Texas has had a total of 2,660,791 cases as of the same date, with approximately 9175 cases per 100,000 people. [138]

Case Increase by State

To analyze the temporal progression of cases, observe the doubling rates of total confirmed cases in each state in Table 4. A lower doubling time indicates a faster rate of spread and is not desirable when attempting to control the virus. Oregon case counts above the 17th doubling are not included as Oregon has not reached 262,144 cases as of March 1, 2021.

Table 4: COVID Case Count Doubling Times Until March 1, 2021.

		Oregon		Texas	
Total Confirmed Cases	Number of Times Doubled	Date	Days Needed to Double	Date	Days Needed to Double
1	0	2/28/2020	N/A	3/4/2020	N/A
2	1	3/2/2020	3	3/5/2020	1
4	2	3/7/2020	5	3/6/2020	1
8	3	3/8/2020	1	3/7/2020	1
16	4	3/11/2020	3	3/10/2020	3
32	5	3/14/2020	3	3/13/2020	3
64	6	3/17/2020	3	3/15/2020	2
128	7	3/21/2020	4	3/18/2020	3
256	8	3/25/2020	4	3/19/2020	1
512	9	3/29/2020	4	3/21/2020	2
1024	10	4/5/2020	7	3/25/2020	4
2048	11	4/22/2020	17	3/28/2020	3
4096	12	5/29/2020	37	4/1/2020	4
8192	13	6/28/2020	30	4/7/2020	6
16,384	14	7/25/2020	27	4/16/2020	9
32,768	15	9/27/2020	64	5/5/2020	19
65,536	16	11/23/2020	57	6/1/2020	27
131,072	17	1/15/2021	53	6/25/2020	24
262,144	18			7/12/2020	17
524,288	19			8/12/2020	31
1,048,576	20			11/10/2020	90
2,097,152	21			1/16/2021	67

In addition to the information provided in Table 4, Chart 6 represents the speed at which the two states' case counts doubled.

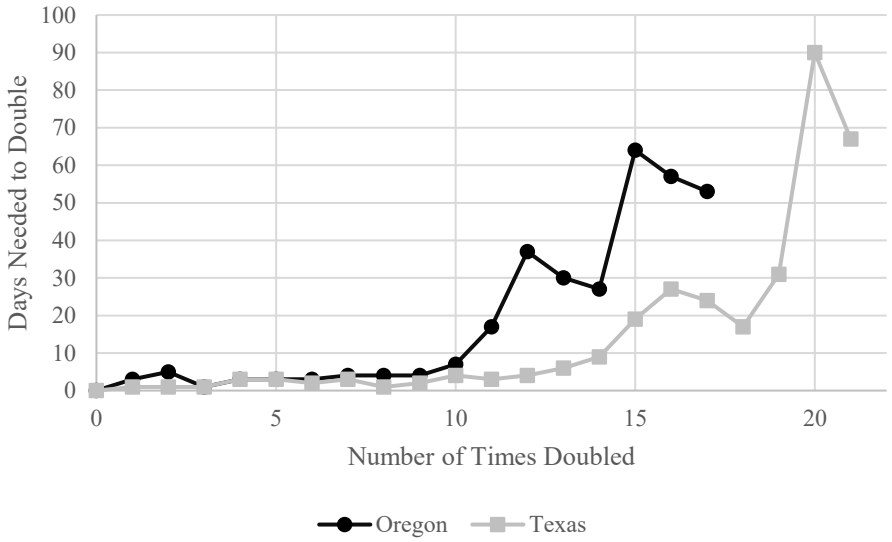

Chart 6: Number of Days Needed to Double Total Confirmed Cases in Oregon and Texas. Each doubling increases the total number of confirmed cases by a factor of 2. A smaller doubling time indicates a faster rate of spread.

While the total case count information can provide helpful insights into the progression of cases within each state, analyzing the increase of each state's confirmed case number adjusted for population will allow for better comparison between the two states. Chart 7 represents the total number of confirmed cases per 100,000 in each state.

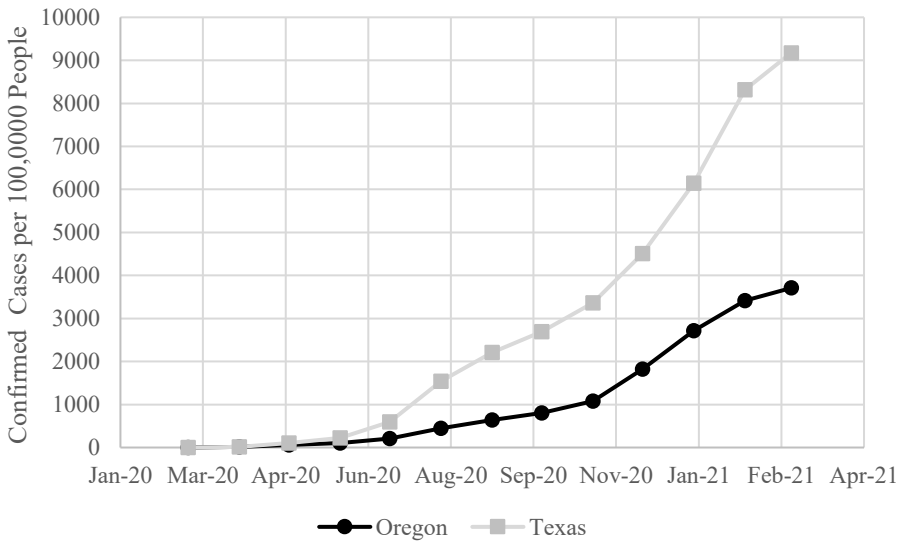

Chart 7: Confirmed Cases per 100,000 by Month; March 2020 to March 2021.

CHAPTER FIVE

Effects of State and Federal Regulation on Coronavirus Cases

Impact of Oregon's COVID-19 Policies on Confirmed Case Numbers

Oregon approached the COVID-19 pandemic by quickly restricting sizes of gatherings, encouraging social distancing, and mandating face coverings. The state's government response index rating increased rapidly in March and April 2020 and has remained mostly stable since. The timely response to the coronavirus pandemic allowed Oregon to quickly implement public health policies while number of people infected with SARS-CoV-2 remained relatively low (Chart 8). In this case, it may have been the *time* of the policies, rather than the policies themselves, which made a significant difference in Oregon's number of confirmed cases of COVID-19.

In addition, Oregon's government created several new programs for economic support for households and small businesses, such as the COVID-19 Temporary Paid Leave Program, the Oregon Worker Quarantine Fund, and the Coronavirus Relief Fund. These programs consistently earned Oregon a particularly high economic support rating and may have helped incentivize possible carriers to stay at home rather than go to work and risk spreading the virus.

Throughout the pandemic Oregon's social distancing policies appear to have helped keep the viral spread relatively low. Despite being one of the first states to have a resident test positive for COVID-19, Oregon saw very low spread of the virus until the holiday season. This is likely due to increased numbers of social gatherings for the holidays, despite such groups not being allowed due to the pandemic.

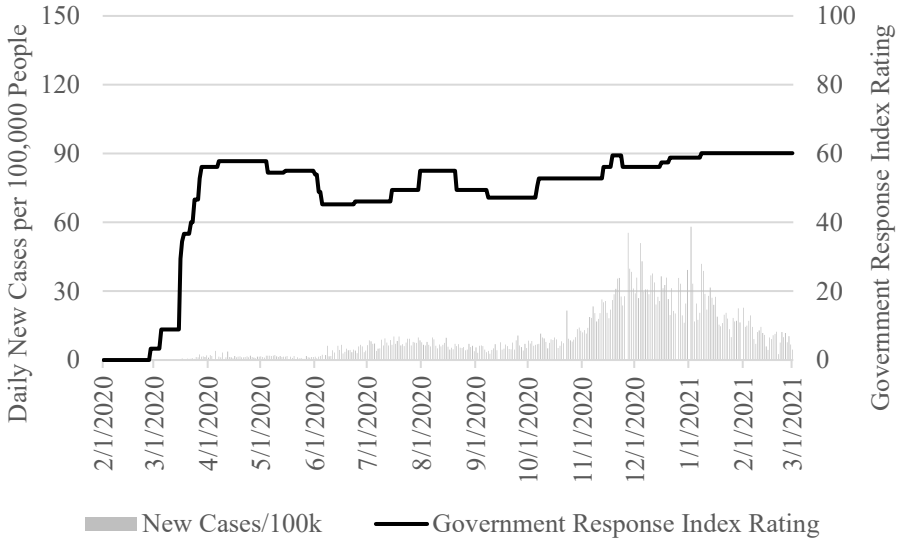

Chart 8: Oregon Daily New Confirmed Cases per 100,000 People vs Government Response Index; February 1, 2020 to March 1, 2021.

Impact of Texas' COVID-19 Policies on Confirmed Case Numbers

Throughout the coronavirus pandemic, the Texas government repeatedly enforced and then removed public health mandates. In May 2020, the state began to quickly reopen businesses and public areas, despite no decrease in case count (Chart 9). Approximately one month after a rapid decrease in the government response index rating, the number of new confirmed cases began to grow. Even as cases continued to increase at an exponential rate, Texas never reached the same level of government response that it enforced prior to May 1, 2020.

In contrast to Oregon's implementation of income security for people impacted by the virus, Texas had very little in terms of support for those in economic distress. The economic support for Texans remained low despite an increasing number of confirmed cases. This may have forced those who needed to work away from home to continue to expose themselves or others to the virus rather than engaging in safer social distancing practices. In addition, individuals who lost their jobs as a result of the pandemic may have been searching for work in public areas, risking infection.

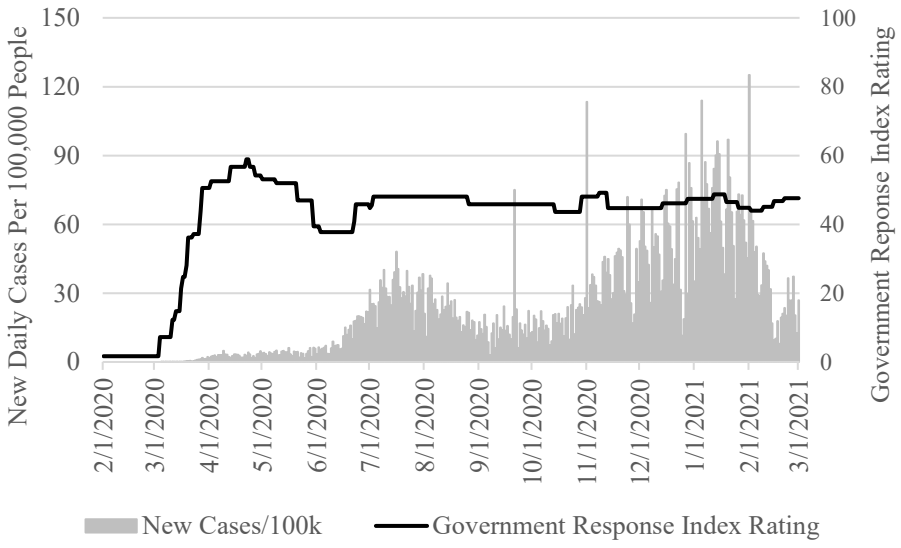

Chart 9: Texas Daily New Confirmed Cases per 100,000 People vs Government Response Index; February 1, 2020 to March 1, 2021

Despite identifying its first case nearly a week after Oregon, Texas quickly eclipsed Oregon in terms of cases per 100,000. When observing the relationship between new confirmed cases and government response index ratings, keep in mind some key differences between Oregon and Texas case data. The most new cases Oregon has seen in a single day is 2439, an approximate new 580 cases per 100,000 people. In contrast, the most new cases Texas has seen in a single day is 36,283. This is approximately 1251 new cases per 100,000 people – more than twice that of Oregon's highest day. Note that Oregon has consistently had a lower doubling rate than Texas and has not yet reached the 18^{th} doubling. In addition, both states had relatively short doubling times at the beginning of the pandemic, before widespread protection measures were put into place.

CHAPTER SIX

Future Implications and Application of Results

Possible Considerations

When identifying the implications of this study it is important to take into consideration the possible weaknesses with these data collection methods. First of all, recall that only policies which impacted entire states were considered. This means that any counties or cities which implemented their own COVID requirements were not accounted for in this study, although they may have had effects on the case counts in those regions. This was particularly apparent in Texas, where individual cities enforced their own COVID policies quite frequently until they were halted from doing so by the state Attorney General.

Attempting to study an ongoing pandemic is not without its challenges. In order to ascertain a holistic understanding of the COVID-19 pandemic over time, all information is accurate as of March 1, 2021. It is

entirely possible that after this date there could be significant changes to state policies or case numbers.[ii] Further work could be conducted following the end of the pandemic to conduct a more thorough investigation.

Finally, there are some inherent shortcomings when using confirmed case counts to estimate COVID severity in each state. Severe SARS-CoV-2 test shortages made it difficult to ascertain accurate case counts, particularly in the early days of the pandemic. While including probable cases with the confirmed case counts could have accounted for the missed cases, counts of probable cases were not recorded by the CDC until April 14, 2020.[139] Due to this delay in information, this project focused solely on confirmed case counts as provided by the OGCRT.

Analysis of Results

Enforcement of Public Health Policies

This study focused on state COVID requirements but not on the enforcement of these requirements. It is entirely possible (and almost guaranteed) that individual citizens refused to follow the mandates

[ii] For example. on March 10, 2021, Texas Governor Greg Abbott rescinded the state's mask mandate. This particular action holds very serious consequences for Texas' COVID-19 spread but was not considered in this study.

introduced within their states, particularly in Texas where there was little enforcement of COVID policies. Without threat of punishment of jail time or a fine for not adhering to social distancing requirements, it is incredibly doubtful that all people would continue to follow those rules. This could explain why cases in Texas continued to skyrocket even when restrictions on gathering and the mask mandate were in place. In the future, states which wish to implement such policies must also make clear the repercussions for not obeying such mandates in order to ensure proper adherence.

Political Implications

As previously discussed, Oregon is a primarily Democratic state whereas Texas is largely Republican. As seen in Chart 2, every state which has never implemented a universal mask mandate is led by a Republican governor. Only three states with Democratic governors were in the slowest 50% of states to require masks. In addition, only one Democratic governor waited longer than 200 days to mandate mask wearing. Finally, the five governors which no longer require face coverings to be worn are all members of the Republican Party. There appears to be a correlation between political affiliation and enforcement of public health policies at the state level. For this reason, state public health departments in states led by Republican governors may benefit from additional federal funding in order

to increase their level of community engagement and education to prevent viral spread.

Recommendations for Future Pandemics

The information found in this study suggests that Oregon's method of quickly introducing public health safety measures and continuing to enforce such regulations helped reduce the number of confirmed cases throughout the state. In contrast, Texas' style of continually altering social distancing guidelines may have not only allowed people to have increased contact with one another, possibly spreading the virus, but it also contributed to the 'infodemic,' as the constantly changing rules and regulations could have been difficult to understand and to follow. In addition, by slowly responding to this dangerous public health emergency, Texas state officials may have unknowingly downplayed the seriousness of COVID-19. For these reasons, states that wish to minimize the toll that future pandemics will take are recommended to act quickly to enforce public health safety measures, create legislation with unity and continuity, continue to invest in public health education, and partner with nearby states to create and enforce reasonable social distancing and quarantine requirements.

APPENDIX

Tables and Captions

Table 3:

Mask mandates by state as of March 10, 2021. 36 states have required face coverings when indoors and it is not possible to remain at least 6 feet from anyone who is not a member of your household. 27 states have required face coverings at any time when inside a public building, no matter the social distancing capabilities. 27 states have mandated mask wearing outdoors if social distancing is not possible; Massachusetts requires masks to be worn at all times outdoors even when at least six feet from individuals outside your household. Of the 36 states with currently active mask mandates, 14 have allowed some counties to opt out of the requirements due to low rates of individuals infected with SARS-CoV-2.

State	Masks required indoors when social distancing is not possible	Masks required indoors at all times	Masks required outdoors when social distancing is not possible	Counties can opt out of mask requirements
AL	Yes	No	Yes	No
AK	No	No	No	Not Required
AZ	No	No	No	Not Required
AR	Yes	No	Yes	No
CA	Yes	Yes	Yes	No
CO	Yes	Yes	No	Yes
CT	Yes	No	Yes	No
DE	Yes	Yes	Yes	No

FL	No	No	No	Not Required
GA	No	No	No	Not Required
HI	Yes	Yes	No	No
ID	No	No	No	Not Required
IL	Yes	No	Yes	No
IN	Yes	Yes	Yes	No
IA	No	No	No	Not Required
KS	Yes	Yes	Yes	No
KY	Yes	No	Yes	No
LA	Yes	No	Yes	No
ME	Yes	Yes	Yes	No
MD	Yes	Yes	Yes	No
MA	Yes	Yes	Yes*	No
MI	Yes	Yes	Yes	No
MN	Yes	Yes	No	No
MS	Yes	No	No	Yes
MO	No	No	No	Not Required
MT	No	No	No	Not Required
NE	No	No	No	Not Required
NV	Yes	Yes	Yes	No
NH	Yes	Yes	Yes	No
NJ	Yes	Yes	Yes	No
NM	Yes	Yes	Yes	No
NY	Yes	No	Yes	No
NC	Yes	Yes	Yes	No
ND	No	No	No	Not Required
OH	Yes	Yes	Yes	No
OK	No	No	No	Not Required
OR	Yes	Yes	Yes	No
PA	Yes	Yes	Yes	No
RI	Yes	No	Yes	No
SC	No	No	No	Not Required
SD	No	No	No	Not Required
TN	No	No	No	Not Required
TX	Yes	Yes	Yes	Yes
UT	Yes	Yes	Yes	No
VT	Yes	Yes	Yes	No
VA	Yes	Yes	Yes	No
WA	Yes	Yes	Yes	No
WV	Yes	Yes	Yes	No
WI	Yes	Yes	Yes	No
WY	Yes	Yes	No	Yes
Total	**36**	**27**	**27**	**4**

Chart 2:

Days between the first U.S. case or state local case of COVID-19 and implementation of a universal mask mandate where masks are required when indoors and social distancing cannot be achieved. States led by Democratic governors are blue; states led by Republican governors are red. Eleven states are not listed because they have not created any statewide face covering requirements; they are all led by Republican

governors. Of the states listed, IA, MS, MT, ND, and TX no longer have functioning mandates.

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