Learning Lessons from COVID-19 to Create a Better Federal Action Plan for Future
Public Health Crises

by
Hector N. Hernandez

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Thesis Committee:

Dr. Aaron Gamino, Thesis Director

Dr. Daniel Smith, Second Reader

Dr. Ennio Piano, Thesis Committee Chair

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APPROVED:

_____

Dr. Aaron M. Gamino, Thesis Director
[Assistant Professor, Department of Economics and Finance]

_____

Dr. Ennio Piano, Thesis Committee Chair
[Assistant Professor, Department of Economics and Finance]

Disclosure of Interests

Abstract

When the novel coronavirus arrived in early 2020, very few people were prepared to react and contain the virus from spreading rapidly. This lack of preparation impacted the American economy, leading to mass unemployment and a significant number of businesses and households suffering financially as a result. A weak governmental response, combined with lockdowns that were not comprehensive enough and ended prematurely, helped compound issues that hurt America physically and economically. Through the commissioning of Middle Tennessee State University's Political Economic Research Institute, I look at metrics and statistics pertaining to the novel coronavirus and its impacts, to propose a unified federal action policy that keeps our nation as safe as possible, as prosperous as possible, and combats similar, society-destroying future crises as quickly as possible. The proposed federal plan responds quicker to the threat of incoming viral diseases, defines the essential businesses and sectors that would stay open during a six-week full shutdown period, and protects the most vulnerable citizens, while reopening the economy at the time when the American people can no longer afford to go without work.

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Introduction

When the novel coronavirus (COVID-19), a severe acute respiratory virus that was first noticed in Wuhan in central China, started making news around the world, most Americans underestimated the disease. Americans either refused to believe it would come across the Pacific or ignored the disease altogether. It was not until the middle of March 2020 that the United States took notice and understood the weight of what the virus was. Churches ceased to gather in person for multiple months, every competitive athletic league and musical tour came to a grinding halt, and large-scale social interaction ceased. Today, Americans are still reeling from all the effects, and a lot of nonessential workers, students, politicians, and those in the hospitals on ventilators have some of the same thoughts, "If only I knew."

The problem is, I knew it was coming. I had enrolled in a Business Intelligence class at Middle Tennessee State University where most lectures started with Dr. Scott Seipel sounding warning alarm. As early as February 2020, he quoted news that warned about the virus coming stateside, that said the effects would be disastrous, saying that it could shave 10% from our nation's GDP. However, very few people, myself included, prepared for this virus, and this lack of preparation forced state and federal leaders to make crucial life-saving and life-ending decisions to balance safety with prosperity in limited time.

This lack of knowledge concerning COVID-19 and large-scale epidemiology's relation to everyday life interested the Political Economic Research Institute (PERI). Members of PERI want to know how all levels of government could learn from this virus and be better prepared for similar future crises. As a result, this question comes to mind,

"what should be done or mandated to keep prosperity and economic health at a respectable level, and restore public health to a normal level, when people cannot gather and assemble safely?"

To answer that question, I will analyze the impact of COVID-19, using metrics, statistics, academic papers, and other sources- to create a unified, federal plan of action that keeps our nation as safe and as prosperous as possible. Leading up to the construction of this plan, I will look at the three major points of political action that dictated the economic effects of the coronavirus in America: decisiveness in initial action, steps taken to mitigate the virus, and economic assistance in the face of crisis.

The first section, "Decisiveness in Initial Action", will analyze governmental response to the coronavirus. This section will look at how the government responded when the virus was increasing on other continents and yet to make an impact in America, as well as the government's over-arching philosophy in mitigating the virus once it became clear that the virus was going to affect our nation significantly.

The second section, "How the Virus Was Handled," will analyze governmental techniques of handling the unknown nature of COVID-19. It will begin by outlining the importance of social distancing and the initially undetectable nature of the coronavirus. This section will then transition into articulating the importance of comprehensive lockdowns and detailing the problems with America's attempts at implementing lockdowns during COVID-19.

The third section, "Economics in Crisis," will examine the financial impacts of COVID-19. I will look at the financial state of Americans and how well off they would be in the instance of a long-term economic shutdown, like the one brought on by COVID-

19. I will continue this section by assessing the impact of COVID-19 on small, nonessential businesses. This section will detail the potential economic cost of a more effective stimulus given to people unable to work due to nonessential businesses closing, as well as the best way to help small businesses during similar future crises.

The fourth section, "The Proposal," will build on this information and outline a federal plan that would avoid repeating the same mistakes the federal government made in 2020 with COVID-19, in the case of a future pandemic, or situation that shuts down larger societal function.

Before I begin discussing the idea at hand, I want to discuss similar events that are not viral in nature where this research could be applicable. I came across a flurry of headlines in the spring of 2020 concerning a locust swarm that destroyed many crops in Africa, Asia, and the Middle East, and realized that it could be similar in nature to COVID-19. Both events created a huge obstacle to even getting out of your home. However, in the case of locusts, social distancing would not be needed, as locusts are not proven to kill humans on their own and I was unable to find proof that larger groups of people have significantly more danger of losing their lives. According to pest control company Orkin and their facts page on locusts, people with significant reactions to some allergens will have a harder time with the allergens that large locust swarms create (Orkin, 2018). This would affect a few people's health, but society would not need to stop; affected individuals would only need to wear more protective clothing. Similarly, businesses would not need to shut down or close. Businesses would have to be careful about their products, especially if the product is an article of clothing (risk of insect eggs

left behind) or portions of food. The economy is more affected by food and product supply than the actual insect population itself.

In October 2011, over fifty exotic animals were intentionally freed from the Muskingum County Zoo in Zanesville, Ohio, causing mass hysteria and forcing local police to quickly spot and kill most of the freed animals (Jarman et al., 2011). If something like the Zanesville incident happened on a much larger scale, then there would be some interesting dialogue about how much risk to take in reopening the economy (How many unaccounted animals would people be comfortable with?) when there are high risks of injury or death by mauling from an exotic animal. In this case, it is significantly easier to account for these exotic animals, unlike virus droplets which are undetectable to the naked eye.

Finally, the topic of weather came up, as the weather can make interhousehold interaction cease just like COVID-19. The Dust Bowl in the 1930's led to massive losses of life, destruction of crops, outside life being dangerous, and mass migration out of the Heartland. While the social distancing and revised economy would have different purposes than those of coronavirus times, this research could be generalizable to possible dust bowls, unhealthy and polluted episodes of fog, and in an apocalyptic event that tornadoes, earthquakes, and blizzards happen so often that lives are in great danger if they are not at home. However, there is no ability to control the negative effects of weather, so no amount of federal action could overcome any future trials the weather could bring.

Chapter 1: "Decisiveness in Initial Action"

The key components that we can look to change and impact as a political community—independent of any other sector—are the response, preparedness, and timeliness of government action in the event of a crisis like a pandemic.

The most common descriptor of 2020 and the wild events that came through as a result was "unprecedented." The last time an entire nation had to worry about a public health threat as deadly as COVID-19 was the Spanish Flu nearly a century earlier. The first news of COVID-19 came in early January 2020, with BBC News publishing their first article on this topic on the 3rd (BBC News, 2020). CNN published their first article on a "mysterious strain of pneumonia" from China on the 7th (Gan, 2020), while under one hundred cases were reported in Wuhan, the first city to experience an outbreak. At that time, the coronavirus had mostly been used as a joke in the western world, as the virus just happened to share the same name with the popular Mexican beer brand Corona and the idea of government-mandated shutdowns seemed foreign. The first known domestic case of COVID-19 was announced to the nation on January 21, 2020, as a resident living in Washington state had just returned from the Wuhan area (Center for Disease Control and Prevention, 2020a), and people's worries incrementally built up until mid-March, when schools closed, and President Donald Trump addressed the nation concerning European travel bans. In mid-March, a poll from the Kaiser Family Foundation showed that 63% of people were at least somewhat worried about a family member contracting COVID-19, and 53% of people were worried about a loss of hours worked due to a workplace closure or reduction in hours due to COVID-19 (Hamel et al., 2020).

During this time, plenty of private businesses were proactive in sending their employees to work from home. A lot of nonessential businesses were creative in switching their product offerings, like bars switching from becoming a hangout spot to burger joints, other restaurants fully switching to take-out and delivery operations, and companies changing their output to make important medical equipment, such as sporting apparel manufacturer Fanatics making masks (Associated Press, 2020), and car company Tesla making ventilators (Templeton, 2020). Plenty of private businesses did likewise and were great blessings in the effort to combat COVID-19.

Public response was nowhere near as diligent. The first step in response came from President Trump's administration on January 31, 2020, closing entry to America from China (Aubrey, 2020), which was enacted at a reasonably early time. A continental European travel ban was not issued until March 11, 2020 (Taylor, 2020a), which could have been enacted earlier to slow the spread of the virus, as international knowledge of the virus was spreading. Hundreds of new positive cases were announced in major European countries, and over 2,000 new cases were reported that day in Italy (Johns Hopkins University CSSE, 2020). The Center for Disease Control and Prevention (CDC), which is the federal health protection agency, listed 1,215 known cases of COVID-19 nationwide on March 11 (Center for Disease Control and Prevention, 2020b). The threat of COVID-19 was well-known at that time, and actions already could have been taken to mitigate the virus before it ever became an issue to people's livelihoods and lifestyles. Reports surfaced alleging that President Trump received briefings on the coronavirus in late January of 2020 (Dwyer & Rascoe, 2020). Even though representatives of the Director of National Intelligence denied the reports (Dwyer & Rascoe, 2020), it can still

be concluded that travel bans were not enough to slow down the virus's entry into our nation.

In theory, if everyone in this scenario had a chance at a mulligan on January 21st, the odds of being able to mitigate a disease like this before it became a problem are very low. The bulk of infections cause mild symptoms or are asymptomatic, making such an epidemic hard to eliminate, especially early on when testing technology is so imperfect. It is highly likely that even if all international travel was banned on January 31st, the infection still would have appeared in America at some point, due to compassionate exemptions in said travel bans that allowed American residents and their foreign immediate family members to return (Aubrey, 2020). This does not slight the fact that repatriation efforts from Europe could have come at an earlier time when case numbers in other countries were lower, reducing the risk of infection among repatriations.

Once the nation's objective switched from preventing the arrival of the virus to "flattening the curve," the federal government's actions did not do a lot of favors. The primary approach by the executive branch was to pass the onus of containment and regulation onto the states and their governments, with Washington D.C. serving as "backup," according to recollection of a conference call between President Trump and the state governors (Ronayne & Lemire, 2020). While that ideology is expected from a conservative executive branch and makes sense given the diversity between all fifty states, it made for a disunified containment plan. This decision led to many conflicts between different levels of government. Governors clashed with the President over containment strategies, as President Trump instructed Vice President Mike Pence not to call Democrat governors in Washington and Michigan who have been critical of Trump's

actions to combat the pandemic (Wilkie, 2020). Georgia governor Brian Kemp filed a lawsuit against the Democrat-heavy Atlanta City Council and mayor Keisha Lance Bottoms to fight enactment of a mask mandate, leading to nasty disputes before the lawsuit was eventually dropped (Cole, 2020). States had to bid against each other to secure ventilators and masks (PBS News, 2020). Public health experts differed greatly in opinion (Anthony Fauci and Robert Redfield on the extremely cautious side and Scott Atlas of the "herd immunity" belief), and people of one political party would argue and disagree with people of another political party. The most critical issue was the lack of a consensus opinion on how long shutdowns should last, and as a result, different states and regions trended in totally opposite directions at times, which will be explored in Chapter 2. These diverging case trends led to a drawn-out pandemic period, with a handful of states seeing random spikes in cases near October and December.

This issue was exacerbated by highly influential people in America saying snippets that flew in the face of conventional wisdom. In a press conference on March 24, 2020, President Trump said that he was hoping the economy would reopen by Easter Sunday, and that he was working hard "to make it a reality" (Taylor, 2020b). Easter was nineteen days away, and no conventional wisdom was ever going to justify a re-opening occurring in that time frame. Christian preacher John MacArthur—a well-known name in the Christian community, with over 200 thousand followers on Twitter, and the lead pastor of a large church in the Los Angeles metropolitan area—defied governmental orders to refrain from meeting in person and had over 7,000 congregants in church largely without masks (Cosgrove, 2020). Phrases such as "there is no pandemic" and "virus of deception" came from MacArthur's mouth during worship services in August of

2020, and as his church fought against shutdown orders from California, he received plenty of approval and support from many conservatives (Cosgrove, 2020).

Other countries dealt with the coronavirus in a more decisive way that resulted in fewer deaths per capita than in the United States. The island of Taiwan, with a population of twenty-three million people, had under fifteen deaths attributed to COVID. Taiwan closed borders early and used sim-tracking devices to make sure that people were following quarantine, all while requiring temperature checks and hand sanitizing before entering businesses (Johns Hopkins Bloomberg School of Medicine, 2020). Their Vice President, Chen Chien-jen, holds a doctorate from Johns Hopkins University in epidemiology and human genetics, which played a role in Taiwan's effective response to COVID-19 (Johns Hopkins Bloomberg School of Medicine, 2020). New Zealand saw similar success without tracking its citizens, as they quickly instituted a Level 4 lockdown, akin to an American "stay-at-home" order without any exemptions for churches (Bremmer, 2021). This lockdown was implemented within one month of its first known COVID case (Bremmer, 2021). Their government had uniform federal action, which included direct text messages to citizens that communicated with them consistently and powerfully (Bremmer, 2021).

The United States suffered dearly because of the pandemic, and the hands-off approach by the federal government which placed decisions in the hands of the states and counties, leading to chaos in our country due to differences in beliefs. While nothing can be done to force people away from less-polarizing influences, a set unified plan, such as the one I will propose, can keep the nation from going in multiple different directions in

trying to contain a future outbreak, and help restore society to normal in a quicker

fashion.

Chapter 2: "How the Virus Was Handled"

The most complex aspect of managing a virus like COVID-19 is determining what actions should be done to contain it once a dangerous outbreak is underway. Many levels of physical separation, movement restrictions, and quarantines are considered and implemented, hoping to decrease the presence of a virus. In this section, I will explain the importance and benefits of social distancing and comprehensive lockdowns, and how the United States' attempts at those measures were ineffective.

According to the CDC, social distancing, or physical distancing as it is also known, is defined as keeping space between oneself and people outside of their home. Tips given on how to practice social distancing include staying at least six feet away from other people, refusing to gather in groups, and staying away from crowded places (Centers for Disease Control and Prevention, 2020c).

Social distancing has been given a high level of importance, because one person that is infected can infect a lot of other people and exponentially spread the disease in that way. Many mathematicians and scientists have tried to quantify just how infectious a disease is through calculations of a basic reproduction number. The basic reproduction number, known as R_0, is a value that denotes the expected number of cases of a virus caused by one infected person. Initial calculations made with December 2019 to January 2020 data by Julien Riou and Christian Althaus at the University of Bern in Switzerland estimated that the R_0 of COVID-19 in China was around 2.2, with a 90% high density interval between 1.4 and 3.8 (2020, pp. 1-5). That estimate seems believable, and very much in line with estimates for other pandemics that have occurred, according to BMC Medicine, which has the R_0 at 1.5 for the H1N1 swine flu pandemic of 2009 and at

approximately 2 for the Spanish Flu pandemic in 1918 (Coburn et al., 2009, pp. 1-8),

which also falls in line near the calculations of R_0 for seasonal strains of influenza which

has a mean number of around 1.3 (Coburn et al., 2009, pp. 1-8). However, more

calculations from a group of Los Alamos National Laboratory researchers calculated the

median R_0 in Wuhan to be around 5.7, which makes spread a lot more rapid, with a 95%

likelihood that the empirically true R_0 was in between 3.8-8.9 (Sanche et al., 2020, p.

1475). This means that if every person transmits the infection at the median rate (1 person

infecting 5.7 people, each of the 5.7 people infecting 5.7 additional people), one case of

COVID-19 can turn into 1,055 infections (this could even increase to 6,270 cases with

the high R_0 of 8.9) in less than a month, compared to one infection of seasonal influenza

($R_0 = 1.3$) turning into three cases in the same amount of time. Once this information

began to surface, people realized that this virus was going to require more strict action to

contain it.

       If coronavirus testing was more reliable and if symptoms were apparent, social

distancing would be unnecessary, because the uncertainty about people wondering

whether they have the disease would be lessened, and there would be little concern about

hangouts and large events passing a virus around. However, people cannot tell right away

when they are infected and the reliability of tests and detecting symptoms is not perfect.

General medical opinion says that symptoms usually appear five to six days after

exposure but can take as long as two weeks to become noticeable (Marshall, 2021). The

World Health Organization reported in March of 2020 that around 80% of COVID-19

cases are mild or asymptomatic (World Health Organization, 2020). The Harvard Health

Publishing website says that there is a 40% percent chance that a nasal/throat swab or

saliva test, which are the common methods used in COVID-19 tests, will result in a negative test result when the person is legitimately infected (Harvard Health Publishing, 2020). Due to the imperfect nature of tracking the virus, social distancing is used to mitigate the spread more than anything.

  The logical course of action in the face of a dangerous epidemic or pandemic is to freeze all possible outlets of transmission for a limited period until cases hit a low number, and then life would go on. It seems easy to pause social activity, and force everything to stop for two weeks before resuming normal life, but that is not sufficient to successfully maneuver a pandemic. The main issue comes with an increase in social activity after a short lockdown period. It is not reasonable to expect scientists and medical experts to have technology developed that is highly accurate and timely in reporting infections and antibodies, or to have developed immunizations to the public in a span of two weeks. As a result, people will still leave their residences and traverse about their life whenever restrictions are lifted. Because technology at this time would not tell a person that they have just been exposed or infected, there will be an increase of people that get infected without knowing, and still be emotionally healthy and feel physically safe, unknowingly passing the virus on to people they encounter. This would happen more often with people constantly moving and interacting, which leads to an increase in daily cases reported. There is no indication that mitigation and the end of the pandemic would happen through only social distancing and wearing masks. This comes after influential people, including CDC director Robert Redfield, said that COVID could be ended in four to six weeks if Americans consistently wore masks (Fernandez, 2020). As a

result, comprehensive lockdowns or policies that restrict movement are necessary for dangerous viral situations such as COVID-19.

When American states began instituting lockdowns in the spring of 2020, there seemed to be a mass hysteria around going into an unprecedented time—a time where interpersonal interaction had been forced to stop due to government orders for the very first time. However, due to a lot of people working in professions labeled as "essential," lockdowns were not very effective. In a case for making lockdowns more comprehensive, Dr. Michael Osterholm of the Center for Infectious Disease Research and Policy at the University of Minnesota noted that his own state deemed 78% of its own workers to be essential, therefore really minimizing the level of impact a lockdown would have had at all (Osterholm & Kashkari, 2020). This figure of 78% was double the percentage of workers that were considered to work in essential industries according to the Economic Policy Institute (McNicholas & Poydock, 2020). The Bureau of Labor Statistics calculated the national rate of essential workers to be 45%, with a significant number of states placing essential worker rates between 43% and 52%, and no state had a rate above 57% (Fish, 2020). Minnesota is not known for having a government that is at the forefront of anti-mask rhetoric, or for being outspoken about lifting restrictions like the South is, or for having a job market so different that it could reasonably justify the 78% figure quoted by Osterholm, so it could be reasonable to assume that other states have very similar laws that kept too many people working their nonessential jobs at a workplace.

When Tennessee, Georgia, and other states did not reapply stay-at-home orders in the beginning of May 2020 during the COVID-19 pandemic and started gradually

reopening, early sentiment in a post-peak society was positive, as cases were slowly

decreasing. Tennessee governor Bill Lee emphasized in an April 20th press conference

that he was not extending the stay-at-home order from April 3rd because "for the good of

the state …. our economic shutdown cannot [continue]" (Allison, 2020). The initial stay-

at-home orders and lockdowns led to decreased case numbers, but the Institute of Health

Metrics and Evaluation projected that Tennessee should not consider relaxing movement

restrictions and social distancing recommendations until May 20th (2020), and projected

that very few states would be wise to open when Tennessee did. Georgia had a similar

date of June 22nd but planned to open on May 1st, with other states similarly following

suit (Huth & Wu, 2020). People who were no longer under movement restrictions began

to assume that the worst of the virus had passed. However, many large cities in the

Southeast either reversed course on opening the economy or mandated stricter

enforcements, due to a resurgence in cases in the summer of 2020, after reopening much

sooner than expert models suggested. The city of Nashville went from phase three back

to phase two in early July of 2020, reducing capacity of restaurants from 75% down to

half capacity, with the mayor mandating masks with enforcement of Class C

misdemeanors for violators of the mask mandate, and remained at Phase 2 until

November 2, 2020 (Baird, 2020). Several states and large metropolitan cities followed

suit nationwide in backpedaling from the progress made toward fully reopening

(Mervosh, 2020).

  The large number of states that reopened early had spikes in cases that

endangered social events, school years, and other important events, while places that

seemingly went to a larger extent in freezing social activity and closing businesses, such

as the New York City tri-state area—including New Jersey and Connecticut—and Illinois, which fully reopened their economy much later than every other state, all showed little to no increases in daily new cases.

New York State had a seven-day average of new cases of approximately 4,500 on May 2nd, New Jersey had a seven-day average of 2,600, while Connecticut averaged 672 new cases per day and Illinois reported 2,390 in that time span. On July 2nd, those averages were down to 639, 309, 93, and 782, respectively. Conversely Tennessee's average rose from 494 to 1,212, Texas's numbers ballooned from 991 to 6,497, and Arizona experienced an increase from 302 to 3,457. Most states had similar increases in new cases, almost fifteen weeks after the virus was initially noticed and society stopped. Among European countries, Italy seemingly neared the end of their coronavirus battles in the summertime after having much more strict lockdown policies near the start, as Italy went from May 29th to August 7th with less than 500 new cases per day. American retroactive COVID-19 numbers in this paragraph came from the New York Times, with European numbers in this paragraph coming courtesy of Johns Hopkins University (New York Times, 2021; Johns Hopkins University CSSE, 2021). All signs point to the idea that lockdowns were lifted too soon when active cases were still present at an unsafe level.

Many will wonder whether lockdowns are effective enough and would argue for outright herd immunity, but research proves that lockdowns helped reduce the number of confirmed COVID cases (Courtemanche et al., 2020; Alwan et al., 2020, pp. e71-e72; Gatto et al., 2020, pp. 10484-10491). Had COVID-19 not become an issue that affected the entire nation, Americans would not have seen every major metropolitan area cease

life as they know it for multiple months. There is a different dynamic about viral spread in rural areas compared to the much larger metropolitan areas, but mask mandates and stay-at-home orders were not as common in those areas to begin with, and life went on at a relatively normal level whenever the state governments in larger metros did not interfere as much with life in sparsely-populated areas.

If I were to poll Americans in larger cities, asking if they would want to lose out on some conveniences, and possibly lose three/four weeks of pay, or something to that effect, to stop a strain of a potentially deadly virus that causes economic harm to those who are affected by it, most people would say yes. A May 2020 survey in the CDC's Morbidity and Mortality Weekly Report that explored public opinions in New York City and Los Angeles gave answers that while not exactly endorsing that sentiment, was very close (Czeisler et al., 2020, pp. 753-758). Eighty percent of respondents in both New York and Los Angeles supported stay-at-home orders and nonessential business closures (Czeisler et al., 2020, pp. 753-758). Out of 439 nonessential workers, 80.9% supported stay-at-home orders and nonessential business closures (Czeisler et al., 2020, p. 756).

Economically, there was reason to wonder whether taking harder steps to mitigate the virus was worth it. Multiple studies on the long-term economic effects of COVID-19 showed losses in the trillions. Researchers at The University of Southern California stated that the American GDP could have a net loss approaching the five trillion dollar mark over the next two years (Gersema, 2020), while a Harvard study from their economics department estimated that the economic cost of COVID-19 in lost GDP approached eight trillion dollars (Cutler & Summers, 2020). These dollar amounts lost due to an extended

pandemic are massive, and quicker mitigation of a virus would help minimize economic loss.

COVID is also costly and damaging when looking at the value of human life. Chris Conover of The Apothecary dove in-depth on how economists calculated the costs and benefits of COVID and its lockdowns, using Value of a Statistical Life and Quality of Life Years (QALY) statistics to calculate the cost and value of a life due to COVID (2020). His estimates varied due to different QALY methods that factored in depreciation of value due to life expectancy and old age, and a willingness to accept compromising situations based on age (Conover, 2020). Conover's final dollar amounts for the value of averting one COVID-19 death ranged from $600,000 to $1.2 million, using his QALY calculations (2020). Other economists who Conover holds in high regard have been quoted in his article as valuing a life at over $5 million even when factoring in old age (Aldy & Viscusi, 2007, p.252; Stevenson, 2020). Conover's estimates are very conservative compared to the figures from Joseph Aldy and Kip Viscusi, Bethany Stevenson, or a $10 million figure proposed by Alex Nowrasteh of Cato Institute (2020). The value of a life is high, and mitigating viral spread is crucial to avoid costly measures to save a life, or to avoid the economic downfall created by a lost life.

Alex Nowrasteh raised some interesting ways to regulate actions in a less-costly way while protecting freedoms and conveniences, such as a Pigovian tax on actions that spread COVID-19 and Coasean bargains like assigning liability, including from COVID-19, to private entities (2020). However, as Nowrasteh noted, the imperfect information of a viral disease is difficult to overcome (2020). This means that until safety can be

properly ensured for a viral outbreak like COVID, lockdowns are the best course of action.

While the lockdowns that were carried out in the United States did not do enough to combat the pandemic, there were other countries that went to extreme lengths that the American public would presumably not approve of. In Italy, an early epicenter of the coronavirus pandemic, laws were passed in March 2020 that could punish people who tested positive with a minimum of one year in prison if they intentionally leave home after testing positive for COVID and fining people up to three thousand euros for quarantine violations (Messia, 2020). Some cities in Colombia are regulating movement outside the house based on national ID number, and Panama restricted movement based on gender (BBC News, 2020b). India went to extreme levels of restrictions, banning places of worship and all interstate movement as well as all nonessential movement (New Indian Express, 2020). The American people would not want an overly long lockdown period and would not agree to banning houses of worship for an extended period either. In late April, only twenty-two states had limited their worship gatherings to the CDC guideline of ten people or less, while fifteen states allowed religious gatherings without a limit on congregation size, according to Virginia Villa from Pew Research (2020). A poll from American website The Hill showed that 74% of American voters were concerned that they would lose their freedoms, with only 48% worried about losing a job (Schulte, 2020). Protests at governmental buildings spotlighted public disapproval of lockdowns, such as the protests in Michigan's state capitol building (Beckett, 2020). It is abundantly clear that following in India's and Colombia's footsteps would not be tolerated well at all.

An absence of lockdowns leads to more activity, leading to more infections and deaths. Lockdowns that are ineffective cause problems and lead to the scenario in the previous sentence whenever a virus has not been properly contained, leading to a crisis that hurts businesses and people alike. Even then, unless testing is mostly accurate and can show infection from the earliest moment of infection, the lockdown method must hold up, at least until adequate technology is available. If the United States wanted to make a united effort that would be effective in truly removing a virus from public worry for good so that life could continue as normal, lockdowns and social distancing must be mandated until it is sure that the virus is at a low and controllable level. Governments cannot reopen the economy during a future pandemic while there are still a substantial number of cases and spread occurring and expect things to return to a semblance of normalcy based on hope and wishful thinking. As a result, the aim of this thesis will be to properly formulate a uniform lockdown procedure that would ideally work in ending the nightmare of a pandemic that keeps society from interacting at a normal level.

Chapter 3: "Economics in Crisis"

COVID-19 impacted the financial state of a lot of Americans and had people wondering how the economy would be affected in the long term. In my quest to make a better government action plan, it is imperative to look at the finances of our citizens and take economic health into account when making critical decisions on comprehensive lockdowns and social distancing.

The median American household has $5,300 in emergency funds and savings lined up, according to LendingTree (Perez, 2021). However, a lot of Americans have significantly less money available for emergencies, as a survey in the Chicago Tribune found that 38% of adults have less than $1,000 to cover expenses when they are unable to work (Huddleston, 2018), which is not enough to cover mortgages and health emergencies that could appear during a global pandemic. The survey said that about 27% of respondents have more than $10,000 available in the case of an emergency (Huddleston, 2018), which could have kept a family afloat during the COVID-19 lockdown period. However, in addition to the 38% that have only three digits worth of emergency funds, the 35% that have between $1,000 and $10,000 would not have enough money in the case that their job is terminated after an epidemic.

To solve the issue of American citizens being unable to pay expenses or live within their means during COVID-19, the American government handed out the first of three stimulus payments, which gave $1,200 to American adults and an extra $500 for each child in the family, with that figure decreasing fifty dollars for every one thousand dollars that a single taxpayer made over $75,000, a head of household made over $112,500, or a married couple made over $150,000 (Watson et al., 2020). The first

stimulus payment was expected to be the only handout given during the COVID-19 pandemic, until the extended length of the pandemic triggered the second and third payments near the 2020 holiday season. While 80% of adults in a Bankrate survey said that their stimulus check was at least somewhat critical to them making it through the pandemic, 31% of respondents said that they expected the stimulus check to sustain them for less than a month, and 64% of respondents believed that the check would sustain them for less than three months (Foster, 2020).

To compute the maximum length of time I would be comfortable with the economy completely stopping, I will use median family size and median family budget statistics to calculate a median family's bank account balance. For the standard median family, the average household size is 2.6 (ESRI, 2020), so I will assume that the average family is made up of two adults and one child, since most American families have children, and a supermajority of adults end up married or partnered at some point (Wang & Parker, 2014; Vanorman & Jacobsen, 2020). I will assume that this perfectly median family has $5,300 in their savings account and received a $2,900 stimulus check (the checks gave $1,200 per adult and $500 per child, not per household), meaning this family has $8,200 to survive from once they hypothetically were furloughed at the beginning of the pandemic. Once housing, transportation, taxes, utilities, food, insurance payments, debt payments/saving deposits, and health care costs are compiled, all essential expenses for an average household add up to just short of fifty-five thousand dollars spent a year, or $4,549.75 monthly (Price, 2020). In pandemic times, transportation costs would drop significantly from $750 a month, to around $500, assuming that only payments on car ownership and car insurance are made, with very little gasoline purchases (Price, 2020).

Deducting that from the monthly total, the average monthly epidemic budget would come out to $4,300, or approximately $139 a day. If no other random lurking expenses or non-linear spending patterns appear, the $8,200 would last the median household a total of 1.97 months, which is approximately eight weeks. Eight weeks comes from the median savings figure at a median budget, at which approximately 50% of middle-income families would deplete the resources in their savings accounts should they lose their source of income, which is not the failure rate economists strive for. If most savings accounts' balances fall near the median, I will cut the $5,300 in half, to make a new figure of $2,650. If I take that $2,650 figure and add the default family stimulus check, I can estimate that significantly more medium-income families with median-expense budgets have at least $5,550 dollars, which would last approximately forty days on a median budget. Similar calculations for people in the 20th to 40th percentile would give the same result as well. Median savings account balances of that percentile are listed at $2,100 (Perez, 2021), and the earnings breakpoint at the 30th percentile of American households is $34,460 (PK, 2020). Assuming that the family was living within their means before the pandemic, this family had monthly expenses lower than $2,872. Adding stimulus payments, families at the median savings amount would last fifty-two days, while families at half the median savings rate would last around forty-three days, once again landing near the five to six week range. Since wealthier families have exponentially more money saved up (Perez, 2020), a shutdown of five to six weeks would be easy for those families to overcome. A shutdown of six weeks would be the maximum optimal length for nonessential businesses of a city to be shut down for the safety of citizens, so

that a super-majority of Americans would still survive without the need for extra

unemployment or welfare benefits.

When I look at how the poorest households in our nation would end up in the case

of a five to six week shutdown, it is reasonable to expect that those who make less money

are unable to accumulate a significant amount of savings. A higher proportion of adults

who earn a lower income work in tourism, restaurants, and entertainment industries

among other similar industries that thrive from bringing in people physically, which

would leave a larger number of lower-income families with no income during a

pandemic, and no extra cushion or reserve finances to depend on (Fairlie, 2020).

The effects of COVID-19 and its subsequent shutdowns on people worldwide

under the poverty line were devastating. The World Bank claimed in October 2020 that

88 to 115 million people were estimated to move into extreme poverty worldwide (The

World Bank, 2020), and the United Nations, among other organizations, sounded

warnings about how COVID-19 affected the poor disproportionately (UNICEF, 2020).

Zachary Parolin from Columbia University's Center on Poverty & Social Policy noted

that the child poverty rate increased from 18.7% before the crisis to 21.4% in August

2020, as unemployment rates already were relatively high among parents with children,

especially single parents, due to expensive childcare costs (Boghani, 2020). COVID-19

forced businesses to take away jobs or place people on furlough, putting more children

out of school buildings and into poverty, with children and families who already were

poor continuing to suffer from economic shutdowns caused by the virus and shutdowns.

In the case of a pandemic or serious economic recession, the bottom quintile of

households in yearly salary would be in rough shape, much more than middle-class and wealthy households.

There are professions and businesses that will suffer during a pandemic, no matter how much preparation is done beforehand. Certain professions operate under a standard of efficiency where profits are made only by having as many people in one place as possible. Most health and basic supply corporations and businesses would be in good shape and still have a demand, if not a heightened demand. However, entertainment services and other social services will always face uncertainty when people cannot be social and convene in large numbers. Most churches eschewed in-person services for online services or no services at all during the initial lockdown (O'Connor, 2020), with some churches opting not to reconvene in-person even when stay-at-home laws were lifted. Each of the five major sports leagues in North America (National Basketball Association, National Football League, National Hockey League, Major League Baseball, and Major League Soccer) paused operations and each resumed to play without the presence of fans. A grand majority of concerts and artist tours were also canceled or postponed, and as of the time of defense, most music festivals will skip their intended 2021 dates as well. Commercial airliners sustained large losses with stay-at-home laws going into effect and businesses doing more meetings over the internet and on video rather than in person. The International Air Transport Association announced in an April 2020 press release that airline passenger revenues would drop by 55% compared to 2019 (IATA, 2020).

Major corporations and entertainment entities were greatly impacted by this pandemic, as revenues decreased, and activity stopped. Those sporting leagues,

megachurches, and other tourist attractions are entities that have relative security in a pandemic. Sporting leagues have major TV deals, and the five major sports leagues and NASCAR and UFC among others are events that will survive, as they have large passionate fan bases that span over entire metropolitan areas and states. Large churches that likely would not be able to meet during epidemics have large crowd bases that tithe and help fund the church's philanthropic efforts and basic costs, keeping them in mostly good health during times of crisis. Airliners are currently the most economic and time-efficient way to travel long distances, and tourist destinations will return as people slowly make their way outside of their homes. Most of these larger corporations will be fine in the long-term.

How should the federal government look at other smaller, nonessential businesses like nail and hair salons, spas, music businesses, and hotels that are operated by smaller families, places that have less publicity than the sports and corporate attractions, and do right by them during a future pandemic? These are the businesses that struggle the most, as new small businesses are not expected to see profits until year two or three, and smaller businesses have less of a known brand and do not market to multiple counties or cities like regional or national chains. The industries that were hit the hardest included restaurants, hotels, transportation, and construction (Fairlie, 2020), all of which are largely operated by minorities or families who are not as inherently wealthy, especially as every individual location typically is under the care of one person or family, who bears the primary responsibility for managing expenses and staff rosters for their own location. An analysis by Robert Fairlie from the University of California at Santa Cruz, delivered grim numbers on the massive impact COVID-19 had on small businesses. His dissection

of statistics from the Current Population Survey (CPS) showed that the number of business owners in the United States dropped by over three million from February to April 2020, a sharp 22% decline. This elimination was more impactful for minority demographics, as those two months resulted in the elimination of 41% of African-American business owners, 32% of Latinx business owners, and 36% of immigrant business owners (Fairlie, 2020). He worried that shutdowns caused by COVID-19 would be "problematic for broader racial inequality" due to the necessity of minority-owned businesses for economic advancement and for creating jobs at the local level (Fairlie, 2020). These numbers are hard to tolerate especially when reports surface that the Los Angeles Lakers and Ruth's Chris Steak House received approval for funds from the government program designed to help small businesses during the pandemic, the Paycheck Protection Program (PPP), even though both businesses returned the large loans that they received (Arnovitz, 2020; Hansen, 2020). Inefficiencies in the PPP had many businesses hoping on a wing and a prayer that they would survive the pandemic.

Three weeks after COVID-19 triggered shutdowns in America, a survey by professors from Harvard University and the University of Illinois was administered to around 5,000 small businesses in America (Bartik et al., 2020, pp. 17656-17666). Approximately 45% of these small businesses were closed at the time of that survey (2020), mostly temporarily at this early time, with the proportion of closed businesses being much higher for businesses with less than five employees (46%) and those between five and nine employees (47%), compared to those who employed between twenty and ninety-nine people (36%) and those between 100 and 499 workers (26%). In the moment, many of those small business owners were much less optimistic about a pandemic-

impacted economy, as less than half of the business owners believed that they could

withstand four months (47%) to half a year (39%) of this crisis, and around 28% of

businesses surveyed expected to close within the next month (Bartik et al., 2020, pp.

17656-17666). Seeing numerous small nonessential businesses close or lose money was a

byproduct of necessary lockdowns. In future crises and societal shutdowns, I would look

to devote more aid and resources towards decreasing closures of small businesses and

save jobs in those businesses.

While the stimulus given to every American was a nice solution that led to people

avoiding poverty (Boghani, 2020; Foster, 2020), a decent portion of that money turned

into extra money in savings, and a more comfortable lifestyle for those whose workplaces

are essential, and whose livelihoods were never in danger (Rachidi, 2020).

Approximately 45% of married households making over $100,000 dollars mostly spent

their economic impact payments in transactions that were not expenses (Rachidi, 2020).

My policy suggestion would make a more efficient use of stimulus funds by only

distributing them to nonessential employees who are unable to work during a future

crisis.

Here is the estimated calculation of the cost of the relief payments to nonessential

employees from my plan. I will assume the 55% likelihood that an employee is not

essential (Fish, 2020) and assume a workforce population from before COVID-19. In

their last monthly employment release before the pandemic, the U.S. Bureau of Labor

Statistics reported the unemployment rate at 3.5%, with the number of unemployed

people at 5.8 million (U.S. Bureau of Labor Statistics, 2020). This assumes that the

96.5% in the workforce that are employed amounts to 159.9 million employed citizens,

87.95 million of which are considered nonessential. Knowing that the birth rate is generally higher for lower-income people, I will assume that around 65% of the children population, which as of the 2010 Census, was 72.3 million people (Howden & Meyer, 2011), would be eligible as dependents of nonessential workers. For this plan, every adult will receive $1,400 in payment, which is equal to the dollar amount given by the third stimulus check, while also receiving $700 for every child, which is close to the amount given per child in the first two stimulus checks (Peter G. Peterson Foundation, 2021). Adding the adult population of nonessential workers (87.95 million) and the population of their dependents (47.00 million), I would see approximately 135 million people served by economic impact payments totaling $156 billion. This figure is a high number, as some nonessential workers would be able to work and keep their livelihoods from home during a hypothetical lockdown and does not account for the subtractions made for the higher end of nonessential workers. Although delivery costs and similar small costs would raise the final dollar figure, this cost would be significantly less than the first round of stimulus checks, which ended up giving 162 million payments totaling $271 billion, and less than the other two rounds of checks as well (Peter G. Peterson Foundation, 2021).

I went over the sharp decline in small businesses, especially those owned by lower-income families (Fairlie, 2020), and would plan for a relief payment to businesses to prevent significant closures and losses during a future pandemic. The payrolls of small businesses usually amount for 25-50% of a monthly budget (Kriss, 2020). Using a reasonable halfway mark, I can assume that a median percentage of a small business budget hangs around 38%. This means that the ratio of other expenses to payroll will be

calculated at around 1.63 to 1. In order to calculate expected interest in my small business

relief program, I will use data from the CARES Paycheck Protection Program (PPP). The

CARES PPP was distributed to small businesses as loans to incentivize keeping

employees on payroll during the pandemic for a maximum of 2.5 months. According to

Alexander Bartik of the University of Illinois, around 72% of small businesses surveyed

indicated that they would accept the loan if available (Bartik et al., 2020). After

extrapolating the 72% proportion to every small business in America, he assumed that the

total figure of all the hypothetical loans would be around $410 billion dollars (Bartik et

al., 2020). Multiplying that dollar amount by 1.63 to switch from payroll to non-payroll

expenses and later dividing by 1.66 to transform the dollar figure from 2.5 months' worth

of expenses to 1.5 months' worth for our simulated six week shutdown, I end up at

approximately $402.6 billion as an initial total cost. This number could rise if there are

more businesses with only 25% of their budget devoted to payroll and could fall if more

businesses are near the 50% mark with their payroll. With businesses no longer needing

to keep a payroll during this shutdown period due to the previous nonessential employee

stimulus, businesses are worried about paying less money every month, which would

lessen the amount of money needed in one of these relief grants.

 It is understood that the financial state of citizens nationwide would only allow

for a very limited government shutdown or break from work, due to the amount of

savings by the average American household. The previous year also saw nonessential

small businesses be greatly affected by the COVID-19 pandemic to a disproportionate

effect. To prevent people from sliding into poverty and businesses from closing, I am

proposing a stimulus like what was given during the COVID-19 pandemic, but only to

nonessential employees whose income would be impacted, and a relief grant to

businesses who need assistance keeping up with other expenses during the six weeks of

shutdown. I expect this proposed relief payment to nonessential employees and proposed

grant for small businesses to be a more efficient use of funds and possibly even less

expensive than the stimulus checks that were distributed during COVID-19. In the face of

a societal shutdown, this plan would hopefully succeed in keeping businesses and people

prosperous in the event of a horrible catastrophe.

Chapter 4: "The Proposal"

Whenever there is a deadly, fast-spreading virus, worse than seasonal influenza, with lockdown measures taken or a state of emergency declared in another country:

Close outbound travel to said country and only allow inbound travel from country for the sole purpose of returning to residence, with a mandated quarantine for a period to ensure lack of infection upon arrival or a quarantine until multiple sources confirm an absence of infection.

Any non-American citizen who is confirmed to have been in said country recently, looking to enter from a non-affected country, will be denied entry.

Demand similar quarantines and tests from other international arrivals.

Whenever a deadly, fast-spreading virus is expanding in the United States and proves to be at risk of spreading past more than one region/metropolitan area, and is at legitimate risk of spreading to a metropolitan/micropolitan/rural area, there should be warning steps taken in the area, including but not limited to:

Mandating the use of face coverings or other personal protective equipment (PPE).

Adjusting business operations to prepare to work from home if possible.

Recommending that certain businesses prepare to make PPE if possible.

Whenever a virus has significant inter-metropolitan/inter-regional spread, but is not deadly to the average healthy American, and found out that the rate of transmission either:

exceeds 1.5, with over 10 new cases per 100,000 people in a metropolitan area or rural region during a span of 14 days.

-or-

exceeds 2.0, with over 75 active cases in a metropolitan area.

-or-

exceeds 1.5, and causes any location to have hospitals and medical networks that are overtaxed and unable to provide their normal quality of emergency care,

the following will occur:

1. Mandatory lockdown for all non-essential services for 5-6 weeks, or until transmission rate/cases per capita numbers are deemed okay (whichever comes first), which are the common consensus of less than 10 new cases per 100,000 people, and a R_0 less than 1.0. The following industries will remain open as "essential" industries:

   - Emergency services.

   - Government offices and other similar community-based services.

   - Transportation, stocking, and other delivery services that are vital to maintaining a proper supply flow.

   - Food and agriculture production services. Restaurants, bars, and grocery stores can stay open for takeout and delivery services only.

   - Health care services (Non-life-threatening procedures and appointments unrelated to the virus are to continue remaining open)

   - Manufacturing services that make products for other essential services.

- Energy, chemical, trash, and water production/management services.

- Communications, and essential in-home product services.

- Religious services provided at a much smaller capacity or in a safer configuration.

- Parks, playgrounds, and other public recreation facilities, provided in a safe, socially distant manner, and consistently disinfected.

- Mental health services, including addiction centers, therapy/counseling centers, suicide help locations, and other mental health crisis management services that do not involve 911.

- Other large outdoor events that are properly monitored and cleared by local municipal authorities first.

- Any business not considered "essential" must operate from home and deliver services over Internet communications or through shipping carriers, if possible.

- A safe distance of six feet must kept between people in different households while in public.

2.   The Defense Production Act will be invoked in said regions and metro areas, increasing the production of materials that combat the outbreak.

3.   All commercial flights with passengers in said shutdown region must cease. Inbound flights can continue with passengers, but airlines will be advised to dramatically reduce booking. Should the flight happen between two locations under this shutdown, passengers can fly only if they are proven to not have the virus and for the sole purposes

of returning to a residence or for dire emergencies. Same principles apply for boat and bus travel.

4.   A relief payment of $1,400 per adult and $700 per child will be given to households who are receiving significantly less income (85% or less of pre-pandemic earnings) due to nonessential business closures. Single taxpayers earning up to $75,000, single parents earning up to $112,500, and married couples earning up to $150,000 will receive full payments. The payments will then decrease by $100 for every additional $1,000 earned. Temporarily inactive small businesses that are deemed nonessential may also apply for a relief payment to pay rent and utilities necessary to stay open during this lockdown. Other outstanding loans for businesses will be suspended as well. Other emergency funds or grants can be approved on a case-by-case basis.

5.   Continued caution (soft open) advised for 3 weeks afterwards: open businesses but operate with lower capacities, and more space for distancing.

6.   Full open afterwards but continue recommending contact tracing and promote and highly encourage proper symptom and virus reporting.

7.   When technology improves to where infection can be very quickly and almost perfectly detected, this ends this full-scale lockdown stage immediately.

        After everything is declared "fully open":

8.   Continue a high-risk and vulnerable quarantine (not mandated, but extremely recommended), possibly subsidize/additional stimulus for those that are high risk for the length of a pandemic crisis. It is highly encouraged to allow for a way for them to receive

some of the mental health benefit industries by having a high-risk only time at parks, churches, etc.

9.   Continued nursing home and hospital employee soft quarantine should there still be a state of emergency, keep visitation hours at a minimum, and highly increase COVID antibody testing.

10.   Should this virus prove to be much more fatal, the time in quarantine and lockdown can be increased.

11.   State governments are expected to enforce these laws by imposing fines, taxes and/or community service punishments, along with a creative reward system for people who do follow them.

The case load per capita required to trigger a shutdown is listed as 10 or more new cases per 100,000 people over a period of 14 days, as any proportion under the 10 per 100,000 rate is considered low incidence for COVID-19 by the CDC (Spiro & Gee, 2020). That threshold is subject to change for future viral outbreaks, but for now we will stick with the COVID-19 low incidence threshold. I chose the baseline transmission rate of $R_0 = 1.5$ as a threshold based on a similar transmission rate for seasonal influenza, $R_0 = 1.3$ (Coburn et al., 2009, pp. 1-8). This empirical transmission rate will be the difference between treating an outbreak like every other influenza and devoting extra attention to mitigating a future problem. If a future virus has a higher transmission rate, with a $R_0 > 2$ like COVID-19 and the Spanish Flu (Riou & Althaus, 2020, pp. 1-5; Coburn et al., 2009,

pp. 1-8), then I recommend early, proactive action, with an arbitrary active case number of seventy-five. Seventy-five cases would not be enough to rise above low incidence in metro areas over 750,000 people, but if each infected person infects two other people on average, the exponential spread will quickly increase case numbers and push it above the low incidence range. We would need 100 active cases in the past two weeks for a metropolitan area with a population of one million, 200 active cases in a metropolitan area of two million, etc. to move out of low incidence. Metropolitan areas would be the Metropolitan Statistical Areas (MSA) defined by the U.S. Office of Management and Budget, while rural regions in this scenario would be decided by the states as groupings of certain counties. The rates of transmission numbers will initially be computed from previous locations that are dealing with the virus in question and/or going from a consensus of scientific opinion, before transitioning to active calculations of transmission rates for metropolitan areas, and current ongoing calculations of transmission rates for rural areas.

The first point in this proposal is a very simple list of all the defined essential service industries. This list comes straight from the Economic Policy Institute list of essential services (McNicholas & Poydock, 2020). However, I have added some special exceptions that add in some professions that help the morale, mental state, and physical health of the people, after concerns and instances of COVID-19 leading to delayed cancer detections, suicides, and overdoses from substances due to no physical location of help, obesity rising due to large amounts of inactivity (Duncan, 2020; Meyer, 2020; Center for Disease Control and Prevention, 2020d). Dr. Jay Bhattacharya of Stanford University Medical School, Dr. Sunetra Gupta of Oxford University, and Dr. Martin Kulldorff of

Harvard University recommended that safety measures only be applied to those who are vulnerable to stop preventable deaths and problems from those issues in the Great Barrington Declaration (2020). The three doctors also suggested that life should go on as normal otherwise (Bhattacharya et al., 2020).

The Defense Protection Act would be invoked to increase the supply of masks, sanitation, and other products necessary to combat a viral outbreak. The third point concerning flights is self-explanatory, and repatriating efforts are allowed to avoid drama and concern that comes with being stranded abroad.

A relief payment for our nonessential employees will help sustain them during the lockdown period and the small business relief payment is a viable option to avoid massive loss of small businesses. The payment given to adults and the upper limit for receiving full payments come from the third round of stimulus checks administered in March 2021, with the money given per child cut in half to better match previous stimulus plans. The scale down is also steeper than previous stimulus payments to devote more money towards small businesses. The 85% stipulation is derived from a traditional workweek being five to six days. If an employee loses income at a larger rate than one workday per week, then they would be eligible (four days worked during shutdown divided by five days worked pre-pandemic = 80%, 5/6 = 83.3%, proportions for less days of the week would be smaller than the 85% figure), and since the percentage is based off of income, this covers people whose hours were significantly decreased during the shutdown. The people already unemployed are encouraged to file for unemployment, as if there was not a crisis. A soft open is prescribed to encourage proper pandemic-mitigating habits after the lockdown, then a full open is expected afterwards. A full open

does sound very unsafe but points 8 and 9 are listed to avoid situations that have a high likelihood of causing deaths.

In the very worst case scenario, after the nine weeks of restrictions, technology and knowledge has advanced, people are a lot more aware and proactive in avoiding compromising situations, and the highest-risk people are in the safest shape, where fatalities are very low, and infections that continue among the normal population are non-fatal and easily treatable. If American society ever gets to this point, the solution to achieve normality or full societal mobility would be herd immunity. As of the time of defense, the topic of herd immunity has no clear consensus opinion in the media, as conflicting studies are out concerning whether herd immunity is attainable, and how long it would take society to get there if it is attainable. With stronger variants of COVID making their way around the world and public fatigue of the coronavirus, concerns and doubts about herd immunity are real (Frolik, 2021; Pollán et al., 2020, p. 535-544). Early estimates believed that approximately 60-70% of people need to be either vaccinated or have already been infected for the whole public to reach herd immunity, which is anywhere from 198 to 231 million people (Omer et al., 2020, p. 2095-2096; Randolph & Barreiro, 2020, p. 737-741). The American COVID case count is nearing thirty million at the time of defense in April 2021, or around 9% of the population (Johns Hopkins University CSSE, 2021). CDC estimates predict that 60% of Americans will be fully vaccinated around the months of September or October, and 70% will be achieved around November 1st (Carlsen et al., 2021). This is the estimated time where herd immunity is reached for the primary strain of COVID-19.

For future epidemics and viral infections, there will have to be a quick vaccine delivery, or a highly contagious spread and transmission, for an infection to run its course in a faster manner, but if we assume that a stronger strain of a virus never shows up in a massive way during the first vaccination period, we can see herd immunity as attainable.

This proposal is my recommendation on how to recover and end future pandemics and similar crises in a timely, united manner that does not destroy our finances, but keeps us in solid economic condition, while working swiftly to eliminate the virus.

Appendix: Essential Businesses

This appendix will comprehensively describe all essential services based on NAICS codes (NAICS). While this list is extensive in nature, it is by no means exhaustive, and other similar industries might be accidentally omitted.

Emergency services:

All offices relating to safety and public order (listed within 922120-922160) are considered essential and will remain open.

Other essential emergency services include emergency and other relief services (624230), ambulance services (621910), emergency telephone dispatch (561421), and motor vehicle towing (488410).

Government offices and other similar community-based services:

All executive, legislative, and other general government offices (listed within 921100-921190) are considered essential and can deliver their services in a normal manner.

All other public administration offices should primarily seek to deliver services from home, if possible).

Transportation, stocking, and other delivery services that are vital to maintaining a proper supply flow:

Transportation services classified as "freight" or "resource transportation", the U.S. Postal Service, general warehousing or storage (various businesses located within

480000-493190), as well as air traffic control and other similarly necessary businesses for transportation operations, will be considered essential and can provide services as normal.

Construction that pertains to transportation (237310) will also be considered essential.

Motor vehicle dealers (listed within 441100-441228) will also be considered essential.

Gasoline stations (447110 and 447190) will also be considered essential.

Automotive repair and maintenance (listed within 811100-811198) will also be considered essential.

Food and agriculture production services. Restaurants, bars, and grocery stores can stay open for takeout and delivery services only:

All businesses that are classified in the agriculture, forestry, fishing, and hunting industries (listed within 110000-115310) will be considered essential and can deliver services in a normal manner.

All businesses that are classified in the mining, quarrying, and oil & gas industries (listed within 210000-213115) will also be considered essential.

All businesses classified under food and drink manufacturing (listed within 311100-312140) will also be considered essential.

All merchants of food or drink (listed within 424400-424590, 424810-424820, and 445100-445310) will also be considered essential.

Restaurants and other eating places (listed within 722500-722515) can remain open for takeout and delivery services only. Other food and drink services (listed within 722300-722410) are encouraged to convert into mainline restaurants.

Health care services (Non-life-threatening procedures and appointments unrelated to the virus are to continue remaining open):

All health care services (listed within 620000-624410), as well as voluntary health organizations (813212) will be considered essential and can deliver services in a normal manner.

Health and personal care stores (listed within 446100-446199), except for cosmetic and beauty supply stores, will be considered essential.

Veterinary services (541940) and pet supply stores (453910) will be considered essential.

Manufacturing services:

Considering all manufacturing is crucial to maintaining a proper supply flow and knowing that non-essential businesses are still expected to offer their services remotely or in a deliverable manner, manufacturing (listed within 310000-339999) is expected to remain open, provided in a limited configuration. The Defense Protection Act would also be in place, transforming production of some inessential businesses' manufacturers to make PPE.

Energy, chemical, trash, and water production/management services:

All utility services (listed within 220000-221330) will be considered essential and can deliver services in a normal manner.

Construction related to utilities (listed within 237100-237130) are also considered essential.

Waste collection, disposal, and management services (listed within 562100-562998) are also considered essential.

Communications, and essential in-home product services:

People within information industries that are responsible for upkeep and maintenance (listed within 517300-517410) can deliver services in a normal manner.

Contractors for in home products (listed within 238100-238390) can deliver services only on an emergency basis. While this is much harder to enforce, it is suggested to cut out non-urgent jobs.

Real estate services, as well as rental and leasing services (listed within 530000-533110) can visit houses or pick-up locations as they please, but they must minimize human interaction when possible.

General business and location support services (listed within 561600-561990) are also considered essential.

General household and industrial repair and maintenance (listed within 811200-811490) are also considered essential.

Dry-cleaning and laundry services (listed within 812300-812332) are also considered essential.

Religious services provided at a much smaller capacity or in a safer configuration:

Religious organizations (813110) can continue to provide in-person services, in a safe manner.

Parks, playgrounds, and other public recreation facilities, provided in a safe, socially distant manner, and consistently disinfected:

Amusement and recreation industries that promote fitness, exercise, or open nature (listed within 713900-713990) can remain open, provided in a safe, socially distant manner, and consistently disinfected.

Mental health services, including addiction centers, therapy/counseling centers, suicide help locations, and other mental health crisis management services that do not involve 911:

All mental health services (listed within 620000-624410, as well as 812191) will be considered essential and can deliver services in a normal manner.

Death care services (812210 and 812220) can continue operating under much safer configurations.

Social advocacy organizations (listed within 813300-813410) that provide an urgent service to people can also deliver services in a normal manner.

Other:

Services relating to architecture and engineering (listed within 541300-541380) will be considered essential and can provide services in a normal manner.

Accommodation services (listed within 720000-721310) can stay open, provided it is in a much safer configuration.

Physical publishing locations (listed within 510000-511210, as well as 512230) will also be considered essential.

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