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COVID-19: An Analysis of the United States' Response to the
Pandemic Compared to Canada and Japan

by

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For Jojo.

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INTRODUCTION

Outbreaks of infectious diseases have long ravaged the world, leaving lasting effects on the nations, economies, communities, and individuals they impact. The bubonic plague, more commonly known as the Black Death, originated in China and spread Westward along trade routes through the Mediterranean and Africa, eventually reaching Europe in the mid-1300's; in just seven years, over 200 million people succumbed to the disease, killing two-thirds of the entire population in some locations.⁵ During the first years of the twentieth century, a cholera pandemic killed hundreds of thousands throughout the world, and in 1968, the Hong Kong H3N2 influenza virus killed at least one million people globally.²¹ HIV/AIDS has killed millions of people internationally, and has killed 700,000 people with an additional 13,000 each year since its introduction to the United States in the early 1980s.⁴¹ Pandemics, the outbreak of a disease affecting all or most of the world, are interwoven into every country's history. In the 1940's and 1950's, polio devastated the United States, and disrupted the entire world. Each year across the U.S., thousands of polio victims became paralyzed, some surviving only by an iron lung medical device which enclosed all but their heads and was used to facilitate breathing.⁷ The H1N1 pandemic of 2009 was among a list of flu pandemics involving the H1N1 virus, most notably being the 1918-19 pandemic, commonly but misleadingly called the "Spanish flu," which killed 50-100 million people globally and roughly 675,000 in the U.S.⁸ The 2009 influenza virus contained elements of avian, swine and human, giving it the byname "swine flu;" within one year, approximately 12,000 people died of the swine flu in the U.S. and upwards of half a million worldwide.⁸ It is not a question of whether another pandemic will occur, rather when the next one will be, where it might originate, and whether we have any way to prevent it. Pandemics

may originate from an epidemic, a virus can mutate rapidly, constantly producing new strains much like the flu does each year, or a pandemic may originate from the case of a single individual contracting a novel virus from a non-human host.

The first known case of today's pandemic-causing coronavirus, or SARS-CoV-2, is thought to be that of an individual who transmitted the virus from an animal at a wet market before ultimately infecting other individuals and resulting in what has become the COVID-19 pandemic.⁵⁰ Within weeks, the virus spread rapidly throughout China, and within just one month, much of the developed world. The initial outbreak of the virus was first reported in Wuhan on December 31st, 2019, and has resulted in almost 100 million cases worldwide as of January 20th, 2021.⁵⁰ The "severe acute respiratory syndrome" coronavirus, SARS-CoV, another novel coronavirus at the time of its emergence in 2003, infected around 8,000 people especially in China, Taiwan, Singapore, Vietnam, and Canada, with symptoms similar to that of COVID-19.¹³ SARS-CoV-2 is an RNA virus, meaning that once access is gained to a host cell, the virus uses the cell's internal machinery to create duplicates of its own RNA to later be packaged and released as other viruses capable of infecting not only other cells, but other people as well. RNA replication lacks important proteins such as the DNA dependent DNA polymerase involved in the DNA replication process which have the proofreading abilities in order to prevent errors in replication.³⁹ This typically means that RNA viruses mutate at a faster rate and can result in varying strains, explaining the need for an annual flu vaccine.

Since the official declaration of a global pandemic by the World Health Organization (WHO) on March 11th, 2020, four SARS-CoV-2 strains have been identified as of January 21, 2021.³ Although considered to have mutated relatively slowly thus far for an RNA virus, varying strains of COVID-19 have emerged and could alter the way in which the world will have to

handle COVID-19 in the future. Different strains could result in different symptoms as well as different infection and transmission rates; they could slow vaccine efforts and could potentially leave the world dealing with an endemic virus similar to the flu, always circulating in relatively low numbers with intermittent outbreaks and new vaccines being developed each year.

Like other respiratory illnesses, SARS-CoV-2 has many symptoms similar to that of the flu: the fevers, fatigue, and body aches are well known to most people, as well as chronic lung inflammation in severe cases. Inflammation in the lungs can lead to pneumonia, which can result in death. However, unlike the seasonal flu, an infection with COVID-19 can result in the loss of taste or smell as well as more serious symptoms such as bluish lips or face, and a persistent inability to breathe. COVID-19 also has a high asymptomatic case rate, with studies showing that 40-50% of people who have tested positive show no symptoms at all.³⁵ Similar to other respiratory illnesses, viral particles are released whenever an infected person breathes, speaks, or coughs and can remain suspended in the air, easily inhaled by anyone in proximity. These virus-containing droplets are also able to settle on surfaces; coronaviruses last between hours and days on surfaces, and the rate of death for the virus is dependent on surface composition, temperature, lighting, etc.¹¹

While some respiratory diseases may present similar symptoms and be transmitted in similar fashions, each disease spreads at different rates. Identified in epidemiology and public health as R_0 or “R naught,” each pathogen can be assigned a number in order to quantify and predict how many individuals will likely become infected from a single case, assuming all individuals in the population are susceptible. What this means is that for a very highly contagious respiratory illness such as measles, with an R_0 ranging between 12 and 18, is that for every 1 person sick, they will likely infect between 12 and 18 others; based on the data collected thus far,

the R_0 of COVID-19 is between 1.4 and 3.9.³⁷ An R_0 greater than 1 indicates that case numbers will increase without public health intervention while a value less than 1 indicates that the number of new infections will decrease, and the virus will eventually be eliminated from the population. This numerical factor is useful in estimations and public health efforts, however, does not account for instances of increased susceptibility. Individuals who are 60 years of age or older, as well as those who are immunocompromised or those with underlying health conditions, are not only at an increased chance of contracting the virus, but also at an increased risk for a more severe response to infection, thus the virus does not affect all individuals in a similar manner. What could be an asymptomatic illness for one individual has proven to be the fight of their lives for others, indicating that there is still much to learn about the novel coronavirus.

As a novel virus, there was no previously recorded history on how to conduct testing for SARS-CoV-2 specifically, how to prevent its transmission, or how to identify symptoms; everything known about SARS-CoV-2 was learned as it was seen and experienced for the first time. Thus, there was no clear-cut path to elimination of the virus, leaving the various countries affected by COVID-19 to establish and enforce public health measures based on their own views and opinions of what was happening domestically and around the world. And for as many countries affected, there are as many varying responses to the pandemic.

As of January 20th, 2021, the end timeline parameter for this thesis, a total of 219 countries and territories have had positive COVID-19 cases.⁴⁰ That is every country in the world with the exception of 15--mostly small isolated populations in the South Pacific such as Tuvalu, American Samoa, The Cook Islands, and Kiribati, but also North Korea and Turkmenistan²² As of January 20, a total of 96.89 million cases worldwide and 24.26 million have been recorded in the United States; across the globe, 2.07 million people have died from COVID-19 with 406,184

being in the U.S.⁴⁰ These are the shocking numbers that led me to ask, how has the country which has long boasted about not only having a superior healthcare system, but also a nonpareil understanding of medicine, accounted for nearly a quarter of the entire world's deaths related to COVID-19? As of January 20, seven percent of the entire U.S. population had been infected with a virus that had already been managed and brought under control in other countries.

Unfortunately, these numbers will continue to rise in the foreseeable future for both the United States and for the world as a whole.

Pandemics historically end in one of two ways: a vaccine or sufficient treatment is developed, typically heavily paired with social and societal constructs around preventing its transmission, deemed a medical end, or a through societal actions in which people essentially grow tired of living under the constraints of a pandemic. A societal end is typically determined not by public health experts and backing data, but rather by socio-political processes. A societal end to a pandemic, one that many would argue much of the U.S. has pushed for, is of course not an end. Ignoring the effects of a potentially deadly disease does not make it go away. Countries such as New Zealand and Australia have proven that not only is “flattening the curve” of case numbers possible but stomping it out by implying the most efficacious contact tracing and public health guidelines is not only achievable but should be the goal. How a country ends a viral pandemic is determined not only by research and public health efforts put forth post outbreak but begins before it takes off. Ending a pandemic begins with its prevention.

The immediate response to a pandemic is, in part, determined before the very first case. Because diverse pandemics have been infrequently dispersed throughout each country's history, many countries have developed national plans for pandemic preparedness and perform constant surveillance of local, national and international public health concerns. Being prepared for the

inevitable is the first step in the containment of a virus. The initial emergence of a potentially global public health concern should be taken seriously long before the death toll has begun, and continued efforts must be employed. In an effort to quantify how the United States has responded to the COVID-19 pandemic, I examined the country's relative preparedness for a global disease outbreak, analyzed the initial reaction to the outbreak in Wuhan, China, the response post-realization of the pandemic's gravity, and continued mitigation efforts. The actions of the United States during these stages will be compared to Canada and Japan. Canada has proven to be no role model during the plight of COVID-19, however it has repeatedly performed better than the United States in part due to government intervention, while Japan has proven that strict government intervention is not always necessary and has attributed much of its success in handling the virus to cultural traditions of mask-wearing as well as individual respect and responsibility for the common good.

Pandemic preparation in the U.S. was dismal to say the least, and guided by a president who would fail to heed warnings, politicize a major public health crisis, and disproportionately place efforts on travel restrictions and preserving the economy, rather than truly take a proactive approach in ending the pandemic.²⁷ While many other countries were watching the outbreak in Wuhan closely, some already preparing for what was destined to become a pandemic, the general public of the United States was receiving reassuring statements on Twitter, and left unsure about what was to come. The declaration of a public health crisis in the U.S. did not come until three months after the outbreak, after the virus had been in circulation for months and was released amidst a plethora of contradictory statements regarding the virus itself and COVID-19.⁴⁴ Increased testing would continue to detect increased cases, illustrating that there were more positive cases than were being recorded, and that not enough tests were being administered. Yet

even with insufficient testing, and thus an inaccurate case count, the United States has become the global leader for COVID-19 cases and deaths and has maintained that position since March of 2020. The goal of this thesis is to analyze the various ways in which the United States has responded to the pandemic at different chronological stages, and how those actions, or lack thereof, has attributed to the United States' inability to manage the SARS-CoV-2 pandemic and high case and death rates.

PLANNING FOR A PANDEMIC

A Brief History of the Flu and Modern Pandemics

Not all infectious diseases have the potential to become a full-blown pandemic. Epidemics of seasonal flu happen each year, where the winter months in the United States are routinely characterized by stuffy noses, sick school children and the annual “get your flu vaccine” campaigns. What many people are unaware of is that the influenza viruses we deal with today are merely descendents of the same virus which killed nearly 8-10% of the living population in 1918; the influenza virus mutates continuously, repeatedly showing the capability to pass through members of different species, acquiring different variations within its genetic makeup as it does.⁹ The influenza pandemics of 1957, 1968, and 2009 are all related to the pandemic of 1918.⁹ There have been a number of influenza pandemics in which a mutated strain of the virus begins circulating at higher levels than usual, and eventually becomes classified as a pandemic when it affects numerous countries on multiple continents. All pandemics begin as relatively localized disease outbreaks; SARS-CoV-2 was categorized as an epidemic as it began spreading through China, before ultimately spreading to every continent except Antarctica, earning the title of a pandemic. The increase in cases and regions affected is typically determined not only by how infectious the virus is, but also the number of susceptible individuals within the population. Flu pandemics are typically resolved when the population generates a relative immunity to the virus, either by active or passive immunity. Active immunity is when an individual is infected with the virus and makes their own antibodies, while passive immunity is obtained through obtaining a vaccination. The immunity holds until the virus mutates and the population once again lacks immunity. Thus a cyclical pattern emerges in which pandemics can

be planned for and in some senses predicted by studying known and similar viruses, as well as analyzing the various relationships humans have with known carriers of pathogens.

Pandemic Preparedness in the United States

While the exact date of a pandemic cannot reasonably be predicted, the knowledge that there are viruses related to H1N1 circulating each year, along with witnessing the repeated resurgence of pandemic level influenza viruses throughout U.S. and world history, it could be expected that the United States might have a plan in place when the country inevitably does find itself in the throes of a pandemic. Prior to 2017, the United States did have such a plan. Developed in 2016 with the goal to share the lessons learned during the Ebola and Zika outbreaks, as well as address future flu-like potential pandemic pathogens, the “Playbook for Early Response to High-Consequence Emerging Infectious Disease Threats and Biological Incidents,” was created, even highlighting novel coronaviruses as potential pathogens of concern.²⁸ The 69-page document was originally generated by PCAST, the President’s Council of Advisors on Science and Technology. PCAST was established in 2001 by President George W. Bush in order to advise during the next pandemic level crisis.² During the 2009 “swine” flu pandemic, President Obama reinstated PCAST during the first month of the virus’ detection.² In December 2019, as the first cases of COVID-19 were surfacing in China, President Trump did not have a single seat of the PCAST team filled, nor was the pandemic playbook referred to.²⁸ In addition to failing to heed warnings throughout his presidency, President Trump has repeatedly fostered a disconnect between the incorporation of science and evidence-backed data into policy and executive decisions. Many of the Trump administration's attempts to promote economic advancement in other areas came at great cost to the public health system, one of which being the

loss of collaboration between the CDC headquarters in Atlanta, GA, and the Beijing Centers for Disease Control and Prevention in China.

In an attempt to promote global health, as well as identify and stop epidemics that often emerge in southern China, the Beijing Centers for Disease Control and Prevention (Chinese CDC) was established in 1983.⁴⁵ Since its creation, the Chinese CDC has trained hundreds of staff in outbreak-response techniques, some even being sent to Africa to aid in the Ebola outbreaks.⁴⁸ The Chinese CDC has also established a real-time reporting system for infectious diseases, accessible throughout China.⁴⁵ U.S. funding and aid allowed the Chinese CDC to flourish, and made possible much of the real-time monitoring of infectious diseases common in China. In 2018, U.S. funding to the Chinese CDC was virtually eliminated, ending a 30-year relationship with the Chinese CDC and U.S. CDC headquartered in Atlanta. The dissolution of the partnership included the removal of thirty-three U.S. positions, including epidemiologists and public health experts.⁴⁵ The elimination of funding resulted in the further loss of previously held positions by Chinese officials. This absence of training and financial support resulted in the Chinese CDC being severely understaffed. As a consequence, the doctors and officials at the Beijing Centers for Disease Control and Prevention were stretched thin, and the center was operating at a limited capacity when COVID-19 began circulating China.

The elimination of the positions at the Beijing Centers for Disease Control and Prevention put not only China, but also the United States and the rest of the world at a severe disadvantage when confronted with SARS-CoV-2 as it emerged. There is no way to tell if the withdrawal of American funds and physical support significantly affected the way in which the world has been impacted by SARS-CoV-2. However, it can be said that it was irresponsible to remove those positions, which provided not only additional hands in the field, but also an

American presence and mode to intercept vital public health knowledge as it was emerging, especially when considering the long-held insight that novel coronaviruses emerging in China could be a future public health concern. At one time, the United States was considered to have the best pandemic preparedness plan throughout the world, and yet, as the world was faced with an international public health concern, the United States did not refer to any of the plans made in preparation for a pandemic-like biological threat.

Pandemic Preparedness in Canada

Outside of Asia, Canada, recording 44 deaths, was the worst country hit by the SARS pandemic in 2003. On a global scale, Canada was not prepared for the first coronavirus outbreak almost 20 years ago, and since has spent millions of dollars and thousands of hours on reconstructing their approach to public health and pandemic preparedness. Training was improved and paired with more effective protocols and PPE to reduce the transmission of infectious diseases.² Isolation rooms were introduced in hospitals, along with more advanced medical equipment, and a digital system with the ability to track cases and testing was created.² The Public Health Agency of Canada was established in 2004, with functions similar to that of the CDC, along with the creation of a new position: the Chief Public Health Officer of Canada, providing a level of communication and collaboration between provincial governments and the federal government, as well as other countries.² Canada has also developed a document called the Candian Pandemic Influenza Preparedness: Planning Guidance for the Health Sector (CPIP), which is consistently updated with new information and amended pandemic guidelines to follow in the case of a flu-like pandemic. The document was originally created in 2006 to be used as a playbook in the event Canada found itself in a pandemic situation similar to that of today.⁴⁷

Learning from the mistakes of previous global health crises, notably the SARS pandemic of 2003, Canada has repeatedly shown an effort to update and redevelop their approaches to public health while modifying pandemic preparedness plans and their approaches to infectious diseases.

Pandemic Preparedness in Japan

Japan has long incorporated public health in its policy decisions and includes multiple ministries within its government structure responsible for overseeing various aspects of public health and potential disease development. The Japanese cabinet includes a Deputy Chief Cabinet Secretary for Crisis Management who manages emergency measures when a situation causing significant disturbance to Japanese people's lives or equity occurs or threatens, including managing the Ebola crisis in Japan and across the world.⁴⁸ The Ministry of Health, Labour and Welfare (MHLW) is the primary agency in charge of responding to infectious disease outbreaks and other public health catastrophes in Japan, and the The Health Risk Management Office of MHLW is continually gathering domestic and overseas information from related departments and from national research and development institutes.⁴⁸ These federal agencies are paired with local public health agencies, and have developed widely distributed local health centers, capable of providing emergency health information 24 hours a day, 7 days a week. During a public health crisis, the health centers throughout Japan become centers of local health crisis management, allowing for treatment and tracing of more individuals in circumstances of global health crisis.

After the 2003 SARS outbreak, Japan, much like Canada, began preparing and updating pandemic preparedness procedures to be followed at the government, local and individual levels in order to respond to an outbreak in both Japan and other parts of the world. Japan conducts nationwide surveillance of infectious disease outbreaks, classifying them within eight categories

dependent upon various factors. Physicians and veterinarians are required to immediately report the diagnosis of diseases falling within five of the eight categories to both The National Institute of Infectious Diseases, in which rigorous testing and analysis of the suspected pathogen is performed, as well as to the local government and the Minister of MHLW who may then respond and enact emergency measures.⁴⁸ These emergency measures are outlined by the Prime Minister and relevant ministries, pulling from dozens of documents created with the intent to prepare the country for future outbreaks of infectious disease. Along with numerous agencies throughout the nation, The Conference of Relevant Ministries and Agencies to Counter New Influenza and Avian Influenza of Japan, established in 2004, is continuously modifying and producing updated pandemic preparedness plans and informational documents to be used in the eventual case of another pandemic.⁴⁸ The constant monitoring for infectious disease, paired with Japan's real time reporting system and the incorporation of health policy in government decisions and planning allows for faster identification of outbreaks and reduced response time, especially in early stages of a pandemic.

EARLY RESPONSE TO COVID-19 OUTBREAKS

The Importance of Response Time

The initial response to a pandemic has the ability to set a country up for great success, or in contrast, failure, when responding to a global disease outbreak. Early response to a global health crisis requires not only careful oversight and monitoring of disease on a national and global scale, but also for the government and people to recognize the severity of the crisis when a pandemic or disease outbreak ultimately emerges. Although all divisions of society are involved in pandemic preparedness and response, the national government is overall responsible for the coordination of efforts and communication to local governments and citizens. During instances of a suspected global outbreak, it is the national government's responsibility to begin responding accordingly, whether that be through the implementation of travel restrictions, contracting PPE manufacturers or educating the public.

The national government is ideally meant to work alongside private agencies such as, but not limited to, the CDC in the U.S. and the WHO, along with government public health officials and state governments in order to best respond to a pandemic. Early responses initiated by national governments can slow transmission between countries and allow for the development of further research in the case of novel viruses in which case testing must be developed as well, in addition to the enactment of nonpharmaceutical interventions (NPIs).² NPIs, do not include direct medical intervention, such as vaccination and medication, are actions that communities and individuals can take to reduce the spread of illness. Although these practices will likely only curb transmission as opposed to stopping it, the employment and adherence to community NPIs such as closures, mask wearing and social distancing, as well as individual NPIs such as isolating

and quarantining, have played vital roles in the containment and subsequent end to many of the pandemics throughout history.^{2,5}

Early Response of the United States to COVID-19

As shown, pandemics are not entirely random events. They occur based on established relationships between humans, animals, and the environment. The United States knew that a novel coronavirus could pose a health risk over a year prior to the first human case of COVID-19; Johns Hopkins University released a paper in May of 2018 warning that respiratory viruses posed a “global catastrophic biological risk,” citing RNA viruses as a concern.⁴² A simulated novel influenza scenario, the Crimson Contagion, was conducted and released by the Department of Health and Human Services in October 2019, predicting over 7 million hospitalizations and 500,000 deaths.⁴² The results from the Crimson Contagion simulation illustrated how underfunded and disorganized the United States would be if faced with a pandemic, yet despite this knowledge, the United States was vastly unprepared for the onset of the COVID-19 pandemic. As a result, the U.S. did not respond well in the early stages of the outbreak. Having pulled positions from the Beijing Centers for Disease Control and Prevention one year prior to the onset of the COVID-19 pandemic, the United States already lacked a key factor in successful early response and did not have access to critical public health information as it was arising. This general unpreparedness and thus unawareness was then amplified by President Trump’s hands off approach, by actively dismissing the seriousness of the pandemic in its early stages even when he knew in early February that the coronavirus posed a “unique and deadly threat to the U.S.”¹⁵ The National Biodefense Strategy is a document which sets the course for the United States’ response to any biological threat to the country, whether they arise from an outbreak or a

terrorist threat.²⁶ The document is essentially a list of goals, one of which being to provide “accurate, timely and actionable public messaging.”²⁶ President Trump strayed from this goal in the early stages of the outbreak, and down-played the virus until it was too evident to ignore.²⁷

The first cases of COVID-19 were reported in Wuhan on December 29, 2019, and the first instances of public health intervention in the United States came weeks later on January 17, in the form of public health screenings at three major airports implemented by the Centers for Disease Control and Prevention.⁴³ This was just two days after an American traveling from Wuhan carried the first case of COVID-19 to the United States. The first case of COVID-19 in the U.S. was a man in Washington State who had traveled from Wuhan on January 15, and was confirmed on January 21, the same day the U.S. developed a test for SARS-CoV-2.⁴³ Again, these findings come days after China and the WHO confirmed through contact tracing that human-human transmission was possible, despite previous claims and public statements that it was not. During the weeks leading up to the first U.S. public health interventions, President Trump made repeated claims via Twitter that the United States, as well as China, had a firm handle on the outbreak, reassuring the public that “everything was under control,” despite releases from the WHO during that same time stating quite the opposite. The WHO had finally released statements validating that the virus was in fact transmissible between humans, however the mode of transmission was still unclear.⁵⁴

As days passed, and as more cases were confirmed throughout the United States and the rest of the world, China began implementing its own set of NPIs, suspending all public transport and air travel, as well as quarantining the 11 million people of Wuhan on January 23rd.¹⁷ Increased testing had identified increased numbers of positive cases; the quarantine of Wuhan would be the largest in history thus far, and last a total of 76 days.¹⁷ Around the same time in the

U.S., a level 3 travel restriction was put into effect by the CDC, advising against travel to the Hubei province unless necessary, however not entirely restricting travel and allowing visitors to return without following any quarantine procedures themselves. The restriction was accompanied by a public statement released by the CDC on January 28th, claiming that the virus was not spreading throughout the community in the U.S.¹¹ Testing in the U.S. was limited, and a paucity of commercial laboratories and academic medical centers which had the capability of processing early tests resulted in a lack of coordination, and delayed results up to a week. The CDC did not seriously consider the role of asymptomatic carriers until weeks after the concept was originally proposed in China after thousands of positive cases had been confirmed. At this point, the United States was not only in a position of receiving second-hand knowledge but was repeatedly delayed in their findings and in responses. The lack of collaboration between both the United States and China, as well as the national U.S. government and public health agencies such as the CDC, fostered a severe disconnect as many U.S. citizens lacked a clear understanding of what exactly COVID-19 was, what their associated risks were, and what they should be doing in order to slow transmission of the virus.

As reassuring messages continued to come from the White House, and unclear reports based on a general lack of knowledge driven by the lack of pre-established international cooperation came from the CDC, the U.S. experienced a grave delay in taking the threat of COVID-19 seriously. As a federal agency under the Department of Health and Human Services, collaboration between the CDC and the national government is vital for a successful pandemic response. The inability of the two to effectively collaborate was further emphasized as an official briefing of senators was called at the request of Republican Sen. Lamar Alexander of Tennessee, with hopes of gaining insight and guidance concerning statements released from the CDC

regarding SARS-CoV-2 and COVID-19.⁴¹ Held at the end of January, CDC officials briefed 14 senators at the sparsely attended meeting.⁴¹ The lack of attendance at the senator's briefing, in addition to the fact that an individual senator had to request the briefing at all, illustrates the lack of coordination occurring between various levels of the United States' government and institutions. The tone of the U.S. response did not begin to change until February 3rd, following a declaration of a public health emergency, mandating that anyone traveling from the Hubei Province in the last 14 days must quarantine for two weeks¹¹. Despite mandating quarantines for those returning, the national government never put forth a travel ban for U.S. citizens to China or the Hubei Province, and travel to China only ceased when individual airline companies began suspending travel around mid-February 2020. Travel to China as well as all indirect travel to and from China via Europe, if not all international travel should have been suspended. Guidance should have come from the national government, including the CDC, prior to allowing the virus to infect over 50,000 people in less than two months. When the U.S. did attempt to accelerate its response by releasing a test kit in early February, the CDC test kit undermined identification of early cases because the kit itself was flawed, resulting in inaccurate results 33% of the time.¹⁵

The first non-travel related case of COVID-19 in the United States was confirmed on February 26th, indicating that limited spread of the virus could have been occurring as early as January; the first confirmed COVID-19 death in the U.S. occurred on February 29, near Seattle, although autopsies belatedly confirmed two earlier deaths in California.¹² The virus had become well-established in the U.S. and by March 26, the U.S. had become "the country hardest hit by the pandemic," with at least 81,321 confirmed infections and more than 1,000 deaths; this was more reported cases than in China, Italy or any other country at the time.⁴⁴

Early Response of Canada to COVID-19

Across the border, Canada began its efforts against the emerging global health crisis on January 15th, when the Public Health Agency of Canada activated the federal, provincial, and territorial Public Health Response Plan for Biological Events opening the Health Portfolio Operations Centre¹⁹. This required additional health screening questions at international airports, as well as prompted a plan to distribute signage in airports, warning about the virus which had been circulating for approximately two weeks at this time. Screening for travelers returning from China began on January 22nd, expanding to screening travelers from other affected areas on February 9th, 2020¹⁹. Canada's effort at the onset of the outbreak was a humanitarian approach, focusing on educating citizens and providing social and financial support, which although necessary, left provinces to implement varying public health strategies at different times, lacking a nationally unified approach towards a virus that knows no borders.

In an attempt to promote international collaboration, Canadian public health officials began requests to work with both the WHO, as well as the Chinese government in an effort to research the new virus and restrict its transmission. Requests for a team to be sent to Beijing were initiated in the last week of January, and on February 9th, Canadian epidemiologist, Dr. Bruce Aylward led a team of international experts to China to investigate the outbreak.⁵¹ Meanwhile, requests from the U.S. government and public health agencies to send teams to China remained unanswered. Likely in retaliation for pulling funding and positions to begin with, the inability of the United States to have active teams on the ground in the country of the outbreak delayed research and postponed the timing at which the U.S. received vital public health information.

Similar to the United States, despite having a fully assembled and aware public health team, Canada did not consider the threat of the outbreak as dangerous as it was in its early stages and failed to make some major preparations as the country's case count continued to rise after its first confirmed case on January 25. The man from Toronto who returned to Canada from Wuhan on January 22 with no symptoms required a trip to the hospital on the next day.⁵¹ In a COVID-19 infection, an individual is infectious up to 48 hours prior to the onset of symptoms, thus he was likely contagious while entering the country.

As hospitals in China quickly became flooded with patients, a majority of Canadian hospitals were already operating at full capacity prior to the pandemic. Three weeks after the first confirmed case of COVID-19 in Canada, before the country experienced a surge in cases, Dr. James Simpson, an emergency room physician in Ontario, recalls treating regular patients in unused closets, open hallways, and any free space he could find, as emergency room beds were being used for admitted patients. Dr. Simpson's experience was not exclusive, as many of Canada's hospitals were struggling to manage the volume of patients they were receiving even prior to the onset of COVID-19; there was no planning or preparation for the beds or PPE which would ultimately be needed for COVID-19 patients.²

PPE such as face masks and shields are now known to reduce the transmission of COVID-19 between individuals and are most effective when both parties wear a mask.¹¹ However in the early days of the pandemic, the use of surgical masks and face coverings was actually discouraged. With no recommendation given by Canadian public health officials by mid-February, many Canadian pharmacies were struggling to meet public demands, causing pharmacists to discourage consumers from buying masks, as well as provoking a statement from Canada's Chief Public Health Officer, stating that "masks are more useful for people who are

actually sick.”⁵¹ While at this time the exact mode of transmission was unknown, it was clear that SARS-CoV-2 presented with flu-like symptoms infecting both lower and upper respiratory tracts. Despite Canada’s educational approach to the virus in addition to prior knowledge of flu-like viruses which infect the respiratory system where mask wearing is highly effective, when individual citizens did begin preparing and purchasing the masks that unbeknownst to everyone would become a global necessity, they were advised against doing so.

As numbers in Canada rose at a relatively lower rate than other countries, the realization of COVID-19’s severity did not take a foothold in Canada until late February. By February 15, Canada had recorded eight cases, and as the numbers continued to increase Canada would realize that SARS-CoV-2 was past the point of containment.⁵¹ Canadian officials began preparing for the possibility of what at this time could already be considered a pandemic. On February 27, Dr. Tam issued a national emergency stating that officials would be preparing to manage a pandemic crisis; federal and provincial officials and centers were beginning to stockpile medical supplies, including masks and also advised Canadians to prepare their own food and medical stockpiles.⁵¹ Despite having an active public health assembly as well as active leadership in Prime Minister Justin Trudeau, Canada repeatedly responded just behind the curve in the early stages of the COVID-19 pandemic. The implementation of these practices just weeks earlier could have greatly reduced the number of individuals ultimately infected with SARS-CoV-2.

Early Response of Japan to COVID-19

After China, the origin of the zoonotic spillover, and Thailand, Japan was the third country affected by COVID-19, thus Japan’s response to the outbreak was inadvertently forced to be an early one. Japan’s first case was confirmed on January 15 when the NIID established an

in-house PCR assay to detect for COVID-19 mRNA.³⁸ However, the individual began seeking treatment the day of his return from Wuhan to Japan, making health officials aware as early as January 6.⁵⁴ Early awareness of the first case in Japan allowed the Ministry of Health, Labour and Welfare (MHLW) to alert health governments of the respiratory illnesses in Wuhan by using the existing surveillance system for serious infectious illness with unknown etiology as early as January 6, as well as to implement quarantine and screening measures for travelers beginning the following day.⁵⁴ Despite a strong initial collaboration between the national government, as well as multiple local and national public health agencies, the number of confirmed positive cases in Japan continued to rise quickly especially due to the infamous *Diamond Princess* cruise ship outbreak. With over 3,700 passengers on board, the ship recorded a total of 712 cases and 14 deaths from multiple countries during its almost month-long quarantine.⁵⁵ Despite having developed an effective test for COVID-19 relatively early, rather than focus heavily on testing and making testing widely available, Japan placed a heavy focus on contact tracing.

Since the beginning of the outbreak, Japan's public health surveillance teams have actively participated in what was early called "cluster-busting" contact tracing, later referred to as backwards contact tracing. Unlike forward contact tracing in which the individuals whom a positive case was in contact with will be identified, backwards contact tracing focuses on the identification of who the new positive case transmitted the virus from in the first place, as well as anyone either individual was in contact with.²⁸ Backwards contact tracing in addition to forward tracing allows for the identification of a greater number of individuals who should be either isolated or quarantined, and such an active contact tracing approach in turn prevents future exposures and future cases.

Japan continued its active battle against COVID-19 as the virus not only began to spread to other countries, but also began claiming its first lives. On January 30 former Prime Minister Shinzo Abe established the Japan Anti-Coronavirus National Task Force to oversee both national and local governments' response to the pandemic.³⁸ On February 27, Prime Minister Abe requested the temporary closure of all Japanese elementary, junior high and high schools until a predetermined date in April, going as far as to negotiate postponement of the 2020 Summer Olympics.³⁸ While at this time much was still to be discovered about SARS-CoV-2, Japan employed active and preemptive measures against COVID-19 as it was first detected circulating in late December/early January (Figure 1). This aggressive approach to mitigating the outbreak provided Japan not only a successful early response to the pandemic, but also provided a strong foothold as cases and deaths rose globally, escalating the outbreak of COVID-19 to an established pandemic. Japan's first COVID-19 death was an elderly woman on February 13; at this time there were about 250 cases in the country, 218 of which were passengers and crew from the *Diamond Princess* cruise ship quarantined in Yokohama harbor near Tokyo.²⁹

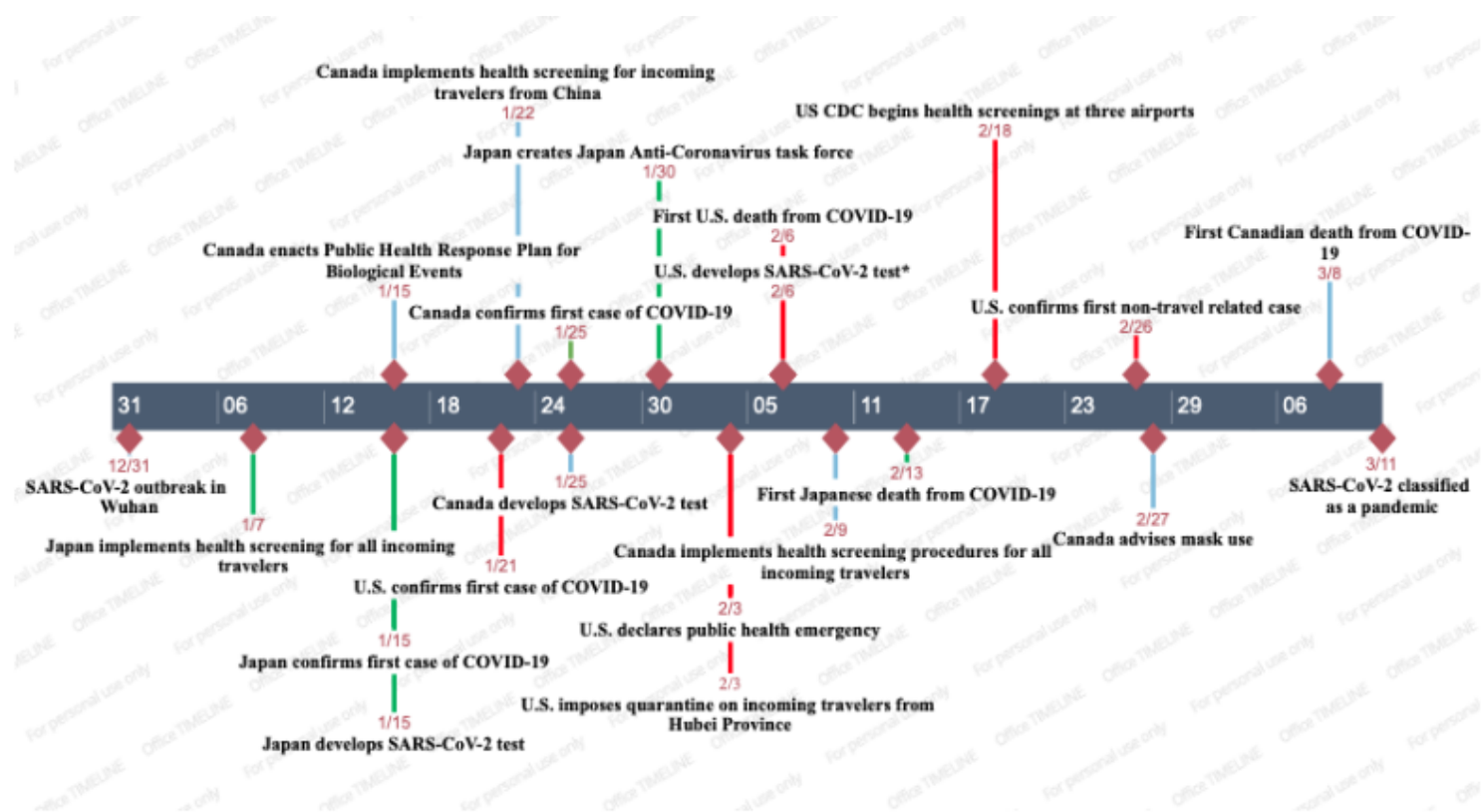


Figure 1. Timeline of major events during the COVID-19 outbreaks from December 31, 2019 to March 11, 2020. United States (red), Canada (blue), and Japan (green), show varying responses at diverse times.

WORLDWIDE RECOGNITION OF COVID-19'S SEVERITY

Realization of COVID-19's Significance and Danger

As the SARS-CoV-2 outbreak shifted from a WHO category of “public health emergency of international concern” on January 30 to the disease being named COVID-19 on February 11, and its classification as a global pandemic on March 11, countries around the world began recognizing the severity of COVID-19 at varying times in varying degrees. The implementation of community-wide quarantines, mask-mandates and social distancing guidelines, as well as an emphasis on testing and research occurred in some countries as a response to a dramatic increase in cases, and thus were used as response measures. However, in early March, at the time of the WHO's pandemic declaration, testing was still limited in many countries, meaning that even a striking increase in cases represented only the tip of the iceberg. In many cases, the virus had already been allowed to transmit freely among individuals for weeks, and potentially months before the first public health guidelines were implemented by any level of authority.⁴⁴

This shift in recognition not only requires the lawmakers in power to acknowledge the severity of a global health crisis, but also effectively convince citizens that a novel virus is a threat worth being taken seriously, and that future changes made to reduce transmission are done to protect them and the rest of the country. During a global outbreak, those within the government are held responsible to their represented people to collaborate with public health agencies in order to provide information and update policies according to recent and relevant public health data, implemented through policy and publicly followed guidelines to best protect their citizens. A general lack of acknowledgement and subsequent lack of executing and enforcing public health procedures only leads to an increase in cases and an increase in

casualties. An acknowledgment of a disease's severity at an earlier stage allows policymakers to act quickly, which in turn, better protects its people.

U.S. Begins to Take Action

On March 13, two days after WHO's declaration of a novel coronavirus pandemic on March 11, President Donald Trump declared COVID-19 a national emergency.⁴³ This national declaration not only drew a new breadth of attention and urgency the cabinet had yet to provide. The declaration of a national emergency released billions of dollars in federal funding to fight the spread of the virus, as well as implemented the first ban on travel.⁴³ At this time, this was the most acknowledgement from the United States government towards the fact that COVID-19 was a true threat at all, let alone one deserving such significance. This new attention toward COVID-19 awareness and prevention sparked collaboration from public health agencies, local governments, and individuals alike. On March 15th, two days after President Trump's declaration, the CDC released guidance advising against public gatherings greater than 50 people, followed a day later by President Trump suggesting the number be reduced to 10 individuals.⁴² Around this same time, the cabinet also released a 30-day campaign advocating primarily for the adherence of social distancing, advising against the large gatherings mentioned, unnecessary shopping, traveling and eating out, as well as promoting the monitoring of symptoms and staying home if not feeling well. This provoked the country-wide shut down of numerous restaurants and businesses, the closure of large, inner-city schools, and the extension of spring breaks for many colleges and universities.

As the COVID-19 pandemic shifted from a foreign and far away threat to being at the forefront of American conversation and decision making, tension throughout the American population increased as concerns about the stock market, the American economy, and the

welfare of the nation. In order to reduce anxiety about the stability of the national economy, as well as that of individual Americans, economic pandemic programs began with the Federal Reserve. As millions of Americans were forced temporarily out of work, the Federal Reserve reduced interest rates to almost 0.25%, as well as began forming plans to stop back mortgage payments, and allowed banks and loaning institutions to lend to those who may be affected by the coronavirus at 0% interest rates.⁴³ Multiple privately and federally owned companies began to follow suit, offering grace periods and payment extension options for individuals adversely affected by the nation-wide shut down. The Federal Reserve continued its efforts in promoting economic stability by establishing the Commercial Paper Funding Facility (CPFF), to support the flow of credit to households and businesses, as well as the Primary Dealer Credit Facility (PDCF) to support the credit needs of households and businesses.⁴³ Not only did awareness and action from the nation's central bank provide a safety net for many citizens and small businesses, but also drew attention to the fact that because a pandemic inadvertently affects a nation's economy, it is well within the power of a capitalist government to diminish those negative effects.

President Trump also began taking a proactive approach toward safeguarding the American economy, as well as providing individual financial benefits to the average citizen. On March 18th, President Trump signed the Families First Coronavirus Response Act into law, responding to the COVID-19 outbreak by providing paid sick leave, tax credits, free COVID-19 testing, expanding food assistance and unemployment benefits; and increasing Medicaid funding.⁴³ On the same day, the U.S. Treasury and Internal Revenue Service (IRS) announced non-corporate tax filers can defer any owed Federal income tax payments up to \$1 million from April 15 until July 15, without penalties or interest.⁴³ For the 40 million Americans living below

the standard poverty guidelines, surviving paycheck to paycheck, implementing increased availability to unemployment benefits as well as increased benefits themselves, paired with a 15% increase in the supplemental nutrition assistance programs (SNAP), allowed many individuals the financial flexibility to participate in social distancing without fear of losing their homes, or being unable to feed their families.

While efforts were made to provide financial security to many individuals and families, it is important to note that throughout the beginnings of the pandemic, the United States did not foster a stable relationship of trust regarding information flow from either the government or public health agencies to the average American. Statements diminishing the threat and severity of COVID-19, as well as actively advising against practices which would be recommended just days later generated conspiracy theories, eventually anti-maskers, and an exponential spread of false information. Despite the American people being at a disadvantage, it is ultimately the responsibility of the individual during times of global crisis to not only remain educated but maintain a level of obligation to themselves and their community. Although the virus had been actively transmitting between individuals for nearly three months in the United States, the realization of COVID-19's severity by the general public did not hit until around mid-March.⁴⁴

By this time, all 50 states in the U.S. had reported at least one case of COVID-19, and despite what may have seemed like valiant efforts to prevent the spread of this novel virus, cases throughout the United States and the rest of the world continued to increase at high rates. As of March 18th, the U.S. had a recorded total of at least 9,345 cases, claiming the lives of at least 140.⁵² What the United States and countries around the world would continue to realize, is that obtaining accurate numbers requires adequate testing. At each instance in which the United States increased testing locations and made testing more widely available, identified cases

increased rapidly indicating reduced detection of cases. In under 24 hours, the U. S. experienced a 40% increase in positive cases, surpassing 19,000 and triggering California to become the first state to issue an official stay at home warning.⁵⁶ As New York followed suit the next day on March 20th, stay-at-home orders mandated that individuals should remain home unless working an essential job or shopping for essential items, and avoid all large gatherings.

The temporary closure of schools and what ultimately resulted in the permanent closure of many small businesses left many Americans feeling unsettled. This feeling of unease left many Americans without a strong foothold on what COVID-19 was, and how to best protect themselves and their loved ones.³ Paired with a continued lack of knowledge on both the virus itself, precautions to take, as well as a lack of general knowledge of the way in which the scientific process unfolds, the average American was at a disadvantage when responding to the pandemic. Within two weeks, mask wearing went from being “entirely unneeded and overprecautious,” to being recommended by the CDC on April 3rd, and mandated by many states and local municipalities¹. This recommendation was made after weeks of knowing that SARS-CoV-2 could be transmitted via respiratory particles, and another dramatic surge of cases had taken place. April 3rd also marked over 270,000 U.S. cases of COVID-19, along with what Dr. Anthony Fauci called a likely under-representation of 7,000 deaths⁴. Within just four months, the number of global deaths associated with COVID-19 quickly surpassed the deaths associated with both SARS and H1N1. By the end of April, the U.S. had reported 1,069,534 cases and 63,001 deaths.²³ For a country of roughly 323 million people, that translates to a case rate of 0.33%, and a death rate of 0.06%. On a global scale, the United States continued to rank as the country worst affected by the pandemic, and as of April 30th, had accounted for 27% of the world's deaths related to COVID-19, despite only accounting for 4.25% of the world population. Throughout

history, the U.S. has continued to claim, “American exceptionalism,” its superiority over almost all aspects of development, society, and culture. This was emphasized when President Trump had announced in late May that the U.S. would be withdrawing from the WHO, including the withdrawal of financial support.²⁶ When the entire world was faced with a novel and deadly virus, the U.S. repeatedly demonstrated an inability to produce reliable and punctual information, enforce guidelines and in some cases basic awareness, all while alienating relationships cost many people their lives, jobs, homes, and well-being.

Canada’s Early Response and a Quantitative Comparison to the U.S.

As much of the United States’ responses to the pandemic were in reaction to a dramatic increase in cases or international health advisories, and placed an overt emphasis on the nation's economy, and while actively ignoring the threat of the virus for so long, Canada’s response was more one of preparation and proactive caution. After returning from a trip to London, Canadian Prime Minister Justin Trudeau’s wife tested positive for COVID-19 on March 13th, leading her and the Prime Minister to self-isolate for two weeks.⁴⁶ Prime Minister Trudeau being affected by the virus during its first dispersion across Canada and the globe made ignoring its severity and significance by the Canadian government impossible. From personal isolation, within one week of the official WHO pandemic declaration, Prime Minister Trudeau called for a temporary suspension of Parliament, the cancellation of almost all national sports, the temporary closure of schools, shopping malls, restaurants and salons, withdrawal from the 2020 Tokyo Olympics, as well as the closure of Canada’s borders to all non-Canadians.⁴⁵ These initial social distancing measures were implemented country-wide, as much about the virus and its transmission were still to be discovered. The implementation and drastic lifestyle change from one week to the next

was considered radical by many Canadians and received backlash from citizens arguing that case numbers were not high enough in the country to warrant such dramatic measures. Despite not having case numbers (or rates) as high as the United States, Prime Minister Trudeau and the Canadian government wasted no time in beginning lock down preparations for the country. When compared to the United States, Canada's response to the pandemic post realization was one of more preparation and planning which, in turn, potentially saved thousands of lives.

Canada's emphasis on economic stability during the unknowns ahead was similar to that of the United States. On March 18th, still from quarantine, Prime Minister Trudeau announced Canada's COVID-19 Economic Response Plan, granting \$570 billion CAD, approximately \$463 billion USD, in aid to business affected by the pandemic, \$107 billion CAD (\$75 billion USD) to individuals and families, and another \$85 billion CAD (\$69 billion USD) to serve as tax deferrals for both individuals and businesses.⁵¹ The plan granted individuals with lost income up to \$2,000 CAD (\$1,421 USD) for four months to make up lost wages, along with a child and student benefit, and a nationwide salary minimum for essential workers. For businesses, the plan covered up to 75% of their employees' wages for up to three months, enhanced credit and loan accessibility, and the lowering of rent by up to 75%. For many, this financial assistance provided by the Canadian government was the difference between businesses going under and allowed employees to feed their families. The increased financial stability provided by the economic response plan allowed the average Canadian to actively participate in social distancing and the recommended guidelines, rather than be overwhelmed with the uncertainty of both a novel virus, and their ability to provide for themselves and their families. The ability to build any form of security in the uncertain beginnings of a pandemic, as case numbers are only bound to increase as the pandemic progresses, is important in establishing a form of trust between the government

and public health officials, as well as the citizens, which later is important when implementing social distancing protocols, and other public health fueled guidance.

As of March 20th, one week after Prime Minister Trudeau's own personal COVID-19 experience, Canada had recorded just over 1,000 positive cases of COVID-19. Comparatively, across the border, New York State was entering a mandated stay-at-home order in response to the U.S. reaching over 19,000 positive cases. Although when analyzed chronologically, Canada and the United States began implementing public health guidelines at approximately the same time, Canada's employment of social distancing practices and restrictions were implemented earlier than the U.S. in terms of the percentage of the population which had already contracted COVID-19. It is important to note that Canada has a population of about 38 million, roughly an eighth of the population of the United States, with much of Canada's vast north territories being unsuitable for human habitation. However, when factoring in population size, on March 20, Canada had an infection rate of 0.0026%, with the U.S. averaging twice that at 0.0058%, both seemingly low but potentially heralding a coming deluge of cases. Also on March 20, Chief Public Health Officer Theresa Tam released guidance suggesting the wearing of masks whenever social distancing wasn't possible.²⁰ The recommendation for facial coverings from the Public Health Agency of Canada came two weeks before the CDC's recommendation, once more illustrating the United States' delayed response, which would soon be evident with an explosion of cases.

Both Canada and the U.S. initiated lock-down recommendations of fourteen days, which were then extended to one month as case numbers steadily increased. By April 20, exactly 31 days post the introduction of social distancing and mask wearing and temporary closure of many businesses and schools, cases in Canada rose to at least 36,800, translating to an increased

infection rate of 0.097% or about 1 in every 1000 people.³² In the United States, April 20 marked just above 787,000 cases.²³ This translated to an infection rate of 0.24%, translating to about 2 in every 1000 people. Despite the implementation of social distancing guidelines, the delay allowed the virus to gain momentum in both countries. Although case numbers rose in both instances, cases in Canada rose at much lower rates than the U.S. (Figure 2). Such a dramatic difference in new cases, despite beginning lock-down procedures at roughly the same time, could likely be attributed to the U.S.'s delay and President Trump's increasingly strong denial that the U.S. had a problem.

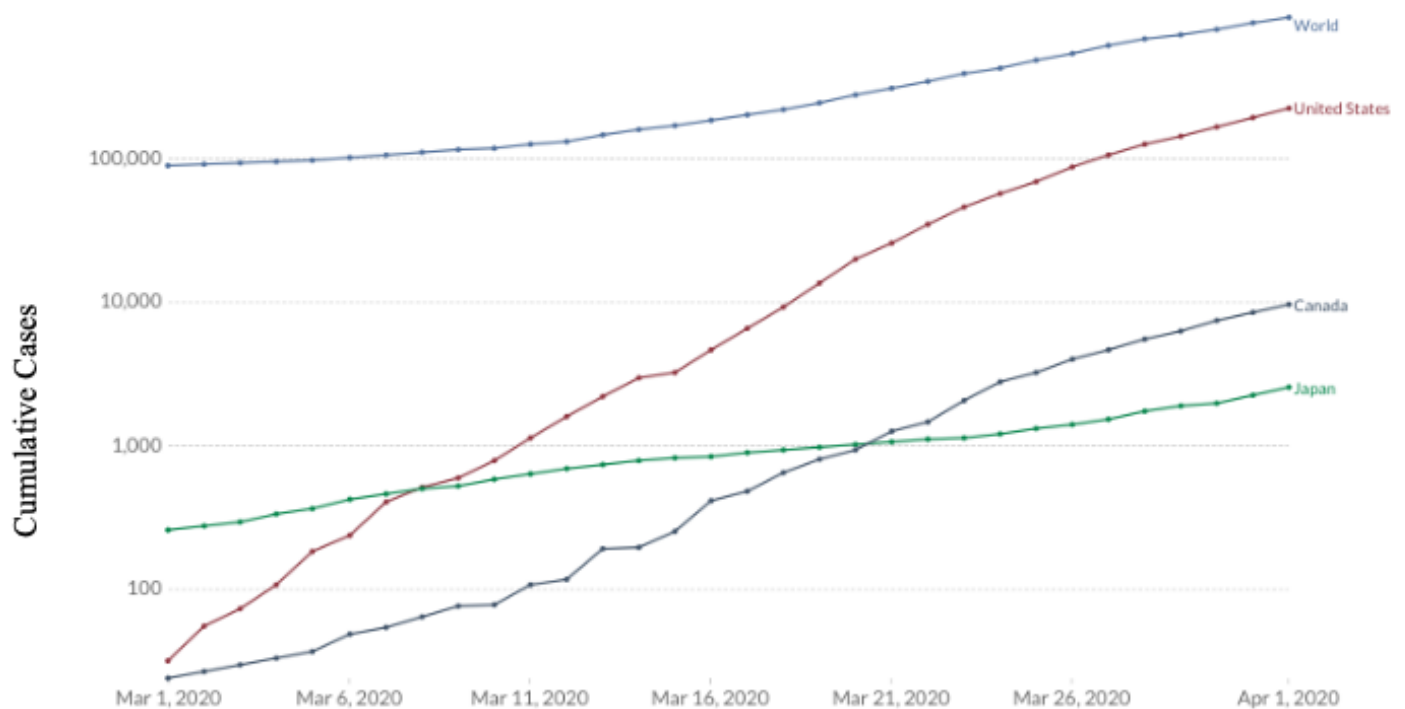


Figure 2. Cumulative Case Comparison from March 20, 2020 to April 20, 2020. Japan shows the lowest increase in cases when compared to the United States and Canada. Data depicted on a log scale. Source: COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University.

As has been shown, how a country responds to a pandemic or a public health emergency of any kind, is just as important as when the country begins responding. While the two countries have different population sizes and varying intrinsic factors affecting the rate at which the virus spread, Canada's implementation of these procedures when case numbers were still low, played a huge role in the country's continued efforts against the pandemic.

As this trend in cases continued, another one month period revealed that by May 20, Canada had recorded over 79,000 cases, resulting in 5,900 deaths, with Ontario, Canada's most populous province, issued another stay-at-home order.²³ The 7% death rate in Canada at this time was attributed to a shortage in medical supplies in hospitals; many hospitals with thousands of sick individuals were operating on reduced supplies of ventilators, masks, gloves, gowns, and general supplies to treat the symptoms of severe infection.⁵¹ Lack of PPE contributed to multiple outbreaks within hospitals, nursing homes, and infections of medical professionals, as staff was unable to safely treat patients. Having an undersupplied hospital or medical facility meant to treat the elderly as the epicenter of a super-spreader event is increasingly dangerous, as these facilities aggregate individuals at increased risk of infection.

In the United States, over 1.5 million positive tests had been documented by May 20, along with over 86,000 deaths.²³ The infection rate in the U.S. rose to 454 out of every 1000 people testing positive for COVID-19. On a global scale, the United States was now the country with the greatest number of cases, surpassing the original country of the outbreak, accounting for 30% of the global cases and 26% of global deaths from COVID-19.⁵⁶ China, with a population of nearly 1.4 billion people-- 18.47% of the global population-- kept numbers far lower than the United States despite being home to the original outbreak. The total number of COVID-19 cases reported in China on May 20, was 82,964 with 4,634 deaths which translates to an infection rate

of 0.005%, or less than 1 in 1,000.²³ Thus, population in terms of sheer numbers is not the driving factor behind how well a country fares in response to a pandemic, or any global crisis for that matter. Countries around the world, all with varying populations, produced a plethora of different responses to the COVID-19 pandemic, each determined by when and how a country responds, the effectiveness of its leadership, and the cooperative nature of citizens.

Japan's Response and a Quantitative Analysis Across Countries

In contrast to the United States and Canada is Japan's illustration of a country's willingness to respond early and take the threat of a zoonotic outbreak seriously long before it reaches pandemic status. Accounts from Alfred University's own staff and students who were visiting Japan in January 2020 recall that less than one month into the start of the pandemic, many Japanese citizens were already wearing masks. This was three months before masks were mandated or recommended in either Canada or the United States, and was not during Japan's hay fever season, when mask wearing throughout the country is considered a cultural norm.

The earliest and most traditional occurrences of mask wearing in Japan stems from religious rituals dating back to the 1600s, in which a mask or facial covering was worn to prevent contamination with unclean air.³⁴ From there, masks were adapted and redesigned, being used heavily during the influenza pandemic from 1918-1920, and have since been used during annual influenza outbreaks and hay-fever seasons.³⁴ In Japan, rather than wearing a mask becoming a symbol of oppression, they were used for exactly what they were designed for, the reduction in the transmission of particles which may be inhaled.

Japan first implemented the practice of social distancing by February 18, a month earlier than its Canadian and American counterparts, as Environment Minister Shinjiro Koizumi began

encouraging his ministry bureaucrats to begin working from home and using staggered office hours as a measure to slow the spread of COVID-19.³⁸ Additionally, on February 26th and 27th, Prime Minister Shinzo Abe requested the cancellation of all sports and cultural events, as well as the continued closure of schools.³⁸ Despite poor management of the *Diamond Princess* cruise ship, which released hundreds of positive carriers into the community and caused much of the early spread across Japan, Prime Minister Abe reacted remarkably quickly in attempting to contain the spread of the virus about which little information was known thus far. The *Diamond Princess*, docked in Yokohama Port on January 20, became the quarantine vessel for over 3,700 crew and passengers as the virus spread from one individual to 712, leading to a ship-wide quarantine beginning on February 3rd.²⁹ At the time, the ship accounted for more than half of the cases occurring outside of mainland China, however, PM Abe's imposition of a 14-day quarantine, as well as requiring passengers to obtain a negative test result before disembarking drastically reduced the number of individuals which would have been affected had such strict guidelines not been imposed.

Prime Minister Abe's rapid response, much like what was seen in Canada, resulted in his repudiation by many of his government counterparts, arguing that he made the decision with no guidance. This critical response echoed by others in the National Diet, Japan's bicameral legislature, made the declaration of a national emergency, originally requested on March 2, increasingly difficult.³⁸ The declaration of a national emergency, allowing the government to make any revisions needed to ensure public safety as well as to release funding needed for the implementation of those revisions, was delayed a full month and was not approved until April 7.⁶ Although receiving opposition from some branches of government, Prime Minister Abe worked to secure a stimulus package for all Japanese citizens affected by the pandemic with no limit on

income. The package, announced on April 7, provided all citizens with 100,000 ¥, or US\$980.³⁶ Titled *The Emergency Economic Measures To Cope With COVID-19*, totaling the equivalent of \$1 trillion U.S. dollars, the plan provided special loans for varying businesses and qualifying individuals, the automatic extension of work and school visas for legal visitors, tax deferral measures, and business grants.⁴⁹ The plan also provided missed wages for individuals with children, unable to find daycare amidst the school closure. This financial assistance, as mentioned in previous sections, provided Japanese citizens some essence of flexibility and stability when responding to the rapidly changing social conditions.

As seen in many countries, these changing social conditions-- the initiation of social distancing, wearing of face masks, and closure of many businesses-- sent citizens into a frenzy of purchasing home goods, food, and disposable face masks.^{20,30} By early April, this fear resulted in nationwide shortages of both disposable and reusable face masks throughout Japan, and eventually led to the government banning the resale of face masks because they were being sold online at extremely high prices. In order to thwart this growing issue, Prime Minister Abe and the Japanese government planned for the disbursement of washable face masks to all of the 50 million families with registered postal addresses, to begin later in April as part of *The Emergency Economic Measures To Cope With COVID-19*.³⁰ Japan was the first country to participate in any nationwide distribution of PPE to mitigate COVID-19's spread, and was cited in the months to come by other countries to begin their own mask distributions or free face mask locations. Masks in Japan were to be distributed first in hotspots of infection such as Tokyo and Osaka, where cases were rising rapidly, and were meant to limit the spread of the virus, as well as to alleviate some of the stress surrounding the nationwide shortage.

Also in an effort to control the spread to large cities throughout Japan, was the de facto closure of Japanese seaports and airports. April 3 marked the closure of Japanese ports and airports to all incoming travelers, regardless of citizenship, pending a 14-day quarantine.³⁸ The imposition of such strict travel restrictions came later for Japan than for both the U.S. and Canada, who implemented initial travel restrictions in January. Yet when comparing case numbers between the three countries, as of April 20, Japan had a cumulative case count of 6,566, along with 171 deaths.²⁸ For Japan, a country with a population of roughly 126 million people (about 38% of the US population), this translates to an infection rate of 0.005%, fewer than 1 in 1,000 people. This in effect could be used to show that while travel restrictions during a pandemic play an important role in limiting the spread of a pathogen, it may not necessarily be worth such concentrated and aggressive efforts. President Trump and the American government focused primarily on travel restrictions in the early and continued stages of the pandemic and argued early on that the spread of the virus was primarily due to foreign visitors and travelers. Initial focus was on the West Coast and stopping incoming travelers from China, overlooking the East Coast and incoming cases from Europe and Italy.¹ Regardless of how cases were entering the country, the United States experienced the highest increase in cases, and quickly became the global leader of SARS-CoV-2 transmission and deaths (Figure 3).

As both the Japanese government and people approached the pandemic cautiously, acting by means of prevention rather than response, Japan was able to both keep case and death numbers relatively low during their first wave of COVID-19 (especially once the many cases from the cruise ship were isolated), as well as to be one of the first countries recovering from initial infections. The practice of social distancing and mask-wearing, paired with temporary closure of many shopping malls and restaurants and continued focus on testing and reverse

contact tracing allowed Japan to maintain active case numbers below 15,000 even at the height of the first wave.³⁸ Fewer than 5,000 active cases on May 14, paired with the maintaining a low case total throughout the first wave of the pandemic, led to Prime Minister Abe announcing the lifting of the COVID-19 state of emergency in 39 of Japan's 47 prefectures, or districts, followed by a formal nationwide end on May 25th.³⁸ Lifting the state of emergency allowed reopening all businesses at full capacity as well as indoor and outdoor gatherings, although no changes were made to mask recommendation, and the mask dispersal process was still underway.

Despite being proactive in many aspects of planning for the pandemic, as well as responding to the pandemic once underway, Japan's preemptive reopening of the economy and return to "normal," effectively caused a significant increase in cases, as more individuals were interacting in confined spaces. By June 4, three weeks after PM Abe's state of emergency was lifted, the number of cases in Japan had risen to over 20,000.³¹ As restrictions continued to be lifted by the Japanese government, undeterred by the dramatic daily increase in cases, Japan was amidst its second wave of the pandemic, illustrating that in a pandemic every action matters, both for the individual and their community, the country as a whole, and the entire world.

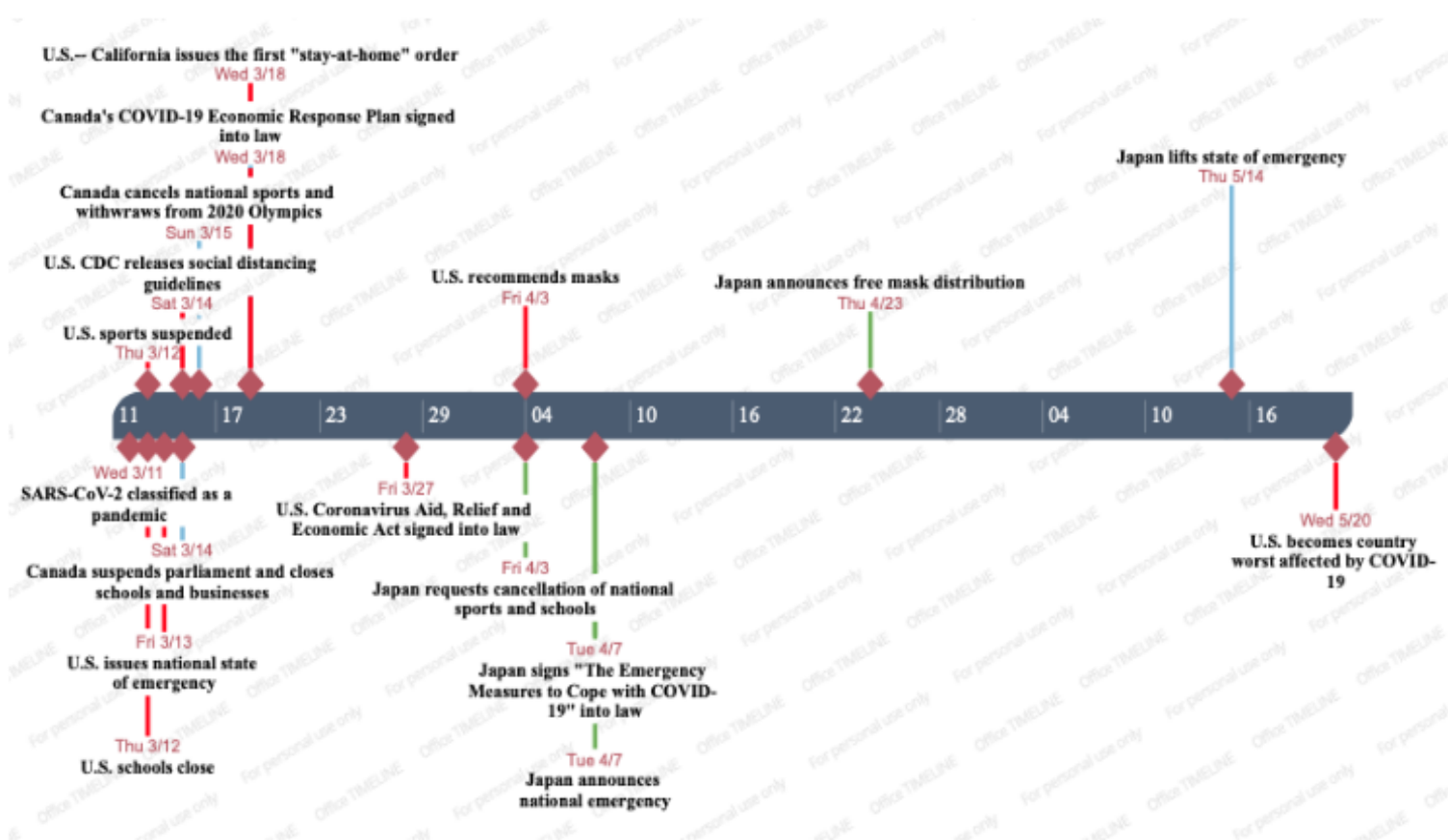


Figure 3. Timeline of major events during the COVID-19 pandemic from March 11, 2020 to May 20, 2020. United States (red), Canada (blue), and Japan (green), show varying responses at diverse times. The United States becomes the country worst affected by the pandemic both in case and death counts on May 20.

CONTINUED RESPONSE TO THE PANDEMIC

As Japan was hitting record low case numbers, reopening the economy, and effectively inducing another wave of cases throughout the nation by June 2020, the United States was still managing its first wave, with cases hitting over 2 million in the early days of June.²³ Cases in the U.S. were steadily increasing at an average of 50,000 new cases per day, evidently causing states to rethink their reopening plans, which arguably were being planned preemptively¹. By mid-June, the United States was focusing heavily on plans for reopening, and some states had already begun opening at limited capacities with minimized social distancing. However, as the nation passed 3 million cases on July 7, the high U.S. case total halted many states' plans to reopen, and in some states caused a reversion to increased social distancing measures such as reducing occupancy and gathering limits¹. Even as states were making plans to reopen the economy, the United States was consistently setting daily records for COVID-19 cases counts. On July 10, the U.S. recorded over 68,000 cases in one day, setting the seventh single day record in eleven days.⁴⁴ Millions of Americans had developed COVID-19, with thousands more cases being recorded single day, yet without guidance coming from the national government, many states were actively ignoring guidelines released by the CDC, and focusing energies on the economy, and reopening businesses and schools, with a push to return to normal.

For many critics, the push to reopen the American economy stems from the argument of lost wages and healthcare. More than 10 million Americans lost their jobs at the beginning of the COVID-19 pandemic, with another 5.4 million losing access to health insurance as a response to their job loss.⁴⁴ It is important to note that Americans, unlike Canadians and Japanese, were able to lose their wages and healthcare in the first place. As discussed, much of the economic

packages produced in Canada and Japan were designed to allow businesses to continue to pay their employees partial wages, in an attempt to curb increased unemployment rates as a result of shutdowns. While the ability to apply for unemployment was still available for many Americans, this did not include parents unable to find childcare as in Canada, nor the direct wage subsidies such as provided by Japan. For many Americans, losing their jobs also meant losing access to health care. Amidst a pandemic of a novel virus, with millions of individuals developing a new disease, millions of Americans were left with the fear and uncertainty of getting sick.

By August 1, after months of national and state governments misplacing their efforts and politicizing a medical crisis, the United States had recorded over 4.6 million cases, with 154,320 deaths.⁵³ After eight months into the pandemic, the United States was still experiencing the highest global COVID-19 case counts and deaths. In Canada, August 1, marked 116,312 cases and 8,941 deaths.²³ This translates to a death rate of 7.7% in Canada, higher than both the United States and Japan (Table1). The high death rate in Canada may be attributed to the greater number of Canadians living with chronic diseases. Attributed to their universal health care policy, Canadians experience a significantly longer wait time to receive medical intervention than many other developed countries, leaving more individuals living with chronic conditions, awaiting generally no-cost treatment, thus, roughly 9.9 million Canadians were living at risk of severe COVID-19 illness.² Paired with a country in need of hospital space, PPE, and other life-saving ventilation equipment, the result was a remarkably high death rate in a country widely known for its liberal approach to health care and medicine, yet unable to treat everyone in need.²

Table 1. Quantitative Analysis of Statistics Related to the COVID-19 Pandemic in the United States, Canada, and Japan on August 1, 2020. Cumulative counts taken December 31, 2019 to August 1, 2020.

	United States	Canada	Japan
Total cases of COVID-19	4.6 million	116,312	38,751
Average daily case count based on previous week	52,569	461	~900
Average cases per 1,000 people	14	3	0.3
Total deaths associated with COVID-19	154,320	8,941	1,026
Mortality %	3.4	7.7	2.6
Population	332 million	38 million	126 million

Sources: Data from Worldometer database, 2021.⁵³

As seen in Japan, the relatively low case total in Canada paired with a low average daily case count and a brief two-week period of no recorded cases falsely led the country to begin reopening procedures. Summer months in Canada were characterized by the reopening of many bars and restaurants, shopping centers, and various businesses, along with reduced social distancing guidelines, and the newly designed legislation to mandate the wearing of masks indoors.³³ By September 8, hundreds of thousands of students and teachers were reentering the classroom for the first time in over six months.³³

Throughout the country, restrictions continued to be eased at the provincial levels, allowing more people to congregate in smaller, more confined, indoor spaces. Looking back, it becomes abundantly clear, that each time a country or its jurisdictions, whether states, provinces or prefectures, lifted recommended public health guidelines and practices or reopened places of business, those geographic regions experienced a dramatic surge of cases. Thus it was no surprise that after months of lifting social distancing guidelines, increasing occupancy limits and reopening businesses, when PM Trudeau announced Canada was amidst its second wave of COVID-19 on September 23.⁴⁶ The announcement was unsurprising, given a constant and steady increase in daily cases, yet many provinces were still undergoing various phases of reopening during the days and hours leading up to the announcement.

In Japan, while August 1 marked just under 40,000 cases, the opposite interaction between the government and its jurisdictions was at play. In direct contrast to Prime Minister Abe's original proactive and liberal approach to the pandemic, by early August, he was being criticized for his now hands-off approach to containing and managing the virus. This left prefectures to declare their own state of emergencies, set their own recommendations and guidelines, and decide on closures and restrictions. While PM Abe was continuing with an approach emphasizing a balance on social and economic activities, on August 5 Aichi Governor Hideaki Omura became the second leader of a prefecture to openly break ranks with the Abe government, declaring a renewed COVID-19 state of emergency to run from August 6 to 24.³⁸ During the rest of his ministry, PM Abe continued a hands-off approach, until his resignation on September 16, when Yoshihide Suga became the new Prime Minister of Japan.³⁸

Without directly continuing PM Abe's indifferent approach, the Suga government placed a high emphasis on holding the postponed 2020 Olympics, and PM Suga began his ministry with

an emphasis on reopening Japan's borders. Three days after entering office, PM Suga announced that Olympic athletes will not be subjected to COVID-19 entry bans and began planning the 2020 Olympics for Tokyo on July 23, 2021.³⁸ For many, his immediate emphasis on what many would consider trivial during a global health crisis was alarming, and was only increased as he continued to lift travel restrictions for permitted visitors later in the month.

At this time in the pandemic, the governors of Japan's 47 prefectures were accustomed to designing and enforcing the various public health procedures which would best suit their region. In Tokyo, as promised to citizens by Governor Yuriko Koike, The Tokyo Center for Infectious Disease Control and Prevention was established on October 1, Tokyo's official version of the CDC, staffing about 80 individuals.³⁸ In response to over 80,000 cases now recorded in the country, the establishment of a center for research and development, education and outreach in the capital of the country was incredibly important. The goal of the Tokyo CDC was similar to that of the CDC in the United States, to maintain and prevent the spread of infectious disease, which amidst a pandemic was quite necessary. Despite various governor's attempts to mitigate the viruses' spread, PM Suga continued his approach to reopen Japanese borders; he released no country-wide recommendations or approaches to actively handle the spread of the virus. By the end of October, the number of confirmed COVID-19 cases in Japan had risen to above 100,000.³⁸ As cases continued to increase daily, and with no lockdown measures underway, the country entered its third wave of the COVID-19 pandemic in ten months.

CONCLUSION

Each country analyzed experienced multiple waves of increased COVID-19 cases occurring at different times when analyzed chronologically. However, the waves themselves, as well as how severe their effects were, can be predicted simply by looking at the actions of both the government and the people of that country leading up to the waves. Just as pandemics are not entirely random occurrences, are the result of relationships between humans and their environment, and thus are entirely preventable, waves of cases once a pandemic is underway are determined by allowing the virus to transmit between individuals in high traffic environments. When more individuals are able to congregate while the virus is in circulation, through lifting social distance guidelines, repealing or simply not enforcing mask mandates, or reducing occupancy limits and allowing businesses to reopen, more individuals are likely to get sick.

By November 2020, it had been clearly established that the onset of symptoms for COVID-19 ranges anywhere from 2-14 days. Countries were reporting increased cases of asymptomatic individuals, meaning that those who may not know they are infected and shedding the virus were able to transmit the disease to other susceptible individuals among lax social distancing procedures. Thus, there is an expected increase in cases each time a country relaxed its action against mitigating the virus' spread and ending the pandemic.

As mentioned above, a pandemic typically ends one of two ways: a medical end in which either a vaccine is derived or through the practice of NPI's, or through a societal end, in which people essentially grow tired of living under the constraints of a pandemic and return to normal life. The virus will continue to circulate until it has infected enough individuals that a majority of the population choosing to live without those constraints are no longer susceptible to infection

and the virus dies out or mutates. In the United States, just months into the pandemic, many were already feeling this push for a societal end, intensely reinforced by President Trump's politicization of the pandemic. This undermining of public health efforts at the highest American political office ceased only when President-elect Joe Biden was sworn in on January 20, 2021, also the end of analyses for this thesis.

In conjunction with silencing public health experts, repeated ignoring of those experts and CDC recommendations for the expense of the economy was prevalent throughout President Trump's dealings with the COVID-19 pandemic. When the CDC issued guidelines for reopening schools safely, President Trump dismissed this directive and threatened to withhold federal funding unless schools fully reopened; many did, and in several states subsequent coronavirus cases forced staff, students, and parents into lockdown.¹⁸ For months after the CDC's release that face masks did in fact limit the transmission of the virus, President Trump refused to wear a face mask and released multiple statements claiming his skepticism of the science behind their recommendation. While President Trump did not directly correlate the willingness to wear a mask being associated with democratic or more liberal views, his choice to not abide by public health recommendations set a precedent for both his fellow Republicans, and the rest of the country. This caused a clear divide in political parties, which came to be signified in the United States by one's willingness to wear a mask and thus comply with public health guidelines. An analysis by Pew Research Center revealed that Democrats and those who lean Democratic are more likely than Republicans and Republican leaners to say they personally wore a mask all or most of the time in the past month (76% vs. 53%) even after controlling for differences in the COVID-19 health impact in the communities where people live, Democrats are more likely to say they personally wear a mask all or most of the time.⁵⁶ The fact of the matter is that during a

global health crisis, during a pandemic which targets any susceptible respiratory system regardless of political affiliation, the simple act of wearing a mask which has repeatedly proven to greatly reduce virus transmission, should have never been made a partisan issue.

As much as a pandemic and the following of public health procedures during that time should not be made a question of national politics, it also should not be one of nationality. Repeatedly throughout the pandemic, President Trump referred to SARS-CoV-2 and the COVID-19 pandemic as the “chinavirus.” This not only serves a racist rhetoric used to point the blame, but divides countries which could be working together, sharing information, and collectively wiping out the virus. A pandemic is the global outbreak of a pathogen, which in this case has affected a total of 215 countries and territories, 85% of the entire world.²² Additionally, this is not a debate about where a pathogen arises, as the argument can be made that where there is supply there is demand, and again, this pathogen, like many others has arisen based on the unnecessary relationships established between humans, and in this case animals. The U.S. allocating \$451.9 billion dollars in trade from China during the year of the outbreak alone, shows America is but one of those demand factors, and thus there is no one finger to blame¹⁴. A pandemic is a global concern and should be treated as such.

The severity of SARS-CoV-2 as a global event can be depicted by examining cases and deaths of the virus since its outbreak. On December 31, 2020, exactly one year after the first publicized case of COVID-19--although cases have been suspected and confirmed as early as November 2019--83,982,673 cases and 1,850,597 deaths were recorded globally.⁵³ While China was the country of the original outbreak and served as the hotspot for infection for roughly two months, after the massive lockdown of Wuhan, the country seemed to turn a corner. As of December 31, China reported 100,000 cases and fewer than 5,000 deaths, yet the United States,

with roughly a quarter of China's population and roughly the same size in square miles, reported a total of 19.7 million cases and its death toll greater than 342,000.²³ Canada recorded 581,195 cases with 15,606 deaths on December 31; Japan recorded a total of 230,304 cases and 3,414 deaths also on December 31.⁵³ Canada has proven that even when a nation has an active national government enacting proactive response measures, each country is subject to various intrinsic factors such as a country's healthcare system. Japan illustrates that the willingness of the people may prove to be the greatest factor in reducing transmission and keeping numbers low. Conversely, within just three months of the pandemic's beginning, the United States became the country with the most cases and deaths of COVID-19 in the world, and has maintained that position since, repeatedly enacting guidelines and releasing information days, and sometimes weeks after other countries.

January 2021 in the United States saw 80,000 COVID-19 deaths, the most since the onset of the pandemic.⁵³ With vaccine distribution in the U.S. beginning slowly in mid-December, a daily increase in vaccinated individuals decelerated the upward trend in cases, and temporarily saved the United States from disaster. The development and administration of vaccines for SARS-CoV-2 for rich countries like the United States which have been unable to get a handle on this virus at any time throughout the course of the pandemic, may, if administered to enough individuals, be how the U.S. turns the tide against COVID-19.

Cases and deaths are caused in myriad ways, influenced by population variables, genetic susceptibility to the virus, living conditions, social structure, political attitudes, and cultural patterns, but are most affected by how and when a country responds. There are "best practices" but there is no single "right" way to respond to a pandemic; each nation is unique, as will be its response. However, comparing the responses of the U.S. at varying stages in this global health

concern to two very different countries illustrates that when the next pandemic does eventually arise, the United States has much work to do in terms of preparation and execution in order to prevent the catastrophic results we have witnessed thus far in the COVID-19 pandemic. A pandemic must both be prepared for and also actively prevented. Again, many pandemics are predicted based on contacts humans have with wild animals, arguably unnecessary contacts. Educating the general public about the dangers of pathogens from wild animals may aid in reducing the interactions and thus the chance of a zoonotic spillover event. While prevention is important, planning and preparation are vital, as pandemics are integral parts of all countries' histories. Pandemics will continue to occur; thus, the United States and every country should maintain an active, well-funded, and educated approach toward public health. When a pandemic eventually arises again, it must be approached in a progressive and forceful manner in which the goal should be preventing the virus from ever entering the country at all, while providing support to the country of the outbreak in order to reduce transmission and eliminate the virus. This is both a multi-step and multi-faceted process, requiring the willingness of every single person in the country, if not every single person in the world.

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