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COVID-19 Health Beliefs and Perceptions Impact on Individual Response to Future Health Emergencies

A Thesis in Psychology and Public Health

By

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Abstract

This study investigates the connection between individuals' health beliefs related to COVID-19 impact on their perception of government response to COVID-19 as well as their intention to respond to future health emergencies. Health beliefs focuses on individuals' beliefs about how risky a disease is to them as well as how they can protect themselves from it. Past literature has demonstrated that health beliefs play an active role in how we respond to a disease as well as how we view healthcare and government responses. This study tested whether individuals health beliefs related to COVID-19 impacted their opinions about government response as well as their intentions to respond to the next pandemic. Furthermore, this study also asked participants qualitative questions to get a more expansive view on what people thought COVID-19's impact on our future would be. This study included 179 American adults who were recruited using Amazon mTurk, an online survey platform. The results of this study showed that there was a correlations between 1) perceived severity of COVID-19 and future pandemic response intentions; 2) perceived barriers to COVID-19 and perception of US federal government response; 3) perceived severity and susceptibility to COVID-19 and perception of government response; 4) perceived severity and susceptibility and perceived benefits as well as vaccination status. This study reaffirmed some conclusions about health beliefs effect on perception of government as well as raised questions about COVID-19's impact on our future pandemic responses. Future research should continue to study how COVID-19 has impacted our willingness to respond to a future pandemic.

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Introduction

The Novel-Coronavirus-2019 (COVID-19) has had unprecedented impacts on all aspects of life globally. The initial outbreak had major economic and political repercussions as countries struggled to prevent the spread of the virus. Now three years later the world continues to struggle as new variants appear. COVID-19 has killed millions worldwide and upended the lives of millions more. COVID-19 first surfaced in Wuhan, Hubei province, China on December 31, 2019, when reports of multiple pneumonia cases with no known cause began to appear (Liu, Kuo, & Shih, 2020). In the ensuing weeks and months, this unknown illness was identified as a new coronavirus and quickly spread throughout China and to other countries in Asia. On January 31, 2020, the World Health Organization (WHO) International Health Regulation Emergency Committee declared COVID-19 to be a Public Health Emergency of International Concern, by which point COVID-19 cases had been reported in 18 countries around the world (Center for Disease Control, 2022). A little less than two weeks later, on March 11, 2020, the WHO declared COVID-19 to be a pandemic. In the ensuing weeks cases were reported around the world and countries began to take measures to prevent the spread in their countries through policies like the closing of borders, lockdowns, and closing on non-essential services.

There have been significant variations in how countries attempted to mitigate the spread of COVID-19. Since there was no vaccine available until 2021 all countries had to focus their mitigation strategies around non-pharmaceutical interventions (NPIs). Some countries decided to focus their strategies around the suppression of the virus which meant that they were trying to keep the number of close contacts to a minimum, by essentially stopping person to person transmission. COVID-19 suppression was demonstrated in New Zealand's response to the pandemic. In March 2020 when New Zealand had only 100 COVID-19 cases and zero deaths the

Prime Minister decided to take the suppression approach, with the goal of eventually eliminating COVID-19 within New Zealand (Baker, et al., 2020). For the following month country officials shutdown nonessential businesses, restricted travel within the country, prevented international travelers from entering unless they were willing to quarantine in a private facility, and banned social gatherings (Dyer, 2021). The strategy was deemed effective when country officials determined that there was no community spread by mid-May of 2020 (Dyer, 2021). New Zealand then went on to have little to no cases when they reopened internally, while still restricting outside visitors, until 2022 when they reopened there borders and saw a surge in cases (Dyer, 2022). The other strategy that countries used was mitigation, unlike suppression which has the eventual goal of eliminating the spread of the virus, mitigation instead focuses on reducing the impacts of the virus (Ferguson, et al., 2022 p. 3). This can be seen in the efforts of Western countries to "flatten the curve," which was aimed at getting people to lower their contact with other individuals to protect hospitals and doctors from becoming overwhelmed and being unable to provide for everyone who might need lifesaving measures. Furthermore, it can also be seen through the US vaccination strategy when the vaccine did become available, focusing on elderly individuals and people with underlying health conditions who would likely suffer the most health issues if they were to get COVID-19.

Three years since its initial discovery COVID-19 continues to have devastating effects across the globe. As of April 20th, 2022 there have been 507,015,168 reported cases globally with approximately 6.2 million deaths in 225 countries and regions (Johns Hopkins, 2022). The five countries with the greatest total number of COVID-19 cases reported are the United States, India, Brazil, France, and the Germany (April 21st, 2022) (Worldometer, 2022). The United States has accounted for approximately 16.31% of the total reported cases globally, as of April

19, 2022 (Elfein, 2022). Although the pandemic affected every country and many aspects of life around the world this paper will focus on the effects that COVID-19 had on individuals within the United States; with regards to health beliefs, perception of the government, and impact on response to future pandemics.

Literature Review

COVID-19 in the US

COVID-19 was discovered to have reached the US on January 17, 2020, when the first confirmed cases were reported in Washington State (Center for Disease Control, 2022). It was later predicted that COVID-19 had likely entered the United States (US) before January 17th, but went unnoticed. On March 13, 2020, two days after the WHO declared the situation to be a pandemic, President Donald J. Trump declared COVID-19 to be a national emergency (Center for Disease Control, 2022). In the following days, universities, schools, businesses, and recreational centers were closed and began performing in virtual capacities where possible, effectively putting the US into a lockdown. As COVID-19 cases and deaths continued to peak in early April and May 2020, the US turned to more restrictive social distancing measures, requiring that individuals be masked when in public places and putting restrictions on how many individuals could be in one place at a time. However, even as the US hit 103,700 total deaths due to COVID-19 there was still significant pushback from both the general public and government officials about some of the new restrictions (Stokes, et al., 2020). On the same day, April 3, 2020, that the Center for Disease Control (Center for Disease Control, 2022) recommended people wear masks in all public settings, President Donald Trump stated that this recommendation was voluntary and that he himself would not be wearing a mask (Prasad, 2020). “So with the masks it’s going to be, really a voluntary thing. You can do it, you don’t have to do

it. I'm choosing not to do it… They're [The CDC] making a recommendation. It's only a recommendation, it's voluntary" (Trump, 2020). When local officials stepped in to try and enforce social distancing and masking policies they were met with furious, even violent, constituents. In Stillwater, Oklahoma, officials had to retract masking requirements at restaurants and businesses because employees were getting verbally assaulted by customers who refused to follow local guidance. In Flint, Michigan a security guard was shot and killed during an argument with a citizen which was started when the security guard asked the individual to wear a mask (Prasad, 2020). These stories demonstrate the intensity of some individuals' beliefs regarding government mandates surrounding NPIs and their willingness to comply with public health advice.

The US public's response to COVID-19 pandemic has varied drastically between different individuals. Some individual instantly started isolating themselves to reduce their susceptibility, while others were convinced that there was no pandemic and the government was lying. Individuals' belief related to COVID-19 clearly affected there likelihood of responding in a way that protected themselves and others from getting the virus. COVID-19 clearly demonstrated how little the government and other experts understand about how individuals respond to communicable disease. In a world where new COVID-19 variants or a new virus altogether could emerge at any moment, there has been very little research as to how COVID-19 has affected US citizens willingness to respond to the next pandemic. COVID-19 in the US has helped demonstrate how important an effective and precise response to a pandemic is, with COVID-19 deaths reaching 1 million deaths and 81.6 million cases in the US alone as of March 29, 2022 (Worldometer, 2022), it has become clear that more research needs to be done to help predict and improve how the US public will respond to the next pandemic.

Psychological Models of Health Promotion

Health promotion is one of the key objectives of any public health initiative. Health promotion can take many different forms from awareness campaigns to cancer testing, but the end goal is always to keep people healthy. There are many different ways of going about making a happy and healthy community; one of the most common is looking to study or intervene with people's behaviors on the individual level. Individual-level interventions focus on changing the behavior, perception, attitude, and knowledge of individuals or families. These interventions focus on studying and changing how individuals respond to health issues (Minnesota Department of Health Center for Public Health Practice, 2019). Focusing on an individual's behaviors can have significant influence on the community in situations involving infectious diseases (Minnesota Department of Health Center for Public Health Practice, 2019). Individual models of health promotion focus on predicting how individuals will respond to different interventions based on factors like fear or self-efficacy. Some of the key examples of health promotion models that focus on the individual level are the Health Belief Model (HBM) or the Extended Parallel Processing Model (EPPM). These models started to gain momentum in the 1950s when the focus in the field of public health started to shift. Prior to the 1950s, medical care and patients' compliance with medical interventions were seen as outside the purview of public health (Rosenstock, 1974). In a time when infectious diseases such as tuberculosis, polio, influenza, etc. were commonplace and had significant detrimental effects on people's lives, it became important to understand what factors influenced people's decisions to engage in prevention strategies. This was when public health models started to become popular.

Health Belief Model

The HBM was created in the 1950s as a means to help social psychologists explain why people neglect to participate in initiatives that work to detect and prevent disease (Champion & Skinner, 2008, p. 45). The HBM has now become a tool that psychologists use to understand why some people take the initiative to screen for and prevent the spread of illnesses while others do not (Champion & Skinner, 2008, p. 46). The HBM uses the following six factors to predict people's behavior: 1) perceived susceptibility; 2) perceived severity; 3) perceived benefits; 4) perceived barriers; 5) self-efficacy; 6) cues to action (Champion & Skinner, 2008, p. 47). Perceived susceptibility measures how likely individuals' think they are to get a disease or condition. Perceived severity focuses on how serious individuals think a disease or illness would be in terms of consequences for health. Perceived benefits focuses on if individuals think that measures to reduce severity and susceptibility will be effective. Perceived barriers focus on the opposite of perceived benefits and, instead, deals with the things that prevent individuals from implementing preventative behaviors. Self-efficacy is an individual's belief that they can carry out the activities that can protect their health. Finally, cues to action refer to stimuli that trigger individuals to implement preventative actions (Champion & Skinner, 2008, p. 49).

The HBM was often used as a means to study people's vaccination intentions, specifically looking for factors that might influence vaccine hesitancy. Vaccine hesitancy is defined as the "delay in acceptance or refusal of vaccines despite availability of vaccine services" (MacDoland & The SAGE Working Group on Vaccine Hesitancy, 2015, p. 4163). Vaccine hesitancy was listed as one of the top ten challenges facing the world in 2019 (Chen et al., 2021). The likelihood of people accepting a vaccine is affected by such factors as: 1) if they believe the vaccine is reliable; 2) if they trust their healthcare professionals to dispense the

vaccine; 3) if they trust the scientist creating the vaccine; 4) if they believe the side effects of the vaccine to be worthy of the benefits (Chen, et al., 2021).

The HBM has been used in the context of COVID-19 to study people's vaccination intentions. One study had researchers give an online survey to 2,531 participants in China and discovered that individuals were more likely to be classified as vaccine-hesitant, if they had high perceived susceptibility to COVID-19 and if they had high perceived barriers to vaccination (Chen, et al., 2021). Participants with high perceived benefits of vaccination, high self-efficacy for vaccination, who agreed with recommendations from authorities, and who agreed with recommendations from friends and family were less likely to be vaccine-hesitant compared to those who did not (Chen, et al., 2021). A survey of 398 individuals in Israel determined that HBM variables, such as perceived benefits, cues to action, and perceived severity, significantly predicted people's COVID-19 vaccination intentions (Shmueli, 2021). The study also found that individuals who had received their influenza vaccine the year prior were 3.3 times more likely to plan to get their COVID-19 vaccine when it became available (Shmueli, 2021). Demographic factors were also determined as impacting vaccination intention; for example, participants aged 65 years or older reported a higher vaccination intention. Both Shmueli (2021) and Chen et al. (2021) demonstrate, using the HBM, that health beliefs can significantly affect people's intention to get vaccinated. The research also demonstrates that prior vaccination history impacts health beliefs about current vaccination decisions, and this information can be used to help predict individuals response to the next pandemic. Although there was a sizable amount of research on the HBM and vaccine hesitancy, the start of the pandemic triggered a new use for the HBM, which was studying people's health beliefs and their adherence to federal guidelines regarding social distancing and mask usage.

Badr et al. (2021) surveyed 2,435 individuals regarding their health beliefs and their individual-level risk factors regarding COVID-19 and NPI adherence. They found that young, unmarried, and non-college educated individuals ranked lower on measures regarding COVID-19 knowledge, threat, and control. Furthermore, in regard to mitigation strategy adherence males were more likely to report low levels of adherence and high levels of perceived threat. The results of Badr et al. (2021) support findings found across numerous studies which determine that compliance, especially with regards to mask use, is higher in demographics such as females, older adults (aged 50 or older), higher educated individuals, and married individuals (Seale et al. 2020). Seale et al. (2020) performed a meta-analysis of 53 research papers which looked at reasons that individuals did or didn't follow NPIs. Prior research regarding mask adherence during the 2009 H1N1 pandemic and Avian influenza found that people were significantly more likely to wear a face mask if they perceived that there was a very high risk of fatality if they were to be infected with H1N1 (Lau et al., 2010 p. 376-377). A survey in Taiwan found that individuals who did not have current correct knowledge regarding the fatality rate of Avian Influenza were less likely to wear a face mask (Kuo, Huang, & Liu, 2011 p. 3).

Extended Parallel Processing Model

The EPPM is similar to the HBM in that it is used to predict behavioral decisions. Instead of focusing on perceived benefits, barriers, and cues to action, EPPM breaks its focus into two categories: threat variables and efficacy variables (Popova, 2012 p. 455). Threat variables are perceived severity and perceived susceptibility, so extremely similar to the HBM. Whereas, efficacy variables are response efficacy, how effective is a proposed solution, and self-efficacy, how confident are you that you can successfully practice the solution? (Health Communication Capacity Collaborative, n.d.). The EPPM posits that people who suffer from higher health risks

associated with a disease and believe that interventions can help protect them are more likely to engage in self-protective behavior, meaning that in the instance of COVID-19 individuals would be more likely to get vaccinated or participate in social distancing measures. Studies have demonstrated that EPPM does a good job of predicting how people will respond to COVID-19. Results demonstrated that when people were fearful of COVID-19, they had high perceived severity and high perceived susceptibility; therefore, they were more likely to participate in COVID-19 mitigation efforts (Lin & Chen, 2021 p. 131). Another study performed on individuals in Canada found that participants with high perceived threat and self-efficacy were the most likely to follow government recommendations regarding the COVID-19 pandemic (Lithopoulos et al., 2021). The study also found that the best predictor of social distancing measures was self-efficacy (Lithopoulos, et al., 2021).

Political Affiliation and Government Perception

As demonstrated in the last year political polarization can have significant effects on the handling of a pandemic. From the start of the pandemic in the US, there has been significant polarization related to political affiliation. This polarization has become clear in the constant debate on how to best handle the pandemic response. In a study by Delvin and Connaughton (2020) at the Pew Research Center, the researchers found that 52% of the US participants believed that the country did not handle the pandemic well. This was one of the highest of the 14 countries sampled, with the percentage of disagreement falling below only the United Kingdom. The study also determined that there was a link between high political polarization and differences in perceptions of government response to the pandemic (Delvin & Connaughton, 2020). A study released in *Natural Human Behavior* determined that when a country is divided by political opinions during an event like a pandemic, people with different political beliefs are

inclined to draw different conclusions about threat and the behavior needed to mitigate this threat (van Bavel et al., 2020 p. 464). For instance, Democrats reported a higher mean risk perception compared to Republicans when asked about chances of getting infected within the next three months (26% vs. 22%), chances of getting hospitalized if infected (31% vs. 27%), chances of going broke in the next three months (21% vs. 13%), and chances of dying after contracting COVID-19 (22% vs. 18%) (Bruin de Bruin, Saw, & Goldman, 2020 p. 183). Along with differing views on risk perception, political groups in the US also have different perceptions of how the government is handling the pandemic.

The perception of the government's response to the pandemic has differed significantly among people in the US. In their study, Bickhame and Francis (2021) surveyed participants about their trust in the government with a particular focus on how trust differed between levels of the government. Most respondents reported that they strongly or somewhat trusted the information provided by the government regarding health information prior to the start of the pandemic. Participants reported that they trusted their state and local governments the most when it came to information about the stay-at-home order and information regarding social distancing. Regarding information about social distancing and the stay-at-home orders 80.39% of participants stated that they trusted the information coming from the local government and 82.35% said that they trusted the information from the state government; compared to 42.63% of participants said that they trusted the federal government's information about the stay-at-home-order and 48.18% of participants stated they trusted the federal government's information about social distancing (Bickhame & Francis, 2021 p. 196). Although the American public as a whole seems to trust the federal government less than the other levels of government when it came to reporting information about COVID-19 There are significant discrepancies in people's

perceptions when the results are categorized by political ideology. When asked about their confidence in the government lifting regulations at an appropriate time, 90% of Democrats participants shared concerns that the federal government would lift COVID-19 restrictions too early. Eight-eight percent of Democrats stated they had concerns about their state lifting COVID-19 restrictions too early. This is compared to 48% of Republicans who shared concerns about the federal government lifting COVID-19 restrictions too early and 46% of Republicans who shared concerns about their state government lifting restrictions too early (Bruin de Bruin, Saw, & Goldman, 2020, 181). The differences in opinions between political parties also occurred when participants were asked if they thought the government did a good job handling the pandemic. The majority of people who identified as Republicans said that they thought the government did a good job handling the pandemic (76%) (Delvin & Connaughton, 2020). In comparison, only a quarter of those who identified as Democratic or leaning Democratic said that they thought the US government had done a good job handling the pandemic (Delvin & Connaughton, 2020). Overall, the US did not rate well on citizens' perceptions of the government's reaction to COVID-19 when compared to other countries. The US also showed significantly more partisan disagreement than that measured in other countries.

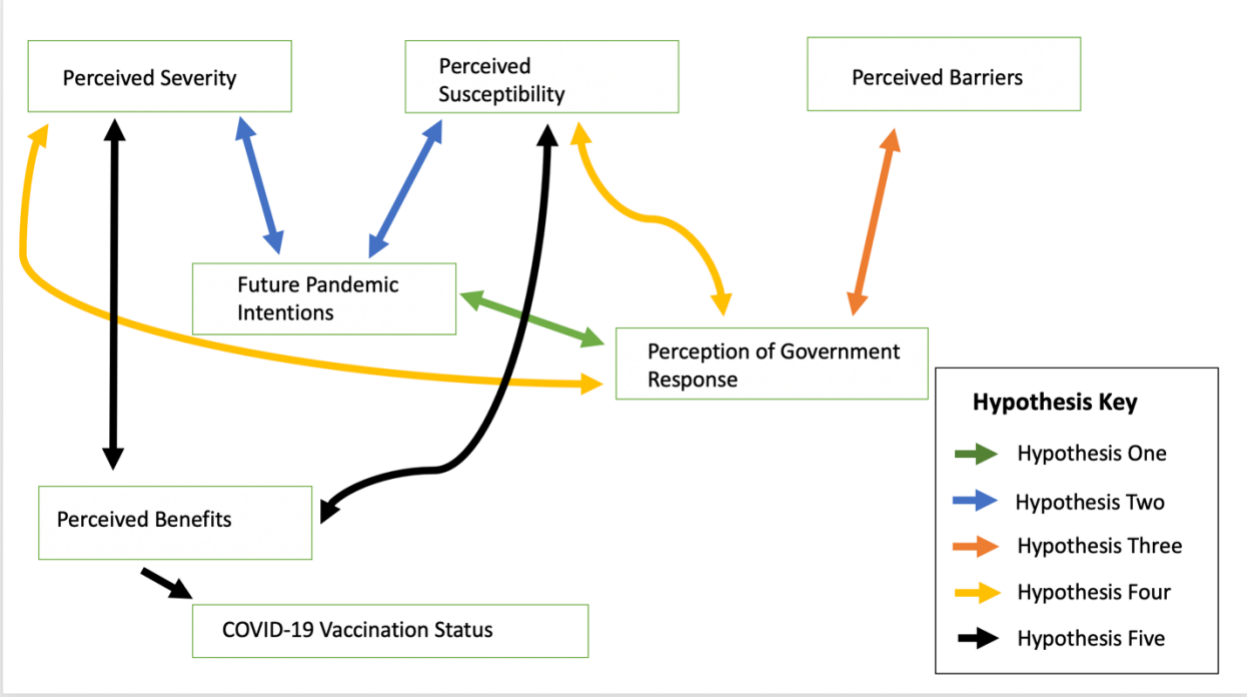
Current Research

Research has demonstrated that the HBM and the EPPM can help predict if individuals will perform actions to prevent illness or disease. The HBM and EPPM both included important variables which can help determine if COVID-19 might have effects on how participants might respond to future pandemics; however they both include factors which will not help determine this, because they are focused on how to get individuals to follow guidance. I decided to utilize the ideas in both of these two models. From the HBM we are using the ideas of perceived

benefits and perceived barriers which coincide with the idea of self-efficacy used in the EPPM, but do not always directly address the issue. From EPPM we are focusing on the factor of perceived threat, perceived susceptibility and severity.

Prior research has also determined that participants who previously received their influenza vaccination were 3.3 times more likely to intend to receive their COVID-19 vaccination (Shmueli, 2021 p. 9). Despite the considerable amount of research done on how behaviors surrounding influenza vaccination and risk avoidance behaviors there has been little research done on how people's response to the current COVID-19 pandemic might impact their views on the government's response to COVID-19 along with how likely they would be to adhere to government guidance regarding public health in the future. The current research will look at how individuals' health beliefs and perceptions of the government affect their response to a new pandemic. The study focuses on the health beliefs perceived severity, perceived susceptibility, perceived barriers, and perceived benefits and their impact on perceptions of the government's response to COVID-19 and all these factors impact on future pandemic response. This study will be testing five main hypotheses.

Figure One Model of Hypotheses



Hypothesis one argues that participants who had a positive perception of the US federal government's handling of COVID-19 will be more likely to follow the guidance in the hypothetical avian flu pandemic.

Hypothesis two establishes that participants who had higher perceived susceptibility and severity about COVID-19 are more likely to have a negative perception of the US federal government's response to COVID-19.

Hypothesis three explores whether people who had a higher perceived barriers will have a negative perception of the US federal government's handling of COVID-19.

Hypothesis four expects that participants with a higher perceived severity and susceptibility will have positive perceived benefits of following COVID-19 regulations and as such will be more likely to be vaccinated against COVID-19.

Hypothesis five predicts that participants who have higher perceived susceptibility and severity will be more likely to follow government regulations in a hypothetical future avian flu outbreak.

Methods

Participants

One hundred eighty-eight people participated in a survey upon receiving a survey link from the crowdsourcing website Mturk. One hundred seventy-nine participants were included in the analysis. Participants took an average of 19 minutes to complete the survey. Approximately 35.8 percent of participants identified as female and 64.2 percent identified as male. Participants were between the ages of 18 and 69 with the greatest number of participants (60.9%) stating that they were between the ages of 30 and 49. The vast majority of respondents identified themselves as being White (79.3%) with the second biggest racial group being Black or African American (11.7%). Of the respondents who answered the political affiliation question 31.3% identified as being most closely aligned with the Democratic Party, 12.3% being most closely aligned with the Republican Party, and 6.1% identified as Independents.

Procedure

This cross-sectional survey administered to participants 18 or older who had lived in the United States for the past six months. Participants were recruited using Mturk, which is a crowdsourcing website owned by Amazon. Participants were given the title of the research, a short description, and a few topic words in order to determine if they were interested in the study. When the participants clicked on the task on MTurk they were directed to a link that redirected them to the survey on Qualtrics. The survey was a cross-sectional survey that took place between January 6, 2022, to February 15, 2022. Participants were first asked to complete informed consent before they proceeded to the study questions. Participants were first asked

questions regarding demographic factors, their COVID-19 history, COVID-19 health beliefs, perception of US federal government's response to COVID-19, future pandemic response, and free-response questions about COVID-19. Participants were asked to answer the questions to the best of their knowledge. After completing the survey, participants were informed about the purpose of the study and thanked for their help. Participants were paid one dollar for their completion of the survey. This research received approval from Drew University's IRB, and all procedures were consistent with the ethical principles of the Declaration of Helsinki.

Measures

The survey question were adapted from a number of surveys previously given. These surveys focused on similar ideas as the current survey, including health beliefs, COVID-19, beliefs about government response, and future pandemic response intentions. However, unlike the current study, none of these research studies asked all the questions together, instead they were focused on one or two of the core ideas of this study rather than all of them. The reason for picking the following studies (view Appendix 1 for complete list of studies used to form the questionnaire) to guide the current research is because they provided clear and concise questions which focused on the objectives of the current research, while looking at other demographic groups or relationships between variables.

Avian Flu was used as the measure for future pandemic response intentions rather than another hypothetical or real disease because it provides individuals a hypothetical pandemic/epidemic with which participants might be familiar and which is different from COVID-19. It was important for the research that the questions focused on a virus which was similar to COVID-19 in its spread and mitigation strategies, however different in that it was not a variant of COVID-19. Since, we are trying to determine if people in the US might respond to a

future pandemic in a similar way to which they responded to the COVID-19 pandemic or if they would be more compliant with social distancing measures we need to make sure that participants saw a clear differentiation between the hypothetical and current COVID-19 variants and responses.

Demographic Information. Participants were asked to report information about their demographic characteristics. Throughout the demographic questions, participants had the ability to select "I do not wish to disclose" as their answer to the question. The first question participants answered as them how they identified themselves with the options of either female, male, or non-binary. They were then asked to report their age with the selection of either 18 to 29, 30 to 49, 50 to 69, and 70 or older. Participants then reported how they identified their race and ethnicity with the options of Asian American or Alaska Native, Asian, South Asian, Black or African American, Native Hawaiian or Other Pacific Islander, Hispanic or Latinx, White, or Mixed Race. After participants reported their race and ethnicity they were asked what their highest level of education was ranging from some high school to master's degree or higher. The next question focused on income; participants were asked to report their household income from 2019-2020 with the options of less than $20,000, $21,000 to $50,000, $51,000 to $100,000, $101,000 to $150,000, and greater than $150,000. The second to last question asked participants to report who was living in their household by age group. Finally, participants were asked if they took any prescription medications and if yes how many in intervals of two stopping at six. The final question of the survey asked participants to report their political affiliation. This question was placed at the end of the survey because we did not want it to affect participants' responses to the other questions. Participants were asked, "Regardless of it or how you are registered to vote, which of the following are you most closely aligned with?" Participants could either select

Democratic Party, Republican Party, Independent, Libertarian Party, Green Party, Other, or I do not wish to disclose.

COVID-19 History. For all questions within the COVID-19 history, section participants had the opportunity to answer "I do not wish to disclose." The first question participants were asked was, "have you ever had COVID-19?" Participants were then asked, "have you received the COVID-19 vaccine?" Participants were then asked if they responded yes to the question about receiving the COVID-19 vaccine they were asked to report their reasoning for doing so. Participants had the options of I want to protect myself, someone suggested I get it, my work/school required me to, I want to protect my friends and family, and other. The next question asked participants who responded "other" to the prior question to report why they received the vaccine. Participants who reported they had not received the COVID-19 vaccine were then asked to indicate their reasoning for not receiving the vaccine from the options: the vaccine was unavailable, scared of side effects, scared of needles, scared of getting COVID-19 from the vaccine, don't think the vaccine is effective, don't have enough information about the vaccine, or other. Participants who responded "other" were again asked to indicate what their reasoning for not receiving the vaccine was. Finally, participants were asked if most of their family and friends received the COVID-19 vaccine with the option of picking responses either yes, no, or I do not know.

Health Belief Questions. For the next section participants were asked to answer nine questions focusing on their beliefs related to COVID-19. For all questions in this section, participants were asked to rate their agreement on a scale of one to five. Participants were told that an answer of one meant that they strongly disagreed with the statement while an answer of five meant that they strongly agreed with the statement. The first set of two questions focused on

perceived susceptibility to COVID-19. The first statement that participants were asked to respond to was “my chance of getting COVID-19 in the past (February 2020- February 2021) was high.” The next question respondents were asked to respond to was “currently, my chances of getting COVID-19 are high.” The second set of two questions focused on the perceived severity of COVID-19. The first question in this section asked “complications of COVID-19 are very serious.” The second question participants were asked was “I will be very sick if I get COVID-19.” The third health belief measure was perceived benefits, participants were again asked two questions to determine this value. The first statement participants were asked to evaluate was “receiving the COVID-19 vaccine will decrease my chances of getting COVID-19.” Participants were then asked to indicate how much they agreed or disagreed with the statement; “wearing a mask and performing other preventative actions (washing hands, avoiding unnecessary travel, etc.) will decrease my chances of getting COVID-19.” The final three statements participants were asked to evaluate associated with health beliefs focused on perceived barriers. Participants were first asked to access the statement “I am concerned about the efficacy of the vaccines available to me.” Next, they were asked to evaluate the statement “I am concerned with the safety/side effects of the vaccination available to me.” Finally, they indicated their agreement with “I believe that the current recommended preventative actions (wearing a mask, washing hands frequently, etc.) are inconvenient to follow.”

Perception of government’s response to COVID-19. In order to determine participants’ perception of the government’s response to COVID-19 participants were asked to indicate their agreement or disagreement to 9 questions where one meant that they completely disagreed with the statement and five meant that they completely agreed. The first statement that respondents were asked was “the government helped me and my family meet our daily needs during the

COVID-19 epidemic in terms of income, food, and shelter." The second statement the participants were asked was "the government communicated clearly to ensure that everyone had the information they needed to protect themselves and others from COVID-19, regardless of socioeconomic level, migrant status, ethnicity or language." The next statement was "I trusted the government's reports on the spread of the epidemic and the statistics on the number of COVID-19 cases and deaths." The fourth statement was "the government had a strong pandemic preparedness team that included public health and medical experts to manage our national response to COVID-19 epidemic." The fifth statement was "the government provided everyone with access to free, reliable COVID-19 testing if they had symptoms." The next statement that participants were asked to assess was "the government provided special protections to vulnerable groups at higher risk such as the elderly, the poor, migrants, prisoners and the homeless during the COVID-19 epidemic." The next statement that participants reviewed was "the government made sure that healthcare workers had the personal protective equipment they needed to protect them from COVID-19 at all times." The second to last statement was "the government provided mental health services to help people suffering from loneliness, depression and anxiety caused by the COVID-19 epidemic." Finally, participants stated their agreement with the statement "the government cooperated with other countries and international partners such as the World Health Organization (WHO) to fight the COVID-19 pandemic."

Reponses to Hypothetical New Epidemic. In this section participants were given the prompt "Now you will be asked some questions about a possible outbreak in the U.S. of pandemic flu, a new type of flu that spreads rapidly among humans and causes severe illness. Currently, there have not been any cases of pandemic flu in the U.S. However, imagine that there was a severe outbreak in the U.S. and possibly in your community and a lot of people were getting very sick from the flu and the flu was spreading rapidly from person to person. Public health officials think

many people will get sick if there is a severe outbreak of pandemic flu. Those less severely sick would need to be taken care of at home rather than at hospitals. Only the sickest people would be hospitalized. I'm going to ask you some questions about two situations: if you yourself were sick, or if you were taking care of someone in your household who was sick from pandemic flu." After reading the prompt participants were answered the following questions. First they answered yes or no, "if public health officials said you should be prepared to take care of members of your household at home for 7 to 10 days if they become sick, would you be able to do that, or not?" The next two questions asked participants if they had the flu would they be willing to stay home for 7 to 10 days if officials told them to and then would you be willing to stay home to protect people even if they did not have the flu. For both of these questions, participants had the option of yes, no, or I do not wish to disclose. Participants then stated yes or no if they would be likely to follow recommendations by the government to help mitigate the spread of the flu. The first two statements participants responded to were: "would they be willing to avoid public events like movies, sporting events, or concerts"; "would they avoid going to malls and department stores." The next questions participant answered was would they be willing to "postpone family or personal events such as parties, weddings, or funerals," "limit your use of public transportation, such as buses, planes, and trains," "reduce contact with people outside your own household as much as possible," and "stay home from work and school." Respondents confirmed or denied if they were willing to "wear a mask in public" and "receive the flu vaccine." Finally, participants determined if they would be comfortable with "requiring people who are suspected or have avian flu to be quarantined at a private facility."

Free-Response Questions. The final section of the survey asked participants to respond in approximately 100 to 200 words to the following seven questions: "How did you feel when

you found out that a novel virus emerged in China?," "How did you feel when you found that there were confirmed cases in the United States?," "What are your main concerns with regard to the current situation?," "What would you change if you could do this?," "What do you think the post-lockdown period will be like in terms of health?," "What do you think the post-lockdown period will be like for society?," and "What do you think the post-lockdown period will be like in terms of human relations?"

Method of Analysis

The first step of our analysis was to combine scores for the questions regarding perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and perception of the government. We created composite scores for all of these values by combining all the participants' answers for the questions in each section and then dividing them by the number of question within the section. For example, for the composite score of perceived susceptibility we took participants answers for the questions "my chance of getting COVID-19 in the past (February 2020- February 2021) was high" and "currently, my chances of getting COVID-19 are high." We then averaged the answers to the two questions to get the composite scores. The composite score was then used to determine frequencies, correlations, and regressions.

The second part of our analysis required the recoding of several variables. Since participants answered question like "have you ever had COVID-19?" with yes or no answers, in order to run analyses yes was coded as one while no was coded as zero. This enabled us to determine if there was a correlation between certain health belief factors, vaccination, and if participants had had COVID-19. This recoding was also performed for questions regarding the responses to a hypothetical Avian Flu pandemic; yes was coded as two, no was coded as one, and I do not wish to disclose was coded as zero. Once all the responses to regulations were

recoded they were added together to get a total. The highest score participants could receive was 22 and the lowest was 0, if they responded that they did not want to disclose to every question.

Most of the analysis run in this study were correlations looking at the relationship between two variables. We also ran regression for hypotheses where we predicted there to be more than one factor influencing the outcome, in order to evaluate the relative strength of predictor variables on outcome variables. We only ran regressions when there was a significant correlation for at least one of the predicted outcome variables.

Results

Demographic

Gender. A total of 179 participants completed the survey, 64 of who identified themselves as female and 115 of whom identified themselves as male. More male than female participants reported that they had received a master's degree or higher (24.3% compared to 15.6%). However, the vast majority of both female and male participants reported their highest level education being at the Bachelor's degree level (female 71.9%; male 60.0%). The majority of male participants reported that they were not taking any prescription medicines (39.1%). Whereas, the majority of female participants reported that they were taking approximately one to two prescription medicines (48.4%). Furthermore, significantly more female participants reported taking one to two prescriptions compared to male participants (48.4% compared to 37.4%). Despite more female participants taking one to two prescriptions than male participants, there were significantly more participants male participants who reported taking three to five prescriptions than female participants (19.1% to 10.9%). In terms of income female and male participants were making similar amounts except there was slightly more male participants who reported making between $101,000 and $150,000 than female participants (10.4% compared to 6.3%).

Race. Most of the participants in the study identified as either Black or African American or White. Of these two racial groups more participants who identified as Black or African American reported having received a Master's degree of higher (33.3% compared to 18.3% White participants). In all the racial groups, except Native Hawaiian or Other Pacific Islander and South Asian (where there was only one participant in each of these groups, so we could not truly run an analysis), the majority of participants reported that their highest level of education was a Bachelor's degree. Both of the participants who identified as Native Hawaiian or other Pacific Islander and South Asian reported having received a Master's degree or higher.

For every racial group, except South Asian, Mixed Race, and Asian, the majority of participants reported that they were taking one to two prescription medicines. There was only one participant who identified as South Asian and three who identified as Mixed Race, all of whom reported that they were not taking any prescriptions. The majority of the participants who identified as Asian reported not taking any prescription medication. Participants who identified as Mixed Race and Hispanic or Latino reported the lowest incomes; with 75% of Hispanic or Latino participants making between $21,000 to $50,000 and 33.3% of Mixed Race participants reporting making less than $20,000. The racial group with the most participants making greater than $150,000 was participants who identified at White with seven participants. Black or African American, Asian, or South Asian all had one participant making greater than $150,000.

Table One Demographic Information

Variable	**Group**	**Percentage of Respondents**
Gender	Male	64.2
	Female	35.8
Age	18-29	26.8
	30-49	60.9

	50-69	11.7
Race	American Indian or Alaska Native	0.6
	Asian	3.4
	Black or African American	11.7
	Hispanic or Latino	2.2
	Mixed Race	1.7
	Native Hawaiian or Other Pacific Islander	0.6
	South Asian	0.6
	White	79.3
Education	Some High School	0.6
	High school diploma	5
	Some College	5.6
	Bachelor's degree (e.g. BA, BS)	64.2
	Master's degree of higher (e.g., MA, MS, PhD)	21.2
Medication	I do not want to disclose	0.6
	No	38.5
	Yes, 1-2 prescriptions	41.3
	Yes, 3-5 prescriptions	16.2
	Yes, 6 or more	2.2
Income	I do not want to disclose	0.6
	Less than $20,000	6.1
	$21,000-$50,000	33
	$51,000-$100,000	45.8
	$101,000-$150,000	8.9
	Greater than $150,000	5.6
Political Affiliations	Democratic Party	31.3

	Republican Party	12.3
	Independent	6.1
	Libertarian Party	1.7
	Other	.6
	I do not wish to disclose	.6

COVID-19 History

Overall, participants from both genders reported similar rates of prior history of COVID-19. Slightly more females reported having COVID-19 in the past compared to males (40.6% compared to 37.4%). Furthermore, 3.1% of females stated that they did not want to disclose if they had had COVID-19. Respondents who identified as Black or African American and Hispanic or Latino had more instances of having COVID-19 than the other racial groups (57.1% and 50%). For all other racial groups the majority of participants responded that they had not had COVID-19.

When it came to vaccination status for COVID-19 more females than males reported having received their COVID-19 vaccine (93.8% compared to 89.6%). Both female and male participants reported that their main reason for receiving the COVID-19 vaccine was to protect themselves. The second most popular reason for both female and male participants was to protect their family and friends. Although, for both genders, protecting family and friends was the second most popular reason, female participants were significantly more likely to choose this option than male participants (31.3% compared to 18.3%). Identical proportions of female and male participants reported that most of their family and friends received the COVID-19 vaccine (93.8% and 93.9%). Only participants in the racial groups Mixed Race or White report that they had not received the COVID-19 vaccine; whereas in all of the other racial groups all the participants reported receiving the COVID-19 vaccine.

Health Belief Model

The mean and median scores of all the health belief factors can be found in table two. Although the mean scores for most of the statements were around three, it was interesting to see that the most common response for all the questions in the perceived benefits was four. Meaning that more respondents selected that they agreed with these statements, compared to the other statements where most respondents said that they were neutral (most common score was a three).

Table 2 Frequencies of Health Belief Model Questions

Variables	Mean	Median	Std. Deviation
Composite Susceptibility	3.17	3.00	1.07
Currently, my chances of getting COVID-19 are high	3.04	3.00	1.33
My chance of getting COVID-19 in the past (February 2020-February 2021) was high	3.31	3.00	1.07
Composite Severity	3.45	3.50	.82
Complications of COVID-19 are very serious	3.80	4.00	.98
I will be very sick if I get COVID-19	3.15	3.00	1.14
Composite Perceived Benefits	3.76	4.00	.94
Receiving the COVID-19 vaccine will decrease my chances of getting COVID-19	3.61	4.00	1.23
Wearing a mask and performing the preventative actions (i.e. washing hands, avoiding unnecessary travel, etc.) will decrease my chances of getting COVID-19	3.91	4.00	1.00
Composite Perceived Barriers	2.90	3.00	1.33
I am concerned about the efficacy of the vaccines available to me	2.97	3.00	1.45

I believe that the current recommended preventative action (wearing a mask, washing hands, frequently etc.) are inconvenient to follow	2.83	3.00	1.48
I am concerned with the safety/side effects of the vaccines available to me	2.92	3.00	1.55

Government Perception

On average participants tended to be relatively neutral about their overall perception of the government's reaction to COVID-19 (N= 157, *M*=3.24, *SD*=.976). Participants voiced the most disagreement with the statement "the government provided mental health services to help people suffering from loneliness, depression, and anxiety caused by the COVID-19 epidemic" (N= 157, *M*= 2.99, *SD*= 1.279). For the rest of the questions, participants were relatively neutral with the means ranging from 3.06 to 3.49.

Table 3 Frequencies of Perception of Government response to COVID-19

Variable	**Median**	**Mean**	**Standard Deviation**
The government helped me and my family meet our daily needs during the COVID-19 epidemic in terms of income, food, and shelter	3.00	3.17	1.229
The government communicated clearly, to ensure that everyone had the information they needed to protect themselves and others from COVID-19 regardless of socioeconomic level, migrant status, ethnicity, or language	3.00	3.29	1.156
I trusted the government's reports on the spread of the epidemic and the statistics on the number of COVID-19 cases and deaths	4.00	3.46	1.130

The government had a strong pandemic preparedness team that included public health and medical experts to manage our national response to COVID-19 epidemic	3.00	3.06	1.267
The government provided special protections to vulnerable groups at higher risk such as the elderly, poor, migrants, prisoners, and the COVID-19 epidemic	3.00	3.23	1.198
The government provided everyone with access to reliable COVID-19 testing if they had symptoms	3.00	3.16	1.278
The government made sure that healthcare workers had the personal equipment they needed to protect them from COVID-19 at all times	4.00	3.32	1.150
The government provided mental health services to help people suffering from loneliness, depression, and anxiety caused by the COVID-19 epidemic	3.00	2.99	1.279
The government cooperated with other countries and international partners such as the World Health Organization (WHO) to fight the COVID-19 pandemic	4.00	3.49	1.054

Hypothetical Avian Flu Regulation Compliance

The average score of future intention was 19.28 meaning that most participants said that they would follow government guidance in a future pandemic situation (*M*= 19.28, *SD*= 3.223). The majority of participants had a composite score of 22 meaning that they said that they would comply with all the hypothetical regulations (24.0%). The second most common response was 21, meaning that participants said they would comply with every regulation except for one. The question that the most participants said that they would not comply with was that if the government required people who were suspected of had Avian Flu to be quarantined in a private

facility, only 65% of participants said they would comply with this and 30.6% said they would not comply.

Table 4 Frequencies of Future Intentions in Hypothetical Avian Flu

Question	Percent of Yes Responses	Percent of No Responses	Percent of I do not wish to disclose Responses
Requiring people who are suspected or have Avian Flu to be quarantined at a private facility	65.0	30.6	4.4
Receive a flu vaccine	76.0	17.5	6.5
Wear a mask in public	80.9	12.6	6.5
Stay home from work and school	76.5	18.0	5.5
Reduce contact with people outside your own household as much as possible	78.1	16.9	4.9
Limit your use of public transportation, such as buses, places, and trains	81.4	13.1	5.4
Postpone family or personal events such as parties, weddings, or funerals	72.7	18.6	8.7
Avoid going to malls and department stores	72.7	21.3	6.0
Avoid public events like movies, sporting events, or concerts	85.2	7.7	7.1
Suppose you had pandemic flu and health officials recommended that you stay at home, away from other people for 7 to 10 days. Is this something you would do, or not?	68.3	27.3	4.3
If public health officials said you should be prepared to take care of members of your household at home for 7 to 10 days if they	85.8	9.8	4.4

became sick, would you be able to do that, or not?			

Hypothesis One

We predicted that participants who had a positive perception of how the US federal government handled the COVID-19 response will be more likely to follow the guidance in the hypothetical avian flu pandemic. We found that there was no correlation between composite perception of the government and composite future intentions $r(157)= .067$ $p= .402$. Given that the *p*-value is greater than .05, we concluded that there is not a significant linear correlation between perception of government reaction and composite future adherence intentions. When we further broke down the composite future adherence intentions, we found that there was a weak positive correlation between perception of government reaction and requiring people who are suspected or have avian flu to be quarantined in a private facility $r(156)=.253$ $p<.001$. This means that participants who had a positive perception of the government's reaction to COVID-19 were more likely to respond yes to if they were okay with people being quarantined in a private facility.

Hypothesis Two

We predicted that participants with higher perceived susceptibility and higher perceived severity related to COVID-19 would have a negative perception of the US federal government's response to COVID-19. Instead, we found that as participants' perceived severity to COVID-19 increased their perception of the US federal government's reaction to COVID-19 became more positive $r(157)=.449$ $p<.001$. There was also a moderate positive correlation between perceived perception of the government's reaction and composite perceived susceptibility $r(157)=.399$ $p<.001$. It may be inferred that, as people viewed themselves as more susceptible to COVID-19,

they also tended to have a positive perception of the government's response. A multiple linear regression was used to test if participants' perceived susceptibility and their perceived severity related to COVID-19 significantly predicted their perception of the US federal government's response to COVID-19. The fixed regression model was: Government Perception= .224 (perceived susceptibility) + .394 (perceived severity) + 1.126. The overall regression was statistically significant R^2=.243, F(2,154)= 24.709, p<.001. This result implies that as perceived susceptibility and perceived severity increase, participants' perception of the government's handling of COVID-19 also increases.

Hypothesis Three

We predicted that people who had higher perceived barriers will have a negative perception of the US federal government's handling of COVID-19. Instead we found that there was a moderate positive correlation between composite perceived barriers and participants perceptions of the government's response $r(157)=.466$, $p<.001$. Our original prediction was based on the assumption that participants who had had high perceived barriers would not like that the government was enforcing mitigation strategies, like vaccination and wearing a mask, which they often did not agree with or had concerns about. In retrospect, just because participants might have not supported the government's intervention does not mean that they would disagree with the statements in the survey regarding perception of the government.

Hypothesis Four

Our fourth prediction was that people with higher perceived severity and perceived susceptibility will have a higher perceived benefit of following COVID-19 regulations and as such will be more likely to be vaccinated against COVID-19. To answer the first part of our hypothesis we found that perceived susceptibility moderately predicted perceived severity

r(179)=.482 *p*>.001. Perceived severity also weakly predicted perceived benefits of COVID-19 prevention strategies *r*(179)= .357 *p*<.001. Perceived susceptibility also weakly predicts perceived benefits of COVID-19 mitigation strategies *r*(179)= .158, *p*<.035.

We predicted that participants who were vaccinated for COVID-19 would be more likely to have high perceived benefits for COVID-19 compared to those who weren't vaccinated for COVID-19. COVID-19 vaccination status does weakly predict perceived benefits *r*(179)= .253 *p*< .001. Although this finding supports our hypothesis that people who received the COVID-19 vaccine would have high perceived benefits, we predicted that there would be a stronger correlation between these two variables than the findings demonstrated.

We also used a multiple linear regression model to determine if participants perceived susceptibility and perceived severity significantly predicted their perceived benefits. The fixed regression model was: perceived benefits=2.356+ .418 (perceived severity) - .016 (perceived susceptibility). The overall regression was statistically significant R^2= .128 F(2,176)= 12.922 *p*<.001. We found that perceived susceptibility did not significantly predict perceived benefits β= -.016 *p*=.816. We found that perceived severity was a stronger predictor of perceived benefits β= .418 *p*< .001. There was a moderate positive correlation between perceived benefits and COVID-19 vaccination status *r*(179)= .253 *p*< .001. Since COVID-19 vaccination status was coded as zero is no and one is yes. This means that as participants' perceived benefits increased, they are more likely to have received the COVID-19 vaccine.

Hypothesis Five

Hypothesis five is that participants who have higher perceived susceptibility and severity will be more likely to follow government regulations in a hypothetical future avian flu outbreak. We found that there was no correlation between perceived susceptibility and future

adherence intentions $r(174) = .008$ $p = .919$. We concluded that there is not a significant linear correlation between perceived susceptibility and future adherence intentions. When we ran further analysis of each individual measure of future adherence intention we found that there was a weak negative correlation between perceived susceptibility and would you reduce contact with people outside your household $r(176) = -.205$ $p = .006$. This means that as perceived susceptibility scores increased, participants become more likely to say they would not reduce contact with people outside the home. We did find a weak correlation between perceived severity of COVID-19 and future adherence intention $r(174) = .192$ $p = .011$. This means that as perceived severity increased, the future adherence intention also increased, meaning that participants were saying that they would adhere to the statements. When we further broke down the statements that created the composite future adherence intention we found a weak correlation between perceived severity and limiting the use of public transportation if asked $r(178) = .159$ $p = .034$.

Demographics. Although we did not find a correlation between composite severity, composite susceptibility, and future pandemic intentions for the participants overall, we did find that there was a correlation for those participants who identified as Black or African American. We found that for Black or African American participants there was a strong negative correlation between perceived susceptibility and composite future pandemic intention $r(20) = -.644$ $p = .002$. This means that as perceived susceptibility increased Black and African American participants reported that they would be less likely to follow regulations in a future Avian flu pandemic situation. For all the other races the correlation was positive however, the *p*-value was not significant. When the analysis of perceived severity and composite future intentions was run, the only significant test was found when studying the participants who identified at White. There was a weak positive correlation between perceived severity and composite future intentions

$r(139) = .217$ $p = .010$. This meant that for participants who identified as White as their perceived severity of COVID-19 increased they became more likely to agree to follow guidance in a future Avian flu situation.

We also found some correlations between future pandemic intentions and perceived severity for participants based on age. There was a strong correlation between perceived severity and intentions to follow guidance in a future Avian flu situation for participants aged 18 to 29 $r(46) = .528$ $p < .001$. This means that for participants 18 to 29 years old as their perceived severity increases they are more likely to say they would follow the guidance in an Avian flu situation. There was similarly a weak correlation between perceived severity and future pandemic intentions for participants who indicated that they had a Bachelor's degree $r(113) = .263$ $p = .005$.

Further Findings

Outside of our original hypotheses we also found a few other correlations that we thought were important. As expected, there was a negative correlation between perceived barriers and respondents vaccination status. Meaning that participants who had high perceived barriers associated with prevention strategies for COVID-19 were less likely to be vaccinated for COVID-19. Although there was a correlation, it was significantly weaker than we expected $r(179) = -.239$ $p < .001$. There was a weak positive correlation between if a participant had tested positive for COVID-19 and their composite perceived susceptibility $r(179) = .260$ $p < .001$. This meant that participants who reported higher perceived susceptibility to COVID-19 were more likely to report that they had tested positive for COVID-19. This correlation was to be expected as it is likely that part of the reason that participants stated they were more susceptible is because

of factors like occupation or home environment which might put them more at risk for contracting COVID-19.

There was a moderate positive correlation between composite perception of the government and composite perceived benefits $r(157) = .348$. This result was expected because we thought that if you believed COVID-19 mitigation strategies were helpful in protecting you against COVID-19 then you would be more supportive of the government's intervention in enforcing these mitigation strategies.

Surprisingly, there was a moderate correlation between participants' belief in the statement that the government provided mental health services to people who needed those services and perceived barriers $r(157) = .460$ $p < .001$. This was slightly surprising because we didn't expect there to be a correlation between participants' perceived barriers and government mental health services. Although, it is not surprising that participants who agreed less with statements like "I am concerned about the efficacy of the vaccine" or that they were scared about the side effects of the vaccine might believe that the US federal government did need to support people's mental health. However, we did not expect that individuals who agreed with statements saying they were concerned about the side effects of the COVID-19 vaccine would also say that they thought the US federal government provided mental health support to those suffering from mental health issues caused by the COVID-19 pandemic. It was also surprising to see that participants who perceived themselves to be more susceptible to COVID-19 also agreed that the government provided mental health services to those suffering from mental issues related to the pandemic $r(157) = .379$ $p < .001$. It was similarly surprising that there was a moderate correlation between how severe people perceived COVID-19 to be and the feeling that the government

provided mental health support for people suffering from mental health issues during the pandemic $r(157)=3.22$ $p<.001$.

Free Response

As the final part of the study the participants were asked to answer five open ended questions. These questions focused on their thoughts when they learned COVID-19 was discovered in China, when it was discovered in the US, and their main concerns regarding COVID-19. It also asked them to predict what post-lockdown would be in terms of health, human relations, society, and what they would change if they could. In total approximately 120 people answered each of the open-ended questions. However, many participants chose to copy paste information from other articles as their responses or wrote something which did not answer the question.

Of the respondents that did answer the questions the response varied greatly, however there were some significant themes. For the question centered on their thoughts when COVID-19 started in China the responses were a mixed bag; some participants focused on how they were extremely scared and were worried about the health and safety of themselves or their families. Whereas, others focused on their disbelief that the virus would ever actually make it to the US.

Discussion

As the US begins to look toward returning to normal, after two years filled with fear and anxiety stemming from a deadly virus, there are still many ways that the pandemic impacts us and will continue to impact us in the future. This paper aimed to look at some of the ways that COVID-19 has impacted our feelings and perceptions about the US federal government and how we might respond to a similar epidemic or pandemic in the future.

Through our research into individuals' opinion on the government's response to COVID-19; we found that there was no correlation between perception of the US federal government's handling of COVID-19 and individuals willingness to follow the guidance in the hypothetical avian flu pandemic. This finding surprised us because there has been significant research highlighting that people's perceptions of the government significantly affected their trust in the governments' requirements and strategies to stop the spread of a disease (Saechang, Yu, & Li, 2021; Chen et al, 2020). Furthermore, this research went a step further and found that individuals' trust in the government impacts people's compliance with government policies. One study found that there was a positive correlation between trust in the government and the likelihood of complying with mask mandates in Thailand (Saechang, Yu, & Li, 2021 p. 5). In addition, an analysis of 102,627 survey respondents across 58 countries found that public distrust in their government can lead them to have lower levels of compliance with government regulation. This is especially true in situations where the government has especially restrictive policies in place (Pak, McBryde, & Adegboye, 2021). However, the survey did demonstrate that when regulations are less restrictive, individuals with lower levels of trust in the government would be more likely to comply. This might be due to the fact that since there are less restrictions, they do not mind giving up small levels of freedoms or rights; however when the public health interventions begin to become too burdensome they will stop following government regulations (Pak, McBryde, & Adegboye, 2021 p. 229). This finding was supported by Chen et al (2020) which found that high political trust not only means higher compliance, but it also relates to higher effectiveness of policies related to COVID-19. In terms of trust, the biggest factor in whether people trusted the government's response was if they thought the regulations were too little or too much (Rieger & Wang, 2021 p. 980). This is likely one of the

main reasons we found no correlation between perception of government response and future Avian flu response. Since we gave participants a hypothetical scenario, it is hard for them to accurately determine how much of an effect the scenario is having on their health; therefore, it was likely hard for them to determine if the regulations we stated were really needed. Additionally, many of the survey questions, on perception of the government's response, focused on if the government provided services rather than truly gaging if participants trusted the government to be providing those services; this distinction means that there could be a gap in our survey where we need to measure not only perception of government response, but also trust in that response.

To our surprise we found that our hypothesis that participants with high perceived susceptibility and high perceived severity would be more likely to have a negative perception of the government was not supported. This was surprising because past research related to anxiety, optimism, perceived severity, and satisfaction with the government found that participants who had high perceived severity were less satisfied with the government's response to COVID-19 (Fragkaki, et al., 2021). One reason that these results might be different between the Fragkaki et al. 2021 and the current study is that the Fragkaki et al. (2021) study was performed in April and May 2020, meaning that participants were in the midst of the pandemic, prior to the vaccine, when it was unclear how many people would die before the virus slowed. When participants were in a state of constant anxiety about how deadly the virus might be and there was still so many unknowns, people would presumably be more critical of a government who was unable to answer the questions and dispell their fears. The participants in the current study were reflecting on their experience with COVID-19 and their perception of the US government. Now that we are returning to normal and understand significantly more about the COVID-19 virus, how it

spreads, how contagious it, etc. there is less anxiety than during Fragkaki et al.'s (2021) study. Since participants were asked to reflect on their perception of the government there is a high likelihood that they might see the response as positive now despite having had a more negative outlook during the pandemic. Finally, Fragkaki et al. (2021) surveyed participants in Greece, Germany, Netherlands, and the US the mixed set of countries means that the results might have been skewed by other countries being more dissatisfied with their governments while the US citizens alone might have felt satisfied with their government's response.

Our third hypothesis predicted that people who had higher perceived barriers will have a negative perception of the US federal government's handling of COVID-19. The analysis of participant response found the opposite to be true; participants who had higher perceived barriers had a positive perception of the government's response to COVID-19. The original hypothesis was based on the fact that individuals who did not support social distancing requirements and vaccination policies would be disappointed by the government having such a strong response and restricting their individual freedoms. This was supported by research done by Martin and Vanderslott (2021) which analyzed 7.89 million tweets in the US and UK that referenced either being pro-masking or anti-masking. While analyzing anti-mask tweets researchers determined that one of the major reasons that people were anti-mask was because they felt that the government was restricting their civil liberties and their right to choose what was best for their bodies (Martin & Vanderslott, 2021). In fact, individuals who had low perceived barriers had a negative opinion of government response; meaning they likely wanted the government to respond with stronger restrictions and were disappointed by the lack of services provided by the government. Martin and Vanderslott (2021) found that individuals who supported mask mandates were concerned about the often "confusing, changing, and unclear" guidance coming

from officials (Martin & Vandersloot, 2021). One of the reoccurring issues was the confusing guidance regarding what types of masks were required or allowed and where they were allowed (Martin & Vanderloot, 2021). In retrospect the questions about perception of the government focused on factors surrounding if people felt that the government provided access to things like testing, mental health care, etc. which even if they disagreed with the policies might still agree that the government had provided these things. Going one step further, individuals who had lower perceived barriers might be more judgmental about confusing government communication, because they wanted to follow the guidance but confusing messages made following the guidance difficult (Martin & Vanderslott, 2021).

Our hypothesis that participants with higher perceived severity and susceptibility would have higher perceived benefits and therefore be vaccinated against COVID-19 was supported. This aligns with previous research that found that people who reported being fearful of COVID-19 were more likely to report receiving the vaccination (Mertens, et al., 2021). In fact the research found that there was an eight percent increase in the likelihood of being vaccinated for every one point increase on the Fear of Coronavirus Questionnaire (Mertens, et al., 2021). The Fear of Coronavirus Questionnaire had respondents rate how much they agreed with eight states which focused on things like “I am very worried about the coronavirus”, if they were constantly following the news, if they took precautions to protect themselves from COVID-19, etc. (Mertens, et al., 2021) Although our hypothesis was supported, we were surprised to see that there was a weaker correlation between perceived benefits and vaccination status than we were expecting. This is likely due to non-medical factors which have been demonstrated to impact vaccination intentions. Our perceived benefits questions only focused on factors related to COVID-19 mitigation strategies and the perceived barriers questions focused only on the barriers

related to these mitigation strategies and the vaccine, but research has found that these only contribute to one-third of the reasons that people choose to either receive or not receive the vaccine (Killgore, Cloonan, Taylor, Dailey, 2021). The research found that nearly two-thirds of vaccination intention could, instead, be attributed to factors like worldview and demographics, which are therefore likely to contribute to the reason that perceived benefits explained so little of the variance in vaccination status. Although these factors were included in the study, there was not enough participants to truly determine their role of health belief factors, but we believe that they likely play a major role and should be studied further in the future.

Prior research has demonstrated that there is a strong connection between perceived susceptibility, perceived severity, and vaccination intentions for COVID-19. Researchers found that intention seems to be consistent with the Health Belief Model in that people who report higher perceived threat to health (perceived severity) and that have higher rates of COVID-19 in their community (perceived susceptibility) were more likely to report that they would receive the COVID-19 vaccine when it was available (Head et al., 2020). Up to this point there has been no significant research on how people's response to one pandemic might affect their response to COVID-19. There was a study done on how people might respond to a hypothetical flu outbreak which found that participants were more likely to state they would follow social distancing and other non-pharmaceutical interventions along with getting vaccinated if they felt that they would be more at risk of getting the hypothetical Avian flu (Bass et al., 2010). Our research found that there was no correlation between perceived severity for COVID-19, perceived susceptibility for COVID-19, and future pandemic response. This could be because participants felt that they did not know enough about the hypothetical situation to make conclusions about what guidance they would follow. Or that they thought the Avian flu would not merit the type of responses listed,

since most of them might associate the Avian flu with the seasonal flu which happens every year. Despite there being no correlation between the two factors overall, we did find an interesting correlation between composite future intentions and perceived susceptibility for participants who identified as Black or African American. This correlation was interesting because it was a strong negative correlation, the opposite of what we expected. We are unsure of what might have caused this interaction, so going forward future researchers might want to look more into the factors that determine people's response to future pandemics with a specific focus on racial differences in perspectives.

Further Finding

It was surprising to see that there was a correlation between perceived severity, perceived susceptibility, and perception of government mental health services. We expected that individuals who perceived themselves to be more susceptible and those who thought that COVID-19 would be severe for them might be suffering from mental health issues related to anxiety and loneliness because they would be more likely to isolate themselves from others. As such we expected that they might have a more negative view of the services provided to them by the federal government; instead, these individuals seemed to agree with the services provided to them.

Free Response Questions

Future Health. Overall participants had a negative perception of post-lockdown health outcomes. Most of the respondents focused on potential mental health outcomes, with many of the respondents talking about how much of a mental toll the pandemic has taken on many people.

> I think mental health will be even worse than before. Before the pandemic, we had a lot of mass shootings due to poor mental health. I think that might come

> back up again because the crazy people will notice that people are in large groups again and will have easy targets.

Other participants' responses focused on other aspects of health including healthcare institutions and physical health. Overall, the respondents who did mention health institutions in the future thought that they would likely take a while to recover or would continue to be overburdened as cases rose when restrictions were lifted. One such response said:

> I think honestly that it would be just like last time. Physical health would decline because our immune systems would all be shot from lack of exposure, and our mental health would be a wreck collectively, as it was after COVID lockdowns. Our healthcare organizations would be overburdened, and overworked and the workers unrecognized. Our healthcare policies would be equalized for a while and get better, and then they would get much worse again as special provisions ended and people could not keep follow up and long term care appointments due to the cost involved.

There were very few responses who said anything positive about post-lockdown health outcomes. Of the responses that were positive they tended to be hopeful in nature saying things like they hoped that we would learn from our mistakes in terms of response and preparedness. One participant said "And officials have learned what does and doesn't work as far as restrictions go. So obviously from those perspectives they can use their knowledge to be better prepared next time around. But all in all I think the post pandemic world will look similar." Participants also hoped that the pandemic would open the eyes of policy makers and officials to the desperate need of things like more reliable and significant mental health funding and support.

Societal Changes. When asked about how they thought society might change after lockdown participants had two types of responses: either they thought it would go back to normal or they hoped things would drastically change. Many participants stated that they anticipated that people would quickly forget about the mask mandates and social distancing and go back to their old ways. One participant stated:

> I think that things will most likely go back to normal. I think a lot of people have already gone back to normal. I live in a rural area and a lot of people only cared for about the first month and then they just got selfish. People will stop wearing masks. I think people will talk about the pandemic for a long time afterwards though because it has effected so many people negatively.

The concept of the US moving forward and past the pandemic was repeated across many of the free response questions. Many participants anticipated that there would be few systematic or cultural changes that would be noticeable in their daily lives; the only significant change that participants predicted was a technological change. These technological changes usually focused on the ability to be more flexible in terms of work location. After spending months and even years working from home many participants felt a continuation of this norm, to a degree, might take some of the pressure off feeling as though they had to be in the office in order to do work. Many listed that they hoped there would be a bigger push to work from home when you are sick or more opportunities to do things in a virtual manner if in-person is not possible. Although the hope of this change was listed as a positive change for some participants, others had a more negative outlook on this new technological freedom. A few participants listed some of the ways this new digital age has restricted our growth and understanding of one another. Many were concerned about the lack of physical connection brought on by only ever having met people online and how this could possibly affect compassion and understanding in the future; especially for the younger generations who had significant developmental milestones take place over zoom. One participant highlighted some of these concerns in their response saying:

> Many of us have been relying on social media and Zoom meetings to stay in touch with people during the pandemic. But, while I'm grateful that I can keep up with friends on Facebook or visit with folks via videoconferencing, these aren't really the same as seeing people in-person. Why? For one thing, social media doesn't always bring us closer together. People often heavily curate what they post online to make their lives appear carefree and wonderful, which leaves little room for sharing vulnerability—an important way to connect with others. And, of course, there's also a lot of alarmist news and clickbait on social media that can wreak havoc with your happiness. If you're looking for deeper connection there, you're bound to be

> disappointed. Zoom conferencing is an improvement, as you can see people face to face and have actual conversations. But it's tough to read body language on Zoom, and so it's harder to pick up on how people are feeling. Also, the science of touch shows us that we humans crave physical contact, which neither Zoom conferencing nor social media can provide.

Although we can hope that the technological abilities learned during the pandemic will open new doors for us in terms of connecting with individuals who might be too far away or otherwise unable to connect, it is important that we continue to seek out physical connection.

Policy Changes

As to be expected when participants were asked about what they would change about the current situation if they could, many participants focused on changing the government's response. As to be expected, both sides of the political spectrum had issues with the government's response, some wished that there was a stronger response while others wished that there had been no response at all. One participant stated their wish that the government had enforced mask use and vaccination more severely in the US. This participant also took their policy changes a step further by saying, "I would encourage online learning with limited in home support, telehealth and covid support healthcare would continue free of charge indefinitely. I would institute policies to make it so that sick people cannot go to work, and they are reasonably compensated during illness." This idea of making the services provided during COVID-19 more long-term was something that many of the participants who liked the government's response but wished it had gone further articulated as one of their hopes for the future.

There were also a significant number of participants who voiced their disagreement with the US government response at all. Saying things like COVID-19 was made-up, that masks don't work, or the government was massively corrupt and COVID-19 was all just a

conspiracy theory. Their disagreement usually led them to say something similar to the following participant's statement:

> Literally everything. I would have never "locked" anything down. When it was proven that lock downs didn't work, I would have immediately opened everything back up. I would have never required masks. If I did, after I read the studies and data showing they don't do anything, I would have immediately rescinded it. For a virus with an average mortality age around 80 and no risk to children, I would have never put covid positive patients INTO nursing homes and shut down schools. I would never have masked children. I would have been honest about the fact that covid poses no significant risk to children and it never has. I would have been honest about the fact that people under 40 have more risk from the seasonal flu. I would have been honest about the fact that the vaccines were never designed to "stop the spread." This was something literally known since day one, which politicians and media lied about anyway. I don't know what else I'm supposed to add because the entire premise of trying to "stop" a coronavirus was never realistic. I would have taken precautions with the elderly, been honest about the risks, focused on therapeutics, not tried to forcibly inject people with something they don't want or need, and basically do the exact opposite of everything that was done. The government, media and "experts," have been responsible for FAR more death and destruction over the past two years than the virus has.

Although this statement addresses some of the concerns about the government's response, there were also multiple responses who were significantly more agitated about the failings of the government.

Limitations

Although this study worked to identify some of the connections between people's health beliefs related to COVID-19, their perceptions of the government's response to COVID-19, and the impact that they might have on people's responses to future pandemics, there were some limitations within the study's design. First, one of the main concerns from participants within the study was that there was too much writing for the compensation provided. Participants were provided one US dollar for completing the study, however many participants complained that considering there was five free-response questions this level of compensation was unfair. As such there were numerous participants who dropped out of the study before getting to the free-

response portion of the survey and many who decided not to answer the free-response questions. This means that we did not get as clear of a picture of how participants felt about these issues. Along, with the issue of participants dropping out or not completing parts of the survey, we also experienced the issue of participants copy-pasting information they had found from sources online, often making it hard to determine if they had chosen this method because they truly believed the information they had found accurately answered the question or because they wanted to avoid writing answers to the questions. Although the responses of participants who chose to answer the free-response questions were thoughtful and helped researchers to gain a clearer idea of what some of the struggles and thoughts of people during the pandemic were, the amount of response which did not answer the questions meant that many of the responses provided little insight for the researchers.

The second big limitation of this study is the fact that participants were being asked to recall from their memory their behavior or anticipated behavior in situations. Although participants were asked to respond to the best of their ability how they would have or would respond in the situations provided it is unlikely that they were fully honest in all of their responses. Furthermore, since participants were asked to answer questions regarding controversial issues like if they are vaccinated, their perception of the government, etc. there is a chance they hid their true beliefs.

The third major limitation is that the study had a small sample size. Given that there were only 188 people who completed the survey, the participants' responses were not representative of the US as a whole. Furthermore, although the survey was able to gain a diverse range of participants, many of the demographic groups within the study were too small to be

representative to gain any meaningful information about their vaccination intention, health beliefs, perception of government response, and future pandemic response intentions.

Future Research

This research aimed to demonstrate how a current pandemic can impact people's response to a future pandemic on the individual level. So, much of the focus of recent research has been on how the government or healthcare systems will respond to the next pandemic, which is extremely important research. However, it falls short of focusing on some of the key factors which impacted COVID-19 spread, people's behavior. Governments' changing their responses is extremely important, but if people are coming into that situation burnt out and unwilling to respond to the next pandemic, then this is unhelpful. What we found is that some people are whole-heartedly ready to listen and adapt to how the government suggests they respond. With people responding to the free response questions saying things like:

> REGARDING THE CURRENT SITUATION WHEN IT COMES TO REGULATIONS THE US GOVERNMENT TOOK SEVERAL STEPS TO STOP THE SPREAD OF COVID-19,SO IT THEPEOPLES DUTY TO FOLLOW THE REGULATIONS .EVERY SINGLE PERSON SHOULD GET VACCINATED,SINCE IT GIVES THE IMMUNE TO PREVENT OURSELVES FROM THE COVID.

However, we also have people responding about how disappointed they are with the government's response. When asked about how they felt when they heard about COVID-19 arriving in the US, people responded with things like: "I was hopeful. I thought that we would have a strong response and wouldn't have to deal with it for too long. It turns out the government is useless no matter who is in charge." Overall, participants have reported many different feelings about the pandemic. It would be interesting to see in future research if they used focus groups rather than just asking participants to write response and enabled participants to really

talk to one another other about their what participants would say about their feelings toward COVID-19 and how they would respond to the next pandemic.

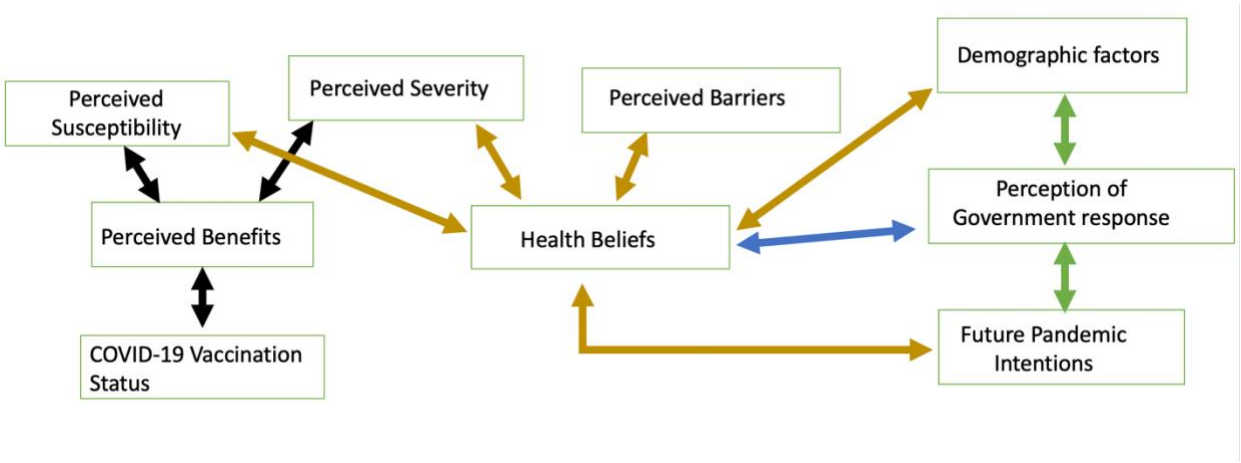
In the future research should focus on the topic of how COVID-19 will likely affect our response to future pandemics. Although the sample did seem to accurately demonstrate the US population in some factors it fell short in others like political affiliation, race, etc. A bigger participant pool might demonstrate correlations between some or the variables which did not have significant *p*-values.

As researchers in the future continue this work on how COVID-19 health beliefs and perception of government response impacted how the US population might respond to the next pandemic, we have a few recommendations in terms of adjustments to our original hypothesis model. We still believe that COVID-19 health beliefs will have an impact on future pandemic beliefs, however after we testing our hypothesis we have come to conclude that it is not just one part of the health belief system that determines this conclusion, rather it is likely an intermix of all the components plus demographic factors. Furthermore, in the future researchers would likely find a stronger relationship between health beliefs and future pandemic intentions if they have a large study, with a more diverse population; seeing as our survey only have 188 participants it is unlikely that this sample is indicative of the whole US and their health beliefs in relation to COVID-19.

Since, the hypothesis that people with higher perceived severity and perceived susceptibility would be more likely to have higher perceived benefits and therefore be more likely to be vaccinated for COVID-19 was true, we included it again in our model. We also think that in the future researchers should look at the role COVID-19 status plays in future pandemic intentions. It is possible that individuals who chose to receive the COVID-19 vaccine might be

more likely to say that they would follow government and expert advice when it comes to response to the next pandemic. Whereas, individual who chose not to receive the vaccine might be less likely to say that they would follow the more restrictive regulations and advice, like a forced stay at home order.

Figure Two Updated Model of Hypotheses



Finally, we changed our model for how the perception of the government's response to COVID-19 will impact future pandemic intentions. In the original hypothesis we stated that people with a positive perception of the US government's response to COVID-19 would be more likely to report positive future pandemic intentions, meaning that they would follow regulations. In the original hypothesis we did not account for the role that demographic factors such as race, political affiliation, age, etc. might have on perception of government response. If we had a bigger sample we might have been able to gain more information about how demographic factors impacted perception of government response and therefore future pandemic intentions.

Conclusion

The COVID-19 pandemic has forever changed the way we think about our ability to combat disease. The pushback against government regulations has demonstrated how significant

the reluctance and misinformation surrounding vaccination and public health measures go. In this study we looked at the ways that perception of the US government's response to COVID-19 and individuals' health beliefs might impact future pandemic response intentions. What we found was there is a connection between individuals' and their perception of the US government's response to COVID-19. We also found that there is a connection between health beliefs and individual's responses to COVID-19, in terms of being vaccinated. What our study was unable to determine was if there is a relationship between perception of US government's response to COVID-19 and individuals' future pandemic intentions or individuals' health beliefs and future pandemic intentions.

Furthermore, through the evaluation of participants' free response answers we were able to see commonalities among participants regarding fear and hope when it comes to the future of our healthcare system. As well, significant disagreement among individuals from different political ideologies around how they would have changed the US response to COVID-19 if they could and what they would potentially do differently during the next pandemic.

This research is incredibly important because we continue to deal with the threat of COVID-19, with the possibilities of new variants appearing and the possibility of a completely new virus appearing at any moment. Understanding what went wrong or well during the COVID-19 pandemic can and will provide a basis to determine what should be done in the situation of a new pandemic. Although, determining this on a government level is important, the most significant determinant of a public health initiative's success is individuals. Research on COVID-19 effects on future health reactions should continue to be at the forefront of research in order to best predict and improve how individuals will respond in the future.

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