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What COVID-19 tweets reveal about risk perception and safety preventative measures and behaviors two years into a pandemic

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WHAT COVID-19 TWEETS REVEAL ABOUT RISK PERCEPTION AND SAFETY PREVENTATIVE MEASURES AND BEHAVIORS TWO YEARS INTO A PANDEMIC

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WHAT COVID-19 TWEETS REVEAL ABOUT RISK PERCEPTION AND SAFETY PREVENTATIVE MEASURES AND BEHAVIORS TWO YEARS INTO A PANDEMIC

A

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Abstract

WHAT COVID-19 TWEETS REVEAL ABOUT RISK PERCEPTION AND SAFETY PREVENTATIVE MEASURES AND BEHAVIORS TWO YEARS INTO A PANDEMIC

Elizabeth Vargas

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The purpose of this study was to examine individuals Covid-19 risk perceptions two years into a long running pandemic. Data was collected analyzing risk perception and safety preventative measures to understand how individuals communicated risk in a health crisis that lasts more than two years. 116,401 tweets were collected from March 7-18, 2022, and analyzed utilizing a qualitative content analysis design. Four main classes were identified from the data which looked at how individuals perceived risk, how individuals determined risk from information that was shared, what preventative measures individuals were utilizing, and how individuals were living after the SARS-CoV-2 pandemic had lasted more than two years. Five conclusions were made at the end of identifying themes and subthemes and recommendations for further research were provided.

Keywords: COVID-19, SARS-CoV-2, risk, risk perception, safety, pandemic

Table of Contents

Acknowledgments iii

Abstract iv

Table of Contents v

List of Tables x

List of Abbreviations xi

Chapter 1 1

Rationale and Justification of the Study 1

Statement of the Problem 2

Research Questions 3

Justification of the Study 3

Limitations 8

Definition of Terms 8

Chapter 2 11

Literature Review 11

United States Response to Past Pandemics 12

United States Response to SARS-CoV-2 Pandemic 15

Measuring Risk 19

Behavioral Immune System Reactions 22

Disgust 22

Affect and Risk Tolerance Level 23

Social Factors 24

Demographic Factors 25

Communication 26

Trust in Information 28

Trusted Sources 30

Preventative Measures 32

Overview of Social Media 34

Twitter 35

Role of Twitter During the SARS-CoV-2 Pandemic 36

Fact Checking and Misinformation 38

Spread of Fear and Panic through Misinformation 39

Ignoring the Warning Signs 40

- Risk Homeostasis Theory 41
- Optimism Bias 41
- Reactance Theory 42
- Tribalism 43
- Confirmation Bias 44
- Individualism 45

Implications for Counseling Field 46

Summary of Current Literature 48
Chapter 3 50
Methodology 50
Assumptions and Rationale for Design 50
Participants and Role of Researcher 51
Data Collection Procedures 52
Data Analysis Procedures 53
Methods for Verification 53
Chapter 4 55
Results 55
Main Class One: Determining Risk 58
The Need for Honesty 58
Defining Misinformation 59
Uncertainty About What is Defined as Risky 60
Lying About Pandemic 61
Extreme Positions on the Impact of Covid-19 in Healthy Individuals 62
Main Class Two: Trust in Information 69
Political 69
Public Health Sources 74
Social Media Information 78

Main Class Three: Preventative Measures 82
Vaccines 83
Religion/Spirituality 84
Masks 85
Widespread Restrictions 86
Preventative Measures/Behaviors 87
Treatments 89
Main Class Four: Life Before/After the Pandemic 90
Mental Health 90
Nostalgia 91
Life After COVID-19 92
Normalizing Risk 93
Impact on Women and Children 94
Life on Hold 94
Humor 95
Discussion of the Results 96
Conclusions 103
Chapter 5 107
Summary, Implications, and Recommendations 107
Implications 109

Recommendations.....111

References.....114

List of Tables

Table 1. Number of Monthly active Users (MAUs) Worldwide…….35

Table 2. United States Twitter user Age Distribution by Percentages…….36

Table 3. United States Twitter user Race Distribution by Percentages……36

Table 4. Main Classes, Main Themes, and Subthemes……57

List of Abbreviations

CDC	Center for Disease Control
COVID-19	Coronavirus Disease of 2019
SARS	Severe Acute Respiratory Syndrome
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
WHO	World Health Organization

Chapter 1

Rationale and Justification of the Study

A *pandemic* is defined as "an outbreak of a disease that occurs over a wide geographic area and affects an exceptionally high proportion of the population" (Merriam-Webster, n.d., entry 3). Since the 1900's, the Center for Disease Control and Prevention (CDC) reports that five pandemics have occurred which include the (a) 1918 H1N1 virus; (b) 1957-1958 H2N2 virus; (c) 1968 H3N2 virus; (d) 2009 H1N1 virus; and (e) the SARS-CoV-2 which began in the US in 2020 (CDC, 2018; 2022a). Prior to SARS-CoV-2 there was an estimated 52.5 million deaths as a result of the four earlier pandemics (CDC, 2019a; CDC, 2019b; CDC, 2019c; CDC, 2019d).

On June 3, 2022, the World Health Organization (WHO), estimated roughly 526 million people have been infected with the 2020 SARS-CoV-2 and its respective variants (WHO, 2022b). Of those infected, 6,287,797 individuals have lost their lives as of June 3, 2022. To date, SARS-CoV-2 continues to mutate, and infections are ongoing (WHO, 2022b).

Decision making and risk perception during the pandemic has been influenced by social media, political persuasion, and news coverage not previously seen to this magnitude (Block et al., 2022). This study utilized a qualitative content manifest analysis design to analyze how individuals perceived risk two years into the ongoing SARS-CoV-2 pandemic. The purpose of this study was to examine individuals' risk perception, safety preventative measures, and COVID-19 related perceptions going into the second year of the SARS-CoV-2 pandemic. This information can be used to assist mental health professionals with understanding how individuals make decisions and perceive risk when numerous external factors are present.

Statement of the Problem

Multiple influences such as misinformation, changing recommendations and guidelines, conspiracy theories, inconsistencies with public officials, and ongoing scientific debate factor into decision making during the duration of the pandemic (Joslyn et al., 2021; Kumar & Nayar, 2020; Van Bavel et al., 2020). Prior research regarding risk perception and safety preventative measures is not available on a pandemic that has lasted more than a year and where multiple influencing factors exist (Joslyn et al., 2021).

Recent literature looks at risk from two main perspectives (Cialdini & Goldstein, 2004; Cruwys et al., 2021; Hlay et al., 2021; Kim & Crimmins, 2020; Li et al., 2020; Miller & Prentice, 1996; Myerson et al., 2021; Schaller & Park, 2011; Shook et al., 2020; Tybur & Lieberman, 2016; Van Bavel et al., 2020). Perspective one focuses on biological components using disgust, evolutionary factors, and behavioral immune systems reactions (Hlay et al., 2021; Schaller & Park, 2011; Shook et al., 2020; Tybur & Lieberman, 2016). Perspective two involves social factors like conformity, temporal shifts, and gains/losses (Cialdini & Goldstein, 2004; Cruwys et al., 2021; Miller & Prentice, 1996). When understanding risk, demographic factors have been considered such as age, political affiliation, and socioeconomic status (Kim & Crimmins, 2020; Li et al., 2020; Myerson et al., 2021). According to Zinn (2021) previous studies have not evaluated how individuals determine risk two years into the pandemic with numerous external compounding factors.

This research adds to the understanding of how individuals perceive risk and make decisions in a pandemic that has lasted for more than a year. By comparing this research with studies that measured risk perception at the beginning of the pandemic, risk perceptions could be

described over time. This information can be utilized for educational materials and campaigns to continue to combat the spread of the infection and assist in planning for future pandemics.

At present, little research exists to assist mental health professionals to aid clients in assessing risk and making decisions about a politically linked health crisis in an age of social media and conspiracy theories (Pennachio & Rice, 2004; Venegas-Murillo et al., 2022). This study utilized a qualitative content manifest analysis design to assess Twitter tweets for current perspectives on risk, safety, and preventative behavior related to SARS-CoV-2. This information can assist in understanding how individuals make decisions in a new era of external demands and numerous sources from which they receive information.

Research Questions

To understand how individuals were perceiving risk and defining safety preventative measures, the following questions were asked when analyzing Twitter data collected through a qualitative content manifest analysis design.

- How do individuals express concern regarding COVID-19 two years into a pandemic?
- How do individuals discuss safety, risk, and preventative measures two years into a pandemic?
- How do these expressions define risk two years into a pandemic?

Justification of the Study

During the early transmission of SARS-CoV-2, the CDC provided minimum recommendations like the slogan, “Cover Your Cough,” which suggested that individuals use a tissue, or their elbow to cover sneezes, wash hands for 20 seconds, and that you may be asked to wear a mask (CDC, 2020a, Cover your Cough). On February 27, 2020, the CDC tweeted a

recommendation that individuals did not need to wear face masks (CDC, 2020). This was followed by another tweet from the U.S. Surgeon General Dr. Jerome Adams on February 29, 2020, which specifically told individuals to not buy masks because they "are NOT effective in preventing [the] general public from catching #Coronavirus" (U.S. Surgeon General, 2020). Dr. Adams further linked the CDC guidelines at the time to support his claim.

On March 1, 2020, the WHO tweeted, "When to use mask • If you are healthy, you only need to wear a mask if you are taking care of a person with suspected #coronavirus infection. • Wear a mask if you are coughing or sneezing" (WHO, 2020b). At the end of March 2020, McReynolds (2020) found guidelines that still supported this claim. The CDC guidelines on masks according to McReynolds were, "If you are NOT sick: You do not need to wear a facemask unless you are caring for someone who is sick (and they are not able to wear a facemask)," and "[masks] should be saved for caregivers." According to Brown (2020) the CDC and WHO messages were sent to prevent fear and chaos even though prior studies showed that face masks and hand washing, if done correctly, reduce the spread of respiratory illnesses (Aiello et al., 2010; MacIntyre et al., 2009; Van der Sande & Sabel, 2008).

On March 13, 2020, SARS-CoV-2 was declared a nationwide emergency by President Donald J. Trump (White House Proclamation 9994, 2020). Individual states began lockdowns in an attempt to prevent further spread of SARS-CoV-2 (Moreland et al., 2020). By April 3, 2020, the CDC recommended social distancing, wearing a mask, and social isolation if infected (CDC, 2022a).

Further recommendations were made by the CDC to combat misinformation that was being disseminated (CDC, 2022a). For example, on March 19, 2020, during a daily briefing, President Trump stated that remsdesivir and chloroquine would be "a game changer," and added

that “they’re very powerful,” for treating SARS-CoV-2 (White House, 2020b). At that time, the Food and Drug Administration (FDA) had not approved either drug to be used in this manner (Ebbs, 2020, para. 5). Individuals began using over the counter chloroquine at home without a prescription from a doctor, which caused people to become ill and resulted in death for some (CDC, 2022a).

On March 28, 2020, the CDC released a warning on the Health Alert Network (HAN) to persuade individuals not to use chloroquine improperly and without a prescription (CDC, 2022a). With influence from President Trump, the FDA approved hydroxychloroquine (which is different from the over-the-counter chloroquine version) for emergency use in treating COVID-19 (CDC, 2022a). However, in June 2020 after evaluating data collected in the months prior, the FDA revoked the emergency use authorization as the medication was found to be an ineffective treatment (U.S. FDA, 2020).

Misinformation continued to spread as individuals distrusted public health officials due, in part, to comments and political persuasion by political leaders who supported Trump (McLaughlin & Sanders, 2021). President Trump discredited public health officials like National Institute of Allergy and Infectious Diseases (NIAID) director Dr. Anthony Fauci, White House Coronavirus Response Coordinator Dr. Deborah Birx, and the CDC on recommendations that were being made (Collins & Klein, 2020). An example of discrediting public health officials was when President Trump tweeted that Dr. Birx was “pathetic,” after she addressed concerns with the spread of SARS-CoV-2 (Collins & Klein, 2020, para. 3). President Trump also discredited public health officials and claimed that the reported SARS-CoV-2 cases and deaths were “far exaggerated” (Dzhanova, 2021, para. 3). On July 12, 2020, President Trump continued to add to mistrust by retweeting television personality Chuck Woolery’s post, which stated “the most

outrageous lies are the ones about COVID-19. Everyone is lying. The CDC, Media, Democrats, our Doctors, not all but most, that we are told to trust" (Mangan, 2020, para. 3).

Other tweets from President Trump were removed by Twitter after being flagged as misinformation (Haupt & Mackey, 2021). On July 27, 2020, President Trump tweeted clips from a video that were against Dr. Fauci, for the use of hydroxychloroquine to treat COVID-19, and against face masks and lockdowns (Sheperd, 2020). On August 30, 2020, President Trump retweeted information about inaccurate death statistics from COVID-19 (Lee, 2020). On October 6, 2020, President Trump compared COVID-19 to the flu, in a tweet which was subsequently removed (Hider, 2020). These tweets, as well as statements made by President Trump, referenced SARS-CoV-2 as a democratic ploy (Dyer, 2020). For example, President Trump tweeted, "Now the Democrats are politicizing the coronavirus. This is their new hoax," (Egan, 2020, para. 2). These statements were used as an attempt to minimize the impact of the pandemic and led to many conspiracy theories (Dyer, 2020).

On, March 17, 2020, human trials began for the SARS-CoV-2 Moderna vaccine (CDC, 2022a). Additional conspiracy theories circulated on social media (Ginossar et al., 2022) and vaccine hesitancy was noted in individuals that were hesitant about the vaccine due to mistrust (Eshel et al., 2022). Some conspiracy theories discussed vaccines as being unsafe, rushed, containing microchips, or as having the potential to shorten lifespans (Thelwall et al., 2021). Jamison et al. (2020) found that antivaxxers (those who were against receiving vaccines) posted on Twitter three times more often than those individuals in support of the vaccine. According to Wang et al. (2019), misinformation spreads more easily because stories that illicit fear are more interesting. Additionally, stories that lack scientific information are easier for individuals to understand (Wang et al., 2019).

On October 1, 2020, the CDC released a poster with the following recommendations to "Stop the Spread of Germs" (CDC, 2020b, Stop the Spread of Germs). The poster included instructions for people to (a) stay 6 feet away from other people; (b) cover coughs; (c) wear a mask; (d) avoid touching one's eyes, nose, and mouth; (e) disinfect frequently touched areas; (f) stay home if sick; and (g) wash hands with soap and water. The slogan "Slow the Spread" (CDC, 2020b, 0:40) was used throughout social media. Posts around this time showed how divided individuals were with regards to how to prevent the spread of the SARS-CoV-2 virus with ongoing debate as of 2023 (Batzdorfer et al., 2021).

According to Lin et al. (2016), crisis and risk communication is readily available through social media platforms. Wang et al. (2021) cited Twitter as one of the largest media sources that has been used to communicate crisis and risk-related information in the United States. However, Wang et al. also noted that during the early stage of the outbreak, inconsistencies in communication were prevalent. Hotez (2021) argued that even with the amount of information that was available, individuals blatantly ignored CDC and WHO recommendations and engaged in risky behavior in the spirit of medical freedom.

Although there is existing research addressing how individuals perceive risk and decide safety preventative measures, no research assessing these concepts in relation to the SARS-CoV-2 pandemic has been conducted (Zinn, 2021). Understanding how individuals adapt or change during a long-standing pandemic is crucial to safely guiding the global populace through future health crises. According to Zinn (2021), analyzing individuals' perceptions of risk and risk-taking behaviors during the SARS-CoV-2 pandemic could be used for interventions in future public health crises.

Limitations

This study utilized information that was readily available on Twitter. It is not possible to glean any reliable demographics from individual Twitter accounts (McCormick et al., 2017; Yildiz et al, 2017). As such, adequate representation of all individuals may not have been collected. This study cannot define who is the average Twitter person or who is not based on tweets alone. This study is limited to only the information that has been tweeted and did not include context from the individual that posted. When datasets were retrieved, it is possible that tweets related to the topic may have been missed due to search parameters. Statistics shared by Shepherd (2022) indicated that 92% of tweets are produced by 10% of Twitter users indicating unequal representation of content creation. However, twitter content is being shared and retweeted through more than 500 million tweets and retweets on a daily basis. Utilizing Twitter data was determined to be the best method for this study to allow for limiting social constraints around the topic.

Another limitation to this study is the timeframe of when data was collected. The timeframe utilized did not account for individual perceptions of risk three years into the pandemic. At the time of this writing, the SARS-CoV-2 pandemic was in the third year of being categorized as a pandemic.

Definition of Terms

The conceptual and operational definitions of the major terms in this study include the following:

- ***BOTS***

  A software program that can be designed to perform automated, repetitive, tasks. These are considered digital tools. In Twitter, bots can be utilized to automate messages, engage with other Twitter users, send tweet content, follow users, and retweet content (Shingh, 2022).

- ***COVID-19***

  COVID-19 is the disease that is caused by SARS-CoV-2 (WHO, 2023a).

- ***Endemic***

  An endemic is defined as "a disease that is constantly present in a certain geographic area or in a certain group of people (National Cancer Institute, n.d.)."

- ***Epidemic***

  An epidemic is defined as "an outbreak of disease that spreads quickly and affects many individuals at the same time (Merriam-Webster, n.d.)."

- ***Pandemic***

  A pandemic is defined as "an outbreak of a disease that occurs over a wide geographic area (such as multiple countries or continents) and typically affects a significant portion of the population (Merriam-Webster, n.d.)."

- ***Risky behavior***

  Risky behavior is defined as "any consciously, or non-consciously controlled behavior with a perceived uncertainty about its outcome, and/or about its possible benefits, or costs for the physical, economic, or psycho-social well-being of oneself or others" (Trimpop, 1994).

- ***Twitter***

  An online social media platform that allows individuals to send and receive text-based communication on the platform of up to 280 characters per message (Techopedia, 2013).

- ***Tweet***

  The message that is sent by an individual to followers they have on the online social media platform, Twitter (Techopedia, 2011b).

- ***Retweet***

  When an individual on the Twitter platform shares another person's tweet (Techopedia, 2011a).

- ***SARS-CoV-2***

  SARS-CoV-2 is a viral illness that causes the disease COVID-19; SARS-CoV-2 was first detected in December of 2019 (WHO, 2023b).

Chapter 2

Literature Review

Throughout history, there have been epidemics, pandemics, and endemics in the United States and across the world (Charters & Heitman, 2021; Meyer 2022). Which term is used depends on the prevalence of the disease in a local region versus worldwide and is not an indicator of how severe or deadly a disease is within the population (Meyer, 2022). According to the CDC (2012), an endemic is "the constant presence and/or usual prevalence of a disease or infectious agent in a population within a geographic area" (para. 2). The disease outbreak occurs in a specific region and remains present throughout the area (CDC, 2012). Examples of an endemic are malaria, coccidioidomycosis (valley fever), chicken pox, flu, and syphilis (CDC, 2012).

The CDC (2012) defined an epidemic as "an increase, often sudden, in the number of cases of a disease above what is normally expected in that population area" (para. 3). The CDC explained that epidemics are not just contagious diseases; other large scale health related behavior can be an epidemic as well. Examples of an epidemic may include an outbreak of hepatitis A. Ebola, yellow fever, smallpox, measles, obesity, smoking, opioid drug addiction, or polio in a population area (CDC, 2012).

The CDC (2012) further defined a pandemic as an "epidemic that has spread over several countries or continents, usually affecting a large number of people" (para. 3). Pandemics are global events that have included SARS-CoV-2, the1918 influenza, HIV, SARS, bubonic plague, and swine flu (CDC, 2012). Epidemics, endemics, and pandemics have impacted humans for thousands of years and are predicted to continue to be prevalent in our environment (Meyer, 2022).

United States Response to Past Pandemics

The United States has experienced multiple pandemics. Understanding how policies have been developed or changed with each new threat is relevant to understanding how the United States responded to the SARS-CoV-2 pandemic and to those that will emerge in the future (Cook & Cohen, 2008). Cook and Cohen (2008) believed that by utilizing patterns, strengths, and areas of growth from past pandemics such as the 1918 influenza, HIV, SARS, and swine flu, researchers could save lives through better responses. When reviewing prior responses to pandemics in the United States, McCarthy et al. (2022) noted that the United States responded to the 1918 Influenza pandemic with social distancing, wearing a mask, closing schools and businesses, and implementing quarantines. McCarthy et al. found that these measures had also been used with polio and tuberculosis outbreaks and were not considered a new tactic. Media played a significant part in distributing information and influencing public attitude (McCarthy et al., 2022).

McCarthy et al. (2022) suggested that even with the use of newspaper coverage, messages were unclear and coordination across the United States was inconsistent. According to the Dayton Journal, (as cited in McCarthy et al., 2022) terms such as “influenza hysteria” and claims such as “proper preventative measures and avoidance of hysteria, there is no danger of epidemic” increased criticism of measures that were being utilized (para. 2). Due to the lack of federal guidance, local areas had to enact laws and make public health decisions (Erwin et al., 2021; McCarthy et al., 2022). Without federal guidance, public health officials struggled to make decisions as there was no organization as noted by the Massachusetts State Department of Health when they stated, “the absence of uniform methods of organization . . . in the department of

health have bungled . . . the handling of the influenza pandemic" (Grand Rapid News, 1918, p. 1).

McCarthy et al. (2022) noted that socioeconomic status played a significant role in the death rate during the 1918 influenza pandemic as individuals from a lower socioeconomic status had almost double the death rate than those considered financially stable. When looking at life expectancy of individuals during the beginning of the SARS-CoV-2 pandemic in 2020, McCarthy et al. found that White males' life expectancy declined by 10 months and Black males' declined by almost 3 years. At the beginning of 2020, Black men were already had a life expectancy four years shorter than their White counterparts. The SARS-CoV-2 pandemic widened the gap to 6 years (McCarthy, 2022).

McCarthy et al. (2022) noted that with COVID-19, underlying health concerns such as obesity, hypertension, and diabetes are factors which increased the severity of the illness. Black and Hispanic Americans are more likely to be diagnosed with these health issues which is indicative of a health system that does not provide equal services (McCarthy, 2022). A correlation between severity of disease and demographic factors such as income, race, and gender classifications were noted in past pandemics as well (Brzezinski, 2021).

Brzezinski (2021) looked at the short and medium-term impact on income, wealth, and gender inequalities after the H3N2 Flu, SARS, H1N1 Swine Flu, MERS, Ebola, and Zika outbreaks. Brzezinski found that income inequality increased during a period of four to five years after the start of each pandemic or epidemic. Brzezinski noted that the pandemics and epidemics also impacted the gender gap in unemployment with more females unemployed at the start of the outbreaks. However, more females slowly returned to the workforce with each passing year. Brzezinski reported no negative inequalities on wealthy individuals.

Similar results were reported by Roberts and Tehrani (2020) when they compared the United States' response to the 1918 Influenza pandemic to the COVID-19 response. Roberts and Tehrani explained that the public health response to infections and outbreaks has hardly changed in the last 101 years; the same strategies are utilized, and the same challenges of inconsistencies and inequalities based on politics, race, and socioeconomics exist. Current examples of inequalities noted were testing and vaccination sites that are not easily accessible to individuals without transportation (Roberts & Tehrani, 2020). According to Roberts and Tehrani, data on race and gender were not available for several months after the start of the pandemic and by not having adequate reporting information, response teams could not be sent to areas that were most in need.

Roberts and Tehrani (2020) found that once data was available, there was an overrepresentation of African Americans testing positive for COVID-19. Concerns with a lack of aid being sent to areas such as Louisiana, which had cases doubling faster than in other areas, were noted. Roberts and Tehrani reported that mid-March through April 2020 Louisiana was ranked 5th in the nation with number of COVID-19 cases. It was suggested that 70% of the COVID-19 cases in Louisiana were among African Americans. Roberts and Tehrani linked the lack of response to ongoing racial injustices in the United States.

Dr. Victoria Harden, Lifetime Achievement Award recipient of the American Association for the History of Medicine and staff member at the NIAID, in a discussion regarding the public policy responses to epidemics in the United States, reported a lack of a response by the United States government to a pandemic based on moral concerns (Wilson Center, 2022). During the discussion, Dr. Harden stated that even though information about the transmission of acquired immunodeficiency syndrome (AIDS) was released from 1981 to 1982, the United States

government ignored the disease because of the population being impacted. Dr. Harden stressed the importance of medical research for future epidemics and all diseases should be taken seriously (Wilson Center, 2022).

According to Jedwab et al. (2021), the CDC called HIV the "4H disease" as it impacted heroin users, homosexuals, hemophiliacs, and Haitians (p. 8). Jedwab et al. found that throughout history when pandemics occur, there is evidence of scapegoating and persecution of minority groups. With the AIDS pandemic, the United States Surgeon General, Dr. Harden, did not begin an AIDS campaign until 1988, six years after the release of information (Wilson Center, 2022). Dr. Harden (as cited in Wilson Center, 2022) reported this was due to the initial reports of the disease impacting homosexuals and drug users. According to Dr. Harden, significant efforts to slow the spread of AIDS are still lacking (Wilson Center, 2022).

United States Response to SARS-CoV-2 Pandemic

January 20, 2020, the CDC reported the first recorded case of COVID-19 in the United States (CDC, 2022a). The United States government, in an attempt to stop the spread of SARS-CoV-2, placed restrictions on non-U.S. travelers that had visited China within 14 days. The restrictions went into effect on February 2, 2020, as the disease spread throughout China. However, the restrictions still allowed for U.S. residents to travel to and from China (CDC, 2022a).

Schucha (2020) reported that travelers from countries such as Italy, Austria, Denmark, Germany, Spain, and Sweden were allowed into the United States in February 2020, which was during the early transmission time of COVID-19. According to Schuchat, strains of COVID-19 collected in February 2020, indicated exposure from China, however, strains taken in March 2020 indicated the disease came from Europe and China. Additional travel restrictions on Europe

did not occur until March 13, 2020, when President Trump declared the SARS-COV-2 pandemic a national emergency (White House, 2020a).

Transmission of COVID-19 around the globe continued in March 2020 as cruise ships were still operating and returning to ports with infected passengers (Schuchat, 2020). A "No Sail Order" was issued on March 14, 2020 (CDC, 2022a). Warnings and public health notices were issued to discourage international travel and screening of travelers increased from January through March 2020, as cases increased in the United States (Schuchat, 2020). Concerns regarding accuracy of test results available from Emergency Use Authorization Packs of CDC SARS-CoV-2 diagnostic tests were reported in February of 2020 (CDC, 2022a). In response to these lab results and a shortage of tests, the U.S. Food and Drug Administration allowed for additional laboratories to create COVID-19 tests on February 29, 2020 (CDC, 2022a).

After President Trump declared COVID-19 a nationwide emergency, individual states began to implement various lockdown or stay at home procedures with no consistency among the 50 states (CDC, 2022a). Responses to COVID-19 varied across the United States as cases began to significantly increase in March 2020 (CDC, 2022a). On April 3, 2020, the CDC (2022a) issued a recommendation that masks be worn outside; four months after the first case was reported in the United States. According to the WHO Situation Report 71 (2022a), by March 31, 2020, there had been 163,014 reported COVID-19 cases and 2,836 deaths before masks were recommended outside.

Scientific and political recommendations varied as cases continued to rise (CDC, 2022a). On April 13, 2020, President Trump stated that funding to the WHO would discontinue (CDC, 2022a). Subsequently, Georgia, Alaska, and Oklahoma lifted restrictions even when the CDC did not recommend doing so (CDC, 2022a). On May 8, 2020, news outlets reported that the

White House had shelved the CDC "Guidance for Implementing the Opening Up America Again Framework" (CDC, 2022a). While large gatherings showed spikes in infections, on November 03, 2020, the CDC lifted the "No Sail Order," for cruise ships (CDC, 2022a).

The first COVID-19 vaccines were authorized in December 2020. The Pfizer-BioNTech and Moderna COVID-19 vaccines were released within the same week that same month (CDC, 2022a). According to the CDC, by December 24, 2020, an estimated 1 million people had been vaccinated in the United States (2022a). As vaccines were distributed recommendations from the CDC continued to shift and evolve (2022a).

Honein et al. (2020) reported that by December 2020, the CDC recommended the following public health strategies: (a) universal use of face masks; (b) physical distancing and limiting contacts; (c) avoid nonessential indoor spaces and crowded outdoor settings; (d) increased testing, diagnosis, and isolation; (e) prompt case investigation and contact tracing to identify, quarantine, and test close contacts; (f) safeguarding persons most at risk for severe illness or death; (g) protecting essential workers; (h) postponing travel; (i) increased room air ventilation; (j) enhanced hand hygiene, cleaning, and disinfection; and (k) widespread availability and coverage with effective vaccines. These strategies were intended to reduce the spread of COVID-19 and provide guidelines for states to safely reopen. Honein et al. (2020) suggested that multiple preventative measures would be necessary to combat the spread of COVID-19.

Although recommendations had been provided and vaccinations were being distributed, by January 19, 2021, the Johns Hopkins Coronavirus Resource Center reported that more than 400,000 Americans had died of COVID-19 (Nitkin, 2021). At the beginning of 2021, new variants from Brazil and South Africa were being detected in the United States (CDC, 2022a).

The Alpha, Beta, and Gamma variants were detected and concerns for potential future variants were noted by the CDC (2022a). By March 13, 2021, 100 million vaccinations had been administered in the United States and the CDC recommended that fully vaccinated individuals could gather indoors without wearing a mask (CDC, 2022a). Later in that month, the CDC posted recommendations that schools could socially distance 3 feet instead of 6 feet (2022a). This was followed by recommendations that fully vaccinated individuals could travel within the U.S. without needing a COVID-19 test before departures (CDC, 2022a).

A third wave of infections began in the summer of 2021 when the Delta variant spread rapidly (CDC, 2022a). During this time, the CDC (2022a) recommended that individuals should wear masks in indoor environments with high rates of probable transmission. To determine if an area had high rates of transmission, individuals could utilize the CDC website and search by state and county (CDC, 2022a). The COVID-19 Data Tracker (CDC, 2022b) was updated weekly to reflect changing situations as cases increased or decreased in an area. Further research utilized by the CDC late in 2021 indicated that vaccines offered more protection than a previous infection (CDC, 2022a). Additionally, the Pfizer-BioNTech pediatric vaccine for children between the ages of 5 and 11 years old was approved on November 2, 2021 (CDC, 2022a).

As of November 2022, the CDC COVID Data Tracker indicated that 84,636,391 individuals have been infected and 1,003,925 individuals in the United States had died from COVID-19 (2022b). The CDC also estimated that there had been 258,800,250 individuals that received at least one dose of the vaccine which represented roughly 82.8% of the population (2022b). Recommendations from the CDC varied based on individuals being at low or high risk for severe illness or death in combination with the degree of transmissibility in a given environment (CDC, 2022c). At the end of 2022 the CDC recommended (a) that people may wear

masks at any time, (b) if infected, quarantine and isolate based on vaccination and prior infection status, (c) testing if symptoms are present, (d) masking when ill, and (e) staying up to date with COVID-19 vaccines (CDC, 2022d). Ventilation in public indoor spaces was suggested for all levels of community exposure as was screening/testing for medium and high-risk exposure areas (CDC, 2022d).

The CDC continues to provide recommendations, but the degree to which these guidelines are followed is left up to individuals, businesses, and states (CDC, 2022a; Erwin et al., 2021; Zimmerman, 2020). These decisions depend on how an individual perceives the risk of catching COVID-19 and the severity of symptoms they may experience, as well as how they interpret information, and their overall experience with COVID-19 (Rubin et al., 2010; Taylor, 2019; Vicente Lugo-Gonzalez et al., 2020). After reviewing decisions made during the SARS-CoV-2 pandemic by individuals and varying agencies, Gostin and Wetter (2022) reported understanding how individuals make tradeoffs while measuring risk and evaluating changing information is crucial to defining policies and preparing for pandemics.

Measuring Risk

Merriam Webster (n.d.) defines risk as the "possibility of loss or injury, someone or something that creates or suggests a hazard, and the degree of probability of such loss" (entry 4). Athearn (1971) reviewed risk terminology, and noted definitions have a common theme that "equate risk with uncertainty" (p. 639) and refer to events in the future. Crow and Horne (1957) (as cited in Athearn, 1971) found that "risk does not cause uncertainty but rather that uncertainty results from the entity's interpretation of reality" (pp. 641-642). How an individual perceives and interprets the event will define how and if they see an event as a risk (Athearn, 1971).

Athearn (1971) explained that decision theory and risk theory are used to understand how an individual will decide what choices to make. Decision theory looks at how an individual makes choices when there are multiple possible outcomes (Athearn, 1971). Athearn noted that using decision theory, the individual makes a choice by creating expectations of the event. Risk theory is used to understand how decisions are made in relation to potential negative consequences (Athearn, 1971).

Utilizing decision theory to assess how individuals make decisions, Lewis (2022) proposed that during the SARS-CoV-2 pandemic, individuals were faced with making four decisions regarding vaccination. When applied to individuals deciding on whether to get the COVID-19 vaccine or not, Lewis defined the choices as getting the vaccine or not with possible outcomes of contracting COVID-19 or not. According to Lewis, decision theory requires one to identify the agent(s), the agents' choices, potential outcomes, and the possible outcomes in relation to the various choices. Lewis (2022) hypothesized that individuals struggled making decisions because they were unable to determine related probabilities to the possible outcomes when analyzing the payoffs.

Lewis (2022) used concepts from decision theory and stated that when an individual is struggling to decide, the individual should use the "maximin criterion" to "pick the choice that has the largest possible minimum payoff" (p. 212). In this example, Lewis implied that the best choice would be for an individual to get that vaccine such that should they contract COVID-19, they would likely have fewer severe symptoms. Lewis noted that individuals that have decided not to get vaccinated may be utilizing the maximax criterion of the theory where individuals pick the "largest possible maximum payoff" (p. 213). Lewis explained that, under this condition, the decision maker ignores the idea that the individual will get COVID-19 or have any negative

symptoms. Lewis pointed out that societal factors, such as being required to get vaccinated for employment and education, may significantly impact an individual's decision-making process as more incentives or consequences are in place.

Examples of how individuals attempt to gain control within unpredictable environments can be seen through the use of insurance (Rawlings, 2016). Rawlings (2016) wrote that insurance was created to recoup loss and create a sense of certainty against the unpredictable for hundreds of years. Rawlings reported that the first attempts at creating an insurance system date to the 1570s when merchants attempted to create a system of protection against loss. The first insurance company in the United States was The Friendly Society which opened in 1735 (Insurance Information Institute, 2022). According to the Insurance Information Institute (2022), insurance is used as a means to insure against the unknown by transferring the risk to a company that, for a fee, will reimburse financial losses. The risks are shared amongst numerous policy holders such that potential losses will not overwhelm or financially debilitate the insurer (Insurance Information Institute, 2022).

Vaccines can be seen as insurance against the chance of catching an illness and a reduction of the risks to oneself and others (Pauly, 2017). Hesitancy around vaccines has been prevalent since their introduction (Nyawa et al., 2022). When studying individuals that were hesitant to receive a COVID-19 vaccine, Bennett et al. (2022) found that individuals that had the risk of possible job loss or an increase in health insurance premiums would opt to receive a vaccine. Bennett et al. (2022) suggested external pressure persuaded individuals to get the vaccine while they considered their perceived risk of getting COVID-19.

Behavioral Immune System Reactions

Understanding how an individual manages their perceived risk of contagion has been examined from various angles including that of evolution (Schaller, 2011). Studies have revealed that when humans are faced with the risk of contagions, behavioral immune system reactions occur (Hlay et al., 2021; Schaller, 2011; Schaller & Duncan, 2007; Schaller & Park, 2011; Shook et al., 2020). Behavioral immune system reactions prompt heightened sensitivities to threats and discriminatory social behaviors (Schaller, 2011). Schaller (2011) described the functions of the behavioral immune system as detection, response, and functional flexibility as heightened sensitivities reduce the risk of infection through modified social interactions.

Schaller (2011) explained that discriminatory social behaviors serve to safeguard humans against exposures to perceived threats and contagions. For example, Schaller described how part of the discriminatory response utilizes an individuals' sensory systems to detect possible contagions. With regards to SARS-CoV-2, Shook et al. (2020) discovered that individuals with higher levels of germ aversion and pathogen disgust sensitivity had a kind of a behavioral immune system responses for SARS-CoV-2 and were more likely to utilize recommended preventative health behaviors. However, Schaller described how the behavioral immune system can be overridden, increasing an individual's risk of possible infection.

Disgust

Another key biological concept for avoiding disease is the evolutionary advantage of disgust (Schaller, 2011). Disgust is defined as something that provokes loathing, repugnance, or aversion (Merriam-Webster, n.d., entry 1) and can be a crucial avoidant behavior when it comes to perceived risks and the behavior immune system (Curtis & Biran, 2001; Curtis et al., 2004;

Curtis et al., 2011; Oaten et al., 2009). Disgust can adversely make an individual reject a perceived threat (Curtis et al., 2011).

Hlay et al. (2021) added to prior behavioral immune system and disgust research by examining the relationship between current pathogen risk and levels of disgust. Hlay et al. conducted two studies to test individual levels of disgust when associated with local communicable disease death rates. Hlay et al. surveyed 361 individuals in study one and 821 individuals in study two. Hlay et al. utilized Tybur et al.'s (2009) Three Domains of Disgust scale in study one to measure the severity of disgust across sexual disgust, moral disgust, and pathogen disgust domains. In study two, Hlay et al. utilized correlation statistics to identify perceived risk of COVID-19 and levels of disgust. In both studies Hlay et al. tested the hypothesis that as perceived mortality rates increased individuals' perceived infection exposure and disgust sensitivity would increase.

Hlay et al. (2021) found that when faced with the risk of contracting COVID-19, individuals in the study engaged in elevated levels of disgust and avoidance behaviors. Hlay et al. reported that both studies show that individuals' perceptions of risk and mortality are reliable predictors for infectious disease and that individuals use smell, appearance of an individual, and how an individual moves to further make decisions regarding risk and safety with illnesses. The findings support earlier research by Curtis et al. (2011).

Affect and Risk Tolerance Level

According to Schwarz (2012) another component to decision making is how an individual emotionally feels towards an event. Schwartz reported that emotions (affect) are an important part of information processing when assessing potential outcomes. Loewenstein et al., (2001) found that affective responses are better predictors of how an individual will make

decisions and respond to an event. Loewenstein et al., reported that emotions can override cognitive assessments of risk and impact how the individual behaves. Shou et al., (2022) noted that understanding an individual's risk attitude (affective response) will help predict their risk tolerance level. Maner et al., (2007) found that individuals with lower risk tolerance engage in negative emotions during a risky event. Having negative emotions towards an event increases the probability that an individual will avoid the risky event. Depending on a person's risk attitude, Shou et al. reported that risk tolerance level could be used as a predictor for how individuals will respond in a crisis. Shou and Olney (2021) created the Multi-Domain Risk Tolerance (MDRT) scale to measure an individual's risk attitude level.

Social Factors

Siegrist and Zingg (2014) found that the perception of risk extended beyond biological functioning to include social factors when determining risk. Siegrist and Zingg also reported that the amount of trust the individual has in the information received is a social factor for risk perception. Siegrist and Bearth (2021) attributed personal opinion, shared values and knowledge, worldviews, interpersonal/intrapersonal trust, and social trust to risk perception.

Goodwin et al. (2011) studied individuals' initial behavioral responses to a pandemic and found that personal values and societal normative pressures were significant predictors to how an individual responds to the pandemic. By surveying 186 respondents, Goodwin et al. found that during the initial stages of H1N1, 25% of respondents worried about becoming infected, 40% worried a loved one would become infected, 20% were canceling or delaying travel, and 20% were planning to buy preparatory materials. The results indicated that risky behaviors are not just evolutionary or biologically influenced, but that other societal factors need to be considered when evaluating behaviors during a pandemic (Goodwin et al., 2011).

Wong and Sam (2010) noted that during the first weeks of the H1N1 pandemic, there were temporal changes with individual health protective behaviors. By conducting cross-sectional telephone interviews with 1050 individuals, Wong and Sam found that regular hand washing increased as the number of deaths increased, and that it decreased as the number of deaths decreased. Behavior modification associated with perception of risk was also noted by Rubin et al. (2009).

During the 2009 H1N1 pandemic, Rubin et al. (2009) used cross sectional telephone surveying, with random digit dialing, to speak to 997 who spoke English, were over the age of 18, and had heard of the disease. Rubin et al. found if individuals perceived the pandemic as a risk, they modified their behavior. Of those surveyed, Rubin et al. found 38% engaged in behavior changes such as increased handwashing, avoiding large crowds. Respondents also stated they believed they were in control of their risk of exposure. Most notably, Rubin et al. found that the strongest predictor of behavior change was due to ethnicity, with minority groups being more likely to have behavioral changes associated with risk.

Demographic Factors

Van Cauteren et al. (2012) found that risk related behaviors increased during the H1N1 pandemic. Van Cauteren et al. conducted a random cross-sectional telephone survey of 10076 individuals and found that 37.5% of the respondents reported increased hand washing during the pandemic, and that 11.3% wore a face mask when ill. Van Cauteren et al. noted that vaccinated individuals, women and children, and those residing in large towns were more likely to follow provided recommendations. Van Cauteren et al. concluded that individuals with higher levels of perceived risk were more likely to get vaccines and follow preventative and hygiene recommendations.

Similar trends were noted in a meta-analysis conducted by Bish and Michie (2010) in which 26 studies focusing on demographic and psychological factors were reviewed. Bish and Michie reported that age, gender, and ethnicity were related to the likelihood of adopting risk reducing behaviors. Bish and Michie found individuals who were older, female, educated, and non-White more frequently adopted behaviors to reduce risk. Bish and Michie reported that the results of this study also indicated that as the risk increased, so did trust in the authorities making behavioral recommendations. According to Bish and Michie, their results indicated that there was an increased belief that making behavioral changes would, in fact, reduce risk.

When looking at age, Reynolds et al. (2019) noted that young adults' cognitive functioning is not fully developed. Further, Reynolds et al. suggested that evidence indicates that young adults and individuals with poor executive functioning are more likely to engage in risky behaviors. However, a study conducted by Sadiq et al. (2020) noted individuals 22 years of age or older adhered to social distancing and hand washing procedures, with females having a higher rate of compliance. Sadiq et al. found that knowledge about some aspects of prevention, like hand washing and social distancing, were high, with individuals understanding correct social distancing standards and proper mask removal techniques to lesser degrees. Sadiq et al. noted how specific guidelines and recommendations geared at reducing risk can be perceived as confusing when the information changes quickly. Sadiq et al. emphasized how health awareness programs produced by the WHO during the SARS-CoV-2 pandemic contributed to reducing confusion.

Communication

According to Wang et al. (2021), during the initial stages of a pandemic, risky behaviors persisted, in part, due to inconsistent and incongruent communication. After reviewing 13,598

tweets from 67 federal and state-level agencies, Wang et al. reported that during the initial stages of the SARS-CoV-2 pandemic, information was inconsistent and incongruent. According to Ippolito et al. (2020), individuals find it difficult to understand and interpret different information received from multiple sources.

Lin et al. (2018) conducted a survey of 1,569 individuals. A hierarchical multivariable logistic regression was run to examine how interpersonal and intrapersonal individual characteristics impacted nonpharmaceutical interventions and vaccine use. Lin et al. found that individuals with more knowledge or those who had consulted a doctor were more likely to consider interventions to reduce their risk of catching a contagion. Lin et al. suggested that interpersonal and intrapersonal factors are key factors for nonpharmaceutical interventions and vaccine use during a pandemic.

Springer et al. (2020) examined trends in internet searches between January and April of 2022, as the SARS-CoV-2 pandemic unfolded. According to data available through a Google tracking tool, Springer et al. reported that the number of individuals worldwide that searched for information regarding how to properly wash their hands and social distance increased as the rates of infection increased. Using Pearson correlation coefficient, Springer et al. found a high correlation between COVID-19 symptoms and the terms panic buying, lock down, social distancing, and wash hands. Springer et al. reported that Google Trends can show what individuals are searching for. However, the degree of importance of the search terms is a limitation to this type of research.

Li et al. (2020) conducted a cross-sectional survey with 979 respondents looking at what individuals in the U.S. searched for on the internet between April 10-14, 2020. Li et al. found that individuals that looked up more COVID-19 related health information were more likely to

wash their hands, wear a facemask, and cover their nose and mouth while sneezing or coughing. Li et al. also noted that individuals who had a family member, or personally knew someone, or who became ill with COVID-19 were more likely to adopt preventative behaviors. Once made aware of risky behavior and seeing the consequences firsthand, individuals were more likely to evaluate the risk more rationally for themselves (Li et al., 2020).

Trust in Information

Trust in the information that individuals receive can be a factor for understanding and deciding types of behavior that pose a risk to one's health and well-being (Han, 2022). According to Leavitt (2021), trust in government and scientific efforts is necessary for widespread public compliance. Concerns with the sources from which individuals receive information have been noted across the 2009 H1N1 and SARS-CoV-2 pandemics (Ahmed et al., 2018; Zhao et al., 2020).

Ahmed et al. (2018) reported concerns with messaging on the social media site, Twitter, during the 2009 H1N1 pandemic. Ahmed et al. analyzed a simple random sample of 7,679 tweets. Ahmed et al. found that in some tweets, individuals were confused by the term "swine flu," assuming that it could only be transmitted to pigs, thus being less of a threat to humans. After conducting a thematic analysis, overall themes from the data reported by Ahmed et al. consisted of those related to emotions, health concerns, media organizations, the origins of H1N1, general commentary and resources, food, and humor and sarcasm. Ahmed et al. reported that these themes indicated an overall lack of concern for the H1N1 pandemic and found evidence that the information that was shared was inaccurate.

Zhao et al. (2020) examined individual's preventative and risky behaviors between March 10 and June 09, 2020. Zhao et al. found that when multiple sources of information are available,

individuals implemented preventative measures consistent with the source they trusted the most. Zhao et al. examined data from 4,863 respondents who completed all five waves of the Understanding America Study (UAS) COVID-19 National Survey and reported three significant findings. The first significant finding found by Zhao et al. was that individuals that trusted Fox News Channel (FNC) more than CNN engaged in significantly fewer preventative behaviors and instead engaged in more risky behaviors. Second, an individual's political stance influenced behaviors. Third, overall behaviors changed to match the tone and information that was shared by news outlets (Zhao et al., 2020).

As the FNC increased its broadcasting of information on preventative measures, individuals that reported trusting this news outlet increased their SARS-COV-2 related preventative behaviors (Zhao et al., 2020). Zhao et al. also found that when the FNC shifted from covering COVID-19 to political news, these same individuals reported a decline in preventative behaviors. Zhao et al. speculated that when broadcasters for the FNC questioned social distancing and shifted to talking more about the economy, they may have promoted an increase in risky behaviors amongst their viewers. The results of this study emphasized the potential influence that mass media messaging has on human behavior (Zhao et al., 2020).

O'Shea and Ueda (2021) explored demographic factors to assess individuals' trust in information from COVID-19 experts. O'Shea and Ueda conducted a logistic regression to analyze data collected from 1,880 participants surveyed to gauge how they felt about individuals who did not listen to (a) government advice, (b) follow scientific advice, and (c) follow medical professionals' advice. O'Shea and Udea found that individuals who were perceived as lower socioeconomic, Black, Hispanic, or social conservatists were more likely to support those who did not listen to advice from the government, scientific community, or medical professionals.

O'Shea and Ueda (2021) noted that individuals who are less worried about contracting COVID-19 and had lower germ aversion, were more likely to ignore COVID-19 experts.

In an analysis study conducted by O'Shea et al. (2021), four existing studies were utilized to analyze political ideology in relation to perceived vulnerability to disease. Shea et al. accessed the survey results from 385,972 respondents who completed the "President Task" on the Project Implicit website published by Harvard University. The multilevel analyses conducted on survey data indicated that individuals that lived in states with higher infectious disease rates aligned with the Republican party and were more conservative. In a separate analysis, O'Shea et al. accessed survey data from the American National Election Study and determined that germ aversion could predict political affiliation. In study four, O'Shea et al. conducted a survey with 1,182 participants that were volunteers in Project Implicit. O'Shea et al. tested three dependent variables with eight independent variables. O'Shea et al. found predictors between germ aversion and conservative ideologies. Collectively, O'Shea et al. deduced that the data indicated that individuals who were affiliated with a conservative political party were less likely to be worried about infection or contracting COVID-19.

Trusted Sources

To reduce the number of individuals potentially impacted during a pandemic, preventing the spread of the contagion is crucial (CDC, 2022a; Orset, 2018). Due to the number of individuals who have been exposed to one, if not multiple pandemics in their lifetime, there are concerns as to the psychological damage resulting from these experiences (Geraldo da Silva et al., 2020; Holmes et al., 2020). Understanding how individuals comply with the preventative recommendations in an attempt to slow infection and transmission is necessary (Kleitman et al., 2021). Geraldo da Silva et al. (2020) suggested that information should be provided in such a

way as to nudge individuals into changing their behavior. Geraldo da Silva et al. described nudge theory as a framework designed to assist individuals to make decisions. Sinclair et al. (2021) recommended that cultivating a community habit of seeking information from reputable sources will nudge individuals to evaluate perceived risk with actual risk. Geraldo da Silva et al. explained that if information is presented in a way so as to lay out alternatives which cause minor changes in the environment, individuals will be more willing to comply without having to be forced.

Geraldo da Silva et al. (2020) suggested information addressing cognitive distortions that made decision-making confusing, like propaganda, which produces inaccurate assumptions such as swine flu only impacting swine, or that the pandemic is a hoax, should be addressed as well. Throughout the SARS-CoV-2 pandemic, scientific communities worked to reduce the rates of infection and transmission by keeping the public informed (Geraldo da Silva et al., 2020). Epidemiologists, physicians, members of the CDC, and the WHO regularly alerted the global community on issues related to the evolution of SARS-CoV-2, treatment options, and optimal means for avoiding infection (Han, 2022; Malekpour, 2021; Waltman et al., 2021).

A weekly COVID-19 Snapshot Monitoring (COSMO) database was created in Germany to collect information on the spread of the disease and monitor individuals' perceptions and understanding of the pandemic (Betsch et al., 2021). This data was used to help address information shared to prevent infections and focus on behavioral changes and risk perceptions (Basch et al., 2020). According to Sonar Global (2022), this system was only utilized by seven countries (Argentina, Canada, Denmark, Ethiopia, Germany, Israel, and Saudi Arabia). As of January 2023, there is no single channel for disseminating information which allowed for confusion and multiple sources to receive information (Tagliacozzo et al., 2021).

In February of 2020, McFadden et al. (2020) surveyed 718 individuals to learn where they received trusted information and to understand how they formed risk perceptions about COVID-19. At the time of the survey, McFadden et al. found that 90% of the respondents reported being aware of COVID-19 and receiving information from the news. McFadden et al. further found that of the respondents, 69% reported trusting information from scientific/public health leaders, while only 14% trusted it sourced from political leadership. McFadden et al. also found that the majority of respondents were in favor of strict infection prevention policies and travel restrictions. McFadden et al. concluded that communication from public health officials and scientific leadership that was open and responsive could improve public compliance.

Preventative Measures

As late as 2007, there was little research on how individuals perceived health risks and implemented recommended preventative measures (Leppin & Aro, 2009). Part of the infection prevention policies issued by the WHO and the CDC during the SARS-CoV-2 pandemic focused on social distancing in public spaces and home confinement when sick as preventative measures (CDC, 2022a). Orset (2018) studied perceptions and individual behavior on how individuals would respond to a potential home confinement to prevent the spread of an illness. Orset surveyed 200 individuals about home confinement if an influenza pandemic occurred. Orset found that 75% of respondents reported they would participate in home confinement and found this an effective suggested measure to prevent the spread. Orset further found home confinement to be a cost-effective preventive measure for slowing the spread of a disease. Lennon et al. (2020) surveyed 5,137 adults across the United States and found that 86% of respondents indicated they would use social distancing, and 95% reported they would stay home if ill.

Basch et al. (2020) studied and compared the differences between COVID-19 media coverage by the United States media versus international media coverage. A total of 401 broadcast news segments published on the Google Video platform between January and February 2020 were reviewed. Among the broadcasts, 43.6% focused on death, 37.4% highlighted anxiety, and roughly 3.0% included actual preventative measures such as how to change masks or blow your nose. Basch et al. found that news segments in the United States were not as long as international segments, did not contain captions or subtitles, and were less likely to mention death or death rates when compared to international media segments. Even though United States media segments did not focus on death or death rates as often as international media segments, Basch et al. concluded news segments were not effective in focusing on preventive measures to slow the spread of the illness. It appeared that media producers were focusing more on death and anxiety rather than the actual preventative measures needed to reduce risk (Basch et al. 2020). Brown (2006) suggested that prudent decision-making behaviors increase during times of uncertainty when adequate feedback is provided. Brown (2006) noted that if an individual is unable to predict the consequences of their actions they act more impulsively.

Wearing a mask has been a controversial debate in the United States during the SARS-CoV-2 pandemic (Lang et al., 2021). Rieger (2020) examined when people would be willing to wear a mask. In a survey conducted by Rieger, 206 individuals were asked about varying situations to measure their likelihood of wearing a mask. Rieger found that 50-80% of respondents stated they would probably wear a mask if they had one as COVID-19 cases increased. Respondents also reported that the experience of being judged by others would weigh on their decisions to wear a mask. Rieger also reported that most participants indicated they would wear a mask if it were legally required. Without any legal mask mandate, most individuals

indicated they would not wear a mask while walking in the street in densely populated areas (Rieger, 2020).

Overview of Social Media

Duong (2020) noted the first social media platform was Usenet. Usenet was developed in 1979 as a platform to share articles and news. Duong further noted that social media evolved during the 1990s. As social media evolved, various sites emerged that allowed individuals to interact, share information, and discuss public policy. According to Duong, social media continued to develop into the early 2000's leading to many of the social media platforms utilized today. Duong (2020) stated that although numerous definitions of social media are available, the main goal of social media is to function as a space that provides users with "the ability . . . to communicate, create, edit, and share online contents" (p. 114). Table 1, created from data shared by Lua (2022), shows the top 20 social media platforms with number of monthly active users (MAUs) worldwide. Twitter is the 10th most used social media platform (Walsh, 2022).

Table 1

Number of Monthly active Users (MAUs) Worldwide

Social Media Platform	MAUs
Facebook	2.9 billion
YouTube	2.2 billion
WhatsApp	2 billion
Instagram	2 billion
Facebook Messenger	1.3 billion
WeChat	1.26 billion
TikTok	1 billion
Sina Weibo	573 million
QQ	538.91 million
Telegram	550 million
Snapchat	538 million
Kuaishou	519.8 million
Qzone	517 million
Pinterest	444 million
Twitter	436 million
Reddit	430 million
Quora	300 million
Skype	300 million
Microsoft Teams	270 million
LinkedIn	250 million

Note. Information collected from Lua (2022) for social media platforms in the United States.

Twitter

Twitter was created in 2006 and allows users to post tweets with up to 280 characters (Twitter, 2022). As stated on the About Twitter page, “Twitter is what’s happening and what people are talking about right now” (Twitter, 2022). According to Sheperd (2022), Twitter is used by 77.75 million users in the United States. Table 2 shows the distribution of age by percentages of United States Twitter users.

Table 2

United States Twitter User Age Distribution by Percentages

Age	Percentage
13-17	6.6
18-24	17.1
25-34	38.5
35-49	20.7
50 and older	17.1

Dixon (2022b) reported that in 2021, 38.4% of users in the United States identified as female, while 61.6% identified as male. Overall, Dixon reported equal distribution of users based on race. Table 3 shows the percentage of United States Twitter users based on race (Dixon 2022a).

Table 3

United States Twitter User Race Distribution by Percentages

Race	Percentage
Asian	35
Latino	31
White	30
African American	28

Role of Twitter During the SARS-CoV-2 Pandemic

Social media is a tool that can be used to share information quickly between health officials and the public during an outbreak of a communicable disease (Mandeville et al., 2014). Mandeville et al. (2014) found that this sharing of information has societal benefits during large scale disastrous events. During the SARS-CoV-2 pandemic, Twitter users increased worldwide as individuals found ways to connect during lockdowns. According to Statista (2023) Twitter users worldwide steadily increased from 2019-2022, and then began decreasing in 2023 as many

regulations and lockdowns were removed. Wang et al. (2021) explained that Twitter was used to quickly share information regarding how individuals could protect themselves from contracting and spreading the disease. Wang et al. noted that the WHO and other health agencies provided information on their respective Twitter accounts to help provide factual information and stop the spread of misinformation.

With an analysis of 3,331,008 tweets, Zappavigna and Dreyfus (2022) found that some individuals connected with other users after sharing their firsthand experiences of having had COVID-19. Zappavigna and Dryefus described how through sharing, people could bond over a common experience. Results of the analysis indicated that through tweets, individuals used circumstantial meaning to ask probing questions or make statements that answered how, why, how long, what for, when, where, and according to whom, in tweets to connect with others (Zappavigna & Dryefus, 2022).

Park et al. (2021) found that during the beginning of the COVID-19 outbreak, individuals used Twitter to share research about COVID-19, how to prevent contracting COVID-19, and information from health organizations like the WHO. Park et al. also found that there were no dominant tweeter accounts provided the majority of information. Park et al. concluded that at the beginning of the outbreak, individuals focused on multiple topics and issues around COVID-19. Park et al. (2021) suggested that understanding how and what individuals are sharing via social media could help agencies better understand individuals' decision-making processes and plan for how to best disseminate information.

Shoaei and Dastani (2020) conducted a literature review on 24 articles assessing the role of Twitter during the beginning of the SARS-CoV2 pandemic. Shoaei and Dastani found that individuals using Twitter were able to quickly share information regarding their firsthand

experiences with COVID-19 and get information from various health professionals and government agencies. Shoaei and Dastani reported that a great deal of information came from sources with questionable credibility. Shoaei and Dastani recommended that government agencies and health professionals utilize social media platforms early in a crisis to help eliminate misinformation.

Fact Checking and Misinformation

On February 15, 2020, on the Twitter account belonging to the WHO, Director General Dr. Tedros tweeted, "We're not just fighting an epidemic; we're fighting an infodemic. Fake news spreads faster and more easily than this virus, and is just as dangerous." (WHO, 2020a). Xu and Sashara (2021) reported that during the SARS-CoV-2 pandemic, bots were suspected of spreading a great deal of misinformation on Twitter. In their study, Xu and Sashara assessed the role of bots in spreading noncredible COVID-19 sources. After coding 37,219,979 tweets posted between February 2021, and May 2021, into credible and noncredible sources, Xu and Sashara found that "malicious bots" (p. 608) and humans, were found to amplify information that did not always come from credible sources. Xu and Sashara concluded that individuals who were classified as conspiracy theorists or right-winged, added to the spread of misinformation.

Ye et al. (2022) examined how academic information was shared on Twitter. Ye et al. suggested that when looking at data from Twitter, understanding who tweeted and why is important when looking at the validity and credibility of the information that was shared. Ye et al. reported that of the top 659 Twitter accounts that shared research articles 10 or more times, 35.96% of the top tweeters were automated users. Ye et al. focused on academic literature shared and did not imply that bots shared misinformation.

Hopfer et al. (2021) utilized Twitter to assess change over time on how individuals were communicating risk and mask wearing during COVID-19. After analyzing 7,024 tweets that specifically mentioned masks, Hopfer et al. found that when looking at Twitter users' expressions on risk perception and mask wearing, risk perception during the first 5 months of COVID-19 infections on Twitter showed two strong movements. Hopfer et al. found that these movements indicated that risk was influenced by numerous influential sources and risk perception had numerous societally influenced meanings. Hopfer et al. used the social amplification risk framework (SARF) to examine what was amplified in tweets and how COVID-19 was perceived as a risk. Hopfer et al. concluded that varying ideas about the severity of risk came from a number of sources. Hopfer et al. reported that these sources included accounts that minimized COVID-19, and those that modeled risky behavior – both of which had been amplified through retweeting. To combat misinformation, Hopfer et al. suggested effective messaging would include targeting the social norms of particular subgroups.

Health organizations like the WHO used Twitter to combat misinformation throughout the SARS-CoV-2 pandemic (Muñoz-Sastre et al., 2021; Vraga & Bode, 2021). Muñoz-Sastre et al. (2021) analyzed 849 vaccine related tweets that were sent out on the WHO Twitter channel from November 2020 to March 2021, and found consistent messaging designed to combat misinformation and to provide scientific information. Muñoz-Sastre et al. reported that the WHO consistently utilized Twitter to share up to date scientific information.

Spread of Fear and Panic through Misinformation

Combating misinformation is important during a pandemic for numerous reasons (Gabarron et al., 2021; Rosenberg et al., 2020; Vraga & Bode, 2021). Gabarron et al. (2021) reviewed 22 studies that researched misinformation around COVID-19 during the beginning of

the pandemic and found that each of the studies reported that misinformation led to "fear or panic" (p. 456). Naeem and Ozuem (2022) set out to understand how misinformation shared on social media can increase panic buying. Naeem and Ozuem utilized a triangulation method and collected information from YouTube channels focused on panic buying, tweets, and focus groups. Naeem and Ozuem found that when information from public health officials did not align with misinformation that went viral on social media, misinformation would become socially validated and create panic buying. Naeem and Ozuem recommended that celebrities and influencers could help reduce public panic by dispelling misinformation on social media and stores could act in a more proactive role to communicate confidence in the supply chain and availability of goods.

Rosenberg et al. (2020) appealed to Twitter users to limit their consumption of content on the site stating that it could result in "increased mental distress, self-harm, and suicide" (p. 418). Rosenberg et al. further reported that when misinformation is spread, individuals cannot effectively implement preventative measures. Rosenberg et al. noted that the overwhelming amount of information available to individuals through social media can be misleading or confusing. Rosenberg et al. intimated that one of the methods Twitter uses to combat misinformation was by removing posts that were inconsistent with recommendations made by health officials.

Ignoring the Warning Signs

According to Franz and Dhanani (2020) social factors and perceptions impact how an individual responds, or does not respond, to a pandemic. Social factors such as risk homeostasis theory (Wilde, 1998), optimism bias (Pascual-Leone et al., 2021; Sharot, 2011), reactance theory (Brehm, 1966), tribalism (Stroud, 2010; Tong & Hippel, 2020; Winegard & Clark, 2020),

confirmation bias (Bullard, 2023), and individualism (Triandis, 1989) were areas that were further explored during the research as potential reasons to why individuals would ignore the warning signs of Covid-19. Included in the next sections are components of each of the above-mentioned social perceptions which may influence individual decision making during a pandemic.

Risk Homeostasis Theory

Risk homeostasis theory (also known as risk compensation) proposed by Wilde (1998) postulates that at any given time individuals will compare the amount of risk that they perceive in an event with the level of risk that they are comfortable with and then adjust their behaviors accordingly. Wilde compared this behavior to a thermostat. According to Wilde a thermostat is used to adjust the temperature and although there may be varying degrees in temperature overall, the purpose of the thermostat is an attempt to maintain the target temperature.

Along the lines of the thermostat analogy, Wilde (1998) suggested individuals will adjust behaviors after considering potential risks and their ideas about actual risk. Along these lines, people will change their behaviors if new target levels are defined. Wilde reported that risk reduction and increased safety measures by participants will occur when an incentive with a future payout requiring completing future obligations is utilized. Wilde recommended the use of incentives to motivate changes resulting in increased safety and reduced risk. Wilde pointed to the fact that while the incentive of living may seem enough, more incentives may be necessary (1998).

Optimism Bias

According to Sharot (2011), optimism bias is when an individual believes that they are less likely to experience a negative event when compared to their peers. Sharot claimed that

individuals will engage in optimism bias and ignore safety recommendations to reduce stress and anxiety for optimal mental health. Pascual-Leone et al. (2021) assessed if individuals were more worried about potential COVID-19 health concerns for others more than for themselves. Pascual-Leone et al. compared data collected from research by YouGov and the Barcelona Brain Health Initiative (BHHI) and found that individuals reported more worry for others than themselves. In the BHHI data, Pascual-Leone et al. found that 30% of survey respondents reported more worry for self than others while the YouGov data found this rate to be only 15%. Even when individuals had been exposed to COVID-19, were hospitalized, or knew someone that had been hospitalized, Pascual-Leone et al. still found that individuals would still report thinking of others safety more than their own. Pascual-Leone et al. concluded that individuals were engaging in optimism bias. Pascual-Leone et al. reported that without proper interventions individuals engaging in optimism bias would not adopt appropriate health safety and risk preventative measures.

Reactance Theory

According to Brehm (1966) psychological reactance theory is utilized to describe how individuals are motivated to restore individual freedom that has been perceived to be threatened. Rosenberg and Siegel (2018) conducted a literature review on the development of the psychological reactance theory over the last 50 years and concluded that current literature supports that when individuals attempt to correct the perceived loss of freedom, goal-oriented measures are utilized to restore freedom. Rosenberg and Siegel reported that current psychological reactance theory focuses on motivation of individuals to regain loss of freedom.

Perceived loss of freedom has been identified to reduce the effectiveness of public health messaging efforts (Byren & Hart, 2009; Erceg-Hurn & Steed, 2011). Health messages that use strong language, require larger amounts of change, or were internalized as persuading, trigger

threats of limits on freedom (Quick et al., 2013). Disregarding health messages over maintaining personal freedom has been noted in prior studies (Richards & Banas, 2015; Richards et al., 2017). Hart and Nisbet (2012) claim that health messages that limit individuals perceived freedoms will result in less support of the preventative measure. According to DeFranza et al. (2020) reactance has impacted the effectiveness of COVID-19 health campaigning and preventive measures.

Dimoff et al. (2020) reported that reactance theory and the terror management health model (TMHM) need to be considered for effective health communication. Dimoff et al. proposed that TMHM elicits thoughts about death and dying. Dimoff et al. concluded that these thoughts increase anxiety and will motivate individuals to reduce their anxiety even if reducing the behavior means not engaging in safety preventive measures. Dimoff et al. suggested that safety preventative messaging during a pandemic need to factor in both TMHM and reactance theory to be effective.

Tribalism

According to Winegard and Clark (2020) individuals are reliant on other individuals to define their own attitudes and beliefs. Winegard and Clark reported that when an individual is part of a community or group, or tribe, they will rely on the overall collective group knowledge to make decisions and do not often question the groups' beliefs). According to Clark et al. (2019) individuals interact and share information in ways that will promote their tribe. Tong and Hippel (2020) argued individuals have learned to value tribalism over seeking out the truth. Tong and Hippel claimed that individuals are rewarded for holding views of the group and punished or ostracized when they are not. Tong and Hippel claimed that individuals in the group that supported the group message more, were prized as higher standing members of the group. Tong

and Hippel reported that valuing tribalism over truth hampers political progress and scientific research.

According to Stroud (2010) individuals will seek out information that supports their tribes' interests and beliefs and reject and avoid any information that goes against the tribes' beliefs. Ditto et al. (2019) found that as individuals are receiving information, they will accept information without critically evaluating the information. Alternatively, they will criticize information that goes against the tribe. According to Kettl (2020), when COVID-19 decisions were left up to the individual states to make decisions, every state responded in a different way, which best supported the group and often competed with other states. Kettl (2020) argued that without consistency some groups suffered more than others because of those who focused on their own interest.

Confirmation Bias

Confirmation bias is defined as seeking information that confirms an individual's pre-existing beliefs which increases the bias on the information (Bullard, 2023). According to Modgil et al. (2021) social media is used as a source for confirmation bias and leads to polarization. O'Hara and Stevens (2015) define social media induced polarization (SMIP) as biased opinions, information that can also contain misinformation regarding socio-cultural products, services, and shared experiences and activities. Technology companies that allow for SMIP to occur have been accused of spreading conspiracy theories and increasing agitation due to the speed and volume of information that is shared (Reuters, 2021; Weckler, 2021).

Due to the speed which information travels on social media, Bessi (2016) claimed individuals are able to connect with others that have the same viewpoints and echo their opinions, thus creating what is called an "echo chamber." Echo chambers impact an individual

because individuals will not seek out other viewpoints that oppose their beliefs (Hayat &Samuel-Azram. 2017). Modgil et al. (2021) explored how SMIP leads to echo chambers by supply chain providers. Modgil et al. utilized thematic analysis to further understand what elements contribute to developing echo chambers. Modgil et al. conducted 35 interviews between September and December 2020. A total of four themes were found that impacted the creation of echo chambers by supply chain providers. The four themes included various environment settings, actors, mechanisms, and outcomes, which need to be evaluated when looking at confirmation bias and echo chambers. Modgil et al. recommended that individuals need to adequately examine information present on social media, and that social media companies work to reduce misinformation.

Individualism

According to Triandis (1989) "individualists give priority to personal goals over the goals of collectives" (p. 509). Shulruf (2011) claimed that individualists will prioritize their desires, needs, and concerns over others. Feng et al. (2023) studied levels of reported individualism with social distancing rules during the SARS-CoV-2 pandemic. Feng et al. ran four studies which utilized longitudinal and correlational design methods. Feng et al. found that individuals who report higher levels of individualism were less likely to comply with social distancing rules. Additionally, Feng et al. noted that individuals that were rated as more individualistic reportedly refused to comply with social distancing rules because they were bored or selfish. Feng et al. (2023) recommended that policy makers target regions with higher individualism scores to reduce the spread of contagion with policies that focus on the benefit to the individual not the community as a whole. Mehta et al. (2023) compared individuals' COVID-19 safety behaviors to their level of individualism to see it impacted COVID-19 safety behaviors. Mehta et al. utilized a

mixed methods approach interviewing 11 individuals and surveying 283 individuals. Mehta et al. found that individuals that scored higher for individualism and identified as either conservative or with the Republican political party were less likely to follow COVID-19 safety measures. Mehta et al. recommended that further research on the impact of social media on public opinion, public policies, and COVID-19 safety responses is needed.

Implications for Counseling Field

Jacobs et al. (2010) reported that understanding how individuals determine and perceive a risk is crucial in order to prepare for and plan safety messaging. Mental health providers serve a vital role in supporting the mental well-being of the communities in which they serve, often focusing on risk and preventative behaviors (Bornheimer et al., 2022). A mental health provider's skill for assessing risk and determining if an individual needs support with risk management during the shared decision-making process is crucial to being able to provide the right resources and tools to make the best decision (Ahmed et al., 2021).

Venegas-Murillo et al. (2022) surveyed therapists that provided services to minorities with psychiatric disorders from January to March 2021 to assess whether providing educational interventions regarding COVID-19 would impact clients' decisions around vaccines and preventative measures. Venegas-Murillo et al. found that the educational interventions significantly increased vaccine acceptance and positively impacted clients' understanding of risk. Vengas-Murillo et al. (2022) proposed that mental health providers were a valid resource for supporting clients through decision making during the SARS-CoV-2 pandemic.

As the SARS-CoV-2 pandemic continues, unknown long-term effects are yet to be discovered (Iqbal et. al, 2020; Lopez-Leon et al., 2021). Branquinho et al. (2021) set out to assess health risk behaviors of individuals before and during the SARS-CoV-2 pandemic.

Branquinho et al. surveyed 5,746 individuals and conducted a comparative study and found that females ate less, exercised less, engaged in more consumption behaviors, significantly increased mobile phone use, and reported poorer quality sleep. Branquinho et al. also found that males were found to eat more, increased consumption behaviors, watched more TV, and used more social media and online games. Branquinho et al. reported an expectation that future public health policies and preventative measures would need to be reevaluated with regards to behaviors during a pandemic.

Alaradi et al. (2021) examined 24 studies that looked at mental health for healthcare workers during the SARS-CoV-2 pandemic. Alaradi et al. noted that anxiety, depression, insomnia, and stress were addressed in the literature. Alaradi et al. suggested using supportive social measures to combat mental health fatigue. Numerous studies of the general population indicated there were increases in depression, anxiety, and traumatic stress during SARS-CoV-2 pandemic (Alzueta et al., 2020; Chadi et al., 2022; Salazar de Pablo et al., 2020; Ramos, 2022; Salari et al., 2020; Xiong et al., 2020).

Valdez et al. (2020) analyzed 86,581,237 tweets at the onset of the SARS-CoV-2 pandemic to assess for any common themes. Valdez et al. concluded that individuals turned to social media as a way to manage isolation during lockdowns and to cope with the pandemic in general. Valdez et al. cited concerns with the impact of social media on psychological well-being in the context of overburdened mental health care systems. Valdez et al. emphasized a need for further research on best practices for mental health providers during the SARS-Co-V-2 pandemic.

Boden et al. (2021) utilized a population mental health framework to assess the impact of SARS-CoV-2 on mental health. A population mental health framework is a lens that considers

multiple factors when deciding policies, interventions, and strategies that would be beneficial for mental health across diverse populations (Evans & Bufka, 2020). Boden et al. concluded that SARS-CoV-2 has significantly negatively impacted mental health, especially among populations that are already underserved and vulnerable.

Lopez-Leon et al. (2021) pointed out that research indicated mental health was negatively impacted during SARS-CoV-2. Understanding factors such as risk perception, risk communication, and how individuals respond to extreme events are crucial for planning and communicating effectively with the public (Han, 2022; Lennon et al., 2020; Rogers & Pearce, 2013). Rogers and Pearce (2013) suggested that effective risk communication reduces anxiety, allows individuals to respond more effectively, and enables a quicker recovery following a crisis. By increasing our understanding of how individuals perceive risk during a long-term event, mental health providers and counselor educators, as practitioners and policy makers, can provide adequate education, resources, tools, and interventions to promote positive changes in mental health during a crisis (Rogers & Pearce, 2013).

Summary of Current Literature

Current research around preventative behavior during a pandemic focused on handwashing, home confinement, covering coughs, and social isolation (Lu et al., 2021; Smailhodzic et al., 2021). Schaller (2011) noted that more research is needed to explore disease-avoidant behavior through the lens of social pressures. Research is lacking on how individuals perceive pandemic related risks and their need for preventative measures during pandemics that last more than a year (Qin et al., 2021).

Research has shown that individuals have ignored COVID-19 safety preventative measures due to individualism and the threat to loss of freedom (Feng et al., 2023). Social media

has played a role in COVID-19 safety preventive measures and sharing information (Wang et al., 2021). This study adds to the body of literature in how individuals make decisions when faced with social media pressure and massive availability of avenues from which to seek information.

Chapter 3

Methodology

This study is built on the need for more understanding of risk perception in pandemics that last longer than a year by focusing on how individuals express concern regarding COVID-19, discuss preventative measures, and define risks. This research was conducted through a qualitative content manifest analysis design. According to Downe-Wambolt (1992), "content analysis is a research method that provides a systematic and objective means to make valid inferences from verbal, visual, or written data in order to describe and quantify specific phenomena" (p. 314). Kleinheskel et al. (2020) defined manifest content analysis as a means to "transcend simple word counts and delve into a deeper examination of the language in order to organize large amounts of text into categories that reflect a shared meaning" (p. 128). Utilizing a qualitative content manifest analysis design provided a framework which allowed me to examine written accounts of individuals' perspectives on the phenomena of risk perception and safety measures two years into a pandemic.

Assumptions and Rationale for Design

McLeod (2019) explained that qualitative research methods are used for studies that describe how individuals perceive and prescribe meaning to a phenomenon. Qualitative research methods are used when studying non-numerical data such as observations of language (McLeod, 2019). According to Mantzoukas (2008), qualitative research is used when not all of the variables of the study are known, and the researcher attempts to interpret and describe the phenomenon. The research questions in this study were consistent with those of qualitative inquiry, with the goal of this study being to describe individuals' perspectives on risk and safety measures during a prolonged pandemic by examining observations in textual evidence.

Krippendorff (2004) reported that qualitative content analysis methods are utilized to identify concepts in texts. According to Hsieh and Shannon (2005) manifest content analysis design allows researchers to investigate a phenomenon in the least restrictive manner possible. Hsieh and Shannon argued that content analysis allows a researcher to collect data without imposing their beliefs or predetermined themes. Manifest content analysis research design assumes that texts contain valuable information about a phenomenon (Kondracki et al., 2002), is limited by sampling, and the researcher uses knowledge of language and their interpretation of the observations to infer meaning (Krippendorff, 2004).

Participants and Role of Researcher

Due to the ease with which researchers can access data on Twitter, substantial amounts of information can be gleaned from this social media site. Twitter is a popular forum for discussions with regards to health information (Ahmed, 2018; Love et al., 2013; Smailhodzic et al., 2016). Twitter was the social media platform that was utilized for data collection. Collection will be filtered to see users that tweet or retweet in English about COVID-19 during an 11-day period on the two-year anniversary mark of COVID-19 being declared a pandemic. By gleaning information from a social media platform, I had access to a rich amount of content created by individuals not hampered by the limits of surveys or potentially corrupted by testing biases.

I had no contact with the individual authors of any tweets and had no known relationship with them. As an individual, I was extremely interested in how individuals defined, perceived, and assigned meaning to risk. I attempted to remain open to all perspectives on risk. Although I have my own perspective of risk, I monitored my perceptions as interpretations were made from data collected.

My choices and experiences during the SARS-Co-V-2 pandemic shaped my perceptions of risk. I saw my curiosity of risk as a positive factor in this research study. Curiosity prompted me to explore and expose myself to a variety of perceptions that I would not have normally entertained or sought out. By having exposed myself to multiple perspectives, I believed I was better equipped to assess whether my interpretations are based on my personal bias.

Data Collection Procedures

As this study utilized tweets that were open to the public and readily available, St. Mary's IRB determined this study is not regulated research under. A pilot study for a preliminary analysis was conducted with results that are in line with procedures for the full-scale study. Twitter data between March 7 - 18, 2022 was collected and utilized for this study. This time period was selected as it includes the timeframe during the two-year anniversary of the SARS-COV-2 pandemic. Data was collected in the form of tweets from Twitter by using MaxQDA's Twitter collection function. Search terms utilized to collect data focused on COVID-19, preventive safety and COVID-19, COVID-19 and risk, and awareness and COVID-19.

The following key words were utilized for collecting data: covid is this risky; covid misinformation; wash hands; cover your cough; antivax; antimasker; covidiot; covid fear; covid long; scam pandemic; vaccine; covid risky; covid is real; covid is fake; face mask policy; covid is not over; covid is not real; covid is not dangerous; covid is a lie; corona; Rona; risk perception; fake news; SARS; pandemic; covid no risk; covid mask; covid masks; covid idiots; stupid covid; covid anniversary; covid risk; covid prevent; covid awareness; covid scare; covid safety; and, sheeple. This data was analyzed to assess themes related to perception, risk, and safety. As themes emerged, they were coded. Twitter data was assessed for fake bots by following guidelines suggested by Makara (2019) which included looking to see if there is an unrealistic

number of tweets, no profile picture or bio, only posting quotes, excessive tweets that are duplicates, having very few followers, or not interacting with others. Data from probable fake bots were excluded.

Data Analysis Procedures

MaxQDA was utilized to capture data by using the import Twitter data feature and the results were categorized by relevant themes and analyzed for perceptions. A coding handbook was created, and themes were outlined and discussed in the results of the study and discussion portion of the dissertation. Retweets were excluded from the study with data only utilized from tweets and replies. Tweets included in the study were categorized by theme(s) that developed during analysis. Tweets that were suspected to be from bots were removed from the study. Any data that is excluded is discussed, along with the reasons for any exclusions, and how these tweets might have impacted individuals that were exposed to them.

Methods for Verification

According to Creswell and Creswell (2018) internal validity can be established by utilizing multiple strategies. Strategies suggested included: detailed descriptions; discussing discrepant data; detailing researcher bias and impact to study; and utilizing peer debriefing and external auditors as means to establish internal validity (Creswell & Creswell, 2018). Detailed descriptions which included any discrepant perspectives were utilized when the data was analyzed and reported.

As the researcher, I included my bias regarding the topic and my perspectives on risk and safety measures which includes experiences that have shaped my perspective. I immersed myself into Twitter tweets regarding COVID-19 which increased my knowledge of the phenomenon.

Throughout the research process, I had access to my dissertation director who served as an external auditor.

To address reliability, following suggestions from Yin (as cited in Creswell & Creswell, 2018), a detailed database and codebook was established which outlined all procedures utilized as well as exact steps that were completed throughout the study. To further increase reliability, following suggestions from Gibbs (as cited in Creswell & Creswell, 2018) I reviewed codes, assessed definitions and meanings assigned to codes to maintain consistency within assigned codes, as well as checked for errors in the coding process. Following guidelines from Whittemore et al. (2001), detailed analysis and description allowed me to assess credibility, authenticity, criticality, and integrity which added to validity.

Chapter 4

Results

The purpose of this study was to understand how individuals communicated concern and risk and defined risk two years into a pandemic. A total of 116,401 tweets and replies were collected from March 7 - 18, 2022. This chapter includes classes, themes and subthemes that were discovered while analyzing data utilizing the qualitative content manifest analysis design. Tweets and replies that were not relevant to the research, not written in the English language, or suspected of being bots were excluded from the analysis. Of the initial tweets and replies gleaned from Twitter, 8503 were removed. When saturation of themes was discovered within keywords, analysis of tweets with the keyword(s) would discontinue. Classes and themes were developed from the analyzed tweets to answer the following three questions:

- How do individuals express concern regarding COVID-19 two years into a pandemic?
- How do individuals discuss safety, risk, and preventative measures two years into a pandemic?
- How do these expressions define risk two years into a pandemic?

I limited my use of social media as much as possible while doing the analysis to limit any potential bias. From the analysis of the tweets and replies, four main classes emerged. The first class describes how individuals discussed and calculated risks associated with COVID-19. Individuals identified COVID-19 as either having risk, determined there was no risk, or were unsure if there was an associated risk. Class two describes how individuals struggled to trust information associated with politics, public health officials and other individuals on Twitter. Classes one and two were utilized to answer research question one.

Class three describes how individuals perceived the need for preventative measures. A range of decisions were described that included no precautionary measures being taken to multiple strategies being used. Class three also encompassed when government organizations should determine which preventative measures to require and enforce. Theme three was utilized to answer research question two.

Class four describes how individuals reflect on life before the pandemic and as the pandemic continued over a time. This class also covers individuals normalizing COVID-19. Research question three was answered after reviewing the compilation of all available information from classes, themes, and subthemes. Under each main class, themes and subthemes were identified. I explored each theme and subtheme until data saturation was reached. The following sections detail each class and its associated themes and subthemes identified during the content analysis. As shown in Table 4, each class, main theme, and subtheme is provided.

Table 4

Main Classes, Main Themes, and Subthemes

Themes:	Main Themes and Subthemes:
Main Class One: Determining Risk	The Need for Honesty
	Defining Misinformation
	Uncertainty About What is Defined as Risky
	Lying about Pandemic
	Extreme Positions on the Impact of COVID-19 in Healthy Individuals
	Risk to Children or Not
	Risk of Long COVID
	Debates on the Efficacy and Safety of the Vaccines
	Severity of the COVID-19 Infections
Main Class Two: Trust in Information	Political
	Left-wing
	Right-Wing
	Race/Equality
	Voter Suppression, Censorship, & Freedom of Speech
	War in Russia
	Sheeple/Covidiots
	Public Health Sources
	Medical Information
	Use of Scientific Evidence
	Distrust of Scientific Evidence
	Testing Data/Reported Deaths
	Campaigns to Combat Misinformation
	Big Pharma
	Social Media Information
	Bots
	Cults
	Other Countries
	Conspiracy Theories
	Fake News
	Shift in Media
	Echo Chambers
Main Class Three: Preventative Measures	Vaccines
	Religion/Spirituality
	Masks
	Widespread Restrictions
	Preventative Measures/Behaviors
	Treatments

Main Class Four: Life Before/After the Pandemic	Mental Health Nostalgia Life After COVID-19 Normalizing Risk Impact on Women and Children Life on Hold Humor

Main Class One: Determining Risk

In class one, individuals tweeted and replied to statements regarding their perceived risk of the SARS-CoV-2 pandemic, COVID-19, and vaccines. Main themes and subthemes defined were the need for honesty, defining misinformation, uncertainty about what is defined as risky, lying about the pandemic, extreme positions on the impact of COVID-19 in healthy individuals, risk to children or not, risk of long COVID, debates on the efficacy and safety of the vaccines, and severity of the COVID-19 infections. Keywords representing this theme emerged when searching tweets utilizing the following terms: covid is this risky; antivax; antimasker; covidiot; covid fear; covid long; scam pandemic; vaccine; covid risky; covid is real; covid is fake; covid is not over; covid is not real; covid is not dangerous; covid is a lie; corona; Rona; risk perception; SARS; pandemic; covid no risk; covid idiots; stupid covid; covid anniversary; covid risk; covid scare; covid safety; and, sheeple. The following subthemes were identified when individuals were discussing risk.

The Need for Honesty

Individuals in this main theme tweeted concerns regarding honesty with what other individuals posted and provided as information. Tweets contained statements that directly asked for honesty or noted concern with people not being truthful about the pandemic. Individuals discussed concern with how dishonesty may impact others and their decision-making process. Individuals asked for people to be honest and to stop sharing information that was not truthful.

The following tweets are samples of what individuals shared that listed honesty as a concern. Theadtan (2022) tweeted “Intellectual dishonesty" is worse than peddling fake news. Intellectually dishonest people INTENTIONALLY commit fallacies and INTENTIONALLY deceive people. They poison the minds of their readers and listeners so they can advance the interests of the few.” MifloresJade (2022) replied “They are tricky with what they put out there: they often spread disinformation and fake news. Worse, they make you believe their information is true and those from their opponents are lies.”

Defining Misinformation

Another main theme that emerged reflected how individuals struggled to define misinformation related to the pandemic. Tweets were found that described how information changed during the pandemic. Tweeters shared how information that was held to be true at the start of the pandemic became inaccurate as the pandemic progressed. The change of information as the pandemic unfolded was noted as confusing in numerous posts. Tweeters would comment on information that had changed since the start of the pandemic and then question how they were supposed to make decisions. This process was complicated by the fact users struggled to sort through data that was potentially fake news or misinformation. The following tweets illustrate examples of individuals questioning how we define misinformation.

- Heat005498 (2022) replied, “Moreover, if the idea of “misinformation” changes rapidly then perhaps the concept of misinformation is wholly flawed. As the debate around COVID-19 proved, what is misinformation today may be fact tomorrow.”
- Siamoquioggi (2022) replied, “No doubt others have asked, who decides what is misinformation? All current search engines are full of misinformation from the

Western narrative . . . The Covid narrative in two years has taught us what was regarded misinfo, in fact wasn't."

- AmericanMuskrat (2022) replied, "@PStyxie @Letsgob8675309 @Mr_A_McSquiffy @primalpoly @HbdNrx @yegg A number of covid related issues were initially labeled misinformation but turned out to be true. Censorship is a foolish slope to slide down as ANYTHING can be labeled misinformation."

Uncertainty About What is Defined as Risky

Individuals in this main theme tweeted concern with what is defined as risky. As information shifted throughout the pandemic, individuals tweeted concerns about what, exactly, was constituted risk. Individuals questioned what was considered safe travel and if you did travel how you should travel. Questions were posed as to how severe the illness was due to the changes in information.

Tweeters posted statements that showed confusion in how to decide if they were at risk or not two years into the pandemic. As mandated restrictions changed due to political or data driven reductions individuals questioned these changes. Individuals shared changing guidelines both in the United States and in other countries in an attempt to understand how other areas were interpreting the measure of risk given what was happening in distinct parts of the world. As the pandemic continued, individuals discussed how to navigate the changing information and be flexible with the changes. This can be seen in the following examples.

- TheRealSamasonS (2022) tweeted, "This morning a friend in B.C. informed me that the pandemic is over up there. What they meant was that the mandates and restrictions were being lifted. No mask requirements starting today."

- WEAU13News (2022) tweeted, “The CDC says taking a cruise is less risky now than it was earlier this year.”
- Jillneimark (2022) replied, “It’s not an either/or, of isolate forever or expose yourself to Covid . . . Lots of flexibility if you understand risk, keep track of local incidence, know how and where to wear a mask, and adapt as many have.”

Lying About Pandemic

A number of tweeters in this main theme posted statements that indicated that the poster believed that the SARS-CoV-2 pandemic was a lie. Some individuals tweeted that they had been around others that supposedly had COVID-19 and shared they had not been vaxed, did not wear masks, and never got sick. By not getting sick, individuals concluded the SARS-CoV-2 pandemic was fake.

Individuals stated that the pandemic was fabricated, and the concept of the pandemic was created to serve other purposes. These individuals reported that the SARS-CoV-2 pandemic was created to increase income for the wealthy, pharmaceutical corporations, impact the elections, and distract citizens from other more important worldly events. Individuals called the SARS-CoV-2 pandemic a lie, a scam, a hoax, not real.

Other individuals discussed how lies about the pandemic resulted in increased deaths and argued that this loss of life was the fault of dishonest politicians. Individuals tweeted that lying about the illness caused individuals to lower their perception of risk and in doing so increased their chances of getting ill or dying. Individuals tweeted that spreading lies and misinformation impacted decision making while weighing risk.

- College_mick (2022) replied, “You know Covid is a lie don’t you? You know media have one voice, one message?”

- Lucinda23648169 (2022) tweeted, “Covid is a lie and masks don’t work anyway. Viruses are detritus left over from previous infections and are dead. They cannot multiply or pass from one to another. You a phd? Pah! Pathetic.”
- Ogwillzz (2022) tweeted, “I’ve been around people with Covid and been outside this whole time with no vax and them test results came back negative every single time. Covid is fake.”

These statements were argued against by other individuals that stated COVID-19 was real. The data demonstrated the presence of a suitable number of arguments and counterarguments about the legitimacy of the SARS-COV-2 pandemic. Individuals referenced the number of people that had died, increased hospital stays, and shared personal accounts of individuals that they knew that had died as well.

- AngelofLightTr1 (2022) replied, “Except that pretty much everybody in the US knows at least one person who got deathly ill from this fake virus that killed 969K Americans. It also killed some of your antivax/anti-mask friends.”
- Gotemsmokem (2022) replied “This Karen's sister died of covid b/c she was convinced not to get vaccinated. And this Karen still thinks Covid is fake. Incredible.”

Extreme Positions on the Impact of Covid-19 in Healthy Individuals

For those individuals that did accept that the SARS-CoV-2 pandemic was real, individuals in this theme focused on if COVID-19 was risky to healthy individuals or not. Individuals posted that COVID-19 posed a risk to healthy individuals and there were as many individuals that posted just the opposite. Healthy individuals tweeted accounts of how they had recovered from COVID-19 and asserted their experience was proof that others would fare as well

as they did. Individuals that did not get COVID-19 when they were around others that tested positive tweeted statements that they had super immune systems or even surprise if they hadn't caught the virus. Several tweets were found that utilized similar statements as the ones that follow.

- Mr_B_Morgan (2022) tweeted, "3 out of 4 tested in my house have Corona. Haven't tested the boy (2). I clearly have superman genes! 🦸"
- Claytonclabaugh (2022) replied, "No, the problem, is that covid is dangerous for specific at risk groups, the old and those with health concerns. . . . I'm over 60 and survived Covid twice with no problems."
- Thoushalknoweth (2022) replied, "covid itself doesn't seem to kill anyone. When I see that a lot of the ppl dying from covid are at/past life expectancy, then I'm sorry to be blunt, but it isn't a crisis. Ppl die."
- SurviveBiz (2022) replied, "The truth is, Covid is no longer a significant risk for those who are healthy and vaccinated, was never a significant risk for kids, and is not something most people need to worry about anymore."

Individuals that held opposing views, cited stories of healthy individuals that had died, posted their own experiences with the illness, and made general statements that COVID-19 was risky.

- Isag22 (2022) tweeted, "I know #CovidIsNotOver cause 2 days ago I lost another loved one to this pandemic. If you're keeping track, that's now 14 people in my life gone in 2 years. Do better and follow the guidelines."

- Jj_jalayna (2022) tweeted, “people who still think covid is fake is mind blowing to me. Almost everyone i know who tested positive for covid all have POTS. theses [sic] are young healthy individuals with heart diseases now.”
- Norfolkbookworm (2022) tweeted, “Covid really is no joke. It isn't like a heavy cold, or even like flu . . . it is worse than both of those by quite some way and this is (allegedly) a milder strain and I'm triple jabbed.”

Risk to Children or Not. In this subtheme, individuals tweeted that there was no risk to children due to COVID-19. When children were recorded as being ill, similar sentiments were tweeted that indicated that children were ill with COVID-19 not from COVID-19 as was seen in a previous subtheme regarding healthy adults. Tweets were found to contain concerns regarding vaccines for children. Individuals posted that children were more able to survive COVID-19 with little to no complications. The following examples exemplify these thoughts and concerns.

- WalterSobchakSr (2022) replied, “Plus, the vast majority of these children were hospitalized WITH COVID, not FOR COVID. Many were there FOR the flu but happened to have COVID. Without that context, what NYT is reporting there is straight up misinformation.”
- GeorgeBattagl11 (2022) replied, “covid is not dangerous to children, just look at the data - this is since the beginning of the pandemic so over 2 years.”

Not all tweets were found to agree that COVID-19 posed no risk to children. Other individuals posted that COVID-19 was a risk to children as children had been recorded as dying from COVID-19 complications. In addition, individuals also tweeted concerns for children getting long COVID and having future health concerns. Individuals posted sentiments that

encouraged individuals to take COVID-19 seriously for children. The following tweets illustrate the urgency some individuals attempted to convey.

- Pilondenis (2022) replied, " In fact, COVID-19 ranks as one of the top 10 causes of death for children ages 5 through 11 years. Nothing anywhere close to your 99.9% misinformation."
- UrquharMilissa (2022) replied, "Yes, my children are 1 of 2 in their classes, still wearing a mask. Covid causes long-term health problems; why are people so lax about getting covid?"
- IrelandTorin (2022) replied, "Yes, it is [risky]. Most respiratory viruses don't cause PANS or ME/CFS. COVID does, OFTEN. It is WAY more risky than the seasonal flu in children - perhaps not death-wise, but the neuropsychiatric issues it can cause are catastrophically bad."

Risk of Long COVID. This subtheme contained tweets from individuals that shared sentiments regarding the long-term health complications that followed a COVID-19 infection, commonly referred to as "long COVID." Individuals provided medical information from researchers and public health officials in an effort to document that long COVID involved a variety of symptoms that emerged after individuals recovered from COVID-19. Few tweets were found to oppose the reality of long COVID. The considerable number of tweets found to assert the SARS-COV-2 as a hoax extended to denying long COVID as well. The tweets that follow are examples of individuals expressions on long COVID.

- Thornbird04 (2022) replied, "I know two people with Long covid. One lady is still struggling to walk 5 mins a day, and one who got terrible cognitive impairments after. I hate what this virus did and is still doing."

- Smalltreatsorg (2022) replied, “lack of understanding that COVID is NOT "just a cold" - cardiovascular, immune, neuro, damage, long covid for some . . . not just a cold.”
- Hellodeliaaaaa (2022) replied, “good to point out that a large group of ppl who get covid will get a long term or permanent disability from it . . . which seems worse than the effects of ‘long term unemployment.’”

Debates on the Efficacy and Safety of the Vaccines. In this subtheme, numerous tweets were found regarding the safety and effectiveness of the vaccines for both adults and children. There was a clear divide with individuals deciding if vaccines were risky or not. Some tweets argued that the vaccines were safe for adults while others argued the opposite. Naeburger1 (2022) replied to several Twitter users, “It was more risky to take the vax with NO long term safety data than what it is for a healthy young person to catch Covid. Those that think otherwise . . . 🤦‍♀️ These 💉 are not safe and they’re not effective.” While Gina73605417 (2022) argued the vaccines were safe by tweeting, “They’re trying to stop the spread of misinformation that’s costing lives. The vaccines are safe. Covid is dangerous.”

Tweets regarding vaccines for children were similar but also included concerns with whether children even needed to take a vaccine. Tweets were found where individuals expressed concern with the speed at which vaccines were produced and the number of vaccines that were recommended throughout the pandemic.

Some tweets claimed vaccines were part of a governmental conspiracy while others linked them to 5G and mind control. Afganliberty (2022) tweeted, “Remember when twitter was flaging posts linking covid 19 and 5G as misinformation? Makes me think someone should be

looking into that." While Jasoneg33 (2022) made light of 5G posts when posting, "I got 5G now so I hope I don't catch Covid or whatever that stupid stuff people were saying before lol."

Individuals tweeted conspiracy theories about Bill Gates. These conspiracy theories about Gates asserted that he owned the patent for the SARS-COV-2 vaccines, wanted to control people, depopulate the Earth, or make money. ReineJackie (2022) tweeted, "Y'all sure it wasn't propaganda against ivermectin? Sounds like the DS is panicking over people finding out that the vaccine really Doesn't Work, & that ivermectin does. Remember, Bill Gates is BIG on depopulation. They want people dead." Several tweets were found that encouraged individuals to listen to what Bill Gates shared about vaccines. Individuals provided data from research they had found and shared their own experience with the vaccines as proof to support their claims. CarpintWero (2022) replied, "Covid is a get richer scam for those who already have billions. The 'death count' is a lie and the vaccines have actually killed many (my own family included). Open your eyes and read something relevant."

- Marthaj44 (2022) replied, "Natural immunity killed almost a million Americans getting it. The fear of a vaccine is ridiculous. I caught covid and I was vaccinated . Thise [sic] vaccines likely saved my life."
- Wecanvax (2022) replied, "The vaccine decreases the risk of children developing a severe form of paediatric inflammatory multi-systemic syndrome (PIMS), and possibly long COVID."

Severity of the COVID-19 Infections. In this subtheme, confusion was found surrounding the severity of COVID-19 infections. Individuals tweeted that COVID-19 was severe while other individuals asserted the opposite.

Several individuals tweeted that the illness was no worse than a cold. Other individuals posted concern that deaths that were attributed to COVID-19 were not actually due to the severity of COVID-19. Individuals tweeted that people died with COVID-19 not because of COVID-19. Individuals tweeted concerns about comorbidities and that individuals that were dying were mostly older individuals or individuals that had other more significant illnesses. Individuals posted that people were overreacting to the pandemic and that most people did not need to worry about getting ill as they would survive.

Those individuals that posted about the severity of the illness shared stories of loved ones that had passed or others that they knew that had died of COVID-19. Posts were found that shared statements about long COVID and the long-term impacts of catching the illness. Individuals encouraged others to take the SARS-CoV-2 pandemic and COVID-19 seriously as they stated the illness was not a mild cold or like the flu.

- WasOnceLoved (2022) replied, “You think Covid is a head cold? How many have died of this ‘head cold’? How many more without the global vaccine programme? Why are charlatans like you still able to promulgate this dangerous misinformation?”
- Lenapatsa (2022) replied, “This level of ignorance 2 yrs into this pandemic is inexcusable. As is your insistence in spreading antivax rhetoric. The millions of people that Covid has killed did not die of the common cold. As I said: #covidiot.”
- Spunkbubble2020 (2022) replied, “I am unjabbed and I had covid, I felt ill for about 12 hours. Its really not bad, you can stop living in fear.”

Main Class Two: Trust in Information

Main class two focused on individuals struggling to trust information about COVID-19. Individuals expressed concern with information that was provided from political, medical, and health related sources as well as information shared by others on Twitter. Within this class, the following themes and subthemes were defined, political, left-wing, right-wing, race/equality, censorship, voter suppression, and freedom of speech, war in Russia, sheeple/covidiots, public health sources, medical information, use of scientific evidence, distrust of scientific evidence, testing data/reported deaths, campaigns to combat misinformation, big pharma, social media information, cults, other countries, conspiracy theories, fake news, shift in media, and echo chambers. Keywords utilized to search the theme were fake news; sheeple, covid idiots; stupid covid; covid misinformation, covid is not real; SARS; and scam pandemic.

Political

This main theme describes political statements that impacted how individuals deciding what was legitimate information or misinformation related to the SARS-CoV-2 pandemic. There was a clear divide between left- and right-wing political affiliates. The pandemic was discussed in relation to political parties and how it impacted the economy. Individuals tweeted how politically affiliated information was laden with agendas and could not be trusted. Individuals often stereotyped other individuals into a particular political party based on the content they found on the other person's twitter profile as well as what tweets they had created or retweeted. Individuals politically stereotyped others based on the beliefs they held about the pandemic as left- or right-winged.

Left-Wing. Tweets in the data in this subtheme were found that stereotyped individuals as belonging to left-wing political views. Individuals that were designated as left-wing were

associated with belonging to the democratic party or liberal. Left-wing individuals were assumed to support vaccines, were cautious with COVID-19, promoted masks and preventative measures, were less often to question data, and accused of blindly agreeing to everything the government and public health officials recommended even at the cost of freedom. Tweets were found where individuals clearly stated they were not in the right-wing group.

- Kyle Yoakum (2022) replied, “More like liberal, left wing folks fell for government mandates and fear of Covid over those who want less government and who don’t trust big Pharma.”
- Oneforamerica76 (2022) replied, “ Biden kept that and the Covid scare tactics going as long as possible under the direction of Fauci, the democrat demigod, in order to crash our economy. They want the ’great reset’ . . . turn us into a socialist country.”
- Jim91740911 (2022) replied, “I noticed you included 'Wash Hands'. You must be a democrat.”

Right-Wing. Individuals in this subtheme were also stereotyped as belonging to the right-wing political party. These stereotypes included belonging to the republican political party, being antivax, antimask, not believing in covid, and believing in conspiracies and that COVID was a hoax. These individuals were concerned with their freedom being infringed on. Individuals that identified people as belonging to the right-wing group often characterized them as taking more risks thus being dangerous to be around. Self-identified right-wing individuals were noted as using statements implying, they were glad they did not belong to the left-wing group.

- NelsonGich (2022) tweeted, “Republican vaccine obstructionism isn’t about serving a coherent ideology, says @paulkrugman, it's all about power. A

successful vaccination campaign would have been a win for Biden, so it had to be undermined using any and every argument available."

- Campus_Maximus (2022) tweeted “Republicans have been repeatedly WARNED by Democrats, about the dangers of Covid. If Republicans CHOOSE not to get vaccinated, then that's ALL on them. Republicans are FREE to self-destruct.”

Race/Equality. Tweets that addressed the political main theme also were found to mention how COVID-19 impacted individuals differently depending on their race or socioeconomic background. In this subtheme, some twitter users noted that individuals from economically disadvantaged areas were impacted more by COVID-19 than those residing in wealthier areas. While analyzing this subtheme, I also found tweets with racist undertones blaming COVID-19 on varying ethnic groups or using terms to denote that they believed that the pandemic came from China.

- Factoids4All (2022) tweeted, “ omicron wave’s unequal toll: it hit unvaccinated and under-vaccinated people hardest, data shows, wounding communities with inadequate access to health care and where officials have failed after a year to stamp out vaccine misinformation and distrust.”
- Nyupublichealth (2022) tweeted, “NYU researchers unpack social media’s unique impact on COVID-19 misinformation among underserved, underrepresented, and often invisible Asian American communities.”
- Mandeep_Dh (2022) tweeted, “As long as the rights of marginalized people are neglected and inequalities dictate health outcomes, the pandemic will continue . . . true for HIV, COVID and other pandemics!”

Censorship, Voter Suppression, and Freedom of Speech. Individuals in this subtheme were found to tweet concern with COVID-19 due to information being censored. This subtheme identified concerns that voters were intentionally suppressed due to the pandemic which impacted political outcomes. Additional statements were found that reported individuals believed they were being unfairly censored if they stated information that was not in support of COVID-19 and the SARS-CoV-2 pandemic. Individuals in this subtheme tweeted concerns with their freedom of speech being limited or infringed upon. The following tweets illustrate individuals conveying concern with censorship, voter suppression, and freedom of speech.

- Theodore_homa (2022) replied, "Lemon is a coconspirator who should be prosecuted except he is an exempt fake news elite. We are just citizens who are censored on social media for telling the truth. Lies WIN."
- AgoristView (2022) replied, "Covid was a govt funded bio weapon . . . Breathing thru a dirty cloth & being indoors increases spread of illnesses. The injections prevent nothing & harmed more than covid. At every step people saying these things were attacked & censored."
- Commandcreation (2022) tweeted, "a perfect example is those of us that chose to not vaxx- we didn't align with the world view . . . two years later i didn't get covid and suffered nothing but loss of my freedom? Stop oppressing freedom of speech."

War in Russia. Individuals in this subtheme were found to connect the events in Ukraine and the war with Russia as being connected to COVID-19. Individuals shared that the war in Russia was politically motivated and stated COVID-19 was politically motivated as well. Individuals would express beliefs that connected with COVID-19, Ukraine, or Russia when sharing information.

- SnitchCrumby (2022) tweeted, “It is so shocking that the same people peddling COVID misinformation are also peddling Russian propaganda word for word. Truly shocking. Could never have predicted that. Gasp”
- Csinco (2022) replied, “many Americans can’t fathom how Russians fall for this propaganda BUT then I was like ’people, do we not remember the last two years of COVID misinformation and the Big Lie of the 2020 Election??!!’”

Sheeple/Covidiots. Many tweets in this subtheme were found to contain the words sheeple or covidiots however, the term was not used consistently. Sheeple were people that were considered blindly following a mass decision without asking questions, but this term was also used for people that supported COVID-19 preventative behaviors and those that did not believe COVID-19 was a risk.

Similarly, the term covidiots was used in the same manner. Individuals tweeted and used this term to describe individuals that were not following COVID-19 preventative behaviors and also to describe individuals that were following COVID-19 preventative behaviors. Individuals noted how people used the terms and would often assign people to the left-wing or right-wing group or apply additional stereotypes to individuals based on how they had used the term sheeple or covidiot to describe another tweeter.

- R_Walters59 (2022) replied, “Actually, by then the elite class will have new causes and existential threats to rally the ‘sheeple’ around. Just remember the sky is always falling somewhere. And only activism and sacrifice on your part will fix it.”
- CurseWaterBoy (2022) replied, “The extremes can be broken up into 2 camps the Blue Church of Covidian and the Red Church of Covidiot. Most nuanced people

like myself live somewhere in the middle and look to find the synthesis between the two tribes."

- MrBosephone (2022) replied, "You sir, are the Covidiot. I am what you would think is a sheep. Another misnomer of course since sheep are smart and herd together to protect themselves and the rest of their group . . . how humans could/should be."

Public Health Sources

This main theme describes concerns individuals tweeted regarding information provided by public health sources. Some individuals tweeted mistrust from information while others shared information from public health sources in an attempt to combat misinformation. Individuals reported concern with understanding risk as information from public health officials changed during the first two years of the SARS-CoV-2 pandemic. Additional subthemes found while analyzing public health sources were medical information, use of scientific evidence, distrust of scientific evidence, testing data and reported deaths, campaigns to combat misinformation, and big pharma.

Medical Information. Individuals in this subtheme tweeted medical information that was provided by their doctors or sources of information that were provided by individuals claiming to be medical professionals. When medical professionals posted, often individuals would state that the information they provided was not accurate or that they did not qualify as experts on infectious diseases. Individuals noted that information provided by medical professionals could be contradictory and unclear which individuals reported impacted how individuals perceived risk. Individuals also reported concerns over what steps to take following a positive COVID-19 test as medical advice on twitter appeared inconsistent.

- Michaelak49 (2022) replied, “That's absolutely a misinformation quote. Hospitals by Federal law cannot refuse you service even if you get covid.”
- SloggenDazs (2022) replied, “ if you said anything about healthy lifestyle having an impact on COVID it was considered misinformation. There was a national post article not long ago where and "expert" actually said a "healthy lifestyle isn't a risk mitigation strategy."
- Janwillsey (2022) replied, “So these doctors, scientists professors are wrong or are they planning a new pandemic? It is called science . . . Nothing about covid is a lie, especially not the almost one million people who have died.”

Use of Scientific Evidence. When individuals were trying to understand medical information or preventative measures, often individuals would request that others provide scientific evidence to support claims that were being provided. Tweets in this subtheme were found to include articles that supported claims. However, little peer reviewed studies were actually found by the researcher while analyzing tweets. Individuals were more likely to share articles, images, or quotes from articles than actual links to peer reviewed materials. The lack of peer-reviewed articles was noted by some individuals.

- Anarchodelphis (2022) replied, “Why not cite a few actually peer-reviewed articles? Or doctors who've considered that the current consensus is that YOU'D NEED THREE DOSES of a 2-dose COVID vaccine to minimize symptoms and hence the risk of transmission?”
- Nightlycruise2 (2022) replied, “Show us the peer reviewed studies that masks work & that these vaccines prevent catching & spreading covid.”

Distrust of Scientific Evidence. When scientific evidence was provided, individuals would tweet that they did not trust the information. Studies were identified as being outdated, or controversial. Individuals in this subtheme would tweet studies that disproved other research posting by other users. Individuals questioned scientific evidence that was provided. Some individuals stated they were using information that came from a particular research study however, like in the use of scientific evidence subtheme, did not provide a link to the actual data. The following two tweets mention evidence, however, provided no evidence.

- MelissaKarabin (2022) replied, "Because there is no scientific evidence to support that the vaccine is causing long term issues. Studies have repeatedly shown that getting vaccinated reduces the risk of Long COVID. I base my health decisions on peer reviewed medical trials."
- JeanCourtney413 (2022) tweeted, "And here is evidence to support masking."

Testing Data/Reported Deaths. Individuals in this subtheme reported concern with accuracy of testing data and the number of reported deaths due to COVID-19. The tweets that were compiled representing this subtheme contained statements that testing data was not accurate as the numbers of individuals that are reported as having had COVID-19 were either over or underrepresented. Individuals shared that testing data did not accurately represent the number of positive cases as some individuals did not get tested. Other individuals reported an overrepresentation of cases and shared articles claiming some PCR tests produced false positives. Other individuals argued that not COVID-19 deaths were the result of infections but were due to other comorbidities and should not have been included as a part of the death counts.

- SteveThorup (2022) replied, "Not re-categorizing Covid deaths - accurately reporting actual deaths from Covid. They did the same with hospitalizations, and

roughly 50% of people in hosp w Covid were/are in for something else. You have been misled and conditioned to fear."

- SkogkattB (2022) replied, "I don't meant Covid is a lie, but not all cases had to be Covid if you could not rely on the test. Got it?"

Campaigns to Combat Misinformation. To combat misinformation, tweets in this subtheme were found where individuals would organize various types of campaigns. The events discussed were intended to target misinformation by sharing scientific information through infographics, talks, meetings, and panel discussions. Events had the potential to reach a larger audience as most of the events were still offered online.

- IUImpact (2022) replied, "An @IndianaUniv study found that brief exposure to an infographic about the scientific process may have the power to strengthen people's trust in science, including reducing the influence of COVID-19 misinformation."
- RoySocMed (2022) tweeted, "#COVID-19 Series episode 99: Tackling hesitancy and online #misinformation. Chaired by Dr @timringrose, President of RSM Digital Health, our guests will be @sjpiatek, @LSHTM Vaccine Confidence Project, and Prof @SusanMichie, @ucl. Register to join 👉 https://t.co/4QyEM6rsFT https://t.co/GBL06ca6qm"

Big Pharma. Individuals in this subtheme cited risk with information around COVID-19 due to the involvement of the government and vaccine industries. Some individuals identified and called vaccine producers "big pharma" and stated that the products they produced were intended solely for profit as opposed to being safe to safe for consumers. Big pharma statements

were often associated with political concerns or affiliations and often noted by individuals that had been associated as right-wing followers.

- Ttaskett (2022) replied, “The greed & corruption in the drug marketing side of the pharma business helped legitimize the antivax movement. A lot of the terms & phrases . . . in decades of criticism of drug business is being echoed in antivax agitprop [political propaganda].”
- VanelliBarbara1 (2022) replied, “With very few studies on human beings and animals and just for big pharma interests, we know perfectly, we are less stupid than you would think. #COVIDIOT #Covid_19 #NoGreenPass #NoVaccinePassportsAnywhere”

Social Media Information

This main theme addresses tweets that were found where individuals reported concern with information that was being distributed on social media. Individuals tweeted concerns that information on social media was not accurate and was often based on opinions or fears. Individuals were observed flagging other users whom they had identified as promoting false or misinformation. This was represented in the data with tweets that stated an individual had blocked another user or reported them to Twitter for misinformation. VAmisem (2022) tweeted, “I finally blocked him. Opposing views are fine but when it comes to Covid I have a science background & there's 3 nurses 2 doctors & a mycologist in my family.” Gmalau32 (2022) tweeted they were blocked and knew others had been as well by another user, “Sentlese had blocked many people including myself for disagreeing with him on Covid vaccines that came out now to be a scam.”

Individuals identified misinformation as being associated with bots, conspiracy theories, fake news, and even cults. The term “cults” was utilized to describe individuals that belonged to either the right- or left -wing political group. In an attempt to understand information, individuals tweeted COVID-19 news headlines and data from other countries. People tweeted that misinformation was being quickly spread through echo chambers on Twitter and on other social media platforms.

BOTS. In this subtheme, messages that were repeated with exact phrasing in large numbers sent by the same user(s) were found. As I looked up some of the accounts associated with these types of tweets, many matched criteria for a suspected bot. Individuals expressed concern that information they were encountering may be false or suspected they were dealing with a bot. Some Twitter users asked for more assistance from Twitter to ban bots. Others expressed concern that the bots were spreading misinformation and lies. FungoBat1934 (2022) replied, “I have read multiple places that 80% of the misinformation about Covid and the Covid vaccines was spread by Russian bots. Not a big leap to make to this. Would love to see some data on the 80%.” Misinformation spreading was suspected by Mutzuk (2022) when they replied, “I see the Bots are still pumping out the #antivax propaganda like anyone still believes them...Cue the #EchoChamber #BlockAndRun in 3..2..1..”

Cults. Individuals were accused of belonging to a cult if they held beliefs consistent with right- or left-wing viewpoints. In this subtheme, individuals identified statements made by other users and accused them of belonging to a cult. Once identified as belonging to a cult, the user lost credibility of the information they provided.

- Solutions_covid (2022) replied, “For the most part, it's #CovidOligarchy: safety and profit for the rich; everyone else is on their own. There's also the endemicist cult, but both of these require steady #CovidGaslighting to promulgate. 🤘”
- Dee_redhead (2022) tweeted, “antivax ppl really starting to sound like a cult.”

Other Countries. In an attempt to understand risk, in this subtheme individuals tweeted information and data originating from other countries. The information and articles demonstrated how other countries were responding to the SARS-CoV-2 pandemic. Individuals tweeted comparisons of how the United States responded to the pandemic compared to other countries and questioned decisions made in the United States. Individuals used information from other countries in an attempt to understand what was happening or would be happening in the United States.

- Jaysimmo3 (2022) replied, “In March/April most of world *did* lockdown but many countries didn’t close borders, didn’t quarantine infected arrivals. Many Euro countries got it down to low hundreds then opened up! One/two months more & no need for vaccines.”
- ChatswoodPamela (2022) replied, “Covid infections are rising again in many countries. Next wave happening. New Omicron variant much more transmissible. Sorry for the folks in denial, but Covid is NOT over . . . far from it. Pretending it's over doesn't make it so.”

Conspiracy Theories. Individuals in this subtheme identified some information on social media as being associated with a conspiracy theory. Conspiracy theories most often focused on vaccines, governmental control, increased wealthy financial gains, as well as decreasing rights of individuals. Sometimes when individuals tweeted about conspiracy theories, they would

stereotype the identified Twitter user as belonging to the right-wing group. Some individuals sent messages directly to Twitter asking why these accounts were not being blocked.

- A_safe_House_ (2022) replied, “I saw networks like Fox constantly lying about the 2020 election being stolen. They also presented covid conspiracy theories / misinformation as reliable.”
- Koianu (2022) tweeted to Twitter, “Why aren’t you cancelling/deleting/suspending the accounts of anti-science, antivax Covid conspiracy accounts? I await your response with anticipation.”

Fake News. Along with conspiracy theories, individuals in this subtheme also discussed news that they believed to be fake. Individuals that information they identified as fake news shared the reasons why they believed this was the case. Twitter users would also simply respond to posted information by simply writing “fake news.” Individuals tweeting misinformation and fake news increased confusion around decision making and understanding risk with regards to the SARS-CoV-2 pandemic.

- GottesfeldGary (2022) replied, “Unfortunately, it seems that a free press is not necessarily an antidote to fake news and lies. Just look at . . . the US in the last year. Some people just believe what they want to believe regardless of the facts.”
- Loopy_Johnson (2022) replied, “The irony is every news station besides local ones are labeled "fake news" now. Although it's not fake, it's just biased.”

Shift in Media. The severity of COVID-19 infections and the SARS-CoV-2 pandemic was questioned by some individuals as they noted that media outlets were covering other topics. Some individuals saw this shift as proof that the pandemic was never that serious but rather as a

story exaggerated up by the media. Tweets analyzed in this subtheme questioned if COVID-19 was really risky if media changed topics that quickly.

- Philsongmusic (2022) tweeted, “So since the Russian and Ukraine war or invasion, we no longer see covid updates again, now we all know the media crates [sic] fear.”
- KerbyNancy (2022) tweeted, “And just like that Covid is no longer in the news. Sort of makes me wonder how much of the news about COVID was simply propaganda and a method of control.”

Echo Chambers. A small number of individuals in this subtheme used the term “echo chamber” to describe when they believed other individuals were sharing information that only echoed a particular thought and did not take into account any additional perspectives. Echo chambers identified in this data were noted as being negative by individuals. Some individuals insisted they were not simply echoing what others shared.

- TomDoubting (2022) replied, “[I] do read opposing points of views. I don't exist in an echo chamber only listening to things I agree with, like most Trumpsters do who block out the truth and label it "fake news!”
- Economicright (2022) replied, “You’re only scared because you sit in social media echo chambers and gobble up antivax propaganda like a sheep. Go look at the actual studies and healthcare data and you won’t be quite so petrified of modern science.”

Main Class Three: Preventative Measures

Main class three focused on preventative measures two years into a pandemic. Themes defined were vaccines, religion and spirituality, masks, widespread restrictions, preventative measures and behaviors, and treatments. Keywords were: antivax; antimasker; covid

misinformation; wash hands; cover your cough; face mask policy; covid mask; covid masks; covid prevent; covid awareness; covid is not over; risk perceptions; covid safety.

Vaccines

In this main theme, a substantial number of tweets discussed vaccines. Individuals tweeted about vaccines being risky, the degree to which they were effective, and which strains vaccines were designed to target. Confusion regarding the purpose of vaccines was noted as some individuals tweeted that vaccines would keep people from catching COVID-19, while others tweeted vaccines would prevent individuals from getter seriously ill if they tested positive. Others tweeted that vaccines were pointless and did not assist with decreasing the COVID-19 infections. In lieu of vaccines some individuals tweeted that humans should rely on their natural immunity as a preventative measure. Those that tweeted for the use of vaccines shared sentiments that vaccines were an effective means to prevent long covid and decrease severity of COVID-19 infections.

Individuals also shared varying concerns with vaccines for children as noted in a previous subtheme, with individuals felt vaccines were unsafe for children. Individuals shared information about the need for vaccines as a preventative measure to decrease the chances of long covid in children as well as reduce the chance for death. Those that opposed vaccines in children argued that their low death rates hospitalizations justified no need for vaccination.

Within this main theme individuals also tweeted sentiments that they wanted freedom of choice for their body on whether or not to get the vaccine. Tweets that used statements that stated it was an individual's choice what to put in their body where often made by those that were against getting in the vaccine. Individuals for the vaccine would point these statements out and would often call these statements as hypocritical or claim the poster was a religious zealot.

- Stuart6trout (2022) replied, “The reason taking this covid vaccine is very risky, a vaccine only becomes a vaccine once it is proven not toxic to humans, this rule is ignored for 'emergency' vaccines.”
- ArmenHovsepian (2022) replied, “It [vaccine] was never meant to prevent covid, its role is to boost the immune system in order to do a better job fighting it off once infected … the worst thing about all of this is the misinformation spread … its very confusing.”
- Xmacaveli (2022) replied, “But a vaccine doesn’t prevent transmission and a mask doesn’t prevent transmission.. your point couldn’t be more invalid! In one case my body my choice leads 100% to a death and in the other case it’s for your feelings!”

Religion/Spirituality

Some individuals in this main theme tweeted prayers to protect individuals from illness. Other individuals asked for prayers themselves, loved ones, or friends who had contracted COVID-19. A small number of individuals reported they were not worried about preventative measures as religion was all that they needed to remain safe.

- TruthSe57477214 (2022) replied, “Me either. No mask, no vax and no covid for the entire time! Its Total BS!! I refuse to walk in fear! My God is all I need. Jesus is King!”
- Sarahwtucker (2022) tweeted, “Took me the entire pandemic to catch the RONA . . . send prayers please for health, and anxiety over the situation!

Masks

Numerous tweets in this main theme were found with statements regarding masks. Individuals tweeted either for or against the use of masks as a preventative measure. Individuals that were against the use of masks made statements that there was no proof that masks were effective against contracting COVID-19. Individuals that were for the use of masks as a preventative measure shared how wearing one prevented them from getting ill.

Individuals shared their opinions towards others that did not hold the same views as themselves. Individuals that believed masks were a necessary preventative tool during the pandemic often shared frustration that others did not want to wear masks, found it easy to wear masks, and felt unsafe in spaces with people not wearing masks. Individuals tweeted concerns about the removal of mask mandates and reported they would continue to wear masks until they felt ready to stop. Some individuals reported concerns for children in school as they were in areas without proper ventilation for several hours a day. KierstenDrynan (2022) tweeted, “I work in a classroom with a faulty ventilation system + windows I can’t open without a ladder. 26 students + me at risk.” Herbalbug (2022) tweeted similar concerns, “Schools are crowded places with poor ventilation, yet you say no need to wear masks. Our staff are vaccinated but we are now seeing teachers off sick with covid for a second time.”

Individuals that stated they did not believe masks were an effective preventative measure during the pandemic shared statements that they were glad mandates had been lifted. They also showed frustration with people that wore masks as they stated they were ineffective, did not work, and that there were not many studies that proved they were an effective preventative measure. Individuals against masks reported they were glad that mask mandates were lifted from most public places and showed frustration with businesses that were still requiring masks.

Tweets by individuals who wore masks shared what type to wear, when to wear one, or made general statements that masks were effective at slowing the spread of the contagion. Sayit4word (2022) tweeted, “We wear a mask for the same reason we were a year ago . . . or two years ago. There is a lessened risk off contracting or spreading COVID if you wear a mask . . . especially if you are fully vaccinated.” Some individuals tweeted that they wore masks to help prevent vulnerable individuals from catching COVID-19. As seen in an earlier subtheme some individuals were stereotyped and identified as antimaskers and right-wing, while other individuals were called sheeple and left-wing. Numerous tweets were found with individuals that shared concerns that they would be treated disrespectfully or unfairly.

- LindsdyDiLoreto (2022) tweeted, “Just a week after our school abandoned their mask policy, our family now has COVID. Great job, excellent foresight.”
- Killaakellzzz (2022) replied, “I’m nervous about ignorant people who treat others who still choose to wear a mask and businesses that still choose to enforce a mask policy disrespectfully. You never know why someone else will still be wearing a mask.”
- Anneanimallover (2022) replied, “Unless everyone is wearing N95s there is no point. Omicron is not early covid and cloth masks are not effective. Children are missing out on important parts of language and social development wearing masks.”

Widespread Restrictions

Individuals shared opinions about how changes in restrictions over the course of the pandemic impacted preventative measures. Tweets captured supporting this main theme shared concerns about lowering restrictions too soon, dropping mask mandates, and lifting travel

restrictions. Some individuals shared they were glad restrictions had changed and argued this as proof that cases of COVID-19 were decreasing, or that widespread restrictions had been ineffective. Some individuals tweeted concerns that widespread restrictions would need to occur again as future mutations of SARS-CoV-2 would result in the number of positive cases increasing.

- SiskoCarter (2022) replied, “The ceasing of mandates has nothing to do with people's risks of getting Covid. A 17% decline of deaths that are higher now than last year . . . It's risky now because people r no longer protecting themselves or others.”
- Khenslelowrance (2022) tweeted, “My town’s mask mandate for public buildings/schools was just removed. Our vaccination rates are high & COVID cases are low, but I’m uneasy. Giving up these protections—while the pandemic still kills people every day—seems risky.”
- TheMegoAddly (2022) replied, “I've said that and that's why I've said it was stupid to put all these restrictions in place like vaccine passports, the masks, and everything because covid is the new flu.”

Preventative Measures/Behaviors

Included in this main theme are tweets regarding the use of preventative measures. Some individuals listed little to no preventative measures while other individuals tweeted a list of several preventative behaviors for individuals to utilize in an attempt to lower their risk of contracting COVID-19. This main theme also included tweets from individuals that discussed their observations of others and their lack of preventative behaviors utilized.

Individuals shared sentiments that some people were not doing enough to reduce the spread of SARS-CoV-2. Individuals tweeted that basic preventative measures such as covering your mouth when you cough or sneeze, self-isolating when ill, and washing your hands were not being utilized. Some individuals noted differences between preventative behaviors they wanted to engage in but struggled to do so due to different views friends, or family held.

- Asensitivesoph (2022) tweeted, “my dad's so fucking selfish, he has covid and has given it to everyone . . . he refuses to cover his mouth when he coughs or wash his hands, and now he's . . . coughing everywhere and complaining that I'm wearing a mask 😒″
- DrSJNZ (2022) tweeted, “People’s shifting risk perception is strange. Two weeks ago we had zoom birthday drinks for a family member, this week they want us all to hangout indoors for dinner. Nothing’s changed for me except for the worse.”
- Kardash_sam (2022) tweeted, “I did not wear a mask for the past year, I did not take any COVID-19 vaccines. I did not get Covid. I refuse to live my life in fear for even one second longer.”
- Tegdavieswyp (2022) tweeted, “completely respect an individual’s decision whether or not to wear a mask. However, it is human decency to at least cover your mouth with your elbow when you cough. Not doing this, especially on public transport, is honestly disgusting.”
- Rosepoet (2022) tweeted, “COVID has hit the most disadvantaged the hardest. Those least able to afford to self-isolate are also more likely to work outside the

home, use public transport and live in overcrowded housing – all risk factors for catching the virus.

Treatments

A large variety of COVID-19 symptom management treatments were shared between users. Some treatments were highly contested, like using UV lights and disinfectant, while other treatments were more widely accepted, like staying hydrated, resting, and going to the hospital if symptoms worsen. Controversial treatments that were noted were the use of UV lights, marijuana, alcohol, Remdesivir, vaccines, and cannabidoiolic acid (CBDA). Other treatments suggested were humidified warmed CO2, drinking fluids, povidone-iodine (PVP-I) throat gargle, Paxlovid, steroid treatment, no treatment, oxygen, antivirals, and going to the hospital. Individuals discussed seeking treatment in numerous tweets, however, were not specific to what the treatments actually are. With unclear messages on how to treat symptoms if an individual does contract COVID, even caring for yourself or someone else could be confusing.

- Glassybydeanna (2022) tweeted, “Cannabis has never been ties to an overdose death . . . It helps with cancer . . . helps people get off opioids. And there is research from israel that shows it is helpful in fighting covid.”
- FischerToy (2022), replied, “When we say he's stupid and responsible for covid deaths, he asked if there's a way to pump uv light into the body, or can we inject disinfectants like a cleaning.”
- JamesLynchGTC (2022) replied, “If remdesivir is so deadly, youll be able to point me to a clinical trial where it increased mortality.”
- MedicalScitech (2022) replied, “The antiviral therapies #remdesivir, #molnupiravir, and the active ingredient in Pfizer's #Paxlovid pill (#nirmatrelvir),

remain effective in laboratory tests against the BA.2 variant of SARS-CoV-2, the virus that causes COVID-19. https://t.co/XgXOPs8dlr”

Main Class Four: Life Before/After the Pandemic

Main class four focuses on individuals sharing comparisons of life before and after the pandemic. Individuals reported how COVID-19 impacted and even delayed events in their life. Individuals discussed concerns with mental health and catching COVID-19 and expressed nostalgia for a time before the SARS-CoV-2 pandemic. A number of tweets demonstrated efforts to normalize the risks associated with COVID-19 in attempts to adapt to and live with COVID-19. Individuals tweeted about how the SARS-CoV-2 pandemic will have longstanding impacts on women. Main themes defined were mental health, nostalgia, life after COVID-19, normalizing risk, impact on women and children, life on hold, and humor. The keywords were covid anniversary; stupid covid; pandemic; and SARS.

Mental Health

Individuals in this main theme noted concern with mental health due to the SARS-CoV-2 pandemic. Some individuals tweeted concerns that lockdowns and restrictions had negative effects on the mental health of adults and children. Individuals reported concern for the mental health of children due to the lack of social interactions and reduced time in school. Some tweets had statements expressing concerns with increased anxiety and depression. Others tweeted predictions that more mental health concerns will occur as long COVID continues. Instances of concerns about increased substance abuse were found within the data. Fear was also noted in tweets where individuals worried about their loved ones catching COVID-19 or unknown health issues with long COVID.

- MarcPatrone (2022) tweeted, “No wonder kids are afraid of taking masks off . . . The psychological damage from two + years of covid brainwashing, masking, lockdowns, and fear-mongering will take years of therapeutic deprogramming to undue.”
- ChuckWurster (2022) replied, “We lived in fear every day that we would get sick and die doing our jobs. We were also terrified that we would bring Covid home and hurt our families or give an infection to a patient.”
- ZainJalali (2022) tweeted, “Never had anxiety in all my life but after COVID-19 lockdown this started to happen and now sometimes I am even unable to go outside home in night due to unknown fear.”
- HungHuanglo (2022) tweeted, “I believe lockdowns killed more people (especially younger people due to mental health, addiction issues and domestic violence caused by being isolated) than COVID ever would have. ”
- MrsH_Teaches (2022) replied, “Autoimmune diseases and COVID are noooo joke . . . My mom had RA and passed away a few weeks ago from COVID. I can totally see numbers of autoimmune diseases rising and I fear for people's health!

Nostalgia

Individuals in this main theme were found reminiscing on times prior to the SARS-CoV-2 pandemic and before COVID-19. Individuals reflected on how time had changed and reported differences in how they lived their life two years into a pandemic. Some individuals reflected on how time during the first two years of the pandemic felt extremely longer than the actual time that had passed. The following tweets show examples of nostalgia seen in this main theme. Statements were found that mentioned what life was like before COVID-19.

- WBUR (2022) tweeted, “They're some of the youngest kids who can reflect on how the pandemic changed their lives. From isolation and fear, to Zoom cooking with grandma, to a police parade, birthdays . . . kids remember most about the last two years.”
- Athyliss (2022) tweeted, “today was a really good day, I went shopping with a friend then we went to a restaurant (I haven’t been eating in a restaurant for so long because of covid) and then we visited an old friend).”

Life After COVID-19

Some individuals in this main theme reflected on how COVID-19 had changed their life forever. VealeRandolph (2022) tweeted, “This week will be the 2nd anniversary that America was shut down . . . it was a first in all of our lifetime that changed the world forever aka the pandemic as Covid-19 first arrived to the United States.” Others noted that life would never be the same now that COVID-19 had occurred. Lorinworm (2022) tweeted, “the gag is that it will never be ‘normal’ again, ppl have lost family members, jobs/had economic difficulties, struggling w long covid and the issues that come with that. the world will never be the same again.” Individuals reported concern with how COVID-19 would continue to impact individuals in the future with new mutations, or seasonal deaths like the flu.

- LongBeachMayor (2022) tweeted, “Long Beach has created a digital memorial to honor the 1,236 members of our community . . . lost to COVID. They were our friends, neighbors & loved ones — our hearts go out to every single person who has lost someone.”

- Matt_Chalfant (2022) tweeted, “I was at Daytona Bike Week when corona went crazy. They asked me to not come back for 2 weeks in case I had it . . . 2 years later and I haven’t worked a day in office since lol”

Normalizing Risk

Some individuals in the data called for others to accept COVID-19 as a part of life and utilized statements to normalize risk. In this main theme tweets were found that contained statements that utilized normalizing risk as a way to reduce anxiety and fear. Those opposed were found to reject the notation of normalizing the risk of COVID-19. Harmonyhelen (2022) tweeted, “which speaks to the importance of duty of care & shared responsibility. Just because YOU feel ‘safe’ & happy to ‘live with it,’ does not mean those around you are the same.” Individuals would use statements to either keep fighting the risk of COVID-19 while others would encourage moving forward and living life again.

- Rickpatricio4 (2022) replied, “I’m ok with moving forward. I’m triple vaxxed and need to trust the science. I just don’t think we can keep living with a fear of catching covid as it won’t ever disappear.”
- UnderlyingDemon (2022) replied, “Honestly, and I mean this respectfully but you all need to stop living in fear of covid and start living your lives again.”
- ColleenLarkin10 (2022) replied, “My entire family . . . work, school, shopping, etc. Covid is not over; ceasing to be vigilant will cause a resurgence.”
- SamLace65948404 (2022) replied, “Wearing masks destroys the perception of ‘normal’, and reminds people that COVID is not over. The goal here is to, in a sense, demonize mask-wearing and precautions, promote the false notion that there is no risk.”

Impact on Women and Children

Individuals in this theme reported concerns about how the SARS-CoV-2 pandemic had impacted women and children. Some noted concerns with women needing to leave the workplace to care for children. Carissajune1 (2022) replied, "I had to quit my job after 6m bc of so many Covid call outs from my daughter in daycare." Other tweets indicated a concern that women and children may have been impacted by spending more time in abusive homes. Individuals shared articles and reported frustration that women and children would have these hardships and go unseen or unheard.

- Wacp06 (2022) tweeted, "The Lasting Effects of the COVID-19 Pandemic on Women's Work, Health, And Safety on @Scribd #ReadMore https://t.co/VCvBHBOzQ"
- Catgiorgi (2022) tweeted, "Women have been disproportionately impacted by COVID-19. This is the case when it comes to increased risky alcoholic product use & experiencing increased harm from alcoholic product use."
- TheGFF (2022) tweeted, "A lack of preparedness for the pandemic has diverted resources to cope with Covid-19. Lockdowns, fear of contracting Covid-19 and financial hardship meant that fewer women and children could make it to health facilities."

Life on Hold

Individuals in this main theme reported that because of the SARS-CoV-2 pandemic or catching COVID-19 their lives had to be placed on hold. Individuals shared plans that were delayed due to the pandemic. Individuals expressed concern that the pandemic would not end.

- Helenleon4321 (2022) replied, “So you're perfectly fine with the huge amount of school staff sick with long Covid? My illness was horrific and ended the career I loved dead in its tracks.”
- LadyLettera32 (2022) tweeted, “Yesterday was the 2nd anniversary of COVID, and honestly I’m just so tired. I know we all want this to be over, but if we don’t all get fully vaxxed, keep wearing our masks, keep distancing etc I’m worried this will never end.”
- DawkinsSian (2022) replied, “I’ve been asked to take part in long covid research 👍 jumped at the chance! 15 months in, been told I now have ME too, I was super fit, now can barely leave bed/sofa/house.”
- SophiaMeloni15 (2022) tweeted, “Every spring break me and my brother and my dad would go to Virginia but we haven’t gone to Virginia in a while cause of stupid covid.”
- ErinDLit (2022) tweeted, “I should be on my way here instead of in SW Illinois doing nothing. I should be eating delicious food in Tokyo and seeing one of my favorite bands. I am cranky because . . . stupid covid numbers are shooting up.”
- Evolambert (2022) tweeted, “’You cannot live your life like you used to,’ a covid long-hauler told @KatherineJWu, ‘life just becomes this shell.’ For individuals, for societies, ‘this is not going away.’ Hospitalizations and deaths don't cover the total toll of this pandemic.”

Humor

In this main theme individuals attempted to use humor while discussing COVID-19. Tweets were found that attempted to make jokes or make light of the pandemic. Glenramos

(2022) tweeted, “If nothing Covid has brought us some wonderful new words . . . #Covidiot#Freedumb#Decerebrate#Pretendemic.” Links with videos, memes, or gifs were shared making fun of the pandemic. SamuelChaplin (2022) tweeted, I made this and I think it helped people laugh through the fear - it also spread round the world like a very catchable thing! https://t.co/OlRfRCNmFu.”

Discussion of the Results

The purpose of this study was to understand how individuals expressed concern and made meaning of risk two years into a long-standing pandemic. The three research questions addressed in this study were:

- How do individuals express concern regarding COVID-19 two years into a pandemic?
- How do individuals discuss safety, risk, and preventative measures two years into a pandemic?
- How do these expressions define risk two years into a pandemic?

The results from themes one and two were utilized to answer research question one, theme three for question two, and all themes to address question three. The results from each main theme and subtheme were outlined individually in the proceeding section. Overall conclusions follow to answer each research question individually.

When answering research question one the data indicated that individuals expressed concern by arguing, calling each other names, listing what individuals should/should not do. Individuals protested against current mandates and displayed frustration that people were not following guidelines or rules that they felt were adequate. Individuals stated which “side” they

belonged to by arguing against the opposite view they held. Political and economic concerns were often utilized to make points.

Individuals used memes, pictures, and attached articles to continue to add additional information past Twitter's limit of 280 characters per tweet. Terms like covidiot were used interchangeably to define people that were not following the posters ideology about the pandemic. People were identified as belonging to a cult if they held an opposing viewpoint (more often identified as a cult if you did not support COVID-19 preventative measures).

Some individuals utilized humor to cope with inconsistent rules, not wanting to follow rules, or not understanding the concepts they were trying to share. Individuals made statements telling people they could do what they wanted but then wished them illness. Some individuals questioned their safety with worry that people would verbally harass them or physically hurt them for not wearing or wearing a mask, while they were out.

Individuals expressed concern that even following somebody on Twitter that had been deemed a "covidiot" would impact how other people viewed them. Mental health concerns were noted with some individuals fearing COVID-19, while others feared for the safety of their loved ones. Fear was also noted in relation to long covid as the long-term health impacts were unknown and not well understood. Cleotibbitts (2022) replied, "Yeah, it's hard. I'm dealing with my son's Covid anxiety and fear for his future, as well as my own . . . and the possibility that I may need to homeschool my daughter long term too. It's a lot."

Some individuals said that the SARS-CoV-2 pandemic and COVID-19 was a scam and that there was nothing to worry about in the first place. Individuals that did believe in the illness reported concern with the health care system and overwhelmed hospitals. They also expressed concern with testing data and worried whether or not it could be trusted, was accurate, or actually

captured every positive case. This led people to question the actual severity of the illness and resulted in expressing concern that the disease was either over- or underrepresented.

People who had not contracted COVID-19 expressed surprise, or even noted themselves as having super immune systems. Some of those that believed they hadn't gotten COVID-19, or would never test positive, reported being lied to. Others tweeted sentiments about conspiracy theories. Individuals expressed concern with education, and women's rights. Examples of conflicting restrictions were provided to illustrate inconsistency. For example, several tweets mentioned NBA players not being vaccinated but who were allowed to travel, and seemingly unrestricted with respect to the sport, unless they were in an area that would not allow them to play but sit on the sidelines unmasked.

Some individuals referenced peer reviewed articles, but not everyone who referred to an article provided a link to the actual information. A lack of evidence was also seen when individuals would provide charts/graphs with no reference to where the information came from. Other individuals would just cite the CDC with no specific additional information. I explored a few of the links provided in several tweets but was unable to access the referenced information.

Some individuals expressed concern with others making decisions for them. Individuals tweeted statements that implied they wanted freedom with their body and to decide their own level of risk. Additional statements were found by individuals stating they were not concerned about the health of others if it put their own health at risk. Overall individuals expressed concern with how to identify the level of risk and what were the appropriate steps to take.

Question two, how do individuals discuss safety, risk, and preventative measures two years into a pandemic? When answering question two individuals discussed safety by pointing out what others were doing wrong. I observed that individuals were on opposite ends of the

spectrum with their viewpoints on safety, risk, and preventative measures. Risk was addressed by individuals attacking what others were doing or not doing. These attacks truly included little with what the other should be doing with respect to prevention.

Preventative measures were discussed from the point of view of washing hands, wearing a mask, self-isolating if ill, and getting a vaccine. Not all users agreed on what were the correct preventative measures. An example of this was seen when a meme on how to wear a mask was shared and another user shared the meme and called them a covidiot for wearing a mask stating they had found a covidiot. Individuals identified other individuals as being riskier by calling them antivaxxers which implied these people were taking increased risk. The researcher found tweets with people surprised by friends and family members choices during the pandemic. Anita_Ervin_73 (2022) replied, “Looking around among family and friends, I cannot make out a single predictor to who would become a "Covidiot" and who a ‘Corona cultist’ . . . both groups look at each other with utter disbelief that they could be this crazy.” There were also tweets with individuals deciding they would not support or be associated with someone that is suspected of being an antivaxxer. LizahatesTories (2022) tweeted, “I’m always really disappointed when I read an antivax or anti mask tweet, and realise it’s on my timeline because someone I follow has liked or RTd it. I’ve soft blocked a lot of people recently. I will . . . block you.” AnthonyFStevens (2022) tweeted, “Today I've finally accepted I've lost my brother. 😢 He's fallen so far into the CONspiracy theory wormhole that I fear we'll never get him back. I laughed at the 5g, ChemTrails . . . Antivax pushed me to my limits.”

Some individuals tweeted that COVID-19 was created to increase power for some elite groups and provide more income to the wealthy while continuing to separate income social class brackets. As restrictions changed individuals continued to question what was risky as others were

attempting to normalize the risk of COVID-19. BennyDog42 (2022) tweeted, “during a pandemic, if you have no safeguards, masks, social distancing etc, the pandemic will spread. People will become seriously ill, many will die, and hospitals will fill up . . . Yet we were told to live with it.” Concerns about COVID-19 and long covid were tweeted by individuals cautioning them not to normalize the illness. MichelleOnKP (2022) replied, “If you somehow escape the brain damage, clotting disorders that damage heart, kidneys, pretty much all of your other organs, and autoimmune issues caused by the COVID itself. ‘Let it rip’ is a lousy plan even for those without prior risk factors.”

Being healthier was noted by some individuals as reducing their risk level. Other individuals expressed a degree of vulnerability and asked other people to follow recommendations out of fear for their own safety. Individuals tweeted statements communicating that the SARS-CoV-2 pandemic was not over. Often times these cautionary tweets included recommendations to wear a mask, get a vaccine, utilize PCR tests, and to isolate if ill. Fcktrwing (2022) replied, “Facts. Covid is not over just because antivaxxers want their privileges back. #WearAMask #SocialDistancing #VaccinePassports #COVIDisAirborne #CovidIsNotOver.”

As COVID-19 case numbers began to rise in different areas around the world, individuals began tweeting warnings about how to be prepared as the next wave made it to the United States. NaheedD (2022) tweeted, “Learning to ‘live with COVID’ doesn't mean we ignore COVID...It means we upgrade ventilation. Offer PCR tests. Wear masks to protect each other. Provide paid sick days for workers. Build trust to increase vaccine uptake.” ChatswoodPamela (2022) replied to another user regarding future waves, “ And please stop calling them ‘restrictions.’ These mitigations are actually ‘protections.’” Mitigations like mask mandates & TTIQ [Test-trace-

isolate-quarantine], better indoor ventilation are PROTECTIONS. Covid is not over, in fact a worse variant is here now. We need to stop transmission."

Tweets were shared on case numbers being reported and on policies in areas as they changed both locally and globally. Individuals reported mistrusting government officials and public health experts, and cited concerns about the motivations of pharmaceutical companies. Specifically, accusations were made the vaccine producers were motivated by greed and money. . The phrase, “my body my choice” was noted in the data as form of protest against the threat of mandated vaccines. Individuals questioned why they had to take a vaccine they perceived as risky.

Question three: How do these expressions define risk two years into a pandemic? When answering question three, individuals shared how they tried to understand risk and make decisions. Individuals were found weighing risks to make decisions. They reflected on actions they had taken or how the scenario had changed over the last two years. If they believed that they were exposed to COVID-19, some individuals would engage in some preventative measures depending on how severe their experience was with the illness.

Individuals shared that it was hard to know what a risk was when information was unclear and being constantly contested. MMendes2020 (2022) replied, “I had a friend who is a chemist who got swept up w/anti-vaxxers . . . says things like ‘I don't trust the CDC.’ If a college grad educated in science can be swindled w/misinformation imagine how easy it is for uneducated ppl." Individuals stated that fake news clouded their decision making and understanding what true risk was or not. Individuals were found sharing scientific information without any associated reference. Sometimes these tweets encouraged others not to trust scientific information but did not provide links to evidence that supported their claims. When

individuals attached articles, not all of them came from peer reviewed sources. In addition to tweets that did not continue evidence, numerous tweets were found that were believed to be from suspected bots.

Suspected bot accounts also supplied information that added to confusion by amplifying the messages that were sent out. An example of a suspected bot found in this data set was from a user identified as @Adventuremotive which posted 87 tweets stating different countries "might want to dream (or strive) of Corona Virus vaccine forever (or without worry)." Their tweets usually identified a country and included a message about what they might want to do. For example, "Asia might want to dream of Corona Virus vaccine eternally" or "the world shouldn't provide corona virus vaccine without worry" or "north america won't dream of corona virus vaccine forever." These tweets were not unclear and had grammatical errors. I noticed a pattern where a suspected bot would repeatedly publish the same 5 or 6 tweets but alternated their use such that the same tweets would not be tweeted in succession.

Another message was shared 380 times from multiple accounts was posts that stated "Pharma's monopoly grip on COVID vaccines, tests + treatments continues to put the world at risk for the next deadly variant. We call on world leaders to stand with people, not Big Pharma." This was seen again when 136 bot accounts tweeted an identical statement, "@OlafScholz today marks two years since the @WHO declared #Covid a global pandemic. We could have been celebrating the end of the #global #pandemic. But Big pharmaceutical corporations still haven't shared vaccine patents." In total, 653 tweets were shared by Victori44685362 that read, "The COVID-19 Pandemic has not been delightful to many people. This is a hint to visit a mental health professional if Corona Virus has affected your financial situation, relationship, or general

peace of mind." These tweets were removed from the data however individuals were potentially exposed to them when making decisions and defining risk.

Ultimately individuals defined risk by using multiple sources of information. They shared and tweeted information to communicate risk to others. Some people shared information about emerging variants, changes in restrictions, and number of reported deaths from other countries in an attempt to understand and define risks. Individuals noted it was hard to define risk due to the conflicting information that changed over time. Several tweets indicated people were overwhelmed with information. The data collected in this study indicated that individuals struggled to reach a consensus on what are risks even two years into a pandemic with individuals divided on what was considered risky or not. The people represented in this Twitter sample appeared to make decisions about risk early on, and tweeted mis- and scientific information as the pandemic progressed that validated and justified their opinions.

Conclusions

General conclusions were drawn from the information analyzed in these findings. The first conclusion was *that individuals defined risk from the very beginning of the pandemic and all decisions made after the initial decision remained consistent with their initial position.* If an individual decided the pandemic and COVID-19 was real, then those individuals would engage in behaviors that would reduce their potential chances of experiencing COVID-19. However, if the individual decided that the pandemic and COVID-19 were a hoax then those individuals would engage in behaviors that were against any efforts to mitigate something that was not real. In their opinion these efforts were seen as a risk because preventative measures were not needed. As noted in chapter two, Goodwin et al. (2011) studied initial pandemic behavioral responses and attributed personal values and societal norms to understand how an individual may respond.

Individuals in this study did not discuss initial personal values at the start of the pandemic, however there were perceived societal norms that individuals appeared to prescribe to themselves after deciding their initial position. If an individual identified as not believing in the pandemic, they belonged in one group and if they believed in the pandemic they belonged in another group. Both sides matched the norms of the group they related to and defended their group fiercely.

The second conclusion is that *multiple sources of information significantly impacted how individuals communicated risk and made meaning of risk*. Individuals attempted to share information to prove their beliefs or point of view however varying levels of risk were found within the data. Even when the same data was shared between users, based upon their initial position they made about the pandemic, individuals would interpret the data with varying levels of risk. Individuals were very passionate about their position and worked hard to defend their position and provide proof/evidence to make other individuals question their beliefs that was not observed in this study is why did individuals make early decisions about the pandemic? Shou et al., (2022) cited in chapter two, reported that emotions/affect impact decision making. Due to the emotional language that was observed in the discussions, further research needs to address if early decision making occurs due to affective responses that impact the individuals risk tolerance level.

The third conclusion was that *individuals did not have a clear consensus as to what were best practices for preventative measures and treatments*. Most individuals utilized hand washing as an agreed upon preventative measure, however multiple individuals pointed out events where they saw individuals not practicing this hygienic method. There was a clear divide between individuals that felt masks and/or vaccines were a good preventative measure and those that did

not. Individuals appeared to make decisions early on during the pandemic and this potentially impacted behaviors and treatments they would engage in. As noted in chapter two, Hlay et al. (2021) reported perceived disgust as a factor in changes in preventative behaviors during a pandemic however the observations in this data set do not discuss changing behaviors. Individuals in this study were consistent with sharing behaviors or lack of behaviors they have engaged in since the beginning of the pandemic through the two-year mark.

The fourth conclusion was that *individuals struggled with emerging knowledge about the pandemic*. This observation was noted as individuals discussed adapting to new information like long COVID, reinfections, booster shots, changes in restrictions, changing variants, and rapidly changing information. As cited in chapter two, O'Shea and Ueda (2021) noted depending on how worried an individual is about contracting COVID-19 and their level of germ aversion, their level of listening to COVID-19 experts would vary. If individuals decided early in the pandemic that they were not disgusted, had low levels of germ aversion, and they didn't believe the pandemic was real, then they would not listen to COVID-19 experts that shared information about how the pandemic was impacting others. On the other hand, those individuals that had higher levels of germ aversion, made an early decision that the pandemic was a high risk, would engage in continued behaviors to protect themselves and others from becoming ill and see others as being reckless for not doing the same.

The fifth conclusion was that *individuals were politically divided, and political affiliation was associated with how individuals made sense of risk and determined appropriate preventative measures*. Politically affiliated comments were always negative when directed to the other group. Opposing viewpoints were seen throughout numerous factors two years into the pandemic. Tweets showed that there was opposition on vaccines, lifting mask mandates, travel restrictions,

opening schools with no masks, and lockdowns. This dynamic happened over and over again. This behavior is consistent with information found in the O'Shea et al. (2021) study. In their study, they concluded that individuals that were affiliated with the conservative political party would have lower levels of germ aversion and be less worried about contracting COVID-19. The data found in this study highlighted that individuals from the republican party noted less concern with catching COVID-19 or claimed that the pandemic was a hoax. On the other hand, those individuals that claimed they were associated with the democratic party would indicate more concern with catching COVID-19.

With the divisiveness that was evident in this study, I question what might have happened if everybody had been able to come together to one side or the other. Individuals worked to dispute each other, provide evidence to support their side, used shaming tactics, and even hateful language to prove their point. What would it have meant if everyone agreed on one side? Would there be a sense of increased safety? Was being decisive and having something to argue about an element that increased a sense of control in an environment that felt out of control? To what extent did the overly abundant arguing and split camps play in this pandemic and more importantly what will this behavior indicate for future crisis-related phenomenon? Prior pandemics like the 1918 pandemic noted varying degrees of determining risk and preventative measures however, there is no other crisis-related phenomenon of this magnitude with political and social media influence to date that I am aware of where individuals have behaved this way.

Due to the observations made in this study, further research is needed to understand the varying degrees of risk individuals defined. This study needs to be expanded on to better understand how and why individuals engage in early decision making during a crisis as that initial position appears to impact numerous future decisions.

Chapter 5

Summary, Implications, and Recommendations

This study was conducted to understand how individuals make meaning and define risk two years into a pandemic. A total of 116,401 tweets were collected and analyzed using a qualitative content manifest analysis design. Of the data gleaned from Twitter, 8503 tweets and replies were removed as suspected of being bots, not written fully in the English language, or multiple repeats. Themes and subthemes were explored until data saturation was met and no new results were discovered for the theme.

The following three questions were asked and were the focus of this research:

- How do individuals express concern regarding COVID-19 two years into a pandemic?
- How do individuals discuss safety, risk, and preventative measures two years into a pandemic?
- How do these expressions define risk two years into a pandemic?

Four classes were identified after analyzing tweets. In class one individuals tweeted their perceived risk with the SARS-CoV-2 pandemic and COVID-19 and it was determined there were three levels of risk: risk, no risk, and uncertain of risk. Five main themes and four subthemes were identified for theme one: the need for honesty, defining misinformation, uncertainty about what is defined as risky, lying about the pandemic, extreme positions on the impact of COVID-19 in healthy individuals, risk to children or not, risk of long COVID, debates on the efficacy and safety of the vaccines, severity of the COVID-19 illness of the illness.

In class two individuals discussed where they were receiving information from and discussed mistrust in the information. Three main themes and 19 subthemes were identified . The

first main theme looked at political information with the following six subthemes under it: left-wing, right-wing, race and equality, censorship/voter suppression/freedom of speech, war in Russia, and sheeple/covidiots. The second main theme was identified as public health sources with the five following subthemes under it; medical information, use of scientific evidence, distrust of scientific evidence, campaigns to combat misinformation, and big pharma. The last main theme was social media information with seven additional subthemes under it: bots, cults, other countries, conspiracy theories, fake news, shift in media, and echo chambers.

Class three assessed preventative measures and how individuals perceived their safety. This class had the following six main themes under it: vaccines, religion/spirituality, masks, widespread restrictions, preventative measures/behaviors, and treatment.

Class four contained individuals reflecting on how their life was impacted by the pandemic and continued to be impacted two years into the pandemic. Class four had the following main themes; mental health, nostalgia, life after Covid-19, normalizing risk, impact on women and children, life on hold, and humor.

Five main conclusions were drawn after analyzing all of the themes and subthemes.

1. *Individuals defined risk from the very beginning of the pandemic and all decisions made after the initial decision remained consistent with their initial position.*
2. *Multiple sources of information significantly impacted how individuals communicated risk and made meaning of risk.*
3. *Individuals did not have a clear consensus as to what were best practices for preventative measures and treatments.*
4. *Individuals struggled with emerging knowledge about the pandemic.*

5. *Individuals were politically divided, and political affiliation was associated with how individuals made sense of risk and determined appropriate preventative measures.*

Implications

As noted in chapter 2, Jacobs et al. (2010) reported that while planning and preparing for safety messaging, understanding the process with which individuals make meaning and perceive risk is a vital component of risk planning and development. When considering the crucial role that mental health providers play while assisting individuals with decision making during risk and preventative behaviors (Bornheimer et al., 2022) and providing the necessary tools, support, and resources to assist individuals with making decisions (Ahmed et al., 2021); this study adds to the body of knowledge to assist mental health providers and counselor educators with supporting clients and the community during a long-standing crisis.

Boden et al. (2021) and Lopez-Leon et al. (2021) reported concerns with mental health during a crisis which the SARS-CoV-2 pandemic can be classified as a crisis. Han, (2022); Lennon et al., (2020); Rogers and Pearce, (2013) recommended understanding risk perception and how individuals respond and make meaning of a crisis as a necessary step for communicating information. By understanding how individuals make meaning and define risk during the SARS-CoV-2 pandemic resources can be provided that reduce negative mental health impacted during a crisis. Rogers and Pearce (2013) suggested appropriate risk communication decreases strains on mental health which this study assists with.

The results indicated that *individuals defined risk from the very beginning of the pandemic and all decisions made after the initial decision remained consistent with their initial position.* In addition, *multiple sources of information significantly impacted how individuals*

communicated risk and made meaning of risk. This study adds to the growing body of knowledge implying that clear communication is necessary for individuals to make meaning and understand their level of risk during a crisis especially at the start of a crisis. This information is significant as it supports that public health officials and media need to be transparent and forthcoming with information that is unified and provides a clear message to their audience to increase individuals understanding of risk and be able to take appropriate preventative measures.

In addition, the results of this study demonstrated that *individuals did not have a clear consensus as to what were best practices for preventative measures and treatments* two years into a pandemic. By having multiple sources of conflicting information, individuals tweeted inconsistent messages with how to prevent getting ill two years into a pandemic and what were best practices across the United States. This implies that unified messages were not clearly communicated nor trusted by the individuals in this data set.

Finally, the results illuminated the impact that politics play in decision making, *and political affiliation was associated with how individuals made sense of risk and determined appropriate preventative measures.* Political affiliation and being politically divided was noted as a significant factor for how individuals identified themselves and how they spoke to others that did not identify as they did. Works by Stanley (2018) and Tong and Hippel (2020) note concern with a politically divided or tribalistic group mentality of us versus them. To increase cohesion and create a unified effort, this factor must be addressed. This information implies that messaging could be targeted to areas of particular political affiliations to support necessary preventative measures as well as provide peer reviewed resources to increase trust in the information. More targeted campaigns could be utilized to share knowledge on preventative measures that individuals are weary of. By having clear communication from public health

officials and more clear communication mental health distress may be reduced. I was unable to find a current decision-making model or theory that considers the significance that politics and political affiliation can have on individual judgement and behavior. This implies a new model will need to be developed to account for this factor.

Recommendations

The results of this study indicate that more clear and consistent messaging is needed to increase individuals understanding of risk and use of preventative measures two years into a pandemic. Mental health providers and counselor educators work closely with individuals building rapport and assisting individuals during a time of crisis. To aid individuals in understanding risk and risk perceptions, the researcher recommends the following actions for mental health providers and counselor educators:

- Assist individuals with finding peer reviewed resources when making decisions and understanding risk during a crisis.
- Encourage individuals to seek out information from sources that utilize peer reviewed resources when understanding risk during a crisis.
- Be clear and transparent with risk preventative measures when working with individuals during a crisis.
- Assist individuals with managing stress during the decision-making process as information does rapidly change during a crisis and pandemic and individuals manage long term changes that occur due to the crisis/pandemic.
- Be knowledgeable with knowing that initial affective responses can impact future decision making and emotions may need to be processed and addressed before an individual may be able to consider new information or varying perspectives.

By assisting individuals with information that is from trusted sources, individuals will be able to have more factual information available for their decision-making process and understanding of risk. As individuals noted mental health concerns in this data set two years into a long-standing pandemic, additional resources need to be considered to assist with the strain that a pandemic of this length and magnitude has on mental health. Individuals in this study identified concerns for women, children, the underserved population, and disproportional services to individuals based on socioeconomic status and race.

Future research could compare this study with how individuals perceive and make meaning of risk three years into a long-standing pandemic with multiple resources available as the SARS-CoV-2 pandemic has lasted for more than three years. Future studies could target peer reviewed campaigns in areas with higher political affiliations that were noted as following fewer preventative measures and engaged in what individuals in this data set determined as risky. Decision making models need to be addressed and reevaluated with how political affiliation impacts an individual. Understanding why individuals make decisions early during a crisis and are consistent with their decision needs to be further explored. Emotional responses and how affective decision making can impact an individual's risk tolerance level could be investigated. Finally, future research could focus on the impact on mental health of populations identified in the data set.

This study has limitations as no demographic data could be gleaned and not all individuals may have been equally represented. The research is limited to the tweets that were accessed during the time period collected and may not encompass all themes that contribute to the phenomenon. I made every attempt to monitor my bias while analyzing tweets, categorizing

themes, and subthemes, and reporting final conclusions. I recommend that demographic data be collected in future studies to determine if results are associated with any specific group.

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