5-1-2022

Masked Up and Feeling Down: The Association Between Mental Health and Preventative Regulation During the Covid Pandemic

Mary Margaret Mitchell
Mississippi State University

Masked Up and Feeling Down: The Association Between Mental Health and Preventative Regulation During the Covid Pandemic

By

Mary Margaret Mitchell

Ben Porter	Megan Stubbs-Richardson
Assistant Professor	Assistant Research Professor
Psychology	Social Science Research Center
(Director of Thesis)	(Committee Member)

Anastasia Elder

Associate Dean and Professor

Shackouls Honors College

(Shackouls Honors College Representative)

Honors Thesis submitted to Shackouls Honors College, Mississippi State University, Spring 2022

Masked Up But Feeling Down: The Association Between Mental Health and Regulations During The COVID Pandemic

By:
Mary Margaret Mitchell

A Thesis
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for an Honors Thesis in the Shackouls Honors College
Mississippi State, Mississippi
May 2022

Introduction

In December of 2019, the first cases of COVID-19 were documented, and by March 11, 2020 the World Health Organization (WHO) declared COVID-19 to be a pandemic. Since then, the world has seen over 500 million cases and over 6 million deaths. This worldwide pandemic has caused widespread actions taken by governments all around the world to try to slow the spread. Within the United States, there has been several waves of COVID-19 throughout the pandemic, and the government has tried several different ways of containing the spread. Mask mandates, gathering bans, closing of bars, and stay at home orders were all government regulations that differed by location. Mask mandates constitute requiring any person to wear a facial covering. Gathering bans constitute limits of large gatherings. Closing of bars constitute requirements to close and reopen bars. Stay at home orders constitute requiring or recommendations for people to stay at home.

Emotional Regulation

Depression and anxiety have been big mental health concerns, and in one study ranked in the top ten of global disabilities (James et al., 2018). Therefore, as the COVID-19 pandemic unfolded across the world, there was concern of increasing rates of depression and anxiety. A recent study found that as COVID-19 cases increased across the United States and other countries, internet searches concerned with fear, panic, and worry increased as well (Du et al., 2020). People were not sure what COVID-19 even meant, and that spilled over into all aspects of life.

In the beginning of the pandemic, there was a lot of uncertainty around the virus itself, as our knowledge and information changed rapidly as we learned more and more. Anxiety and depression have already been shown to increase during COVID-19 (Kujawa et al., 2020). This

study created and used Pandemic Stress Questionnaire to assess anxiety and depression due to the pandemic, modeled after the well-established Adolescent Perceived Events Scale. The CDC has also tracked rises in anxiety and depression from the Household Pulse Survey, which is an online survey that asks questions about the pandemic's effects on social and economic issues (Cai et al., 2021). This data is localized to the state level and did not use standardized measures.

Particularly, one study found that middle-aged and older adults in the United States have had an increase in worry about COVID-19 (Kobayashi et al., 2021). This study formed a cohort called COVID-19 Coping Study and looked especially at mental health outcomes during COVID-19. Overall, as the pandemic has changed over the course of time, so has people's emotional reaction changed over time (Crosta et al., 2021). The study looked at how spending habits varied at different points in the pandemic based on psychological factors, such as anxiety over the future. By studying spending habits, researchers could track overall sentiment about the pandemic, like the hoarding of toilet paper at the beginning of the pandemic being a sign of stress and anxiety.

Government and Emotion

Government regulations and communications often cause strong emotion to be expressed in the population being affected by those regulations and communications (Bollen et al., 2021). Bollen and colleagues used sentiment analysis on Twitter data to look at emotion in response to multiple types of announcements or news in different spheres of influence. In the past, research has found that negative emotion detection is becoming more important in government emergency management (Zhang et al., 2020). Research in the United Kingdom on a government social media campaign and the emotions expressed by the public in response found that the language of the campaign led to increased volatility of emotional reactions (Forkert et al., 2016). So, the way

in which government campaigns and communications are worded can impact how citizens will react and to what degree they will react.

Research done by Min and colleagues in China found that higher trust in government led to better preventive behaviors during COVID-19 (2020). Other research has found that trust in government institutions was positively correlated with hope and negatively correlated with anxiety, fear, and sadness during COVID-19 (Ahn et al., 2021). One study looked at government intervention in obesity and found that government intervention led to moral judgements being made about those with obesity (Farrell et al., 2016). Farrell and colleagues also found that because of these moral judgements being made, government intervention led to negative emotions being expressed (2016). Another study found that empathy might be related to attitudes towards government intervention, but demographics better predicted attitudes towards government intervention (Wagaman & Segal, 2014). Demographics generally associated with less social access or power were better indicators of attitudes towards government intervention than empathy (Wagaman & Segal, 2014).

Other research has looked at the introduction of seat belt laws into the United States and the emotion expressed during that process (Desai & You, 1992). When seatbelt laws where first regulated, there was a lot of pushback from the population (Roos, 2020). People did not want their freedoms limited, even though it would keep them more safe and decrease deaths on the road. Overall, researchers have found initial strong negative reactions to seat belt laws that gradually decreased, until general adopting of wearing seat belts (Freedman et al., 1974). Although, there are still small and specific populations that do not regularly wear their seat belt (Steptoe et al., 2002). Some research has even compared vaccines to seatbelts in effort to make the argument for regulations around vaccines (Giubilini & Savulescu, 2019).

Another study looked at over all trends in people pushing back against safety regulations, specifically smoking, and this study found that people will push back over the limitations of freedoms and the goal of individual choice (Brown, 2008). Another researcher found that when health and safety regulation was more likely to impact the day to day lives of individuals, there was more chance for backlash and negative support (Vogel, 1990). So, government's attempts at regulation have often been met with some negative reactions in the past.

Emotion and COVID-19

While anxiety and depression have been studied frequently over the past decades, research about the COVID-19 pandemic and anxiety and depression primarily focuses on general themes, such as loneliness (Koh & Liew, 2020; Gubler et al., 2020). Gubler and colleagues looked at different personality traits and correlations to loneliness during COVID-19. Koh and Liew used Twitter data to look at different themes of loneliness found in social media, including social distancing, group impacts of loneliness, and the mental health impacts of loneliness. COVID-19 has drastically changed the ways people lived their lives, at least for a while, and that has resulted in many mental health issues (Castaldelli-Maia et al., 2021). Isolation from others has been a frequently studied topic during COVID-19, since many of the actions taken to slow the impacts of COVID-19 was to stay away from one another.

In one study, they found during COVID-19 that depression rates were at 24.0% and anxiety rates were at 21.3% globally, which they attributed to social distancing measures (Castaldelli-Maia et al., 2021). This is higher than in the past, somewhere around three times the baseline in 2019 (Cai et al., 2021). Overall, general anxiety and depression have been contributed to COVID-19 as a whole, but more specific causes have not been investigated.

Geography and Time

Furthermore, more fine-grained temporal and geographic research concerning COVID-19 would be valuable in mental health research. Temporal and geographic research is a still growing field, in which physical health is more readily studied. One study looked at mental health rates at a county level and found that "[poor] mental health days increased considerably due to natural disasters" (Goetz et al., 2015). Goetz and colleagues also found that mental health did differ at county levels, though most differences were attributed to other factors besides geography, such as "educational attainment, employment opportunities including self-employment, and social capital" (2015). So, while the locations are not the reasons people may experience mental health disorders and difficulties, this county level research still lets us investigate closely the changes in government mandates and regulations.

The progression of COVID-19 in the United States is a natural experiment, as COVID-19 has hit different parts of the country at different times. Researchers had no control over the conditions of this experiment, but we can still look changes in exposures to make inferences (Thomson, 2021). This may be the largest natural experiment that has occurred in recent years, as there has not been an event that has impacted the world to the extent that COVID-19 since the last pandemic, arguably. Not only was every area of the world impacted, but different parts of the world were also impacted to different extents, from the United States where cases were widespread to Japan where cases have been limited (*Covid-19 situation*, 2022).

Current Research

This project is using publicly available CDC data that tracks county level changes of mask mandates, gathering bans, closing of bars, and stay at home orders with mental health data. By comparing the mental health impacts recorded to the changes in government regulations, we can observe a potential relationship. This natural experiment can be observed by researchers because of all the actions taken by different people to combat this pandemic. Our current

research project is looking at how this natural experiment affected levels of anxiety/depression in the residents of the United States and how government's actions to slow the spread of COVID-19 affected those levels of anxiety/depression. We can observe on a county level how people reacted as federal, state, and local governments tried to stop COVID-19 from spreading further.

Methods

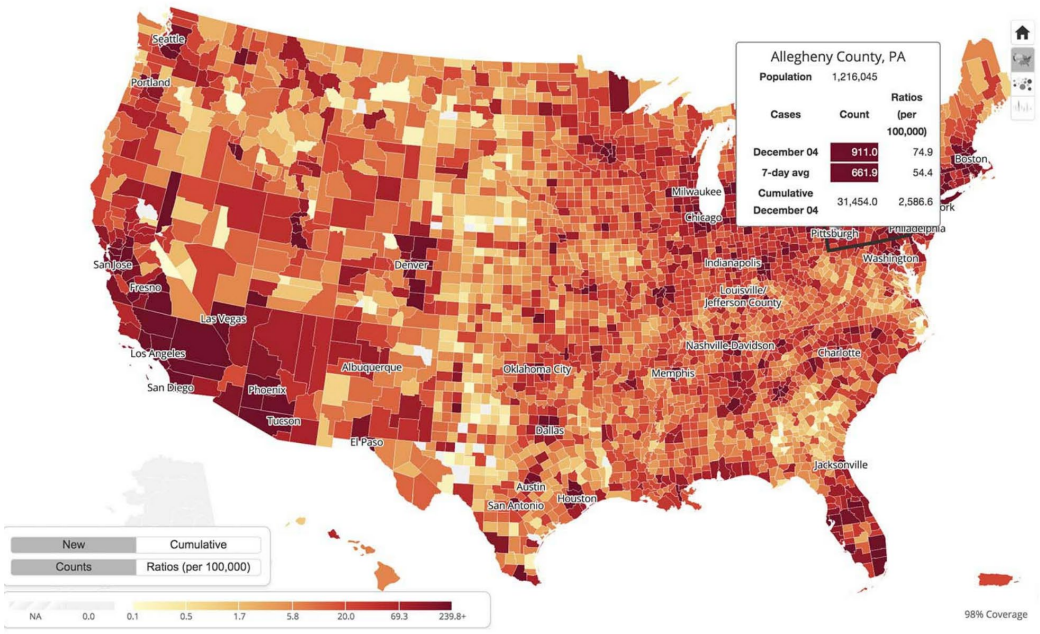
Data

CDC has been tracking multiple sources of data throughout the pandemic, including data from federal, state, or local governments on mask mandates, gathering bans, closing of bars, and stay at home orders. This data has been collected from March 11, 2020 to August 15, 2021 at the county level, updated daily, pulling from "publicly available state and territorial executive orders, administrative orders, resolutions, and proclamations ("orders")" as a part of the CDC's Center for State, Tribal, Local, and Territorial Support and policy surveillance (Howard-Williams, 2021).

Delphi Research Group from Carnegie Mellon University has been collecting COVID-19 data through Facebook surveys, healthcare partners, technology companies and other methods and compiling it into COVIDcast, what they believe is "the nation's largest public repository of real-time, geographically-detailed indicators of COVID activity in the U.S" (COVIDcast, 2021). This data includes health insurance claims, internet-based surveys, COVID antigen tests, search trends, and mobility data (Reinhart, 2021). A visualization of COVID cases on December 4, 2020 pulled from an interactive dashboard of COVIDcast can be seen below in Figure 1.

Figure 1

COVIDcast Map of COVID Cases on December 4, 2020



The data from the current study used surveys administered through a random sample of Facebook users as a part of the US COVID-19 Trends and Impacts Survey (CTIS) (Salomon, 2021). These Facebook users would receive a prompt on their feed to participate in the survey, and from there, the users would answer general questions about their experiences with COVID-19. From the COVIDcast dataset, data was pulled about mental health including questions that asked how often people have felt depressed or anxious. The percentage of people who answered "most of the time" or "all of the time" to those questions is the data we are using in this study. Depression is usually categorized by a feeling of hopelessness and constant sadness, while anxiety is usually categorized by a constant worry and overwhelming nervousness. Many symptoms of anxiety and depression overlap.

COVIDcast does exclude some counties to protect private information. When there is only a small number of responses from a county on a given day, that county will be excluded (Salomon et al., 2021). Overall, the final database contained depression data for 102,544 county-days and anxiety data from 103,516 county-days spread across 189 days and 754 counties.

Measures

Once all this data was downloaded, we complied the data together using SAS 9.2 (Cary, NC). Data from CDC concerning government regulations were collapsed into more useable categories. Bar closures were categorized as fully open, open with curbside deliver or other restrictions, or closed. Gathering bans were categorized as not banned, bans of gatherings of a certain size, and bans of gatherings of any size. Mask mandates were categorized as either absent or present. Stay-at-home orders were categorized as not mandatory, advised/recommended, or mandatory for at least part of the population/region (which was approximately evenly split between mandates for all individuals and mandates for only at-risk individuals). These are categorized in Table 1.

Table 1. *Categorization of Regulations*

Values	Closing Bars	Mask Mandates	Stay At Home Orders	Gathering Bans
0	Fully open	No masks required	No stay at home orders	No ban
1	Open with restrictions (occupancy % or carryout only)	Masks required	Recommended	Bans on groups of a certain size
2	Completely closed		Mandatory for at least one group (e.g., at risk groups)	Bans on all gatherings

In Table 2, pictured below, the categorizations of regulations are shown along with the frequencies of each categorization.

Table 2. *Frequencies of Categorization*

Table 2. Frequencies of Categorization

Characteristic	N (%)
Bar Closures	
Fully Open	12,404 (13.06%)
Open with restrictions	75,656 (79.65%)

Completely Closed	6,930 (7.30%)
Mask Mandates	
No Masks Required	20,159 (21.22%)
Masks Required	74,831 (78.78%)
Stay at Home Orders	
No Stay At Home Orders	41,451 (43.64%)
Recommended	44,810 (47.17%)
Mandatory for at least one group	8,729 (9.19%)
Gathering Bans	
No Ban	27,646 (29.10%)
Bans on groups of certain size	45,975 (48.40%)
Bans on all gathering	21,369 (22.50%)

Data Analysis

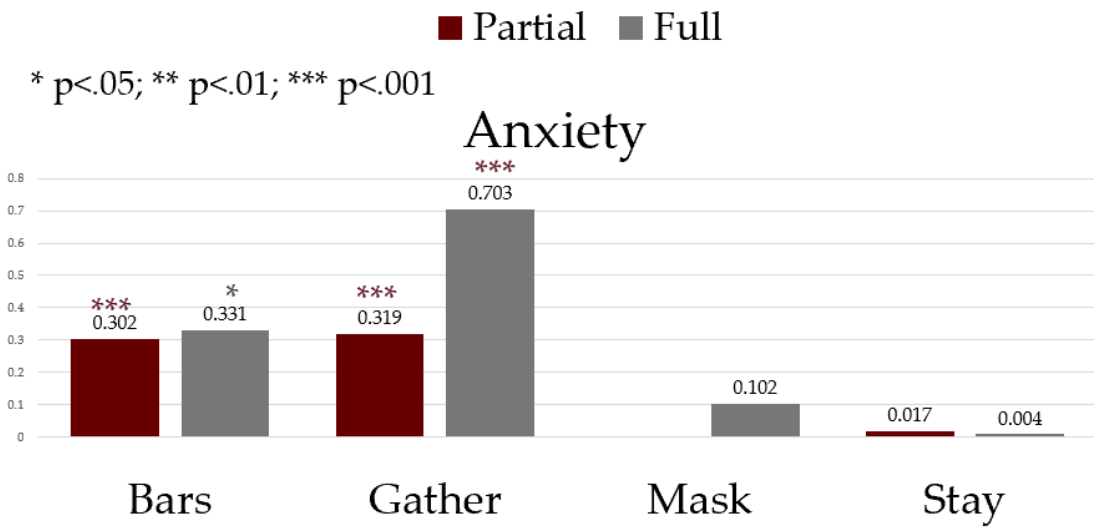
Each observation was nested within county and day (i.e., multiple observations came from each day and multiple observations came from a given county across days). Therefore, cross-classified models with a random intercept for county and day were used to control for this non-independence. Models were run separately for depression and anxiety.

Results

After analysis was run, anxiety levels rose .30% and .33% for partial bar closures and full bar closures, respectively. Also, anxiety levels rose .32% and .70% for partial gathering bans and full gathering bans, respectively. Anxiety levels were not found to be significantly associated with mask mandates or for stay-at-home orders. This can be seen in Figure 2 below.

Figure 2

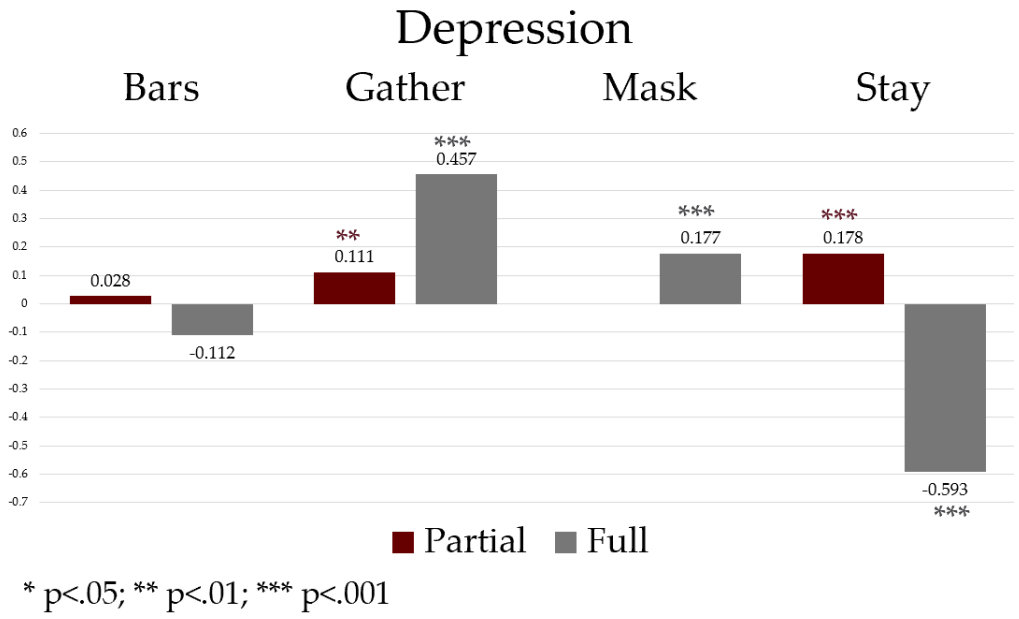
Graph of Association between Anxiety and Regulations



Depression levels rose .11% and .46% for partial and full gathering bans, respectively. Depression levels rose .18% for mask mandates. Depression levels rose .18% and decreased .59% for partial stay-at-home orders and full stay-at-home orders, respectively. Depression levels were not found to be significantly associated with bar closures. All of these can be seen in Figure 3 below.

Figure 3

Graph of Associations between Depression and Regulation



Discussion

While we didn't determine a causal relationship between government preventive regulations and anxiety and depression levels, measures were generally associated with increased reports of depression and anxiety, except for complete stay-at-home orders being associated with lower levels of depression. It is interesting that the associations between preventive government regulation was different for depression and anxiety. Typically, these associations mirror each other. Increased anxiety was correlated with partial and full bar closures and partial gathering bans. On the other hand, increased depression was correlated with partial and full gathering bans, full mask mandates, and partial and full stay-at-home orders.

One possible reason for this divergence in association could be the types of preventive government regulations. Mask mandates, stay-at-home orders, gathering bans, and bar closures varied greatly in their impact and when they were imparted. For instance, some orders might have correlated with more anxiety, if people felt that the order meant COVID-19 was more serious. On the other hand, some orders might have caused more depression if they isolated people. Complete stay-at-home orders were associated with lower levels of depression. This is surprising since loneliness is usually correlated with depression (Weeks et al., 1980). One possible reason for this surprising finding is that full stay-at-home orders meant that people had a removal of work stress. High work stress is found to be a predecessor for depression, so the ability to work from home or not work at all could have decreased that work stress (Melchior et al., 2007). Another possible reason is that stay-at-home orders meant more time with family, which could lead to more feelings of support (Al Omari et al., 2020).

There were several indicators that were not significant, which could be due to several different reasons. Depression levels were not significantly correlated with bar closures, and anxiety levels were not significantly correlated with mask mandates or stay-at-home orders. One possible reason for these non-significances is that there was a lot of strong conflicting emotion being expressed throughout the pandemic, specifically from those that found the government regulations to be comforting and those that found the government regulations to be stifling. These two conflicting perspectives could have potentially canceled each other out, leading to non-significance. Another possible reason is that there was just little impact of certain government measures on anxiety and depression, and people were not as affected.

Previous research has found initial negative reactions to government regulations, which could explain some of these negative reactions seen in our research, especially considering these regulations are more like seatbelts regulations than obesity communications. So, there is a chance some of this negative emotion could be connected to opposition to these regulations. Overall, there is more research to be done about the types of governance and the impacts of people and their reactions, including their mental health.

Strengths and Limitations

There were several limitations to this study. One major limitation was that COVIDcast excluded some counties on some days if there was not enough information reported. Due to privacy concerns, if only a few people filled out the survey for a county, the county would be excluded. This could lead to our study having a bias towards areas of higher density, where they were more likely to have enough people respond to surveys every day. Even with this limitation, we were still able to see comparable levels of anxiety and depression across the United States. Another limitation is that COVIDcast does not use standardized measures for depression and anxiety. The survey asked general questions about feeling depressed and feeling nervous,

anxious or on edge. However, the levels of depression and anxiety recorded from the data is consistent across the study period and thus any changes are on the same item. Another limitation is that COVIDcast data is biased towards people that have internet access and have Facebook profiles. As such, areas with poor internet connectivity or availability may not be fully represented in the current population. COVIDcast demographic information is not connected to the publicly available dataset, so we aren't able to understand demographic associations of the people experiencing anxiety and depression. Because of this limitation, more research that expands on different populations that may not use Facebook would be a good avenue for the future.

On the other hand, there were several strengths to this study, including that this is study is nationally representative. Our study included a large amount of data, with over 1.5 million data points obtained from quality sources from all over the country, at the very specific county level. With such a large source of data, differences within the data are likely representative of the population of the United States. The large size also means that the study is sensitive to even small changes in mental health. Another strength of this study being nationally representative is that our results are less likely to be influenced by local events.

Conclusion

Overall, higher rates of depression and anxiety were generally associated with preventative regulations, besides complete stay-at-home orders that were associated with lower rates of depression. This research was nationally representative and was generally consistent with other research into depression and anxiety. While there were some limitations stemming from the COVIDcast data, this research establishes a firm foundation into the impact of COVID-19 and all the actions taken to combat the pandemic on the mental health of the general population. With depression and anxiety not mirroring each other in response to these

government regulations, there is potential to research further into the impacts of different types of preventative regulations on different types of mental health. Further research could incorporate sentiment analysis from Twitter data to further flush out connections between emotion and government regulations specifically during COVID-19. Further research could also dig deeper into why the full stay-at-home orders were correlated with lower levels of depression. Even more research could look into why anxiety and depression did not mirror each other. COVID-19 has caused major changes that we will not fully be able to understand for years to come and will continue to be an emerging source of research in the coming future. Public health will continue to be a rapidly growing area of research, as we live in world in which we are more connected than ever before, virtually, and physically. COVID-19 spread across the entire globe, and the entire globe had to respond.

The specific impact of government regulations on resident's mental health has not been studied much, although research could provide valuable insights to those in government positions (Prentice et al., 2020). Especially as COVID-19 continues to develop further, information about the start of the pandemic is worthwhile for government decisions made in the future to continue to slow the spread. Government can find information about how the public responds to their communications and regulations to be useful no matter the circumstance, as it may change how they communicate in the future.

References

Ahn, J., Kim, H. K., Kahlor, L. A., Atkinson, L., & Noh, G. Y. (2021). The Impact of Emotion and Government Trust on Individuals' Risk Information Seeking and Avoidance during the COVID-19 Pandemic: A Cross-country Comparison. Journal of health communication, 26(10), 728-741.

Al Omari, O., Al Sabei, S., Al Rawajfah, O., Abu Sharour, L., Aljohani, K., Alomari, K., ... & Alhalaiqa, F. (2020). Prevalence and predictors of depression, anxiety, and stress among youth at the time of COVID-19: an online cross-sectional multicountry study. Depression research and treatment, 2020.

Bollen, J., Mao, H., & Pepe, A. (2011). Modeling public mood and emotion: Twitter sentiment and socio-economic phenomena. In *Proceedings of the international AAAI conference on web and social media* (Vol. 5, No. 1, pp. 450-453).

Cai, C., Woolhandler, S., Himmelstein, D. U., & Gaffney, A. (2021). Trends in anxiety and depression symptoms during the COVID-19 pandemic: results from the US Census bureau's household pulse survey. *Journal of General Internal Medicine*, *36*(6), 1841-1843.

Castaldelli-Maia, J., Marziali, M., Lu, Z., & Martins, S. (2021). Investigating the effect of national government physical distancing measures on depression and anxiety during the COVID-19 pandemic through meta-analysis and meta-regression. Psychological Medicine, 51(6), 881-893. doi:10.1017/S0033291721000933

Covid-19 situation update worldwide, as of Week 15, updated 21 April 2022. European Centre for Disease Prevention and Control. (2022, April 21). Retrieved April 21, 2022, from https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases

Di Crosta, A., Ceccato, I., Marchetti, D., La Malva, P., Maiella, R., Cannito, L., ... & Di Domenico, A. (2021). Psychological factors and consumer behavior during the COVID-19 pandemic. PloS one, 16(8), e0256095.

Desai, A., & You, M. B. (1992). Policy implications from an evaluation of seat belt use regulation. Evaluation review, 16(3), 247-265.

Du, H., Yang, J., King, R. B., Yang, L., & Chi, P. (2020). COVID-19 increases online searches for emotional and health-related terms. Applied Psychology: Health and Well-Being, 12(4), 1039-1053.

Farrell, L. C., Warin, M. J., Moore, V. M., & Street, J. M. (2016). Emotion in obesity discourse: understanding public attitudes towards regulations for obesity prevention. *Sociology of health & illness*, *38*(4), 543-558.

Forkert, K., Jackson, E., & Jones, H. (2016). Whose feelings count? Performance politics, emotion and government immigration control. In *Emotional States* (pp. 193-206). Routledge.

Freedman, K., Wood, R., & Henderson, M. (1974). Compulsory seat belts: A survey of public reaction and stated usage (No. Report No. 9/74).

GBD 2017 Diseases and Injuries Collaborators, James, S. L., Abate, D., Abate, K. H., Abay, S. M., Abbafati, C., Abbasi, N., … Murray, C. J. L. (2018). Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: A systematic analysis for the Global Burden of Disease Study 2017. The Lancet, 392(10159), 1789–1858. doi: 10.1016/s0140–6736(18)32279–7CrossRefGoogle Scholar

Giubilini, A., & Savulescu, J. (2019). Vaccination, risks, and freedom: the seat belt analogy. Public Health Ethics, 12(3), 237-249.

Goetz, S. J., Davlasheridze, M., & Han, Y. (2015). County-level determinants of mental health, 2002–2008. *Social Indicators Research*, *124*(2), 657-670.

Gubler, D. A., Makowski, L. M., Troche, S. J., & Schlegel, K. (2021). Loneliness and well-being during the Covid-19 pandemic: Associations with personality and emotion regulation. *Journal of Happiness Studies*, *22*(5), 2323-2342.

Kobayashi, L. C., O'Shea, B. Q., Kler, J. S., Nishimura, R., Palavicino-Maggio, C. B., Eastman, M. R., ... & Finlay, J. (2020). The COVID-19 Coping Study: A longitudinal mixed-methods study of mental health and well-being among older US adults during the COVID-19 pandemic.

Koh, J. X., & Liew, T. M. (2020). How loneliness is talked about in social media during COVID-19 pandemic: Text mining of 4,492 Twitter feeds. *Journal of psychiatric research*.

Kujawa, A., Green, H., Compas, B. E., Dickey, L., & Pegg, S. (2020). Exposure to COVID-19 pandemic stress: Associations with depression and anxiety in emerging adults in the United States. *Depression and anxiety*, *37*(12), 1280-1288.

Megan Brown; Somehow We All Survived: The Ideology of the U.S. Backlash against Risk Management. South Atlantic Quarterly 1 April 2008; 107 (2): 287–307. doi: https://doi.org/10.1215/00382876-2007-067

Melchior, M., Caspi, A., Milne, B. J., Danese, A., Poulton, R., & Moffitt, T. E. (2007). Work stress precipitates depression and anxiety in young, working women and men. Psychological medicine, 37(8), 1119-1129.

Min, C., Shen, F., Yu, W., & Chu, Y. (2020). The relationship between government trust and preventive behaviors during the COVID-19 pandemic in China: exploring the roles of knowledge and negative emotion. *Preventive medicine*, *141*, 106288.

Reinhart, A., Brooks, L., Jahja, M., Rumack, A., Tang, J., Agrawal, S., ... & Tibshirani, R. J. (2021). An open repository of real-time COVID-19 indicators. *Proceedings of the National Academy of Sciences*, *118*(51).

Roos, D. (2020, August 31). When new seat belt laws drew fire as a violation of personal freedom. History.com. Retrieved April 21, 2022, from https://www.history.com/news/seat-belt-laws-resistance

Salomon, J. A., Reinhart, A., Bilinski, A., Chua, E. J., La Motte-Kerr, W., Rönn, M. M., ... & Tibshirani, R. J. (2021). The US COVID-19 Trends and Impact Survey: Continuous real-time measurement of COVID-19 symptoms, risks, protective behaviors, testing, and vaccination. *Proceedings of the National Academy of Sciences*, *118*(51).

Steptoe, A., Wardle, J., Fuller, R., Davidsdottir, S., Davou, B., & Justo, J. (2002). Seatbelt use, attitudes, and changes in legislation: an international study. *American journal of preventive medicine*, *23*(4), 254-259.

Thomson, B. (2020). The COVID-19 pandemic: a global natural experiment. *Circulation*, *142*(1), 14-16.

University, C. M. (2020, December 8). Delphi enhances COVIDcast with change healthcare claims data - news - carnegie Mellon University. Delphi Enhances COVIDcast With Change Healthcare Claims Data - News - Carnegie Mellon University. Retrieved April 23, 2022, from https://www.cmu.edu/news/stories/archives/2020/december/covidcast.html

Prentice, C., Zeidan, S., & Wang, X. (2020). Personality, trait EI and coping with COVID 19 measures. International Journal of Disaster Risk Reduction, 51, 101789.

Vogel, D. (1990). When consumers oppose consumer protection: The politics of regulatory backlash. Journal of Public Policy, 10(4), 449-470.

Wagaman, M. A., & Segal, E. A. (2014). The relationship between empathy and attitudes toward government intervention. *J. Soc. & Soc. Welfare*, *41*, 91.

Weeks, D. G., Michela, J. L., Peplau, L. A., & Bragg, M. E. (1980). Relation between loneliness and depression: a structural equation analysis. Journal of personality and social psychology, 39(6), 1238.

Zhang, W., Wang, M., & Zhu, Y. C. (2020). Does government information release really matter in regulating contagion-evolution of negative emotion during public emergencies? From the perspective of cognitive big data analytics. *International Journal of Information Management*, *50*, 498-514.