Project Proposal: The COVID-19 Epidemic, Public Health Restrictions, and Mental Health

due October 18, 2021 by 11:59 PM

Matt Mohn, Melannie Nimocks, and Katherine Beltz

10/18/2021

Load Packages

```
library(tidyverse)
library(readxl)
library(lubridate)
library(tidymodels)
library(knitr)
library(xtable)
```

Load Data

```
setwd('../')
restrictions_worldwide <- readr::read_csv("data/phsm-severity-data-short.csv")
google_trends <- readr::read_csv("data/google_trends_data_c.csv")
```

```
# for each dataset, make the countries standardized
restrictions_worldwide$COUNTRY <- gsub("United States Of America", "United States", restrictions_worldw

restrictions_worldwide$COUNTRY <- gsub("United Kingdom Of Great Britain And Northern Ireland", "United


google_trends <-
  google_trends %>%
  mutate(COUNTRY = nation) %>%
  mutate(DATE_START = week)


match_dates<-merge(restrictions_worldwide, google_trends, by=c("COUNTRY","DATE_START"))

new_set <-
  match_dates %>%
  select(-c(week, nation))
```

```
new_set <- new_set %>%
  mutate(date = mdy(DATE_START))
```

Introduction and Data, including Research Questions

From the beginning of the COVID-19 pandemic until now, the global community has suffered social, economic, and medical burdens in unprecedented levels. Though the physical health of individuals has been of paramount concern due to the high infectivity of COVID-19, with 237.88 million cases and 4.85 million deaths in as of October 2021, another burden on individuals, governments, and health systems has manifested itself in the form of rapidly deteriorating mental health (Our World in Data, 2021). It has been widely accepted that as the COVID-19 pandemic has progressed, mental health has decreased (Centers for Disease Control and Prevention, 2021). However, there is a much less comprehensive body of data surrounding how certain mitigation efforts specifically have impacted mental health, and which mental health conditions each restriction affects the most. For example, the Centers for Disease Control and Prevention (2021) acknowledge that social distancing may increase loneliness, stress, and anxiety, but it is less understood if masking is more directly correlated to obsessive compulsive disorder than it is to depression. Therefore, there is a need to fully understand these intricate relationships in order to drive efforts towards creating more individualized mental health treatments, as well as being able to predict what kind of mental health treatment will be needed in response to an increase in any given public health restriction.

Our data analysis will answer the following research question: how do different COVID-19 mitigation efforts correlate to different types of mental illnesses? In doing so, our project will begin to uncover how certain restrictions may impact different mental illness depending on both the type of restriction and the type of mental illness. Our project will make use of two datasets and merge the datasets based on country in order to ensure there are sufficient relationships to explore in the data. The first dataset is of the frequency of different search terms related to mental health from January of 2019 through September of 2021 for a variety of countries. The data was collected from Google Trends and records the popularity of that search term for any given week in a given country. There is a new data value corresponding to each week, where the date collected is marked as the first of the week. This dataset will be used to gauge how concern with certain mental health topics, including anxiety, depression, obsessive compulsive disorder, therapists, and insomnia, has changed over the course of the pandemic. The second dataset tracks implementation of various mitigation efforts in different countries. This dataset was derived from the World Health Organization's tracking of public health and social measures, and indices were calculated on the raw data in order to quantify the intensity of the restriction, whether the restriction is on masks, gatherings, businesses, schools, or travel. This data has daily values from January 2020 through September of 2020. Through a series of data tidying and wrangling steps, the data has been joined on both country and date. Since the search terms are weekly observations whereas restrictions are daily observations, the search term frequency will be kept constant throughout the week, but each observation for restrictions will be observed for changes. This will enable our analysis to observe how daily changes may affect weekly averages without altering or extrapolating data.

Glimpse

```
## This is the PHSM severity index data set.

glimpse(restrictions_worldwide)
```

```
## Rows: 142,506
## Columns: 11
## $ DATE_START   <chr> "8/20/2020", "9/4/2020", "3/13/2021", "10/18/2020", "4/18~
```

```
## $ COUNTRY      <chr> "Yemen", "Belarus", "Egypt", "Uzbekistan", "Finland", "Is~
## $ ISO3         <chr> "YEM", "BLR", "EGY", "UZB", "FIN", "IMN", "MLI", "MYS", "~
## $ WHO_REGION   <chr> "EMRO", "EURO", "EMRO", "EURO", "EURO", "EURO", "AFRO", "~
## $ MASKS        <dbl> 0, 67, 100, 100, 47, 0, 0, 67, 0, 0, 0, 67, 0, 100, 0, 10~
## $ TRAVEL       <dbl> 100, 0, 33, 100, 100, 0, 0, 67, 100, 100, 100, 33, 100, 1~
## $ GATHERINGS   <dbl> 30, 25, 50, 25, 5, 0, 0, 5, 0, 25, 0, 0, 0, 50, 0, 25, 25~
## $ SCHOOLS      <dbl> 25, 25, 25, 75, 25, 0, 50, 80, 25, 0, 25, 0, 25, 30, 25, ~
## $ BUSINESSES   <dbl> 13, 13, 67, 67, 67, 0, 0, 47, 0, 47, 33, 0, 0, 33, 0, 33,~
## $ MOVEMENTS    <dbl> 80, 40, 100, 40, 20, 0, 0, 20, 60, 60, 0, 0, 0, 40, 0, 80~
## $ GLOBAL_INDEX <dbl> 41, 28, 62, 68, 44, 0, 8, 48, 31, 39, 26, 17, 21, 59, 15,~
```

```
## This is the Google Search trend data set.

glimpse(google_trends)
```

```
## Rows: 858
## Columns: 9
## $ week       <chr> "9/26/2021", "9/19/2021", "9/12/2021", "9/5/2021", "8/29/20~
## $ depression <dbl> 75, 80, 72, 70, 67, 61, 69, 67, 66, 68, 69, 68, 64, 67, 70,~
## $ ocd        <dbl> 75, 100, 80, 74, 67, 69, 74, 74, 66, 67, 68, 71, 68, 63, 76~
## $ anxiety    <dbl> 100, 98, 98, 96, 97, 97, 95, 93, 89, 92, 94, 93, 95, 90, 89~
## $ insomnia   <dbl> 81, 80, 83, 77, 79, 70, 85, 84, 82, 78, 73, 75, 70, 74, 81,~
## $ therapy    <dbl> 80, 85, 86, 85, 88, 86, 86, 84, 87, 86, 88, 90, 88, 91, 85,~
## $ nation     <chr> "United States", "United States", "United States", "United ~
## $ COUNTRY    <chr> "United States", "United States", "United States", "United ~
## $ DATE_START <chr> "9/26/2021", "9/19/2021", "9/12/2021", "9/5/2021", "8/29/20~
```

```
## This is the data set joining restrictions and search trends by both date and country.

glimpse(new_set)
```

```
## Rows: 522
## Columns: 17
## $ COUNTRY      <chr> "Brazil", "Brazil", "Brazil", "Brazil", "Brazil", "Brazil~
## $ DATE_START   <chr> "1/10/2021", "1/12/2020", "1/17/2021", "1/19/2020", "1/24~
## $ ISO3         <chr> "BRA", "BRA", "BRA", "BRA", "BRA", "BRA", "BRA", "BRA", "~
## $ WHO_REGION   <chr> "AMRO", "AMRO", "AMRO", "AMRO", "AMRO", "AMRO", "AMRO", "~
## $ MASKS        <dbl> 47, 0, 47, 0, 47, 0, 47, 47, 0, 47, 47, 47, 47, 47, 47, 4~
## $ TRAVEL       <dbl> 100, 0, 100, 0, 100, 0, 100, 100, 0, 100, 17, 17, 100, 17~
## $ GATHERINGS   <dbl> 30, 0, 30, 0, 30, 0, 30, 30, 0, 5, 5, 5, 5, 5, 5, 5, 30, ~
## $ SCHOOLS      <dbl> 25, 0, 25, 0, 25, 0, 25, 30, 0, 25, 25, 25, 25, 25, 25, 2~
## $ BUSINESSES   <dbl> 47, 0, 47, 0, 80, 0, 47, 80, 0, 80, 80, 80, 80, 80, 47, 4~
## $ MOVEMENTS    <dbl> 80, 0, 20, 0, 20, 0, 80, 20, 0, 80, 20, 20, 80, 80, 20, 8~
## $ GLOBAL_INDEX <dbl> 55, 0, 45, 0, 50, 0, 55, 51, 0, 56, 32, 32, 56, 42, 41, 5~
## $ depression   <dbl> 36, 41, 37, 46, 35, 40, 37, 33, 39, 40, 39, 37, 39, 39, 3~
## $ ocd          <dbl> 74, 66, 65, 59, 71, 61, 77, 77, 57, 51, 87, 66, 60, 70, 6~
## $ anxiety      <dbl> 87, 67, 86, 69, 86, 73, 86, 87, 67, 70, 74, 82, 71, 74, 7~
## $ insomnia     <dbl> 79, 87, 69, 74, 83, 83, 77, 68, 71, 55, 56, 53, 62, 64, 5~
## $ therapy      <dbl> 78, 83, 81, 85, 80, 84, 76, 74, 80, 86, 91, 88, 86, 80, 7~
## $ date         <date> 2021-01-10, 2020-01-12, 2021-01-17, 2020-01-19, 2021-01-~
```

Data Analysis Plan

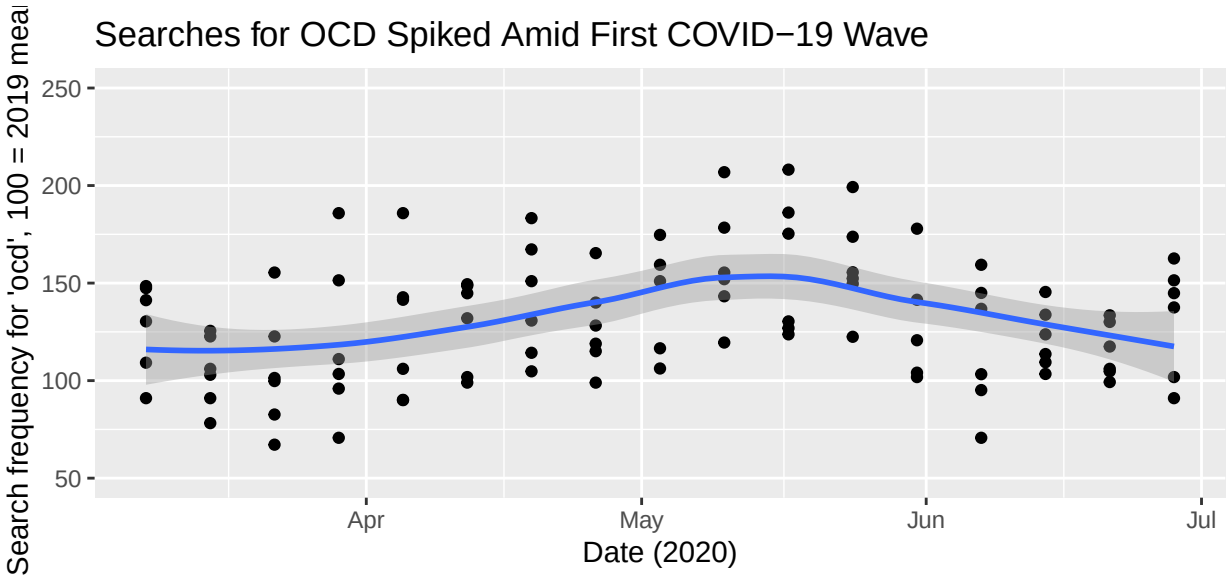
In order to conduct our analysis, we will examine various combinations of mental health search term popularity as explained by the index of public health measure severity. Mental health search term popularity will be used as an indicator for what mental illness is most prevalent during a given time frame, and will be analyzed alongside what restriction was most intense for the same time frame. This relationship will be explored across various countries in order to account for the differences in public health measures that each government enacted throughout the course of the pandemic, as well as determine global averages for mental health search term popularity for each public health measure.

In order to examine if there are some mental health issues that are impacted more strongly by certain public health measures, an analysis of variance (ANOVA) will be conducted on the data. This test will allow for the comparison across multiple means, where each mean is the global averages of mental health search term popularity for each public health measure. We hypothesize that there will be a statistically significant difference among mental illness prevalence as a result of certain public health measures. In order to reject the null hypothesis that there is no difference among certain public health measures disproportionately affecting certain mental illnesses, our p-value for this ANOVA would need to be less that 0.05 for a confidence level of 95%.

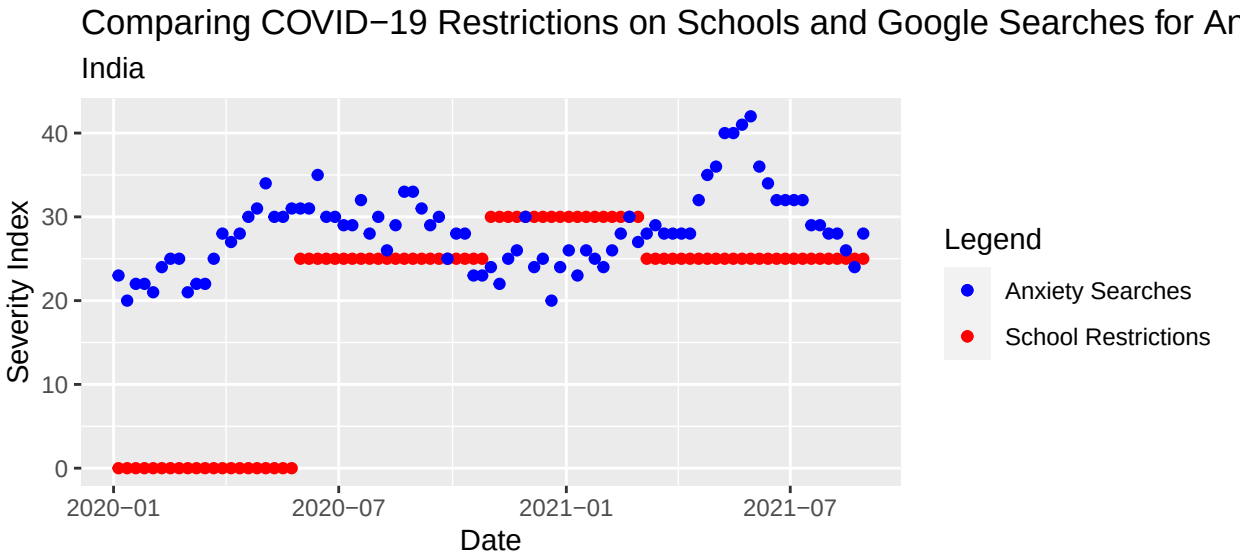
```
summary_stat <-
  data.frame(depression_mean = aggregate(depression ~ COUNTRY, new_set, mean),
             depression_sd = aggregate(depression~COUNTRY, new_set, sd),
             anxiety_mean = aggregate( anxiety ~ COUNTRY, new_set, sd ),
             anxiety_sd = aggregate(anxiety~COUNTRY, new_set, sd),
             ocd_mean = aggregate( ocd ~ COUNTRY, new_set, mean ),
             ocd_sd = aggregate(ocd~COUNTRY, new_set, sd),
             insomnia_mean = aggregate( insomnia ~ COUNTRY, new_set, mean ),
             insomnia_sd = aggregate(insomnia~COUNTRY, new_set, sd),
             therapy_mean = aggregate( therapy ~ COUNTRY, new_set, mean ),
             therapy_sd = aggregate(therapy~COUNTRY, new_set, sd)
)

summary_stat <- subset(summary_stat, select = -c(
                                                  depression_sd.COUNTRY,
                                                anxiety_mean.COUNTRY,
                                             anxiety_sd.COUNTRY,ocd_mean.COUNTRY,
                        ocd_sd.COUNTRY,insomnia_mean.COUNTRY,insomnia_sd.COUNTRY,
                        therapy_mean.COUNTRY,therapy_sd.COUNTRY) )


summary_stat<-(rename(summary_stat, COUNTRY=depression_mean.COUNTRY))

#knitr::kable(summary_stat)
```

```
natl_avg <- google_trends %>%
  mutate(tidytime = mdy(DATE_START), ocd2 = as.integer(ocd), insomnia2 = as.integer(insomnia)) %>%
  filter(tidytime < mdy("1/1/2020")) %>%
  group_by(COUNTRY) %>%
  summarise(Ndepression = mean(depression), Nocd2 = mean(ocd2), Nanxiety = mean(anxiety), Ninsomnia2 = m

lim_set <- merge(new_set, natl_avg, by=c("COUNTRY")) %>% mutate(relative_ocd = 100 * as.integer(ocd) / I

graph_set <- lim_set %>% filter(mdy(DATE_START) > mdy("3/1/2020"), mdy(DATE_START) < mdy("7/1/2020")) %
```

```
ggplot(data = graph_set, mapping = aes(x = mdy(DATE_START), y = relative_ocd)) + geom_point() + geom_sm
```




```
new_set %>%
  filter(COUNTRY == "India") %>%
  ggplot() + geom_point(mapping = aes(y = SCHOOLS, x = date, color = "Red")) + geom_point(mapping = aes
```



Linear Regression

```
#new_set <- new_set %>%
#  filter(MASKS != 0, TRAVEL != 0, GATHERINGS != 0, SCHOOL != 0, BUSINESSES != 0, MOVEMENTS != 0)
```

```r
US_data <- lim_set %>%
  filter(COUNTRY == "United States")


US_relative_ocd_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_ocd ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = US_data)

US_relative_ocd_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: USA, Search: OCD")
```

Table 1: Nation: USA, Search: OCD

term	estimate	std.error	statistic	p.value
(Intercept)	105.1712	3.5146	29.9240	0.0000
MASKS	-0.0521	0.0411	-1.2677	0.2086
TRAVEL	-0.0328	0.0934	-0.3513	0.7263
GATHERINGS	-0.1426	0.1320	-1.0797	0.2835
SCHOOLS	0.2194	0.1435	1.5294	0.1301
BUSINESSES	-0.0208	0.0505	-0.4121	0.6814
MOVEMENTS	0.0136	0.0389	0.3499	0.7273

```r
US_dep_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_depression ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = US_da

US_dep_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: USA, Search: Depression")
```

Table 2: Nation: USA, Search: Depression

term	estimate	std.error	statistic	p.value
(Intercept)	97.7856	2.6600	36.7609	0.0000
MASKS	0.0150	0.0311	0.4814	0.6315
TRAVEL	-0.0210	0.0707	-0.2974	0.7669
GATHERINGS	-0.4587	0.0999	-4.5901	0.0000
SCHOOLS	-0.1778	0.1086	-1.6380	0.1054
BUSINESSES	-0.0073	0.0383	-0.1919	0.8483
MOVEMENTS	-0.0316	0.0294	-1.0735	0.2863

Table 3: Nation: USA, Search: Therapy

term	estimate	std.error	statistic	p.value
(Intercept)	93.4381	1.8105	51.6102	0.0000
MASKS	0.0706	0.0212	3.3349	0.0013
TRAVEL	0.0109	0.0481	0.2269	0.8211
GATHERINGS	0.1804	0.0680	2.6523	0.0096
SCHOOLS	-0.2416	0.0739	-3.2691	0.0016

term	estimate	std.error	statistic	p.value
BUSINESSES	0.0994	0.0260	3.8175	0.0003
MOVEMENTS	0.0014	0.0200	0.0693	0.9449

Table 4: Nation: USA, Search: Anxiety

term	estimate	std.error	statistic	p.value
(Intercept)	101.6822	1.8172	55.9569	0.0000
MASKS	0.0706	0.0213	3.3207	0.0014
TRAVEL	0.0017	0.0483	0.0354	0.9718
GATHERINGS	0.1011	0.0683	1.4803	0.1427
SCHOOLS	-0.1738	0.0742	-2.3427	0.0216
BUSINESSES	0.0693	0.0261	2.6509	0.0097
MOVEMENTS	0.0428	0.0201	2.1284	0.0364

Table 5: Nation: USA, Search: Insomnia

term	estimate	std.error	statistic	p.value
(Intercept)	113.9429	3.9660	28.7297	0.0000
MASKS	0.1051	0.0464	2.2642	0.0263
TRAVEL	-0.1683	0.1054	-1.5968	0.1143
GATHERINGS	-0.1557	0.1490	-1.0448	0.2993
SCHOOLS	-0.3157	0.1619	-1.9504	0.0546
BUSINESSES	-0.0645	0.0570	-1.1308	0.2615
MOVEMENTS	0.0539	0.0439	1.2280	0.2231

```
Brazil_data <- lim_set %>%
  filter(COUNTRY == "Brazil")


Brazil_relative_ocd_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_ocd ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = Brazil_data)

Brazil_relative_ocd_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: Brazil, Search: OCD")
```

Table 6: Nation: Brazil, Search: OCD

term	estimate	std.error	statistic	p.value
(Intercept)	101.6838	3.5204	28.8838	0.0000
MASKS	0.1732	0.0755	2.2947	0.0244
TRAVEL	-0.0516	0.0534	-0.9648	0.3376
GATHERINGS	0.1819	0.1557	1.1681	0.2462
SCHOOLS	-0.6105	0.1860	-3.2825	0.0015
BUSINESSES	0.0771	0.0624	1.2347	0.2206
MOVEMENTS	0.1870	0.0694	2.6958	0.0086

```
Brazil_dep_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_depression ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = Brazi

Brazil_dep_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: Brazil, Search: Depression")
```

Table 7: Nation: Brazil, Search: Depression

term	estimate	std.error	statistic	p.value
(Intercept)	76.8860	1.6397	46.8913	0.0000
MASKS	-0.0326	0.0352	-0.9267	0.3569
TRAVEL	0.0037	0.0249	0.1473	0.8833
GATHERINGS	-0.1302	0.0725	-1.7952	0.0764
SCHOOLS	0.2165	0.0866	2.4994	0.0145
BUSINESSES	-0.1012	0.0291	-3.4803	0.0008
MOVEMENTS	-0.0091	0.0323	-0.2819	0.7788

```
Brazil_relative_therapy_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_therapy ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = Brazil_

Brazil_relative_therapy_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: Brazil, Search: Therapy")
```

Table 8: Nation: Brazil, Search: Therapy

term	estimate	std.error	statistic	p.value
(Intercept)	108.1074	1.6076	67.2479	0.0000
MASKS	0.1889	0.0345	5.4795	0.0000
TRAVEL	-0.0760	0.0244	-3.1160	0.0025
GATHERINGS	-0.1496	0.0711	-2.1048	0.0385
SCHOOLS	0.1444	0.0849	1.7004	0.0929
BUSINESSES	-0.0862	0.0285	-3.0224	0.0034
MOVEMENTS	-0.0322	0.0317	-1.0177	0.3119

```
Brazil_relative_anxiety_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_anxiety ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = Brazil_

Brazil_relative_anxiety_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: Brazil, Search: Anxiety")
```

Table 9: Nation: Brazil, Search: Anxiety

term	estimate	std.error	statistic	p.value
(Intercept)	116.4117	2.2198	52.4425	0.0000
MASKS	0.2032	0.0476	4.2693	0.0001

term	estimate	std.error	statistic	p.value
TRAVEL	0.0014	0.0337	0.0428	0.9660
GATHERINGS	0.1331	0.0982	1.3553	0.1791
SCHOOLS	0.2405	0.1173	2.0512	0.0435
BUSINESSES	0.0180	0.0394	0.4568	0.6491
MOVEMENTS	-0.0161	0.0438	-0.3684	0.7136

```
Brazil_relative_insomnia_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_insomnia ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = Brazil

Brazil_relative_insomnia_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: Brazil, Search: Insomnia")
```

Table 10: Nation: Brazil, Search: Insomnia

term	estimate	std.error	statistic	p.value
(Intercept)	114.0047	4.2587	26.7697	0.0000
MASKS	0.0616	0.0913	0.6750	0.5016
TRAVEL	-0.0088	0.0647	-0.1366	0.8917
GATHERINGS	0.2003	0.1883	1.0634	0.2908
SCHOOLS	-1.2472	0.2250	-5.5436	0.0000
BUSINESSES	0.2408	0.0755	3.1872	0.0021
MOVEMENTS	0.0943	0.0839	1.1233	0.2647

```
Mexico_data <- lim_set %>%
  filter(COUNTRY == "Mexico")


Mexico_relative_ocd_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_ocd ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = Mexico_data

Mexico_relative_ocd_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: Mexico, Search: OCD")
```

Table 11: Nation: Mexico, Search: OCD

term	estimate	std.error	statistic	p.value
(Intercept)	138.9079	11.7854	11.7865	0.0000
MASKS	-0.5221	0.4024	-1.2974	0.1982
TRAVEL	-0.0625	0.1327	-0.4709	0.6390
GATHERINGS	-0.3618	0.4127	-0.8768	0.3832
SCHOOLS	0.9272	1.0161	0.9126	0.3642
BUSINESSES	0.2315	0.1830	1.2651	0.2095
MOVEMENTS	0.2300	0.5410	0.4251	0.6719

```
Mexico_dep_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_depression ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = Mexi

Mexico_dep_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: Mexico, Search: Depression")
```

Table 12: Nation: Mexico, Search: Depression

term	estimate	std.error	statistic	p.value
(Intercept)	103.9686	4.3731	23.7745	0.0000
MASKS	0.5112	0.1493	3.4236	0.0010
TRAVEL	-0.0224	0.0492	-0.4557	0.6499
GATHERINGS	0.4850	0.1531	3.1672	0.0022
SCHOOLS	-1.0561	0.3770	-2.8010	0.0064
BUSINESSES	0.1051	0.0679	1.5477	0.1257
MOVEMENTS	-0.6979	0.2007	-3.4766	0.0008

```
Mexico_relative_therapy_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_therapy ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = Mexico_

Mexico_relative_therapy_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: Mexico, Search: Therapy")
```

Table 13: Nation: Mexico, Search: Therapy

term	estimate	std.error	statistic	p.value
(Intercept)	100.9349	2.0019	50.4206	0.0000
MASKS	0.0765	0.0684	1.1188	0.2666
TRAVEL	-0.0466	0.0225	-2.0681	0.0419
GATHERINGS	-0.1579	0.0701	-2.2522	0.0271
SCHOOLS	0.2278	0.1726	1.3199	0.1906
BUSINESSES	0.0392	0.0311	1.2602	0.2112
MOVEMENTS	-0.1112	0.0919	-1.2097	0.2299

```
Mexico_relative_anxiety_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_anxiety ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = Mexico_

Mexico_relative_anxiety_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: Mexico, Search: Anxiety")
```

Table 14: Nation: Mexico, Search: Anxiety

term	estimate	std.error	statistic	p.value
(Intercept)	124.0169	4.0845	30.3629	0.0000
MASKS	0.1912	0.1395	1.3707	0.1743

term	estimate	std.error	statistic	p.value
TRAVEL	0.0435	0.0460	0.9452	0.3474
GATHERINGS	-0.4290	0.1430	-2.9993	0.0036
SCHOOLS	1.3158	0.3521	3.7365	0.0003
BUSINESSES	-0.0662	0.0634	-1.0437	0.2998
MOVEMENTS	-0.2131	0.1875	-1.1368	0.2590

```
Mexico_relative_insomnia_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_insomnia ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = Mexico_

Mexico_relative_insomnia_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: Mexico, Search: Insomnia")
```

Table 15: Nation: Mexico, Search: Insomnia

term	estimate	std.error	statistic	p.value
(Intercept)	104.6186	7.6423	13.6894	0.0000
MASKS	-1.7312	0.2610	-6.6339	0.0000
TRAVEL	0.1912	0.0860	2.2221	0.0291
GATHERINGS	-0.4785	0.2676	-1.7881	0.0776
SCHOOLS	3.9493	0.6589	5.9939	0.0000
BUSINESSES	0.0240	0.1187	0.2021	0.8403
MOVEMENTS	1.6124	0.3508	4.5964	0.0000

```
NewZealand_data <- lim_set %>%
  filter(COUNTRY == "New Zealand")


NewZealand_relative_ocd_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_ocd ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = NewZealand_

NewZealand_relative_ocd_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: New Zealand, Search: OCD")
```

Table 16: Nation: New Zealand, Search: OCD

term	estimate	std.error	statistic	p.value
(Intercept)	112.9591	16.3976	6.8888	0.0000
MASKS	NA	NA	NA	NA
TRAVEL	0.0513	0.1642	0.3122	0.7557
GATHERINGS	-0.1562	0.6477	-0.2411	0.8101
SCHOOLS	0.3477	0.2874	1.2101	0.2298
BUSINESSES	-0.3988	0.3586	-1.1122	0.2693
MOVEMENTS	0.0867	1.5186	0.0571	0.9546

```
NewZealand_dep_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_depression ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = NewZ

NewZealand_dep_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: New Zealand, Search: Depression")
```

Table 17: Nation: New Zealand, Search: Depression

term	estimate	std.error	statistic	p.value
(Intercept)	85.8043	6.1572	13.9356	0.0000
MASKS	NA	NA	NA	NA
TRAVEL	0.1367	0.0617	2.2165	0.0295
GATHERINGS	0.2416	0.2432	0.9934	0.3235
SCHOOLS	-0.3181	0.1079	-2.9483	0.0042
BUSINESSES	-0.1054	0.1347	-0.7830	0.4359
MOVEMENTS	0.6475	0.5702	1.1356	0.2595

```
NewZealand_relative_therapy_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_therapy ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = NewZeala

NewZealand_relative_therapy_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: New Zealand, Search: Therapy")
```

Table 18: Nation: New Zealand, Search: Therapy

term	estimate	std.error	statistic	p.value
(Intercept)	104.9165	3.7656	27.8619	0.0000
MASKS	NA	NA	NA	NA
TRAVEL	-0.0165	0.0377	-0.4371	0.6632
GATHERINGS	0.2461	0.1487	1.6545	0.1019
SCHOOLS	0.0821	0.0660	1.2437	0.2172
BUSINESSES	-0.3045	0.0823	-3.6973	0.0004
MOVEMENTS	0.0040	0.3487	0.0115	0.9909

```
NewZealand_relative_anxiety_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_anxiety ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = NewZeala

NewZealand_relative_anxiety_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: New Zealand, Search: Anxiety")
```

Table 19: Nation: New Zealand, Search: Anxiety

term	estimate	std.error	statistic	p.value
(Intercept)	84.3557	5.3406	15.7951	0.0000
MASKS	NA	NA	NA	NA

term	estimate	std.error	statistic	p.value
TRAVEL	0.0537	0.0535	1.0047	0.3181
GATHERINGS	0.3360	0.2110	1.5928	0.1151
SCHOOLS	0.1478	0.0936	1.5793	0.1182
BUSINESSES	0.1676	0.1168	1.4353	0.1551
MOVEMENTS	-0.1052	0.4946	-0.2127	0.8321

```
NewZealand_relative_insomnia_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_insomnia ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = NewZeal

NewZealand_relative_insomnia_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: New Zealand, Search: Insomnia")
```

Table 20: Nation: New Zealand, Search: Insomnia

term	estimate	std.error	statistic	p.value
(Intercept)	103.8355	12.4822	8.3187	0.0000
MASKS	NA	NA	NA	NA
TRAVEL	-0.0641	0.1250	-0.5129	0.6094
GATHERINGS	0.0695	0.4931	0.1410	0.8882
SCHOOLS	-0.2912	0.2187	-1.3312	0.1868
BUSINESSES	0.1570	0.2730	0.5750	0.5669
MOVEMENTS	1.1378	1.1560	0.9842	0.3279

```
India_data <- lim_set %>%
  filter(COUNTRY == "India")


India_relative_ocd_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_ocd ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = India_data)

India_relative_ocd_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: India, Search: OCD")
```

Table 21: Nation: India, Search: OCD

term	estimate	std.error	statistic	p.value
(Intercept)	129.9740	5.0571	25.7011	0.0000
MASKS	0.6315	0.1801	3.5060	0.0007
TRAVEL	-0.2281	0.1316	-1.7336	0.0868
GATHERINGS	0.0579	0.1675	0.3458	0.7304
SCHOOLS	-1.2598	0.3535	-3.5644	0.0006
BUSINESSES	-0.0564	0.1566	-0.3603	0.7196
MOVEMENTS	0.0999	0.0755	1.3242	0.1892

```
India_dep_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_depression ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = India

India_dep_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: India, Search: Depression")
```

Table 22: Nation: India, Search: Depression

term	estimate	std.error	statistic	p.value
(Intercept)	108.9893	22.9494	4.7491	0.0000
MASKS	0.1275	0.8175	0.1559	0.8765
TRAVEL	0.1556	0.5972	0.2606	0.7951
GATHERINGS	0.6706	0.7601	0.8822	0.3803
SCHOOLS	1.2974	1.6040	0.8088	0.4210
BUSINESSES	-0.6624	0.7105	-0.9324	0.3539
MOVEMENTS	0.0522	0.3424	0.1525	0.8792

```
India_relative_therapy_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_therapy ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = India_da

India_relative_therapy_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: India, Search: Therapy")
```

Table 23: Nation: India, Search: Therapy

term	estimate	std.error	statistic	p.value
(Intercept)	114.4363	2.5684	44.5559	0.0000
MASKS	0.2941	0.0915	3.2152	0.0019
TRAVEL	-0.1772	0.0668	-2.6516	0.0097
GATHERINGS	-0.1074	0.0851	-1.2631	0.2102
SCHOOLS	-0.2459	0.1795	-1.3698	0.1746
BUSINESSES	0.0985	0.0795	1.2394	0.2188
MOVEMENTS	0.0696	0.0383	1.8161	0.0731

```
India_relative_anxiety_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_anxiety ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = India_da

India_relative_anxiety_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: India, Search: Anxiety")
```

Table 24: Nation: India, Search: Anxiety

term	estimate	std.error	statistic	p.value
(Intercept)	94.1356	4.5351	20.7572	0.0000
MASKS	0.3905	0.1615	2.4173	0.0179

term	estimate	std.error	statistic	p.value
TRAVEL	-0.0961	0.1180	-0.8144	0.4178
GATHERINGS	0.0148	0.1502	0.0987	0.9216
SCHOOLS	-0.6451	0.3170	-2.0352	0.0451
BUSINESSES	0.2298	0.1404	1.6365	0.1057
MOVEMENTS	0.0138	0.0677	0.2036	0.8392

```
India_relative_insomnia_reg <- linear_reg() %>%
  set_engine("lm") %>%
  fit(relative_insomnia ~ MASKS + TRAVEL + GATHERINGS + SCHOOLS + BUSINESSES + MOVEMENTS, data = India_

India_relative_insomnia_reg %>%
  tidy() %>%   knitr::kable(digits=4,caption="Nation: India, Search: Insomnia")
```

Table 25: Nation: India, Search: Insomnia

term	estimate	std.error	statistic	p.value
(Intercept)	118.1261	7.2126	16.3777	0.0000
MASKS	0.5406	0.2569	2.1043	0.0385
TRAVEL	-0.2096	0.1877	-1.1171	0.2673
GATHERINGS	0.6567	0.2389	2.7490	0.0074
SCHOOLS	-2.2563	0.5041	-4.4758	0.0000
BUSINESSES	0.4375	0.2233	1.9595	0.0535
MOVEMENTS	0.0890	0.1076	0.8265	0.4110

References

Centers for Disease Control and Prevention. (2021). Coping with stress. Centers for Disease Control and Prevention. Retrieved October 11, 2021, from (https://www.cdc.gov/mentalhealth/stress-coping/cope-with-stress/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fdaily-life-coping%2Fmanaging-stress-anxiety.html).

Our World in Data. Cumulative confirmed covid-19 cases and deaths. Our World in Data. (n.d.). Retrieved October 11, 2021, from (https://ourworldindata.org/grapher/cumulative-deaths-and-cases-covid-19).