PROJECT REPORT

TEAM #3

Emily Grayek, Steffi Nazareth, David Robusto, Yanbing Zhao, Divya Gupta

A/B TESTING

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TITLE:

Effect of Information Delivery Type on Delivering COVID-19 Prevention Information

EXECUTIVE SUMMARY:

This study was completed with the intention of understanding the effects that different forms of information delivery (text, infographic, etc.) have on COVID-19 prevention information delivery. Specifically, we aimed to capture respondents' understanding of the effectiveness of COVID-19 prevention methods before and after viewing information from the Centers for Disease Control and Prevention. By randomizing the form of information delivery (text vs infographic) across participants we are able to capture any difference in knowledge gained from one form over another. In addition to these pre- and post- test questions, we collected demographic data and other information about respondents' pre-test conceptions of COVID-19.

We were able to collect 139 responses, of which 100 were usable as they had both the pre- and post- test questions completed. In order to calculate the change in perceived effectiveness of these prevention methods between the treatment and control group, we employed difference in differences models on three primary outcomes of interest (effectiveness of handwashing, social distancing, and mask wearing). These models did not reveal any significant difference between the change in perception of those individuals in the treatment vs control groups. We hypothesize that this lack of significance is drawn partially from selection bias issues in assembling our sample, but also partially due to the fact that COVID prevention methods are likely very baked in at this point.

1. Introduction

COVID-19 cases have been on the rise more so than ever. The United States alone saw a 20% increase in reported COVID-19 cases two weeks after the Thanksgiving holidays and passed the threshold of 300,000 deaths on December 14th. While news of the Pfizer and Moderna vaccines has inspired hope across the country, continued vigilance by the populus and work on behalf of the Centers for Disease Control and Prevention (CDC) to spread information is crucial in the period to come.

As the winter holiday approaches, the number of people who travel during this time is expected to reach another peak. It is necessary to deliver COVID-19 prevention information effectively to protect people from being infected and decrease the chance of spreading and getting COVID-19.

Our aim is to help the CDC plan for how best to deliver COVID-19 prevention information in advance of the winter holidays. To do this, we want to perform an A/B test using CDC information previously released for Election Day 2020.

With the A/B test, we want to answer the following question:
Is there a difference in people's understanding of the content of COVID prevention information released by CDC depending on if it is delivered via text vs infographic?

2. Experimental Design

Unit of analysis:
We conducted our analysis at an individual user level and the only restriction we applied was to ensure respondents are unique.

Treatment:
Our treatment group was the group reading the CDC infographic for Election Day 2020.

Control:
Our control group was the group reading CDC's website text referring to the same information.

How we implemented the A/B test:
We used Qualtrics to randomize participants into the treatment or control group. In the first section of the Qualtrics survey, every individual was asked to answer a certain number of questions related to COVID prevention information ("pre-test" questions) to set the baseline of their understanding related to it. In the second section of the survey, the individuals in the treatment group saw the infographic information and the

individuals in the control group saw the same information displayed in text. In the third section, every individual was then asked the same set of pre-test questions again (now referred to as “post-test” questions) to check if the information they retained from the infographic or text displayed in section two of the survey improved their understanding of COVID prevention measures. To analyze the data at hand, we used R and Microsoft Excel.

The outcome of interest:
To measure a change, if any, in the participants’ understanding of the COVID prevention information via text or via infographic. The three outcomes in particular we are interested in are people’s perception of the protective power of mask wearing, handwashing, and social distancing.

Model:
As we are attempting to measure the change between our treatment and control groups over time (where before represents respondents’ answers prior to viewing the CDC information and after represents their responses after viewing the information), we employed a Difference in Differences model. In reality, we actually employed three separate models, each one testing the change in a separate outcome of interest.

$$\text{Prevention masks} = \alpha + \text{Infographic}*X_1 + \text{Post}*X_2 + \text{Infographic|Post}(X_1 \times X_2) + \varepsilon_{12}$$

$$\text{Prevention handwashing} = \alpha + \text{Infographic}*X_1 + \text{Post}*X_2 + \text{Infographic|Post}(X_1 \times X_2) + \varepsilon_{12}$$

$$\text{Prevention distancing} = \alpha + \text{Infographic}*X_1 + \text{Post}*X_2 + \text{Infographic|Post}(X_1 \times X_2) + \varepsilon_{12}$$

- Prevention ‘____’ is the effectiveness rating for wearing masks, social distancing, or washing hands
- α is the effectiveness rating for the text intervention group before the text information was displayed
- X_1 is a dummy variable indicating whether the respondent belonged to the treatment/control group (1=treatment)
- X_2 is a dummy variable indicating whether the respondent’s answers are being recorded pre or post intervention (1=post)
- Infographic|Post($X_1 \times X_2$) is an interaction term between the treatment variable and the time variable. The coefficient on the interaction term will signify the change in outcome, if any, that individuals in the treatment group saw relative to the control group

- ε is the covariates that affect the comprehension of the information displayed (e.g. numeracy, education, etc.)

Null Hypothesis:

$H_0 : Infographic|Post = 0$

3. Data Collected

3.1 Variables

Our independent variable was whether Election Day Covid-19 information was displayed in an infographic or text format. This was coded as 1 if individuals saw the infographic information or 0 if they were shown text information.

For our dependent variables, we modified questions from Mehta's survey[1] on perceived effectiveness of Covid-19 prevention measures. We asked "In your opinion, how effective are the following actions for keeping you safe from COVID-19?" for thirteen prevention measures. We focused on the three prevention measures that were the focus of the CDC's infographic and text information. These were wearing a face mask, washing your hands with soap frequently, and maintaining six feet of distance from people outside of your household. Respondents could choose options from a 5-point Likert scale ranging from "Not effective at all" to "Very effective" and coded as 1-5 accordingly.

Because each individual was likely to have a preconceived understanding of the effectiveness of these measures, we asked this question both before and after the information was displayed. The data was stored by creating a variable, 'post', and coding this variable as 0 if the data was collected before the information was displayed or 1 if it was after the information was displayed as 1. For our regression we found the difference in participant's perceived effectiveness of each measure after reviewing the information.

The remaining ten 'prevention measure' perceived effectiveness variables were treated as covariates. Additional covariates were collected before displaying the CDC information. Questions were asked to collect demographic information, knowledge of Covid-19, perception of Covid-19 risks, trust of news sources, recent use of news sources, and perceived effectiveness of policy interventions. See Appendix A for complete information about all of the variables collected.

[1] Mehta, Shruti. 2020. "- JHU COVID-19 Community Response Survey." NIH Public Health Emergency and Disaster Research Response (DR2). https://dr2.nlm.nih.gov/search/?q=22096.

3.2 Descriptive Statistics

T-tests were used to compare the treatment and control group to test our randomization of the text and infographic interventions. Eight of the seventy-five covariates collected were statistically significantly different in the text and control groups. While this was over the 5% that would be expected to be different by random chance, many of the differences were for variables related to trust in news sources and beliefs about the effectiveness of policy interventions. We do not believe that these differences would have a major impact in the trust of CDC information or beliefs in personal prevention measures.

Table 1. Covid-19 Knowledge

Text Infographic	P-value		
total_symptoms	13.750000	13.375000	0.6719800
correct_symptoms	12.519231	12.166667	0.6286327
incorrect_symptoms	1.230769	1.208333	0.9273019
total_transmission	2.692308	2.708333	0.8743582

Table 2. Pre-intervention perceived effectiveness of prevention measures

	Text	Infographic	P-value
mask_use	4.442308	4.291667	0.3567547
praying	1.442308	1.437500	0.9780990
hand_washing	4.461538	4.312500	0.3056444
handsanitizer	4.230769	3.958333	0.0880243
Doctor_visit_when_sick	3.634615	3.562500	0.7567706
Doctor_visit_when_exposed	2.846154	2.666667	0.5114201
avoid_crowds	4.750000	4.645833	0.4325187
avoid_high_risk_people	4.365385	4.583333	0.2525825
avoid_hospitals	3.615385	3.791667	0.3712927
avoid_restaurants	4.384615	4.083333	0.0863343
avoid_public_transportation	4.288462	3.958333	0.0616445
increased_ventilation	3.807692	3.625000	0.3715874
increased_physical_distance	4.423077	4.250000	0.3007091

Table 3. Demographics

	Text	Infographic	P-value
education	6.3137255	6.4255319	0.5006874
income	4.9807692	4.5744681	0.4724411
internet	3.9615385	3.9574468	0.9190145
social_media	3.5576923	3.5531915	0.9716906
percent_white	0.6730769	0.5833333	0.3530677
percent_hispanic	0.0576923	0.0416667	0.7133511
percent_women	0.6153846	0.4583333	0.1154177
percent_female	0.6153846	0.4791667	0.1713289
percent_fulltime	0.3076923	0.3541667	0.6214553
percent_republican	0.0192308	0.1041667	0.0739711

4. Results Obtained

4.1 Results:

According to our original hypothesis, people would successfully learn and retain more information about the effectiveness of handwashing, social distancing, and mask wearing via infographics relative to text information. We expected this to manifest in a significant increase in the rated effectiveness of these prevention measures in the treatment group relative to the control group. In order to test this hypothesis, we ran the aforementioned difference in differences models, along with several t-tests to ensure our variables were not significantly different between groups.

As you can see in Table 1 in Appendix D, there are essentially the same number of respondents who were divided into our treatment and control groups. In addition to our groups being balanced, as you can see in Table 2 in section 3.2, we can see that our treatment and control groups did not answer the pre-intervention prevention questions in a way that is statistically different at the 0.05 level. Particularly for our outcomes of interest, it is a good sign that our groups did not answer differently for the effectiveness of mask wearing, handwashing, and physical distancing even at the 0.1 level.

```
##
## ================================================================================
##                                          Dependent variable:
##                              ---------------------------------------------------
##                              Handwashing Wearing Masks Maintaing Physical Distance
## --------------------------------------------------------------------------------
## Infographic                     -0.149       -0.151              -0.173
##                                 (0.144)      (0.163)             (0.168)
##
## post                             0.058        0.019               0.173
##                                 (0.143)      (0.162)             (0.136)
##
## Infographic:post                -0.120        0.106              -0.048
##                                 (0.210)      (0.237)             (0.229)
##
## Constant                       4.462***     4.442***            4.423***
##                                 (0.104)      (0.111)             (0.104)
##
## --------------------------------------------------------------------------------
## Week                              No           No                  No
## --------------------------------------------------------------------------------
## Observations                     200          200                 200
## R2                               0.022        0.006               0.024
## Adjusted R2                      0.007       -0.009               0.009
## Residual Std. Error (df = 196)   0.740        0.837               0.800
## F Statistic (df = 3; 196)        1.440        0.410               1.611
## ================================================================================
## Note:                                              *p<0.1; **p<0.05; ***p<0.01
```

Figure 1. *Difference in Differences Models*

Above, you can see the results of our difference in differences models. The row of interest is the interaction term between our treatment (Infographic) and the time period (post). As you can see, the interaction term did not have any kind of significant effect on any of the three outcomes of interest. This result implies that, to return to our causal question of interest, there is no difference in people's understanding of the content of COVID prevention information released by the CDC regardless of its delivery mechanism. Interestingly, the coefficients on 'post' were also insignificant across the outcomes. Meaning, it appears the CDC's information did not significantly impact people's perception of the effectiveness of health measures regardless of the delivery mechanism.

While there might be other explanations for this insignificance, another possibility is that at this point in time, people's perception of COVID prevention mechanisms are too baked-in. If that is the case, no intervention on the CDC's part would be able to convince people that their perceptions are not properly aligned.

4.2 Limitations:

As noted in section 4.1, we did not see any significant coefficients on either our interaction term or on 'post.' One theory to explain this is that, as we are nine months into the pandemic significantly impacting the US, people's understanding how effective certain measures are in preventing the virus has solidified.

However, another explanation might have to do with the problem of selection bias. Selection bias occurs when the sample of a study is significantly different from the population of interest. The CDC's messaging should be available and beneficial to all people, although it is targeted towards US inhabitants, our results are not reflective of the US population. Our respondents are more educated, younger, significantly more democratic, and work more in STEM fields than the country as a whole. This skewed sample likely has to do with the types of people immediately surrounding the researchers as the survey was primarily shared via word of mouth (text, email, Facebook, etc.)

If we were to complete this experiment again with more time and resources, we would ideally want to see a sample not only balanced across groups, but one that is representative of the broader population. So, while it is possible that our sample's understanding of the effectiveness of COVID prevention methods could be baked in, the same does not necessarily hold true more broadly. The imbalance of political affiliation is of particular interest as the virus has become so politicized. It would be interesting to

see if the results have heterogeneous effects, were we able to acquire a more balanced sample.

5. Future Work:

In the future, we would like to improve both the internal and external validity of our experiment. As mentioned in section 4.2, our biggest challenges to external validity resulted from selection bias leading to us having an unrepresentative sample of the population of interest. If we were to re-run or complete a follow-up experiment, we would invest significantly more time and resources into improving our sampling methods.

An internal validity challenge we were made aware of throughout the experiment was that respondents interpreted the repetition of the prevention questions as an error or bug in the survey, instead of something to be tested. This resulted in more respondents either skipping those questions or exiting the survey earlier than expected. If we were to repeat the experiment, we would make it much more clear that respondents should continue answering questions until they receive confirmation of their submission.

While our results might be affected by selection bias, which could seemingly suppress the effect of the treatment, it is worth noting the policy implications of the alternative possibility that the CDC's interventions are not that effective. If we were to complete the experiment again with a more representative sample and received the same results, we would be more inclined to make policy recommendations to the CDC that their current type of messaging is not having any significant effect. In which case, their resources are likely better spent elsewhere.

APPENDIX A. Variable Information - descriptions

Independent Variable

Infographic=0 if individuals were shown text in the survey (i.e. for individuals in the control group)
Infographic=1 if individuals were shown the infographic in the survey (i.e. for individuals in the treatment group)

Post=0 for answers to questions asked before the text/infographic was displayed (i.e. "pre-test" questions)
Post=1 for answers to questions asked after the text/infographic was displayed (i.e. "post-test" questions)

Each of the below variables record responses to the question: In your opinion, how effective are the following actions for keeping you safe from COVID-19?

Dependent Variables
Prevention_washing: Washing your hands with soap frequently
Prevention_mask: Wearing a face mask
Prevention_distance: Maintaining six feet of distance from people outside of your household

Covariates
Prevention_praying: Praying
Prevention_sanitizer: Using hand sanitizer frequently
Prevention_sick: Seeing a health care provider if you feel sick
Prevention_exposure: Seeing a health care provider if you feel healthy but worry that you were exposed
Prevention_crowd: Avoiding public spaces, gatherings, and crowds
Prevention_highrisk: Avoiding contact with people who could be high-risk
Prevention_hospitals: Avoiding hospitals and clinics
Prevention_restaurants: Avoiding restaurants
Prevention_transport: Avoiding public transport
Prevention_ventilation: Increasing ventilation (i.e. opening windows whenever possible)

For each of the variables, the responses are recorded as either "Not effective at all", "Hardly effective", "Somewhat effective", "Effective" or "Very effective" and coded as 1-5.

Each of the below variables record responses to the question: How likely do you think it is that the following events will happen in light of the current COVID-19 pandemic?

PerceivedRisk_personalinfection: You will be infected
PerceivedRisk_closeinfection: Someone in your direct environment (family, friends, colleagues) will be infected
PerceivedRisk_personalhospitalization: You will have to go to the hospital if you get the infection
PerceivedRisk_personalquarantine: You will have to go into quarantine independent of you being infected or not
PerceivedRisk_personalinfectionofothers: You will get infected and you will infect someone else
PerceivedRisk_closedeath: Someone in your direct environment (family, friends, colleagues) will die

For each of the variables, the responses are recorded as either "No chance", "Very small chance", "Medium chance", "High chance", "Very high chance", "Absolutely sure" or "This has already happened" and coded as 1-7.

Each of the below variables record responses to the question: How much do you trust the following sources to provide accurate COVID-19 information?

Trust_Twitter: Twitter
Trust_Facebook: Facebook
Trust_Newspaper: Newspaper
Trust_FriendsFamily: Friends or Family
Trust_CoworkersClassmates: Coworkers or Classmates
Trust_Doctors: Doctors
Trust_Gov: Official Government websites
Trust_Trump: President Trump
Trust_State: State Governor/Mayor
Trust_WHO: World Health Organization
Trust_CDC: Centers for Disease Control and Prevention

Trust_HealthDept: State, County, or City health department
Trust_CNN: CNN
Trust_Fox: FOX News
Trust_MSNBC: MSNBC
Trust_LocalNews: Local news station (e.g., CBS, ABC, NBC)
Trust_NPR: NPR

For each of the variables, the responses are recorded as either "Not at all", "Somewhat", "Mostly" or "Completely" and coded as 1-4.

Each of the below variables record responses to the question: In the last one week, which of the following sources have you used to get information about COVID-19?

Recent_Twitter: Twitter
Recent_Facebook: Facebook
Recent_Newspaper: Newspaper
Recent_FriendsFamily: Friends or Family
Recent_CoworkersClassmates: Coworkers or Classmates
Recent_Doctors: Doctors
Recent_Gov: Official Government websites
Recent_Trump: President Trump
Recent_State: State Governor/Mayor
Recent_WHO: World Health Organization
Recent_CDC: Centers for Disease Control and Prevention
Recent_HealthDept: State, County, or City health department
Recent_CNN: CNN
Recent_Fox: FOX News
Recent_MSNBC: MSNBC
Recent_Local: Local news station (e.g., CBS, ABC, NBC)
Recent_NPR: NPR

For each of the variables, the responses are recorded as either “Yes” or “No” and coded as 1 and 2.

Each of the below variables record responses to the question: Given the state of the COVID-19 pandemic today and the associated spread, how effective do you think the following policy measures are (whether they are implemented or not at present)?

Effect_CloseSchools: Close schools and daycares
Effect_CloseGyms: Close gyms
Effect_CloseRestaurants: Close restaurants
Effect_CloseSupermarkets: Close all shops except for supermarkets and pharmacies
Effect_NoVisitors: Don't allow visitors in hospitals, nursing homes and elderly homes
Effect_Over70StayHome: Oblige people aged 70 and over or with a medical condition to stay at home except to do basic shopping or because urgent medical attention is required
Effect_StayHome: Oblige everyone who does not work in a crucial professional group (for example, people who work in healthcare, public transport, the food chain) stays at home except to do basic shopping or because urgent medical care is required
Effect_WearMasks: Universal wearing of face masks

For each of the variables, the responses are recorded as either "Not effective at all", "Hardly effective", "Somewhat effective", "Effective" or "Very effective" and coded as 1-5.

The below variables record demographic information.

Race: This variable is used to identify the race of the person filling the survey.
Ethnicity: This variable is used to identify the ethnicity of the person filling the survey.
Gender: This variable is used to identify the current gender identity of the person filling the survey.
Sex: This variable is used to identify the sex assigned to the person filling the survey at birth.
Education: This variable is used to identify the highest level of education completed by the person filling the survey.
Employment: This variable is used to identify the employment status of the person filling the survey.
Occupation: This variable is used to identify the occupation of the person filling the survey.
Income: This variable is used to identify the income in 2019 of the person filling the survey.
Internet: This variable is used to identify internet usage of the person filling the survey.
SocialMedia: This variable is used to identify how often the person filling the survey uses social media.
Party: This variable is used to identify the political party the person filling the survey supports.

APPENDIX B. Variable Information - t-tests

Table 4. Covid-19 Perceived Risks

	Text	Infographic	P-value
personal_infection	3.461539	3.312500	0.5502986
close_infection	4.576923	4.458333	0.7212121
personal_hositalization	2.615385	2.458333	0.3028018
personal_quarantine	4.500000	4.708333	0.5415711
personal_infection_of_others	2.903846	2.979167	0.7296158
close_death	2.826923	2.875000	0.8702159

Table 5. Trust of News Sources

	Text	Infographic	P-value
twitter	1.750000	1.687500	0.6806275
facebook	1.442308	1.416667	0.8384664
newspaper	2.807692	2.520833	0.0520833
friends_family	2.057692	2.125000	0.6322262
coworkers_classmates	2.076923	2.020833	0.6565156
doctors	3.519231	3.375000	0.3166599
government	3.134615	2.833333	0.0879041
trump	1.115385	1.166667	0.5896964
state	2.568627	2.479167	0.5745051
WHO	3.307692	3.083333	0.1838863
CDC	3.384615	3.166667	0.1267101
health_dept	3.192308	2.895833	0.0582562
CNN	2.519231	2.208333	0.0335889
Fox	1.442308	1.250000	0.0847309
MSNBC	2.372549	1.979167	0.0094293
local_news	2.384615	2.062500	0.0252039
NPR	2.921569	2.520833	0.0243906

Table 6. Recent Use of News Sources

	Text	Infographic	P-value
twitter	1.730769	1.770833	0.6478991
facebook	1.846154	1.937500	0.1476261
newspaper	1.442308	1.520833	0.4374042
friends_family	1.384615	1.416667	0.7468186
coworkers_classmates	1.576923	1.687500	0.2569716
doctors	1.538461	1.437500	0.3178550
government	1.480769	1.479167	0.9873747
trump	1.961539	1.958333	0.9356893
state	1.461539	1.479167	0.8616659
WHO	1.692308	1.625000	0.4827877
CDC	1.403846	1.250000	0.1041604
health_dept	1.365385	1.375000	0.9217336
CNN	1.557692	1.750000	0.0444690
Fox	1.942308	2.000000	0.0928599
MSNBC	1.807692	1.916667	0.1190002
local_news	1.673077	1.812500	0.1145471
NPR	1.596154	1.750000	0.1041604

Table 7. Perceived Effectiveness of Policy Interventions

	Text	Infographic	P-value
close_schools	3.653846	3.604167	0.8238922
close_gyms	4.269231	3.875000	0.0511029
close_restaurants	4.230769	3.750000	0.0231598
close_supermarkets	3.788461	3.479167	0.1633812
no_visitors	4.326923	3.791667	0.0037264
stay_home_if_over_70	4.096154	3.812500	0.1331789
stay_home	4.288462	3.708333	0.0097883
wear_masks	4.769231	4.479167	0.0967968

APPENDIX C. Variable Information - Charts

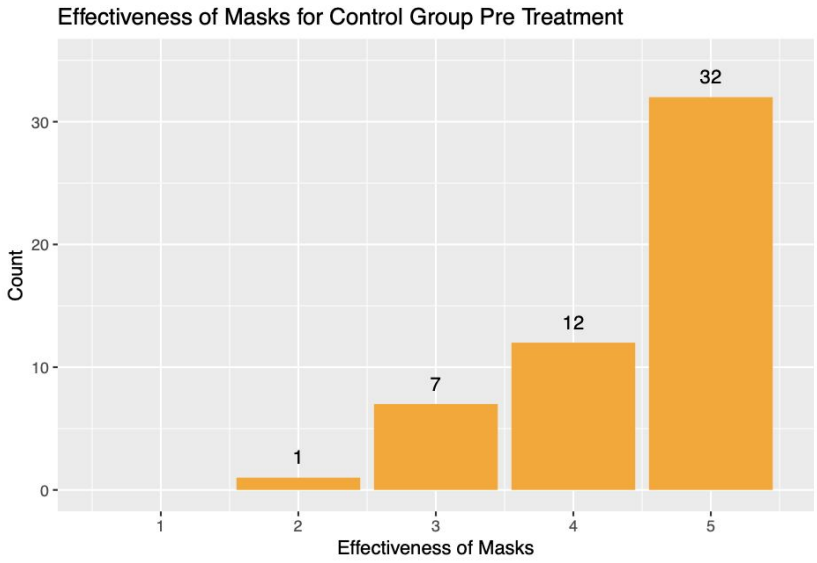

Figure 2. Effectiveness of Masks for the Control Group Pre Treatment

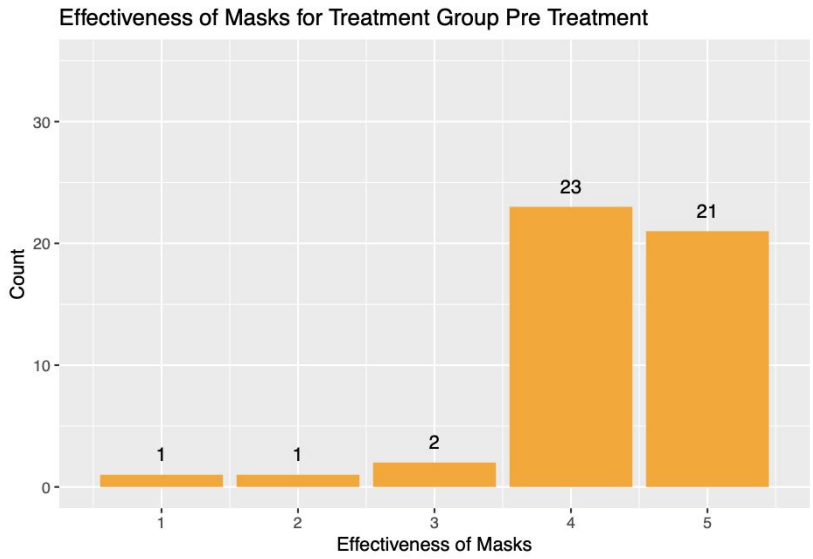

Figure 3. Effectiveness of Masks for the Treatment Group Pre Treatment

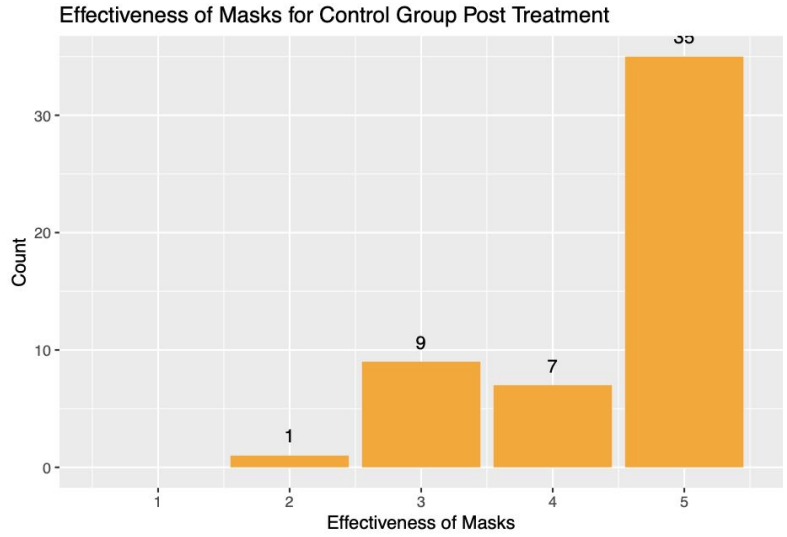

Figure 4. Effectiveness of Masks for the Control Group Post Treatment

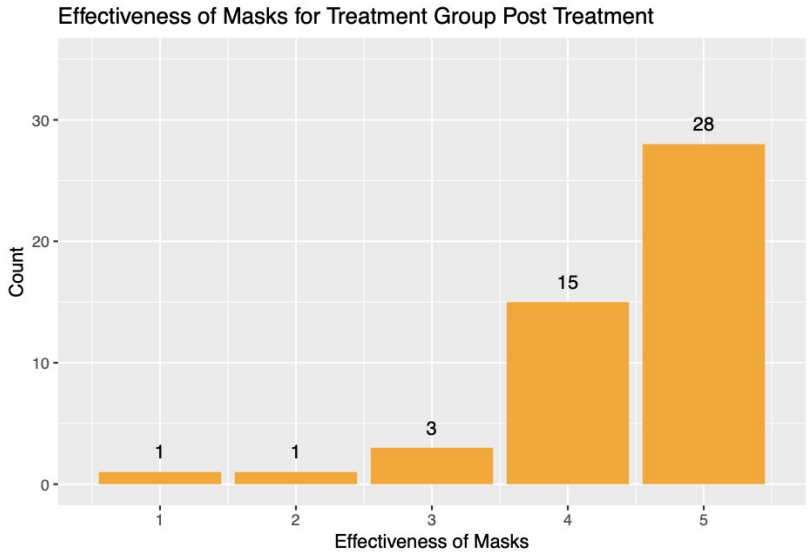

Figure 6. Effectiveness of Masks for the Treatment Group Post Treatment

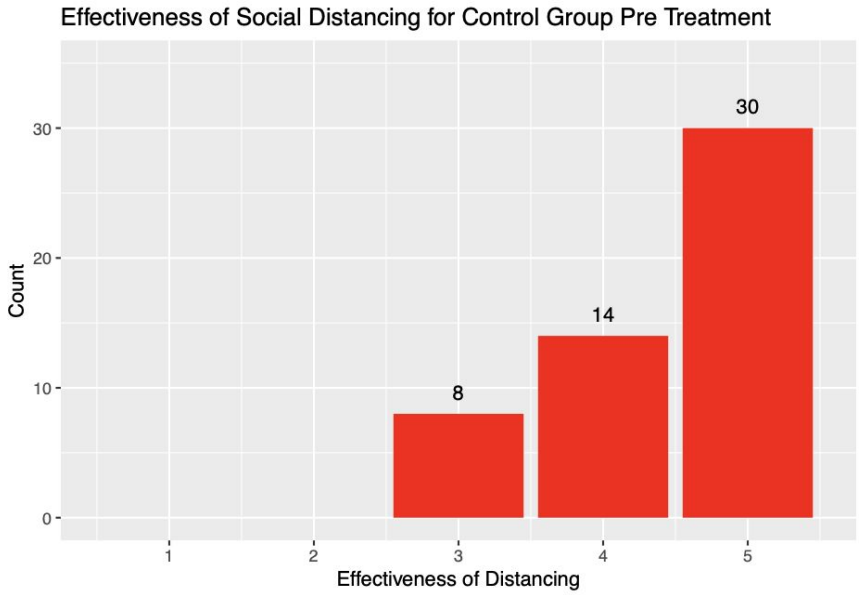

Figure 7. Effectiveness of Social Distancing for the Control Group Pre Treatment

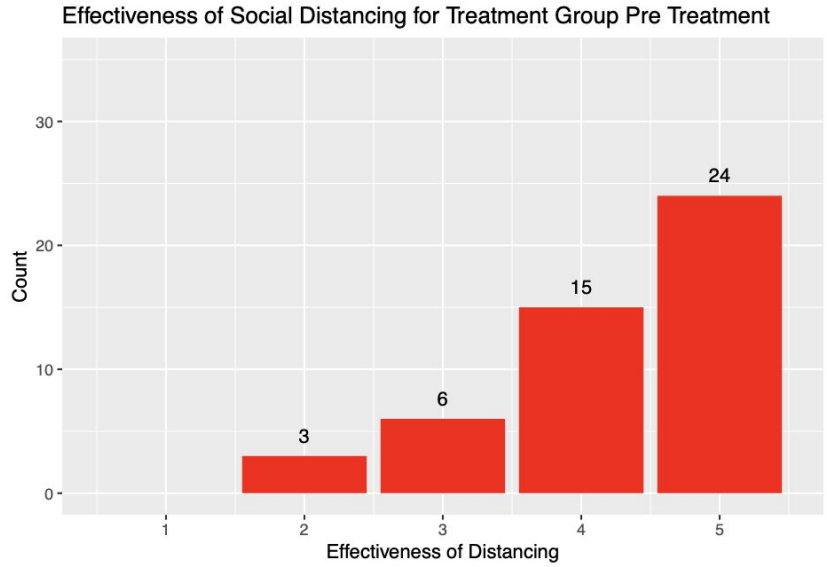

Figure 8. Effectiveness of Social Distancing for the Treatment Group Pre Treatment

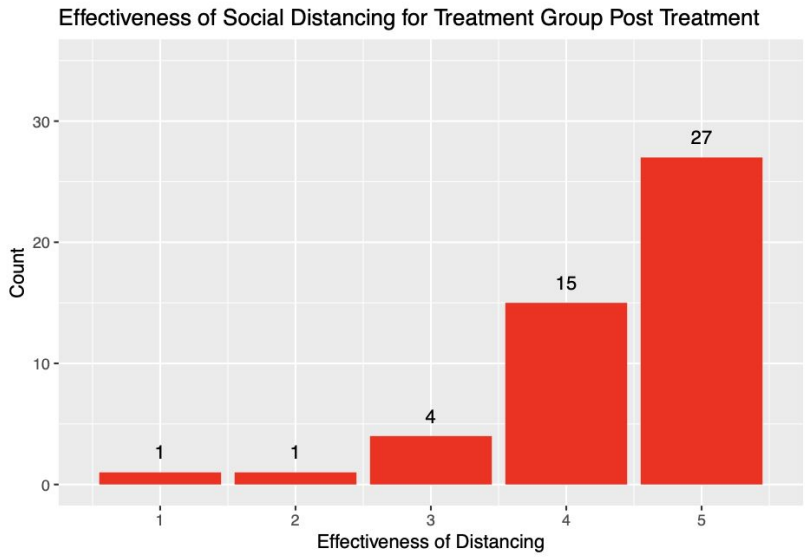

Figure 9. Effectiveness of Social Distancing for the Treatment Group Post Treatment

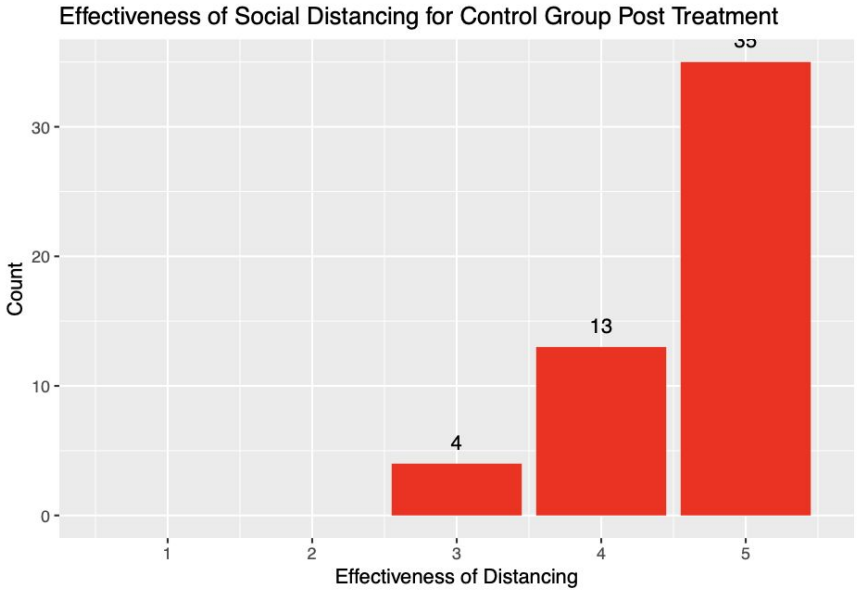

Figure 10. Effectiveness of Social Distancing for the Control Group Post Treatment

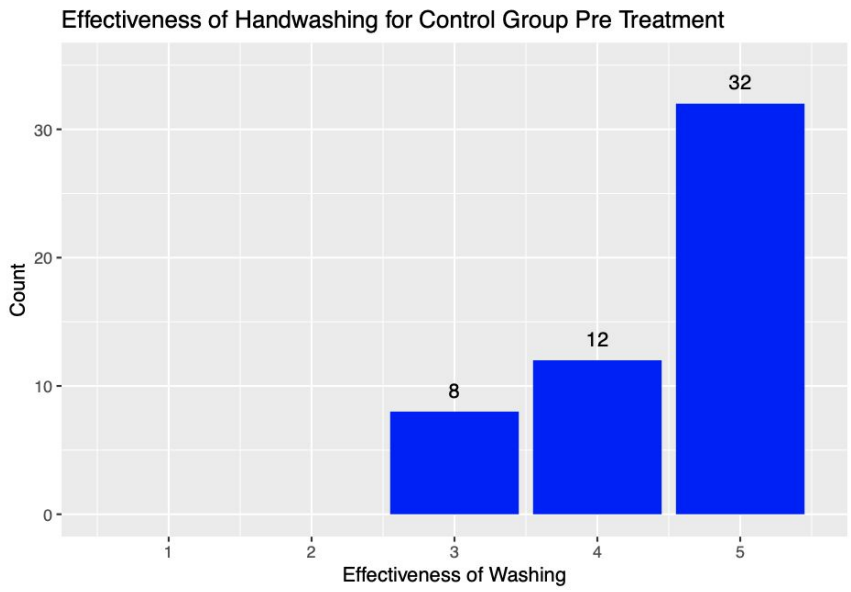

Figure 11. Effectiveness of Hand Washing for the Control Group Pre Treatment

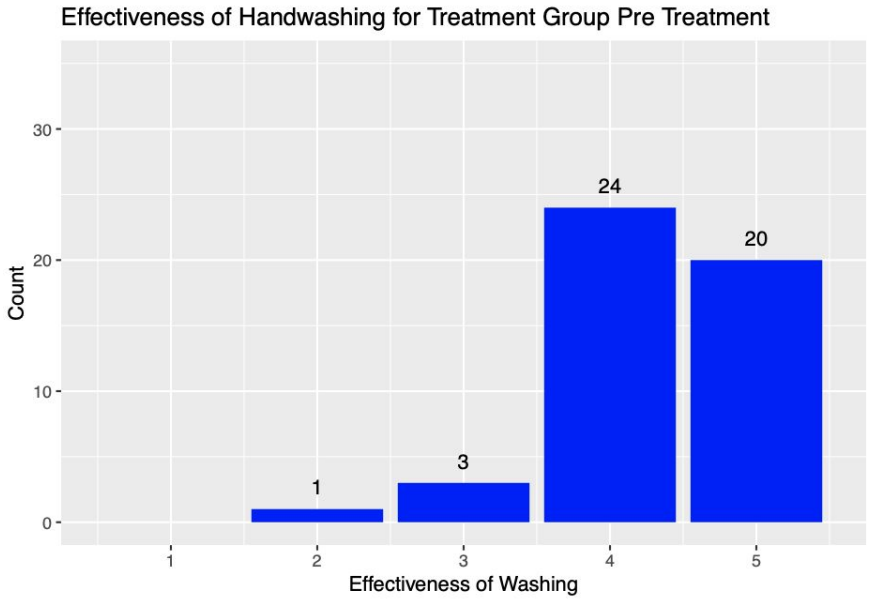

Figure 12. Effectiveness of Hand Washing for the Treatment Group Pre Treatment

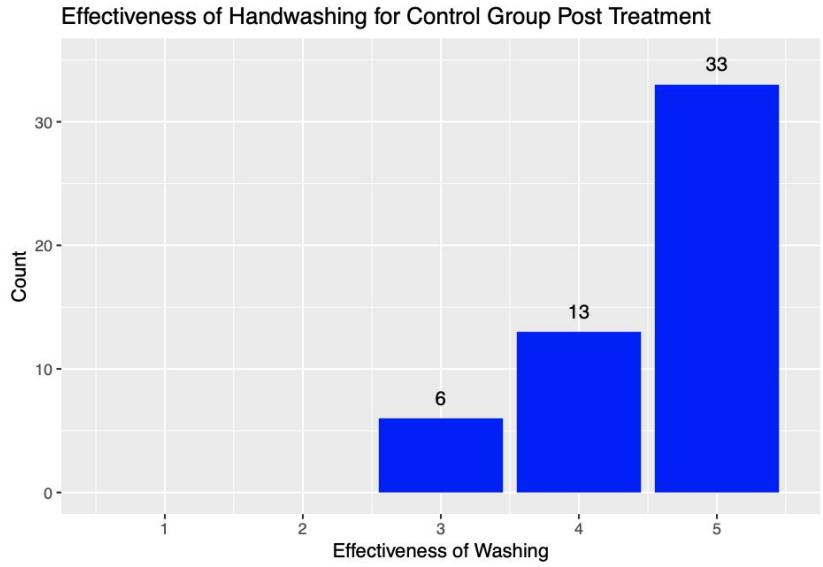

Figure 13. Effectiveness of Hand Washing for the Control Group Post Treatment

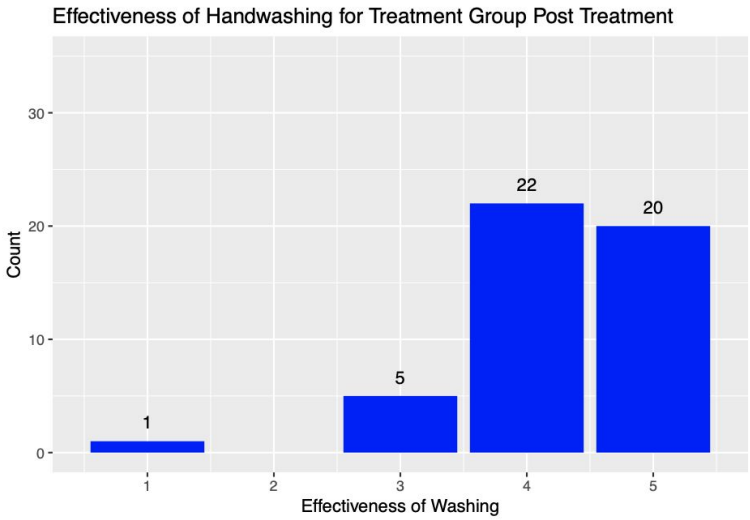

Figure 14. Effectiveness of Hand Washing for the Treatment Group Pre Treatment

APPENDIX D. Variable Information - Tables

```
table(MyData[MyData$post==0]$Infographic)
```

```
##
##  0  1
## 52 48
```

Table 1. Distribution of Control and Treatment.

```
table(MyData[MyData$post==0]$'Sore Throat')
```

```
##
##  0  1
```

```
## 18 82
```

```r
table(MyData[MyData$post==0]$Cough)
```

```
##
##  0  1
##  9 91
```

```r
table(MyData[MyData$post==0]$`Runny nose`)
```

```
##
##  0  1
## 58 42
```

```r
table(MyData[MyData$post==0]$`Shortness of breath when moving (like walking up stairs)`)
```

```
##
##  0  1
## 25 75
```

```r
table(MyData[MyData$post==0]$`Shortness of breath at rest`)
```

```
##
##  0  1
##  7 93
```

```r
table(MyData[MyData$post==0]$Chills)
```

```
##
##  0  1
## 37 63
```

```r
table(MyData[MyData$post==0]$`General lack of energy or malaise`)
```

```
##
##  0  1
## 31 69
```

```r
table(MyData[MyData$post==0]$Fatigue)
```

```
##
##  0  1
##  7 93
```

```r
table(MyData[MyData$post==0]$`Loss of appetite`)
```

```
##
##  0  1
## 51 49
```

```r
table(MyData[MyData$post==0]$`Discomfort, tightness, or pressure in chest`)
```

```
##
##  0  1
## 32 68
```

```r
table(MyData[MyData$post==0]$Vomiting)
```

```
##
##  0  1
## 69 31
```

```r
table(MyData[MyData$post==0]$Nausea)
```

```
##
##  0  1
## 56 44
```

```r
table(MyData[MyData$post==0]$Diarrhea)
```

```
##
##  0  1
## 56 44
```

```r
table(MyData[MyData$post==0]$`Muscle aches`)
```

```
##
##  0  1
## 36 64
```

```r
table(MyData[MyData$post==0]$`Joint aches`)
```

```
##
##  0  1
## 63 37
```

```r
table(MyData[MyData$post==0]$Headache)
```

```
##
##  0  1
## 30 70
```

```r
table(MyData[MyData$post==0]$Seizure)
```

```
##
##  0  1
## 92  8
```

```r
table(MyData[MyData$post==0]$Dizziness)
```

```
##
##  0  1
## 72 28
```

```r
table(MyData[MyData$post==0]$`Altered consciousness or feeling like it was difficult to stay awake`)
```

```
##
##  0  1
## 70 30
```

```r
table(MyData[MyData$post==0]$`Loss of ability to smell`)
```

```
##
##  0  1
## 12 88
```

```r
table(MyData[MyData$post==0]$`Loss of ability to taste`)
```

```
##
##  0  1
##  6 94
```

```r
table(MyData[MyData$post==0]$Fever)
```

```
##
##  0  1
##  6 94
```

```r
summary(MyData[MyData$post==0]$TotalSymptoms)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    2.00   10.00   14.00   13.57   17.00   22.00
```

```r
summary(MyData[MyData$post==0]$CorrectSymptoms)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    2.00    9.75   12.00   12.35   15.00   18.00
```

```r
summary(MyData[MyData$post==0]$IncorrectSymptoms)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    0.00    0.00    1.00    1.22    2.00    4.00
```

```r
table(MyData[MyData$post==0]$NumTransmission)
```

```
##
##  1  2  3
##  2 26 72
```

```r
table(MyData[MyData$post==0]$PerceivedRisk_personalinfection)
```

```
##
##  1  2  3  4  5  6  7
##  1 19 46 19  9  1  5
```

```r
table(MyData[MyData$post==0]$PerceivedRisk_closeinfection)
```

```
##
##  1  2  3  4  5  6  7
##  1  7 23 26 17  3 23
```

```r
table(MyData[MyData$post==0]$PerceivedRisk_personalhospitalization)
```

```
##
##  1  2  3  4  5  6
##  1 55 36  6  1  1
```

```r
table(MyData[MyData$post==0]$PerceivedRisk_personalquarantine)
```

```
##
##  1  2  3  4  5  6  7
##  2  9 20 17 19 14 19
```

```r
table(MyData[MyData$post==0]$PerceivedRisk_personalinfectionofothers)
```

```
##
##  1  2  3  4  5  6  7
##  4 32 43 11  8  1  1
```

```r
table(MyData[MyData$post==0]$PerceivedRisk_closedeath)
```

```
##
##  1  2  3  4  5  7
##  4 52 25  9  2  8
```

```r
table(MyData[MyData$post==0]$Prevention_mask)
```

```
##
##  1  2  3  4  5
##  1  2  9 35 53
```

```r
table(MyData[MyData$post==0]$Prevention_praying)
```

```
##
##  1  2  3  4  5
## 74 14  7  4  1
```

```r
table(MyData[MyData$post==0]$Prevention_washing)
```

```
##
##  2  3  4  5
##  1 11 36 52
```

```r
table(MyData[MyData$post==0]$Prevention_sanitizer)
```

```
##
##  1  2  3  4  5
##  1  1 18 47 33
```

```r
table(MyData[MyData$post==0]$Prevention_sick)
```

```
##
##  1  2  3  4  5
##  7 10 22 38 23
```

```r
table(MyData[MyData$post==0]$Prevention_exposure)
```

```
##
##  1  2  3  4  5
## 24 22 20 22 12
```

```r
table(MyData[MyData$post==0]$Prevention_crowds)
```

```
##
##  1  3  4  5
##  1  5 16 78
```

```r
table(MyData[MyData$post==0]$Prevention_highrisk)
```

```
##
##  1  2  3  4  5
##  3  2  8 19 68
```

```r
table(MyData[MyData$post==0]$Prevention_hospitals)
```

```
##
##  1  2  3  4  5
##  2  8 31 36 23
```

```r
table(MyData[MyData$post==0]$Prevention_restaurants)
```

```
##
##  1  2  3  4  5
##  1  4 11 38 46
```

```r
table(MyData[MyData$post==0]$Prevention_transport)
```

```
##
##  2  3  4  5
##  4 21 33 42
```

```r
table(MyData[MyData$post==0]$Prevention_ventilation)
```

```
##
##  1  2  3  4  5
##  1 13 24 37 25
```

```r
table(MyData[MyData$post==0]$Prevention_distance)
```

```
##
##  2  3  4  5
##  3 14 29 54
```

```r
table(MyData[MyData$post==0]$Trust_Twitter)
```

```
##
##  1  2  3  4
## 45 39 15  1
```

```r
table(MyData[MyData$post==0]$Trust_Facebook)
```

```
##
##  1  2  3  4
## 63 32  4  1
```

```r
table(MyData[MyData$post==0]$Trust_Newspaper)
```

```
##
##  1  2  3  4
##  8 25 59  8
```

```r
table(MyData[MyData$post==0]$Trust_FriendsFamily)
```

```
##
##  1  2  3  4
## 19 54 26  1
```

```r
table(MyData[MyData$post==0]$Trust_CoworkersClassmates)
```

```
##
##  1  2  3  4
## 16 64 19  1
```

```r
table(MyData[MyData$post==0]$Trust_Doctors)
```

```
##
##  1  2  3  4
##  3  4 38 55
```

```r
table(MyData[MyData$post==0]$Trust_Gov)
```

```
##
##  1  2  3  4
##  7 18 44 31
```

```r
table(MyData[MyData$post==0]$Trust_Trump)
```

```
##
##  1  2  3  4
## 90  7  2  1
```

```r
table(MyData[MyData$post==0]$Trust_State)
```

```
##
##  1  2  3  4
##  7 44 37 11
```

```r
table(MyData[MyData$post==0]$Trust_WHO)
```

```
##
##  1  2  3  4
##  5 12 41 42
```

```r
table(MyData[MyData$post==0]$Trust_CDC)
```

```
##
##  1  2  3  4
##  2  9 48 41
```

```r
table(MyData[MyData$post==0]$Trust_HealthDept)
```

```
##
##  1  2  3  4
##  3 19 48 30
```

```r
table(MyData[MyData$post==0]$Trust_CNN)
```

```
##
##  1  2  3  4
## 13 39 46  2
```

```r
table(MyData[MyData$post==0]$Trust_Fox)
```

```
##
##  1  2  3
## 69 27  4
```

```r
table(MyData[MyData$post==0]$Trust_MSNBC)
```

```
##
##  1  2  3  4
## 19 45 33  2
```

```r
table(MyData[MyData$post==0]$Trust_LocalNews)
```

```
##
##  1  2  3  4
## 15 49 34  2
```

```r
table(MyData[MyData$post==0]$Trust_NPR)
```

```
##
##  1  2  3  4
## 10 26 44 19
```

```r
table(MyData[MyData$post==0]$Recent_Twitter)
```

```
##
##  1  2
## 25 75
```

```r
table(MyData[MyData$post==0]$Recent_Facebook)
```

```
##
##  1  2
## 11 89
```

```r
table(MyData[MyData$post==0]$Recent_Newspaper)
```

```
##
##  1  2
## 52 48
```

```r
table(MyData[MyData$post==0]$Recent_FriendsFamily)
```

```
##
##  1  2
## 60 40
```

```r
table(MyData[MyData$post==0]$Recent_CoworkersClassmates)
```

```
##
##  1  2
## 37 63
```

```r
table(MyData[MyData$post==0]$Recent_Doctors)
```

```
##
##  1  2
## 51 49
```

```r
table(MyData[MyData$post==0]$Recent_Gov)
```

```
##
##  1  2
## 52 48
```

```r
table(MyData[MyData$post==0]$Recent_Trump)
```

```
##
##  1  2
##  4 96
```

```r
table(MyData[MyData$post==0]$Recent_State)
```

```
##
##  1  2
## 53 47
```

```r
table(MyData[MyData$post==0]$Recent_WHO)
```

```
##
##  1  2
## 34 66
```

```r
table(MyData[MyData$post==0]$Recent_CDC)
```

```
##
##  1  2
## 67 33
```

```r
table(MyData[MyData$post==0]$Recent_HealthDept)
```

```
##
##  1  2
## 63 37
```

```r
table(MyData[MyData$post==0]$Recent_CNN)
```

```
##
##  1  2
## 35 65
```

```r
table(MyData[MyData$post==0]$Recent_Fox)
```

```
##
##  1  2
##  3 97
```

```r
table(MyData[MyData$post==0]$Recent_MSNBC)
```

```
##
##  1  2
## 14 86
```

```r
table(MyData[MyData$post==0]$Recent_Local)
```

```
##
##  1  2
## 26 74
```

```r
table(MyData[MyData$post==0]$Recent_NPR)
```

```
##
##  1  2
## 33 67
```

```r
table(MyData[MyData$post==0]$Effect_CloseSchools)
```

```
##
##  1  2  3  4  5
##  4 11 29 30 26
```

```r
table(MyData[MyData$post==0]$Effect_CloseGyms)
```

```
##
##  1  2  3  4  5
##  3  5 14 37 41
```

```r
table(MyData[MyData$post==0]$Effect_CloseRestaurants)
```

```
##
##  1  2  3  4  5
##  3  6 20 30 41
```

```r
table(MyData[MyData$post==0]$Effect_CloseSupermarkets)
```

```
##
##  1  2  3  4  5
##  5 10 25 36 24
```

```r
table(MyData[MyData$post==0]$Effect_NoVisitors)
```

```
##
##  1  2  3  4  5
##  2  3 19 38 38
```

```r
table(MyData[MyData$post==0]$Effect_Over70StayHome)
```

```
##
##  2  3  4  5
##  9 19 39 33
```

```r
table(MyData[MyData$post==0]$Effect_StayHome)
```

```
##
##  1  2  3  4  5
##  6  5 12 36 41
```

```r
table(MyData[MyData$post==0]$Effect_WearMasks)
```

```
##
##  1  2  3  4  5
##  2  4  2 13 79
```

```r
table(MyData[MyData$post==0]$Infographic)
```

```
##
##  0  1
## 52 48
```

```r
table(MyData[MyData$post==0]$Age)
```

```
##
## 19 20 21 22 23 24 25 26 27 28 29 30 32 33 34 35 36 38 41 42 45 47 49 54 55 56
##  1  2  3  6 14  9  5  8  9  2  2  2  1  2  2  2  1  1  1  1  1  1  1  4  2  3
## 57 59 60 62 65 66 71 74
##  5  1  1  1  1  1  1  1
```

```r
table(MyData[MyData$post==0]$Race)
```

```
##
##                                          White
##                                             63
##                         Black or African American
##                                              1
## Native American/American Indian or Alaska Native
##                                              0
##                                   Asian American
##                                             12
##              Native Hawaiian or Pacific Islander
##                                              0
##                                          Other
##                                             20
```

```
table(MyData[MyData$post==0]$Employment)
```

```
##
##           Employed full-time (40 hours per week)
##                                                33
## Employed part-time (Less than 40 hours per week)
##                                                 5
##                                     Self-employed
##                                                 4
##                                  Full time student
##                                                46
##                                  Part-time student
##                                                 1
##                                        Unemployed
##                                                 3
##                Unable to work for health reasons
##                                                 1
##                               Stay at home parent
##                                                 2
##                                             Other
##                                                 4
```

```
table(MyData[MyData$post==0]$Ethnicity)
```

```
##
##     Hispanic or Latinx Not Hispanic or Latinx
##                      5                    92
```

```
table(MyData[MyData$post==0]$Gender)
```

```
##
##                           Male/Man                         Female/Woman
##                                 44                                   54
##              Trans Male/Trans Man           Trans Female/Trans Woman
##                                  0                                    0
## Genderqueer/Gender non-conforming                 Different Identity
##                                  1                                    0
```

```
table(MyData[MyData$post==0]$Sex)
```

```
##
##   Male Female
##     44     55
```

```
table(MyData[MyData$post==0]$Education)
```

```
##
##  4  5  6  7
##  4  9 32 53
```

```
table(MyData[MyData$post==0]$Occupation)
```

```
##
##                              Management       Business and Financial Operations
##                                       9                                      11
##              Computer and Mathematical            Architecture and Engineering
##                                      25                                       7
##     Life, Physical, and Social Science           Community and Social Service
##                                       4                                       4
##                      Legal Occupations       Education, Training, and Library
##                                       2                                      11
##  Arts/Design/Entertainment/Sports/Media  Healthcare Practitioners and Technical
##                                      11                                       1

##          Healthcare Support Occupations          Protective Service Occupations
##                                       3                                       0
##    Food Preparation and Serving Related Building/Grounds Cleaning & Maintenance
##                                       0                                       0
##   Personal Care and Service Occupations           Sales and Related Occupations
##                                       1                                       1
##       Office and Administrative Support          Farming, Fishing, and Forestry
##                                       0                                       0
##             Construction and Extraction   Installation, Maintenance, and Repair
##                                       0                                       1
##                  Production Occupations      Transportation and Material Moving
##                                       0                                       0
##           Military Specific Occupations                                   Other
##                                       0                                       6
```

```r
table(MyData[MyData$post==0]$Income)
```

```
##
##  1  2  3  4  5  6  7  8  9
## 22  5  6 15  7 10 18  1 15
```

```r
table(MyData[MyData$post==0]$Internet)
```

```
##
##  3  4
##  4 95
```

```r
table(MyData[MyData$post==0]$SocialMedia)
```

```
##
##  2  3  4
##  7 30 62
```

```r
table(MyData[MyData$post==0]$Party)
```

```
##
##     Republican       Democrat    Independent Something else
##              6             67             16             10
```