Lab 2: Impact of Stay at Home Orders on Individual Mobility

w203: Statistics for Data Science

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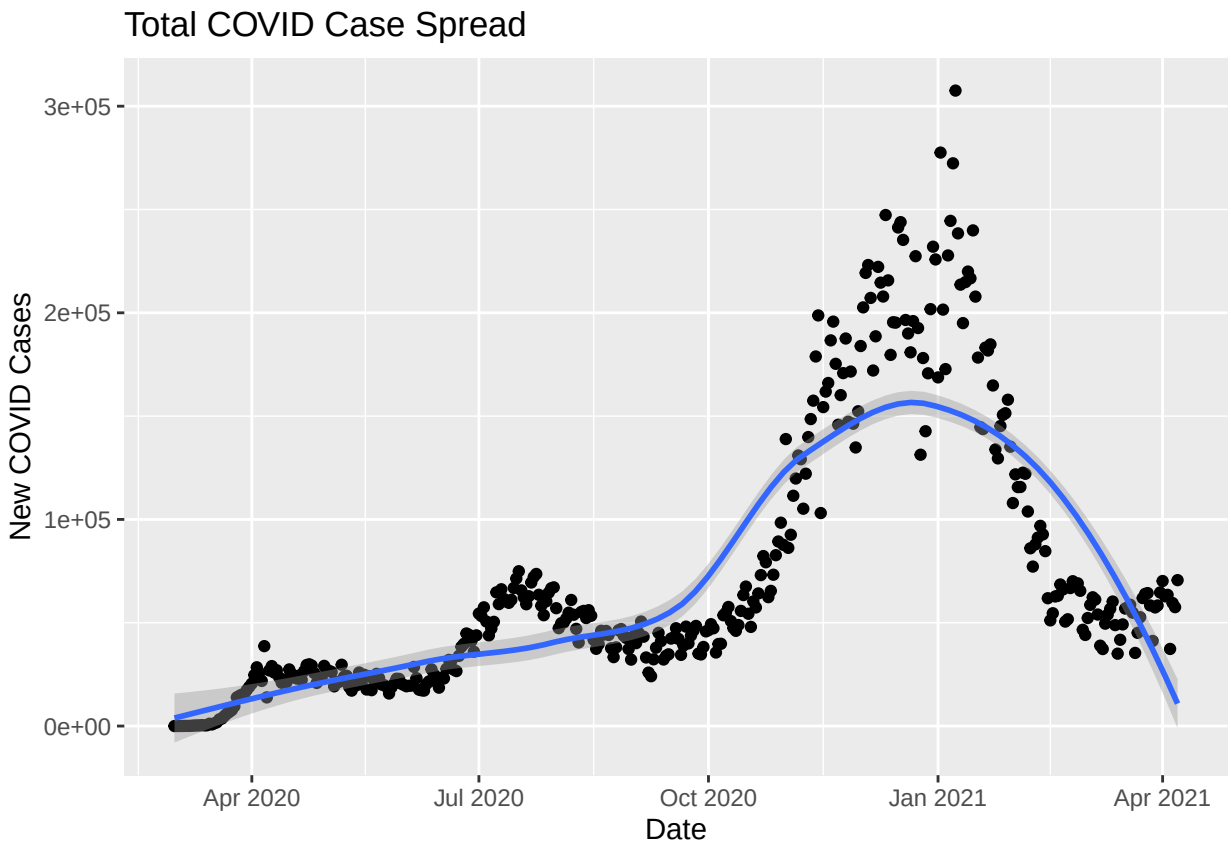
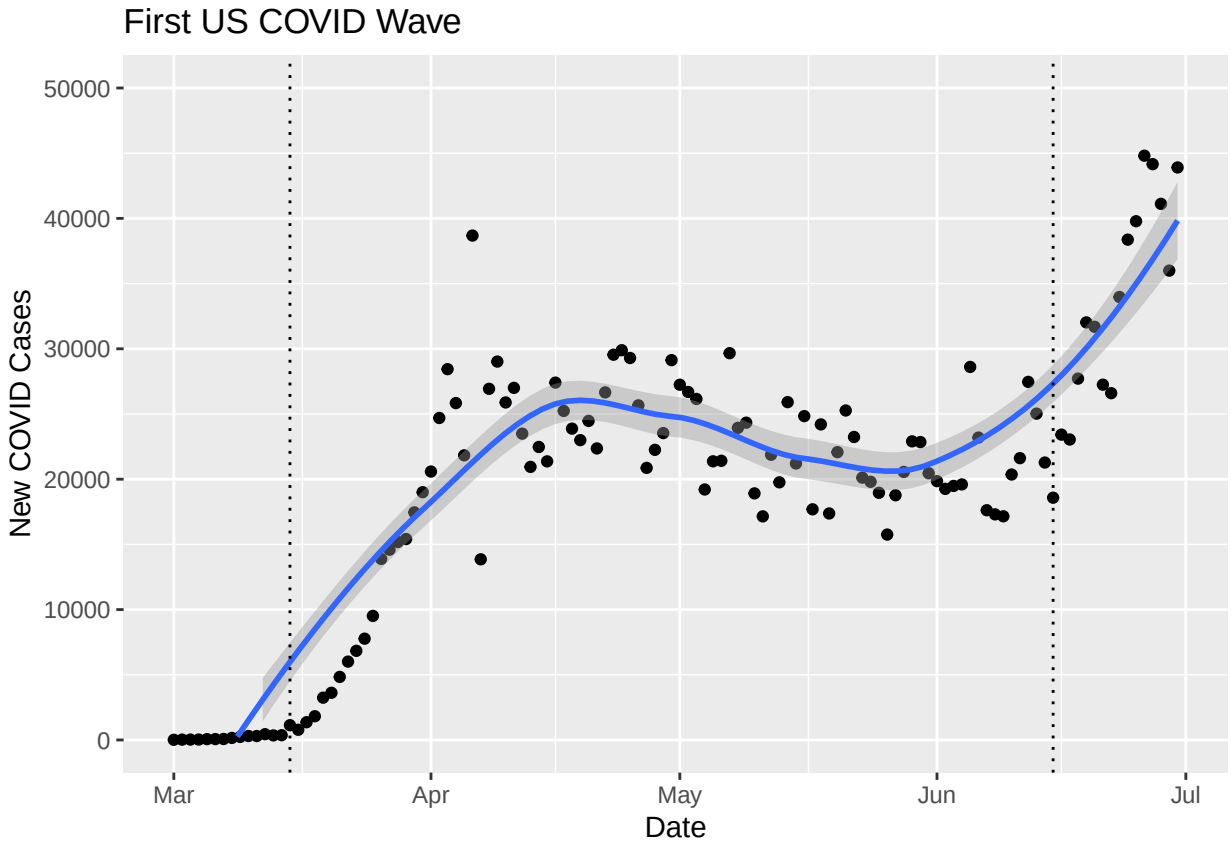
1. Introduction

2. Model Building

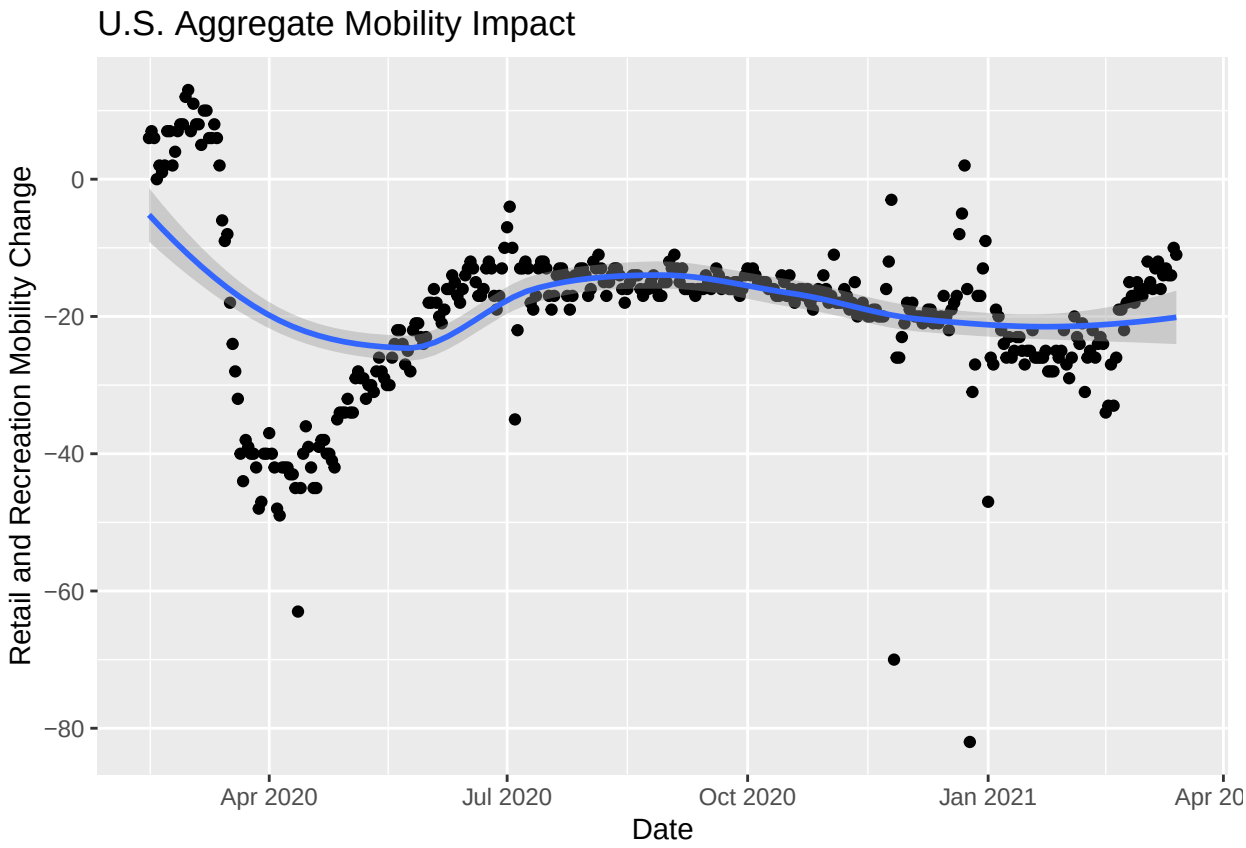
EDA

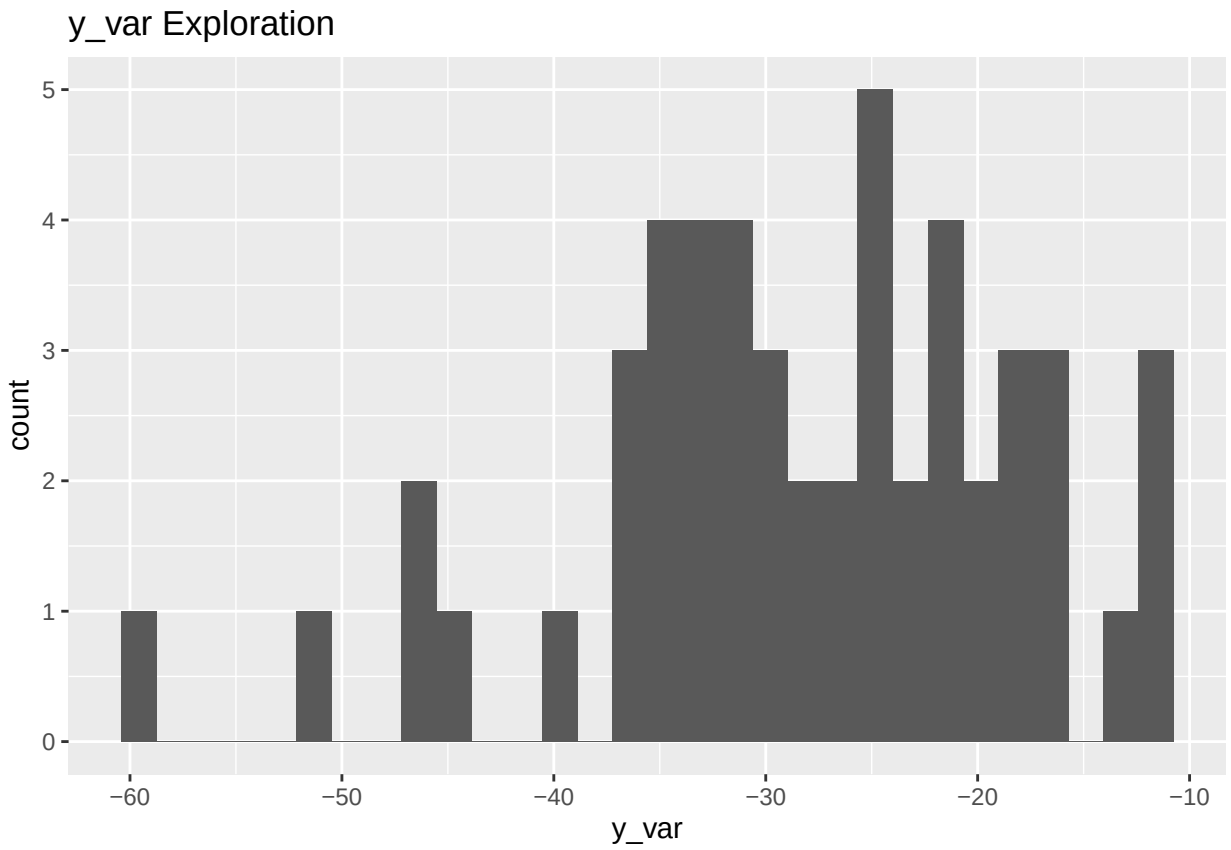



```
## Warning: Removed 5 rows containing missing values (geom_smooth).
```

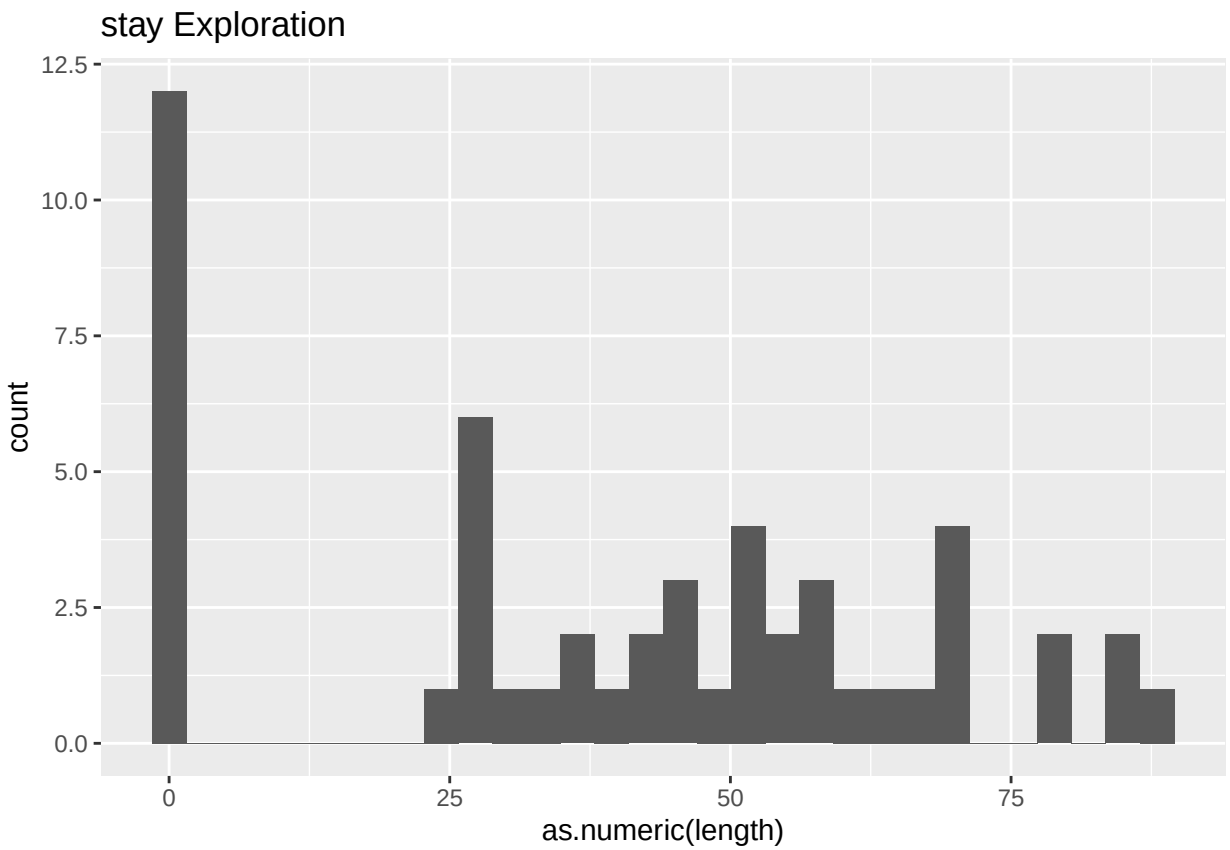


We will begin our analysis by first exploring the Google Mobility dataset. While there are many mobility measures within this dataset, we will focus on the change in mobility for retail and recreation. Unlike the other features that focus on grocery or parks, we beleive that retail and recreation captures the type of activity that stay at home policies intended to reduce.


U.S. Aggregate Mobility Impact
Retail and Recreation Mobility Change
0
−20
−40
−60
−80
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 20
Date

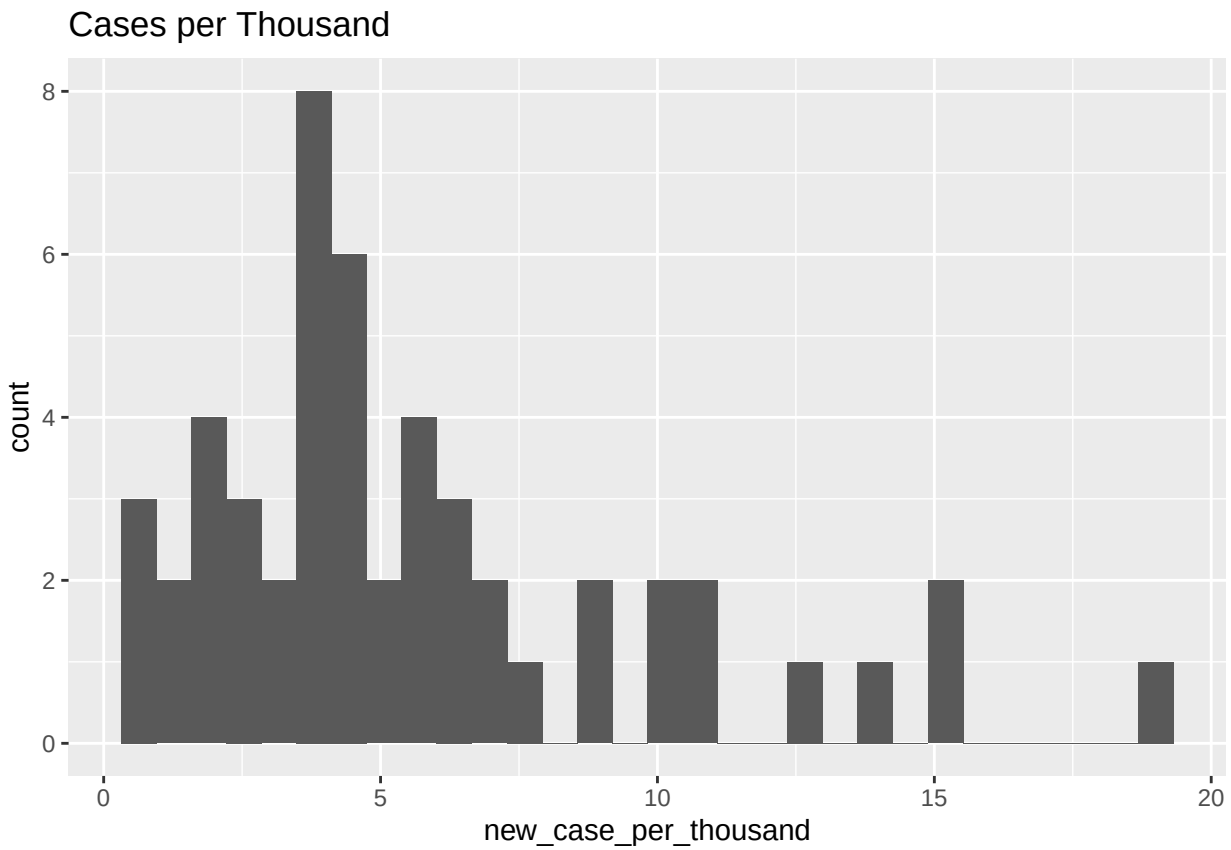

y_var Exploration
count
5
4
3
2
1
0
−60
−50
−40
−30
−20
−10
y_var

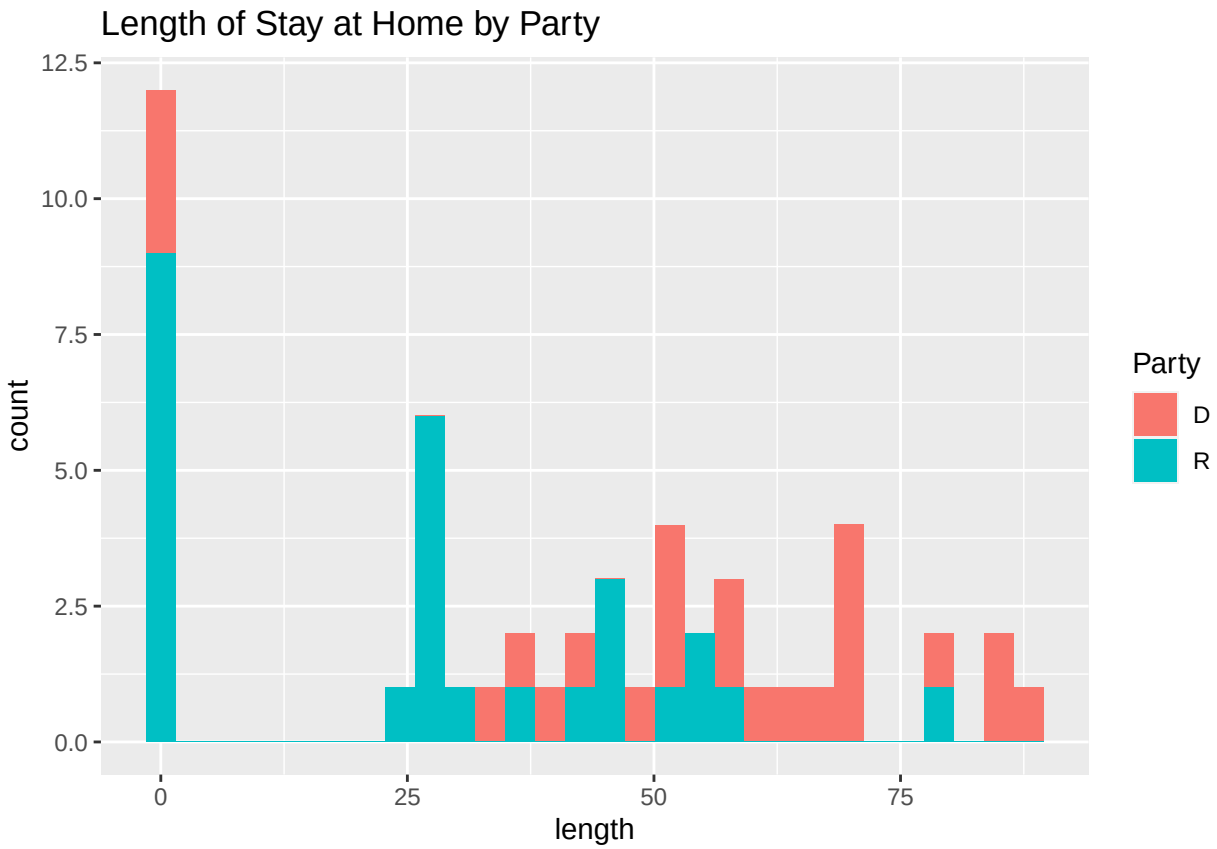
Model 1




```
##
## t test of coefficients:
##
##               Estimate Std. Error  t value  Pr(>|t|)
## (Intercept) -18.506979   1.779985 -10.3973 5.436e-14 ***
## length       -0.247330   0.040557  -6.0983 1.651e-07 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Model 2

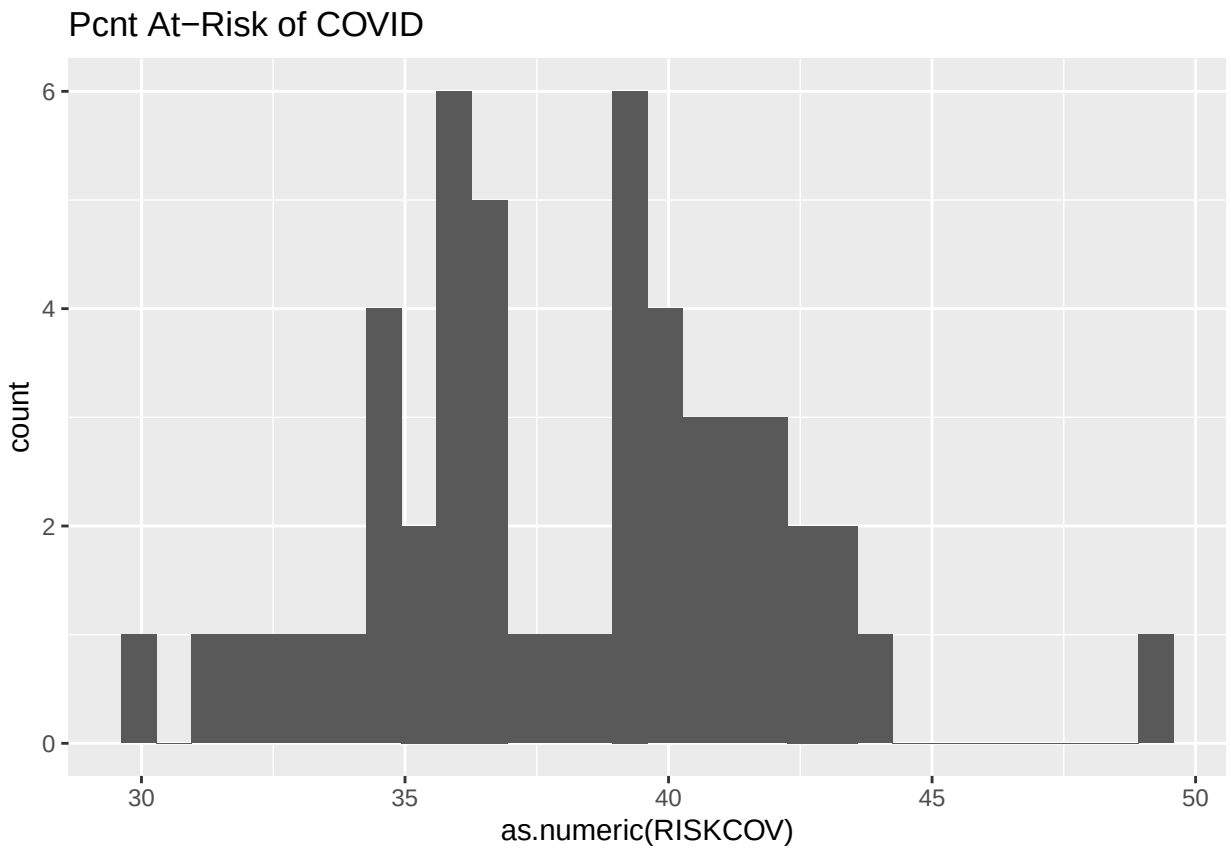

Cases per Thousand
count
new_case_per_thousand
0
2
4
6
8
0
5
10
15
20

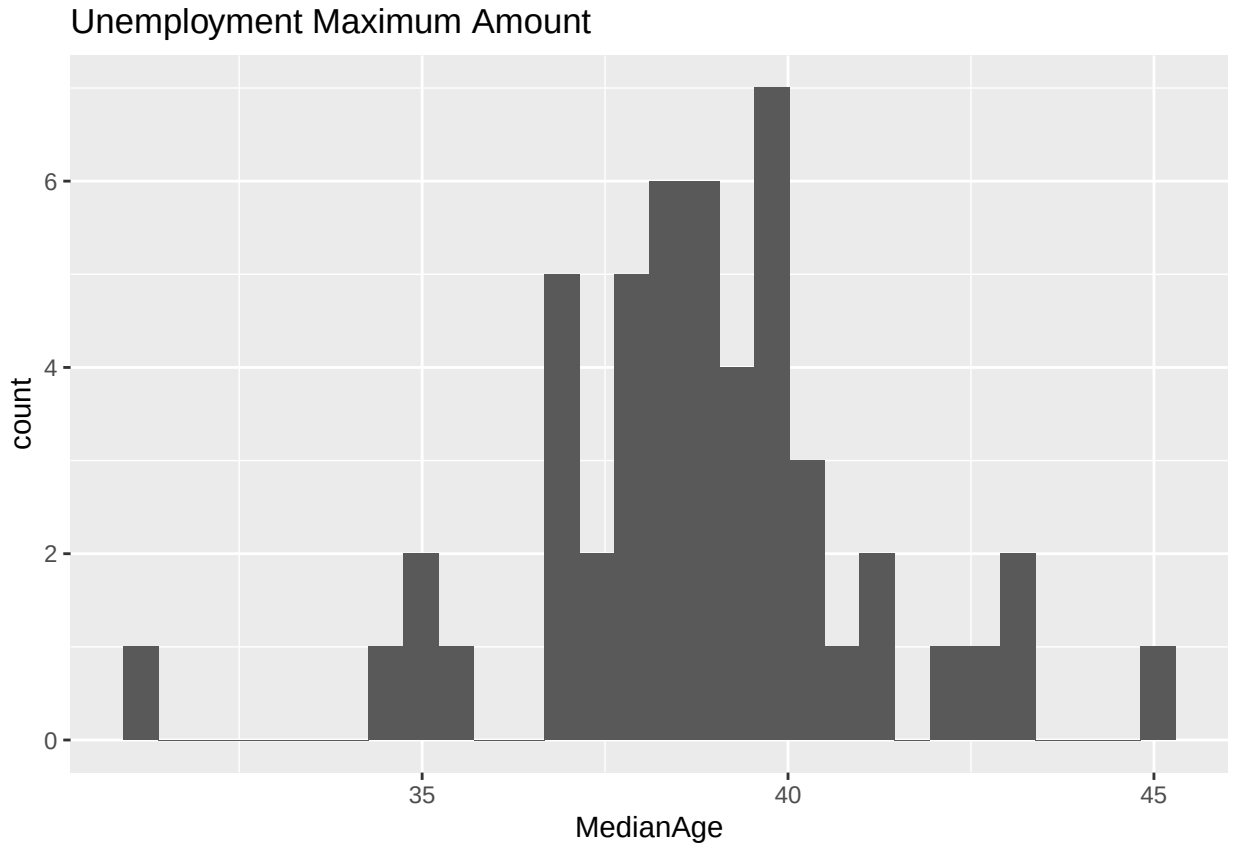



```
##
## t test of coefficients:
##
##                          Estimate Std. Error t value  Pr(>|t|)
## (Intercept)           -20.399821   2.242532 -9.0968 6.202e-12 ***
## length                 -0.172939   0.031091 -5.5623 1.229e-06 ***
## PartyR                  6.059614   1.871777  3.2374  0.002215 **
## new_case_per_thousand  -0.739753   0.297339 -2.4879  0.016453 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
## Analysis of Variance Table
##
## Model 1: y_var ~ length + Party + new_case_per_thousand
## Model 2: y_var ~ length
##   Res.Df    RSS Df Sum of Sq      F    Pr(>F)
## 1     47 1930.5
## 2     49 2899.9 -2   -969.39 11.801 7.034e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Model 3


Pcnt At−Risk of COVID
count
0
2
4
6
30
35
40
45
50
as.numeric(RISKCOV)




```
##
## t test of coefficients:
##
##                          Estimate Std. Error t value Pr(>|t|)
## (Intercept)           -30.397304  22.014331 -1.3808 0.174161
## length                 -0.163799   0.037297 -4.3918 6.75e-05 ***
## as.numeric(RISKCOV)     1.021803   0.314725  3.2467 0.002208 **
## MedianAge              -0.771860   0.724634 -1.0652 0.292480
## PartyR                  5.131007   1.999429  2.5662 0.013680 *
## new_case_per_thousand  -0.548516   0.299251 -1.8330 0.073429 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
## Analysis of Variance Table
##
## Model 1: y_var ~ length + as.numeric(RISKCOV) + MedianAge + Party + new_case_per_thousand
## Model 2: y_var ~ length + Party + new_case_per_thousand
##   Res.Df    RSS Df Sum of Sq      F   Pr(>F)
## 1     45 1556.3
## 2     47 1930.5 -2   -374.21 5.4102 0.007842 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Regression Table and Interpretation

4. Limitations

5. Discussion of Omitted Variables

6. Conclusion