ImpactDataViz 241 Final Project

```r
# load packages
library(data.table)
library(foreign)
library(sandwich)
library(stargazer)
```

```
##
## Please cite as:

##  Hlavac, Marek (2018). stargazer: Well-Formatted Regression and Summary Statistics Tables.

##  R package version 5.2.2. https://CRAN.R-project.org/package=stargazer
```

```r
library(lmtest)
```

```
## Loading required package: zoo

## Warning: package 'zoo' was built under R version 3.6.2

##
## Attaching package: 'zoo'

## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric
```

```r
library(tidyr)
```

```
## Warning: package 'tidyr' was built under R version 3.6.2
```

```r
library(knitr)
library('ggplot2')
library(fastDummies)
```

Common functions

```r
# function to return confidence intervals with bust se
get_confint_robust = function(model, vcovCL) {
  t<-qt(.975, model$df.residual)
  ct<-coeftest(model, vcovCL)
  est<-cbind(ct[,1], ct[,1]-t*ct[,2], ct[,1]+t*ct[,2], ct[,4])
  colnames(est)<-c("Estimate","LowerCI","UpperCI","pValue")
  return(est)
}

# parse out the regression results using robust standard errors
get_regression_results_robust_se = function(model, df, variable_names, showAsTibble) {
  model$vcovHC = vcovHC(model,type="HC1")

  robust_se_all    <- sqrt(diag(model$vcovHC))

  est = get_confint_robust(model,model$vcovHC)

  robust_se = c(rep(0, length(variable_names)))
  i = 1
  for (variable_name in variable_names) {
    robust_se_single <- sqrt(diag( model$vcovHC))[variable_name]
    robust_se[i] = robust_se_single
    i = i + 1
  }

  coef = est[variable_names, 'Estimate']
  ci_lower_robust = est[variable_names, 'LowerCI']
  ci_lower_robust = est[variable_names, 'LowerCI']
  ci_upper_robust = est[variable_names, 'UpperCI']
  p_value = est[variable_names, 'pValue']
  results = data.table(id = variable_names)
  results[, coef := round(coef,4)]
  results[, ci_lower := round(ci_lower_robust,4)]
  results[, ci_upper := round(ci_upper_robust,4)]
  results[, p_value := signif(p_value, 5)]
  results[, robust_se := round(robust_se,4)]

  if (showAsTibble) {
    print(as_tibble(results))
  }
  return( list('estimates'=results, 'robust_se_all'=robust_se_all))
}
# Multiple plot function
#
# ggplot objects can be passed in ..., or to plotlist (as a list of ggplot objects)
# - cols:   Number of columns in layout
# - layout: A matrix specifying the layout. If present, 'cols' is ignored.
#
# If the layout is something like matrix(c(1,2,3,3), nrow=2, byrow=TRUE),
# then plot 1 will go in the upper left, 2 will go in the upper right, and
# 3 will go all the way across the bottom.
#
multiplot <- function(..., plotlist=NULL, file, cols=1, layout=NULL) {
```

```r
  library(grid)

  # Make a list from the ... arguments and plotlist
  plots <- c(list(...), plotlist)

  numPlots = length(plots)

  # If layout is NULL, then use 'cols' to determine layout
  if (is.null(layout)) {
    # Make the panel
    # ncol: Number of columns of plots
    # nrow: Number of rows needed, calculated from # of cols
    layout <- matrix(seq(1, cols * ceiling(numPlots/cols)),
                     ncol = cols, nrow = ceiling(numPlots/cols))
  }

 if (numPlots==1) {
    print(plots[[1]])

  } else {
    # Set up the page
    grid.newpage()
    pushViewport(viewport(layout = grid.layout(nrow(layout), ncol(layout))))

    # Make each plot, in the correct location
    for (i in 1:numPlots) {
      # Get the i,j matrix positions of the regions that contain this subplot
      matchidx <- as.data.frame(which(layout == i, arr.ind = TRUE))

      print(plots[[i]], vp = viewport(layout.pos.row = matchidx$row,
                                      layout.pos.col = matchidx$col))
    }
  }
}
```

1. Parse the survey data into a data.table

```r
parse_survey_data = function(filename, treatment_only=FALSE) {
  cat(filename, "\n")
  raw <- fread(filename)

  # covariates
  setnames(raw, 'Q3', 'state')
  setnames(raw, 'Q4', 'gender')
  setnames(raw, 'Q5', 'age')
  setnames(raw, 'Q6', 'ethnicity_multi')
  setnames(raw, 'Q7', 'political_party')
  setnames(raw, 'Q8', 'education')
  setnames(raw, 'Q9', 'covid_sick')
  setnames(raw, 'Q10', 'covid_hospitalized')
  setnames(raw, 'Q11', 'covid_died')
```

```r
  # duration of survey time
  setnames(raw, 'Duration (in seconds)', 'duration_of_survey')

  # which block was active? (did the user see the treatment or
  # control data viz)
  setnames(raw, 'Q15', 'treatment_viz_is_accurate')
  if (!treatment_only) {
    setnames(raw, 'Q17', 'control_viz_is_accurate')
  }

  # outcome questions about COVID attitudes
  setnames(raw, 'Q18', 'outcome_spread')
  setnames(raw, 'Q19', 'outcome_death')

  # which block was active determines if
  # subject received treatment data viz or control
  # data viz
  cat(" number of responses", nrow(raw), '\n')
  raw[, treatment := ifelse(is.na(treatment_viz_is_accurate), 0, 1)]
  cleaned = raw[!is.na(outcome_spread) & !is.na(outcome_death),]
  cat(" number of responses after dropping na", nrow(cleaned), '\n')

  # ethnicity allows for multiple choice
  # for covariates, just grab the first one
  ethnicity_single = rep(0,nrow(cleaned))
  i = 1
  for (eth_entry in cleaned[,ethnicity_multi]) {
    eth_tokens = unlist(strsplit(eth_entry, ","))
    ethnicity_single[i] = as.numeric(eth_tokens[1])
    i = i + 1
  }
  cleaned[, ethnicity := ethnicity_single ]

  # counts in control vs treatment
  n_control = nrow(cleaned[treatment == 0, ])
  n_treatment = nrow(cleaned[treatment == 1, ])

  cat(" number in treatment", n_treatment, "\n")
  cat(" number in control", n_control, "\n\n")

  return(cleaned)
}
```

```r
# A large run of 260 subjects run on 7/21
run1 <- parse_survey_data("data/run1.2020.07.21.csv")
```

```
## data/run1.2020.07.21.csv
##  number of responses 265
##  number of responses after dropping na 259
##  number in treatment 131
##  number in control 128
```

```r
run1 = run1[, run := 0]
run1[, condition := treatment]


# One small run was done in evening 7/24 treatment only
run2_small <- parse_survey_data("data/run2.small.2020.07.24.csv", TRUE)
```

```
## data/run2.small.2020.07.24.csv
##  number of responses 33
##  number of responses after dropping na 30
##  number in treatment 30
##  number in control 0
```

```r
run2_small[, run := 1]
run2_small[, condition := treatment]
run2_small[, control_viz_is_accurate := ""]

# A large run of 270 run on 7/25 treatment and control
run2_large <- parse_survey_data("data/run2.2020.07.25.csv")
```

```
## data/run2.2020.07.25.csv
##  number of responses 270
##  number of responses after dropping na 262
##  number in treatment 130
##  number in control 132
```

```r
run2_large = run2_large[, run :=1]
run2_large[, condition := treatment]
run2 = rbind(run2_small, run2_large)


# Combine the runs on 7/21 and 7/25
combined = rbind(run1, run2)
```

2. EDA

2.1 Check Duration of Survey

```r
show_duration = function(d) {
  cat('duration for control  ', mean(d[condition == 0,duration_of_survey]), '\n')
  cat('duration for treatment', mean(d[condition == 1,duration_of_survey]), '\n\n')
}
show_duration(run1)
```

```
## duration for control   153.1875
## duration for treatment 172.2061
```

```
show_duration(run2)
```

```
## duration for control   136.7955
## duration for treatment 205.5813
```

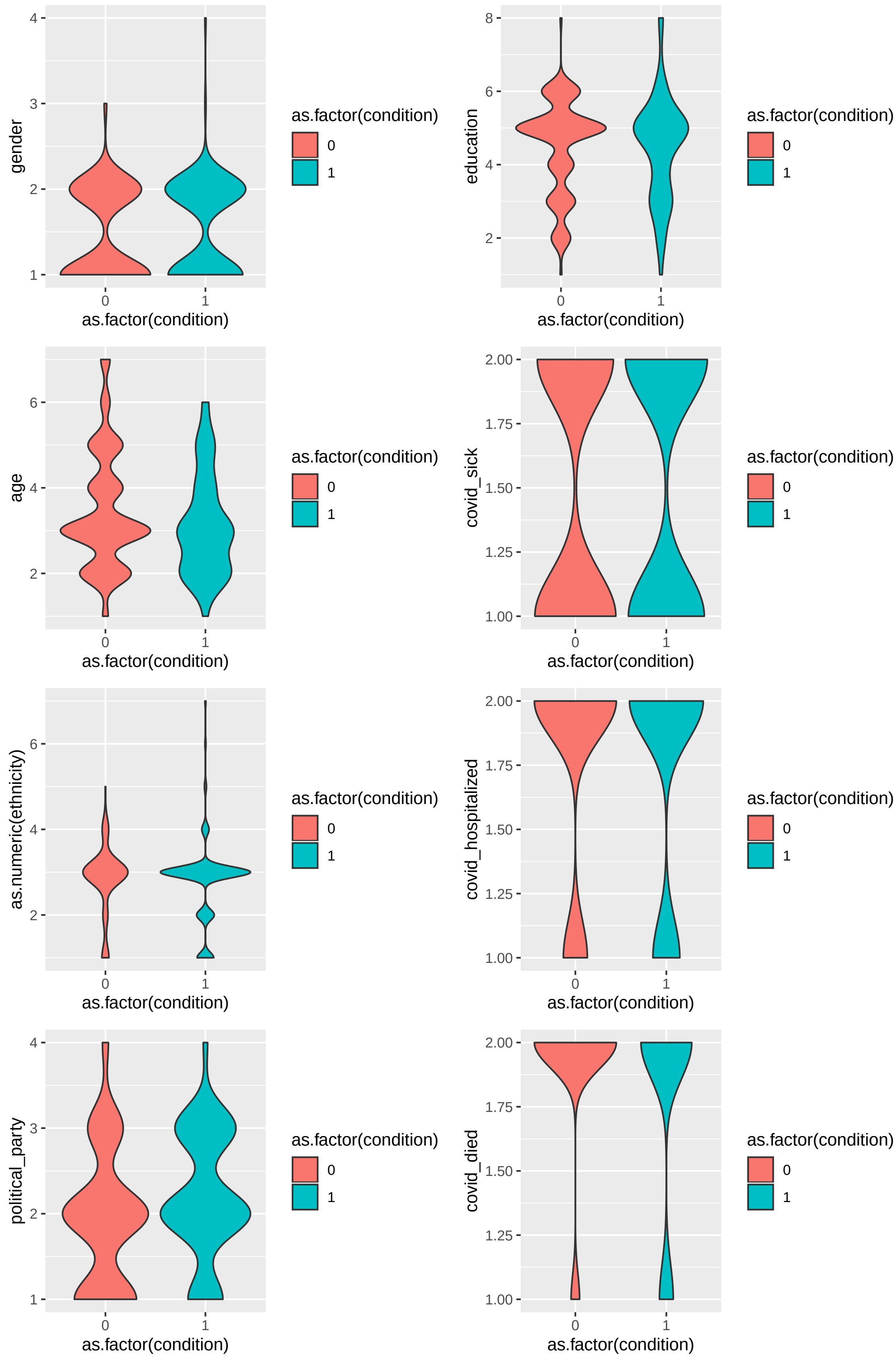
```
show_duration(combined)
```

```
## duration for control   144.8654
## duration for treatment 190.5567
```

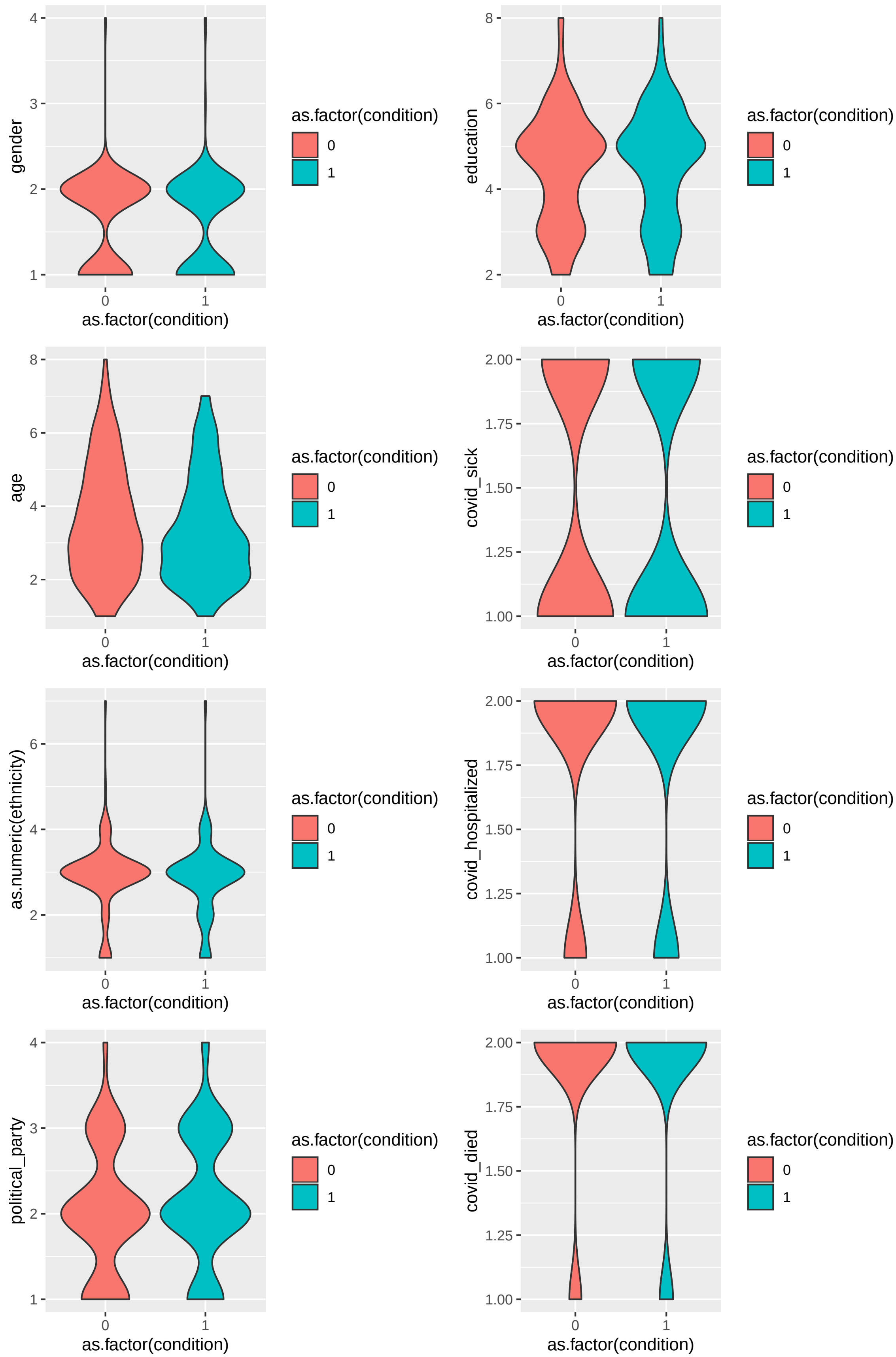
3. Covariate balance

3.1 Compare distributions using violin plote

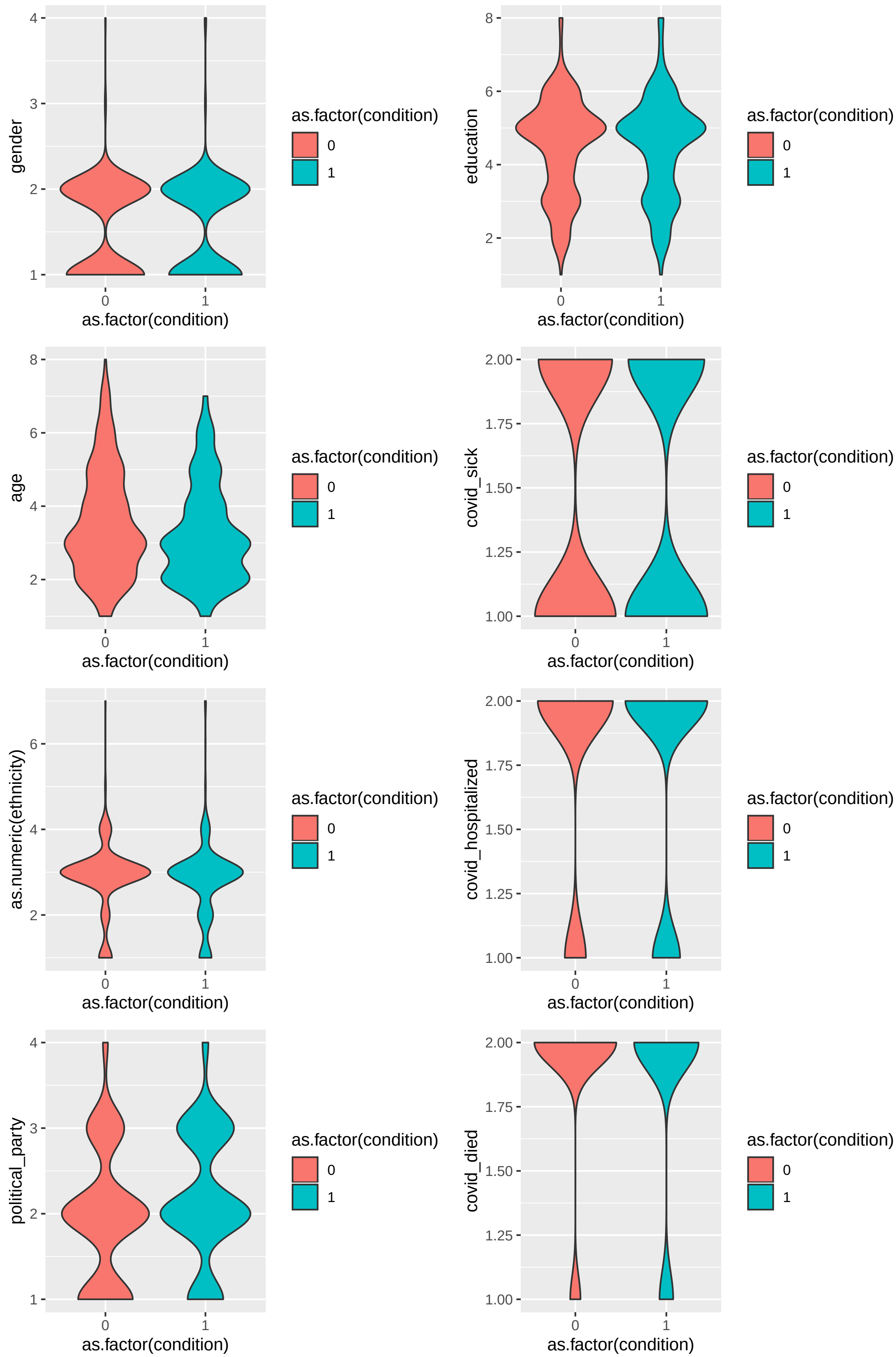
```
check_covariate_balance = function(d) {
  options(repr.plot.width = 14, repr.plot.height = 8)

  p1 = ggplot(d, aes(x=as.factor(condition), y=gender, fill=as.factor(condition))) +
    geom_violin()

  p2 = ggplot(d, aes(x=as.factor(condition), y=age, fill=as.factor(condition))) +
    geom_violin()

  p3 = ggplot(d, aes(x=as.factor(condition), y=as.numeric(ethnicity),  fill=as.factor(condition))) +
    geom_violin()

  p4 = ggplot(d, aes(x=as.factor(condition), y=political_party,  fill=as.factor(condition))) +
    geom_violin()

  p5 = ggplot(d, aes(x=as.factor(condition), y=education,  fill=as.factor(condition))) +
    geom_violin()

  p6 = ggplot(d, aes(x=as.factor(condition), y=covid_sick,  fill=as.factor(condition))) +
    geom_violin()

  p7 = ggplot(d, aes(x=as.factor(condition), y=covid_hospitalized,  fill=as.factor(condition))) +
    geom_violin()

  p8 = ggplot(d, aes(x=as.factor(condition), y=covid_died, fill=as.factor(condition))) +
    geom_violin()

  multiplot(p1, p2, p3, p4, p5, p6, p7, p8, cols=2)
}
check_covariate_balance(run1)
```


gender
education
age
covid_sick
as.numeric(ethnicity)
covid_hospitalized
political_party
covid_died
as.factor(condition)
0
1

```r
check_covariate_balance(run2)
```


gender
education
age
covid_sick
as.numeric(ethnicity)
covid_hospitalized
political_party
covid_died
as.factor(condition)
0
1

```
check_covariate_balance(combined)
```


gender
as.factor(condition)
0
1
education
age
covid_sick
as.numeric(ethnicity)
covid_hospitalized
political_party
covid_died

4. Estimate ATE

4.1 Estimate the ATE for both outcomes

```
estimate_ate = function(d, outcome_field) {
  g <- d[ , .(group_mean = mean(get(outcome_field))), keyby = .(condition)]


  ate <- g[ , diff(group_mean)]

  res <- NA
  for (i in 1:10000) {
      res[i] <- d[ , .(group_mean = mean(get(outcome_field))), keyby = .(sample(condition))][ , diff(gr
  }
  dist_sharp_null <- res
  #hist(dist_sharp_null)
  #abline(v=ate, lwd=3, col='blue')
  #abline(v=abs(ate), lwd=3, col='blue')
  p_value_one_tailed <- mean(dist_sharp_null >= ate)
  p_value_two_tailed <- mean(abs(dist_sharp_null) >= abs(ate))


  cat(outcome_field, '\n')
  cat(' mean control    ', g[condition == '0', group_mean], '\n')
  cat(' mean treatement ', g[condition == '1', group_mean], '\n')
  cat(' ATE             ', ate, '\n')
  cat(' p_value 1-tailed', p_value_one_tailed, '\n')
  cat(' p_value 2-tailed', p_value_two_tailed, '\n\n')
}

cat('run1', '\n')
```

```
## run1
```

```
cat('*******************', '\n')
```

```
## *******************
```

```
estimate_ate(run1, 'outcome_spread')
```

```
## outcome_spread
##  mean control     3.132812
##  mean treatement  3.473282
##  ATE              0.3404699
##  p_value 1-tailed 0.0011
##  p_value 2-tailed 0.0017
```

```
estimate_ate(run1, 'outcome_death')
```

```
## outcome_death
```

```
##  mean control     2.398438
##  mean treatement  2.656489
##  ATE              0.258051
##  p_value 1-tailed 0.0016
##  p_value 2-tailed 0.0022
```

```
cat('run2', '\n')
```

```
## run2
```

```
cat('********************', '\n')
```

```
## ********************
```

```
estimate_ate(run2, 'outcome_spread')
```

```
## outcome_spread
##  mean control     3.151515
##  mean treatement  3.30625
##  ATE              0.1547348
##  p_value 1-tailed 0.0851
##  p_value 2-tailed 0.1597
```

```
estimate_ate(run2, 'outcome_death')
```

```
## outcome_death
##  mean control     2.5
##  mean treatement  2.60625
##  ATE              0.10625
##  p_value 1-tailed 0.1081
##  p_value 2-tailed 0.1988
```

```
cat('combined', '\n')
```

```
## combined
```

```
cat('********************', '\n')
```

```
## ********************
```

```
estimate_ate(combined, 'outcome_spread')
```

```
## outcome_spread
##  mean control     3.142308
##  mean treatement  3.381443
##  ATE              0.2391356
##  p_value 1-tailed 7e-04
##  p_value 2-tailed 0.0025
```

```r
estimate_ate(combined, 'outcome_death')
```

```
## outcome_death
##   mean control     2.45
##   mean treatement  2.628866
##   ATE              0.178866
##   p_value 1-tailed 0.0013
##   p_value 2-tailed 0.0019
```

5. Linear Regression

5.1 Perform linear regression the two outcomens (concern about COVID-19 spread, concern about COVID-19 deaths)

```r
run_regression_outcome1 = function(d, control_for_run=FALSE) {
  model_spread = lm(outcome_spread ~ condition, d)
  if (control_for_run) {
    model_spread_adv = lm(outcome_spread ~ condition
                       + run
                       + as.factor(gender)
                       + as.factor(age)
                       + as.factor(ethnicity)
                       + as.factor(political_party)
                       + as.factor(education)
                       + as.factor(covid_sick)
                       + as.factor(covid_hospitalized)
                       + as.factor(covid_died), d)

  } else {
    model_spread_adv = lm(outcome_spread ~ condition
                       + as.factor(gender)
                       + as.factor(age)
                       + as.factor(ethnicity)
                       + as.factor(political_party)
                       + as.factor(education)
                       + as.factor(covid_sick)
                       + as.factor(covid_hospitalized)
                       + as.factor(covid_died), d)

  }
  est_spread     = get_regression_results_robust_se(model_spread,  d, c('condition'), FALSE)
  est_spread_adv = get_regression_results_robust_se(model_spread_adv, d, c('condition'), FALSE)
  return ( list('model'= model_spread,
                'model_adv'=model_spread_adv,
                'est'=est_spread,
                'est_adv'=est_spread_adv))
}



run_regression_outcome2 = function(d, control_for_run) {
```

```r
  model_spread = lm(outcome_spread ~ condition, d)
  if (control_for_run) {
    model_spread_adv = lm(outcome_death ~ condition
                         + run
                         + as.factor(gender)
                         + as.factor(age)
                         + as.factor(ethnicity)
                         + as.factor(political_party)
                         + as.factor(education)
                         + as.factor(covid_sick)
                         + as.factor(covid_hospitalized)
                         + as.factor(covid_died), d)

  } else {
    model_spread_adv = lm(outcome_death ~ condition
                         + as.factor(gender)
                         + as.factor(age)
                         + as.factor(ethnicity)
                         + as.factor(political_party)
                         + as.factor(education)
                         + as.factor(covid_sick)
                         + as.factor(covid_hospitalized)
                         + as.factor(covid_died), d)

  }
  est_spread     = get_regression_results_robust_se(model_spread,  d, c('condition'), FALSE)
  est_spread_adv = get_regression_results_robust_se(model_spread_adv, d, c('condition'), FALSE)
  return ( list('model'= model_spread,
                'model_adv'=model_spread_adv,
                'est'=est_spread,
                'est_adv'=est_spread_adv))
}
```

```r
regression_labels_run = c('Treatment',
      'Run',
      'Female', 'Non-binary', 'Gender not answered',
      '20-29', '30-39', '40-49', '50-59', '60-69', '70-79',
      'Black/African American', 'Caucasian', 'Hispanic/Latinx',
        'Native American', 'Pacific Islander', 'Ethnicity not answered',
      'Democrat', 'Independent', 'Party other',
      'High school', 'Some college', 'Associates', 'Bachelors', 'Masters', 'Doctoral', 'JD/MD',
      'Sick from COVID-19',
      'Hospitalized from COVID-19',
      'Died COVID-19')



mi_spread_run1 = run_regression_outcome1(run1, TRUE)
mi_spread_run2 = run_regression_outcome1(run2, TRUE)
mi_spread_combined_run = run_regression_outcome1(combined, TRUE)


stargazer(mi_spread_run1$model, mi_spread_run1$model_adv,
```

```r
        mi_spread_run2$model_adv,
        mi_spread_combined_run$model_adv,
        type="text",  report="vcsp*",
        se = list(mi_spread_run1$est$robust_se_all, mi_spread_run1$est_adv$robust_se_all,
                  mi_spread_run2$est_adv$robust_se_all,
                  mi_spread_combined_run$est_adv$robust_se_all),
        title=paste('Response to COVID-19 Spread'),
        dep.var.caption  = "Response to COVID-19 Spread",
        dep.var.labels.include = FALSE, model.numbers=FALSE,
        column.labels = c("July 21, 2020", "July 21, 2020", "July 25, 2020", "Both dates"),
        align=TRUE,
        covariate.labels = regression_labels_run)
```

```
##
## Response to COVID-19 Spread
## ==========================================================================================
##                                                  Response to COVID-19 Spread
##                               -----------------------------------------------------------
##                                    July 21, 2020          July 21, 2020          July 25, 2020
## ------------------------------------------------------------------------------------------
## Treatment                              0.340                  0.339                  0.172
##                                       (0.107)                (0.106)                (0.095)
##                                    p = 0.002***           p = 0.002***           p = 0.071*
##
## Run
##
##
##
## Female                                                       -0.063                  0.187
##                                                              (0.105)                (0.107)
##                                                            p = 0.550              p = 0.081*
##
## Non-binary                                                    0.886                  1.742
##                                                              (0.420)                (0.409)
##                                                           p = 0.035**          p = 0.00003***
##
## Gender not answered                                           0.646                  0.629
##                                                              (0.192)                (0.292)
##                                                           p = 0.001***           p = 0.032**
##
## 20-29                                                         0.323                 -0.454
##                                                              (0.380)                (0.234)
##                                                            p = 0.395              p = 0.053*
##
## 30-39                                                         0.295                 -0.209
##                                                              (0.381)                (0.264)
##                                                            p = 0.440               p = 0.428
##
## 40-49                                                         0.181                 -0.460
##                                                              (0.402)                (0.272)
##                                                            p = 0.654              p = 0.092*
##
## 50-59                                                         0.370                 -0.246
```

```
##                                             (0.412)          (0.255)
##                                            p = 0.370        p = 0.337
##
## 60-69                                       0.393            0.096
##                                             (0.441)          (0.267)
##                                            p = 0.373        p = 0.720
##
## 70-79                                       1.156           -0.458
##                                             (0.437)          (0.336)
##                                          p = 0.009***       p = 0.174
##
## Black/African American                                       1.121
##                                                              (0.463)
##                                                            p = 0.016**
##
## Caucasian                                   0.195           -0.100
##                                             (0.201)          (0.217)
##                                            p = 0.333        p = 0.644
##
## Hispanic/Latinx                            -0.087            0.060
##                                             (0.165)          (0.187)
##                                            p = 0.597        p = 0.750
##
## Native American                             0.230            0.184
##                                             (0.205)          (0.252)
##                                            p = 0.264        p = 0.466
##
## Pacific Islander                           -0.471            0.482
##                                             (0.513)          (0.316)
##                                            p = 0.359        p = 0.127
##
## Ethnicity not answered                     -2.519
##                                             (0.232)
##                                          p = 0.000***
##
## Democrat                                    0.715           -0.121
##                                             (0.304)          (0.585)
##                                           p = 0.019**       p = 0.837
##
## Independent                                 0.675            1.118
##                                             (0.141)          (0.134)
##                                         p = 0.00001***     p = 0.000***
##
## Party other                                 0.357            0.602
##                                             (0.171)          (0.162)
##                                           p = 0.037**      p = 0.0003***
##
## High school                                -0.222           -0.318
##                                             (0.370)          (0.376)
##                                            p = 0.550        p = 0.398
##
## Some college                               -0.050
##                                             (0.800)
##                                            p = 0.950
```

```
##
## Associates                                               0.194                  0.135
##                                                         (0.791)                (0.191)
##                                                       p = 0.806              p = 0.480
##
## Bachelors                                                0.017                 -0.020
##                                                         (0.795)                (0.207)
##                                                       p = 0.983              p = 0.925
##
## Masters                                                  0.188                  0.125
##                                                         (0.781)                (0.174)
##                                                       p = 0.810              p = 0.473
##
## Doctoral                                                 0.337                  0.223
##                                                         (0.786)                (0.195)
##                                                       p = 0.669              p = 0.253
##
## JD/MD                                                   -0.166                  0.029
##                                                         (0.780)                (0.337)
##                                                       p = 0.832              p = 0.931
##
## Sick from COVID-19                                       0.502                  0.842
##                                                         (0.778)                (0.339)
##                                                       p = 0.519             p = 0.013**
##
## Hospitalized from COVID-19                              -0.200                 -0.162
##                                                         (0.119)                (0.117)
##                                                      p = 0.093*              p = 0.167
##
## Died COVID-19                                           -0.166                 -0.056
##                                                         (0.165)                (0.161)
##                                                       p = 0.313              p = 0.726
##
## as.factor(covid_died)2                                   0.092                 -0.110
##                                                         (0.158)                (0.157)
##                                                       p = 0.563              p = 0.483
##
## Constant                          3.133                  2.450                  2.660
##                                  (0.085)                (0.896)                (0.321)
##                              p = 0.000***           p = 0.007***           p = 0.000***
##
## -----------------------------------------------------------------------------------------
## Observations                       259                    259                    292
## R2                                0.038                  0.314                  0.351
## Adjusted R2                       0.034                  0.227                  0.282
## Residual Std. Error         0.858 (df = 257)       0.768 (df = 229)       0.796 (df = 263)
## F Statistic             10.183*** (df = 1; 257) 3.614*** (df = 29; 229) 5.084*** (df = 28; 263) 7
## =========================================================================================
## Note:                                                                              *p<0.
```

```
mi_death_run1 = run_regression_outcome2(run1, TRUE)
mi_death_run2 = run_regression_outcome2(run2, TRUE)
mi_death_combined_run = run_regression_outcome2(combined, TRUE)
```

```r
stargazer(mi_death_run1$model, mi_death_run1$model_adv,
          mi_death_run2$model_adv,
          mi_death_combined_run$model_adv,
          type="text",  report="vcsp*",
          se = list(mi_death_run1$est$robust_se_all, mi_death_run1$est_adv$robust_se_all,
                    mi_death_run2$est_adv$robust_se_all,
                    mi_death_combined_run$est_adv$robust_se_all),
          title=paste('Response to COVID-19 Death'),
          dep.var.caption  = "Response to COVID-19 Death",
          dep.var.labels.include = FALSE, model.numbers=FALSE,
          column.labels = c("July 21, 2020", "July 21, 2020", "July 25, 2020", "Both dates"),
          align=TRUE,
          covariate.labels = regression_labels_run)
```

```
##
## Response to COVID-19 Death
## ===========================================================================================
##                                                            Response to COVID-19 Death
##                            ----------------------------------------------------------------
##                                 July 21, 2020          July 21, 2020          July 25, 2020
## -------------------------------------------------------------------------------------------
## Treatment                           0.340                  0.250                  0.109
##                                    (0.107)                (0.090)                (0.072)
##                                 p = 0.002***           p = 0.006***            p = 0.134
##
## Run
##
##
##
## Female                                                     0.050                  0.082
##                                                           (0.085)                (0.079)
##                                                         p = 0.554              p = 0.303
##
## Non-binary                                                 0.573                  0.899
##                                                           (0.308)                (0.308)
##                                                        p = 0.063*            p = 0.004***
##
## Gender not answered                                        0.437                  0.454
##                                                           (0.159)                (0.207)
##                                                       p = 0.007***            p = 0.029**
##
## 20-29                                                     -0.371                 -0.083
##                                                           (0.191)                (0.175)
##                                                        p = 0.052*              p = 0.638
##
## 30-39                                                     -0.323                  0.071
##                                                           (0.186)                (0.190)
##                                                        p = 0.084*              p = 0.711
##
## 40-49                                                     -0.345                  0.142
##                                                           (0.209)                (0.195)
##                                                        p = 0.099*              p = 0.468
##
```

```
## 50-59                                    -0.258            0.153
##                                          (0.211)          (0.195)
##                                         p = 0.221        p = 0.433
##
## 60-69                                    -0.279            0.370
##                                          (0.260)          (0.213)
##                                         p = 0.284       p = 0.082*
##
## 70-79                                     0.170           -0.288
##                                          (0.254)          (0.295)
##                                         p = 0.503        p = 0.329
##
## Black/African American                                     0.873
##                                                           (0.256)
##                                                        p = 0.001***
##
## Caucasian                                 0.041           -0.022
##                                          (0.168)          (0.147)
##                                         p = 0.809        p = 0.883
##
## Hispanic/Latinx                          -0.103           -0.016
##                                          (0.134)          (0.118)
##                                         p = 0.442        p = 0.893
##
## Native American                          -0.019            0.193
##                                          (0.212)          (0.160)
##                                         p = 0.929        p = 0.227
##
## Pacific Islander                         -0.261           -0.020
##                                          (0.289)          (0.218)
##                                         p = 0.367        p = 0.927
##
## Ethnicity not answered                   -1.667
##                                          (0.176)
##                                       p = 0.000***
##
## Democrat                                  0.374           -0.169
##                                          (0.239)          (0.291)
##                                         p = 0.119        p = 0.561
##
## Independent                               0.543            0.811
##                                          (0.117)          (0.108)
##                                      p = 0.00001***    p = 0.000***
##
## Party other                               0.340            0.414
##                                          (0.134)          (0.132)
##                                        p = 0.012**     p = 0.002***
##
## High school                              -0.107            0.141
##                                          (0.302)          (0.291)
##                                         p = 0.724        p = 0.629
##
## Some college                              0.233
##                                          (0.530)
```

```
##                                                   p = 0.660
##
## Associates                                         0.216                0.040
##                                                   (0.516)              (0.137)
##                                                   p = 0.676            p = 0.773
##
## Bachelors                                          0.135               -0.095
##                                                   (0.524)              (0.166)
##                                                   p = 0.797            p = 0.569
##
## Masters                                            0.088               -0.071
##                                                   (0.512)              (0.133)
##                                                   p = 0.864            p = 0.594
##
## Doctoral                                           0.263               -0.036
##                                                   (0.517)              (0.142)
##                                                   p = 0.612            p = 0.802
##
## JD/MD                                             -0.475                0.041
##                                                   (0.512)              (0.141)
##                                                   p = 0.354            p = 0.773
##
## Sick from COVID-19                                 0.290                0.469
##                                                   (0.513)              (0.239)
##                                                   p = 0.572           p = 0.051*
##
## Hospitalized from COVID-19                        -0.102               -0.097
##                                                   (0.098)              (0.084)
##                                                   p = 0.298            p = 0.246
##
## Died COVID-19                                     -0.084                0.003
##                                                   (0.125)              (0.116)
##                                                   p = 0.500            p = 0.978
##
## as.factor(covid_died)2                             0.067               -0.090
##                                                   (0.128)              (0.118)
##                                                   p = 0.603            p = 0.444
##
## Constant                        3.133               2.327                2.017
##                                (0.085)             (0.570)              (0.239)
##                             p = 0.000***        p = 0.00005***       p = 0.000***
##
## ------------------------------------------------------------------------------------------
## Observations                     259                 259                  292
## R2                              0.038               0.252                0.325
## Adjusted R2                     0.034               0.157                0.254
## Residual Std. Error        0.858 (df = 257)    0.628 (df = 229)     0.591 (df = 263)
## F Statistic             10.183*** (df = 1; 257) 2.657*** (df = 29; 229) 4.533*** (df = 28; 263) 5
## ==========================================================================================
## Note:                                                                                 *p<0.
```