ImpactDataViz 241 Final Project

```
# 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
```

```
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
```

```
library(tidyr)
```

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

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

Common functions

```
# 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) {
```

```
  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

```
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')
```

```
  # 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)
}
```

```
# 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
```

```
run1 = run1[, run := 0]
run1_control = run1[treatment == 0, ]
run1_treatment = run1[treatment == 1, ]
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
```

```
run2_small[, run := 2]
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
```

```
run2_large = run2_large[, run :=2]
run2 = rbind(run2_small, run2_large)
run2[, condition := treatment]


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

2. EDA

2.1 Check Duration of Survey

```
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
```

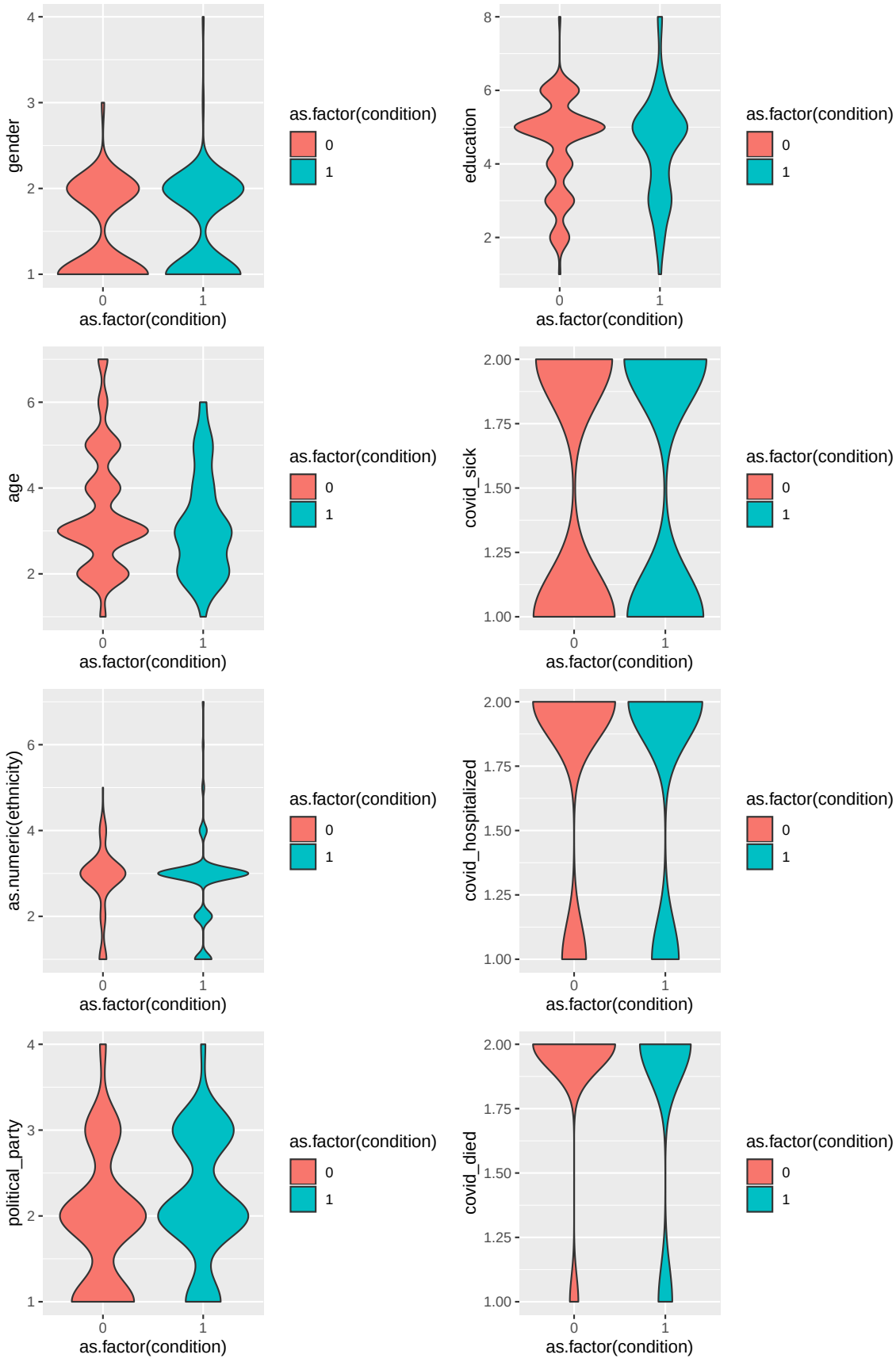
```
show_duration(combined)
```

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

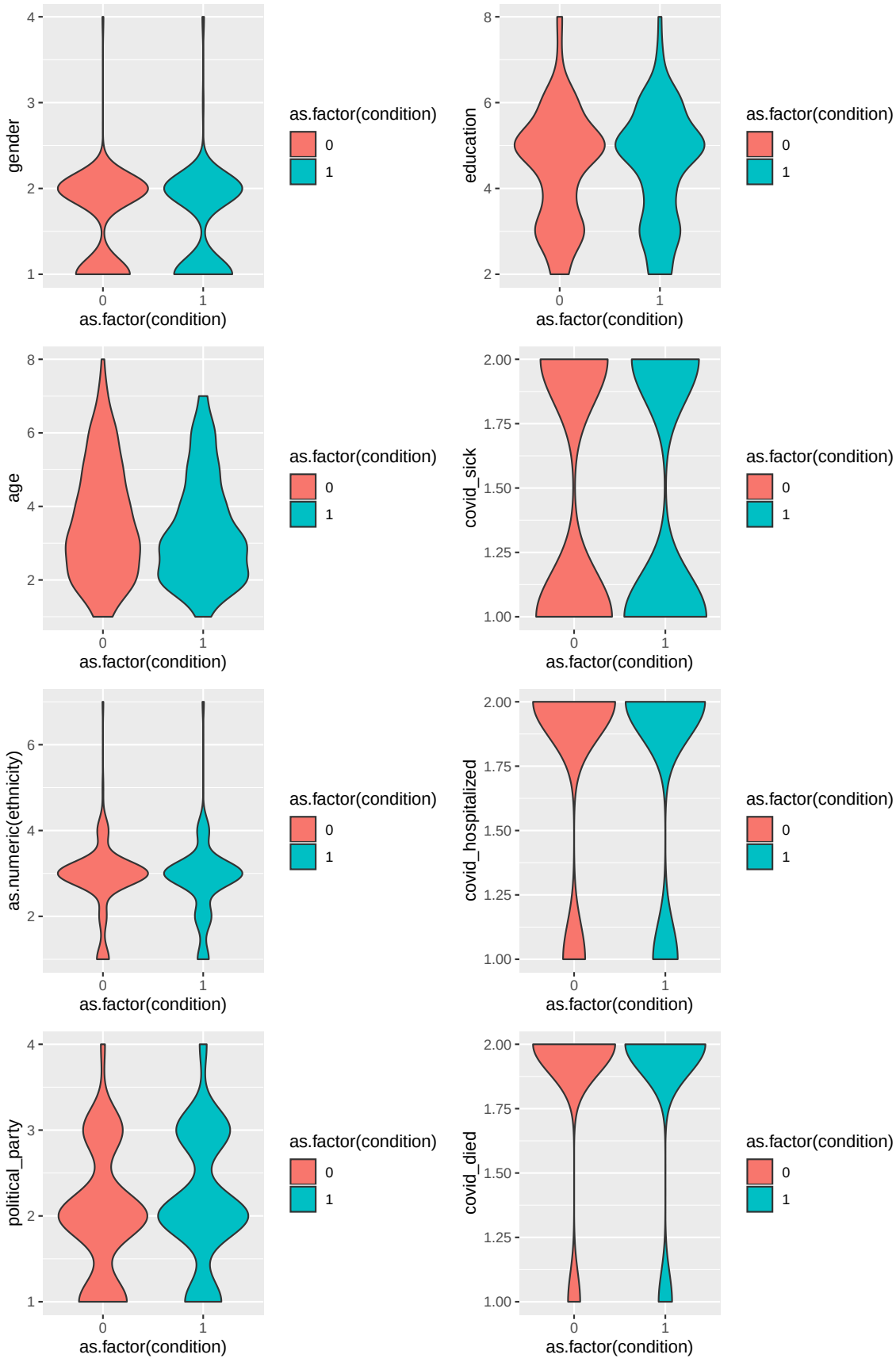
3. Covariate balance

3.1 Compare distributions using violin plote

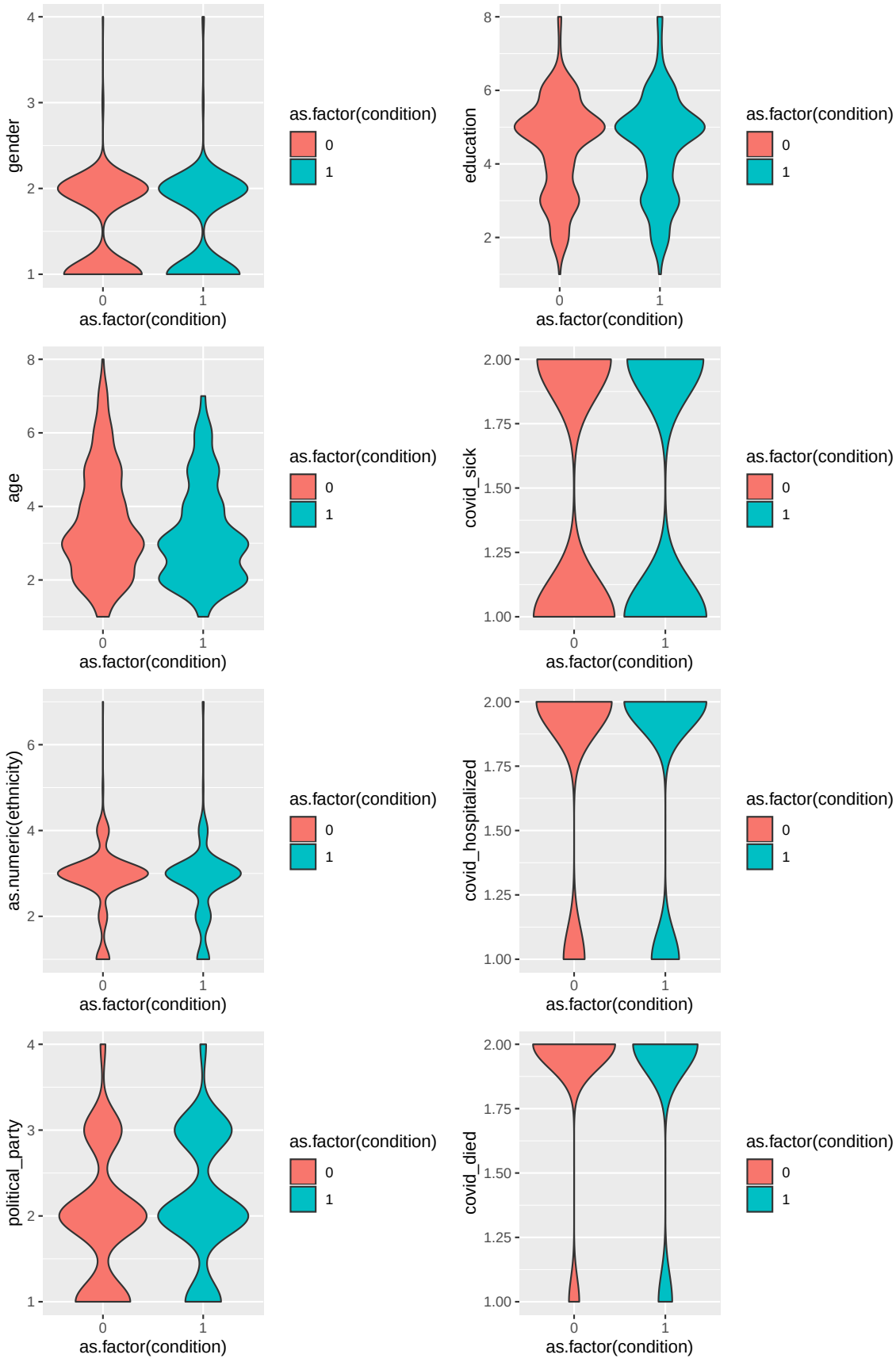
```
check_covariate_balance = function(d) {
  options(repr.plot.width = 14, repr.plot.height = 8)

  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

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

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 5e-04
##  p_value 2-tailed 0.001
```

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

```
## outcome_death
```

```
##  mean control     2.398438
##  mean treatement  2.656489
##  ATE              0.258051
##  p_value 1-tailed 0.0015
##  p_value 2-tailed 0.0027
```

```
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 0.0894
##  p_value 2-tailed 0.1657
```

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

```
## outcome_death
##  mean control     2.5
##  mean treatement  2.60625
##  ATE              0.10625
##  p_value 1-tailed 0.1091
##  p_value 2-tailed 0.2021
```

```
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 8e-04
##  p_value 2-tailed 0.0018
```

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

```
## outcome_death
##  mean control     2.45
##  mean treatement  2.628866
##  ATE              0.178866
##  p_value 1-tailed 0.0018
##  p_value 2-tailed 0.0023
```

5. Linear Regression

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

```
regression_labels = c('Treatment',
      'Female', 'Non-binary', 'Gender not answered',
      '20-29', '30-39', '40-49', '50-59', '60-69', '70-79',
      'Black/African American', 'Caucasian', 'Hispanic/Latinx',
        'American Indian or Alaskan Native', 'Pacific Islander', 'Ethnicity not answered',
      'Democrat', 'Independent', 'Political-party-other',
      'High school', 'Some college', 'Associates', 'Bachelors', 'Masters', 'Doctoral', 'Professional (JD
      'Know someone sick from COVID-19',
      'Know someone hospitalized from COVID-19',
      'Know someone who died COVID-19')

run_regression_outcome1 = function(d) {
  model_spread = lm(outcome_spread ~ condition, d)
  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))
}
mi1 = run_regression_outcome1(run1)
mi2 = run_regression_outcome1(run2)
mi3 = run_regression_outcome1(combined)

stargazer(mi1$model, mi1$model_adv,
          mi2$model, mi2$model_adv,
          mi3$model, mi3$model_adv,
          type="text",  report="vcsp*",
```

```r
          se = list(mi1$est$robust_se_all, mi1$est_adv$robust_se_all,
                    mi2$est$robust_se_all, mi2$est_adv$robust_se_all,
                    mi3$est$robust_se_all, mi3$est_adv$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", "July 25, 2020", "Both da
          align=TRUE,
          covariate.labels = regression_labels)
```

```
##
## Response to COVID-19 Spread
## ================================================================================================
##                                                                                             Respo
##                                         ---------------------------------------------------------
##                                              July 21, 2020          July 21, 2020         July 25, 2
## -------------------------------------------------------------------------------------------------
## Treatment                                        0.340                  0.339                 0.155
##                                                 (0.107)                (0.106)               (0.111
##                                              p = 0.002***           p = 0.002***          p = 0.1
##
## Female                                                                 -0.063
##                                                                        (0.105)
##                                                                      p = 0.550
##
## Non-binary                                                              0.886
##                                                                        (0.420)
##                                                                     p = 0.035**
##
## Gender not answered                                                     0.646
##                                                                        (0.192)
##                                                                    p = 0.001***
##
## 20-29                                                                   0.323
##                                                                        (0.380)
##                                                                      p = 0.395
##
## 30-39                                                                   0.295
##                                                                        (0.381)
##                                                                      p = 0.440
##
## 40-49                                                                   0.181
##                                                                        (0.402)
##                                                                      p = 0.654
##
## 50-59                                                                   0.370
##                                                                        (0.412)
##                                                                      p = 0.370
##
## 60-69                                                                   0.393
##                                                                        (0.441)
##                                                                      p = 0.373
##
```

```
## 70-79                                                    1.156
##                                                         (0.437)
##                                                      p = 0.009***
##
## Black/African American
##
##
##
## Caucasian                                                0.195
##                                                         (0.201)
##                                                       p = 0.333
##
## Hispanic/Latinx                                         -0.087
##                                                         (0.165)
##                                                       p = 0.597
##
## American Indian or Alaskan Native                        0.230
##                                                         (0.205)
##                                                       p = 0.264
##
## Pacific Islander                                        -0.471
##                                                         (0.513)
##                                                       p = 0.359
##
## Ethnicity not answered                                  -2.519
##                                                         (0.232)
##                                                      p = 0.000***
##
## Democrat                                                 0.715
##                                                         (0.304)
##                                                       p = 0.019**
##
## Independent                                              0.675
##                                                         (0.141)
##                                                     p = 0.00001***
##
## Political-party-other                                    0.357
##                                                         (0.171)
##                                                       p = 0.037**
##
## High school                                             -0.222
##                                                         (0.370)
##                                                       p = 0.550
##
## Some college                                            -0.050
##                                                         (0.800)
##                                                       p = 0.950
##
## Associates                                               0.194
##                                                         (0.791)
##                                                       p = 0.806
##
## Bachelors                                                0.017
##                                                         (0.795)
```

```
##                                                                 p = 0.983
##
## Masters                                                           0.188
##                                                                  (0.781)
##                                                                 p = 0.810
##
## Doctoral                                                          0.337
##                                                                  (0.786)
##                                                                 p = 0.669
##
## Professional (JD/MD)                                             -0.166
##                                                                  (0.780)
##                                                                 p = 0.832
##
## Know someone sick from COVID-19                                   0.502
##                                                                  (0.778)
##                                                                 p = 0.519
##
## Know someone hospitalized from COVID-19                          -0.200
##                                                                  (0.119)
##                                                                p = 0.093*
##
## Know someone who died COVID-19                                   -0.166
##                                                                  (0.165)
##                                                                 p = 0.313
##
## as.factor(covid_died)2                                            0.092
##                                                                  (0.158)
##                                                                 p = 0.563
##
## Constant                                        3.133             2.450               3.152
##                                                (0.085)           (0.896)             (0.086
##                                             p = 0.000***      p = 0.007***         p = 0.000
##
## ---------------------------------------------------------------------------------------------
## Observations                                     259               259                 292
## R2                                              0.038             0.314               0.007
## Adjusted R2                                     0.034             0.227               0.003
## Residual Std. Error                       0.858 (df = 257)   0.768 (df = 229)      0.938 (df =
## F Statistic                          10.183*** (df = 1; 257) 3.614*** (df = 29; 229) 1.970 (df =
## =============================================================================================
## Note:
```

```
run_regression_outcome2 = function(d) {
  model_spread = lm(outcome_spread ~ condition, d)
  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))
}

mi1d = run_regression_outcome2(run1)
mi2d = run_regression_outcome2(run2)
mi3d = run_regression_outcome2(combined)

stargazer(mi1d$model, mi1d$model_adv,
          mi2d$model, mi2d$model_adv,
          mi3d$model, mi3d$model_adv,
          type="text",  report="vcsp*",
          se = list(mi1d$est$robust_se_all, mi1d$est_adv$robust_se_all,
                    mi2d$est$robust_se_all, mi2d$est_adv$robust_se_all,
                    mi3d$est$robust_se_all, mi3d$est_adv$robust_se_all),
          title=paste('Response to COVID-19 Deaths'),
          dep.var.caption  = "Response to COVID-19 Deaths",
          dep.var.labels.include = FALSE, model.numbers=FALSE,
          column.labels = c("July 21, 2020", "July 21, 2020", "July 25, 2020", "July 25, 2020", "Both da
          align=TRUE,
          covariate.labels = regression_labels)
```

```
##
## Response to COVID-19 Deaths
## ===================================================================================================
##                                                                                               Respon
##                                         ------------------------------------------------------------
##                                              July 21, 2020          July 21, 2020         July 25, 2
## ----------------------------------------------------------------------------------------------------
## Treatment                                        0.340                  0.250                 0.155
##                                                 (0.107)                (0.090)               (0.111)
##                                              p = 0.002***           p = 0.006***          p = 0.10
##
## Female                                                                  0.050
##                                                                        (0.085)
##                                                                       p = 0.554
##
## Non-binary                                                              0.573
##                                                                        (0.308)
##                                                                       p = 0.063*
##
## Gender not answered                                                     0.437
##                                                                        (0.159)
##                                                                      p = 0.007***
##
## 20-29                                                                  -0.371
##                                                                        (0.191)
##                                                                       p = 0.052*
##
```

```
## 30-39                                                    -0.323
##                                                          (0.186)
##                                                        p = 0.084*
##
## 40-49                                                    -0.345
##                                                          (0.209)
##                                                        p = 0.099*
##
## 50-59                                                    -0.258
##                                                          (0.211)
##                                                         p = 0.221
##
## 60-69                                                    -0.279
##                                                          (0.260)
##                                                         p = 0.284
##
## 70-79                                                     0.170
##                                                          (0.254)
##                                                         p = 0.503
##
## Black/African American
##
##
##
## Caucasian                                                 0.041
##                                                          (0.168)
##                                                         p = 0.809
##
## Hispanic/Latinx                                          -0.103
##                                                          (0.134)
##                                                         p = 0.442
##
## American Indian or Alaskan Native                        -0.019
##                                                          (0.212)
##                                                         p = 0.929
##
## Pacific Islander                                         -0.261
##                                                          (0.289)
##                                                         p = 0.367
##
## Ethnicity not answered                                   -1.667
##                                                          (0.176)
##                                                      p = 0.000***
##
## Democrat                                                  0.374
##                                                          (0.239)
##                                                         p = 0.119
##
## Independent                                               0.543
##                                                          (0.117)
##                                                     p = 0.00001***
##
## Political-party-other                                     0.340
##                                                          (0.134)
```

```
##                                                                  p = 0.012**
##
## High school                                                        -0.107
##                                                                    (0.302)
##                                                                   p = 0.724
##
## Some college                                                        0.233
##                                                                    (0.530)
##                                                                   p = 0.660
##
## Associates                                                          0.216
##                                                                    (0.516)
##                                                                   p = 0.676
##
## Bachelors                                                           0.135
##                                                                    (0.524)
##                                                                   p = 0.797
##
## Masters                                                             0.088
##                                                                    (0.512)
##                                                                   p = 0.864
##
## Doctoral                                                            0.263
##                                                                    (0.517)
##                                                                   p = 0.612
##
## Professional (JD/MD)                                               -0.475
##                                                                    (0.512)
##                                                                   p = 0.354
##
## Know someone sick from COVID-19                                     0.290
##                                                                    (0.513)
##                                                                   p = 0.572
##
## Know someone hospitalized from COVID-19                            -0.102
##                                                                    (0.098)
##                                                                   p = 0.298
##
## Know someone who died COVID-19                                     -0.084
##                                                                    (0.125)
##                                                                   p = 0.500
##
## as.factor(covid_died)2                                              0.067
##                                                                    (0.128)
##                                                                   p = 0.603
##
## Constant                                    3.133                  2.327                  3.152
##                                            (0.085)                (0.570)                (0.086)
##                                          p = 0.000***           p = 0.00005***         p = 0.000
##
## ------------------------------------------------------------------------------------------------
## Observations                                259                    259                    292
## R2                                         0.038                  0.252                  0.007
## Adjusted R2                                0.034                  0.157                  0.003
```

```
## Residual Std. Error                       0.858 (df = 257)        0.628 (df = 229)      0.938 (df =
## F Statistic                           10.183*** (df = 1; 257) 2.657*** (df = 29; 229) 1.970 (df = 1
## ============================================================================================================
## Note:
```