

# poa\_health\_8-13

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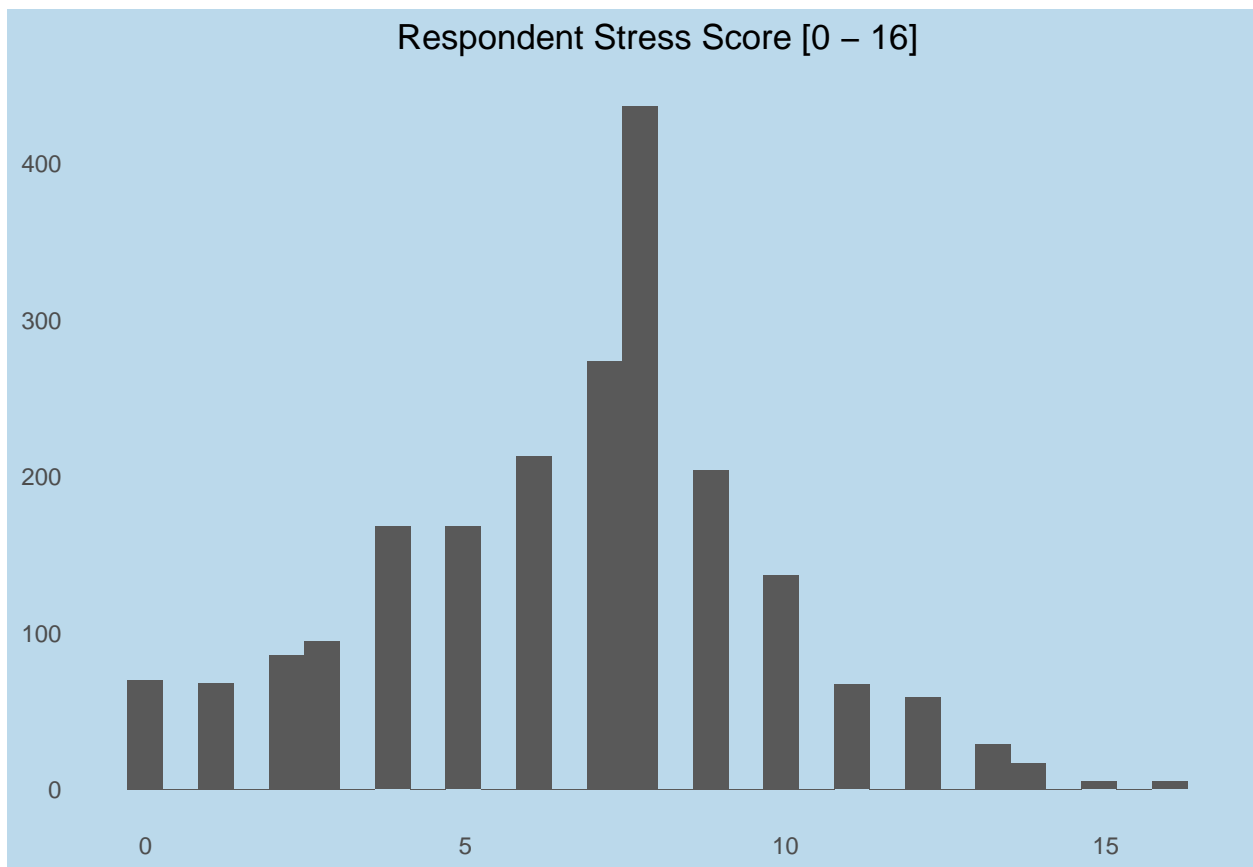
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## Demographics

```
wrangled %>% ggplot(aes(x = stress_score)) + geom_histogram() +
  ggtitle("Respondent Stress Score [0 - 16]") +
  xlab(NULL) + ylab(NULL)
```

```
## 'stat_bin()' using 'bins = 30'. Pick better value with 'binwidth'.
```

```
## Warning: Removed 43 rows containing non-finite values (stat_bin).
```



## 4.1 - 4.2

### 4.1) Households with a case of COVID-19 [36]

1. Run distribution over population

2. Run distribution by sub-demographics
  - a. Compare and find gaps (test unequal proportions)

## 4.2) Individuals with a case of case of COVID-19[36]

1. Run distribution over population
2. Run distribution by sub-demographics
  - a. Compare and find gaps (test unequal proportions)

```
mean(wrangled$posi_all, na.rm = TRUE)
```

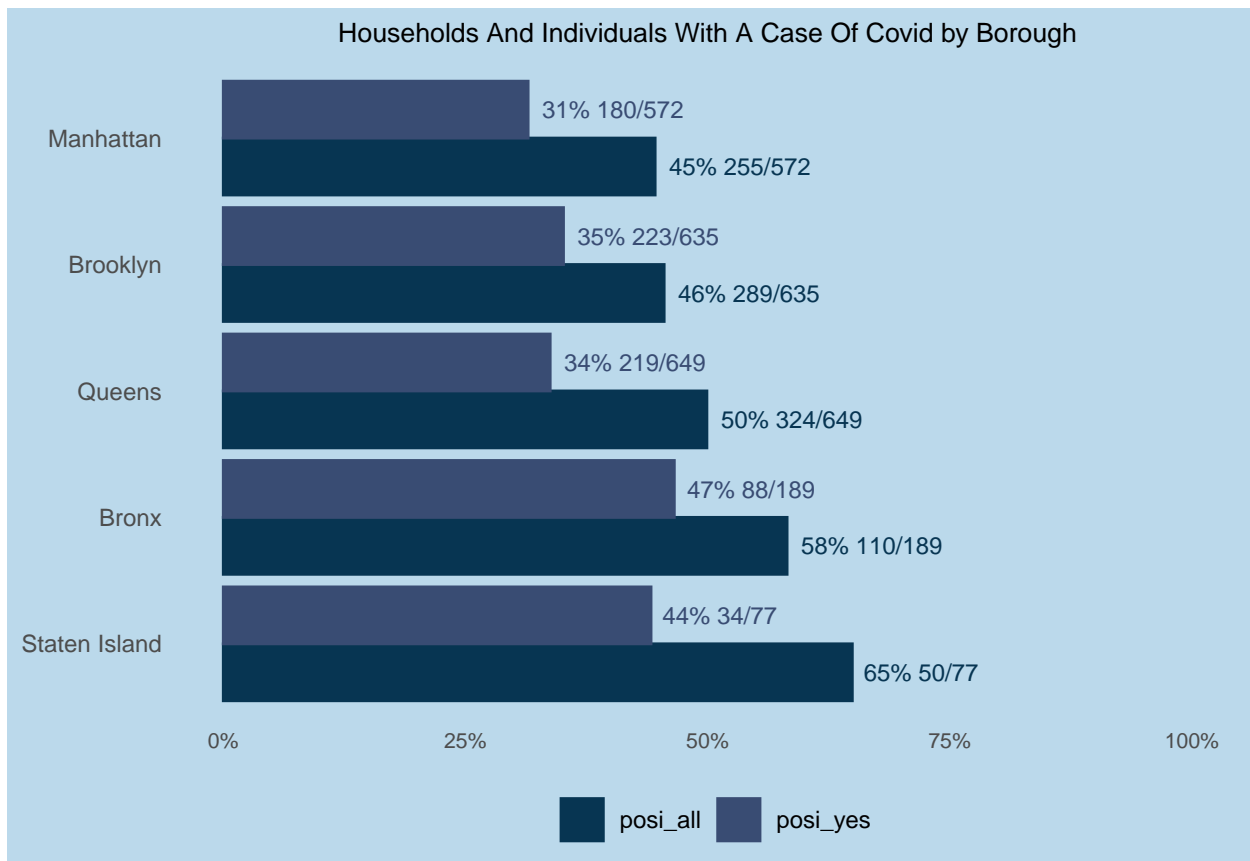
```
## [1] 0.4844486
```

```
mean(wrangled$posi_yes, na.rm = TRUE)
```

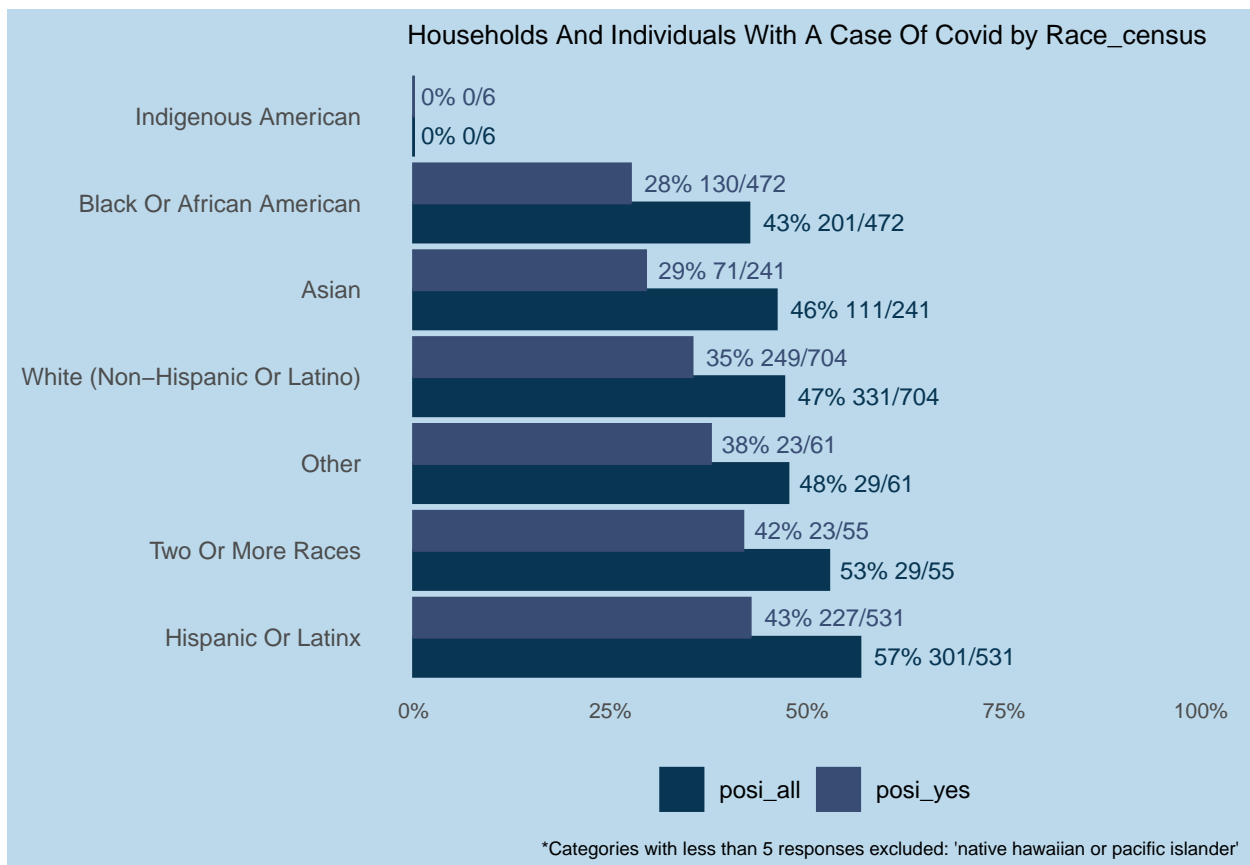
```
## [1] 0.3506126
```

```
make_plots(wrangled, by_vars = demographics,
            hyp_var = c("posi_all", "posi_yes"), title = "Households and Individuals with a case of COVID")
```

```
## $borough
## $borough$plot
```



```
##
## $borough$p.values
## $borough$p.values$posi_all
##           manhattan brooklyn queens  bronx staten island
## manhattan           NA         NA    NA 0.0015           0.0012
## brooklyn            NA         NA    NA 0.0029           0.0019
## queens              NA         NA    NA    NA           NA
## bronx               0.0015  0.0029    NA    NA           NA
## staten island       0.0012  0.0019    NA    NA           NA
##
## $borough$p.values$posi_yes
##           manhattan queens brooklyn staten island  bronx
## manhattan           NA     NA      NA           NA 0.00023
## queens              NA     NA      NA           NA 0.00170
## brooklyn            NA     NA      NA           NA 0.00570
## staten island       NA     NA      NA           NA    NA
## bronx               0.00023 0.0017  0.0057           NA    NA
##
##
##
## $gen
## NULL
##
## $race_census
## $race_census$plot
```

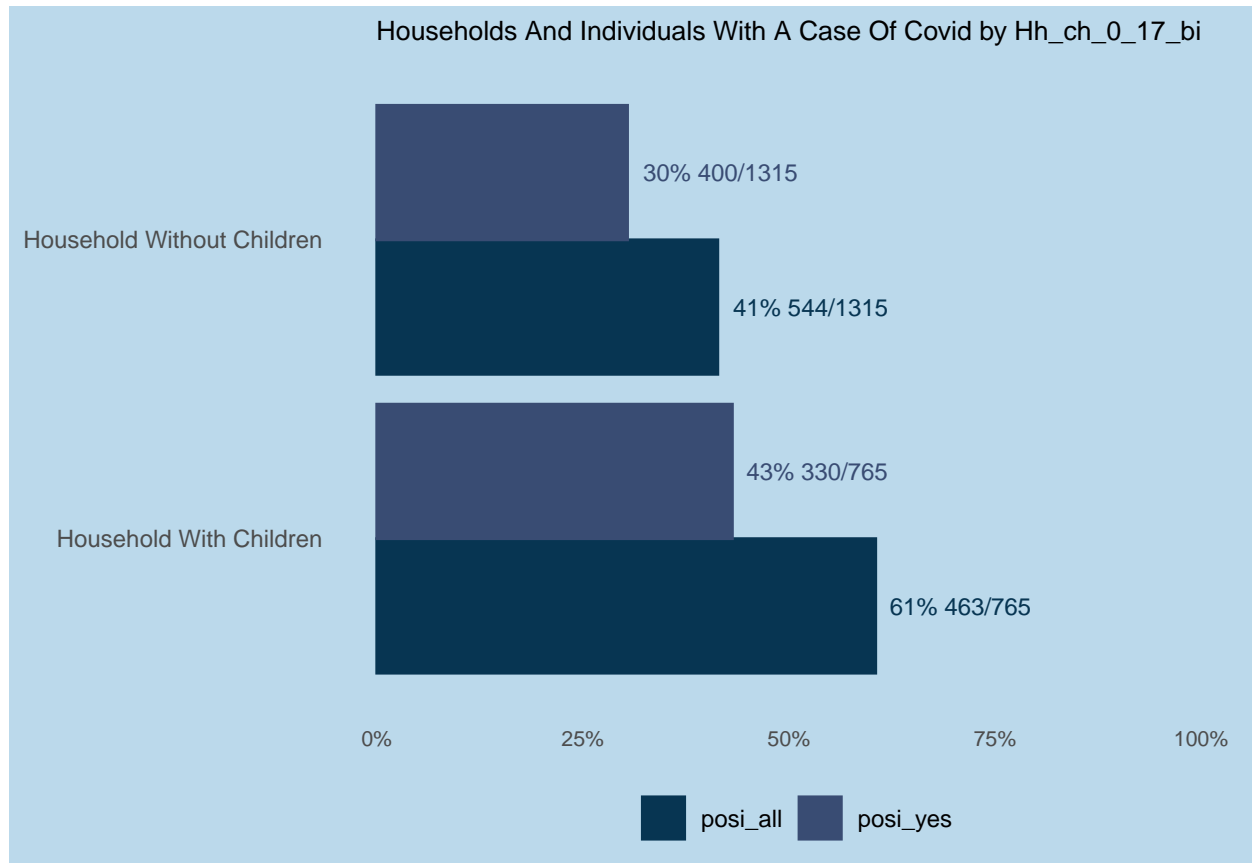


```

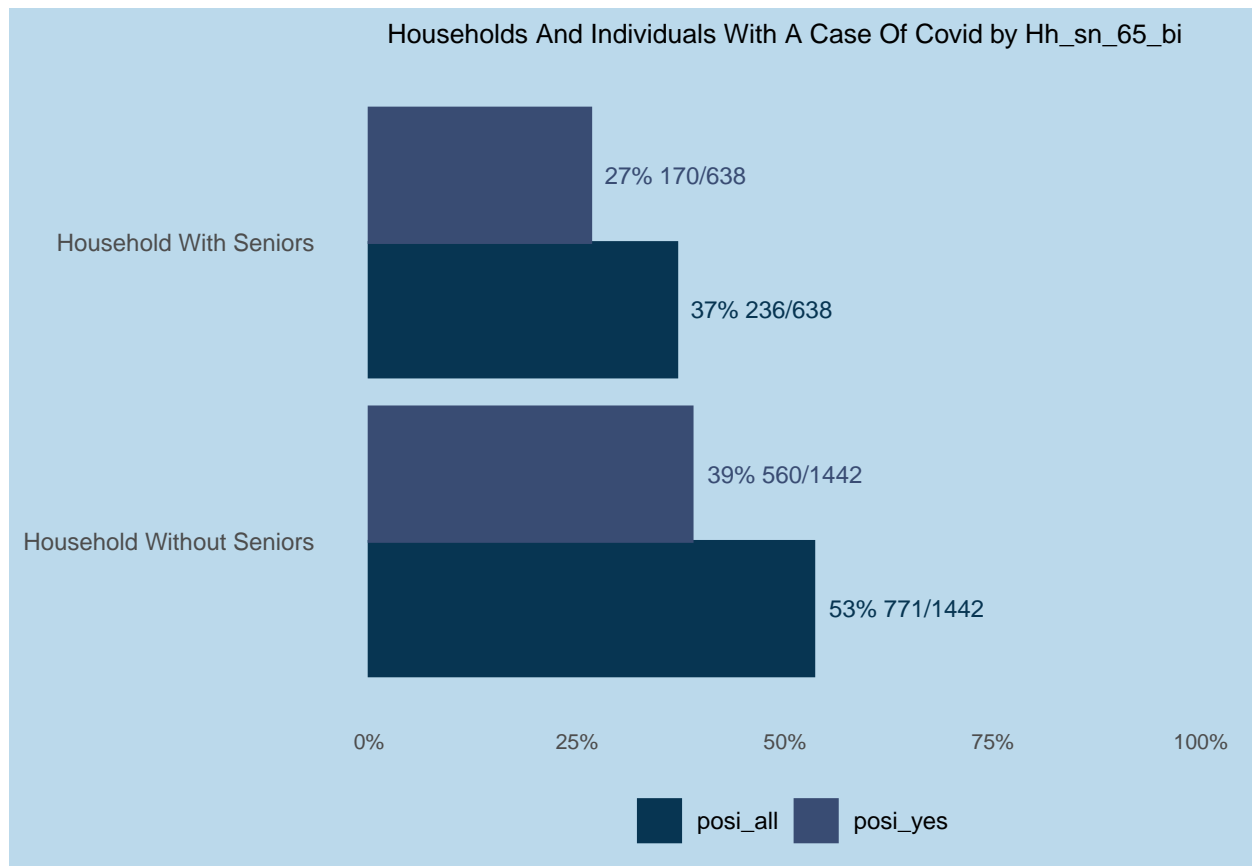
##
## $race_census$p.values
## $race_census$p.values$posi_all
##
## Indigenous American black or african american
## Indigenous American NA NA
## black or african american NA NA
## asian NA NA
## white (non-hispanic or latino) NA NA
## other NA NA
## two or more races NA NA
## hispanic or latinx NA 1.1e-05
##
## asian white (non-hispanic or latino) other
## Indigenous American NA NA NA
## black or african american NA NA NA
## asian NA NA NA
## white (non-hispanic or latino) NA NA NA
## other NA NA NA
## two or more races NA NA NA
## hispanic or latinx 0.0077 0.00094 NA
##
## two or more races hispanic or latinx
## Indigenous American NA NA
## black or african american NA 1.1e-05
## asian NA 7.7e-03
## white (non-hispanic or latino) NA 9.4e-04
## other NA NA
## two or more races NA NA
## hispanic or latinx NA NA
##
## $race_census$p.values$posi_yes
##
## Indigenous American black or african american
## Indigenous American NA NA
## black or african american NA NA
## asian NA NA
## white (non-hispanic or latino) NA 5.9e-03
## other NA NA
## two or more races NA NA
## hispanic or latinx NA 7.2e-07
##
## asian white (non-hispanic or latino) other
## Indigenous American NA NA NA
## black or african american NA 0.0059 NA
## asian NA NA NA
## white (non-hispanic or latino) NA NA NA
## other NA NA NA
## two or more races NA NA NA
## hispanic or latinx 0.00059 0.0099 NA
##
## two or more races hispanic or latinx
## Indigenous American NA NA
## black or african american NA 7.2e-07
## asian NA 5.9e-04
## white (non-hispanic or latino) NA 9.9e-03
## other NA NA
## two or more races NA NA
## hispanic or latinx NA NA
##

```

```
##
##
## $hh_ch_0_17_bi
## $hh_ch_0_17_bi$plot
```



```
##
## $hh_ch_0_17_bi$p.values
## $hh_ch_0_17_bi$p.values$posi_all
##           household without children household with children
## household without children           NA           5.1e-17
## household with children           5.1e-17           NA
##
## $hh_ch_0_17_bi$p.values$posi_yes
##           household without children household with children
## household without children           NA           6.1e-09
## household with children           6.1e-09           NA
##
##
##
## $hh_sn_65_bi
## $hh_sn_65_bi$plot
```



```
##
## $hh_sn_65_bi$p.values
## $hh_sn_65_bi$p.values$posi_all
##           household with seniors household without seniors
## household with seniors              NA              5.7e-12
## household without seniors          5.7e-12              NA
##
## $hh_sn_65_bi$p.values$posi_yes
##           household with seniors household without seniors
## household with seniors              NA              1e-07
## household without seniors          1e-07              NA
##
##
##
## $inc_dist
## NULL
```

### 4.3) People who have received a booster vaccine dose [38]

1. Run distribution over population
2. Run distribution by sub-demographics (a-k)
  - a. Compare and find gaps (test unequal proportions)

```

mean(wrangled$boost_bi, na.rm = TRUE)

## [1] 0.7559467

make_plots(wrangled, demographics, "boost_bi", "Respondents who have received a booster vaccine dose")

## $borough
## NULL
##
## $gen
## NULL
##
## $race_census
## NULL
##
## $hh_ch_0_17_bi
## NULL
##
## $hh_sn_65_bi
## NULL
##
## $inc_dist
## NULL

```

#### 4.4) People who returned to work in person are more likely to be boosted against COVID-19

1. Find respondents who returned to work in person or hybrid [19]
  - a. Find proportion of subset who reported being at least partially vaccinated against COVID-19 [32]
  - b. Find proportion not in subset who reported being at least partially vaccinated against COVID-19 and compare (test unequal proportions)

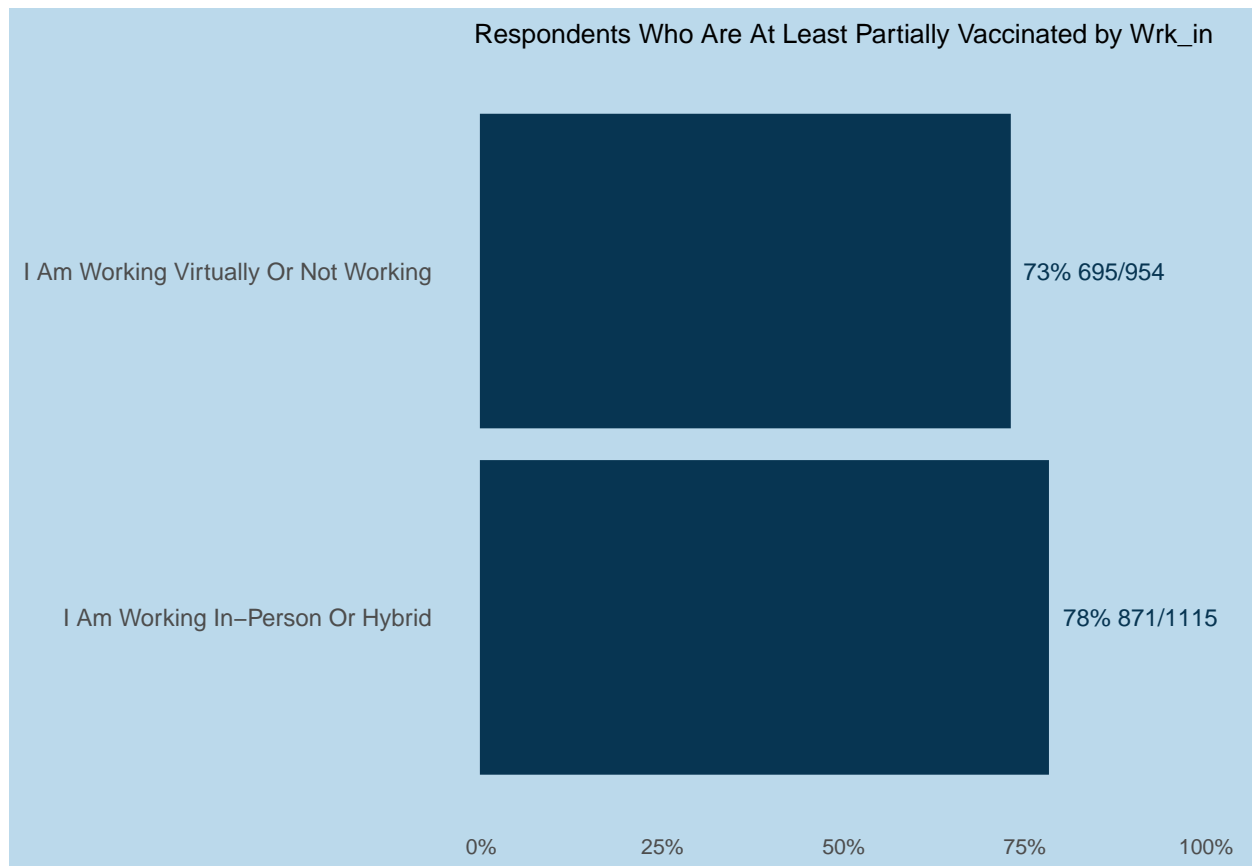
```

make_plots(wrangled, by_vars = "wrk_in", "boost_bi", title = "Respondents who are at least partially va

## $wrk_in
## $wrk_in$plot

```





```
##
## $wrk_in$p.values
## $wrk_in$p.values$boost_bi
##
## I am working virtually or not working NA
## I am working in-person or hybrid 0.0063
##
## I am working in-person or hybrid
## I am working virtually or not working 0.0063
## I am working in-person or hybrid NA
```

## 4.5, 4.14

**4.5) People who ranked the government response as average or above average were more likely to be boosted or planning to get boosted against COVID-19**

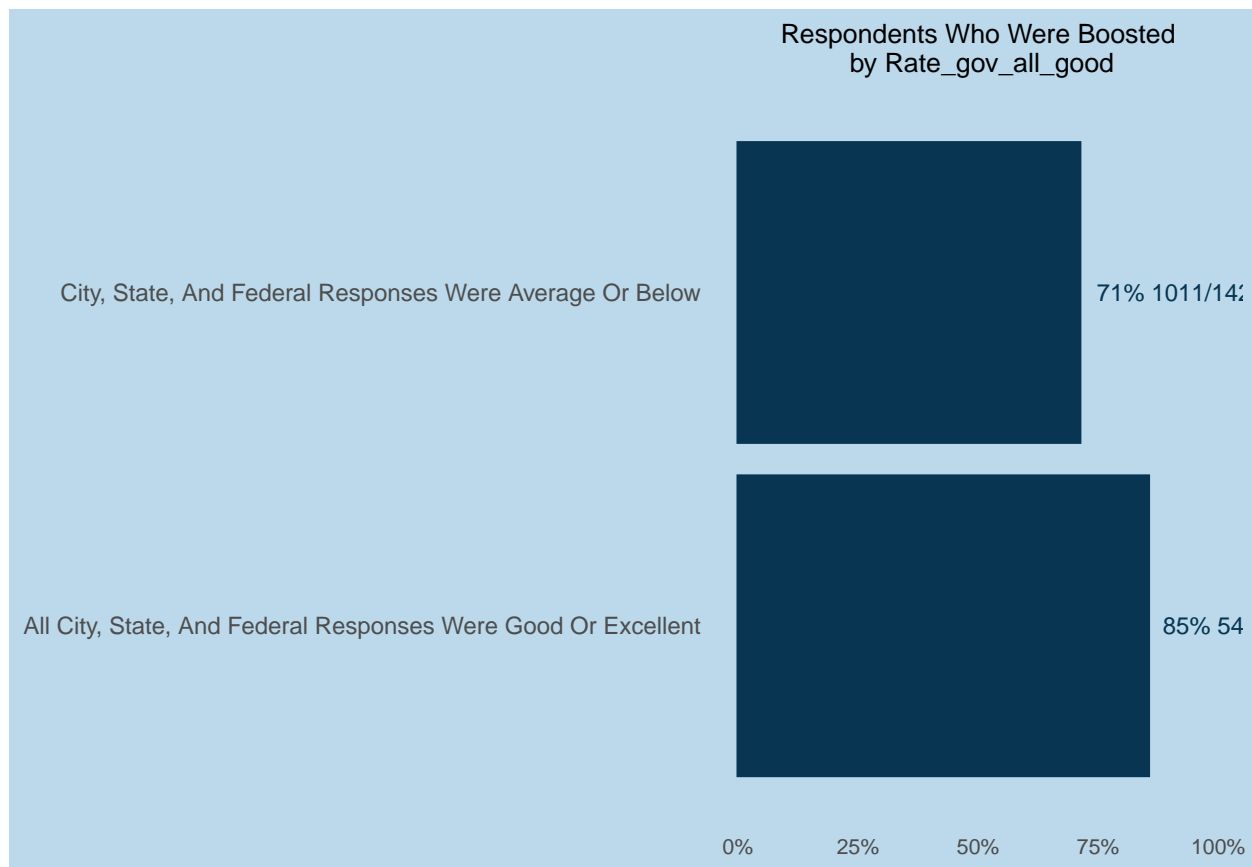
1. Find respondents who rated the government response as average, good, or excellent [31]
  - a. Find proportion of subset who reported being boosted at least partially planning to get boosted against COVID-19 [37]
  - b. Find proportion not in subset who reported being at boosted or at least partly getting boosted against COVID-19 and compare (test unequal proportions)

#### 4.14) People who rated government services (response of government) above average were more likely to be boosted

1. Find proportion of population who rate government services above average (city/state or federal)
2. Find the booster status amongst the population
3. Compare and contrast with the population who rated the response of the government below average.

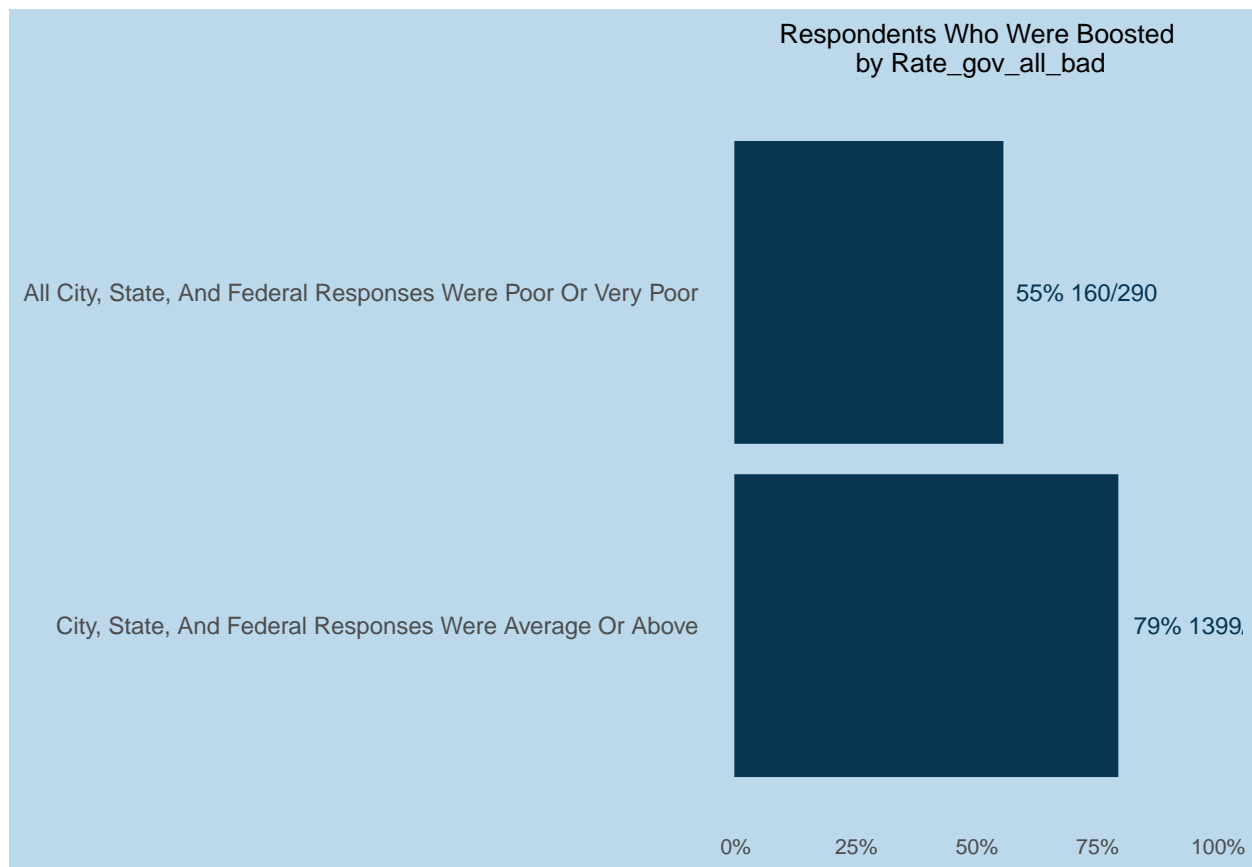
```
make_plots(wrangled, c("rate_gov_all_good", "rate_gov_all_bad"), "boost_bi",
           title = "Respondents who were boosted\n")
```

```
## $rate_gov_all_good
## $rate_gov_all_good$plot
```



```
##
## $rate_gov_all_good$p.values
## $rate_gov_all_good$p.values$boost_bi
##
## city, state, and federal responses were average or below
## all city, state, and federal responses were good or excellent
##
## city, state, and federal responses were average or below
## all city, state, and federal responses were good or excellent
##
##
```

```
##
## $rate_gov_all_bad
## $rate_gov_all_bad$plot
```



```
##
## $rate_gov_all_bad$p.values
## $rate_gov_all_bad$p.values$boost_bi
## all city, state, and federal responses were poor or very poor
## city, state, and federal responses were average or above
## all city, state, and federal responses were poor or very poor
## city, state, and federal responses were average or above
```

#### 4.6) People who have been discriminated against or are worried about discrimination due to COVID-19 [35]]

1. Run distribution over population
2. Run distribution by sub-demographics
  - a. Compare and find gaps (test unequal proportions)

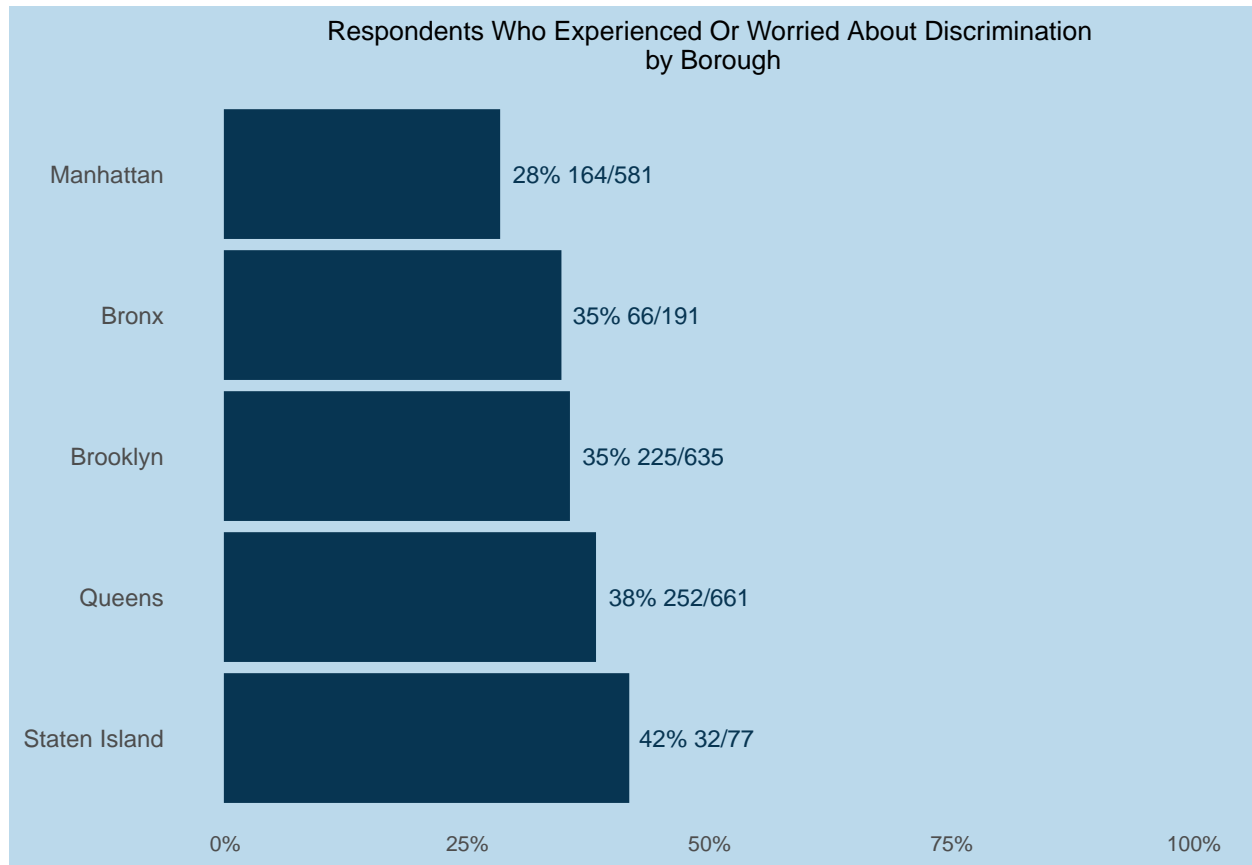
```
mean(wrangled$discrim_bi, na.rm = TRUE)
```

```
## [1] 0.3445221
```

```
make_plots(wrangled, demographics, "discrim_bi", title = "Respondents who experienced or worried about discrimination by borough")
```

```
## $borough
```

```
## $borough$plot
```



```
##
```

```
## $borough$p.values
```

```
## $borough$p.values$discrim_bi
```

```
##      manhattan bronx brooklyn queens staten island
```

```
## manhattan      NA    NA    0.0086 0.00029      NA
```

```
## bronx          NA    NA      NA      NA      NA
```

```
## brooklyn      0.00860  NA      NA      NA      NA
```

```
## queens        0.00029  NA      NA      NA      NA
```

```
## staten island   NA    NA      NA      NA      NA
```

```
##
```

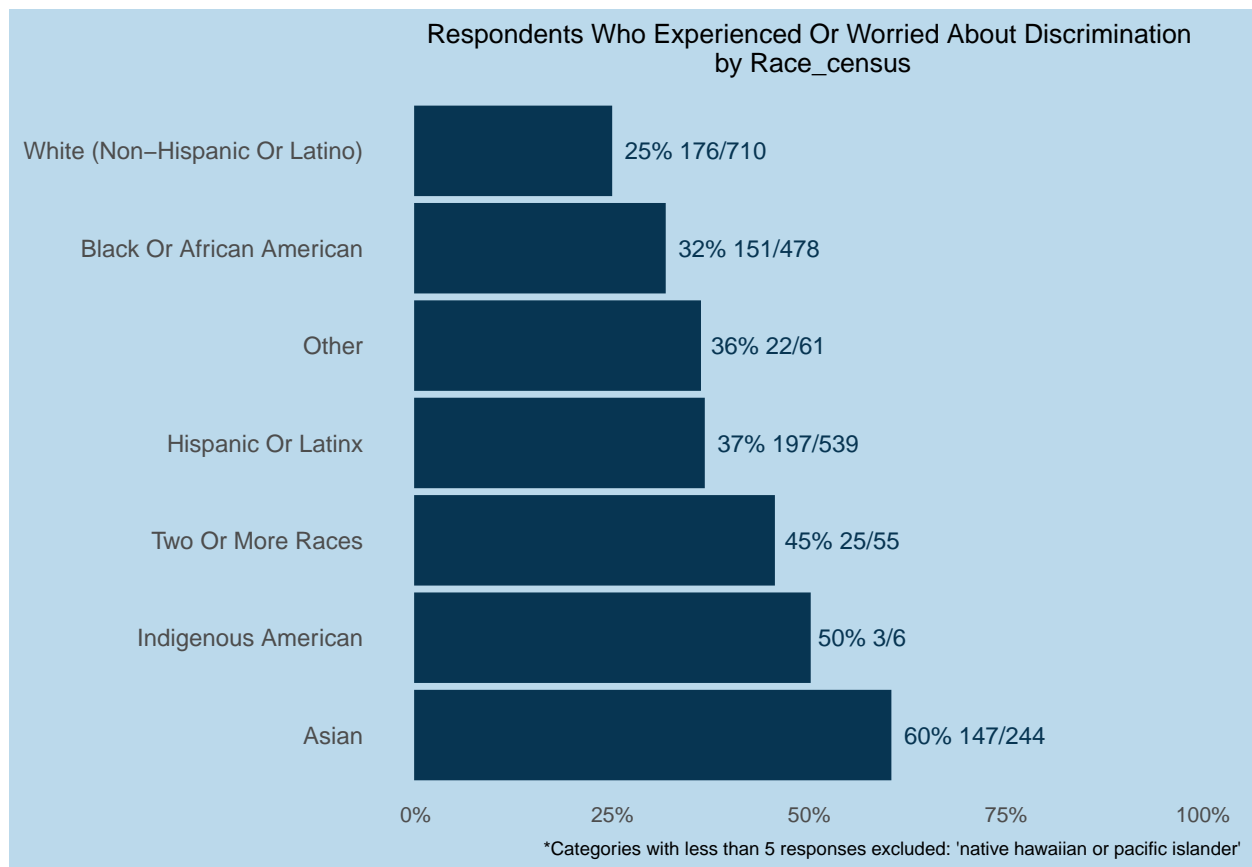
```
##
```

```
##
```

```
## $gen
```

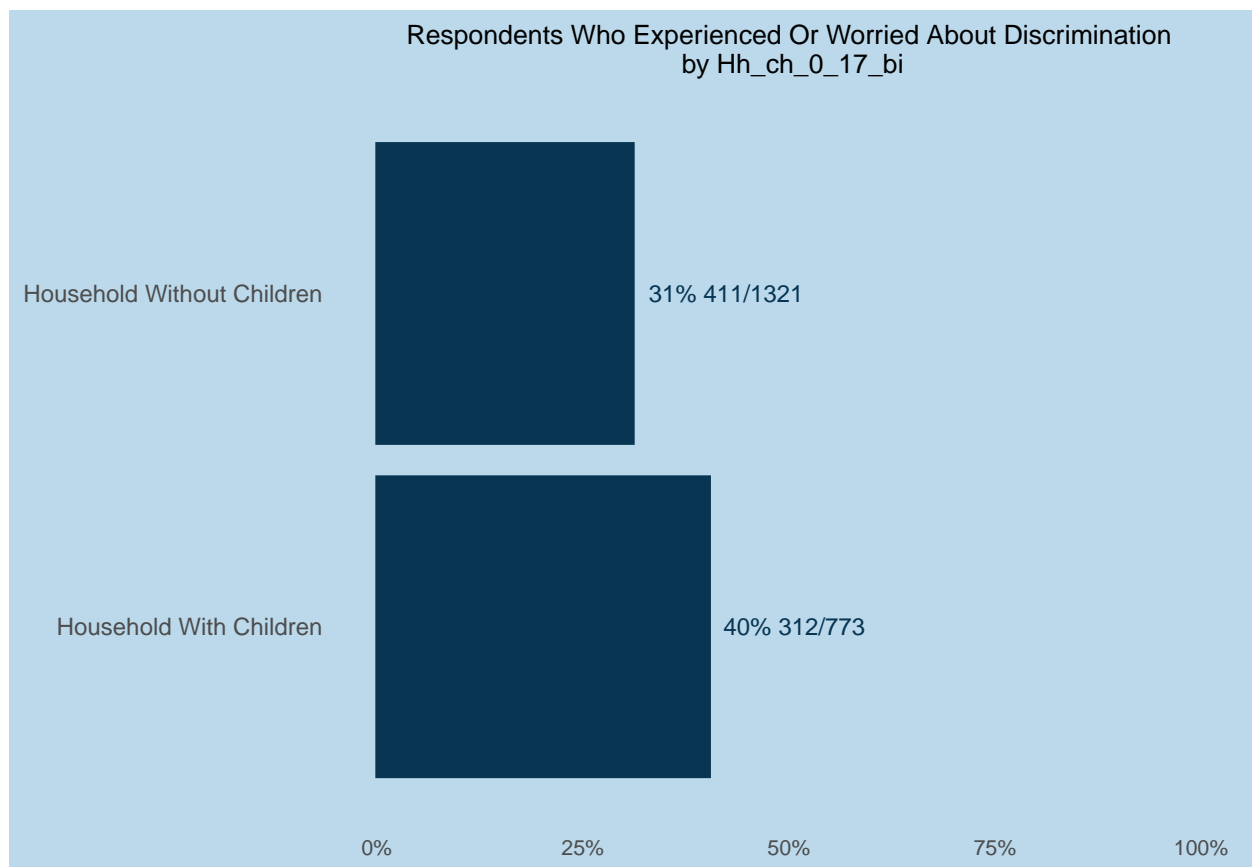
```
## NULL
```

```
##
## $race_census
## $race_census$plot
```



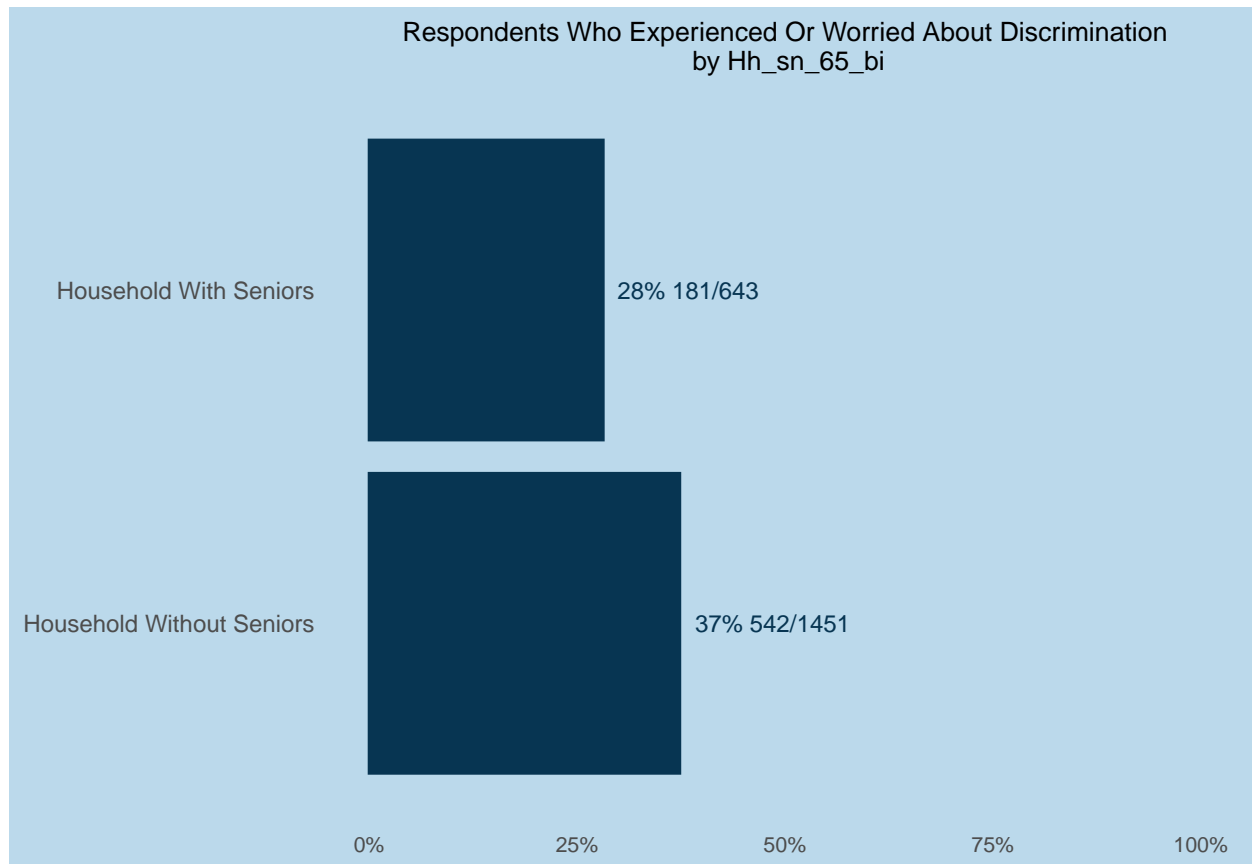
```
##
## $race_census$p.values
## $race_census$p.values$discrim_bi
##
## white (non-hispanic or latino)
## white (non-hispanic or latino) NA
## black or african american NA
## other NA
## hispanic or latinx 9.2e-06
## two or more races 1.4e-03
## Indigenous American NA
## asian 1.3e-23
##
## black or african american other
## white (non-hispanic or latino) NA NA
## black or african american NA NA
## other NA NA
## hispanic or latinx NA NA
## two or more races NA NA
## Indigenous American NA NA
## asian 2.5e-13 0.0011
##
## hispanic or latinx two or more races
## white (non-hispanic or latino) 9.2e-06 0.0014
```

```
## black or african american      NA      NA
## other                          NA      NA
## hispanic or latinx             NA      NA
## two or more races              NA      NA
## Indigenous American            NA      NA
## asian                          9.9e-10 NA
##                                Indigenous American  asian
## white (non-hispanic or latino) NA 1.3e-23
## black or african american      NA 2.5e-13
## other                          NA 1.1e-03
## hispanic or latinx             NA 9.9e-10
## two or more races              NA      NA
## Indigenous American            NA      NA
## asian                          NA      NA
##
##
##
## $hh_ch_0_17_bi
## $hh_ch_0_17_bi$plot
```



```
##
## $hh_ch_0_17_bi$p.values
## $hh_ch_0_17_bi$p.values$discrim_bi
##                                household without children household with children
## household without children      NA                                2.2e-05
```

```
## household with children                2.2e-05                NA
##
##
##
## $hh_sn_65_bi
## $hh_sn_65_bi$plot
```



```
##
## $hh_sn_65_bi$p.values
## $hh_sn_65_bi$p.values$discrim_bi
##
## household with seniors household without seniors
## household with seniors                NA                5.4e-05
## household without seniors            5.4e-05                NA
##
##
##
## $inc_dist
## NULL
```

## 4.7) People who have experienced abuse or violence due to COVID-19 [34]

1. Run distribution over population

2. Run distribution by sub-demographics (a-k)

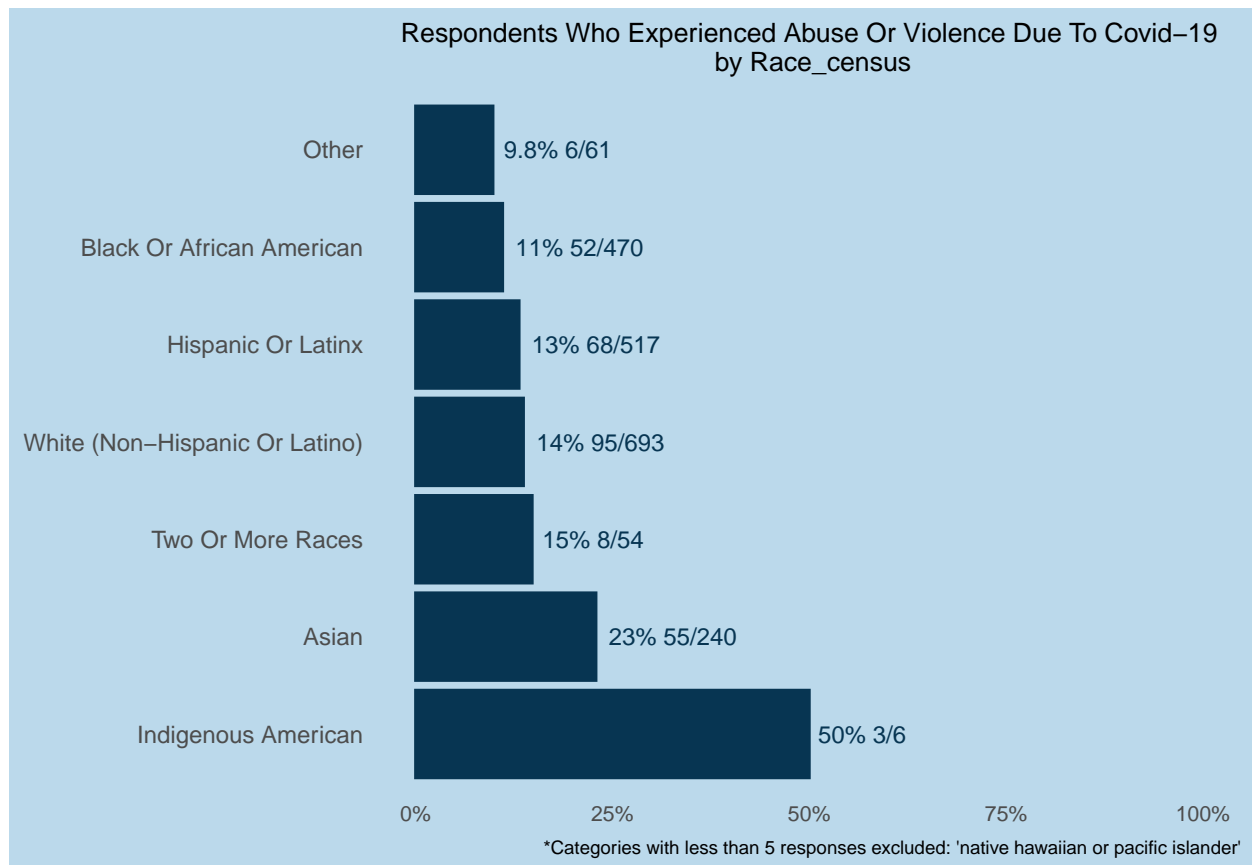
a. Compare and find gaps (test unequal proportions)

```
mean(wrangled$exp_ab_or_vi, na.rm = TRUE)
```

```
## [1] 0.1396461
```

```
#poa %>% mutate(exp_ab_or_vi = exp_ab_or_vi == 1)
make_plots(wrangled, by_vars = demographics, hyp_var = "exp_ab_or_vi",
           title = "Respondents who experienced Abuse or Violence due to COVID-19\n")
```

```
## $borough
## NULL
##
## $gen
## NULL
##
## $race_census
## $race_census$plot
```



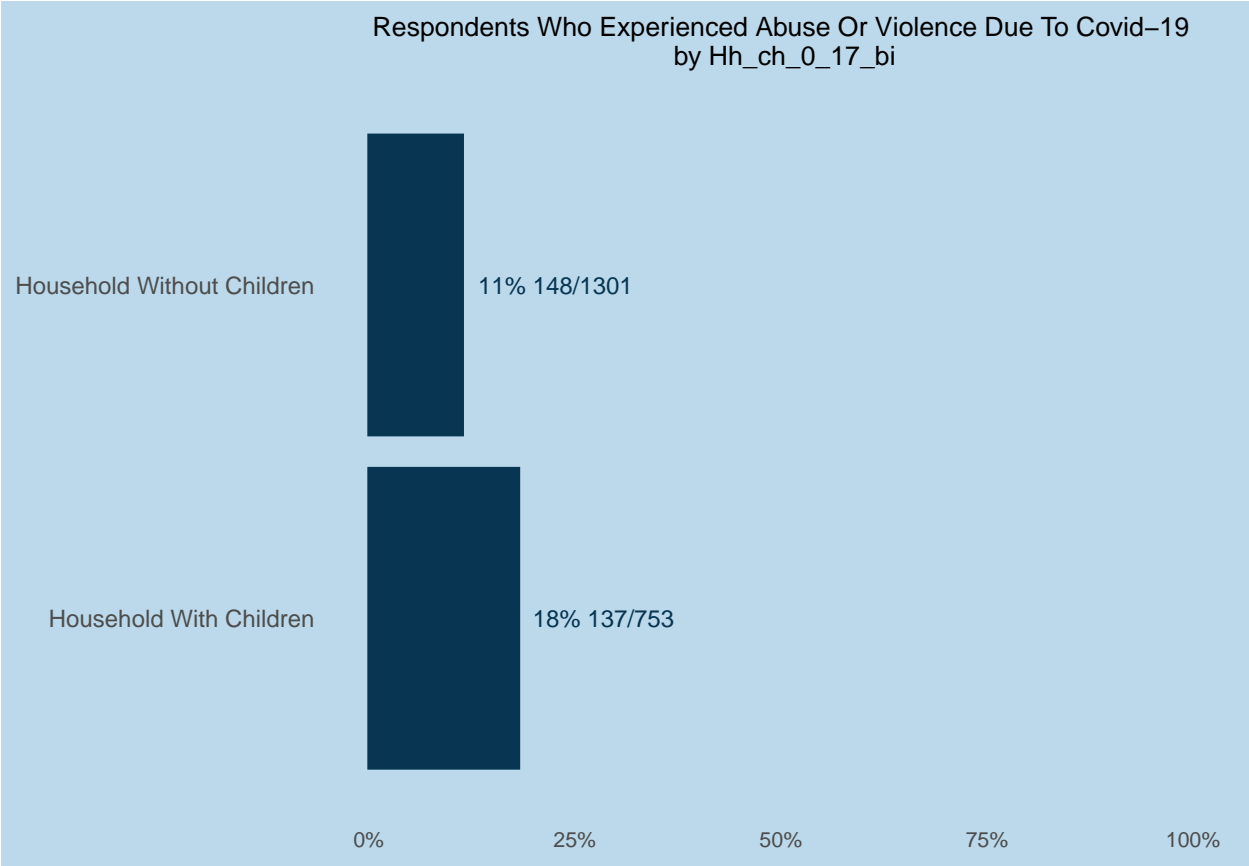
```
##
## $race_census$p.values
```



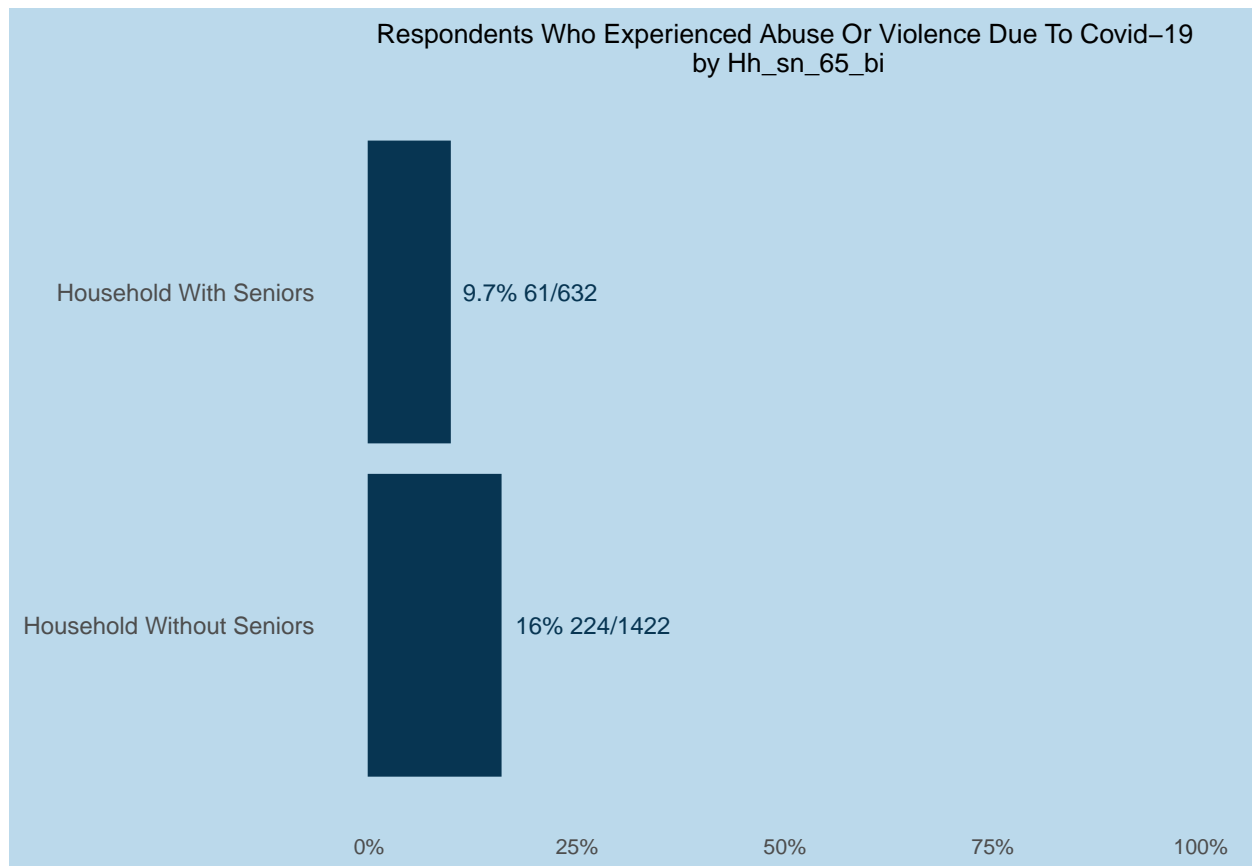
```

## $race_census$p.values$exp_ab_or_vi
##                                other black or african american
## other                          NA                          NA
## black or african american      NA                          NA
## hispanic or latinx             NA                          NA
## white (non-hispanic or latino) NA                          NA
## two or more races              NA                          NA
## asian                          NA                      4.8e-05
## Indigenous American            NA                          NA
##                                hispanic or latinx
## other                          NA
## black or african american      NA
## hispanic or latinx             NA
## white (non-hispanic or latino) NA
## two or more races              NA
## asian                          0.001
## Indigenous American            NA
##                                white (non-hispanic or latino) two or more races
## other                          NA                          NA
## black or african american      NA                          NA
## hispanic or latinx             NA                          NA
## white (non-hispanic or latino) NA                          NA
## two or more races              NA                          NA
## asian                          0.0012                      NA
## Indigenous American            NA                          NA
##                                asian Indigenous American
## other                          NA                          NA
## black or african american      4.8e-05                      NA
## hispanic or latinx             1.0e-03                      NA
## white (non-hispanic or latino) 1.2e-03                      NA
## two or more races              NA                          NA
## asian                          NA                          NA
## Indigenous American            NA                          NA
##
##
##
## $hh_ch_0_17_bi
## $hh_ch_0_17_bi$plot

```



```
##
## $hh_ch_0_17_bi$p.values
## $hh_ch_0_17_bi$p.values$exp_ab_or_vi
##           household without children household with children
## household without children           NA           2.2e-05
## household with children           2.2e-05           NA
##
##
##
## $hh_sn_65_bi
## $hh_sn_65_bi$plot
```



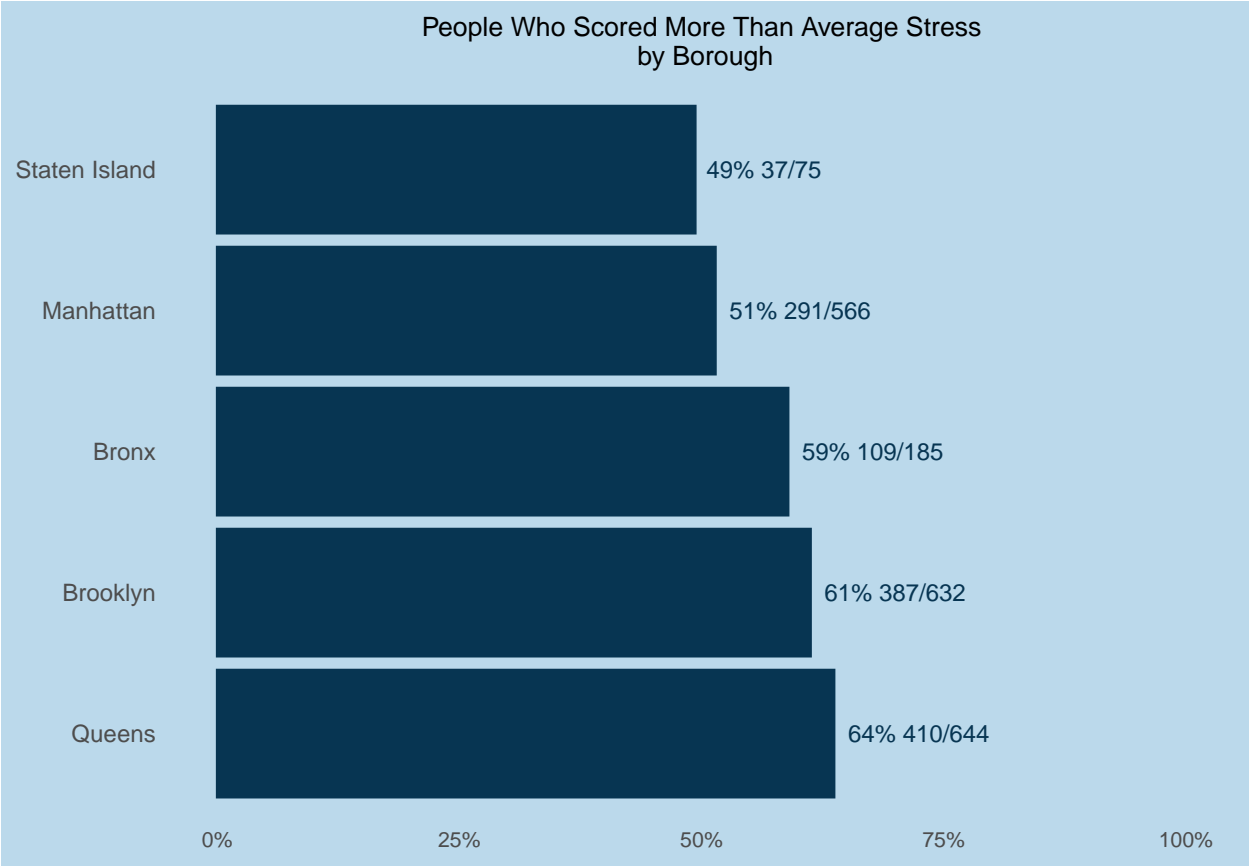
```
##
## $hh_sn_65_bi$p.values
## $hh_sn_65_bi$p.values$exp_ab_or_vi
##           household with seniors household without seniors
## household with seniors                NA                0.00029
## household without seniors            0.00029                NA
##
##
##
## $inc_dist
## NULL
```

#### 4.8) People who score more than average on the quantified mental health quantified questions [38]

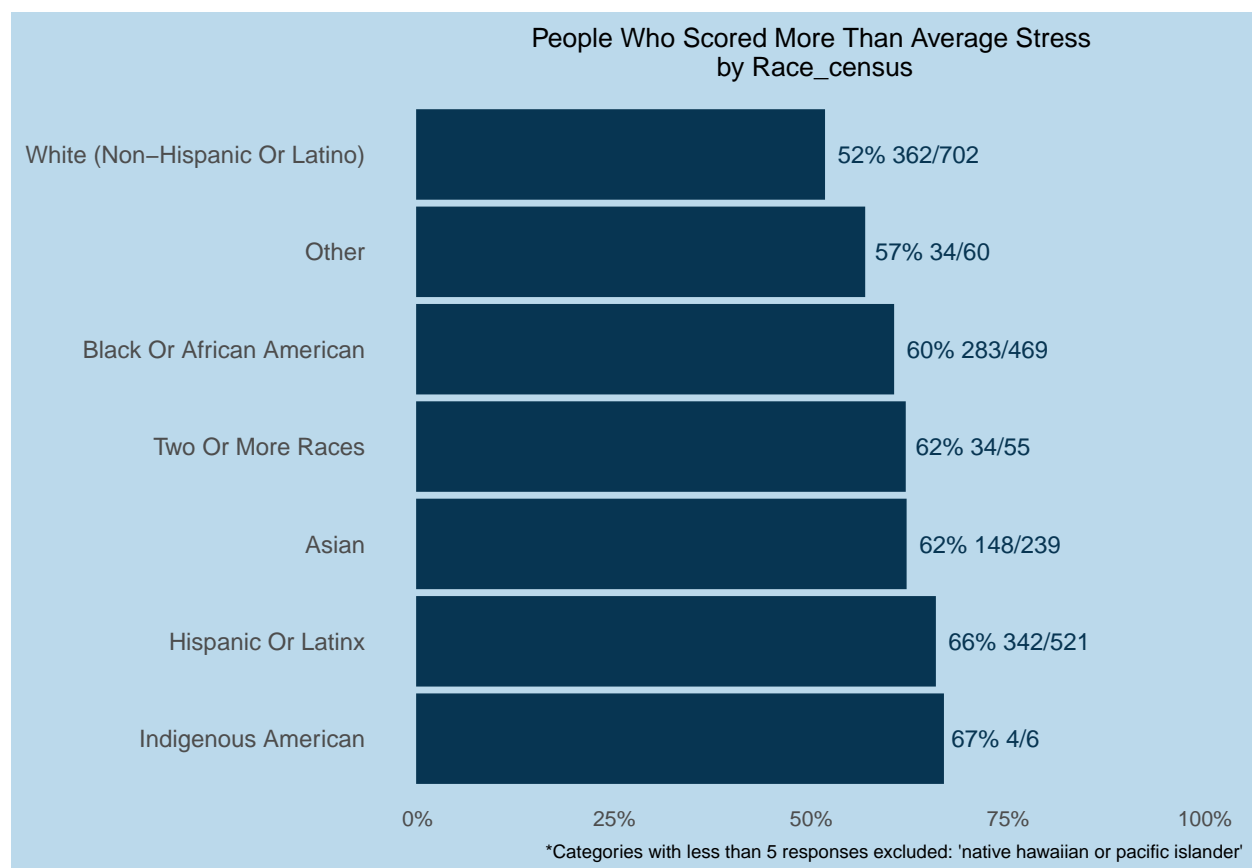
1. Run categorical distribution over population
2. Run distribution by sub-demographics

```
make_plots(wrangled, demographics, "stress_bi", title = "People who scored more than average stress\n")
```

```
## $borough
## $borough$plot
```

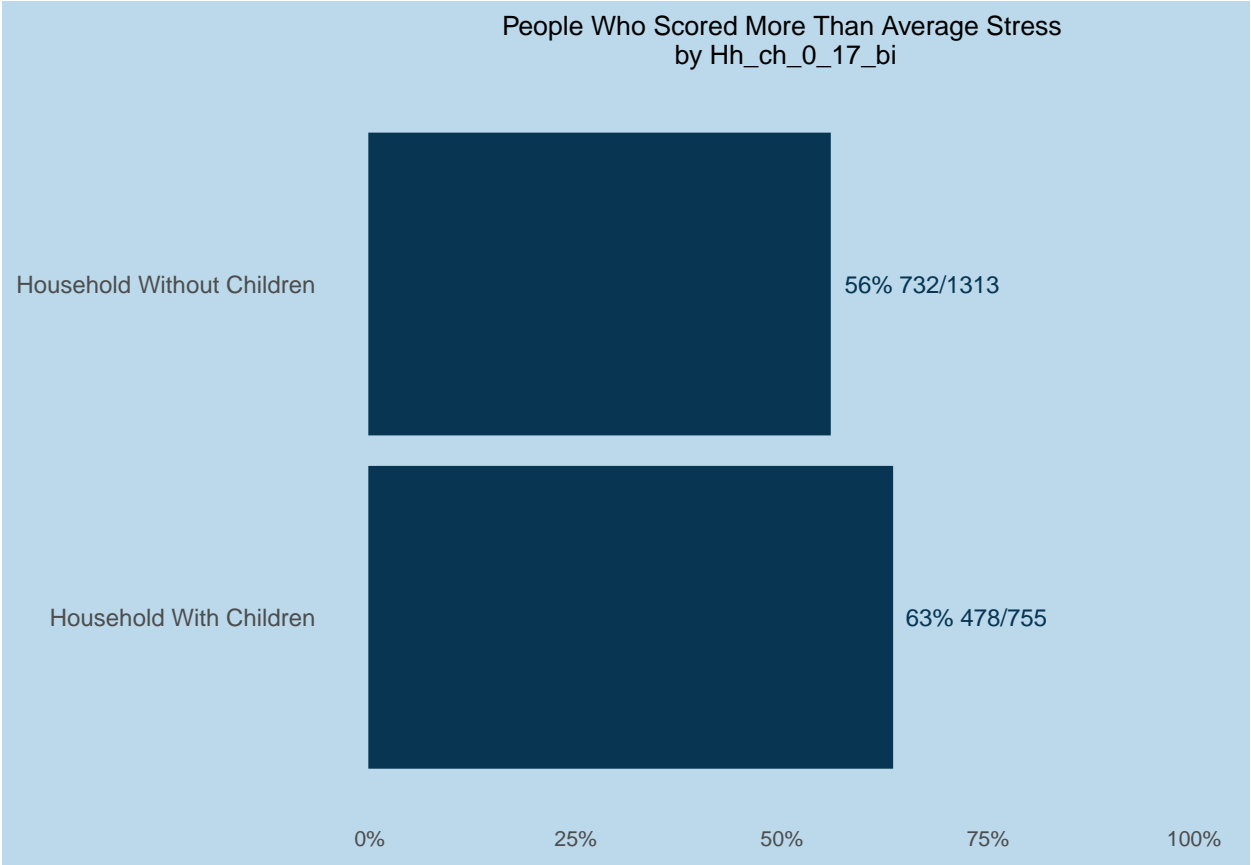


```
##
## $borough$p.values
## $borough$p.values$stress_bi
##          staten island manhattan bronx brooklyn  queens
## staten island          NA          NA      NA      NA      NA
## manhattan              NA          NA      NA 0.00076 2.1e-05
## bronx                  NA          NA      NA      NA      NA
## brooklyn               NA 7.6e-04      NA      NA      NA
## queens                 NA 2.1e-05      NA      NA      NA
##
##
##
## $gen
## NULL
##
## $race_census
## $race_census$plot
```

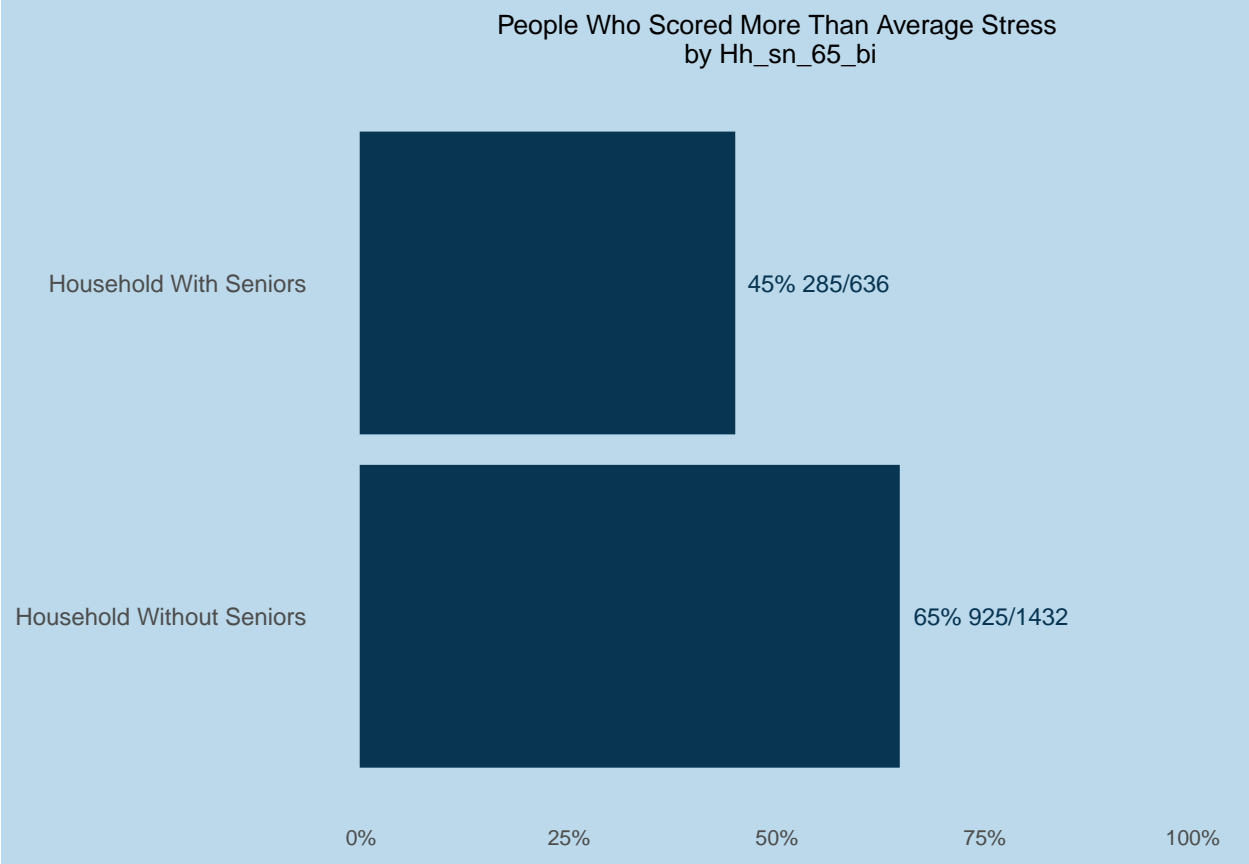


```
##
## $race_census$p.values
## $race_census$p.values$stress_bi
##           white (non-hispanic or latino) other
## white (non-hispanic or latino)           NA  NA
## other                                NA  NA
## black or african american           3.8e-03  NA
## two or more races                    NA  NA
## asian                                6.9e-03  NA
## hispanic or latinx                   1.1e-06  NA
## Indigenous American                  NA  NA
##           black or african american two or more races
## white (non-hispanic or latino)           0.0038  NA
## other                                NA  NA
## black or african american                NA  NA
## two or more races                       NA  NA
## asian                                NA  NA
## hispanic or latinx                     NA  NA
## Indigenous American                    NA  NA
##           asian hispanic or latinx Indigenous American
## white (non-hispanic or latino) 0.0069           1.1e-06  NA
## other                        NA                NA  NA
## black or african american    NA                NA  NA
## two or more races            NA                NA  NA
## asian                        NA                NA  NA
## hispanic or latinx           NA                NA  NA
```

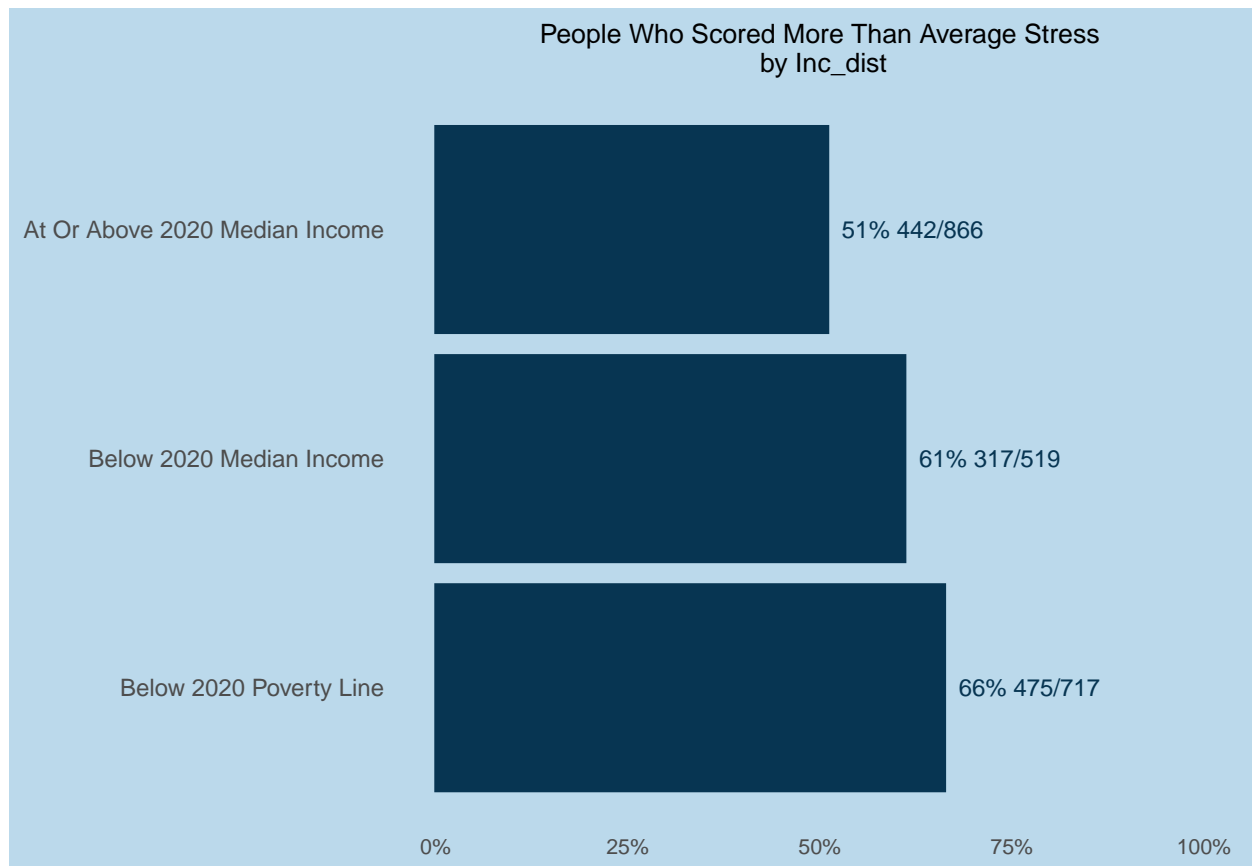
```
## Indigenous American      NA      NA      NA
##
##
##
## $hh_ch_0_17_bi
## $hh_ch_0_17_bi$plot
```



```
##
## $hh_ch_0_17_bi$p.values
## $hh_ch_0_17_bi$p.values$stress_bi
##           household without children household with children
## household without children           NA           0.00092
## household with children           0.00092           NA
##
##
##
## $hh_sn_65_bi
## $hh_sn_65_bi$plot
```



```
##
## $hh_sn_65_bi$p.values
## $hh_sn_65_bi$p.values$stress_bi
##           household with seniors household without seniors
## household with seniors              NA              5.4e-17
## household without seniors          5.4e-17              NA
##
##
##
## $inc_dist
## $inc_dist$plot
```



```
##
## $inc_dist$p.values
## $inc_dist$p.values$stress_bi
##
## at or above 2020 median income
## at or above 2020 median income NA
## below 2020 median income 3.5e-04
## below 2020 poverty line 1.4e-09
##
## below 2020 median income below 2020 poverty line
## at or above 2020 median income 0.00035 1.4e-09
## below 2020 median income NA NA
## below 2020 poverty line NA NA
```

## 4.9 - 4.12

**4.9) People who rated government response poorly were more likely to score higher than average on the mental health score.**

1. Find proportion of population who rated government services below average
2. Find mental health score amongst people who rated government services below average as compared to those who rated government services above average.



#### 4.10) People who are currently unemployed are more likely to score higher than average on the mental health score

1. Find respondents who are currently unemployed [15]
  - a. Find proportion of subset that scored higher than average on the mental health score [38]
  - b. Find proportion not in subset and compare (test unequal proportions)

#### 4.11) People who have experienced abuse or violence are more likely to score higher than average on the mental health score

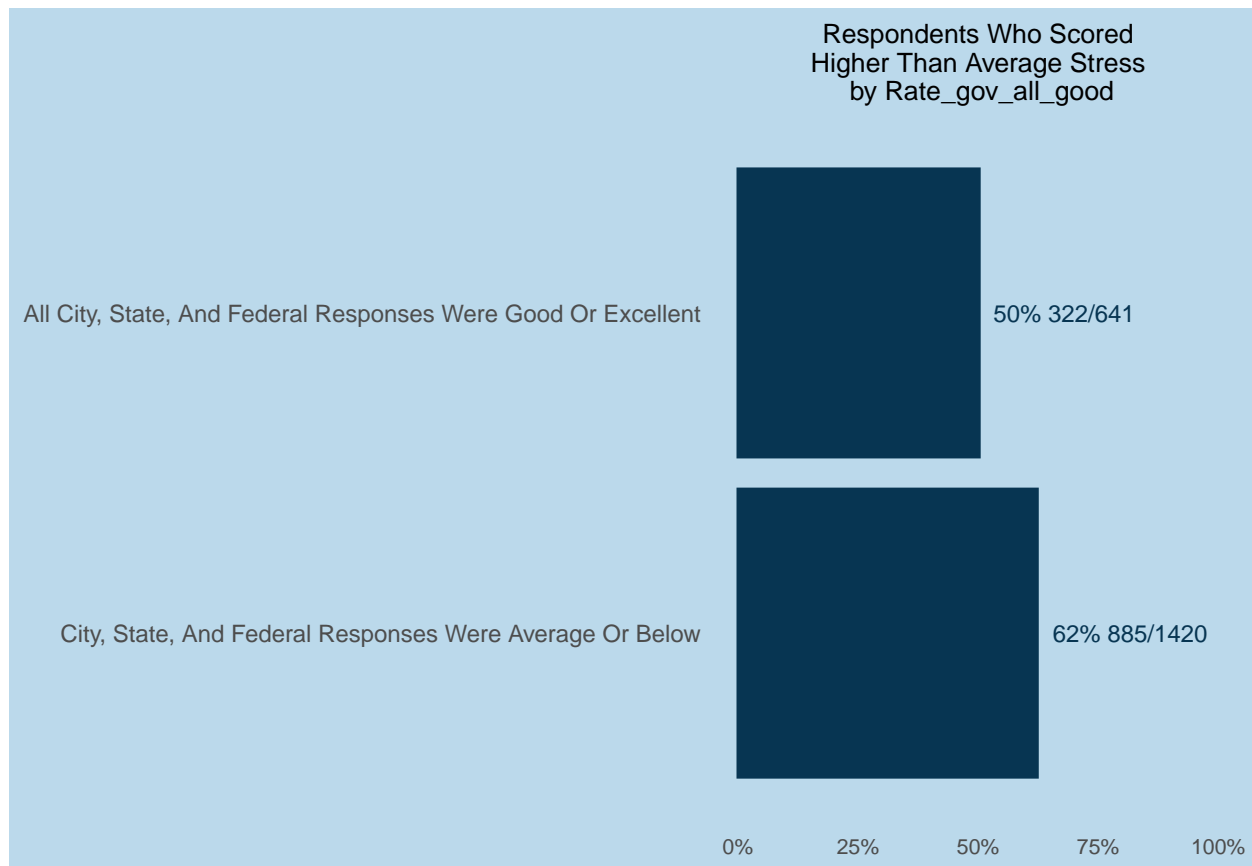
1. Run binary distribution over population [36]
  - a. Yes = experienced verbal abuse or physical abuse
  - b. No = has not experienced any abuse or violence
2. Find respondents who have experienced violence or abuse
  - a. Find proportion of subset that scored higher than average on the mental health score [38]
  - b. Find proportion not in subset and compare (test unequal proportions)

#### 4.12) People who have been discriminated against are more likely to score higher than average on the mental health score

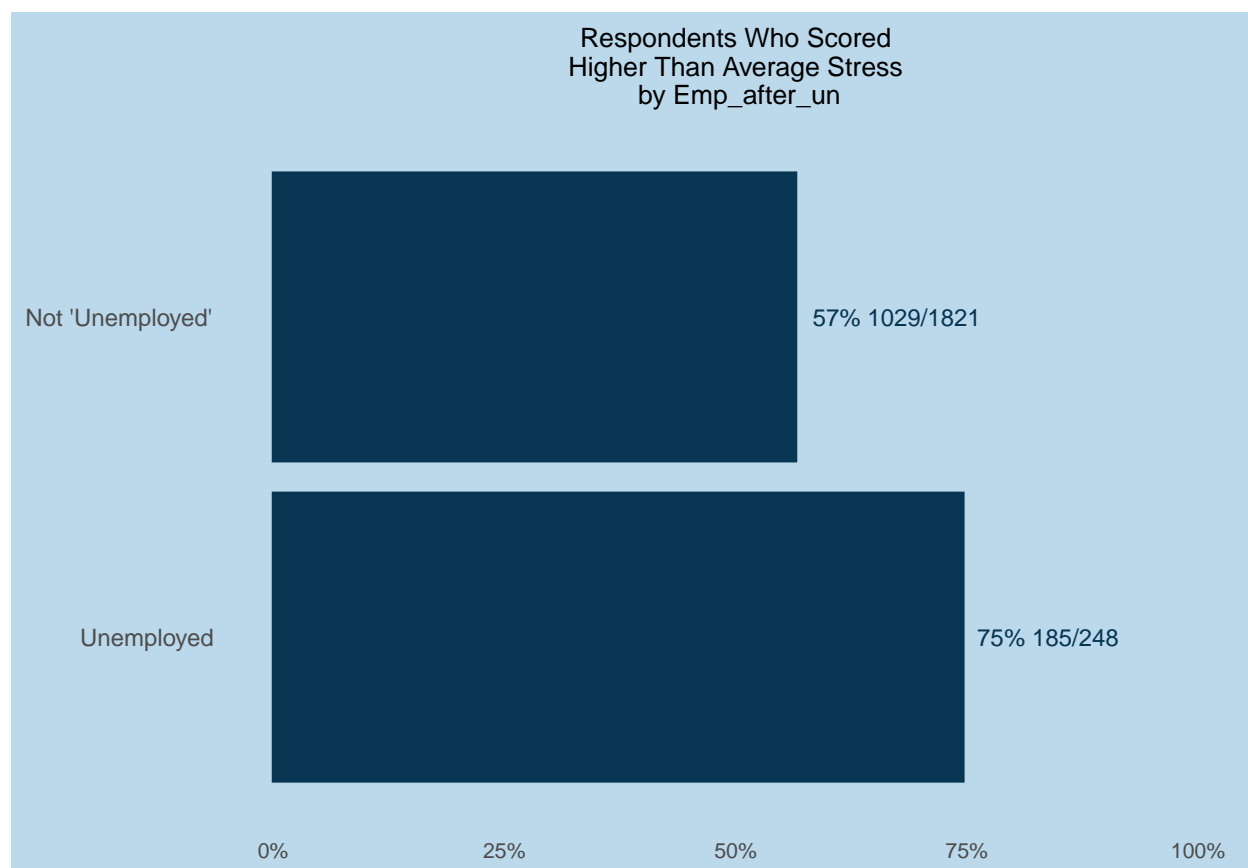
1. Find respondents who have been discriminated against [37]
  - a. Find proportion of subset that scored higher than average on the mental health score [38]
  - b. Find proportion not in subset and compare (test unequal proportions)

```
make_plots(wrangled,
  c(
    # 4.9
    "rate_gov_all_good", "rate_gov_all_bad",
    # 4.10
    "emp_after_un",
    # 4.11
    "exp_ab_or_vi",
    "exp_ab_and_vi",
    # 4.12
    "discrim_bi"),
  "stress_bi", title = "Respondents who scored\nhigher than average stress\n")

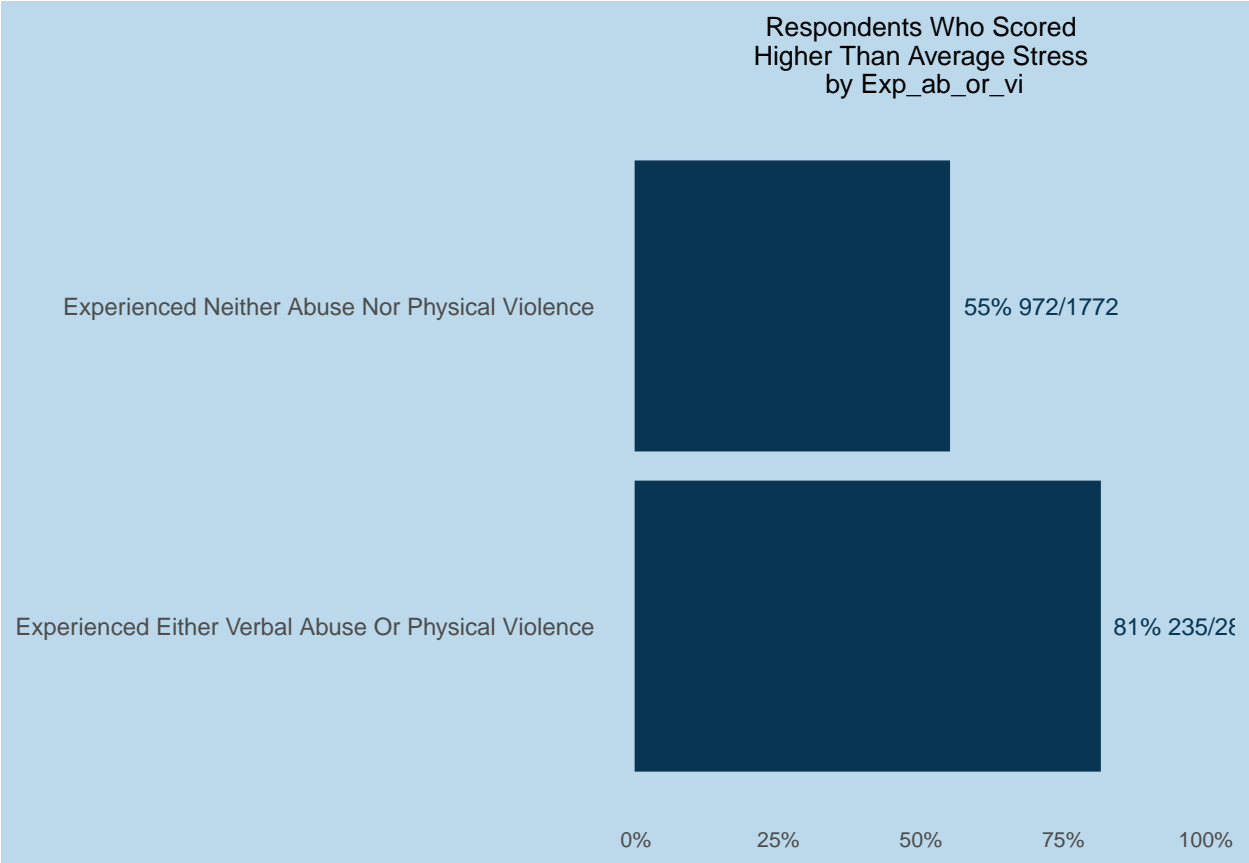
## $rate_gov_all_good
## $rate_gov_all_good$plot
```



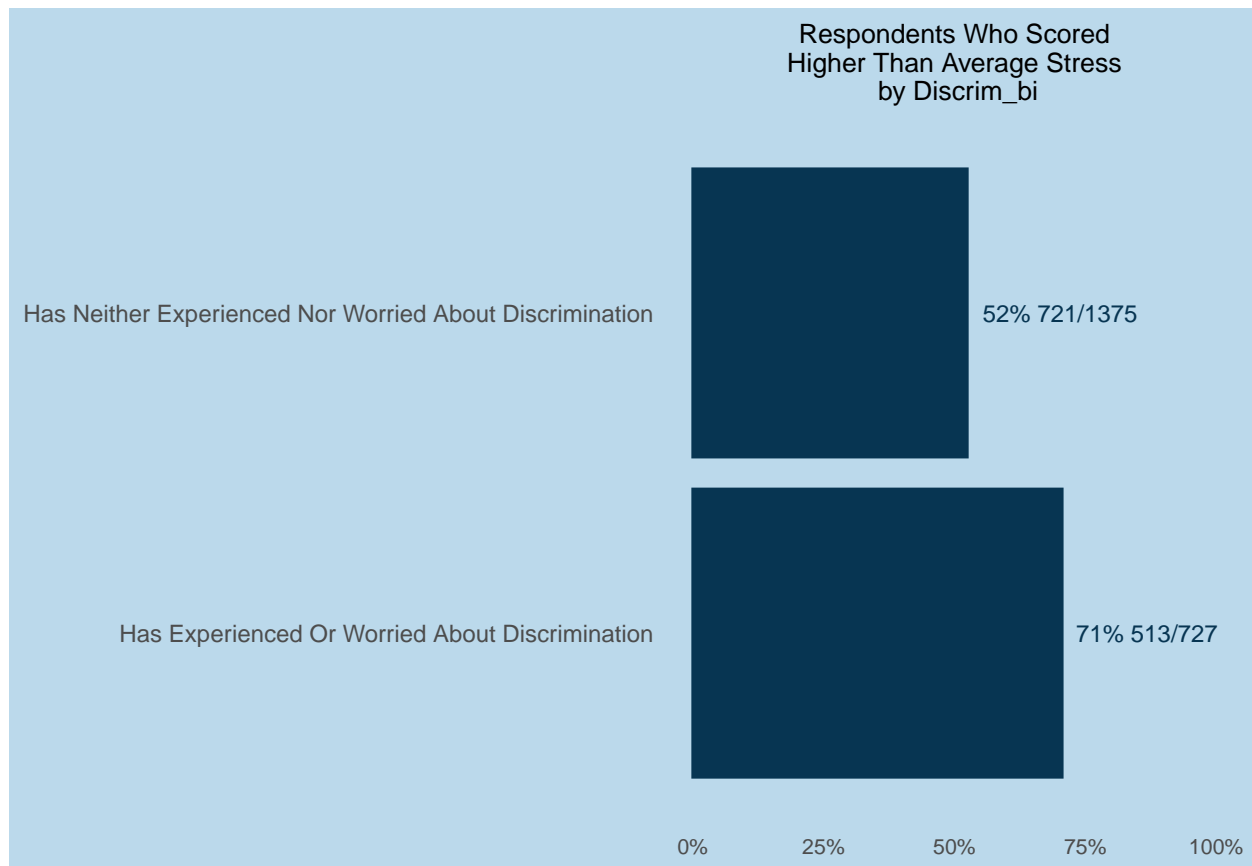
```
##
## $rate_gov_all_good$p.values
## $rate_gov_all_good$p.values$stress_bi
## all city, state, and federal responses
## all city, state, and federal responses were good or excellent
## city, state, and federal responses were average or below
## all city, state, and federal responses were good or excellent
## city, state, and federal responses were average or below
##
##
## $rate_gov_all_bad
## NULL
##
## $emp_after_un
## $emp_after_un$plot
```



```
##
## $emp_after_un$p.values
## $emp_after_un$p.values$stress_bi
##           not 'unemployed' unemployed
## not 'unemployed'           NA      8.4e-08
## unemployed           8.4e-08           NA
##
##
##
## $exp_ab_or_vi
## $exp_ab_or_vi$plot
```



```
##
## $exp_ab_or_vi$p.values
## $exp_ab_or_vi$p.values$stress_bi
##
## experienced neither abuse nor physical violence NA
## experienced either verbal abuse or physical violence 4.3e-17
## experienced neither abuse nor physical violence experienced either verbal abuse or physical vio. 4.3e-17
## experienced either verbal abuse or physical violence
##
##
## $exp_ab_and_vi
## NULL
##
## $discrim_bi
## $discrim_bi$plot
```



```
##
## $discrim_bi$p.values
## $discrim_bi$p.values$stress_bi
## has neither experienced nor worried about discrimination
## has experienced or worried about discrimination
## has neither experienced nor worried about discrimination
## has experienced or worried about discrimination
## has neither experienced nor worried about discrimination
## has experienced or worried about discrimination
```

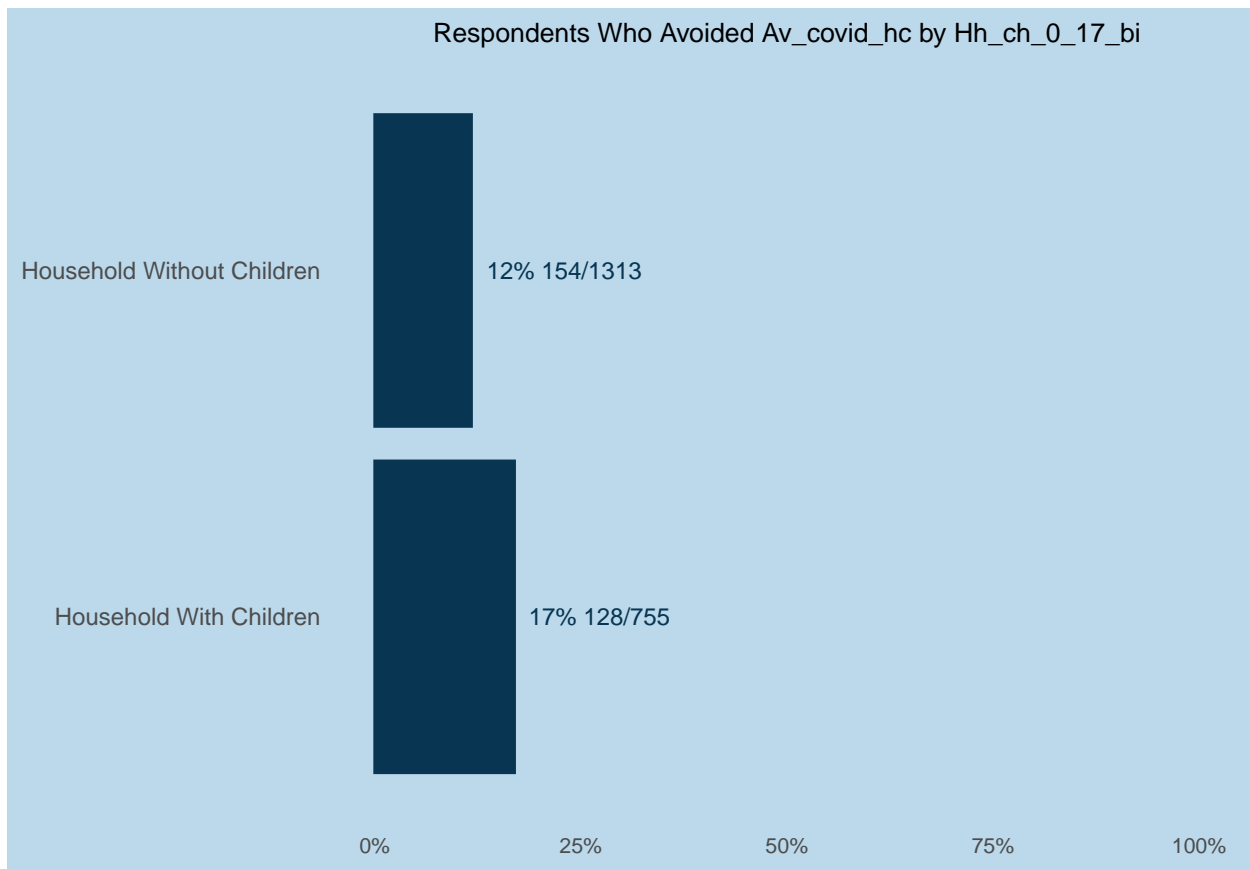
#### 4.13) Run distribution over each activity which has been avoided because of Covid-19

1. Find respondents who avoided any activity because of Covid-19
2. Run sub demographic distribution over each activity

```
av_covid <- wrangled %>% select(starts_with("av_covid_") & !ends_with("text")) %>% colnames
lapply(av_covid, function(var) {
  make_plots(wrangled, demographics, var, title = glue::glue("Respondents who avoided {var}"))
})
```

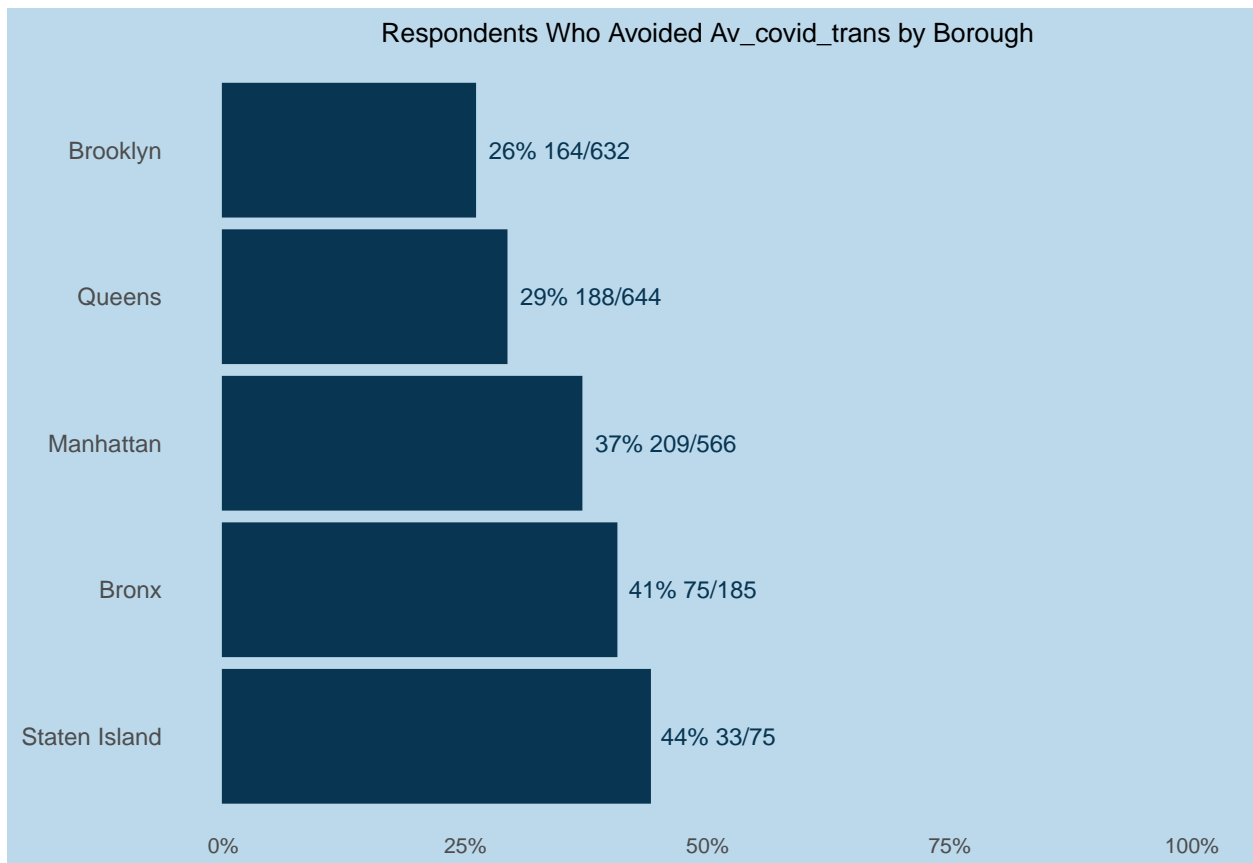
```
## [[1]]
```

```
## [[1]]$borough
## NULL
##
## [[1]]$gen
## NULL
##
## [[1]]$race_census
## NULL
##
## [[1]]$hh_ch_0_17_bi
## [[1]]$hh_ch_0_17_bi$plot
```

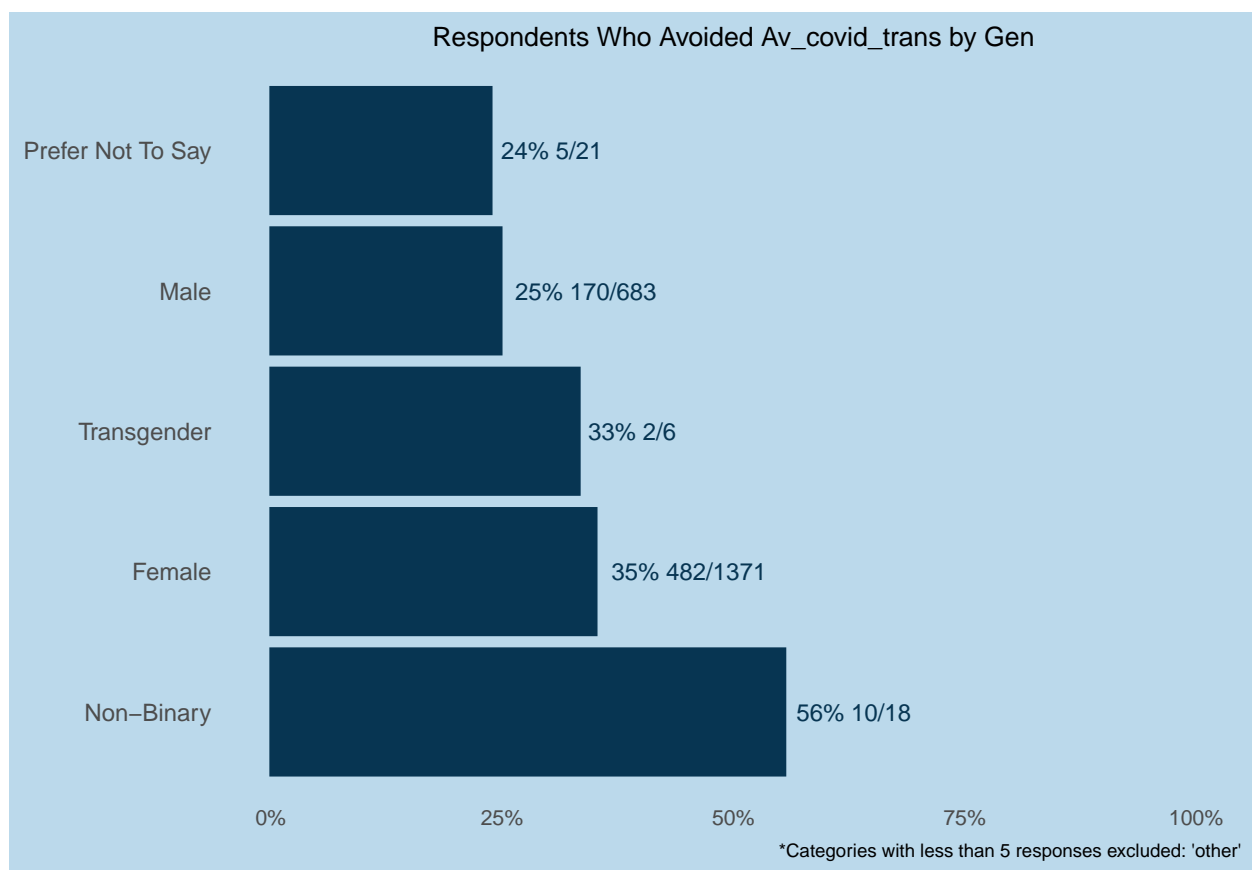


```
##
## [[1]]$hh_ch_0_17_bi$p.values
## [[1]]$hh_ch_0_17_bi$p.values$av_covid_hc
## household without children household with children
## household without children NA 0.0011
## household with children 0.0011 NA
##
##
##
## [[1]]$hh_sn_65_bi
## NULL
##
## [[1]]$inc_dist
```

```
## NULL
##
##
## [[2]]
## [[2]]$borough
## NULL
##
## [[2]]$gen
## NULL
##
## [[2]]$race_census
## NULL
##
## [[2]]$hh_ch_0_17_bi
## NULL
##
## [[2]]$hh_sn_65_bi
## NULL
##
## [[2]]$inc_dist
## NULL
##
##
## [[3]]
## [[3]]$borough
## [[3]]$borough$plot
```



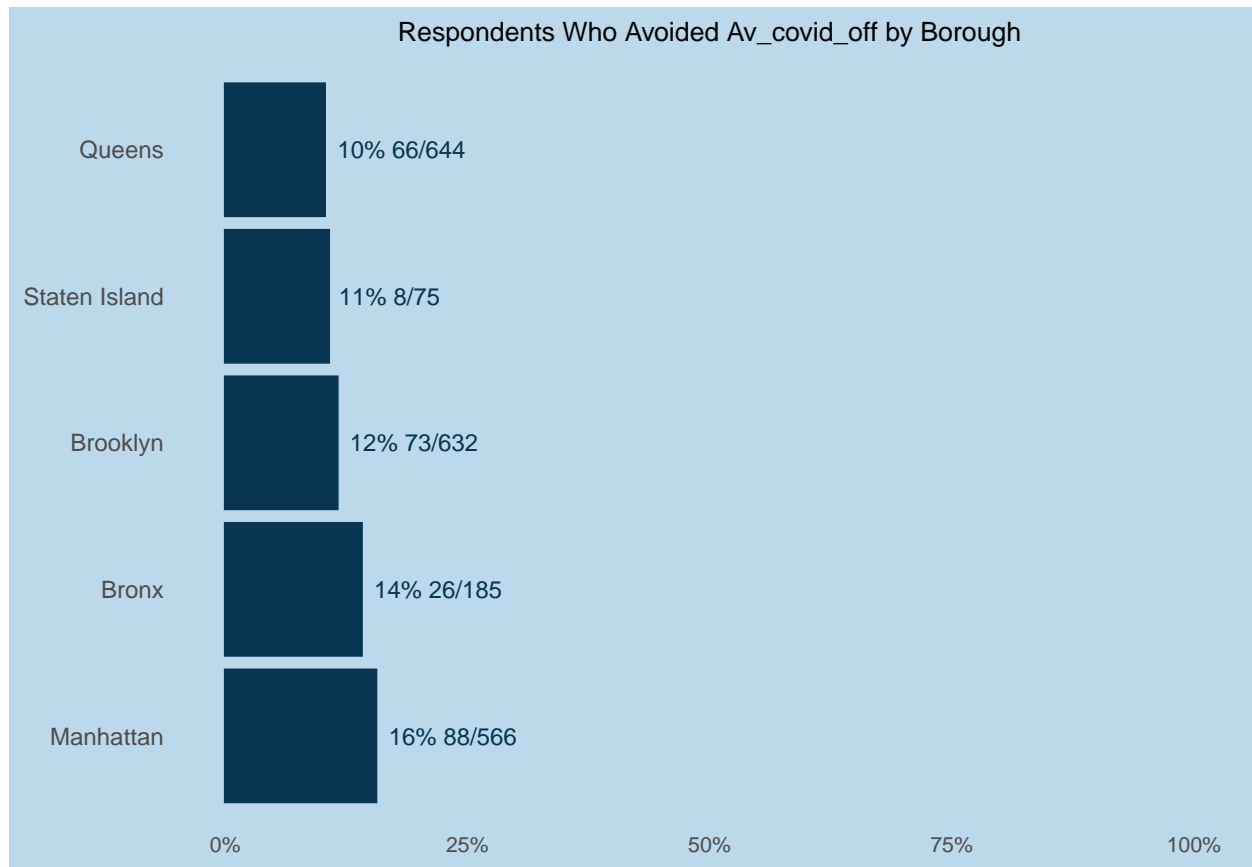
```
##
## [[3]]$borough$p.values
## [[3]]$borough$p.values$av_covid_trans
##          brooklyn queens manhattan  bronx staten island
## brooklyn          NA     NA  5.5e-05 0.00018          0.0016
## queens            NA     NA  5.2e-03 0.00460          NA
## manhattan        5.5e-05 0.0052          NA     NA          NA
## bronx             1.8e-04 0.0046          NA     NA          NA
## staten island    1.6e-03     NA          NA     NA          NA
##
##
##
## [[3]]$gen
## [[3]]$gen$plot
```



```
##
## [[3]]$gen$p.values
## [[3]]$gen$p.values$av_covid_trans
##          prefer not to say  male transgender  female non-binary
## prefer not to say          NA     NA          NA     NA          NA
## male                      NA     NA          NA 3.2e-06          NA
## transgender                NA     NA          NA     NA          NA
## female                    NA 3.2e-06          NA     NA          NA
## non-binary                 NA     NA          NA     NA          NA
##
```



```
##
##
## [[3]]$race_census
## NULL
##
## [[3]]$hh_ch_0_17_bi
## NULL
##
## [[3]]$hh_sn_65_bi
## NULL
##
## [[3]]$inc_dist
## NULL
##
##
## [[4]]
## [[4]]$borough
## [[4]]$borough$plot
```

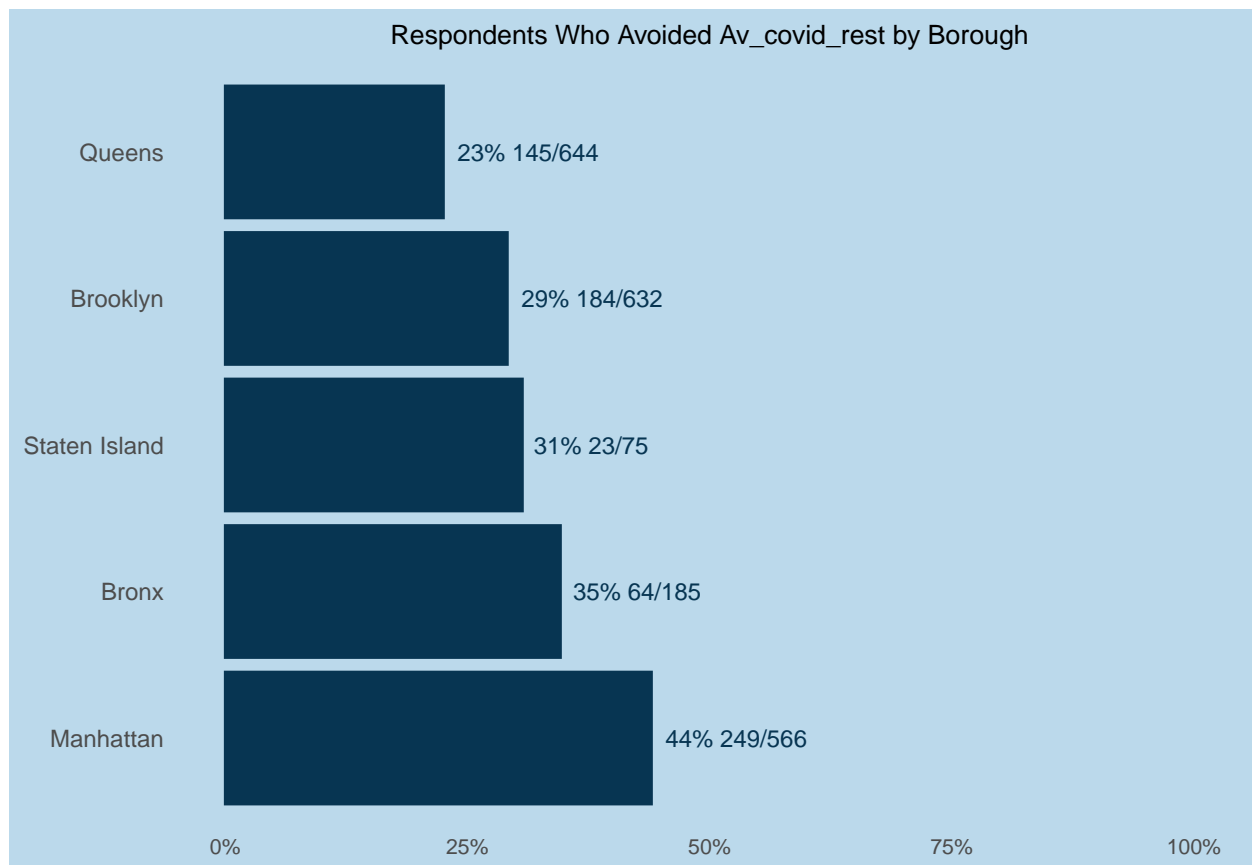


```
##
## [[4]]$borough$p.values
## [[4]]$borough$p.values$av_covid_off
##               queens staten island brooklyn bronx manhattan
## queens             NA             NA      NA      NA      0.0075
## staten island       NA             NA      NA      NA           NA
```

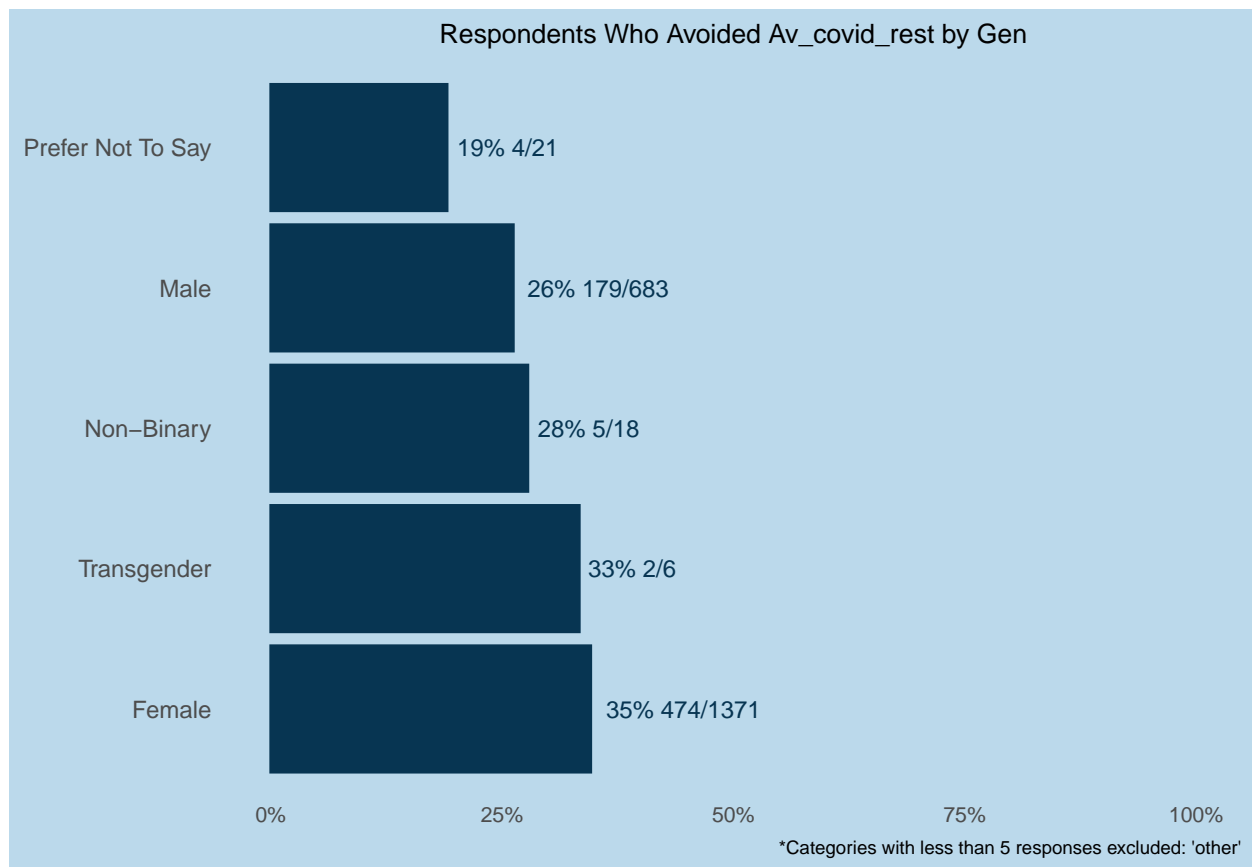
```

## brooklyn      NA      NA      NA      NA      NA
## bronx         NA      NA      NA      NA      NA
## manhattan     0.0075   NA      NA      NA      NA
##
##
##
## [[4]]$gen
## NULL
##
## [[4]]$race_census
## NULL
##
## [[4]]$hh_ch_0_17_bi
## NULL
##
## [[4]]$hh_sn_65_bi
## NULL
##
## [[4]]$inc_dist
## NULL
##
##
## [[5]]
## [[5]]$borough
## [[5]]$borough$plot

```

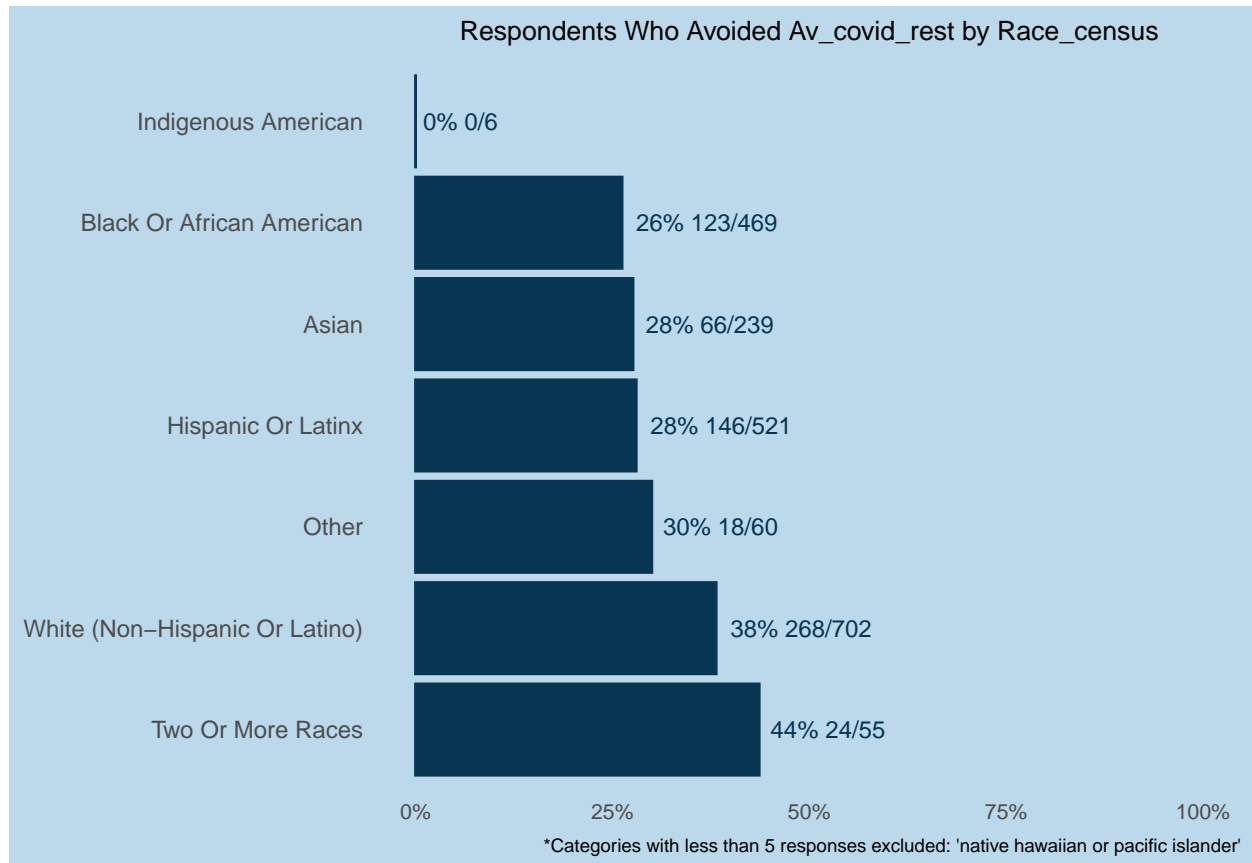


```
##
## [[5]]$borough$p.values
## [[5]]$borough$p.values$av_covid_rest
##           queens brooklyn staten island  bronx manhattan
## queens           NA  8.5e-03           NA 0.0012  2.9e-15
## brooklyn        8.5e-03      NA           NA   NA  1.2e-07
## staten island    NA      NA           NA   NA   NA
## bronx           1.2e-03      NA           NA   NA   NA
## manhattan       2.9e-15  1.2e-07           NA   NA   NA
##
##
##
## [[5]]$gen
## [[5]]$gen$plot
```



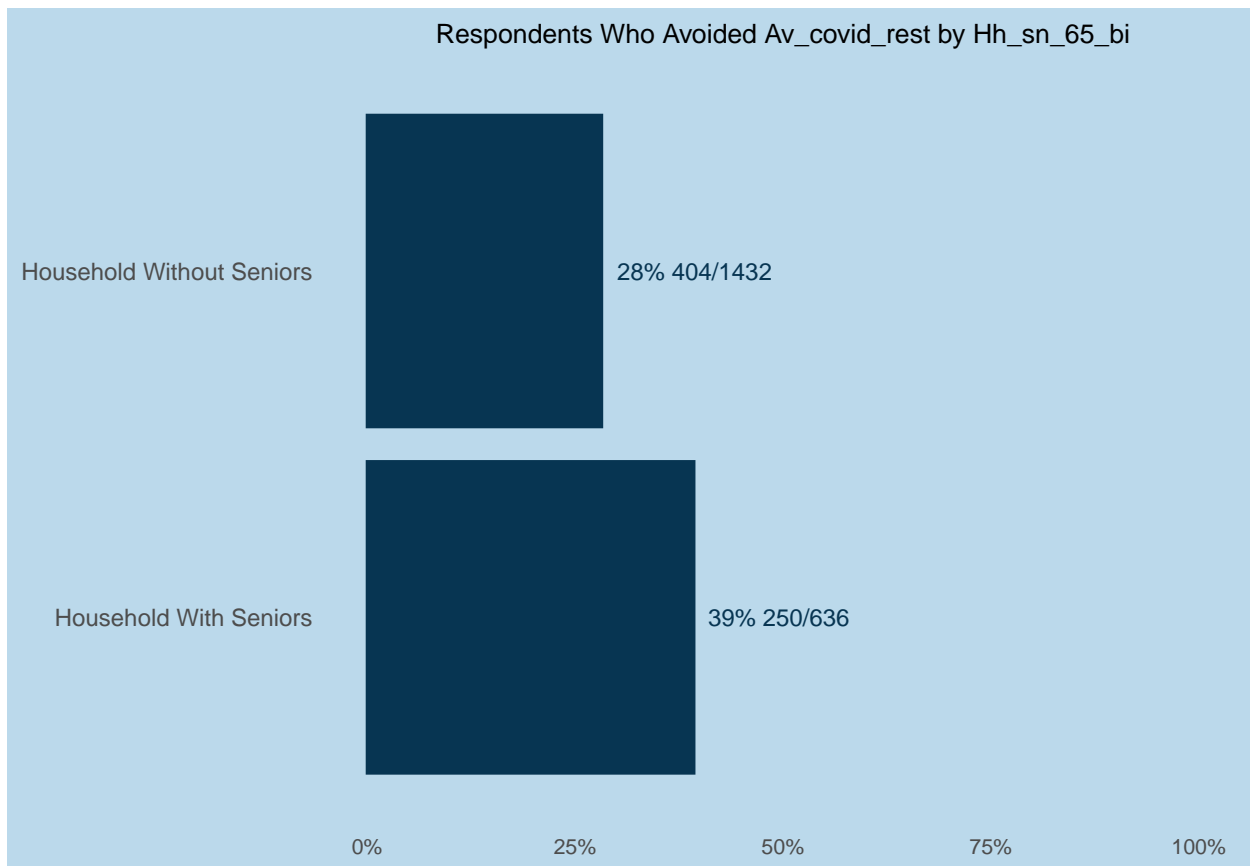
```
##
## [[5]]$gen$p.values
## [[5]]$gen$p.values$av_covid_rest
##           prefer not to say  male non-binary transgender  female
## prefer not to say           NA    NA      NA      NA      NA
## male                     NA    NA      NA      NA 0.00015
## non-binary               NA    NA      NA      NA      NA
## transgender              NA    NA      NA      NA      NA
## female                   NA 0.00015      NA      NA      NA
##
```

```
##
##
## [[5]]$race_census
## [[5]]$race_census$plot
```



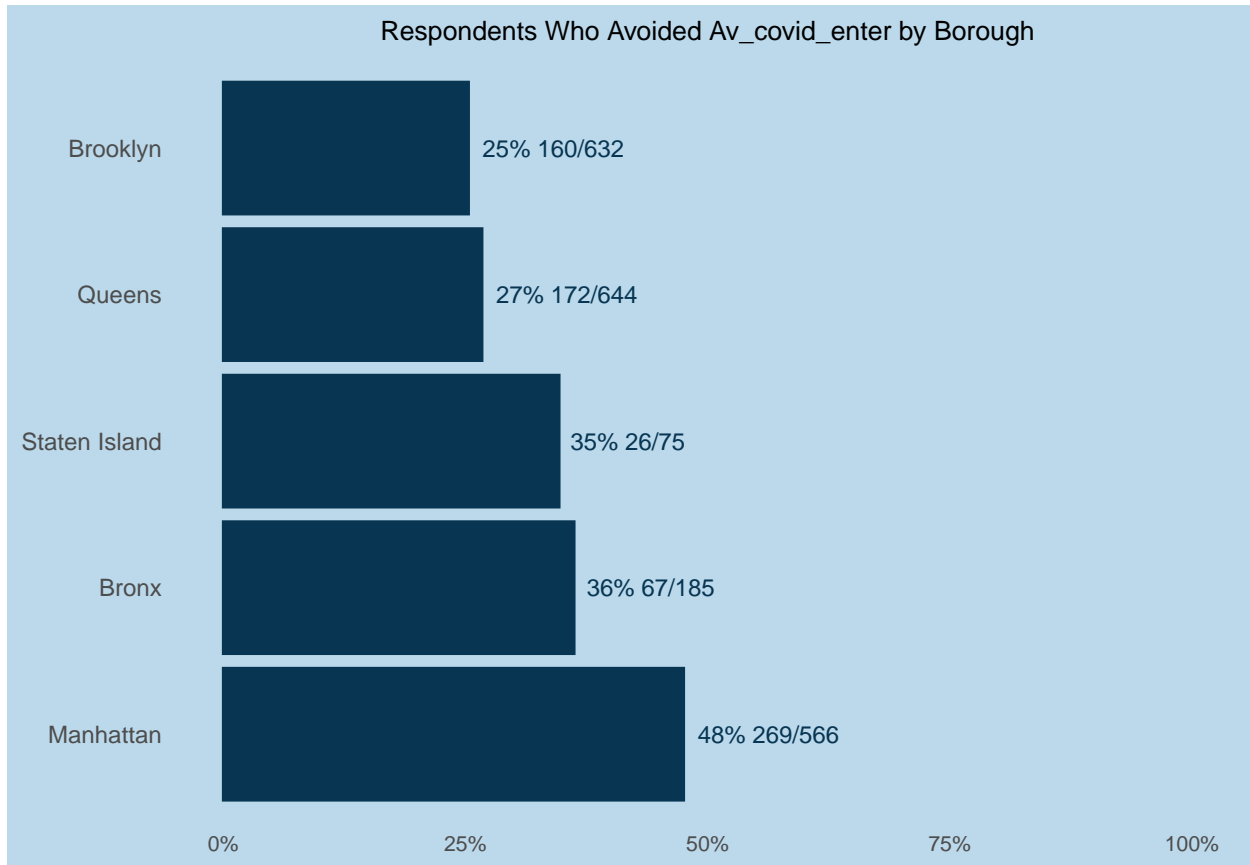
```
##
## [[5]]$race_census$p.values
## [[5]]$race_census$p.values$av_covid_rest
##
##               Indigenous American black or african american
## Indigenous American                NA                      NA
## black or african american            NA                      NA
## asian                               NA                      NA
## hispanic or latinx                   NA                      NA
## other                               NA                      NA
## white (non-hispanic or latino)       NA                    2.8e-05
## two or more races                    NA                    1.0e-02
##
##               asian hispanic or latinx other
## Indigenous American                NA      NA      NA
## black or african american            NA      NA      NA
## asian                               NA      NA      NA
## hispanic or latinx                   NA      NA      NA
## other                               NA      NA      NA
## white (non-hispanic or latino) 0.0041      0.00026    NA
## two or more races              NA          NA      NA
##
##               white (non-hispanic or latino) two or more races
```

```
## Indigenous American          NA          NA
## black or african american    2.8e-05      0.01
## asian                        4.1e-03      NA
## hispanic or latinx           2.6e-04      NA
## other                        NA          NA
## white (non-hispanic or latino) NA          NA
## two or more races            NA          NA
##
##
##
## [[5]]$hh_ch_0_17_bi
## NULL
##
## [[5]]$hh_sn_65_bi
## [[5]]$hh_sn_65_bi$plot
```

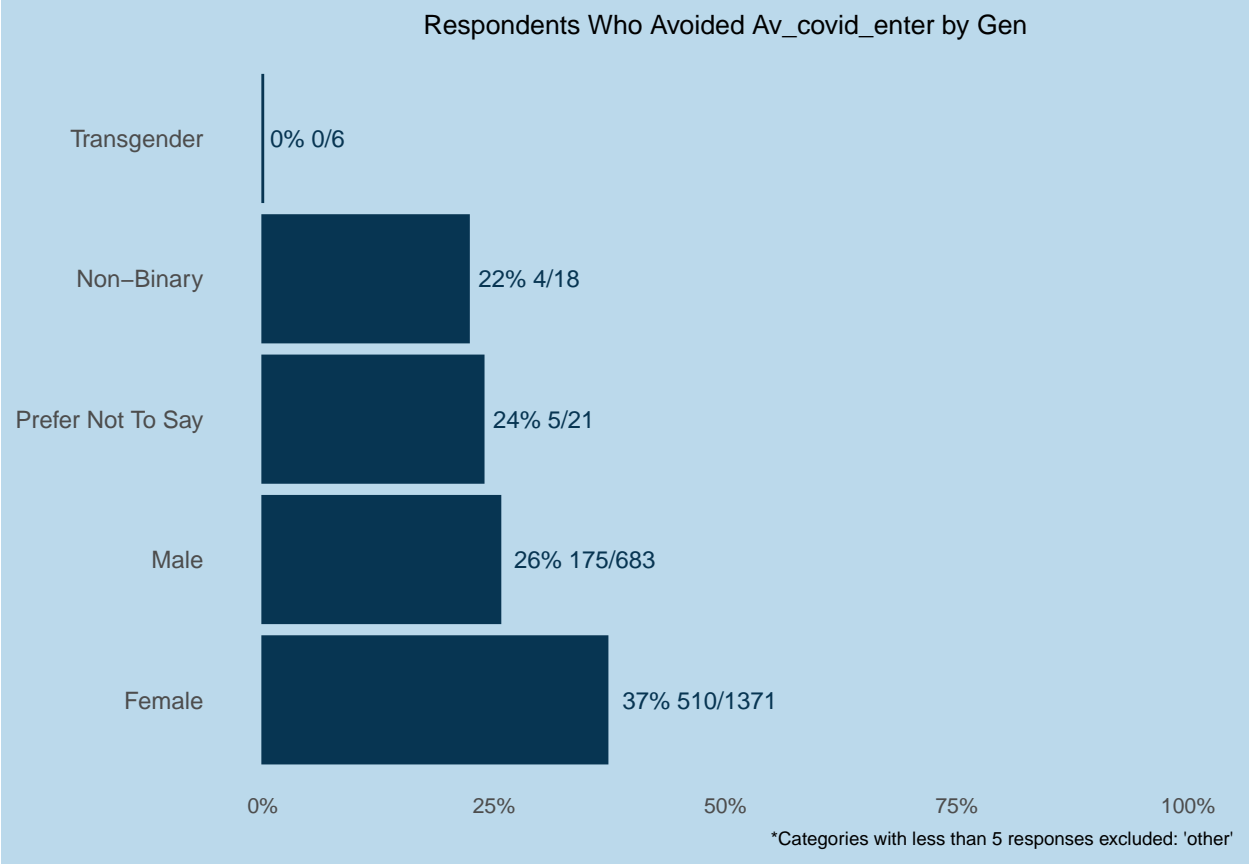


```
##
## [[5]]$hh_sn_65_bi$p.values
## [[5]]$hh_sn_65_bi$p.values$av_covid_rest
## household without seniors household with seniors
## household without seniors          NA          7.2e-07
## household with seniors              7.2e-07          NA
##
##
##
```

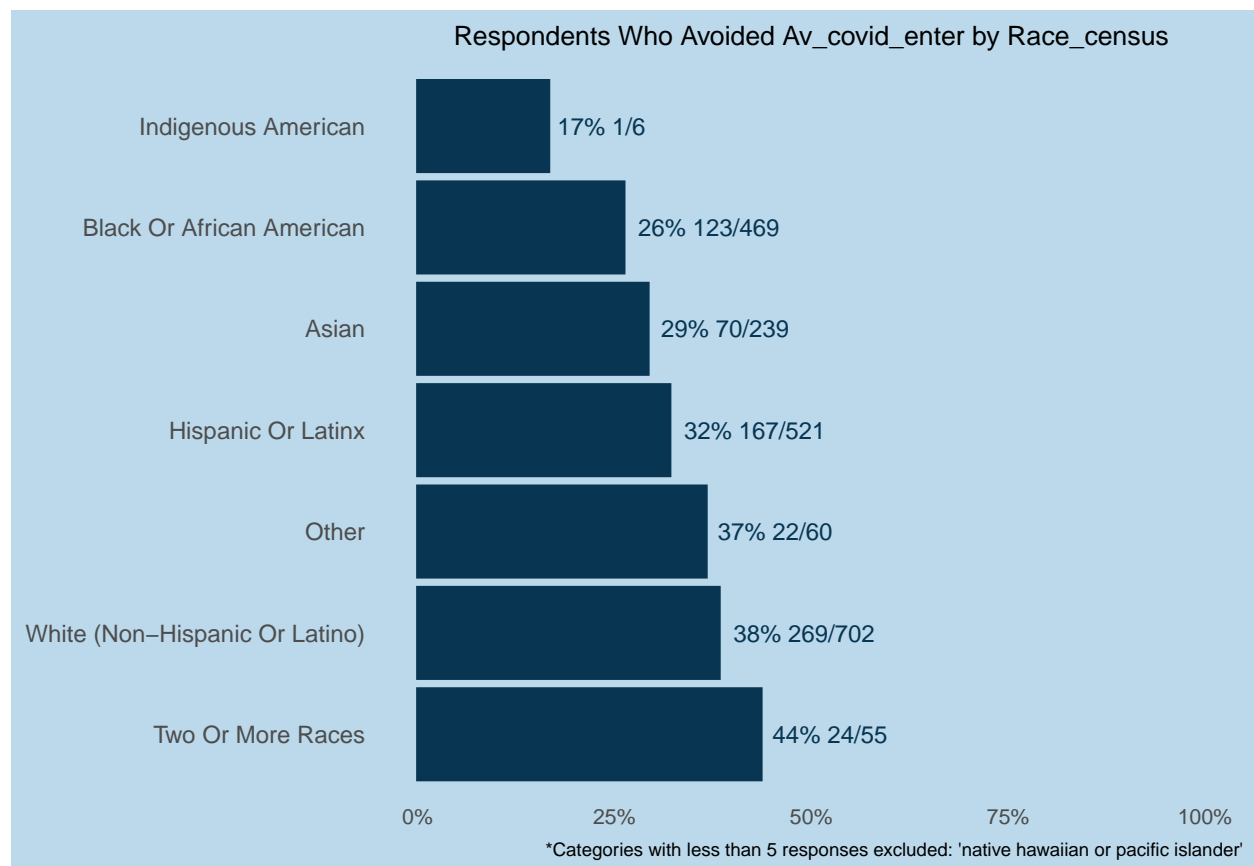
```
## [[5]]$inc_dist
## NULL
##
##
## [[6]]
## [[6]]$borough
## [[6]]$borough$plot
```



```
##
## [[6]]$borough$p.values
## [[6]]$borough$p.values$av_covid_enter
##
##      brooklyn  queens  staten island  bronx  manhattan
## brooklyn      NA      NA              NA 0.0048  1.9e-15
## queens        NA      NA              NA  NA    9.5e-14
## staten island  NA      NA              NA  NA     NA
## bronx          4.8e-03  NA              NA  NA    9.3e-03
## manhattan      1.9e-15  9.5e-14          NA 0.0093  NA
##
##
##
## [[6]]$gen
## [[6]]$gen$plot
```



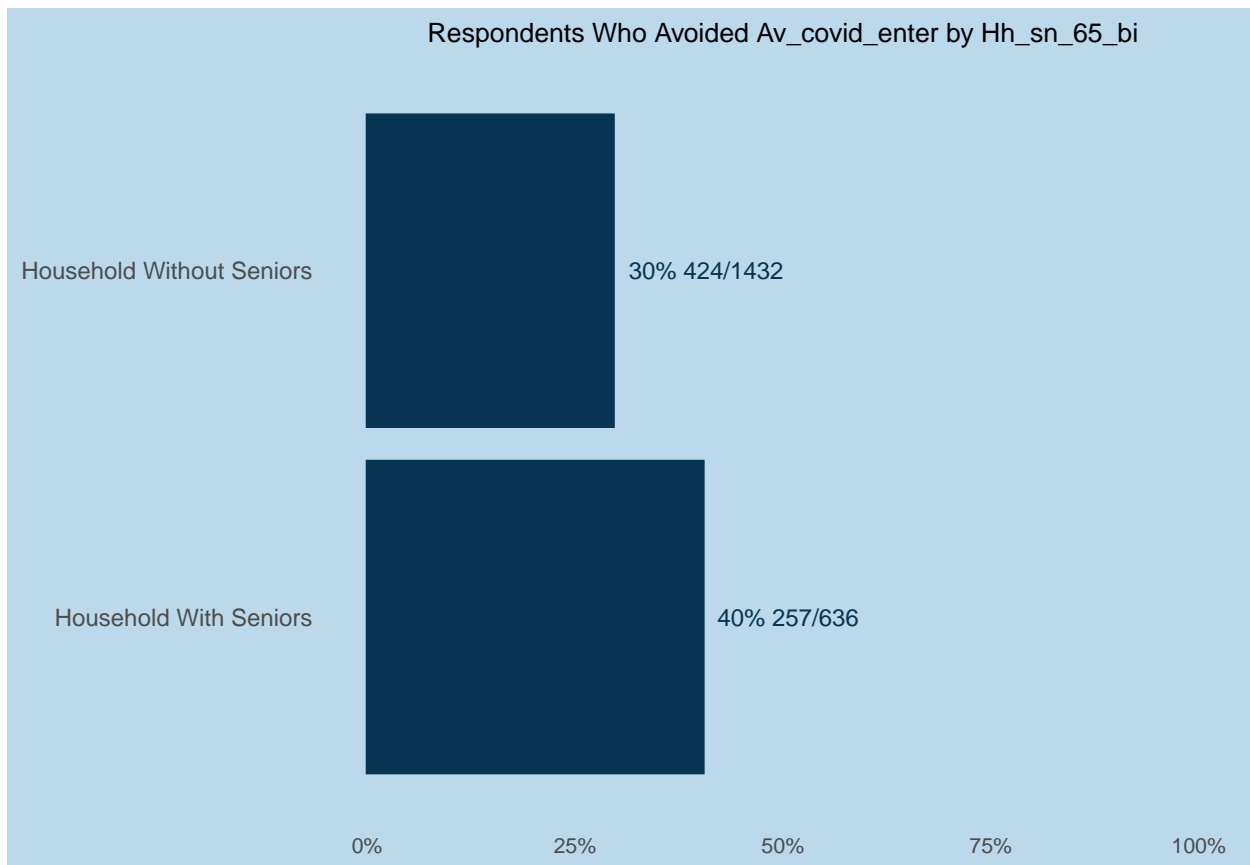
```
##
## [[6]]$gen$p.values
## [[6]]$gen$p.values$av_covid_enter
##               transgender non-binary prefer not to say    male  female
## transgender              NA      NA              NA      NA      NA
## non-binary                NA      NA              NA      NA      NA
## prefer not to say         NA      NA              NA      NA      NA
## male                      NA      NA              NA      NA  2.1e-07
## female                    NA      NA              NA  2.1e-07      NA
##
##
##
## [[6]]$race_census
## [[6]]$race_census$plot
```



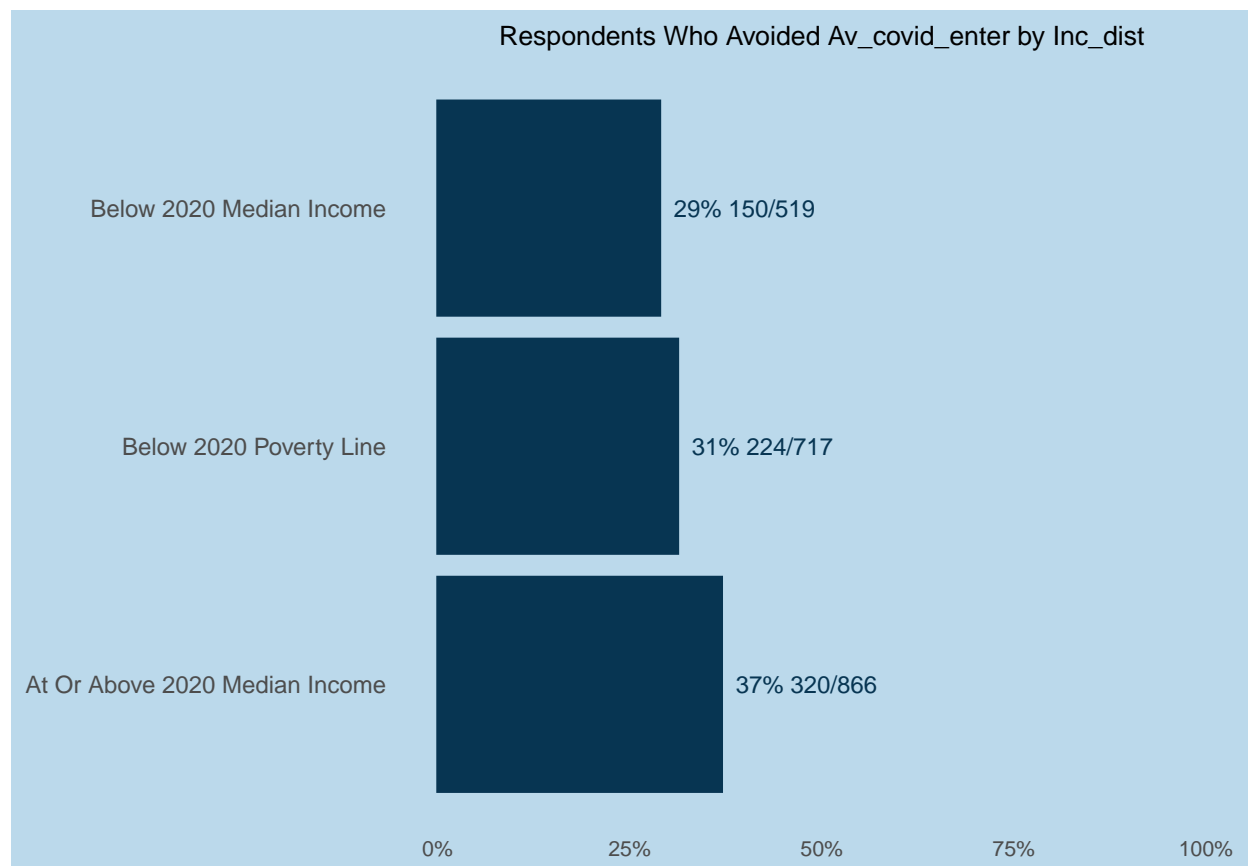
```
##
## [[6]]$race_census$p.values
## [[6]]$race_census$p.values$av_covid_enter
##               Indigenous American black or african american
## Indigenous American                NA                      NA
## black or african american          NA                      NA
## asian                             NA                      NA
## hispanic or latinx                 NA                      NA
## other                             NA                      NA
## white (non-hispanic or latino)     NA                    2.3e-05
## two or more races                  NA                    1.0e-02
##               asian hispanic or latinx other
## Indigenous American          NA          NA    NA
## black or african american     NA          NA    NA
## asian                         NA          NA    NA
## hispanic or latinx            NA          NA    NA
## other                         NA          NA    NA
## white (non-hispanic or latino) NA          NA    NA
## two or more races             NA          NA    NA
##               white (non-hispanic or latino) two or more races
## Indigenous American                NA                      NA
## black or african american          2.3e-05                  0.01
## asian                             NA                      NA
## hispanic or latinx                 NA                      NA
## other                             NA                      NA
## white (non-hispanic or latino)     NA                      NA
```



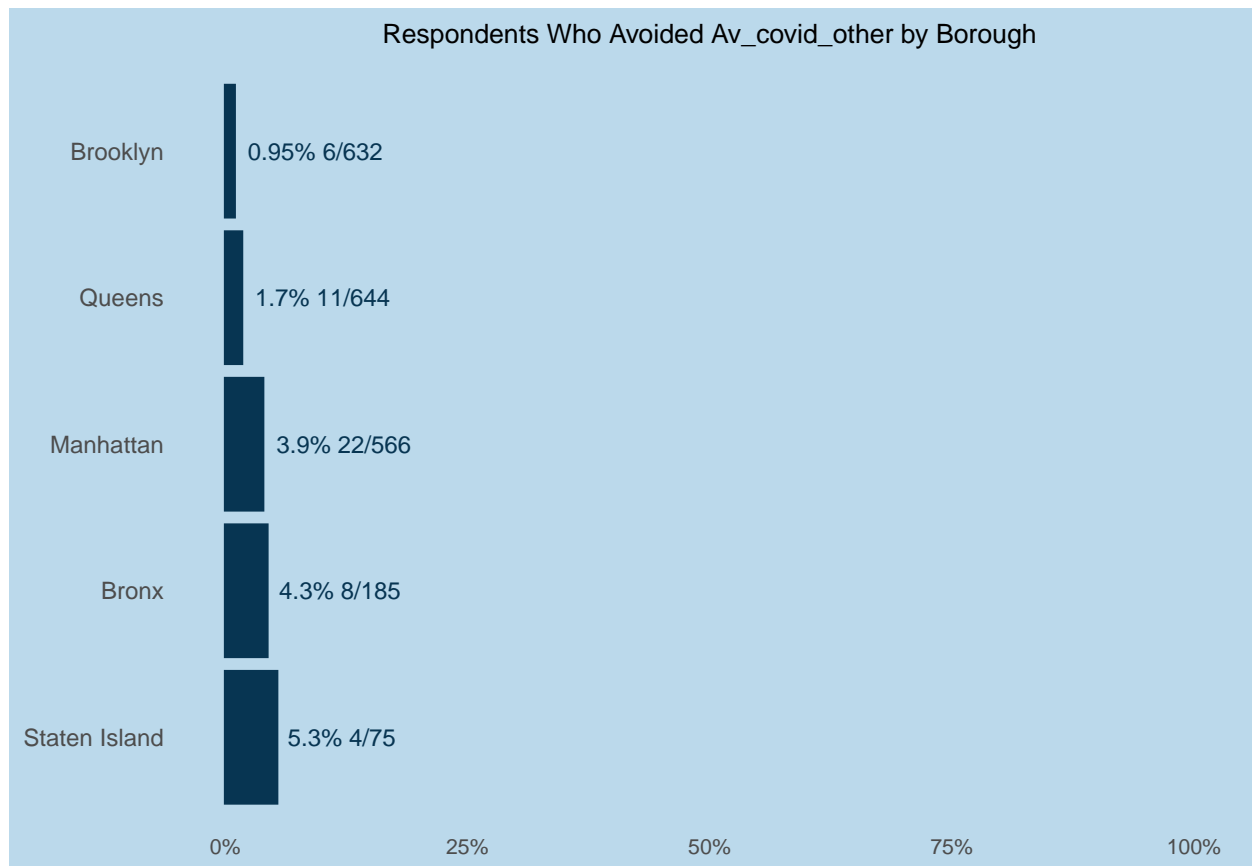
```
## two or more races
##
##
##
## [[6]]$hh_ch_0_17_bi
## NULL
##
## [[6]]$hh_sn_65_bi
## [[6]]$hh_sn_65_bi$plot
```



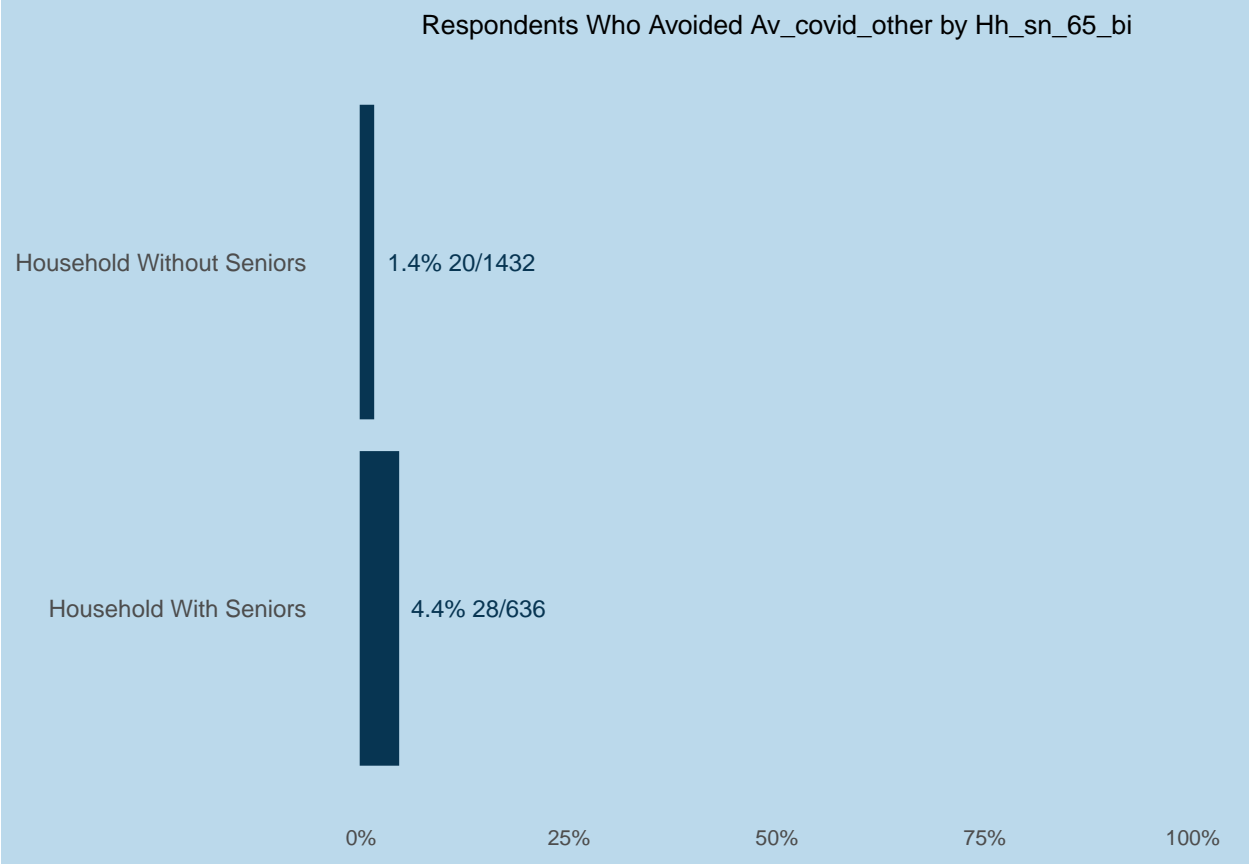
```
##
## [[6]]$hh_sn_65_bi$p.values
## [[6]]$hh_sn_65_bi$p.values$av_covid_enter
## household without seniors household with seniors
## household without seniors NA 1.8e-06
## household with seniors 1.8e-06 NA
##
##
##
## [[6]]$inc_dist
## [[6]]$inc_dist$plot
```



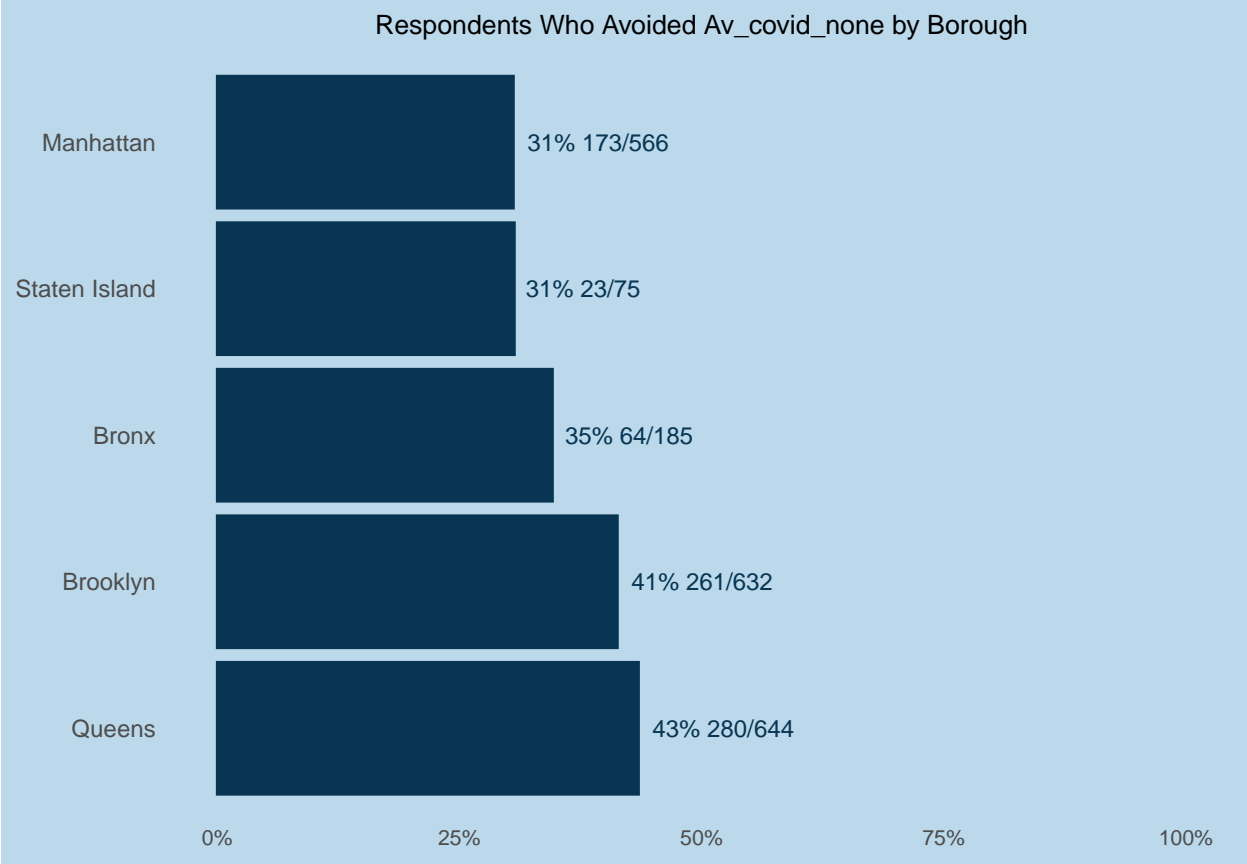
```
##
## [[6]]$inc_dist$p.values
## [[6]]$inc_dist$p.values$av_covid_enter
##
##          below 2020 median income below 2020 poverty line
## below 2020 median income          NA          NA
## below 2020 poverty line          NA          NA
## at or above 2020 median income    0.0027          NA
##
##          at or above 2020 median income
## below 2020 median income          0.0027
## below 2020 poverty line          NA
## at or above 2020 median income          NA
##
##
##
##
## [[7]]
## [[7]]$borough
## [[7]]$borough$plot
```



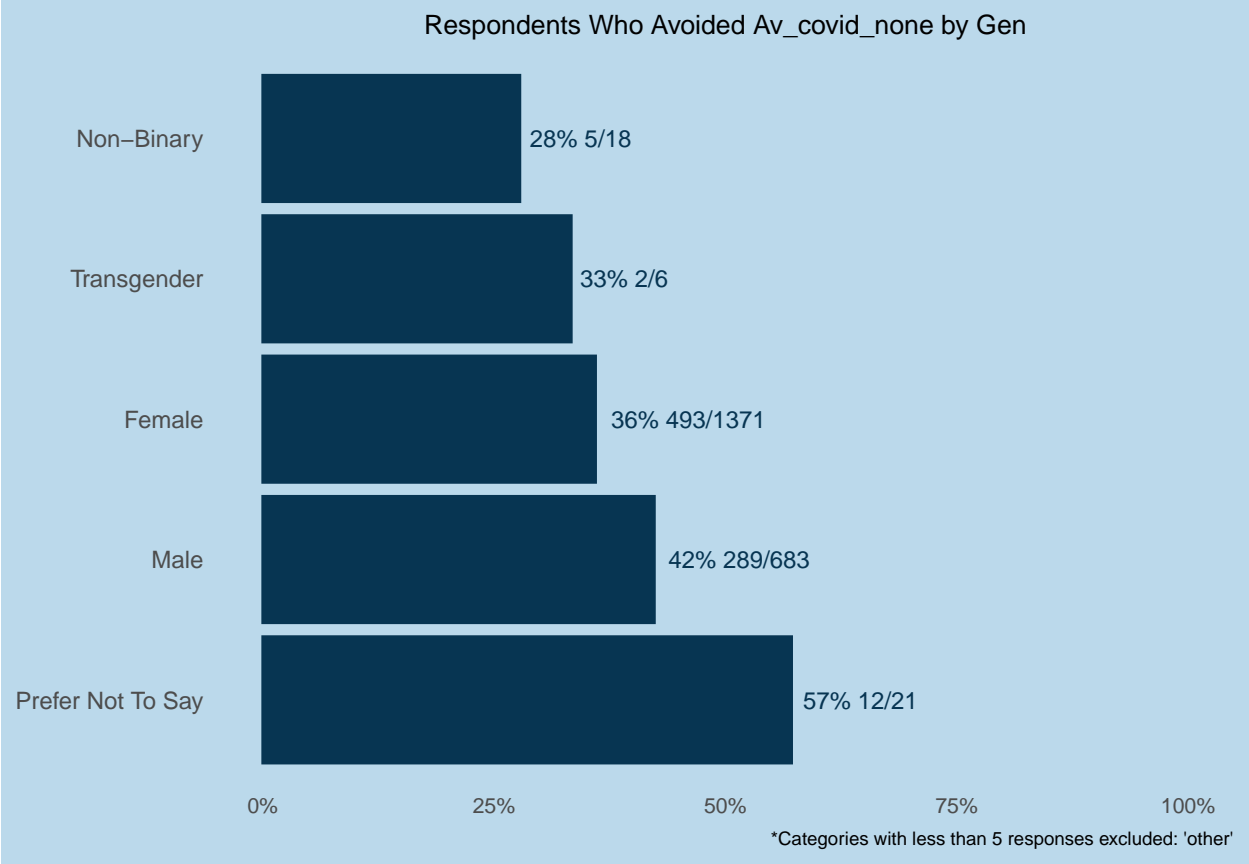
```
##
## [[7]]$borough$p.values
## [[7]]$borough$p.values$av_covid_other
##               brooklyn queens manhattan bronx staten island
## brooklyn          NA      NA      0.0015    NA          NA
## queens            NA      NA          NA    NA          NA
## manhattan         0.0015    NA          NA    NA          NA
## bronx             NA      NA          NA    NA          NA
## staten island     NA      NA          NA    NA          NA
##
##
##
## [[7]]$gen
## NULL
##
## [[7]]$race_census
## NULL
##
## [[7]]$hh_ch_0_17_bi
## NULL
##
## [[7]]$hh_sn_65_bi
## [[7]]$hh_sn_65_bi$plot
```



```
##
## [[7]]$hh_sn_65_bi$p.values
## [[7]]$hh_sn_65_bi$p.values$av_covid_other
##           household without seniors household with seniors
## household without seniors           NA           5.6e-05
## household with seniors           5.6e-05           NA
##
##
##
## [[7]]$inc_dist
## NULL
##
##
## [[8]]
## [[8]]$borough
## [[8]]$borough$plot
```



```
##
## [[8]]$borough$p.values
## [[8]]$borough$p.values$av_covid_none
##      manhattan staten island bronx brooklyn queens
## manhattan      NA           NA   NA  0.00015 4.8e-06
## staten island    NA           NA   NA       NA    NA
## bronx            NA           NA   NA       NA    NA
## brooklyn         1.5e-04       NA   NA       NA    NA
## queens           4.8e-06       NA   NA       NA    NA
##
##
##
## [[8]]$gen
## [[8]]$gen$plot
```



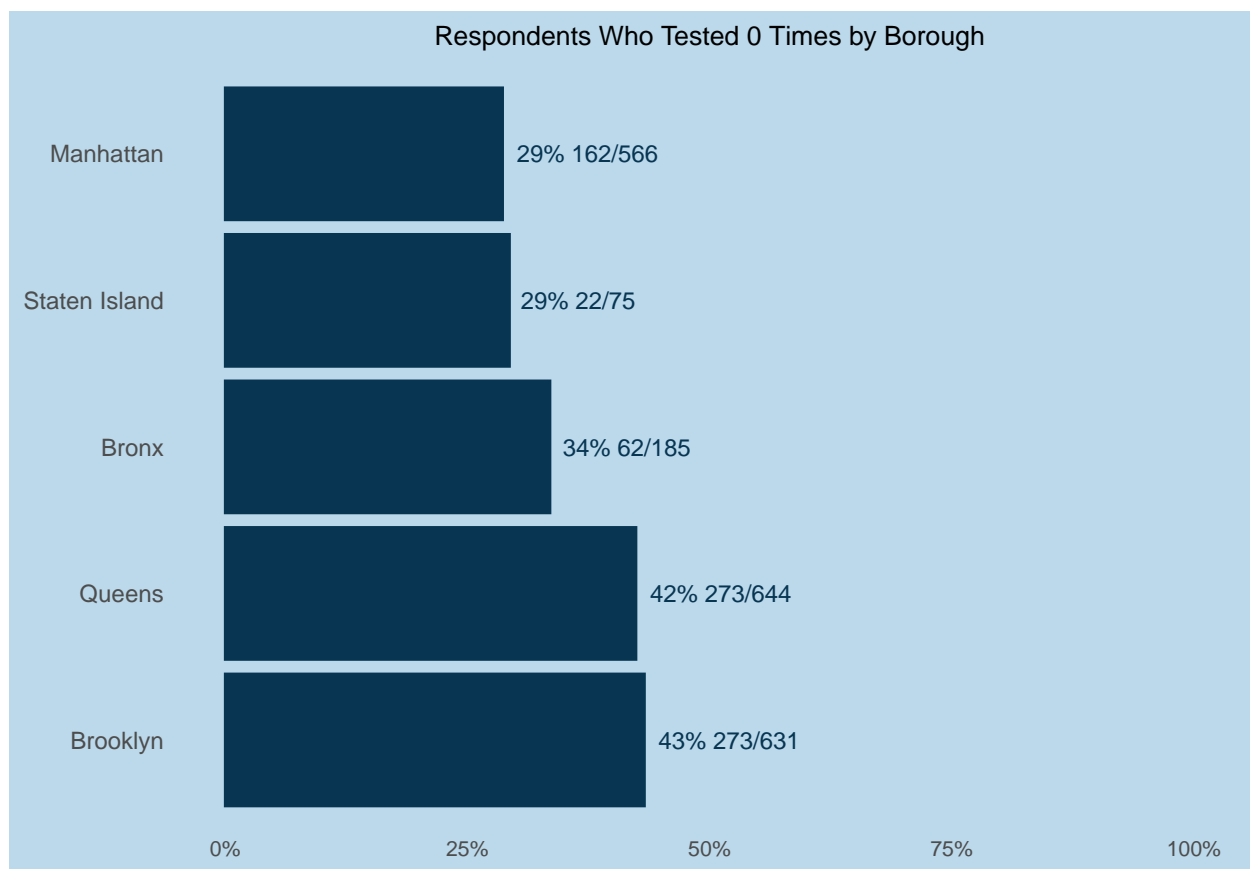
```
##
## [[8]]$gen$p.values
## [[8]]$gen$p.values$av_covid_none
##               non-binary transgender female   male prefer not to say
## non-binary           NA           NA    NA    NA           NA
## transgender          NA           NA    NA    NA           NA
## female               NA           NA    NA 0.006           NA
## male                 NA           NA 0.006    NA           NA
## prefer not to say    NA           NA    NA    NA           NA
##
##
##
## [[8]]$race_census
## NULL
##
## [[8]]$hh_ch_0_17_bi
## NULL
##
## [[8]]$hh_sn_65_bi
## NULL
##
## [[8]]$inc_dist
## NULL
```

## 4.15) Distribution over frequency of testing

1. Run each type of frequency over the sub demographic groups

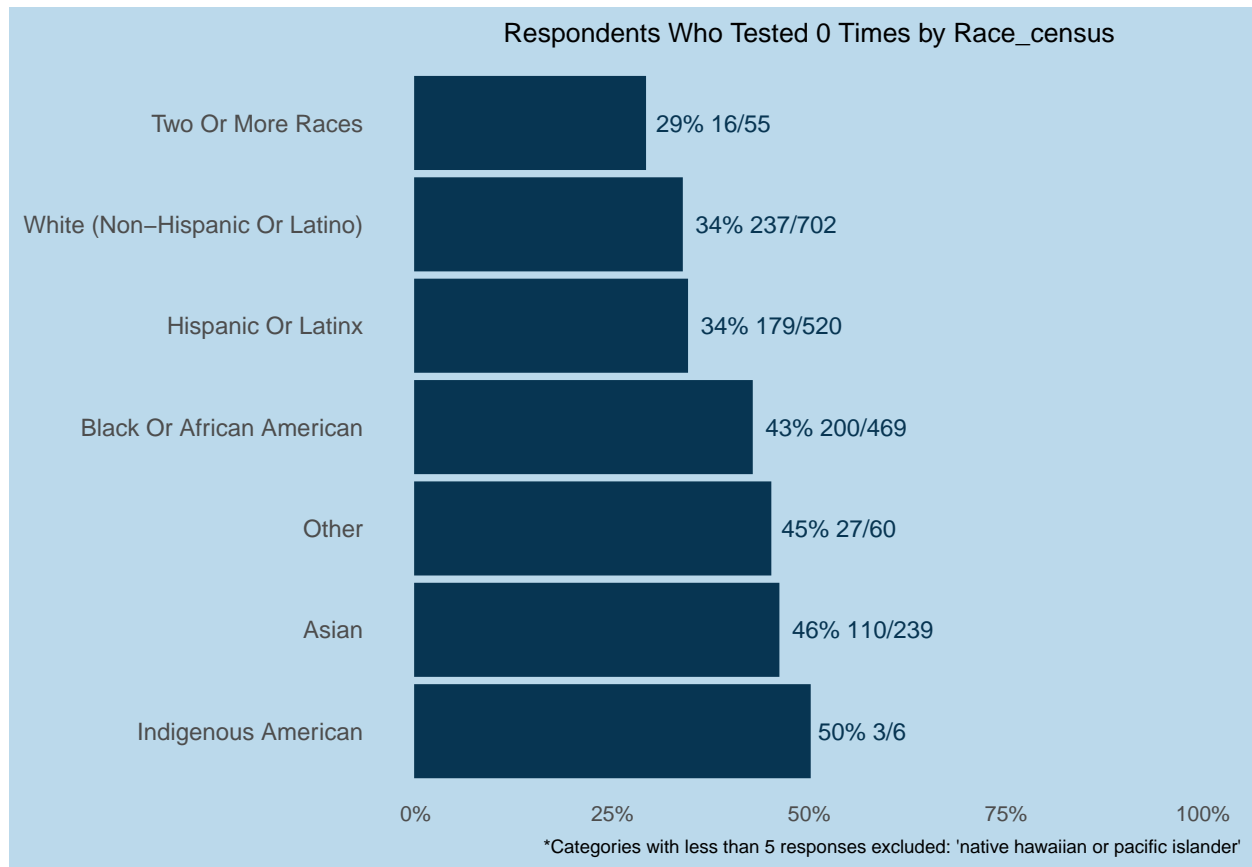
```
lapply(1:4, function(var) {  
  freq <- names(attributes(wrangled$test)$labels[var])  
  make_plots(wrangled %>% mutate(test_freq = test == var), demographics, "test_freq",  
    title = glue::glue("Respondents who tested {freq}"))  
})
```

```
## [[1]]  
## [[1]]$borough  
## [[1]]$borough$plot
```



```
##  
## [[1]]$borough$p.values  
## [[1]]$borough$p.values$test_freq  
##  
##      manhattan  staten island  bronx  queens  brooklyn  
## manhattan      NA           NA    NA 8.6e-07  2e-07  
## staten island    NA           NA    NA    NA    NA  
## bronx           NA           NA    NA    NA    NA  
## queens          8.6e-07      NA    NA    NA    NA  
## brooklyn        2.0e-07      NA    NA    NA    NA  
##
```

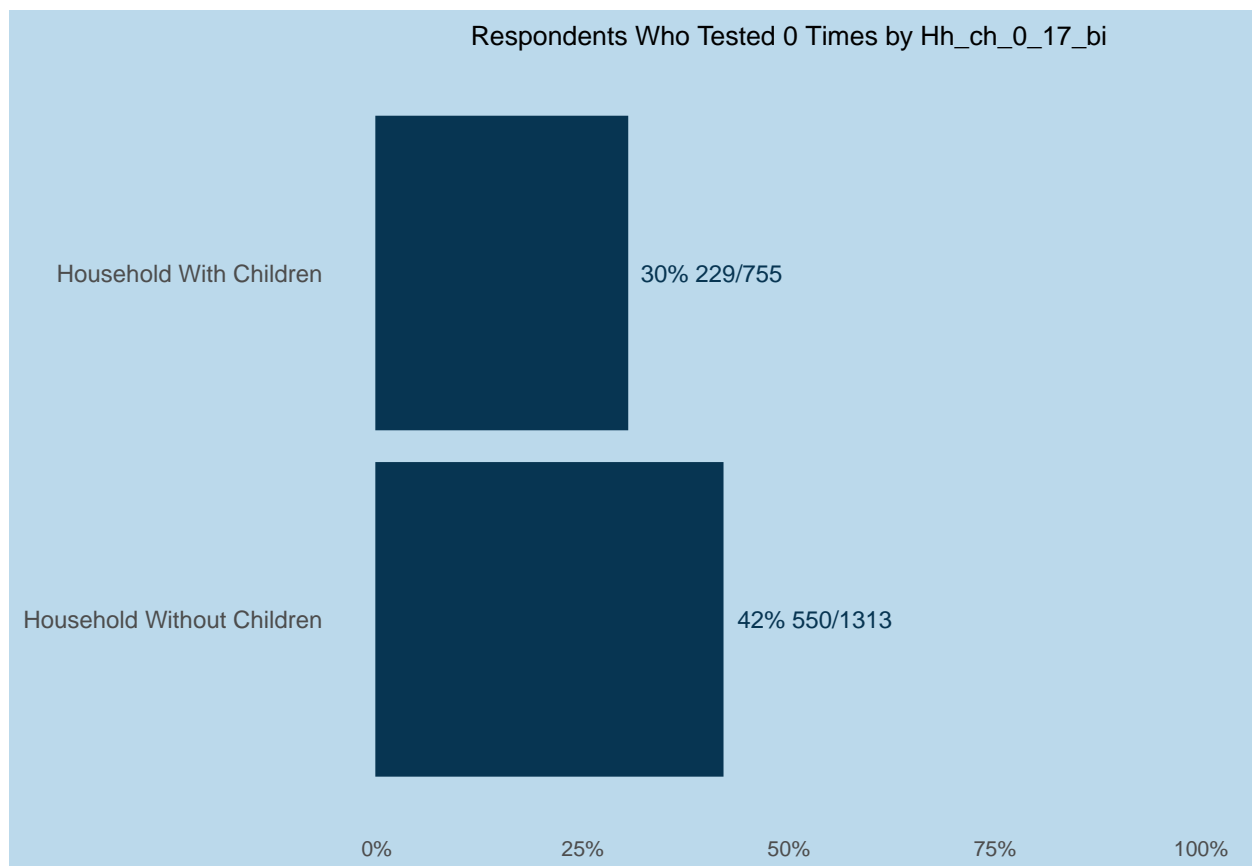
```
##
##
## [[1]]$gen
## NULL
##
## [[1]]$race_census
## [[1]]$race_census$plot
```



```
##
## [[1]]$race_census$p.values
## [[1]]$race_census$p.values$test_freq
##
## two or more races white (non-hispanic or latino)
## two or more races NA NA
## white (non-hispanic or latino) NA NA
## hispanic or latinx NA NA
## black or african american NA 0.00250
## other NA NA
## asian NA 0.00091
## Indigenous American NA NA
##
## hispanic or latinx black or african american
## two or more races NA NA
## white (non-hispanic or latino) NA 0.0025
## hispanic or latinx NA 0.0096
## black or african american 0.0096 NA
## other NA NA
```

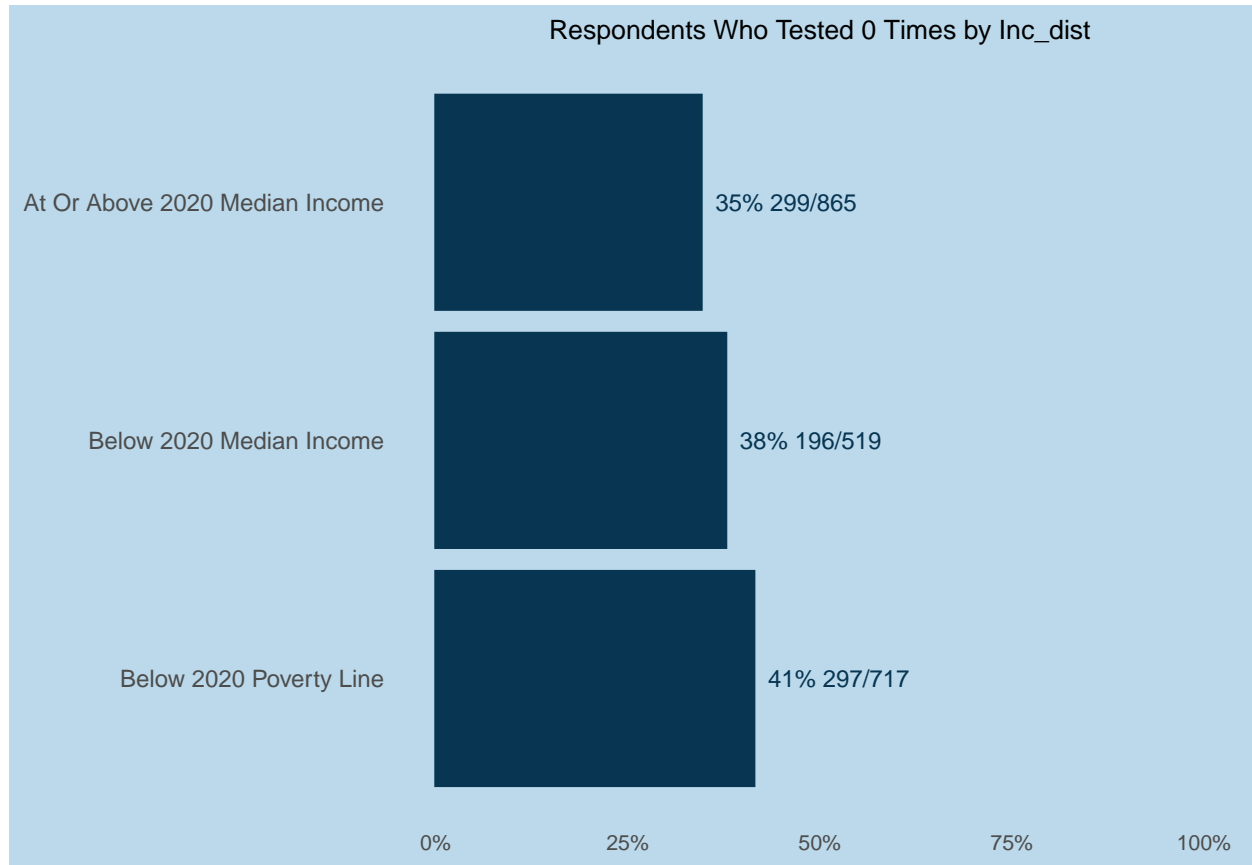


```
## asian                                0.0029                                NA
## Indigenous American                  NA                                NA
##                                     other  asian Indigenous American
## two or more races                    NA    NA                                NA
## white (non-hispanic or latino)       NA 0.00091                        NA
## hispanic or latinx                   NA 0.00290                        NA
## black or african american            NA    NA                                NA
## other                                NA    NA                                NA
## asian                                NA    NA                                NA
## Indigenous American                  NA    NA                                NA
##
##
##
## [[1]]$hh_ch_0_17_bi
## [[1]]$hh_ch_0_17_bi$plot
```

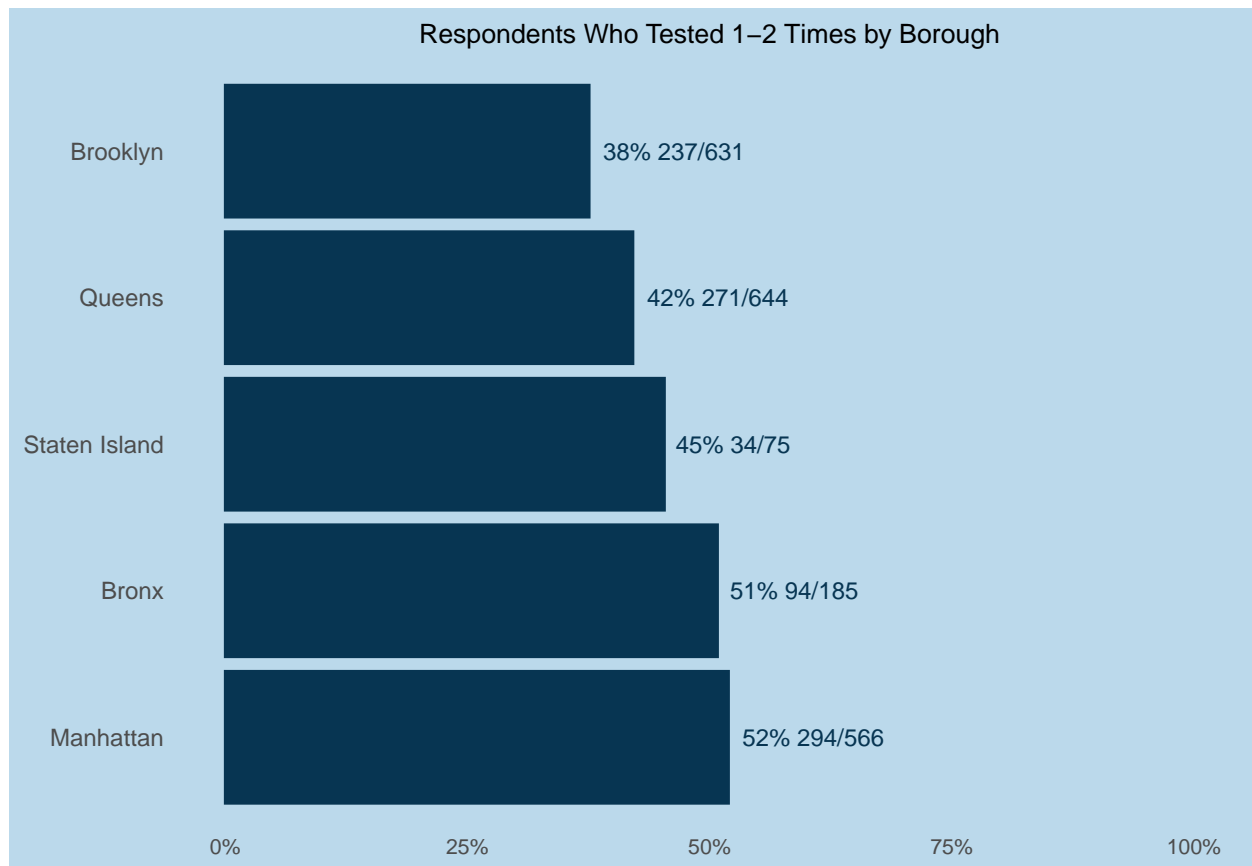


```
##
## [[1]]$hh_ch_0_17_bi$p.values
## [[1]]$hh_ch_0_17_bi$p.values$test_freq
##                                     household with children household without children
## household with children                                NA                        2.3e-07
## household without children                            2.3e-07                                NA
##
##
##
```

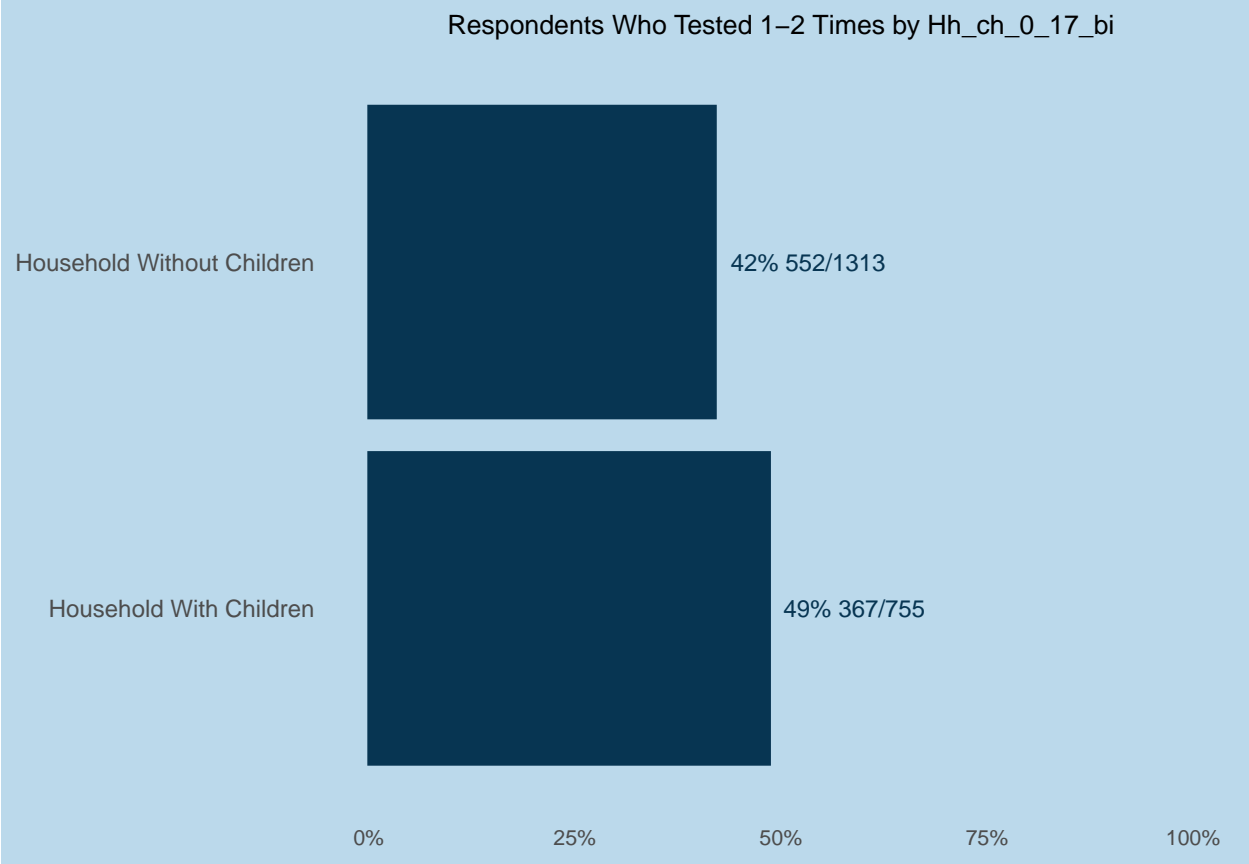
```
## [[1]]$hh_sn_65_bi
## NULL
##
## [[1]]$inc_dist
## [[1]]$inc_dist$plot
```



```
##
## [[1]]$inc_dist$p.values
## [[1]]$inc_dist$p.values$test_freq
## at or above 2020 median income
## at or above 2020 median income NA
## below 2020 median income NA
## below 2020 poverty line 0.006
## below 2020 median income below 2020 poverty line
## at or above 2020 median income NA 0.006
## below 2020 median income NA NA
## below 2020 poverty line NA NA
##
##
##
## [[2]]
## [[2]]$borough
## [[2]]$borough$plot
```

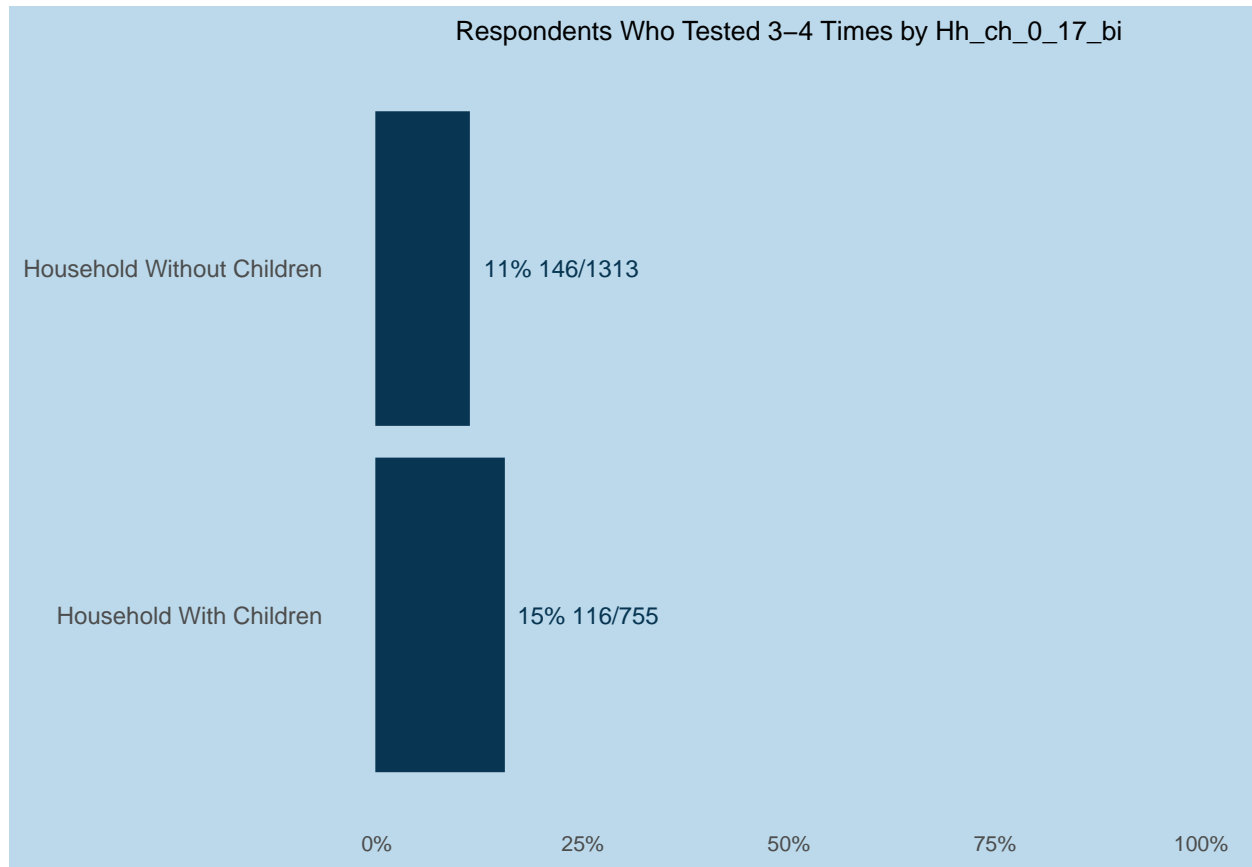


```
##
## [[2]]$borough$p.values
## [[2]]$borough$p.values$test_freq
##
##      brooklyn  queens staten island  bronx manhattan
## brooklyn      NA      NA           NA 0.0017  7.7e-07
## queens        NA      NA           NA  NA    7.4e-04
## staten island  NA      NA           NA  NA      NA
## bronx          1.7e-03  NA           NA  NA      NA
## manhattan      7.7e-07 0.00074       NA  NA      NA
##
##
##
## [[2]]$gen
## NULL
##
## [[2]]$race_census
## NULL
##
## [[2]]$hh_ch_0_17_bi
## [[2]]$hh_ch_0_17_bi$plot
```



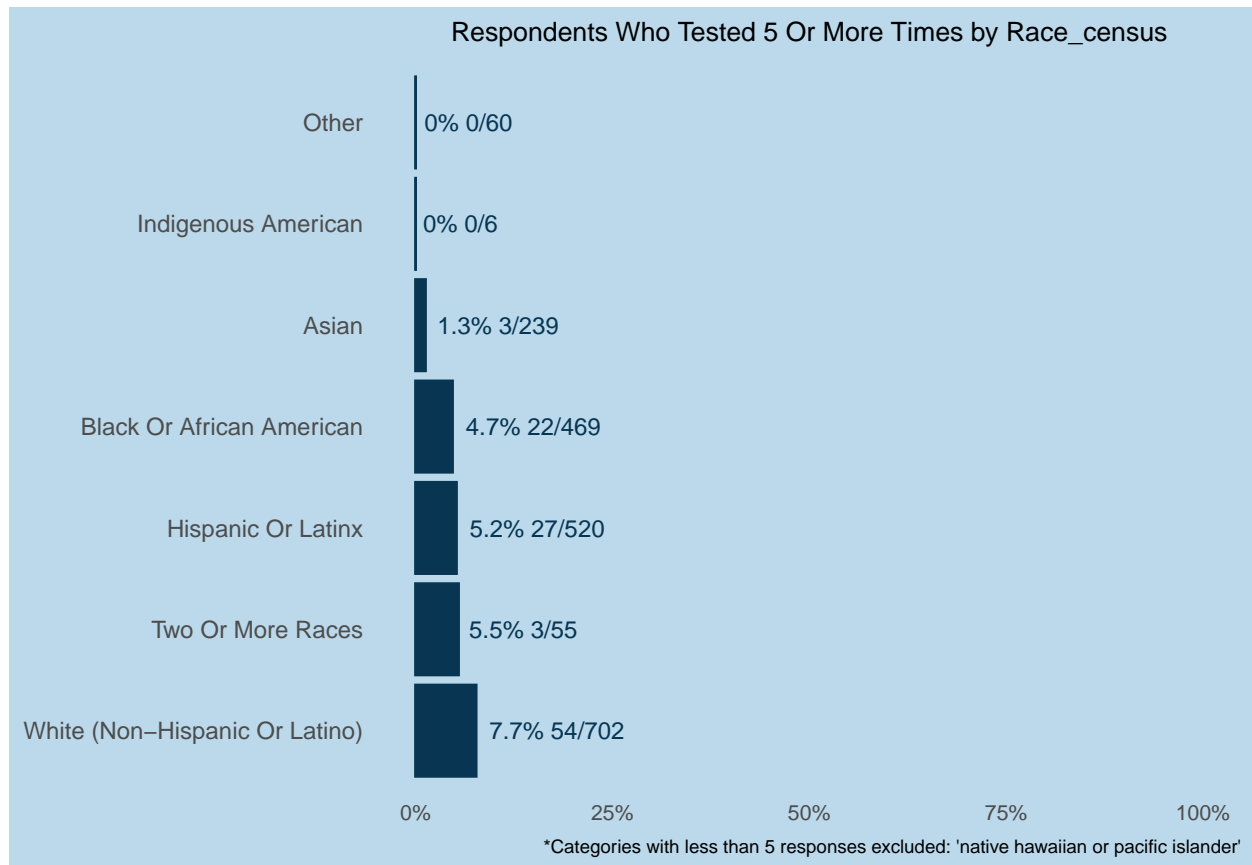
```
##
## [[2]]$hh_ch_0_17_bi$p.values
## [[2]]$hh_ch_0_17_bi$p.values$test_freq
##           household without children household with children
## household without children          NA          0.0044
## household with children          0.0044          NA
##
##
## [[2]]$hh_sn_65_bi
## NULL
##
## [[2]]$inc_dist
## NULL
##
## [[3]]
## [[3]]$borough
## NULL
##
## [[3]]$gen
## NULL
##
## [[3]]$race_census
## NULL
##
```

```
## [[3]]$hh_ch_0_17_bi
## [[3]]$hh_ch_0_17_bi$plot
```



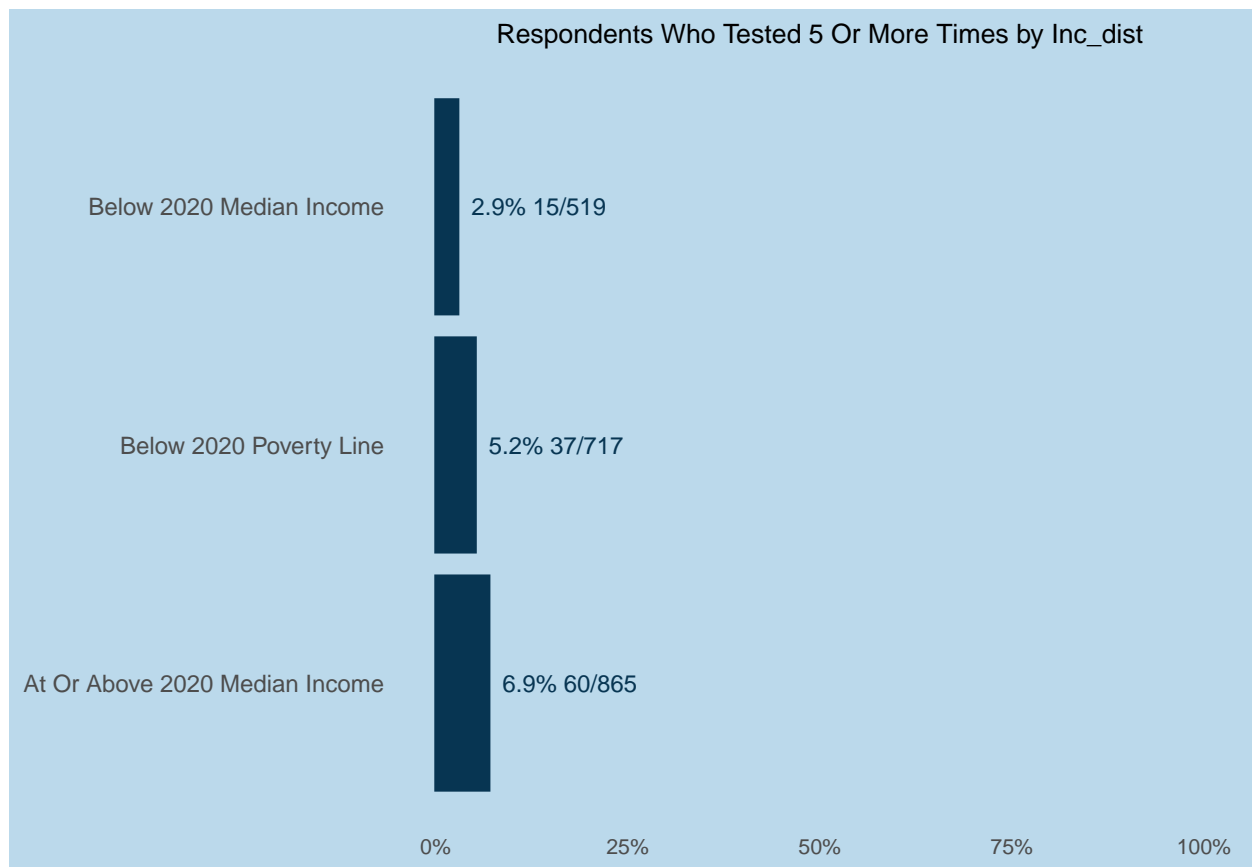
```
##
## [[3]]$hh_ch_0_17_bi$p.values
## [[3]]$hh_ch_0_17_bi$p.values$test_freq
##           household without children household with children
## household without children             NA             0.0064
## household with children              0.0064             NA
##
##
##
## [[3]]$hh_sn_65_bi
## NULL
##
## [[3]]$inc_dist
## NULL
##
##
## [[4]]
## [[4]]$borough
## NULL
##
## [[4]]$gen
## NULL
```

```
##
## [[4]]$race_census
## [[4]]$race_census$plot
```



```
##
## [[4]]$race_census$p.values
## [[4]]$race_census$p.values$test_freq
##
## Indigenous American other asian
## Indigenous American NA NA NA
## other NA NA NA
## asian NA NA NA
## black or african american NA NA NA
## hispanic or latinx NA NA NA
## two or more races NA NA NA
## white (non-hispanic or latino) NA NA 0.00057
##
## black or african american hispanic or latinx
## Indigenous American NA NA
## other NA NA
## asian NA NA
## black or african american NA NA
## hispanic or latinx NA NA
## two or more races NA NA
## white (non-hispanic or latino) NA NA
##
## two or more races white (non-hispanic or latino)
## Indigenous American NA NA
```

```
## other NA NA
## asian NA 0.00057
## black or african american NA NA
## hispanic or latinx NA NA
## two or more races NA NA
## white (non-hispanic or latino) NA NA
##
##
##
## [[4]]$hh_ch_0_17_bi
## NULL
##
## [[4]]$hh_sn_65_bi
## NULL
##
## [[4]]$inc_dist
## [[4]]$inc_dist$plot
```



```
##
## [[4]]$inc_dist$p.values
## [[4]]$inc_dist$p.values$test_freq
## below 2020 median income below 2020 poverty line
## below 2020 median income NA NA
## below 2020 poverty line NA NA
## at or above 2020 median income 0.002 NA
```

```
##                                at or above 2020 median income
## below 2020 median income      0.002
## below 2020 poverty line      NA
## at or above 2020 median income NA
```

## 4.16) Distribution over each difficulty faced while testing

1. Run each type of difficulty over sub demographic groups

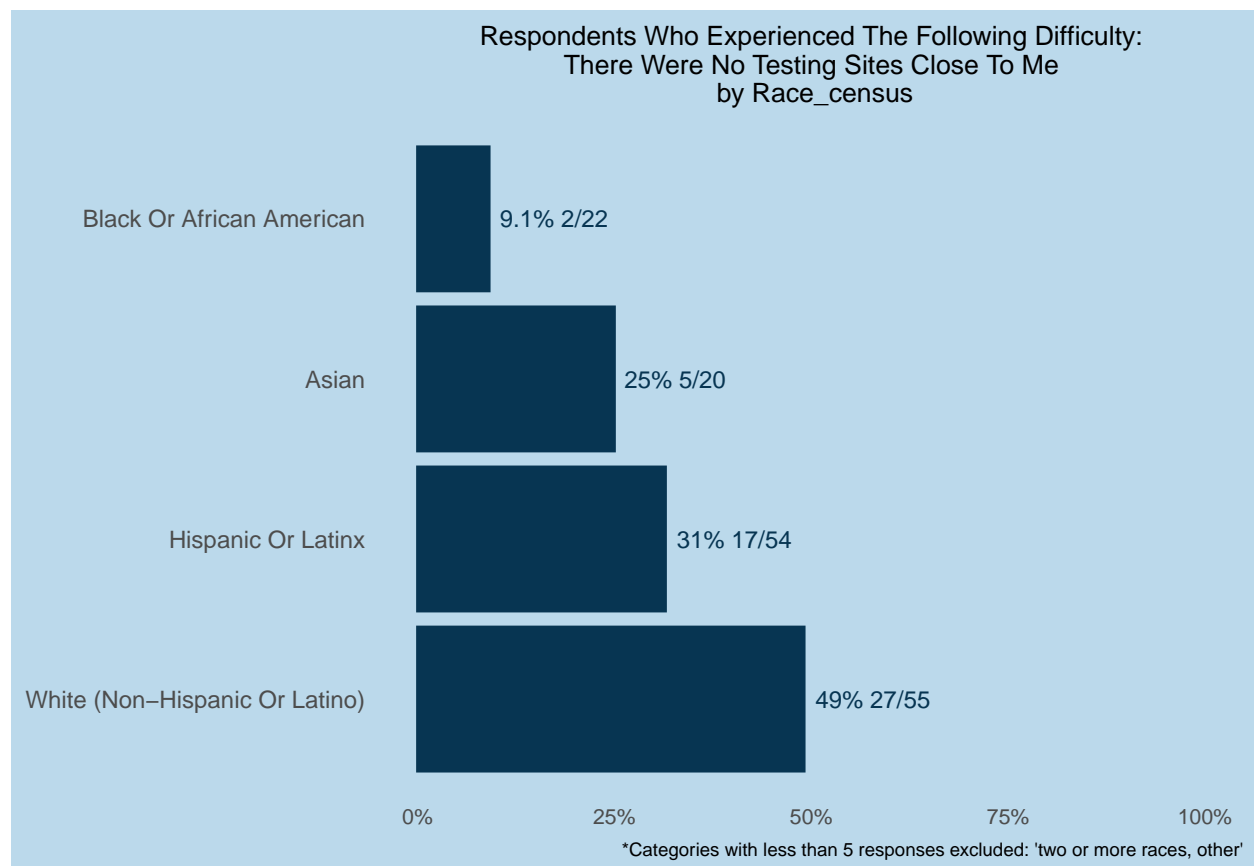
```
test_diffs <- wrangled %>% select(starts_with("test_diffs_") & !ends_with("text")) %>% colnames

lapply(test_diffs, function(test_diff) {
  difficulty <-
    paste0(survey_codebook_labelled$to_name[survey_codebook_labelled$full_name == test_diff], "\n")

  make_plots(wrangled, demographics, test_diff,
             title = paste("Respondents who experienced the following difficulty:", difficulty, sep = "
  })
```

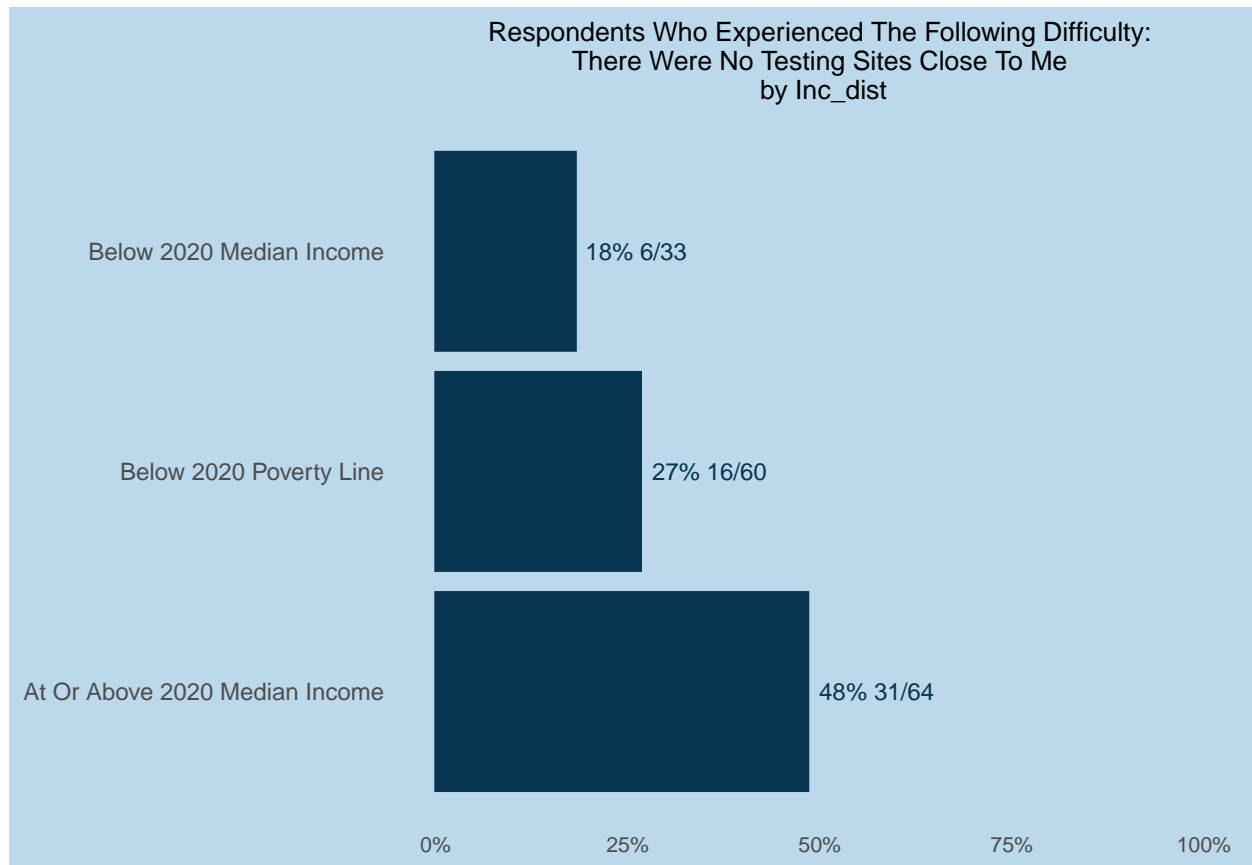
```
## [[1]]
## [[1]]$borough
## NULL
##
## [[1]]$gen
## NULL
##
## [[1]]$race_census
## [[1]]$race_census$plot
```





```
##
## [[1]]$race_census$p.values
## [[1]]$race_census$p.values$test_diffs_close
##               black or african american asian
## black or african american              NA    NA
## asian                                NA    NA
## hispanic or latinx                     NA    NA
## white (non-hispanic or latino)         0.0026  NA
##               hispanic or latinx
## black or african american              NA
## asian                                NA
## hispanic or latinx                     NA
## white (non-hispanic or latino)         NA
##               white (non-hispanic or latino)
## black or african american              0.0026
## asian                                NA
## hispanic or latinx                     NA
## white (non-hispanic or latino)         NA
##
##
## [[1]]$hh_ch_0_17_bi
## NULL
##
## [[1]]$hh_sn_65_bi
## NULL
```

```
##
## [[1]]$inc_dist
## [[1]]$inc_dist$plot
```



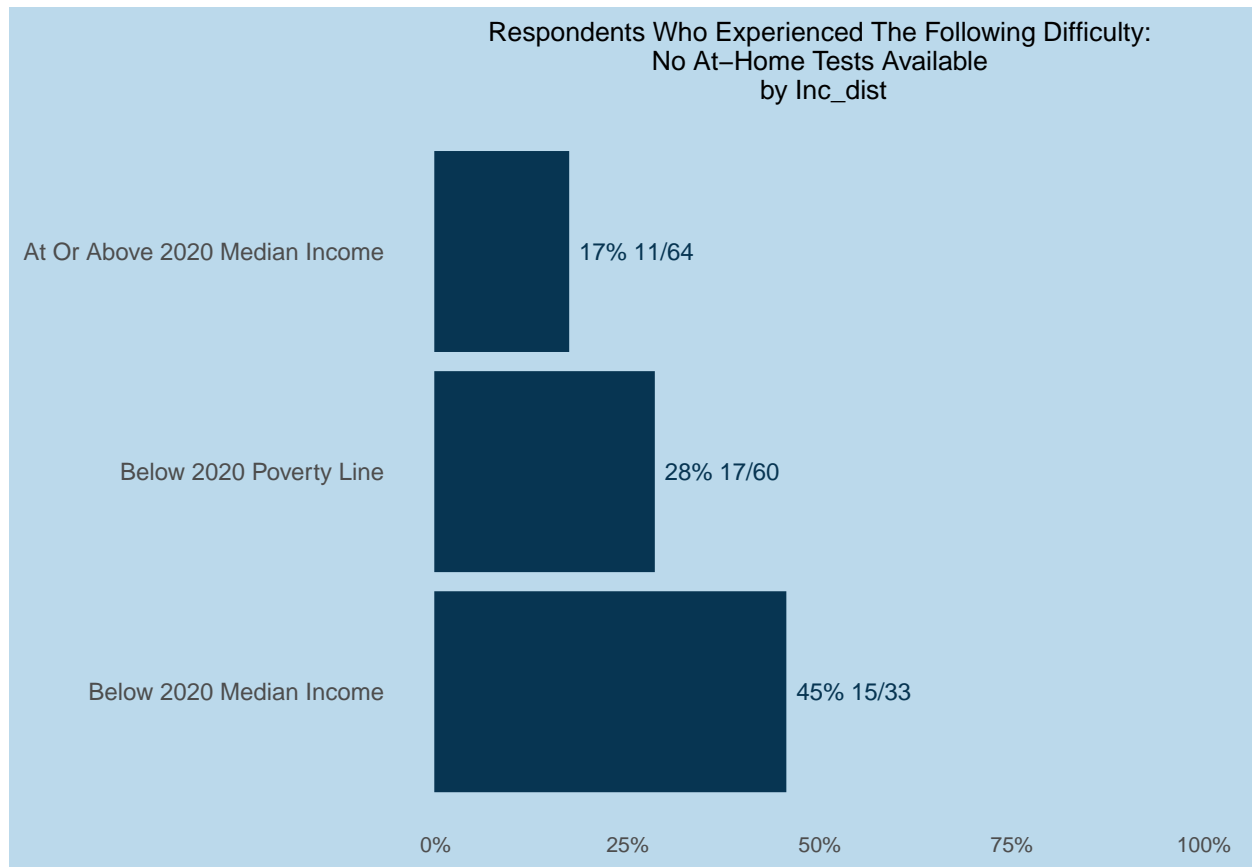
```
##
## [[1]]$inc_dist$p.values
## [[1]]$inc_dist$p.values$test_diffs_close
##
##          below 2020 median income below 2020 poverty line
## below 2020 median income                NA                NA
## below 2020 poverty line                NA                NA
## at or above 2020 median income          0.0072             NA
##
##          at or above 2020 median income
## below 2020 median income          0.0072
## below 2020 poverty line                NA
## at or above 2020 median income          NA
##
##
##
## [[2]]
## [[2]]$borough
## NULL
##
## [[2]]$gen
## NULL
```

```

##
## [[2]]$race_census
## NULL
##
## [[2]]$hh_ch_0_17_bi
## NULL
##
## [[2]]$hh_sn_65_bi
## NULL
##
## [[2]]$inc_dist
## NULL
##
##
## [[3]]
## [[3]]$borough
## NULL
##
## [[3]]$gen
## NULL
##
## [[3]]$race_census
## NULL
##
## [[3]]$hh_ch_0_17_bi
## NULL
##
## [[3]]$hh_sn_65_bi
## NULL
##
## [[3]]$inc_dist
## NULL
##
##
## [[4]]
## [[4]]$borough
## NULL
##
## [[4]]$gen
## NULL
##
## [[4]]$race_census
## NULL
##
## [[4]]$hh_ch_0_17_bi
## NULL
##
## [[4]]$hh_sn_65_bi
## NULL
##
## [[4]]$inc_dist
## NULL
##
##

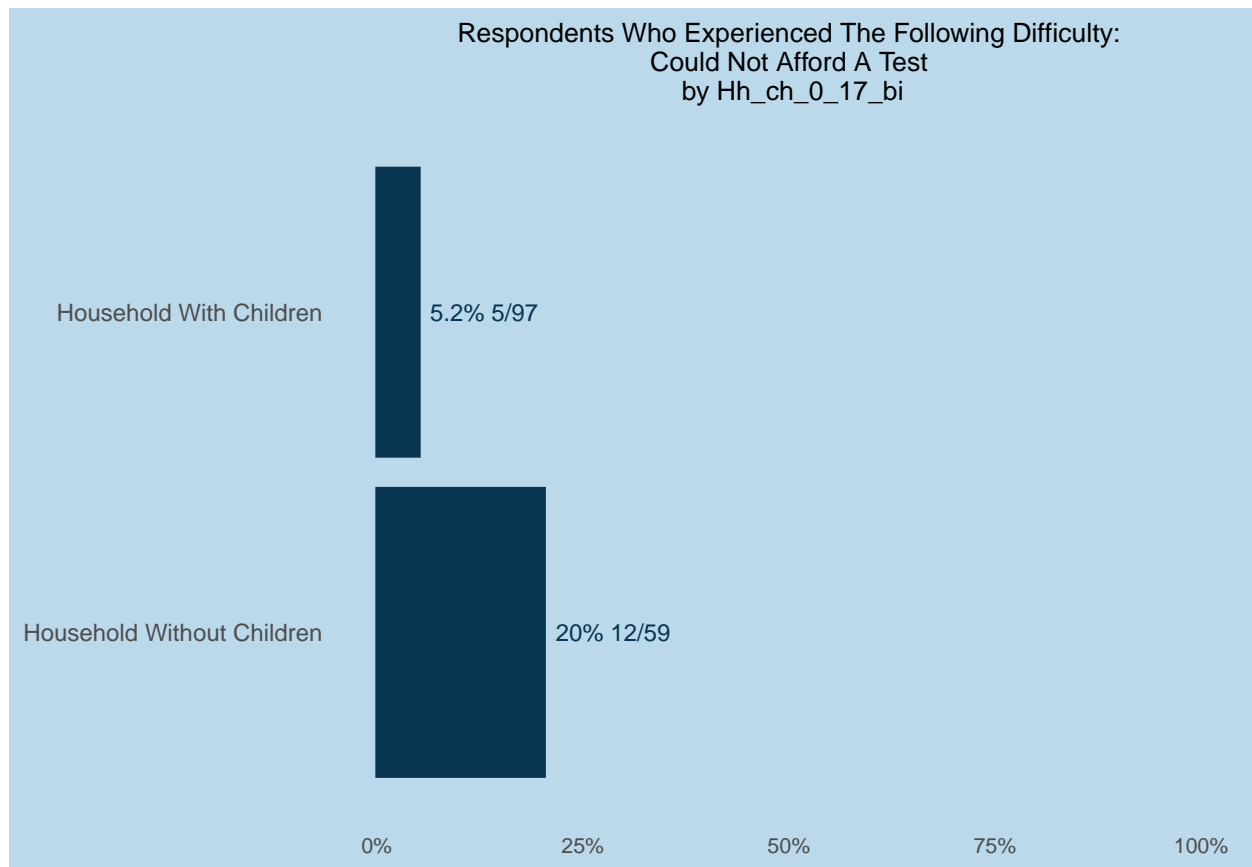
```

```
## [[5]]
## [[5]]$borough
## NULL
##
## [[5]]$gen
## NULL
##
## [[5]]$race_census
## NULL
##
## [[5]]$hh_ch_0_17_bi
## NULL
##
## [[5]]$hh_sn_65_bi
## NULL
##
## [[5]]$inc_dist
## [[5]]$inc_dist$plot
```



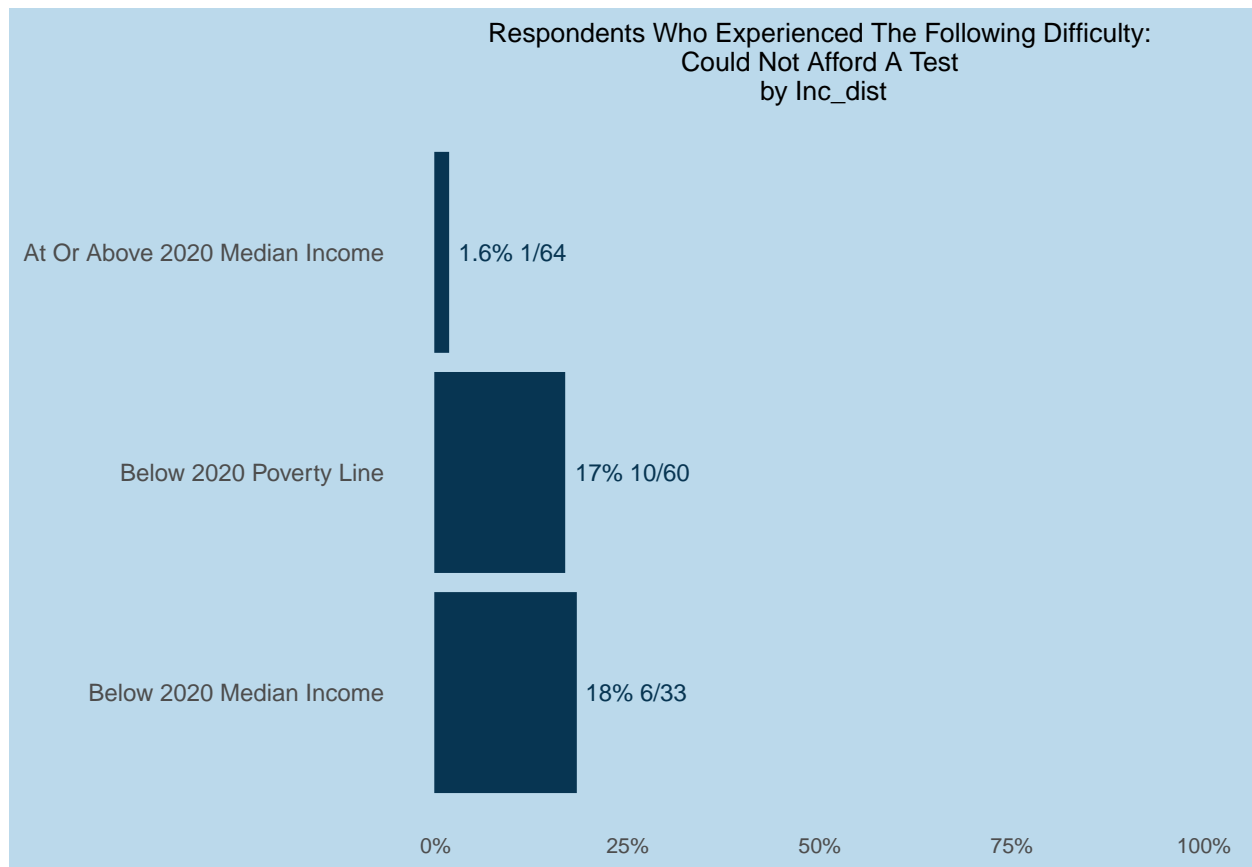
```
##
## [[5]]$inc_dist$p.values
## [[5]]$inc_dist$p.values$test_diffs_at_hm
## at or above 2020 median income
## at or above 2020 median income NA
## below 2020 poverty line NA
```

```
## below 2020 median income                                0.0062
##                                below 2020 poverty line below 2020 median income
## at or above 2020 median income                        NA                0.0062
## below 2020 poverty line                                NA                NA
## below 2020 median income                              NA                NA
##
##
##
## [[6]]
## [[6]]$borough
## NULL
##
## [[6]]$gen
## NULL
##
## [[6]]$race_census
## NULL
##
## [[6]]$hh_ch_0_17_bi
## [[6]]$hh_ch_0_17_bi$plot
```



```
##
## [[6]]$hh_ch_0_17_bi$p.values
## [[6]]$hh_ch_0_17_bi$p.values$test_diffs_aff
```

```
## household with children household without children
## household with children NA 0.0072
## household without children 0.0072 NA
##
##
##
## [[6]]$hh_sn_65_bi
## NULL
##
## [[6]]$inc_dist
## [[6]]$inc_dist$plot
```



```
##
## [[6]]$inc_dist$p.values
## [[6]]$inc_dist$p.values$test_diffs_aff
## at or above 2020 median income
## at or above 2020 median income NA
## below 2020 poverty line 0.0083
## below 2020 median income NA
## below 2020 poverty line below 2020 median income
## at or above 2020 median income 0.0083 NA
## below 2020 poverty line NA NA
## below 2020 median income NA NA
##
##
```

```
##
##
## [[7]]
## [[7]]$borough
## NULL
##
## [[7]]$gen
## NULL
##
## [[7]]$race_census
## NULL
##
## [[7]]$hh_ch_0_17_bi
## NULL
##
## [[7]]$hh_sn_65_bi
## NULL
##
## [[7]]$inc_dist
## NULL
```