

plan_of_analysis

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2/11/2022

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Distributions

```
wrangled %>%
  group_by(emp_change, inc_neg) %>%
  mutate(n = factor(n())) %>%
  filter(!is.na(emp_change) & !is.na(inc_neg)) %>%
  ggplot(aes(x = factor(emp_change), y = factor(inc_neg), color = n)) + geom_jitter() +
  scale_color_manual(values = project_pal) +
```

```
ggtitle("Distribution of Respondents\nby Employment Change and Negative Income Change") +
xlab("Employment Change") + ylab("Negative Income Change\n")
```



1.1) People who changed employment status between before the pandemic and currently (2021) [14 &15]

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

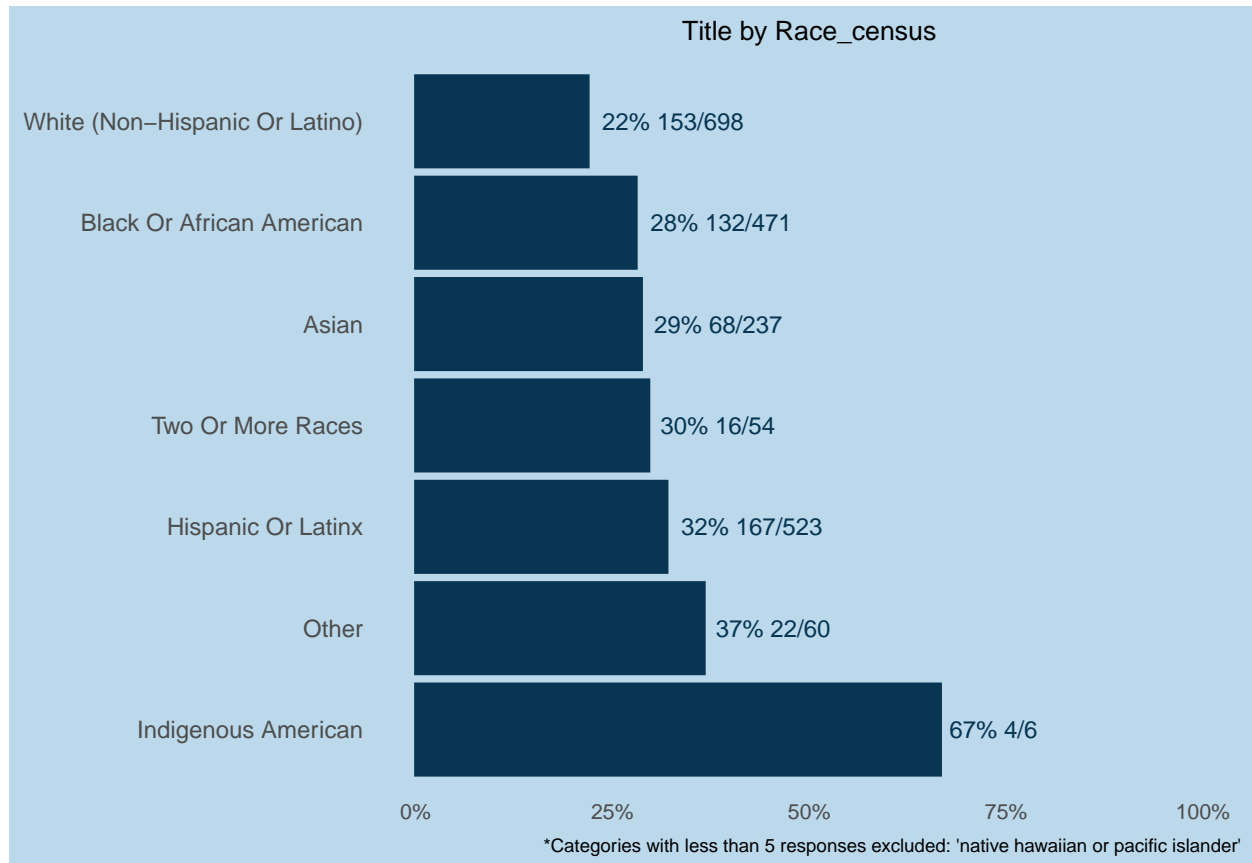
```
mean(wrangled$emp_change, na.rm = TRUE)
```

```
## [1] 0.2740705
```

```
make_plots(wrangled, demographics, "emp_change")
```

```
## $borough
## NULL
##
## $gen
```

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

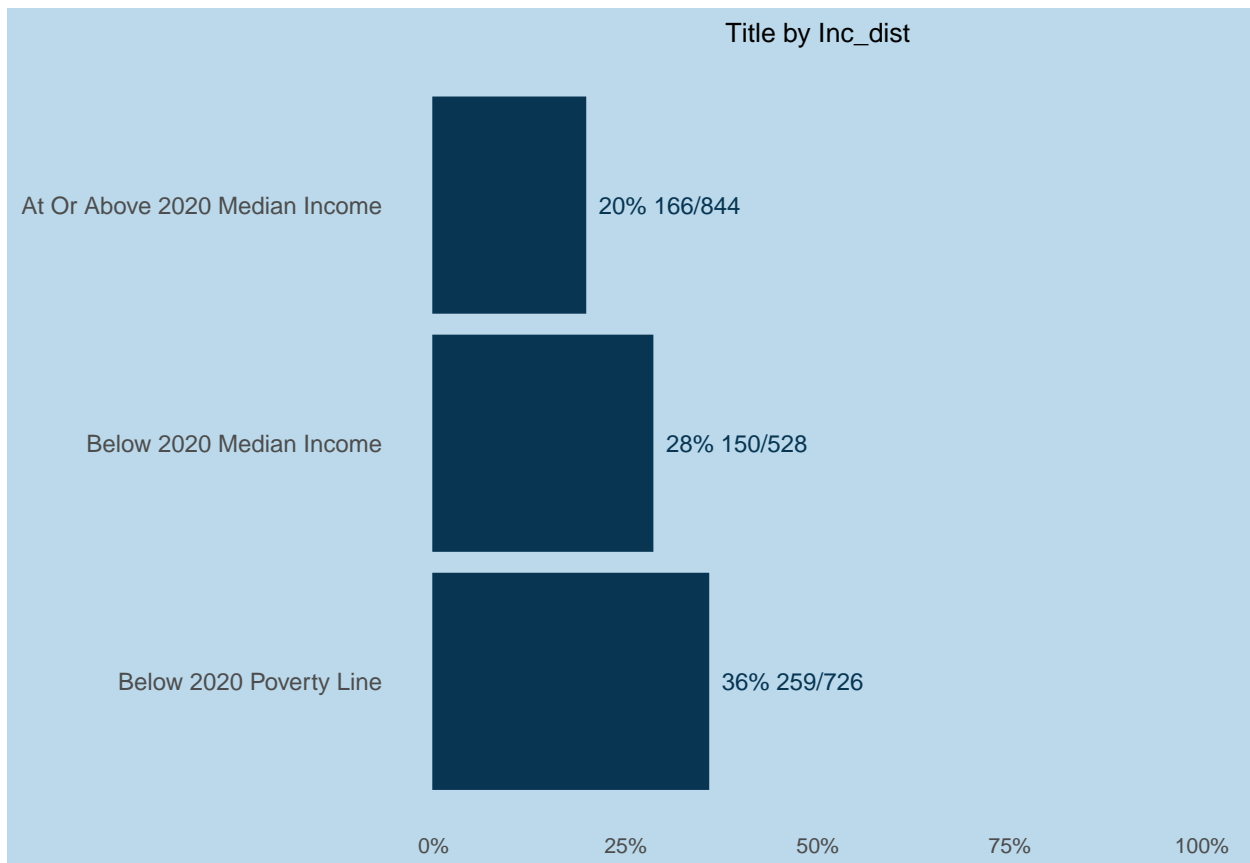


```
##
## $race_census$p.values
## $race_census$p.values$emp_change
##
## white (non-hispanic or latino)
## white (non-hispanic or latino) NA
## black or african american NA
## asian NA
## two or more races NA
## hispanic or latinx 0.00011
## other NA
## Indigenous American NA
##
## black or african american asian
## white (non-hispanic or latino) NA NA
## black or african american NA NA
## asian NA NA
## two or more races NA NA
## hispanic or latinx NA NA
## other NA NA
## Indigenous American NA NA
##
## two or more races hispanic or latinx other
```

```

## white (non-hispanic or latino)      NA      0.00011      NA
## black or african american           NA      NA      NA
## asian                               NA      NA      NA
## two or more races                   NA      NA      NA
## hispanic or latinx                  NA      NA      NA
## other                               NA      NA      NA
## Indigenous American                 NA      NA      NA
##                                     Indigenous American
## white (non-hispanic or latino)      NA
## black or african american           NA
## asian                               NA
## two or more races                   NA
## hispanic or latinx                  NA
## other                               NA
## Indigenous American                 NA
##
##
##
## $hh_ch_0_17_bi
## NULL
##
## $hh_sn_65_bi
## NULL
##
## $inc_dist
## $inc_dist$plot

```



```
##
## $inc_dist$p.values
## $inc_dist$p.values$emp_change
## at or above 2020 median income
## at or above 2020 median income NA
## below 2020 median income 2.4e-04
## below 2020 poverty line 1.7e-12
## below 2020 median income below 2020 poverty line
## at or above 2020 median income 0.00024 1.7e-12
## below 2020 median income NA 8.1e-03
## below 2020 poverty line 0.00810 NA
```

1.2) People who are currently unemployed who were not unemployed in before the pandemic (March 2020) [14&15]

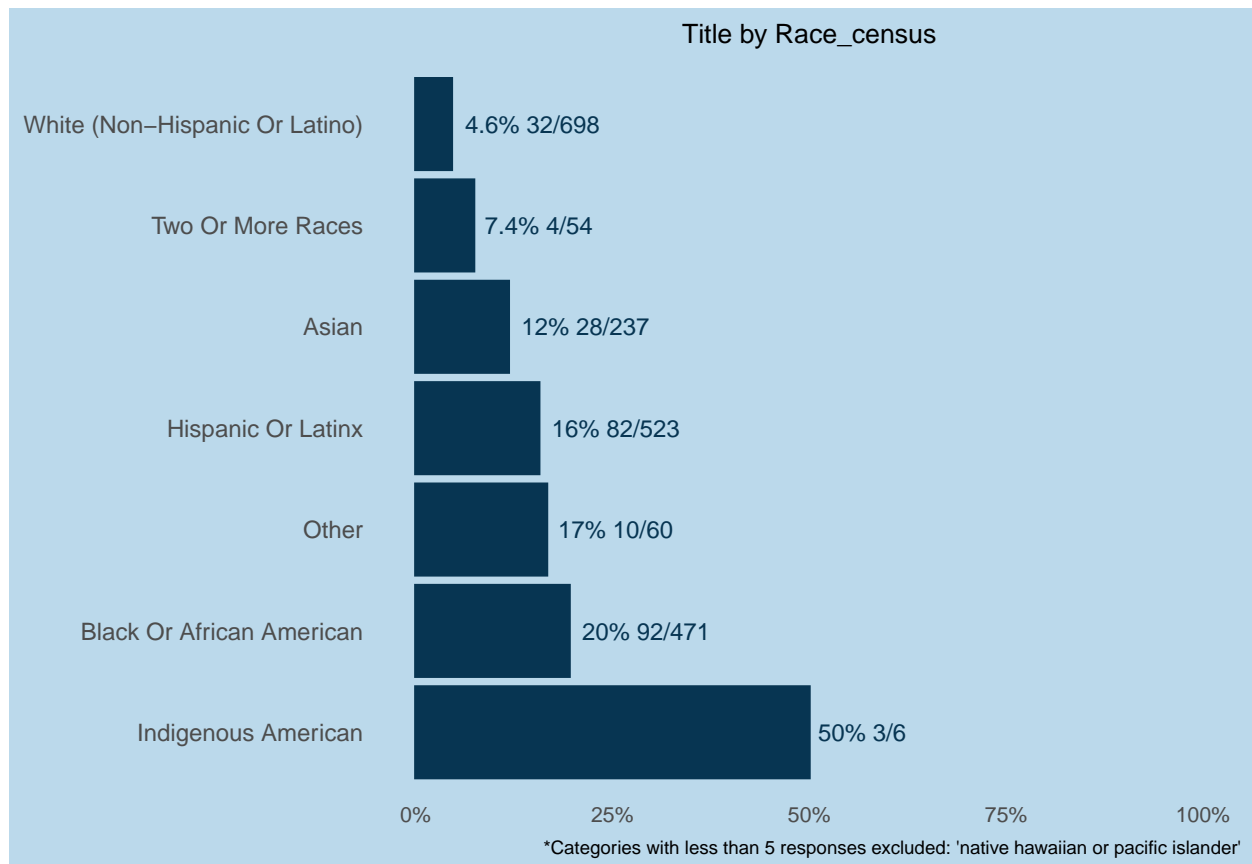
1. Run distribution over population
2. Run distribution by sub-demographics (a-k) and type of previous employment [14]
 - a. Compare and find gaps (test unequal proportions)

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

```
## [1] 0.120591
```

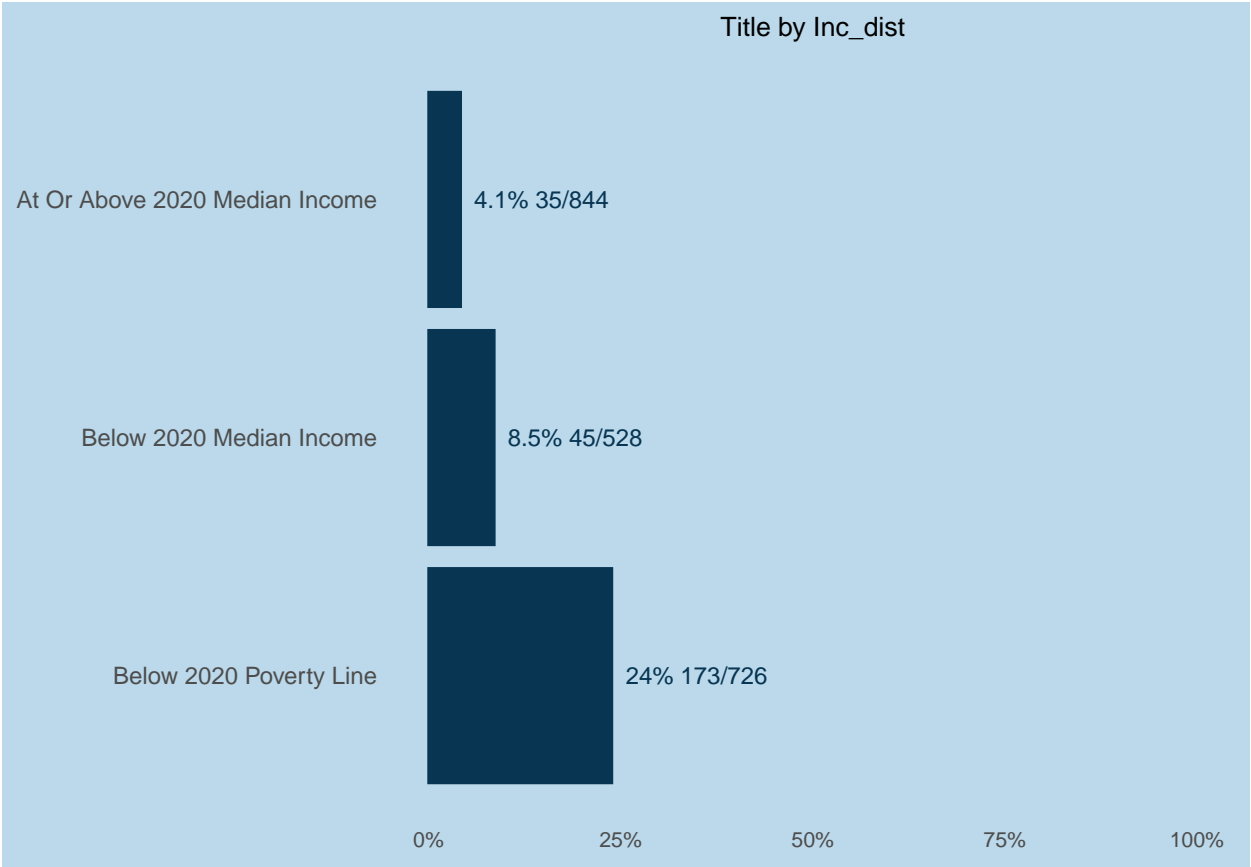
```
make_plots(wrangled, demographics, "emp_after_un")
```

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



```
##
## $race_census$p.values
## $race_census$p.values$emp_after_un
##               white (non-hispanic or latino) two or more races
## white (non-hispanic or latino)                NA                NA
## two or more races                             NA                NA
## asian                                           1.6e-04                NA
## hispanic or latinx                             8.4e-11                NA
## other                                           NA                NA
## black or african american                     8.7e-16                NA
## Indigenous American                           NA                NA
##               asian hispanic or latinx other
## white (non-hispanic or latino) 0.00016      8.4e-11      NA
## two or more races              NA            NA      NA
## asian                          NA            NA      NA
## hispanic or latinx             NA            NA      NA
## other                          NA            NA      NA
## black or african american       NA            NA      NA
## Indigenous American            NA            NA      NA
##               black or african american Indigenous American
## white (non-hispanic or latino) 8.7e-16                NA
## two or more races              NA                NA
## asian                          NA                NA
## hispanic or latinx             NA                NA
## other                          NA                NA
## black or african american       NA                NA
```

```
## Indigenous American
##
##
##
## $hh_ch_0_17_bi
## NULL
##
## $hh_sn_65_bi
## NULL
##
## $inc_dist
## $inc_dist$plot
```



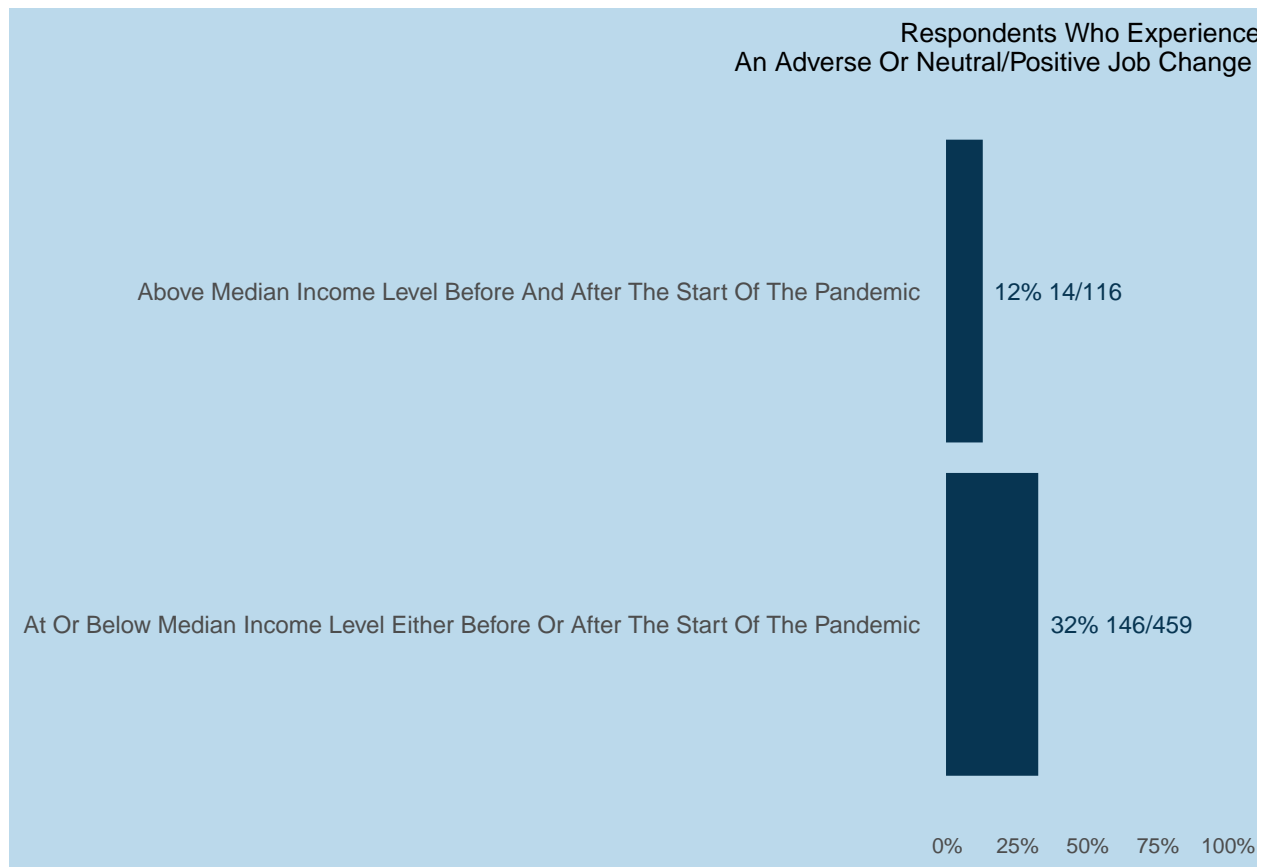
```
##
## $inc_dist$p.values
## $inc_dist$p.values$emp_after_un
##
## at or above 2020 median income
## at or above 2020 median income NA
## below 2020 median income 1.2e-03
## below 2020 poverty line 4.4e-30
##
## below 2020 median income below 2020 poverty line
## at or above 2020 median income 1.2e-03 4.4e-30
## below 2020 median income NA 2.8e-12
## below 2020 poverty line 2.8e-12 NA
```

1.3) Higher paid employees were less likely to face job status changes during the pandemic [12,14,15]

1. Find proportion of people who earned salaries above median income [12]
 - a. Find proportion of subset who faced a job status change [14 & 15]
 - b. Distill the list of respondents who faced an adverse job change i.e. those who faced an income reduction correspondingly to the job change [14 & 15]
- ii. Job change to be considered adverse only if accompanied by reduction in family income
- b. Find proportion not in subset who faced adverse job change and compare (test unequal proportions)

```
make_plots(wrangled %>% filter(emp_change == 1),  
            by_vars = c("inc_ab_med", "inc_be_med"), hyp_var = "inc_neg",  
            title = "Respondents who experienced\nan adverse or neutral/positive job change")
```

```
## $inc_ab_med  
## $inc_ab_med$plot
```



```
##  
## $inc_ab_med$p.values  
## $inc_ab_med$p.values$inc_neg
```



```
##
## above median income level before and after the start of the pandemic
## at or below median income level either before or after the start of the pandemic
##
## above median income level before and after the start of the pandemic
## at or below median income level either before or after the start of the pandemic
##
##
## $inc_be_med
## NULL
```

1.5 - 1.7

1.5) People with at least a Bachelor's degree were more/less likely to face job status changes during the pandemic [11, 14, 15]

1. Find proportion of respondents who have a Bachelor's degree and above [11]
 - a. Find proportion of subset who faced job status changes [14 & 15]. Similar to the hypothesis above, job changes only to be considered adverse if accompanied by reduction in income
 - b. Find proportion not in subset and compare (test unequal proportions)

1.6) People who had insurance (any form) were less likely to face changes in job status [22, 14, 15]

1. Find respondents who have any form of insurance [21]
 - a. Find proportion of subset who faced job status changes [14 & 15] (adverse job status changes)
 - b. Find proportion not in subset and compare (test unequal proportions)

1.7) People who were on private insurance were least likely to face changes in job status [14, 15, 22]

1. Find respondents who have private insurance [21]
 - a. Find proportion of subset who faced job status changes [14 & 15]
2. Find respondents who have insurance that is not private [21]
 - a. Find proportion of subset who faced job status changes [14 & 15]
3. Compare groups of privately insured vs those with other types of insurance with respect to job status changes (test unequal proportions)

```

#table(wrangled$ins[str_detect(wrangled$ins, ";")])
new_variables <- c("sch_bach", # 1.5
                  "ins_has", # 1.6
                  "ins_prvt") # 1.7
new_variables <- setNames(new_variables, new_variables)

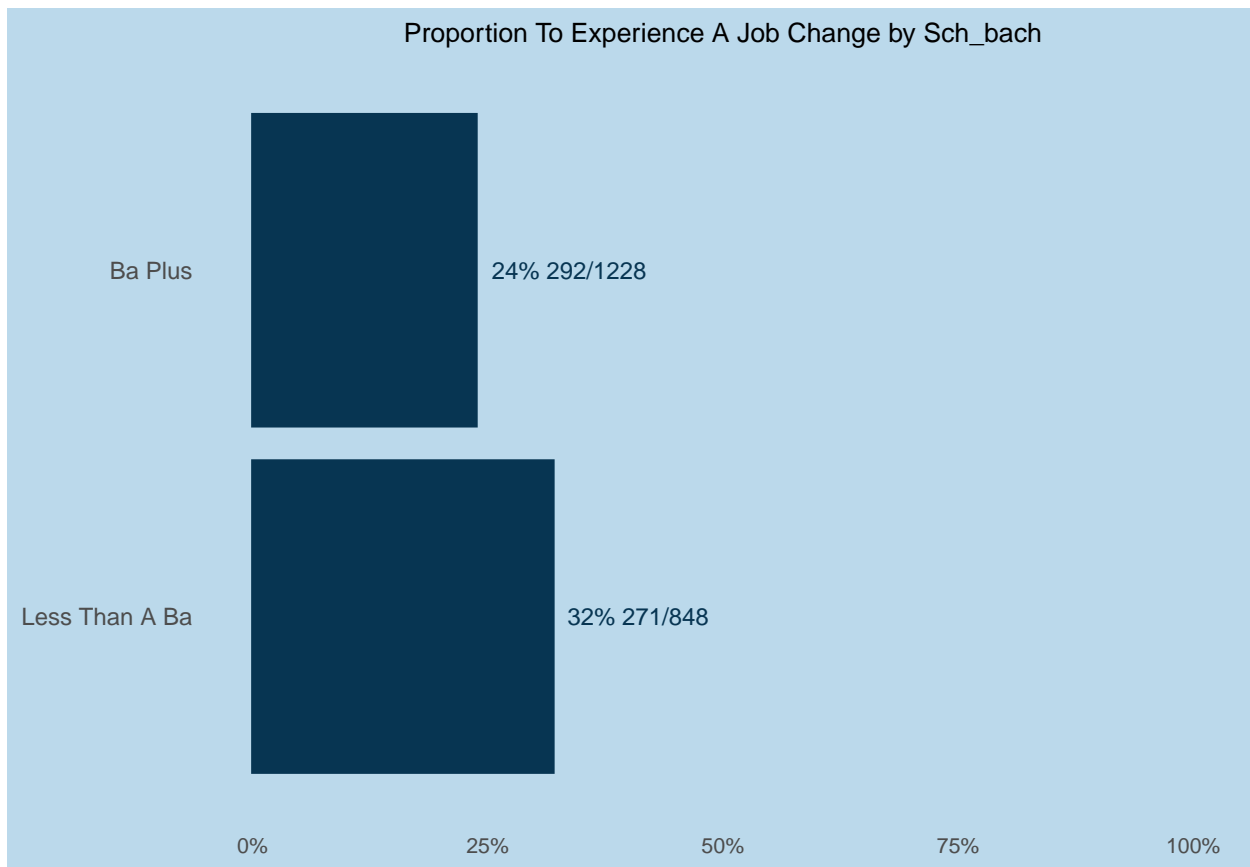
make_plots(df = wrangled,
           by_vars = new_variables,
           hyp_var = "emp_change", min = 5,
           title = "Proportion to Experience a job change")

```

```

## $sch_bach
## $sch_bach$plot

```



```

##
## $sch_bach$p.values
## $sch_bach$p.values$emp_change
##          BA plus less than a BA
## BA plus      NA      4.7e-05
## less than a BA 4.7e-05      NA
##
##
##
## $ins_has

```

```
## NULL
##
## $ins_prvt
## NULL
```

```
make_plots(df = wrangled %>% filter(emp_change == 1),
           by_vars = new_variables,
           hyp_var = "inc_neg",
           title = "Proportion to Experience an Adverse job change")
```

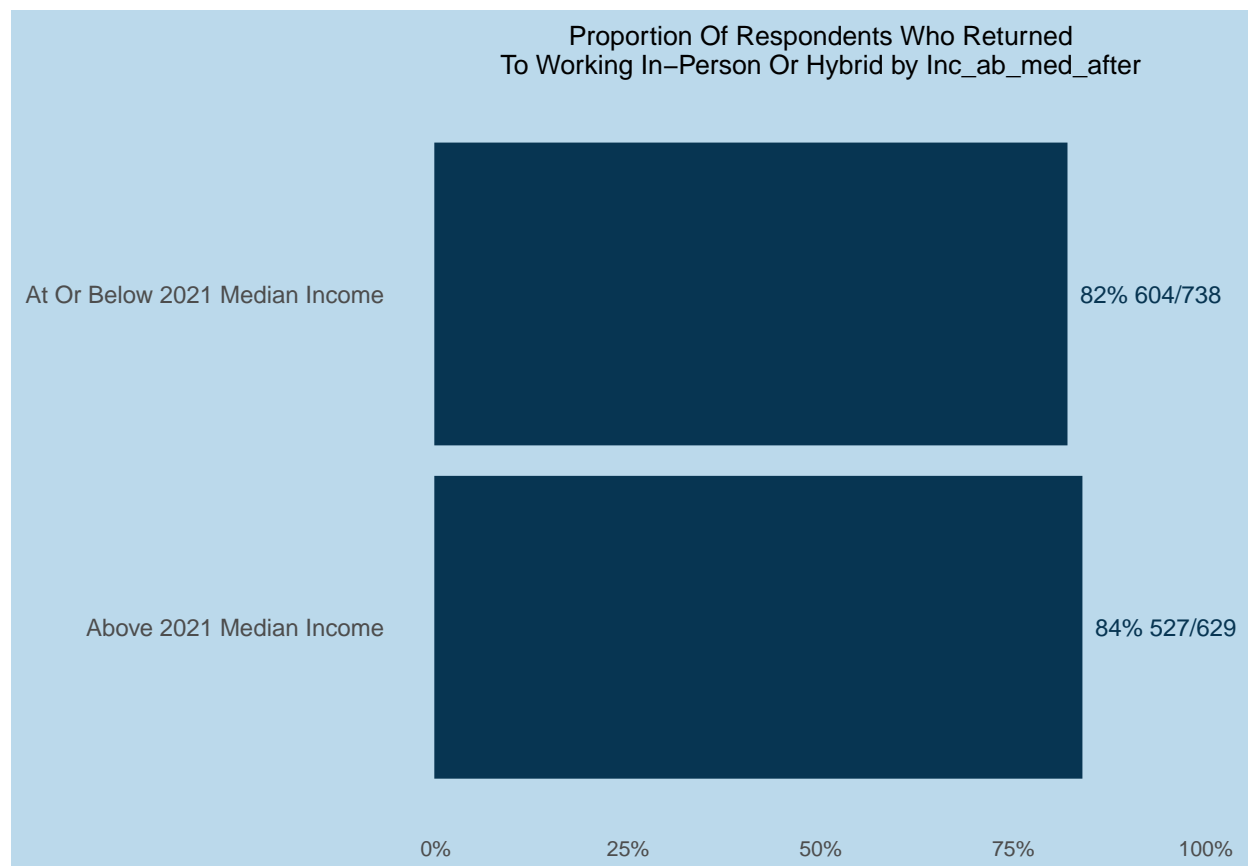
```
## $sch_bach
## NULL
##
## $ins_has
## NULL
##
## $ins_prvt
## NULL
```

1.8) Higher paid employees (above median income) were less likely to return to working in-person [12,13,19]

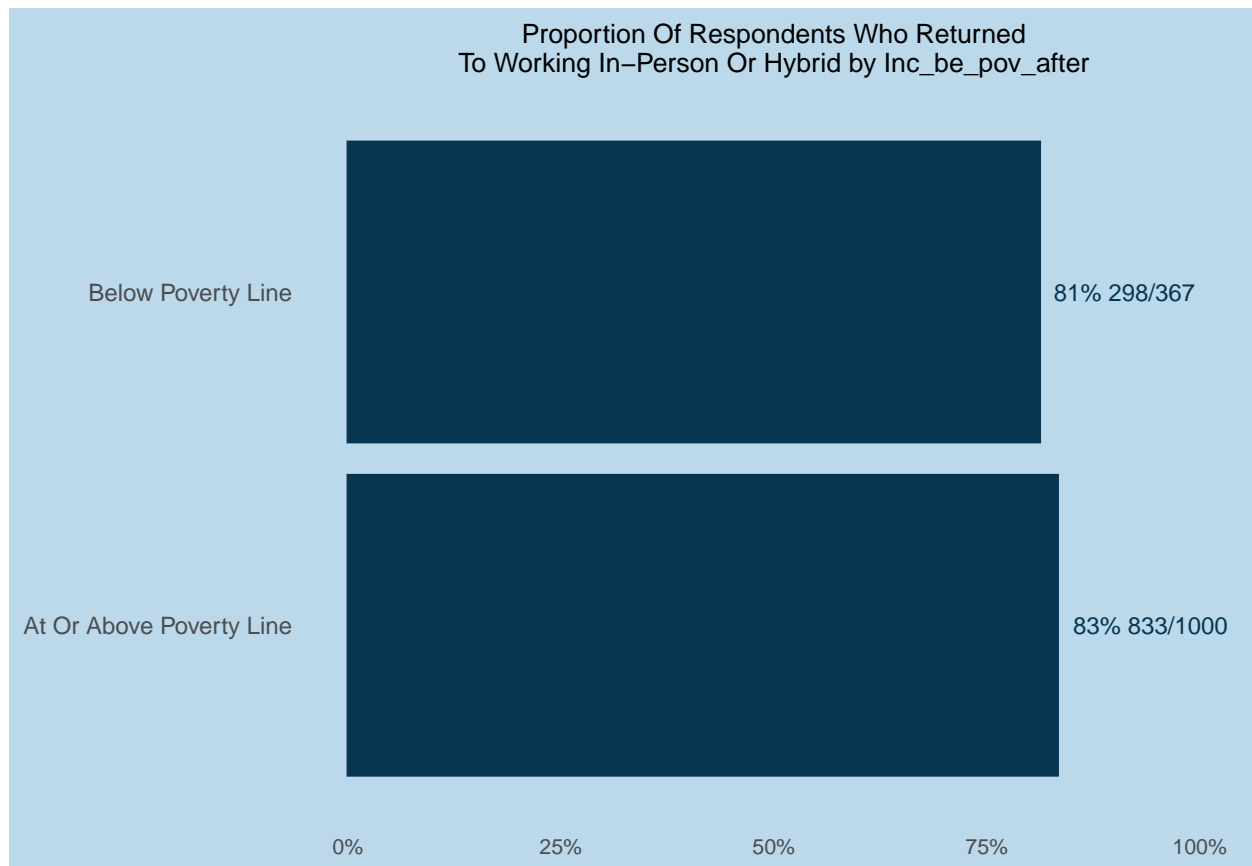
1. Find respondents who are earning above median income [12 &13]
 - a. Find proportion who are working fully virtual and hybrid mode [18]
 - b. Find proportion not in subset and compare
2. Find respondents who are earning below median income [12 &13]
 - c. Find proportion who are working fully in-person [18]
 - d. Find proportion not in subset and compare

```
make_plots(wrangled %>% filter(wrk != 4), c("inc_ab_med_after", "inc_be_pov_after"), "wrk_in",
           title = "Proportion of Respondents who returned\nto working in-person or hybrid",
           show = TRUE)
```

```
## $inc_ab_med_after
## $inc_ab_med_after$plot
```



```
##
## $inc_ab_med_after$p.values
## $inc_ab_med_after$p.values$wrk_in
##               at or below 2021 median income
## at or below 2021 median income                NA
## above 2021 median income                      NA
##               above 2021 median income
## at or below 2021 median income                NA
## above 2021 median income                      NA
##
##
##
## $inc_be_pov_after
## $inc_be_pov_after$plot
```



```
##
## $inc_be_pov_after$p.values
## $inc_be_pov_after$p.values$wrk_in
##               below poverty line at or above poverty line
## below poverty line                NA                NA
## at or above poverty line          NA                NA
```

1.9) People who are unemployed and currently receiving unemployment benefits [17]

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

```
mean(wrangled$unemp_ben == 1, na.rm = TRUE)
```

```
## [1] 0.06324111
```

```
make_plots(wrangled %>% mutate(temp = unemp_ben == 1), demographics, "temp")
```

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

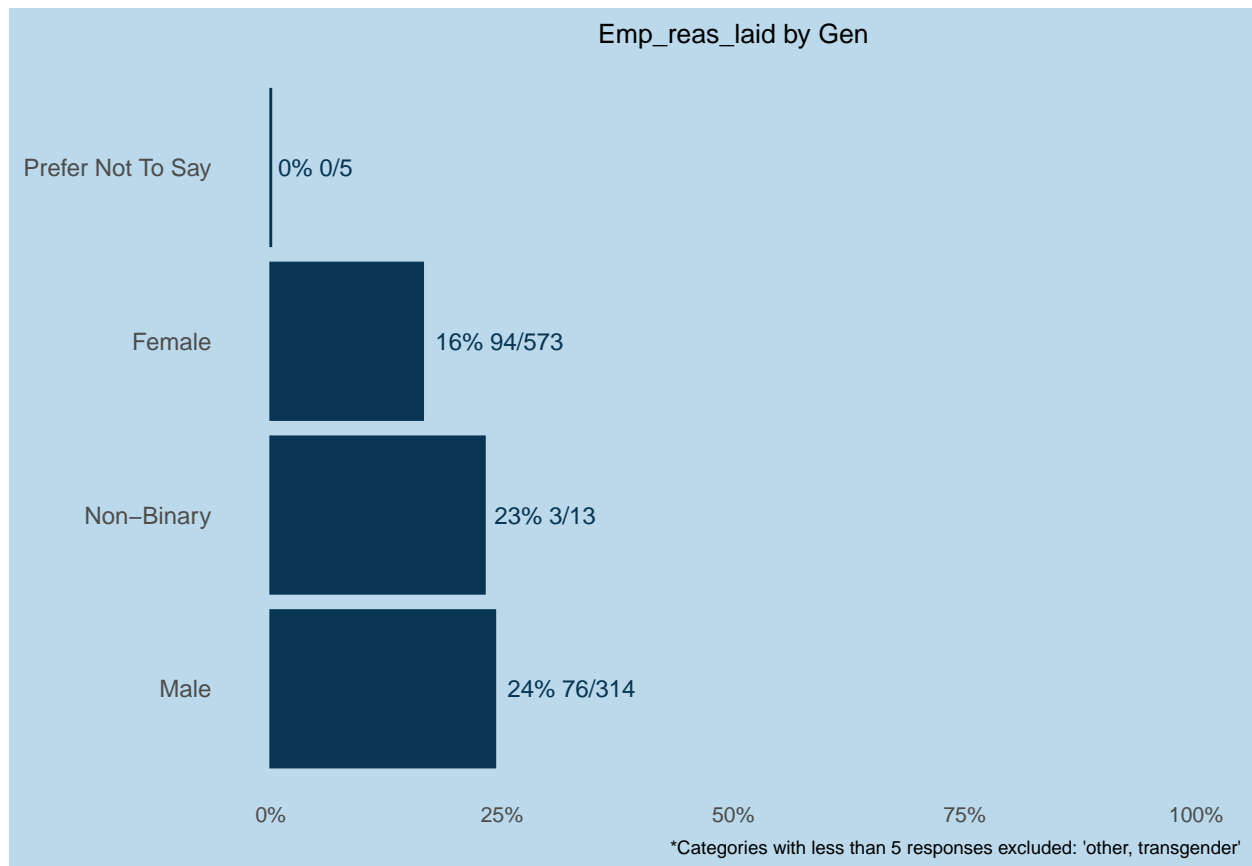
1.10) Reasons for employment change

1. Run sub demographic distribution over each reason of employment change
2. Run distribution over population.

```
emp_reas <- wrangled %>% select(starts_with("emp_reas_")) %>% colnames()
names(emp_reas) <- emp_reas

lapply(emp_reas[1:2], function(reason) {
  make_plots(wrangled, demographics, reason, title = reason)
})
```

```
## $emp_reas_laid
## $emp_reas_laid$borough
## NULL
##
## $emp_reas_laid$gen
## $emp_reas_laid$gen$plot
```



```
##
## $emp_reas_laid$gen$p.values
## $emp_reas_laid$gen$p.values$emp_reas_laid
##           prefer not to say female non-binary   male
## prefer not to say           NA      NA           NA      NA
## female                     NA      NA           NA 0.0063
## non-binary                  NA      NA           NA      NA
## male                        NA 0.0063           NA      NA
##
##
## $emp_reas_laid$race_census
## NULL
##
## $emp_reas_laid$hh_ch_0_17_bi
## NULL
##
## $emp_reas_laid$hh_sn_65_bi
## NULL
##
## $emp_reas_laid$inc_dist
## NULL
##
##
## $emp_reas_fire
## $emp_reas_fire$borough
```

```
## NULL
##
## $emp_reas_fire$gen
## NULL
##
## $emp_reas_fire$race_census
## NULL
##
## $emp_reas_fire$hh_ch_0_17_bi
## NULL
##
## $emp_reas_fire$hh_sn_65_bi
## NULL
##
## $emp_reas_fire$inc_dist
## NULL
```