Homework Lab#2

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9/22/2021

1. What are the names of the people in your study group?

.Thakur Ghimire

.Nicholas Alonso

.Bolina Oxilus

.Diep luu

.Joel rosas

1. Write up the results of your Lab 2 work. I don’t want all of your output, please pick the interesting bits (and start thinking about what makes a result interesting?).

library(MASS)  
library(ggplot2)  
library(tidyverse)

## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --

## v tibble 3.1.4 v dplyr 1.0.7  
## v tidyr 1.1.3 v stringr 1.4.0  
## v readr 2.0.1 v forcats 0.5.1  
## v purrr 0.3.4

## -- Conflicts ------------------------------------------ tidyverse\_conflicts() --  
## x dplyr::filter() masks stats::filter()  
## x dplyr::lag() masks stats::lag()  
## x dplyr::select() masks MASS::select()

load("~/homework Lab#2Rmd/acs2017\_ny\_data.RData")

summary(acs2017\_ny)

## AGE female educ\_nohs educ\_hs   
## Min. : 0.00 Min. :0.0000 Min. :0.000 Min. :0.0000   
## 1st Qu.:22.00 1st Qu.:0.0000 1st Qu.:0.000 1st Qu.:0.0000   
## Median :42.00 Median :1.0000 Median :0.000 Median :0.0000   
## Mean :41.57 Mean :0.5156 Mean :0.271 Mean :0.2804   
## 3rd Qu.:60.00 3rd Qu.:1.0000 3rd Qu.:1.000 3rd Qu.:1.0000   
## Max. :95.00 Max. :1.0000 Max. :1.000 Max. :1.0000   
##   
## educ\_somecoll educ\_college educ\_advdeg SCHOOL   
## Min. :0.000 Min. :0.0000 Min. :0.000 N/A : 5569   
## 1st Qu.:0.000 1st Qu.:0.0000 1st Qu.:0.000 No, not in school:144968   
## Median :0.000 Median :0.0000 Median :0.000 Yes, in school : 46048   
## Mean :0.173 Mean :0.1567 Mean :0.119 Missing : 0   
## 3rd Qu.:0.000 3rd Qu.:0.0000 3rd Qu.:0.000   
## Max. :1.000 Max. :1.0000 Max. :1.000   
##   
## EDUC   
## Grade 12 :55119   
## 4 years of college :30802   
## 5+ years of college :23385   
## 1 year of college :19947   
## Nursery school to grade 4:14240   
## 2 years of college :14065   
## (Other) :39027   
## EDUCD   
## Regular high school diploma :35689   
## Bachelor's degree :30802   
## 1 or more years of college credit, no degree:19947   
## Master's degree :17010   
## Associate's degree, type not specified :14065   
## Some college, but less than 1 year : 9086   
## (Other) :69986   
## DEGFIELD   
## N/A :142398   
## Business : 9802   
## Education Administration and Teaching : 6708   
## Social Sciences : 4836   
## Medical and Health Sciences and Services: 3919   
## Fine Arts : 3491   
## (Other) : 25431   
## DEGFIELDD   
## N/A :142398   
## Psychology : 2926   
## Business Management and Administration: 2501   
## Accounting : 2284   
## General Education : 2238   
## English Language and Literature : 2202   
## (Other) : 42036   
## DEGFIELD2   
## N/A :190425   
## Business : 972   
## Social Sciences : 853   
## Education Administration and Teaching: 611   
## Fine Arts : 465   
## Communications : 352   
## (Other) : 2907   
## DEGFIELD2D   
## N/A :190425   
## Psychology : 284   
## Economics : 260   
## Political Science and Government : 243   
## Business Management and Administration : 217   
## French, German, Latin and Other Common Foreign Language Studies: 205   
## (Other) : 4951   
## PUMA GQ OWNERSHP OWNERSHPD MORTGAGE   
## Min. : 100 Min. :1.000 Min. :0.000 Min. : 0.00 Min. :0.000   
## 1st Qu.:1500 1st Qu.:1.000 1st Qu.:1.000 1st Qu.:12.00 1st Qu.:0.000   
## Median :3201 Median :1.000 Median :1.000 Median :13.00 Median :1.000   
## Mean :2713 Mean :1.148 Mean :1.266 Mean :14.95 Mean :1.453   
## 3rd Qu.:3902 3rd Qu.:1.000 3rd Qu.:2.000 3rd Qu.:22.00 3rd Qu.:3.000   
## Max. :4114 Max. :5.000 Max. :2.000 Max. :22.00 Max. :4.000   
##   
## OWNCOST RENT COSTELEC COSTGAS COSTWATR   
## Min. : 0 Min. : 0 Min. : 0 Min. : 0 Min. : 0   
## 1st Qu.: 1208 1st Qu.: 0 1st Qu.: 960 1st Qu.: 840 1st Qu.: 320   
## Median : 2891 Median : 0 Median :1560 Median :2400 Median :1400   
## Mean :38582 Mean : 393 Mean :2311 Mean :5032 Mean :4836   
## 3rd Qu.:99999 3rd Qu.: 630 3rd Qu.:2520 3rd Qu.:9993 3rd Qu.:9993   
## Max. :99999 Max. :3800 Max. :9997 Max. :9997 Max. :9997   
##   
## COSTFUEL HHINCOME FOODSTMP LINGISOL   
## Min. : 0 Min. : -11800 Min. :1.000 Min. :0.000   
## 1st Qu.:9993 1st Qu.: 41600 1st Qu.:1.000 1st Qu.:1.000   
## Median :9993 Median : 81700 Median :1.000 Median :1.000   
## Mean :7935 Mean : 114902 Mean :1.147 Mean :1.002   
## 3rd Qu.:9993 3rd Qu.: 140900 3rd Qu.:1.000 3rd Qu.:1.000   
## Max. :9997 Max. :2030000 Max. :2.000 Max. :2.000   
## NA's :10630   
## ROOMS BUILTYR2 UNITSSTR FUELHEAT   
## Min. : 0.000 Min. : 0.000 Min. : 0.00 Min. :0.000   
## 1st Qu.: 4.000 1st Qu.: 1.000 1st Qu.: 3.00 1st Qu.:2.000   
## Median : 6.000 Median : 3.000 Median : 3.00 Median :2.000   
## Mean : 5.887 Mean : 3.711 Mean : 4.39 Mean :2.959   
## 3rd Qu.: 8.000 3rd Qu.: 5.000 3rd Qu.: 6.00 3rd Qu.:4.000   
## Max. :16.000 Max. :22.000 Max. :10.00 Max. :9.000   
##   
## SSMC FAMSIZE NCHILD NCHLT5   
## Min. :0.00000 Min. : 1.000 Min. :0.0000 Min. :0.00000   
## 1st Qu.:0.00000 1st Qu.: 2.000 1st Qu.:0.0000 1st Qu.:0.00000   
## Median :0.00000 Median : 3.000 Median :0.0000 Median :0.00000   
## Mean :0.01102 Mean : 3.087 Mean :0.5009 Mean :0.08441   
## 3rd Qu.:0.00000 3rd Qu.: 4.000 3rd Qu.:1.0000 3rd Qu.:0.00000   
## Max. :2.00000 Max. :19.000 Max. :9.0000 Max. :5.00000   
##   
## RELATE RELATED MARST RACE RACED   
## Min. : 1.000 Min. : 101.0 Min. :1.000 Min. :1.00 Min. :100   
## 1st Qu.: 1.000 1st Qu.: 101.0 1st Qu.:1.000 1st Qu.:1.00 1st Qu.:100   
## Median : 2.000 Median : 201.0 Median :5.000 Median :1.00 Median :100   
## Mean : 3.307 Mean : 335.6 Mean :3.742 Mean :2.03 Mean :205   
## 3rd Qu.: 3.000 3rd Qu.: 301.0 3rd Qu.:6.000 3rd Qu.:2.00 3rd Qu.:200   
## Max. :13.000 Max. :1301.0 Max. :6.000 Max. :9.00 Max. :990   
##   
## HISPAN HISPAND BPL   
## Min. :0.0000 Min. : 0.00 New York :128517   
## 1st Qu.:0.0000 1st Qu.: 0.00 West Indies : 8481   
## Median :0.0000 Median : 0.00 China : 4964   
## Mean :0.4153 Mean : 44.75 SOUTH AMERICA: 4957   
## 3rd Qu.:0.0000 3rd Qu.: 0.00 India : 3476   
## Max. :4.0000 Max. :498.00 Pennsylvania : 3303   
## (Other) : 42887   
## BPLD ANCESTR1   
## New York :128517 Not Reported :32021   
## China : 4116 Italian :20577   
## Dominican Republic: 3517 Irish, various subheads,:16388   
## Pennsylvania : 3303 German :12781   
## New Jersey : 3127 African-American : 9559   
## Puerto Rico : 2272 United States : 8209   
## (Other) : 51733 (Other) :97050   
## ANCESTR1D ANCESTR2   
## Not Reported :32021 Not Reported:141487   
## Italian (1990-2000, ACS, PRCS) :20577 German : 9476   
## Irish :15651 Irish : 9238   
## German (1990-2000, ACS/PRCS) :12605 English : 4895   
## African-American (1990-2000, ACS, PRCS): 9559 Italian : 4531   
## United States : 8209 Polish : 3113   
## (Other) :97963 (Other) : 23845   
## ANCESTR2D CITIZEN YRSUSA1   
## Not Reported :141487 Min. :0.0000 Min. : 0.000   
## German (1990-2000, ACS, PRCS) : 9441 1st Qu.:0.0000 1st Qu.: 0.000   
## Irish : 8809 Median :0.0000 Median : 0.000   
## English : 4895 Mean :0.4793 Mean : 5.377   
## Italian (1990-2000, ACS, PRCS): 4531 3rd Qu.:0.0000 3rd Qu.: 0.000   
## Polish : 3113 Max. :3.0000 Max. :92.000   
## (Other) : 24309   
## HCOVANY HCOVPRIV SEX EMPSTAT   
## Min. :1.000 Min. :1.000 Male : 95222 Min. :0.000   
## 1st Qu.:2.000 1st Qu.:1.000 Female:101363 1st Qu.:1.000   
## Median :2.000 Median :2.000 Median :1.000   
## Mean :1.951 Mean :1.691 Mean :1.514   
## 3rd Qu.:2.000 3rd Qu.:2.000 3rd Qu.:3.000   
## Max. :2.000 Max. :2.000 Max. :3.000   
##   
## EMPSTATD LABFORCE OCC IND   
## Min. : 0.00 Min. :0.000 0 : 79987 0 :79987   
## 1st Qu.:10.00 1st Qu.:1.000 2310 : 3494 7860 : 9025   
## Median :10.00 Median :2.000 5700 : 3235 8680 : 6354   
## Mean :15.16 Mean :1.331 430 : 3025 770 : 6279   
## 3rd Qu.:30.00 3rd Qu.:2.000 4720 : 2666 8190 : 5873   
## Max. :30.00 Max. :2.000 4760 : 2563 7870 : 4041   
## (Other):101615 (Other):85026   
## CLASSWKR CLASSWKRD WKSWORK2 UHRSWORK   
## Min. :0.000 Min. : 0.00 Min. :0.000 Min. : 0.00   
## 1st Qu.:0.000 1st Qu.: 0.00 1st Qu.:0.000 1st Qu.: 0.00   
## Median :2.000 Median :22.00 Median :1.000 Median :12.00   
## Mean :1.116 Mean :13.03 Mean :2.701 Mean :19.77   
## 3rd Qu.:2.000 3rd Qu.:22.00 3rd Qu.:6.000 3rd Qu.:40.00   
## Max. :2.000 Max. :29.00 Max. :6.000 Max. :99.00   
##   
## INCTOT FTOTINC INCWAGE POVERTY   
## Min. : -7300 Min. : -11800 Min. : 0 Min. : 0.0   
## 1st Qu.: 8000 1st Qu.: 35550 1st Qu.: 0 1st Qu.:159.0   
## Median : 25000 Median : 74000 Median : 10000 Median :351.0   
## Mean : 45245 Mean : 107111 Mean : 33796 Mean :318.7   
## 3rd Qu.: 56500 3rd Qu.: 132438 3rd Qu.: 47000 3rd Qu.:501.0   
## Max. :1563000 Max. :2030000 Max. :638000 Max. :501.0   
## NA's :31129 NA's :10817 NA's :33427   
## MIGRATE1 MIGRATE1D MIGPLAC1 MIGCOUNTY1   
## Min. :0.000 Min. : 0.00 Min. : 0.000 Min. : 0.000   
## 1st Qu.:1.000 1st Qu.:10.00 1st Qu.: 0.000 1st Qu.: 0.000   
## Median :1.000 Median :10.00 Median : 0.000 Median : 0.000   
## Mean :1.122 Mean :11.51 Mean : 6.184 Mean : 4.117   
## 3rd Qu.:1.000 3rd Qu.:10.00 3rd Qu.: 0.000 3rd Qu.: 0.000   
## Max. :4.000 Max. :40.00 Max. :900.000 Max. :810.000   
##   
## MIGPUMA1 VETSTAT VETSTATD PWPUMA00   
## Min. : 0 Min. :0.0000 Min. : 0.000 Min. : 0   
## 1st Qu.: 0 1st Qu.:1.0000 1st Qu.:11.000 1st Qu.: 0   
## Median : 0 Median :1.0000 Median :11.000 Median : 0   
## Mean : 277 Mean :0.8621 Mean : 9.412 Mean : 1255   
## 3rd Qu.: 0 3rd Qu.:1.0000 3rd Qu.:11.000 3rd Qu.: 3100   
## Max. :70100 Max. :2.0000 Max. :20.000 Max. :59300   
##   
## TRANWORK TRANTIME DEPARTS in\_NYC   
## Min. : 0.000 Min. : 0.00 Min. : 0.0 Min. :0.0000   
## 1st Qu.: 0.000 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.:0.0000   
## Median : 0.000 Median : 0.00 Median : 0.0 Median :0.0000   
## Mean : 9.725 Mean : 14.75 Mean : 373.3 Mean :0.3615   
## 3rd Qu.:10.000 3rd Qu.: 20.00 3rd Qu.: 732.0 3rd Qu.:1.0000   
## Max. :70.000 Max. :138.00 Max. :2345.0 Max. :1.0000   
##   
## in\_Bronx in\_Manhattan in\_StatenI in\_Brooklyn   
## Min. :0.0000 Min. :0.00000 Min. :0.00000 Min. :0.000   
## 1st Qu.:0.0000 1st Qu.:0.00000 1st Qu.:0.00000 1st Qu.:0.000   
## Median :0.0000 Median :0.00000 Median :0.00000 Median :0.000   
## Mean :0.0538 Mean :0.04981 Mean :0.02084 Mean :0.126   
## 3rd Qu.:0.0000 3rd Qu.:0.00000 3rd Qu.:0.00000 3rd Qu.:0.000   
## Max. :1.0000 Max. :1.00000 Max. :1.00000 Max. :1.000   
##   
## in\_Queens in\_Westchester in\_Nassau Hispanic   
## Min. :0.0000 Min. :0.00000 Min. :0.00000 Min. :0.0000   
## 1st Qu.:0.0000 1st Qu.:0.00000 1st Qu.:0.00000 1st Qu.:0.0000   
## Median :0.0000 Median :0.00000 Median :0.00000 Median :0.0000   
## Mean :0.1111 Mean :0.04413 Mean :0.07032 Mean :0.1387   
## 3rd Qu.:0.0000 3rd Qu.:0.00000 3rd Qu.:0.00000 3rd Qu.:0.0000   
## Max. :1.0000 Max. :1.00000 Max. :1.00000 Max. :1.0000   
##   
## Hisp\_Mex Hisp\_PR Hisp\_Cuban Hisp\_DomR   
## Min. :0.00000 Min. :0.0000 Min. :0.000000 Min. :0.00000   
## 1st Qu.:0.00000 1st Qu.:0.0000 1st Qu.:0.000000 1st Qu.:0.00000   
## Median :0.00000 Median :0.0000 Median :0.000000 Median :0.00000   
## Mean :0.01626 Mean :0.0436 Mean :0.003403 Mean :0.02827   
## 3rd Qu.:0.00000 3rd Qu.:0.0000 3rd Qu.:0.000000 3rd Qu.:0.00000   
## Max. :1.00000 Max. :1.0000 Max. :1.000000 Max. :1.00000   
##   
## white AfAm Amindian Asian   
## Min. :0.0000 Min. :0.000 Min. :0.000000 Min. :0.00000   
## 1st Qu.:0.0000 1st Qu.:0.000 1st Qu.:0.000000 1st Qu.:0.00000   
## Median :1.0000 Median :0.000 Median :0.000000 Median :0.00000   
## Mean :0.6997 Mean :0.125 Mean :0.003779 Mean :0.08656   
## 3rd Qu.:1.0000 3rd Qu.:0.000 3rd Qu.:0.000000 3rd Qu.:0.00000   
## Max. :1.0000 Max. :1.000 Max. :1.000000 Max. :1.00000   
##   
## race\_oth unmarried veteran has\_AnyHealthIns  
## Min. :0.0000 Min. :0.00 Min. :0.00000 Min. :0.0000   
## 1st Qu.:0.0000 1st Qu.:0.00 1st Qu.:0.00000 1st Qu.:1.0000   
## Median :0.0000 Median :0.00 Median :0.00000 Median :1.0000   
## Mean :0.1324 Mean :0.45 Mean :0.04443 Mean :0.9513   
## 3rd Qu.:0.0000 3rd Qu.:1.00 3rd Qu.:0.00000 3rd Qu.:1.0000   
## Max. :1.0000 Max. :1.00 Max. :1.00000 Max. :1.0000   
##   
## has\_PvtHealthIns Commute\_car Commute\_bus Commute\_subway   
## Min. :0.0000 Min. :0.0000 Min. :0.00000 Min. :0.00000   
## 1st Qu.:0.0000 1st Qu.:0.0000 1st Qu.:0.00000 1st Qu.:0.00000   
## Median :1.0000 Median :0.0000 Median :0.00000 Median :0.00000   
## Mean :0.6906 Mean :0.2997 Mean :0.02162 Mean :0.07468   
## 3rd Qu.:1.0000 3rd Qu.:1.0000 3rd Qu.:0.00000 3rd Qu.:0.00000   
## Max. :1.0000 Max. :1.0000 Max. :1.00000 Max. :1.00000   
##   
## Commute\_rail Commute\_other below\_povertyline below\_150poverty  
## Min. :0.00000 Min. :0.00000 Min. :0.000 Min. :0.0000   
## 1st Qu.:0.00000 1st Qu.:0.00000 1st Qu.:0.000 1st Qu.:0.0000   
## Median :0.00000 Median :0.00000 Median :0.000 Median :0.0000   
## Mean :0.01332 Mean :0.05506 Mean :0.122 Mean :0.1965   
## 3rd Qu.:0.00000 3rd Qu.:0.00000 3rd Qu.:0.000 3rd Qu.:0.0000   
## Max. :1.00000 Max. :1.00000 Max. :1.000 Max. :1.0000   
##   
## below\_200poverty foodstamps   
## Min. :0.0000 Min. :0.0000   
## 1st Qu.:0.0000 1st Qu.:0.0000   
## Median :0.0000 Median :0.0000   
## Mean :0.2676 Mean :0.1465   
## 3rd Qu.:1.0000 3rd Qu.:0.0000   
## Max. :1.0000 Max. :1.0000   
##

acs2017\_ny$IND\_number <- as.numeric(levels(acs2017\_ny$IND))[acs2017\_ny$IND]

## Warning: NAs introduced by coercion

acs2017\_ny$Covid\_risk <- ((acs2017\_ny$IND\_number > 4600) & acs2017\_ny$IND\_number < 6000) | ((acs2017\_ny$IND\_number > 8500) & (acs2017\_ny$IND\_number < 8700))

summary(acs2017\_ny$DEGFIELD)

## N/A   
## 142398   
## Agriculture   
## 262   
## Environment and Natural Resources   
## 282   
## Architecture   
## 442   
## Area, Ethnic, and Civilization Studies   
## 258   
## Communications   
## 2105   
## Communication Technologies   
## 79   
## Computer and Information Sciences   
## 1530   
## Cosmetology Services and Culinary Arts   
## 50   
## Education Administration and Teaching   
## 6708   
## Engineering   
## 3145   
## Engineering Technologies   
## 246   
## Linguistics and Foreign Languages   
## 683   
## Family and Consumer Sciences   
## 272   
## Law   
## 124   
## English Language, Literature, and Composition   
## 2315   
## Liberal Arts and Humanities   
## 779   
## Library Science   
## 42   
## Biology and Life Sciences   
## 2361   
## Mathematics and Statistics   
## 904   
## Military Technologies   
## 3   
## Interdisciplinary and Multi-Disciplinary Studies (General)   
## 358   
## Physical Fitness, Parks, Recreation, and Leisure   
## 264   
## Philosophy and Religious Studies   
## 523   
## Theology and Religious Vocations   
## 259   
## Physical Sciences   
## 1597   
## Nuclear, Industrial Radiology, and Biological Technologies   
## 12   
## Psychology   
## 3208   
## Criminal Justice and Fire Protection   
## 884   
## Public Affairs, Policy, and Social Work   
## 789   
## Social Sciences   
## 4836   
## Construction Services   
## 46   
## Electrical and Mechanic Repairs and Technologies   
## 14   
## Precision Production and Industrial Arts   
## 0   
## Transportation Sciences and Technologies   
## 84   
## Fine Arts   
## 3491   
## Medical and Health Sciences and Services   
## 3919   
## Business   
## 9802   
## History   
## 1511

covid\_by\_major <- acs2017\_ny %>%  
  
 filter(!is.na(Covid\_risk)) %>%  
  
 group\_by(DEGFIELD,Covid\_risk) %>%  
 summarise(Count=n()) %>%  
   
 mutate(Percentage=Count/sum(Count)\*100)

## `summarise()` has grouped output by 'DEGFIELD'. You can override using the `.groups` argument.

covid\_by\_major <- covid\_by\_major[covid\_by\_major$Covid\_risk==TRUE, ]  
covid\_by\_major %>%  
 arrange(desc(Percentage))

## # A tibble: 37 x 4  
## # Groups: DEGFIELD [37]  
## DEGFIELD Covid\_risk Count Percentage  
## <fct> <lgl> <int> <dbl>  
## 1 Cosmetology Services and Culinary Arts TRUE 18 36   
## 2 Military Technologies TRUE 1 33.3  
## 3 Nuclear, Industrial Radiology, and Biological Te~ TRUE 3 25   
## 4 Fine Arts TRUE 758 21.8  
## 5 Communication Technologies TRUE 16 20.8  
## 6 Physical Fitness, Parks, Recreation, and Leisure TRUE 52 19.7  
## 7 Communications TRUE 314 15.0  
## 8 N/A TRUE 17892 12.6  
## 9 Liberal Arts and Humanities TRUE 95 12.2  
## 10 Area, Ethnic, and Civilization Studies TRUE 31 12.0  
## # ... with 27 more rows

Here I am going to compare the group of business and group of communications

to analyze the impact of Covid.

business <- acs2017\_ny[acs2017\_ny$DEGFIELD=='Business', ]  
business %>% count(Covid\_risk, sort = TRUE)

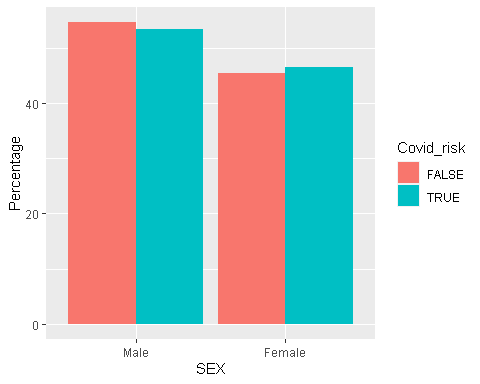
## # A tibble: 3 x 2  
## Covid\_risk n  
## <lgl> <int>  
## 1 FALSE 8659  
## 2 TRUE 1125  
## 3 NA 18

business\_by\_sex <- business %>%   
filter(!is.na(Covid\_risk)) %>%   
group\_by(Covid\_risk, SEX) %>%   
summarise(Count=n()) %>%  
mutate(Percentage=Count/sum(Count)\*100)

## `summarise()` has grouped output by 'Covid\_risk'. You can override using the `.groups` argument.

ggplot(business\_by\_sex, aes(fill=Covid\_risk, y=Percentage, x=SEX)) +   
 geom\_histogram(position="dodge", stat="identity")

## Warning: Ignoring unknown parameters: binwidth, bins, pad



From the graph we see that more males about 54 percent in business sector were affected by Covid than females which is about 46 percent.

business\_by\_citizen <- business %>%   
 filter(!is.na(Covid\_risk))%>%   
 group\_by(Covid\_risk, CITIZEN) %>%   
 summarise(Count=n()) %>%  
 mutate(Percentage=Count/sum(Count)\*100)

## `summarise()` has grouped output by 'Covid\_risk'. You can override using the `.groups` argument.

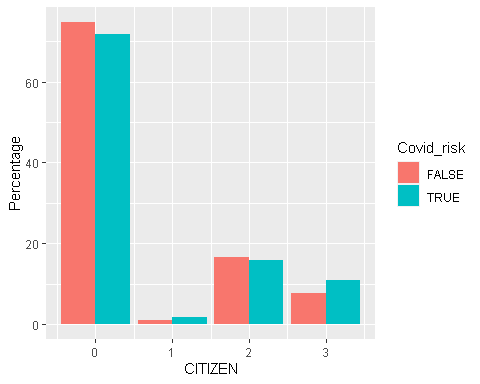
business\_by\_citizen

## # A tibble: 8 x 4  
## # Groups: Covid\_risk [2]  
## Covid\_risk CITIZEN Count Percentage  
## <lgl> <int+lbl> <int> <dbl>  
## 1 FALSE 0 [N/A] 6481 74.8   
## 2 FALSE 1 [Born abroad of American parents] 90 1.04  
## 3 FALSE 2 [Naturalized citizen] 1431 16.5   
## 4 FALSE 3 [Not a citizen] 657 7.59  
## 5 TRUE 0 [N/A] 808 71.8   
## 6 TRUE 1 [Born abroad of American parents] 18 1.6   
## 7 TRUE 2 [Naturalized citizen] 177 15.7   
## 8 TRUE 3 [Not a citizen] 122 10.8

ggplot(business\_by\_citizen, aes(fill=Covid\_risk, y=Percentage, x=CITIZEN)) +   
 geom\_histogram(position="dodge", stat="identity")

## Warning: Ignoring unknown parameters: binwidth, bins, pad

## Don't know how to automatically pick scale for object of type haven\_labelled. Defaulting to continuous.



Here we see that, naturalized US citizens were comparatively more affected than the US citizens born abroad by Covid. The percentage of non citizens under Covid risk is about 12 percent whereas 15 percent of the naturalized citizens and 2 percent of citizens born abroad were impacted by Covid. Citizens born abroad have insignificant impact of Covid in comparison to the naturalized US citizen and non citizens.

Communications <- acs2017\_ny[acs2017\_ny$DEGFIELD=='Communications', ]  
Communications %>% count(Covid\_risk, sort = TRUE)

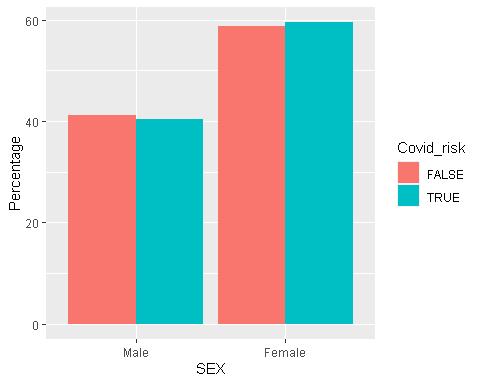
## # A tibble: 3 x 2  
## Covid\_risk n  
## <lgl> <int>  
## 1 FALSE 1786  
## 2 TRUE 314  
## 3 NA 5

Communications\_by\_sex <- Communications %>%   
 filter(!is.na(Covid\_risk)) %>%   
 group\_by(Covid\_risk, SEX) %>%   
 summarise(Count=n()) %>%  
 mutate(Percentage=Count/sum(Count)\*100)

## `summarise()` has grouped output by 'Covid\_risk'. You can override using the `.groups` argument.

ggplot(Communications\_by\_sex, aes(fill=Covid\_risk, y=Percentage, x=SEX)) +   
 geom\_histogram(position="dodge", stat="identity")

## Warning: Ignoring unknown parameters: binwidth, bins, pad



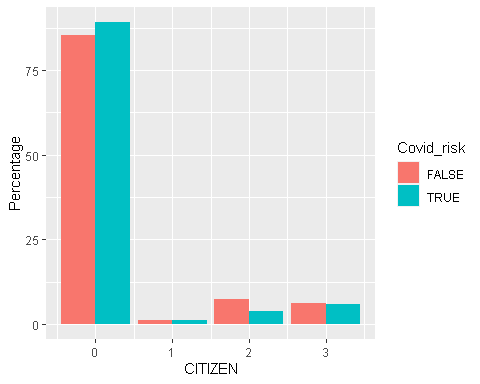
Before Covid, 42 percent male and 58 percent female had communications impact. However after Covid about 40 percent males and 60 percent of females have communications impact due to Covid.

Communications\_by\_citizen <- Communications %>%   
 filter(!is.na(Covid\_risk))%>%   
 group\_by(Covid\_risk, CITIZEN) %>%   
 summarise(Count=n()) %>%  
 mutate(Percentage=Count/sum(Count)\*100)

## `summarise()` has grouped output by 'Covid\_risk'. You can override using the `.groups` argument.

ggplot(Communications\_by\_citizen, aes(fill=Covid\_risk, y=Percentage, x=CITIZEN)) +   
 geom\_bar(position="dodge", stat="identity")

## Don't know how to automatically pick scale for object of type haven\_labelled. Defaulting to continuous.

  
  
In communication sector also naturalized US citizens were comparatively more affected than the US citizens born abroad by Covid. The percentage of non citizens under Covid risk is about 7 percent whereas about 8 percent of the naturalized citizens and 2 percent of citizens born abroad were impacted by Covid. Citizens born abroad have insignificant impact of Covid in comparison to the naturalized US citizen and non citizens.