Final Proposal

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1   Introduction

The dataset, available at "https://www.openicpsr.org/openicpsr/project/131022/version/V3/view?path= /openicpsr/131022/fcr:versions/V3/C19CS-Data-Labeled.xlsx&type=file", focuses on adults nearing retirement age who have been particularly impacted by the recent economic downturn due to COVID-19. The research examines how the early stages of the pandemic have disrupted the work lives and mental health of Americans aged 55 and older. In our research, we want to find ....(will be finished tentative) the correlation betweenthe outcome variable tested positive for covid-19 in the past month (y) and their smoking status as one of the regressor (x).

```r
# setwd('/Users/laix1/OneDrive/Desktop/Final_Proposal')
knitr::opts_knit$set(root.dir = "C:/Users/laix1/OneDrive/Desktop/Final_Proposal/ECON124")

library(haven)

covid_data <- data.frame(read_dta("C19CS Data.dta"))


dim(covid_data)
```

```
## [1] 6938 1867
```

```r
names(covid_data)
```

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##     [3] "t0_panel"          "t0"
##     [5] "t0_dstart"         "t0_dend"
##     [7] "t0_drecord"        "t0_progress"
##     [9] "t0_dursec"         "t0_durmin"
##    [11] "t0_fin"            "t0_consent"
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##    [17] "t0_agegrp"         "t0_sex"
##    [19] "t0_sex_cdc"        "t0_sexw"
##    [21] "t0_eth"            "t0_race_wh"
##    [23] "t0_race_bl"        "t0_race_aian"
##    [25] "t0_race_nhop"      "t0_race_meaa"
##    [27] "t0_race_ch"        "t0_race_fi"
##    [29] "t0_race_ai"        "t0_race_vi"
##    [31] "t0_race_ko"        "t0_race_ja"
```

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```

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##  [355] "t0_chg_news"      "t0_chg_tv"
```

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##  [463] "t1_wry_food"              "t1_wry_comp"
```

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##  [559] "t2_stim"                 "t2_worry"
##  [561] "t2_isolate"              "t2_wash"
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## [593] "t3_fin"                     "t3_lang"
## [595] "t3_relat_ch"                "t3_relat_chnew"
## [597] "t3_relat_chmar"             "t3_relat_chdiv"
## [599] "t3_relat_chsep"             "t3_relat_chwid"
## [601] "t3_relat_choth"             "t3_liv_ch_any"
## [603] "t3_liv_ch_perm"             "t3_liv_ch_temp"
## [605] "t3_liv_ch_othmov"           "t3_liv_ch_vaca"
## [607] "t3_liv_ch_hot"              "t3_liv_ch_ins"
## [609] "t3_liv_ch_oth"              "t3_emp_ch_any"
## [611] "t3_emp_ch_lost"             "t3_emp_ch_furl"
## [613] "t3_emp_ch_hour"             "t3_emp_ch_home"
## [615] "t3_emp_ch_ill"              "t3_emp_ch_new"
## [617] "t3_emp_ch_vac"              "t3_emp_ch_ret"
## [619] "t3_emp_ch_inc"              "t3_emp_ch_away"
## [621] "t3_emp_ch_less"             "t3_emp_ch_more"
## [623] "t3_emp_ch_oth"              "t3_test_self"
## [625] "t3_cov_self_t"              "t3_cov_self_nt"
## [627] "t3_test_ff"                 "t3_cov_ff_t"
## [629] "t3_cov_ff_nt"               "t3_cov_ff_any"
## [631] "t3_hos_ff_any"              "t3_hos_cov_ff_any"
## [633] "t3_death_ff_any"            "t3_death_cov_ff_any"
## [635] "t3_hhist_dep"               "t3_hhist_anx"
## [637] "t3_slfhlth"                 "t3_slfmem"
## [639] "t3_lonely1"                 "t3_lonely2"
## [641] "t3_lonely3"                 "t3_lonely_tot"
## [643] "t3_lonely_fin"              "t3_cesd1"
## [645] "t3_cesd2"                   "t3_cesd3"
## [647] "t3_cesd4"                   "t3_cesd5"
## [649] "t3_cesd6"                   "t3_cesd7"
## [651] "t3_cesd8"                   "t3_cesd_tot"
## [653] "t3_cesd_fin"                "t3_anx1"
## [655] "t3_anx2"                    "t3_anx3"
## [657] "t3_anx4"                    "t3_anx5"
## [659] "t3_anx_tot"                 "t3_anx_fin"
## [661] "t3_satisfy"                 "t3_stim"
## [663] "t3_worry"                   "t3_isolate"
## [665] "t3_wash"                    "t3_mask"
## [667] "t3_distance"                "t3_outside"
## [669] "t3_contact"                 "t3_phone"
## [671] "t3_txtsm"                   "t3_pla_exp"
## [673] "t3_pla_exp_tot"             "t3_pla_exp_groc"
## [675] "t3_pla_exp_pharm"           "t3_pla_exp_fam"
## [677] "t3_pla_exp_fr"              "t3_pla_exp_rest"
## [679] "t3_pla_exp_worsh"           "t3_pla_exp_park"
```

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##  [681] "t3_pla_exp_gym"          "t3_pla_exp_com"
##  [683] "t3_pla_exp_ret"          "t3_pla_exp_pers"
##  [685] "t3_pla_exp_health"       "t3_pla_exp_hosp"
##  [687] "t3_pla_exp_oth"          "t3_contact_exp"
##  [689] "t3_contact_exp_tot"      "t4"
##  [691] "t4_dstart"               "t4_dend"
##  [693] "t4_drecord"              "t4_progress"
##  [695] "t4_dursec"               "t4_durmin"
##  [697] "t4_fin"                  "t4_lang"
##  [699] "t4_relat_ch"             "t4_relat_chnew"
##  [701] "t4_relat_chmar"          "t4_relat_chdiv"
##  [703] "t4_relat_chsep"          "t4_relat_chwid"
##  [705] "t4_relat_choth"          "t4_liv_ch_any"
##  [707] "t4_liv_ch_perm"          "t4_liv_ch_temp"
##  [709] "t4_liv_ch_othmov"        "t4_liv_ch_vaca"
##  [711] "t4_liv_ch_hot"           "t4_liv_ch_ins"
##  [713] "t4_liv_ch_oth"           "t4_emp_ch_any"
##  [715] "t4_emp_ch_lost"          "t4_emp_ch_furl"
##  [717] "t4_emp_ch_hour"          "t4_emp_ch_home"
##  [719] "t4_emp_ch_ill"           "t4_emp_ch_new"
##  [721] "t4_emp_ch_vac"           "t4_emp_ch_ret"
##  [723] "t4_emp_ch_inc"           "t4_emp_ch_away"
##  [725] "t4_emp_ch_less"          "t4_emp_ch_more"
##  [727] "t4_emp_ch_oth"           "t4_test_self"
##  [729] "t4_cov_self_t"           "t4_cov_self_nt"
##  [731] "t4_test_ff"              "t4_cov_ff_t"
##  [733] "t4_cov_ff_nt"            "t4_cov_ff_any"
##  [735] "t4_hos_ff_any"           "t4_hos_cov_ff_any"
##  [737] "t4_death_ff_any"         "t4_death_cov_ff_any"
##  [739] "t4_drink"                "t4_exerc"
##  [741] "t4_slfhlth"              "t4_slfmem"
##  [743] "t4_promis1"              "t4_promis2"
##  [745] "t4_promis3"              "t4_promis4"
##  [747] "t4_promis5"              "t4_promis6"
##  [749] "t4_RawAbl"               "t4_TscoreAbl"
##  [751] "t4_promis7"              "t4_promis8"
##  [753] "t4_promis9"              "t4_promis10"
##  [755] "t4_promis11"             "t4_promis12"
##  [757] "t4_RawFun"               "t4_TscoreFun"
##  [759] "t4_lonely1"              "t4_lonely2"
##  [761] "t4_lonely3"              "t4_lonely_tot"
##  [763] "t4_lonely_fin"           "t4_cesd1"
##  [765] "t4_cesd2"                "t4_cesd3"
##  [767] "t4_cesd4"                "t4_cesd5"
##  [769] "t4_cesd6"                "t4_cesd7"
##  [771] "t4_cesd8"                "t4_cesd_tot"
##  [773] "t4_cesd_fin"             "t4_anx1"
##  [775] "t4_anx2"                 "t4_anx3"
##  [777] "t4_anx4"                 "t4_anx5"
##  [779] "t4_anx_tot"              "t4_anx_fin"
##  [781] "t4_satisfy"              "t4_worry"
##  [783] "t4_isolate"              "t4_interact"
##  [785] "t4_wash"                 "t4_mask"
##  [787] "t4_distance"             "t4_outside"
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##   [793] "t4_pla_exp_pharm"        "t4_pla_exp_fam"
##   [795] "t4_pla_exp_fr"           "t4_pla_exp_rest"
##   [797] "t4_pla_exp_worsh"        "t4_pla_exp_park"
##   [799] "t4_pla_exp_gym"          "t4_pla_exp_com"
##   [801] "t4_pla_exp_ret"          "t4_pla_exp_pers"
##   [803] "t4_pla_exp_health"       "t4_pla_exp_hosp"
##   [805] "t4_pla_exp_oth"          "t4_pla_exp"
##   [807] "t4_pla_exp_tot"          "t4_contact_exp"
##   [809] "t4_contact_exp_tot"      "attwf4m"
##   [811] "pop_attwf4m"             "t5"
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##   [815] "t5_drecord"              "t5_progress"
##   [817] "t5_dursec"               "t5_durmin"
##   [819] "t5_fin"                  "t5_lang"
##   [821] "t5_relat_ch"             "t5_relat_chnew"
##   [823] "t5_relat_chmar"          "t5_relat_chdiv"
##   [825] "t5_relat_chsep"          "t5_relat_chwid"
##   [827] "t5_relat_choth"          "t5_liv_ch_any"
##   [829] "t5_liv_ch_perm"          "t5_liv_ch_temp"
##   [831] "t5_liv_ch_othmov"        "t5_liv_ch_vaca"
##   [833] "t5_liv_ch_hot"           "t5_liv_ch_ins"
##   [835] "t5_liv_ch_oth"           "t5_emp_ch_any"
##   [837] "t5_emp_ch_lost"          "t5_emp_ch_furl"
##   [839] "t5_emp_ch_hour"          "t5_emp_ch_home"
##   [841] "t5_emp_ch_ill"           "t5_emp_ch_new"
##   [843] "t5_emp_ch_vac"           "t5_emp_ch_ret"
##   [845] "t5_emp_ch_inc"           "t5_emp_ch_away"
##   [847] "t5_emp_ch_less"          "t5_emp_ch_more"
##   [849] "t5_emp_ch_oth"           "t5_test_self"
##   [851] "t5_cov_self_t"           "t5_cov_self_nt"
##   [853] "t5_test_ff"              "t5_cov_ff_t"
##   [855] "t5_cov_ff_nt"            "t5_cov_ff_any"
##   [857] "t5_hos_ff_any"           "t5_hos_cov_ff_any"
##   [859] "t5_death_ff_any"         "t5_death_cov_ff_any"
##   [861] "t5_slfhlth"              "t5_slfmem"
##   [863] "t5_lonely1"              "t5_lonely2"
##   [865] "t5_lonely3"              "t5_lonely_tot"
##   [867] "t5_lonely_fin"           "t5_cesd1"
##   [869] "t5_cesd2"                "t5_cesd3"
##   [871] "t5_cesd4"                "t5_cesd5"
##   [873] "t5_cesd6"                "t5_cesd7"
##   [875] "t5_cesd8"                "t5_cesd_tot"
##   [877] "t5_cesd_fin"             "t5_anx1"
##   [879] "t5_anx2"                 "t5_anx3"
##   [881] "t5_anx4"                 "t5_anx5"
##   [883] "t5_anx_tot"              "t5_anx_fin"
##   [885] "t5_satisfy"              "t5_worry"
##   [887] "t5_isolate"              "t5_interact"
##   [889] "t5_wash"                 "t5_mask"
##   [891] "t5_distance"             "t5_outside"
##   [893] "t5_contact"              "t5_phone"
##   [895] "t5_txtsm"                "t5_pla_exp_groc"
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```
##  [897] "t5_pla_exp_pharm"        "t5_pla_exp_fam"
##  [899] "t5_pla_exp_fr"           "t5_pla_exp_rest"
##  [901] "t5_pla_exp_worsh"        "t5_pla_exp_park"
##  [903] "t5_pla_exp_gym"          "t5_pla_exp_com"
##  [905] "t5_pla_exp_ret"          "t5_pla_exp_pers"
##  [907] "t5_pla_exp_health"       "t5_pla_exp_hosp"
##  [909] "t5_pla_exp_oth"          "t5_pla_exp"
##  [911] "t5_pla_exp_tot"          "t5_contact_exp"
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##  [927] "t6_durmin"               "t6_fin"
##  [929] "t6_lang"                 "t6_relat"
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##  [933] "t6_sing_w"               "t6_couple"
##  [935] "t6_bldng"                "t6_bldng2"
##  [937] "t6_reside"               "t6_liv_a"
##  [939] "t6_liv_w_sp"             "t6_liv_w_ch"
##  [941] "t6_liv_w_gch"            "t6_liv_w_fam"
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##  [947] "t6_emp_se"               "t6_emp_pt"
##  [949] "t6_emp_ft"               "t6_emp_di"
##  [951] "t6_emp_le"               "t6_emp_fa"
##  [953] "t6_emp_un"               "t6_emp_re"
##  [955] "t6_emp_pr"               "t6_emp_oth"
##  [957] "t6_test_self"            "t6_cov_self_t"
##  [959] "t6_cov_self_nt"          "t6_test_ff"
##  [961] "t6_cov_ff_t"             "t6_cov_ff_nt"
##  [963] "t6_cov_ff_any"           "t6_hos_ff_any"
##  [965] "t6_hos_cov_ff_any"       "t6_death_ff_any"
##  [967] "t6_death_cov_ff_any"     "t6_drink"
##  [969] "t6_exerc"                "t6_slfhlth"
##  [971] "t6_slfmem"               "t6_promis1"
##  [973] "t6_promis2"              "t6_promis3"
##  [975] "t6_promis4"              "t6_promis5"
##  [977] "t6_promis6"              "t6_RawAbl"
##  [979] "t6_TscoreAbl"            "t6_promis7"
##  [981] "t6_promis8"              "t6_promis9"
##  [983] "t6_promis10"             "t6_promis11"
##  [985] "t6_promis12"             "t6_RawFun"
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##  [989] "t6_lonely2"              "t6_lonely3"
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##  [993] "t6_cesd1"                "t6_cesd2"
##  [995] "t6_cesd3"                "t6_cesd4"
##  [997] "t6_cesd5"                "t6_cesd6"
##  [999] "t6_cesd7"                "t6_cesd8"
## [1001] "t6_cesd_tot"             "t6_cesd_fin"
## [1003] "t6_anx1"                 "t6_anx2"
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## [1013] "t6_contact_fm1"       "t6_contact_fm2"
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## [1017] "t6_contact_wr"        "t6_contact_ne"
## [1019] "t6_contact_cm"        "t6_contact_md"
## [1021] "t6_contact_re"        "t6_contact_oth"
## [1023] "t6_pla_tot"           "t6_pla_ai"
## [1025] "t6_pla_ar"            "t6_pla_ca"
## [1027] "t6_pla_cm"            "t6_pla_fr1"
## [1029] "t6_pla_fr2"           "t6_pla_gr"
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## [1035] "t6_pla_re"            "t6_pla_or"
## [1037] "t6_pla_pa"            "t6_pla_pe"
## [1039] "t6_pla_wo"            "t6_pla_ba"
## [1041] "t6_pla_sc"            "t6_pla_sp"
## [1043] "t6_pla_va"            "t6_pla_ve"
## [1045] "t6_pla_wr"            "t6_pla_fm1"
## [1047] "t6_pla_fm2"           "t6_pla_ph"
## [1049] "t6_pla_oth"           "attwf6m"
## [1051] "pop_attwf6m"          "t7"
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## [1057] "t7_dursec"            "t7_durmin"
## [1059] "t7_fin"               "t7_lang"
## [1061] "t7_relat_ch"          "t7_relat_chnew"
## [1063] "t7_relat_chmar"       "t7_relat_chdiv"
## [1065] "t7_relat_chsep"       "t7_relat_chwid"
## [1067] "t7_relat_choth"       "t7_liv_ch_any"
## [1069] "t7_liv_ch_perm"       "t7_liv_ch_temp"
## [1071] "t7_liv_ch_othmov"     "t7_liv_ch_vaca"
## [1073] "t7_liv_ch_hot"        "t7_liv_ch_ins"
## [1075] "t7_liv_ch_oth"        "t7_emp_ch_any"
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## [1079] "t7_emp_ch_furl"       "t7_emp_ch_ill"
## [1081] "t7_emp_ch_vac"        "t7_emp_ch_ret"
## [1083] "t7_emp_ch_hour"       "t7_emp_ch_inc"
## [1085] "t7_emp_ch_home"       "t7_emp_ch_away"
## [1087] "t7_emp_ch_less"       "t7_emp_ch_more"
## [1089] "t7_emp_ch_oth"        "t7_test_self"
## [1091] "t7_cov_self_t"        "t7_cov_self_nt"
## [1093] "t7_test_ff"           "t7_cov_ff_t"
## [1095] "t7_cov_ff_nt"         "t7_cov_ff_any"
## [1097] "t7_hos_ff_any"        "t7_hos_cov_ff_any"
## [1099] "t7_death_ff_any"      "t7_death_cov_ff_any"
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## [1105] "t7_lonely3"           "t7_lonely_tot"
## [1107] "t7_lonely_fin"        "t7_cesd1"
## [1109] "t7_cesd2"             "t7_cesd3"
## [1111] "t7_cesd4"             "t7_cesd5"
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## [1115] "t7_cesd8"              "t7_cesd_tot"
## [1117] "t7_cesd_fin"           "t7_anx1"
## [1119] "t7_anx2"               "t7_anx3"
## [1121] "t7_anx4"               "t7_anx5"
## [1123] "t7_anx_fin"            "t7_satisfy"
## [1125] "t7_fin_af_sav"         "t7_fin_af_spe"
## [1127] "t7_fin_af_bor"         "t7_fin_af_ast"
## [1129] "t7_money"              "t7_worry"
## [1131] "t7_isolate"            "t7_interact"
## [1133] "t7_wash"               "t7_mask"
## [1135] "t7_distance"           "t7_outside"
## [1137] "t7_contact"            "t7_phone"
## [1139] "t7_txtsm"              "t7_pla_exp_ai"
## [1141] "t7_pla_exp_ar"         "t7_pla_exp_ca"
## [1143] "t7_pla_exp_com"        "t7_pla_exp_fr1"
## [1145] "t7_pla_exp_fr2"        "t7_pla_exp_groc"
## [1147] "t7_pla_exp_health"     "t7_pla_exp_hosp"
## [1149] "t7_pla_exp_mo"         "t7_pla_exp_gym"
## [1151] "t7_pla_exp_ret"        "t7_pla_exp_or"
## [1153] "t7_pla_exp_park"       "t7_pla_exp_pers"
## [1155] "t7_pla_exp_worsh"      "t7_pla_exp_rest"
## [1157] "t7_pla_exp_sc"         "t7_pla_exp_sp"
## [1159] "t7_pla_exp_va"         "t7_pla_exp_ve"
## [1161] "t7_pla_exp_wr"         "t7_pla_exp_fam1"
## [1163] "t7_pla_exp_fam2"       "t7_pla_exp_pharm"
## [1165] "t7_pla_exp_oth"        "t7_pla_exp"
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## [1175] "t8_drecord"            "t8_progress"
## [1177] "t8_dursec"             "t8_durmin"
## [1179] "t8_fin"                "t8_lang"
## [1181] "t8_relat_ch"           "t8_relat_chnew"
## [1183] "t8_relat_chmar"        "t8_relat_chdiv"
## [1185] "t8_relat_chsep"        "t8_relat_chwid"
## [1187] "t8_relat_choth"        "t8_liv_ch_any"
## [1189] "t8_liv_ch_perm"        "t8_liv_ch_temp"
## [1191] "t8_liv_ch_othmov"      "t8_liv_ch_vaca"
## [1193] "t8_liv_ch_hot"         "t8_liv_ch_ins"
## [1195] "t8_liv_ch_oth"         "t8_emp_ch_any"
## [1197] "t8_emp_ch_new"         "t8_emp_ch_lost"
## [1199] "t8_emp_ch_furl"        "t8_emp_ch_ill"
## [1201] "t8_emp_ch_vac"         "t8_emp_ch_ret"
## [1203] "t8_emp_ch_hour"        "t8_emp_ch_inc"
## [1205] "t8_emp_ch_home"        "t8_emp_ch_away"
## [1207] "t8_emp_ch_less"        "t8_emp_ch_more"
## [1209] "t8_emp_ch_oth"         "t8_test_self"
## [1211] "t8_cov_self_t"         "t8_cov_self_nt"
## [1213] "t8_test_ff"            "t8_cov_ff_t"
## [1215] "t8_cov_ff_nt"          "t8_cov_ff_any"
## [1217] "t8_hos_ff_any"         "t8_hos_cov_ff_any"
## [1219] "t8_death_ff_any"       "t8_death_cov_ff_any"
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## [1223] "t8_slfhlth"            "t8_slfmem"
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## [1227] "t8_promis3"            "t8_promis4"
## [1229] "t8_promis5"            "t8_promis6"
## [1231] "t8_RawAbl"             "t8_TscoreAbl"
## [1233] "t8_promis7"            "t8_promis8"
## [1235] "t8_promis9"            "t8_promis10"
## [1237] "t8_promis11"           "t8_promis12"
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## [1243] "t8_lonely3"            "t8_lonely_tot"
## [1245] "t8_lonely_fin"         "t8_cesd1"
## [1247] "t8_cesd2"              "t8_cesd3"
## [1249] "t8_cesd4"              "t8_cesd5"
## [1251] "t8_cesd6"              "t8_cesd7"
## [1253] "t8_cesd8"              "t8_cesd_tot"
## [1255] "t8_cesd_fin"           "t8_anx1"
## [1257] "t8_anx2"               "t8_anx3"
## [1259] "t8_anx4"               "t8_anx5"
## [1261] "t8_anx_fin"            "t8_satisfy"
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## [1265] "t8_frail_walk1"        "t8_frail_walk2"
## [1267] "t8_frail_angina"       "t8_frail_arthritis"
## [1269] "t8_frail_asthma"       "t8_frail_cancer"
## [1271] "t8_frail_ld"           "t8_frail_chf"
## [1273] "t8_frail_diabetes"     "t8_frail_mi"
## [1275] "t8_frail_hbp"          "t8_frail_kd"
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## [1283] "t8_interact"           "t8_wash"
## [1285] "t8_mask"               "t8_distance"
## [1287] "t8_outside"            "t8_contact"
## [1289] "t8_phone"              "t8_txtsm"
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## [1293] "t8_pla_exp_ca"         "t8_pla_exp_com"
## [1295] "t8_pla_exp_fr1"        "t8_pla_exp_fr2"
## [1297] "t8_pla_exp_groc"       "t8_pla_exp_health"
## [1299] "t8_pla_exp_hosp"       "t8_pla_exp_mo"
## [1301] "t8_pla_exp_gym"        "t8_pla_exp_ret"
## [1303] "t8_pla_exp_or"         "t8_pla_exp_park"
## [1305] "t8_pla_exp_pers"       "t8_pla_exp_worsh"
## [1307] "t8_pla_exp_rest"       "t8_pla_exp_sc"
## [1309] "t8_pla_exp_sp"         "t8_pla_exp_va"
## [1311] "t8_pla_exp_ve"         "t8_pla_exp_wr"
## [1313] "t8_pla_exp_fam1"       "t8_pla_exp_fam2"
## [1315] "t8_pla_exp_pharm"      "t8_pla_exp_oth"
## [1317] "t8_pla_exp"            "t8_pla_exp_tot"
## [1319] "t8_contact_exp"        "t8_contact_exp_tot"
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## [1325] "t9_dend"               "t9_drecord"
## [1327] "t9_progress"           "t9_dursec"
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## [1335] "t9_relat_chdiv"      "t9_relat_chsep"
## [1337] "t9_relat_chwid"      "t9_relat_choth"
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## [1341] "t9_liv_ch_temp"      "t9_liv_ch_othmov"
## [1343] "t9_liv_ch_vaca"      "t9_liv_ch_hot"
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## [1349] "t9_emp_ch_lost"      "t9_emp_ch_furl"
## [1351] "t9_emp_ch_ill"       "t9_emp_ch_vac"
## [1353] "t9_emp_ch_ret"       "t9_emp_ch_hour"
## [1355] "t9_emp_ch_inc"       "t9_emp_ch_home"
## [1357] "t9_emp_ch_away"      "t9_emp_ch_less"
## [1359] "t9_emp_ch_more"      "t9_emp_ch_oth"
## [1361] "t9_test_self"        "t9_cov_self_t"
## [1363] "t9_cov_self_nt"      "t9_test_ff"
## [1365] "t9_cov_ff_t"         "t9_cov_ff_nt"
## [1367] "t9_cov_ff_any"       "t9_hos_ff_any"
## [1369] "t9_hos_cov_ff_any"   "t9_death_ff_any"
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## [1373] "t9_slfmem"           "t9_lonely1"
## [1375] "t9_lonely2"          "t9_lonely3"
## [1377] "t9_lonely_tot"       "t9_lonely_fin"
## [1379] "t9_cesd1"            "t9_cesd2"
## [1381] "t9_cesd3"            "t9_cesd4"
## [1383] "t9_cesd5"            "t9_cesd6"
## [1385] "t9_cesd7"            "t9_cesd8"
## [1387] "t9_cesd_tot"         "t9_cesd_fin"
## [1389] "t9_anx1"             "t9_anx2"
## [1391] "t9_anx3"             "t9_anx4"
## [1393] "t9_anx5"             "t9_anx_fin"
## [1395] "t9_satisfy"          "t9_worry"
## [1397] "t9_isolate"          "t9_interact"
## [1399] "t9_wash"             "t9_mask"
## [1401] "t9_distance"         "t9_outside"
## [1403] "t9_contact"          "t9_phone"
## [1405] "t9_txtsm"            "t9_pla_exp_ai"
## [1407] "t9_pla_exp_ar"       "t9_pla_exp_ca"
## [1409] "t9_pla_exp_com"      "t9_pla_exp_fr1"
## [1411] "t9_pla_exp_fr2"      "t9_pla_exp_groc"
## [1413] "t9_pla_exp_health"   "t9_pla_exp_hosp"
## [1415] "t9_pla_exp_mo"       "t9_pla_exp_gym"
## [1417] "t9_pla_exp_ret"      "t9_pla_exp_or"
## [1419] "t9_pla_exp_park"     "t9_pla_exp_pers"
## [1421] "t9_pla_exp_worsh"    "t9_pla_exp_rest"
## [1423] "t9_pla_exp_sc"       "t9_pla_exp_sp"
## [1425] "t9_pla_exp_va"       "t9_pla_exp_ve"
## [1427] "t9_pla_exp_wr"       "t9_pla_exp_fam1"
## [1429] "t9_pla_exp_fam2"     "t9_pla_exp_pharm"
## [1431] "t9_pla_exp_oth"      "t9_pla_exp"
## [1433] "t9_pla_exp_tot"      "t9_contact_exp"
## [1435] "t9_contact_exp_tot"  "t9_vac_freq"
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## [1439] "t9_vac_att3"          "t9_vac_att4"
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## [1443] "t9_vac_att7"          "t9_vac_att8"
## [1445] "t9_vac_att9"          "t9_vac_att10"
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## [1449] "t9_vac_agr3"          "t9_vac_agr4"
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## [1453] "t9_vac_agr7"          "t9_vaccinate1"
## [1455] "t9_vaccinate2"        "t9_outdoor"
## [1457] "t9_pubtran"           "t9_shop"
## [1459] "t9_health"            "attwf9m"
## [1461] "pop_attwf9m"          "t10"
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## [1465] "t10_drecord"          "t10_progress"
## [1467] "t10_dursec"           "t10_durmin"
## [1469] "t10_fin"              "t10_lang"
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## [1473] "t10_relat_chmar"      "t10_relat_chdiv"
## [1475] "t10_relat_chsep"      "t10_relat_chwid"
## [1477] "t10_relat_choth"      "t10_liv_ch_any"
## [1479] "t10_liv_ch_perm"      "t10_liv_ch_temp"
## [1481] "t10_liv_ch_othmov"    "t10_liv_ch_vaca"
## [1483] "t10_liv_ch_hot"       "t10_liv_ch_ins"
## [1485] "t10_liv_ch_oth"       "t10_emp_ch_any"
## [1487] "t10_emp_ch_new"       "t10_emp_ch_lost"
## [1489] "t10_emp_ch_furl"      "t10_emp_ch_ill"
## [1491] "t10_emp_ch_vac"       "t10_emp_ch_ret"
## [1493] "t10_emp_ch_hour"      "t10_emp_ch_inc"
## [1495] "t10_emp_ch_home"      "t10_emp_ch_away"
## [1497] "t10_emp_ch_less"      "t10_emp_ch_more"
## [1499] "t10_emp_ch_oth"       "t10_test_self"
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## [1503] "t10_vac_mo"           "t10_test_ff"
## [1505] "t10_cov_ff_t"         "t10_cov_ff_nt"
## [1507] "t10_cov_ff_any"       "t10_hos_ff_any"
## [1509] "t10_hos_cov_ff_any"   "t10_death_ff_any"
## [1511] "t10_death_cov_ff_any" "t10_drink"
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## [1517] "t10_promis2"          "t10_promis3"
## [1519] "t10_promis4"          "t10_promis5"
## [1521] "t10_promis6"          "t10_RawAbl"
## [1523] "t10_TscoreAbl"        "t10_promis7"
## [1525] "t10_promis8"          "t10_promis9"
## [1527] "t10_promis10"         "t10_promis11"
## [1529] "t10_promis12"         "t10_RawFun"
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## [1533] "t10_lonely2"          "t10_lonely3"
## [1535] "t10_lonely_tot"       "t10_lonely_fin"
## [1537] "t10_cesd1"            "t10_cesd2"
## [1539] "t10_cesd3"            "t10_cesd4"
## [1541] "t10_cesd5"            "t10_cesd6"
## [1543] "t10_cesd7"            "t10_cesd8"
```

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## [1549] "t10_anx3"                  "t10_anx4"
## [1551] "t10_anx5"                  "t10_anx_fin"
## [1553] "t10_satisfy"               "t10_worry"
## [1555] "t10_isolate"               "t10_interact"
## [1557] "t10_wash"                  "t10_mask"
## [1559] "t10_distance"              "t10_outside"
## [1561] "t10_contact"               "t10_phone"
## [1563] "t10_txtsm"                 "t10_pla_exp_ai"
## [1565] "t10_pla_exp_ar"            "t10_pla_exp_ca"
## [1567] "t10_pla_exp_com"           "t10_pla_exp_fr1"
## [1569] "t10_pla_exp_fr2"           "t10_pla_exp_groc"
## [1571] "t10_pla_exp_health"        "t10_pla_exp_hosp"
## [1573] "t10_pla_exp_mo"            "t10_pla_exp_gym"
## [1575] "t10_pla_exp_ret"           "t10_pla_exp_or"
## [1577] "t10_pla_exp_park"          "t10_pla_exp_pers"
## [1579] "t10_pla_exp_worsh"         "t10_pla_exp_rest"
## [1581] "t10_pla_exp_sc"            "t10_pla_exp_sp"
## [1583] "t10_pla_exp_va"            "t10_pla_exp_ve"
## [1585] "t10_pla_exp_wr"            "t10_pla_exp_fam1"
## [1587] "t10_pla_exp_fam2"          "t10_pla_exp_pharm"
## [1589] "t10_pla_exp_oth"           "t10_pla_exp"
## [1591] "t10_pla_exp_tot"           "t10_contact_exp"
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## [1607] "t11_relat_chmar"           "t11_relat_chdiv"
## [1609] "t11_relat_chsep"           "t11_relat_chwid"
## [1611] "t11_relat_choth"           "t11_liv_ch_any"
## [1613] "t11_liv_ch_perm"           "t11_liv_ch_temp"
## [1615] "t11_liv_ch_othmov"         "t11_liv_ch_vaca"
## [1617] "t11_liv_ch_hot"            "t11_liv_ch_ins"
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## [1623] "t11_vac_mo"                "t11_test_ff"
## [1625] "t11_cov_ff_t"              "t11_cov_ff_nt"
## [1627] "t11_cov_ff_any"            "t11_hos_ff_any"
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## [1633] "t11_emp_ch_new"            "t11_emp_ch_lost"
## [1635] "t11_emp_ch_furl"           "t11_emp_ch_ill"
## [1637] "t11_emp_ch_vac"            "t11_emp_ch_ret"
## [1639] "t11_emp_ch_hour"           "t11_emp_ch_inc"
## [1641] "t11_emp_ch_home"           "t11_emp_ch_away"
## [1643] "t11_emp_ch_less"           "t11_emp_ch_more"
## [1645] "t11_emp_ch_oth"            "t11_slfhlth"
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## [1649] "t11_lonely2"               "t11_lonely3"
## [1651] "t11_lonely_tot"            "t11_lonely_fin"
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## [1657] "t11_cesd5"           "t11_cesd6"
## [1659] "t11_cesd7"           "t11_cesd8"
## [1661] "t11_cesd_tot"        "t11_cesd_fin"
## [1663] "t11_anx1"            "t11_anx2"
## [1665] "t11_anx3"            "t11_anx4"
## [1667] "t11_anx5"            "t11_anx_fin"
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## [1671] "t11_wor_l"           "t11_wor_v"
## [1673] "t11_wor_p"           "t11_wor_m"
## [1675] "t11_wor_i"           "t11_wor_o"
## [1677] "t11_isolate"         "t11_interact"
## [1679] "t11_wash"            "t11_mask"
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## [1685] "t11_txtsm"           "t11_pla_exp_ai"
## [1687] "t11_pla_exp_ar"      "t11_pla_exp_ca"
## [1689] "t11_pla_exp_com"     "t11_pla_exp_fr1"
## [1691] "t11_pla_exp_fr2"     "t11_pla_exp_groc"
## [1693] "t11_pla_exp_health"  "t11_pla_exp_hosp"
## [1695] "t11_pla_exp_mo"      "t11_pla_exp_gym"
## [1697] "t11_pla_exp_ret"     "t11_pla_exp_or"
## [1699] "t11_pla_exp_park"    "t11_pla_exp_pers"
## [1701] "t11_pla_exp_worsh"   "t11_pla_exp_rest"
## [1703] "t11_pla_exp_sc"      "t11_pla_exp_sp"
## [1705] "t11_pla_exp_va"      "t11_pla_exp_ve"
## [1707] "t11_pla_exp_wr"      "t11_pla_exp_fam1"
## [1709] "t11_pla_exp_fam2"    "t11_pla_exp_pharm"
## [1711] "t11_pla_exp_oth"     "t11_pla_exp"
## [1713] "t11_pla_exp_tot"     "t11_contact_exp"
## [1715] "t11_contact_exp_tot" "t11_neigh_ev"
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## [1723] "t11_neigh_di"        "t11_neigh_pe"
## [1725] "t11_neigh_ne"        "attwf11m"
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## [1739] "t12_sing_d"          "t12_sing_w"
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## [1743] "t12_bldng2"          "t12_reside"
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## [1749] "t12_liv_w_fam"       "t12_liv_w_fr"
## [1751] "t12_liv_w_rm"        "t12_liv_w_oth"
## [1753] "t12_emp_sc"          "t12_emp_se"
## [1755] "t12_emp_pt"          "t12_emp_ft"
## [1757] "t12_emp_di"          "t12_emp_le"
## [1759] "t12_emp_fa"          "t12_emp_un"
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## [1767] "t12_vac_mo"              "t12_test_ff"
## [1769] "t12_cov_ff_t"            "t12_cov_ff_nt"
## [1771] "t12_cov_ff_any"          "t12_hos_ff_any"
## [1773] "t12_hos_cov_ff_any"      "t12_death_ff_any"
## [1775] "t12_death_cov_ff_any"    "t12_drink"
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## [1783] "t12_promis4"             "t12_promis5"
## [1785] "t12_promis6"             "t12_RawAbl"
## [1787] "t12_TscoreAbl"           "t12_promis7"
## [1789] "t12_promis8"             "t12_promis9"
## [1791] "t12_promis10"            "t12_promis11"
## [1793] "t12_promis12"            "t12_RawFun"
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## [1803] "t12_cesd3"               "t12_cesd4"
## [1805] "t12_cesd5"               "t12_cesd6"
## [1807] "t12_cesd7"               "t12_cesd8"
## [1809] "t12_cesd_tot"            "t12_cesd_fin"
## [1811] "t12_anx1"                "t12_anx2"
## [1813] "t12_anx3"                "t12_anx4"
## [1815] "t12_anx5"                "t12_anx_fin"
## [1817] "t12_satisfy"             "t12_worry"
## [1819] "t12_isolate"             "t12_interact"
## [1821] "t12_wash"                "t12_mask"
## [1823] "t12_distance"            "t12_outside"
## [1825] "t12_contact"             "t12_phone"
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## [1829] "t12_contact_fm1"         "t12_contact_fm2"
## [1831] "t12_contact_rm"          "t12_contact_fr"
## [1833] "t12_contact_wr"          "t12_contact_ne"
## [1835] "t12_contact_cm"          "t12_contact_md"
## [1837] "t12_contact_re"          "t12_contact_oth"
## [1839] "t12_pla_tot"             "t12_pla_ai"
## [1841] "t12_pla_ar"              "t12_pla_ca"
## [1843] "t12_pla_cm"              "t12_pla_fr1"
## [1845] "t12_pla_fr2"             "t12_pla_gr"
## [1847] "t12_pla_hl"              "t12_pla_ho"
## [1849] "t12_pla_mo"              "t12_pla_rc"
## [1851] "t12_pla_re"              "t12_pla_or"
## [1853] "t12_pla_pa"              "t12_pla_pe"
## [1855] "t12_pla_wo"              "t12_pla_ba"
## [1857] "t12_pla_sc"              "t12_pla_sp"
## [1859] "t12_pla_va"              "t12_pla_ve"
## [1861] "t12_pla_wr"              "t12_pla_fm1"
## [1863] "t12_pla_fm2"             "t12_pla_ph"
## [1865] "t12_pla_oth"             "attwf12m"
## [1867] "pop_attwf12m"
```

1.1 Part (b)

2 Data

3 Methodology

4 Main Results

we first did a raw correlation on the smoking status and COVID-19 positivity

```
SM_data <- na.omit(covid_data[, c(201, 851), ])  #
head(SM_data)
```

```
##   t0_smoke t5_cov_self_t
## 1        0            -2
## 2        0            -2
## 3        0            -2
## 4        0            -2
## 5        0            -2
## 7        2            -2
```

```
naive_SM_OLS <- glm(t5_cov_self_t ~ t0_smoke, data = SM_data)
summary(naive_SM_OLS)
```

```
##
## Call:
## glm(formula = t5_cov_self_t ~ t0_smoke, data = SM_data)
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -1.72000    0.01853 -92.840   <2e-16 ***
## t0_smoke     0.02444    0.02612   0.936     0.35
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for gaussian family taken to be 0.5401954)
##
##     Null deviance: 1329.4  on 2461  degrees of freedom
## Residual deviance: 1328.9  on 2460  degrees of freedom
## AIC: 5474.7
##
## Number of Fisher Scoring iterations: 2
```

A person what has an active smoking status is associated with a 2.4% increased in the chance of tested positive for COVID-19 past month.