PANNEURO\_analysis

Christopher Huebel

Sys.Date()

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Frequencies of neurological symptoms in participants of the COPING/RAMP studies

Filtered by participants that self-reported a swap or antibody test

and that answered the neurological questionnaire

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#Set up

Clear global environment

Retrieve the current date to use it for file endings to not overwrite files when one exports files

#Packages Install packages (if they are not available in your version of R)

Load packages

Registered S3 method overwritten by 'pryr':  
 method from  
 print.bytes Rcpp

Attaching package: 'polycor'

The following object is masked from 'package:psych':  
  
 polyserial

corrplot 0.84 loaded

── Attaching packages ────────────────────────────────────────────────────────────────────────────── tidyverse 1.3.0 ──

✓ ggplot2 3.3.2 ✓ purrr 0.3.4  
✓ tibble 3.0.3 ✓ dplyr 1.0.1  
✓ tidyr 1.1.1 ✓ stringr 1.4.0  
✓ readr 1.3.1 ✓ forcats 0.5.0

── Conflicts ───────────────────────────────────────────────────────────────────────────────── tidyverse\_conflicts() ──  
x ggplot2::%+%() masks psych::%+%()  
x ggplot2::alpha() masks psych::alpha()  
x dplyr::filter() masks stats::filter()  
x dplyr::lag() masks stats::lag()  
x tibble::view() masks summarytools::view()

# Colour palettes

Define colours for plotting this are the standard coping colours

Choose in this chunk which palette to use 04.07.2020 - Default to 2 colour COPING palette

# ggplot theme

Set up ggplot theme for the plots

# Data import

## Source data file paths

## Read in data

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[357] "ocir.good\_feel\_bad\_numbers\_base"   
[358] "ocir.hands\_longer\_wash\_base"   
[359] "ocir.saved\_things\_base"   
[360] "ocir.frequently\_difficulty\_rid\_nasty\_base"   
[361] "ocir.i\_check\_things\_more\_often\_than\_necessary\_base"   
[362] "ocir.arranged\_properly\_objects\_upset\_base"   
[363] "ocir.feel\_compelled\_count\_things\_base"   
[364] "ocir.strangers\_touch\_touched\_difficult\_base"   
[365] "ocir.control\_difficult\_find\_thoughts\_base"   
[366] "ocir.i\_collect\_things\_i\_dont\_need\_base"   
[367] "ocir.felt\_pandemic\_feelings\_numeric"   
[368] "ocir.i\_repeatedly\_check\_doors\_windows\_drawers\_etc\_retro\_numeric"   
[369] "ocir.arranged\_things\_change\_upset\_retro\_numeric"   
[370] "ocir.repeat\_feel\_numbers\_retro\_numeric"   
[371] "ocir.clean\_simply\_wash\_feel\_retro\_numeric"   
[372] "ocir.mind\_upset\_unpleasant\_thoughts\_retro\_numeric"   
[373] "ocir.afraid\_avoid\_throwing\_things\_retro\_numeric"   
[374] "ocir.light\_switches\_water\_taps\_retro\_numeric"   
[375] "ocir.arranged\_things\_retro\_numeric"   
[376] "ocir.good\_feel\_bad\_numbers\_retro\_numeric"   
[377] "ocir.hands\_longer\_wash\_retro\_numeric"   
[378] "ocir.saved\_things\_retro\_numeric"   
[379] "ocir.frequently\_difficulty\_rid\_nasty\_retro\_numeric"   
[380] "ocir.i\_check\_things\_more\_often\_than\_necessary\_retro\_numeric"   
[381] "ocir.arranged\_properly\_objects\_upset\_retro\_numeric"   
[382] "ocir.feel\_compelled\_count\_things\_retro\_numeric"   
[383] "ocir.strangers\_touch\_touched\_difficult\_retro\_numeric"   
[384] "ocir.control\_difficult\_find\_thoughts\_retro\_numeric"   
[385] "ocir.i\_collect\_things\_i\_dont\_need\_retro\_numeric"   
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[387] "ocir.arranged\_things\_change\_upset\_base\_numeric"   
[388] "ocir.repeat\_feel\_numbers\_base\_numeric"   
[389] "ocir.clean\_simply\_wash\_feel\_base\_numeric"   
[390] "ocir.mind\_upset\_unpleasant\_thoughts\_base\_numeric"   
[391] "ocir.afraid\_avoid\_throwing\_things\_base\_numeric"   
[392] "ocir.light\_switches\_water\_taps\_base\_numeric"   
[393] "ocir.arranged\_things\_base\_numeric"   
[394] "ocir.good\_feel\_bad\_numbers\_base\_numeric"   
[395] "ocir.hands\_longer\_wash\_base\_numeric"   
[396] "ocir.saved\_things\_base\_numeric"   
[397] "ocir.frequently\_difficulty\_rid\_nasty\_base\_numeric"   
[398] "ocir.i\_check\_things\_more\_often\_than\_necessary\_base\_numeric"   
[399] "ocir.arranged\_properly\_objects\_upset\_base\_numeric"   
[400] "ocir.feel\_compelled\_count\_things\_base\_numeric"   
[401] "ocir.strangers\_touch\_touched\_difficult\_base\_numeric"   
[402] "ocir.control\_difficult\_find\_thoughts\_base\_numeric"   
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[405] "ocir.sum\_score\_base\_raw"   
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[408] "ocir.sum\_score\_base"   
[409] "ocir.sum\_score\_retro"   
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[411] "alsfrs.normal"   
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[413] "alsfrs.not\_all\_words\_are\_legible"   
[414] "alsfrs.able\_to\_grip\_pen"   
[415] "alsfrs.unable\_to\_grip\_pen"   
[416] "alsfrs.have\_you\_noticed\_any\_difficulty\_walking"   
[417] "alsfrs.do\_you\_have\_any\_difficulty\_climbing\_stairs"   
[418] "alsfrs.limb\_weakness\_noticed\_past\_numeric"   
[419] "alsfrs.normal\_numeric"   
[420] "alsfrs.slow\_or\_sloppy\_all\_words\_are\_legible\_numeric"   
[421] "alsfrs.not\_all\_words\_are\_legible\_numeric"   
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[423] "alsfrs.unable\_to\_grip\_pen\_numeric"   
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[425] "alsfrs.do\_you\_have\_any\_difficulty\_climbing\_stairs\_numeric"   
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[427] "ess.sitting\_and\_reading"   
[428] "ess.watching\_tv"   
[429] "ess.sitting\_inactive\_in\_a\_public\_place"   
[430] "ess.break\_passenger\_car\_hour"   
[431] "ess.afternoon\_rest\_circumstances\_lying"   
[432] "ess.sitting\_and\_talking\_to\_someone"   
[433] "ess.sitting\_quietly\_after\_a\_lunch\_without\_alcohol"   
[434] "ess.car\_minutes\_stopped\_traffic"   
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[436] "ess.narcolepsy"   
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[439] "ess.sleep\_apnea"   
[440] "ess.sleep\_terrors"   
[441] "ess.sleepwalking"   
[442] "ess.other"   
[443] "ess.none"   
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[453] "ess.insomnia\_numeric"   
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[458] "ess.sleep\_terrors\_numeric"   
[459] "ess.sleepwalking\_numeric"   
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[465] "midas.days\_past\_month\_miss\_housework"   
[466] "midas.days\_past\_month\_housework\_half\_productivity"   
[467] "midas.days\_past\_month\_miss\_social\_activities"   
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[469] "midas.days\_past\_month\_miss\_work\_school\_numeric"   
[470] "midas.days\_past\_month\_work\_school\_half\_productivity\_numeric"   
[471] "midas.days\_past\_month\_miss\_housework\_numeric"   
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[473] "midas.days\_past\_month\_miss\_social\_activities\_numeric"   
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[477] "nmss.severe\_taste\_smell\_loss\_numeric"   
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[479] "nmsw.regularly\_night\_pass\_urine"   
[480] "nmsw.sex\_difficult\_finding"   
[481] "nmsw.weak\_standing\_feeling\_light"   
[482] "nmsw.acting\_moving\_sleep\_talking"   
[483] "nmsw.double\_vision"   
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[486] "nmsw.sex\_difficult\_finding\_numeric"   
[487] "nmsw.weak\_standing\_feeling\_light\_numeric"   
[488] "nmsw.acting\_moving\_sleep\_talking\_numeric"   
[489] "nmsw.double\_vision\_numeric"   
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[528] "respiratory.breath\_diarrhoea\_fatigue\_fever"   
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[530] "respiratory.persistent\_cough"   
[531] "respiratory.skipping\_meals\_because\_you\_felt\_unwell"   
[532] "respiratory.was\_your\_sense\_of\_smell\_impaired"   
[533] "respiratory.was\_your\_sense\_of\_taste\_impaired"   
[534] "respiratory.feeling\_tiredfatigued"   
[535] "respiratory.throat\_swab\_coronavirus\_nose"   
[536] "respiratory.throat\_swab\_test\_nose"   
[537] "respiratory.coronavirus\_antibody\_test"   
[538] "respiratory.results\_antibody\_test"   
[539] "respiratory.breath\_diarrhoea\_fatigue\_fever\_numeric"   
[540] "respiratory.worst\_ill\_feel\_numeric"   
[541] "respiratory.persistent\_cough\_numeric"   
[542] "respiratory.skipping\_meals\_because\_you\_felt\_unwell\_numeric"   
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[544] "respiratory.was\_your\_sense\_of\_taste\_impaired\_numeric"   
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[552] "respiratory.fatigue\_binary"   
[553] "respiratory.skipped\_meals\_binary"   
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[580] "employment.what\_is\_your\_highest\_level\_of\_education\_numeric"   
[581] "respiratory.coronavirus\_week\_antibody\_test"   
[582] "respiratory.coronavirus\_week\_antibody\_test\_numeric"   
[583] "startDate"   
[584] "cfs.do\_you\_have\_problems\_with\_tiredness"   
[585] "cfs.do\_you\_need\_to\_rest\_more"   
[586] "cfs.do\_you\_feel\_sleepy\_or\_drowsy"   
[587] "cfs.do\_you\_have\_problems\_starting\_things"   
[588] "cfs.do\_you\_lack\_energy"   
[589] "cfs.strength\_muscles"   
[590] "cfs.do\_you\_feel\_weak"   
[591] "cfs.do\_you\_have\_difficulty\_concentrating"   
[592] "cfs.make\_slips\_speaking\_tongue"   
[593] "cfs.correct\_word\_find\_difficult"   
[594] "cfs.how\_is\_your\_memory"   
[595] "cfs.do\_you\_have\_problems\_with\_tiredness\_numeric"   
[596] "cfs.do\_you\_need\_to\_rest\_more\_numeric"   
[597] "cfs.do\_you\_feel\_sleepy\_or\_drowsy\_numeric"   
[598] "cfs.do\_you\_have\_problems\_starting\_things\_numeric"   
[599] "cfs.do\_you\_lack\_energy\_numeric"   
[600] "cfs.strength\_muscles\_numeric"   
[601] "cfs.do\_you\_feel\_weak\_numeric"   
[602] "cfs.do\_you\_have\_difficulty\_concentrating\_numeric"   
[603] "cfs.make\_slips\_speaking\_tongue\_numeric"   
[604] "cfs.correct\_word\_find\_difficult\_numeric"   
[605] "cfs.how\_is\_your\_memory\_numeric"   
[606] "paste0(Sample, ID)"

## COVID swab test positive

respiratory.throat\_swab\_test\_nose Sample n Prop  
1 Positive EDGI 1 0.00  
2 Positive GLAD 60 0.00  
3 Positive NBR 46 0.00  
4 Positive RAMP 10 0.00  
5 Negative EDGI 9 0.00  
6 Negative GLAD 367 0.01  
7 Negative NBR 122 0.00  
8 Negative RAMP 30 0.00  
9 Result awaited EDGI 2 0.00  
10 Result awaited GLAD 81 0.00  
11 Result awaited NBR 49 0.00  
12 Result awaited RAMP 7 0.00  
13 <NA> EDGI 2174 0.03  
14 <NA> GLAD 38562 0.59  
15 <NA> NBR 13772 0.21  
16 <NA> RAMP 9931 0.15

## antibody test

respiratory.results\_antibody\_test Sample n Prop  
1 Positive EDGI 1 0.00  
2 Positive GLAD 14 0.00  
3 Positive NBR 7 0.00  
4 Positive RAMP 2 0.00  
5 Negative EDGI 4 0.00  
6 Negative GLAD 30 0.00  
7 Negative NBR 12 0.00  
8 Negative RAMP 2 0.00  
9 Result awaited GLAD 18 0.00  
10 Result awaited NBR 5 0.00  
11 Result awaited RAMP 2 0.00  
12 <NA> EDGI 2181 0.03  
13 <NA> GLAD 39008 0.60  
14 <NA> NBR 13965 0.21  
15 <NA> RAMP 9972 0.15

## COVID positive test (antibody or swab)

covid\_test\_positive n  
1 0 22  
2 1 132  
3 NA 65069

## COVID probable diagnosis

covid\_probable\_case\_incl\_screening Sample n Prop  
1 No COVID EDGI 460 0.01  
2 No COVID GLAD 10710 0.16  
3 No COVID NBR 12015 0.18  
4 No COVID RAMP 8307 0.13  
5 Probable COVID EDGI 45 0.00  
6 Probable COVID GLAD 1162 0.02  
7 Probable COVID NBR 609 0.01  
8 Probable COVID RAMP 187 0.00  
9 <NA> EDGI 1681 0.03  
10 <NA> GLAD 27198 0.42  
11 <NA> NBR 1365 0.02  
12 <NA> RAMP 1484 0.02

covid\_probable\_case\_incl\_screening n  
1 No COVID 31492  
2 Probable COVID 2003  
3 <NA> 31728

## Cross table probable covid and covid test positive

covid\_probable\_case\_incl\_screening 0 1 <NA>  
1 No COVID 13 37 31442  
2 Probable COVID 6 88 1909  
3 <NA> 3 7 31718

# Demographics

## Age

### Proportion tables

|  |  |  |  |
| --- | --- | --- | --- |
| age\_category | covid\_probable\_case\_incl\_screening | n | Prop |
| 16-18 | No COVID | 1023 | 0.02 |
| 16-18 | Probable COVID | 49 | 0.00 |
| 19-25 | No COVID | 2455 | 0.04 |
| 19-25 | Probable COVID | 204 | 0.00 |
| 26-35 | No COVID | 4574 | 0.07 |
| 26-35 | Probable COVID | 370 | 0.01 |
| 36-45 | No COVID | 4202 | 0.06 |
| 36-45 | Probable COVID | 397 | 0.01 |
| 46-55 | No COVID | 6274 | 0.10 |
| 46-55 | Probable COVID | 431 | 0.01 |
| 56-65 | No COVID | 7387 | 0.11 |
| 56-65 | Probable COVID | 400 | 0.01 |
| 66-70 | No COVID | 3027 | 0.05 |
| 66-70 | Probable COVID | 93 | 0.00 |
| 71-75 | No COVID | 1899 | 0.03 |
| 71-75 | Probable COVID | 45 | 0.00 |
| 76-80 | No COVID | 513 | 0.01 |
| 76-80 | Probable COVID | 11 | 0.00 |
| 81-85 | No COVID | 103 | 0.00 |
| 81-85 | Probable COVID | 2 | 0.00 |
| 86-90 | No COVID | 25 | 0.00 |
| 86-90 | Probable COVID | 1 | 0.00 |
| 91-100 | No COVID | 5 | 0.00 |
| 100+ | No COVID | 5 | 0.00 |

age\_category covid\_probable\_case\_incl\_screening n Prop  
1 16-18 No COVID 1023 0.02  
2 16-18 Probable COVID 49 0.00  
3 19-25 No COVID 2455 0.04  
4 19-25 Probable COVID 204 0.00  
5 26-35 No COVID 4574 0.07  
6 26-35 Probable COVID 370 0.01  
7 36-45 No COVID 4202 0.06  
8 36-45 Probable COVID 397 0.01  
9 46-55 No COVID 6274 0.10  
10 46-55 Probable COVID 431 0.01  
11 56-65 No COVID 7387 0.11  
12 56-65 Probable COVID 400 0.01  
13 66-70 No COVID 3027 0.05  
14 66-70 Probable COVID 93 0.00  
15 71-75 No COVID 1899 0.03  
16 71-75 Probable COVID 45 0.00  
17 76-80 No COVID 513 0.01  
18 76-80 Probable COVID 11 0.00  
19 81-85 No COVID 103 0.00  
20 81-85 Probable COVID 2 0.00  
21 86-90 No COVID 25 0.00  
22 86-90 Probable COVID 1 0.00  
23 91-100 No COVID 5 0.00  
24 100+ No COVID 5 0.00

|  |  |  |  |
| --- | --- | --- | --- |
| covid\_probable\_case\_incl\_screening | age\_category | n | Prop |
| No COVID | 16-18 | 1023 | 0.03 |
| No COVID | 19-25 | 2455 | 0.08 |
| No COVID | 26-35 | 4574 | 0.15 |
| No COVID | 36-45 | 4202 | 0.13 |
| No COVID | 46-55 | 6274 | 0.20 |
| No COVID | 56-65 | 7387 | 0.23 |
| No COVID | 66-70 | 3027 | 0.10 |
| No COVID | 71-75 | 1899 | 0.06 |
| No COVID | 76-80 | 513 | 0.02 |
| No COVID | 81-85 | 103 | 0.00 |
| No COVID | 86-90 | 25 | 0.00 |
| No COVID | 91-100 | 5 | 0.00 |
| No COVID | 100+ | 5 | 0.00 |
| Probable COVID | 16-18 | 49 | 0.02 |
| Probable COVID | 19-25 | 204 | 0.10 |
| Probable COVID | 26-35 | 370 | 0.18 |
| Probable COVID | 36-45 | 397 | 0.20 |
| Probable COVID | 46-55 | 431 | 0.22 |
| Probable COVID | 56-65 | 400 | 0.20 |
| Probable COVID | 66-70 | 93 | 0.05 |
| Probable COVID | 71-75 | 45 | 0.02 |
| Probable COVID | 76-80 | 11 | 0.01 |
| Probable COVID | 81-85 | 2 | 0.00 |
| Probable COVID | 86-90 | 1 | 0.00 |

# A tibble: 24 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening age\_category n Prop  
 <fct> <fct> <int> <dbl>  
 1 No COVID 16-18 1023 0.03  
 2 No COVID 19-25 2455 0.08  
 3 No COVID 26-35 4574 0.15  
 4 No COVID 36-45 4202 0.13  
 5 No COVID 46-55 6274 0.2   
 6 No COVID 56-65 7387 0.23  
 7 No COVID 66-70 3027 0.1   
 8 No COVID 71-75 1899 0.06  
 9 No COVID 76-80 513 0.02  
10 No COVID 81-85 103 0   
# … with 14 more rows

### Cross tables

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| age\_category | n\_No COVID | n\_Probable COVID | Prop\_No COVID | Prop\_Probable COVID |
| 16-18 | 1023 | 49 | 0.03 | 0.02 |
| 19-25 | 2455 | 204 | 0.08 | 0.10 |
| 26-35 | 4574 | 370 | 0.15 | 0.18 |
| 36-45 | 4202 | 397 | 0.13 | 0.20 |
| 46-55 | 6274 | 431 | 0.20 | 0.22 |
| 56-65 | 7387 | 400 | 0.23 | 0.20 |
| 66-70 | 3027 | 93 | 0.10 | 0.05 |
| 71-75 | 1899 | 45 | 0.06 | 0.02 |
| 76-80 | 513 | 11 | 0.02 | 0.01 |
| 81-85 | 103 | 2 | 0.00 | 0.00 |
| 86-90 | 25 | 1 | 0.00 | 0.00 |
| 91-100 | 5 | NA | 0.00 | NA |
| 100+ | 5 | NA | 0.00 | NA |

# A tibble: 13 x 5  
 age\_category `n\_No COVID` `n\_Probable COVI… `Prop\_No COVID` `Prop\_Probable C…  
 <fct> <int> <int> <dbl> <dbl>  
 1 16-18 1023 49 0.03 0.02  
 2 19-25 2455 204 0.08 0.1   
 3 26-35 4574 370 0.15 0.18  
 4 36-45 4202 397 0.13 0.2   
 5 46-55 6274 431 0.2 0.22  
 6 56-65 7387 400 0.23 0.2   
 7 66-70 3027 93 0.1 0.05  
 8 71-75 1899 45 0.06 0.02  
 9 76-80 513 11 0.02 0.01  
10 81-85 103 2 0 0   
11 86-90 25 1 0 0   
12 91-100 5 NA 0 NA   
13 100+ 5 NA 0 NA

### Collapse age categories

Frequencies   
dat.raw$age\_category\_collapsed   
Type: Factor   
  
 Freq % Valid % Valid Cum. % Total % Total Cum.  
----------- ------- --------- -------------- --------- --------------  
 16-18 3117 4.78 4.78 4.78 4.78  
 19-25 9322 14.29 19.07 14.29 19.07  
 26-35 13254 20.32 39.39 20.32 39.39  
 36-45 10147 15.56 54.95 15.56 54.95  
 46-55 11759 18.03 72.98 18.03 72.98  
 56-65 10695 16.40 89.38 16.40 89.38  
 66-70 3788 5.81 95.18 5.81 95.18  
 71-75 2342 3.59 98.77 3.59 98.77  
 76+ 799 1.23 100.00 1.23 100.00  
 <NA> 0 0.00 100.00  
 Total 65223 100.00 100.00 100.00 100.00

### Proportion tables

|  |  |  |  |
| --- | --- | --- | --- |
| age\_category\_collapsed | covid\_probable\_case\_incl\_screening | n | Prop |
| 16-18 | No COVID | 1023 | 0.02 |
| 16-18 | Probable COVID | 49 | 0.00 |
| 19-25 | No COVID | 2455 | 0.04 |
| 19-25 | Probable COVID | 204 | 0.00 |
| 26-35 | No COVID | 4574 | 0.07 |
| 26-35 | Probable COVID | 370 | 0.01 |
| 36-45 | No COVID | 4202 | 0.06 |
| 36-45 | Probable COVID | 397 | 0.01 |
| 46-55 | No COVID | 6274 | 0.10 |
| 46-55 | Probable COVID | 431 | 0.01 |
| 56-65 | No COVID | 7387 | 0.11 |
| 56-65 | Probable COVID | 400 | 0.01 |
| 66-70 | No COVID | 3027 | 0.05 |
| 66-70 | Probable COVID | 93 | 0.00 |
| 71-75 | No COVID | 1899 | 0.03 |
| 71-75 | Probable COVID | 45 | 0.00 |
| 76+ | No COVID | 651 | 0.01 |
| 76+ | Probable COVID | 14 | 0.00 |

age\_category\_collapsed covid\_probable\_case\_incl\_screening n Prop  
1 16-18 No COVID 1023 0.02  
2 16-18 Probable COVID 49 0.00  
3 19-25 No COVID 2455 0.04  
4 19-25 Probable COVID 204 0.00  
5 26-35 No COVID 4574 0.07  
6 26-35 Probable COVID 370 0.01  
7 36-45 No COVID 4202 0.06  
8 36-45 Probable COVID 397 0.01  
9 46-55 No COVID 6274 0.10  
10 46-55 Probable COVID 431 0.01  
11 56-65 No COVID 7387 0.11  
12 56-65 Probable COVID 400 0.01  
13 66-70 No COVID 3027 0.05  
14 66-70 Probable COVID 93 0.00  
15 71-75 No COVID 1899 0.03  
16 71-75 Probable COVID 45 0.00  
17 76+ No COVID 651 0.01  
18 76+ Probable COVID 14 0.00

|  |  |  |  |
| --- | --- | --- | --- |
| covid\_probable\_case\_incl\_screening | age\_category\_collapsed | n | Prop |
| No COVID | 16-18 | 1023 | 0.03 |
| No COVID | 19-25 | 2455 | 0.08 |
| No COVID | 26-35 | 4574 | 0.15 |
| No COVID | 36-45 | 4202 | 0.13 |
| No COVID | 46-55 | 6274 | 0.20 |
| No COVID | 56-65 | 7387 | 0.23 |
| No COVID | 66-70 | 3027 | 0.10 |
| No COVID | 71-75 | 1899 | 0.06 |
| No COVID | 76+ | 651 | 0.02 |
| Probable COVID | 16-18 | 49 | 0.02 |
| Probable COVID | 19-25 | 204 | 0.10 |
| Probable COVID | 26-35 | 370 | 0.18 |
| Probable COVID | 36-45 | 397 | 0.20 |
| Probable COVID | 46-55 | 431 | 0.22 |
| Probable COVID | 56-65 | 400 | 0.20 |
| Probable COVID | 66-70 | 93 | 0.05 |
| Probable COVID | 71-75 | 45 | 0.02 |
| Probable COVID | 76+ | 14 | 0.01 |

# A tibble: 18 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening age\_category\_collapsed n Prop  
 <fct> <fct> <int> <dbl>  
 1 No COVID 16-18 1023 0.03  
 2 No COVID 19-25 2455 0.08  
 3 No COVID 26-35 4574 0.15  
 4 No COVID 36-45 4202 0.13  
 5 No COVID 46-55 6274 0.2   
 6 No COVID 56-65 7387 0.23  
 7 No COVID 66-70 3027 0.1   
 8 No COVID 71-75 1899 0.06  
 9 No COVID 76+ 651 0.02  
10 Probable COVID 16-18 49 0.02  
11 Probable COVID 19-25 204 0.1   
12 Probable COVID 26-35 370 0.18  
13 Probable COVID 36-45 397 0.2   
14 Probable COVID 46-55 431 0.22  
15 Probable COVID 56-65 400 0.2   
16 Probable COVID 66-70 93 0.05  
17 Probable COVID 71-75 45 0.02  
18 Probable COVID 76+ 14 0.01

### Cross tables

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| age\_category\_collapsed | n\_No COVID | n\_Probable COVID | Prop\_No COVID | Prop\_Probable COVID |
| 16-18 | 1023 | 49 | 0.03 | 0.02 |
| 19-25 | 2455 | 204 | 0.08 | 0.10 |
| 26-35 | 4574 | 370 | 0.15 | 0.18 |
| 36-45 | 4202 | 397 | 0.13 | 0.20 |
| 46-55 | 6274 | 431 | 0.20 | 0.22 |
| 56-65 | 7387 | 400 | 0.23 | 0.20 |
| 66-70 | 3027 | 93 | 0.10 | 0.05 |
| 71-75 | 1899 | 45 | 0.06 | 0.02 |
| 76+ | 651 | 14 | 0.02 | 0.01 |

# A tibble: 9 x 5  
 age\_category\_co… `n\_No COVID` `n\_Probable COV… `Prop\_No COVID`  
 <fct> <int> <int> <dbl>  
1 16-18 1023 49 0.03  
2 19-25 2455 204 0.08  
3 26-35 4574 370 0.15  
4 36-45 4202 397 0.13  
5 46-55 6274 431 0.2   
6 56-65 7387 400 0.23  
7 66-70 3027 93 0.1   
8 71-75 1899 45 0.06  
9 76+ 651 14 0.02  
# … with 1 more variable: `Prop\_Probable COVID` <dbl>

### Chi square test

|  |  |  |  |
| --- | --- | --- | --- |
| statistic | p.value | parameter | method |
| 221.1199 | 0 | 8 | Pearson’s Chi-squared test |

# A tibble: 1 x 4  
 statistic p.value parameter method   
 <dbl> <dbl> <int> <chr>   
1 221. 2.23e-43 8 Pearson's Chi-squared test

## Sex

|  |  |  |  |
| --- | --- | --- | --- |
| Sex | covid\_probable\_case\_incl\_screening | n | Prop |
| Male | No COVID | 7227 | 0.29 |
| Male | Probable COVID | 408 | 0.02 |
| Female | No COVID | 15958 | 0.64 |
| Female | Probable COVID | 1408 | 0.06 |

Sex covid\_probable\_case\_incl\_screening n Prop  
1 Male No COVID 7227 0.29  
2 Male Probable COVID 408 0.02  
3 Female No COVID 15958 0.64  
4 Female Probable COVID 1408 0.06

## Smoking not available

## BMI not available

## Key worker status

|  |  |  |  |
| --- | --- | --- | --- |
| key\_worker | covid\_probable\_case\_incl\_screening | n | Prop |
| No key worker | No COVID | 20207 | 0.61 |
| No key worker | Probable COVID | 1033 | 0.03 |
| Key worker | No COVID | 11191 | 0.34 |
| Key worker | Probable COVID | 959 | 0.03 |

key\_worker covid\_probable\_case\_incl\_screening n Prop  
1 No key worker No COVID 20207 0.61  
2 No key worker Probable COVID 1033 0.03  
3 Key worker No COVID 11191 0.34  
4 Key worker Probable COVID 959 0.03

## Smoking

## BMI

## Key worker status

## Ethnicity\_collapsed

### Pie charts

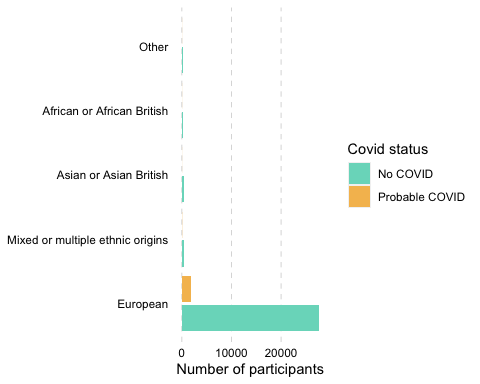
Frequencies   
dat.raw$Ethnicity\_collapsed   
Type: Factor   
  
 Freq % Valid % Valid Cum. % Total % Total Cum.  
-------------------------------------- ------- --------- -------------- --------- --------------  
 European 58435 94.83 94.83 89.59 89.59  
 Mixed or multiple ethnic origins 1383 2.24 97.07 2.12 91.71  
 Asian or Asian British 934 1.52 98.58 1.43 93.15  
 African or African British 390 0.63 99.22 0.60 93.74  
 Other 482 0.78 100.00 0.74 94.48  
 <NA> 3599 5.52 100.00  
 Total 65223 100.00 100.00 100.00 100.00

|  |  |  |  |
| --- | --- | --- | --- |
| covid\_probable\_case\_incl\_screening | Ethnicity\_collapsed | n | freq |
| No COVID | European | 27611 | 0.90 |
| No COVID | Mixed or multiple ethnic origins | 509 | 0.02 |
| No COVID | Asian or Asian British | 364 | 0.01 |
| No COVID | African or African British | 159 | 0.01 |
| No COVID | Other | 157 | 0.01 |
| Probable COVID | European | 1761 | 0.06 |
| Probable COVID | Mixed or multiple ethnic origins | 40 | 0.00 |
| Probable COVID | Asian or Asian British | 17 | 0.00 |
| Probable COVID | African or African British | 18 | 0.00 |
| Probable COVID | Other | 17 | 0.00 |

covid\_probable\_case\_incl\_screening Ethnicity\_collapsed n  
1 No COVID European 27611  
2 No COVID Mixed or multiple ethnic origins 509  
3 No COVID Asian or Asian British 364  
4 No COVID African or African British 159  
5 No COVID Other 157  
6 Probable COVID European 1761  
7 Probable COVID Mixed or multiple ethnic origins 40  
8 Probable COVID Asian or Asian British 17  
9 Probable COVID African or African British 18  
10 Probable COVID Other 17  
 freq  
1 0.90  
2 0.02  
3 0.01  
4 0.01  
5 0.01  
6 0.06  
7 0.00  
8 0.00  
9 0.00  
10 0.00

pie chart with only European label

Warning: Ignoring unknown parameters: binwidth



###Chi-square

|  |  |  |  |
| --- | --- | --- | --- |
| statistic | p.value | parameter | method |
| 15.70198 | 0.0077485 | 5 | Pearson’s Chi-squared test |

# A tibble: 1 x 4  
 statistic p.value parameter method   
 <dbl> <dbl> <int> <chr>   
1 15.7 0.00775 5 Pearson's Chi-squared test

# Neurological frequencies

Adding missing grouping variables: `covid\_probable\_case\_incl\_screening`

[1] "covid\_probable\_case\_incl\_screening"   
[2] "alsfrs.limb\_weakness\_noticed\_past"   
[3] "alsfrs.normal"   
[4] "alsfrs.slow\_or\_sloppy\_all\_words\_are\_legible"   
[5] "alsfrs.not\_all\_words\_are\_legible"   
[6] "alsfrs.able\_to\_grip\_pen"   
[7] "alsfrs.unable\_to\_grip\_pen"   
[8] "alsfrs.have\_you\_noticed\_any\_difficulty\_walking"   
[9] "alsfrs.do\_you\_have\_any\_difficulty\_climbing\_stairs"

alsfrs.limb\_weakness\_noticed\_past, alsfrs.normal, alsfrs.slow\_or\_sloppy\_all\_words\_are\_legible, alsfrs.not\_all\_words\_are\_legible, alsfrs.able\_to\_grip\_pen, alsfrs.unable\_to\_grip\_pen, alsfrs.have\_you\_noticed\_any\_difficulty\_walking, alsfrs.do\_you\_have\_any\_difficulty\_climbing\_stairs

covid\_probable\_case\_incl\_screening alsfrs.limb\_weakness\_noticed\_past n  
1 No COVID No 18396  
2 No COVID Yes 2277  
3 Probable COVID No 620  
4 Probable COVID Yes 218  
 Prop  
1 0.86  
2 0.11  
3 0.03  
4 0.01

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening alsfrs.normal n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Not Normal 579 0.25  
2 No COVID Normal 1704 0.75  
3 Probable COVID Not Normal 80 0.37  
4 Probable COVID Normal 138 0.63

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_scre… alsfrs.slow\_or\_sloppy\_all\_words\_ar… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Not Slow or sloppy, all words are … 2011 0.88  
2 No COVID Slow or sloppy, all words are legi… 272 0.12  
3 Probable COVID Not Slow or sloppy, all words are … 183 0.84  
4 Probable COVID Slow or sloppy, all words are legi… 35 0.16

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening alsfrs.not\_all\_words\_are\_legib… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Not Not all words are legible 2093 0.92  
2 No COVID Not all words are legible 190 0.08  
3 Probable COVID Not Not all words are legible 191 0.88  
4 Probable COVID Not all words are legible 27 0.12

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening alsfrs.able\_to\_grip\_pen n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Not Able to grip pen 2208 0.97  
2 No COVID Able to grip pen 75 0.03  
3 Probable COVID Not Able to grip pen 207 0.95  
4 Probable COVID Able to grip pen 11 0.05

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening alsfrs.unable\_to\_grip\_pen n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Not Unable to grip pen 2176 0.95  
2 No COVID Unable to grip pen 107 0.05  
3 Probable COVID Not Unable to grip pen 199 0.91  
4 Probable COVID Unable to grip pen 19 0.09

# A tibble: 10 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_sc… alsfrs.have\_you\_noticed\_any\_difficu… n Prop  
 <fct> <fct> <int> <dbl>  
 1 No COVID Normal 1310 0.570  
 2 No COVID Early walking difficultly 710 0.31   
 3 No COVID Need a person, crutch or frame to h… 232 0.1   
 4 No COVID Able to stand for transfers 14 0.01   
 5 No COVID No purposeful leg movement 14 0.01   
 6 No COVID N/A 2 0   
 7 Probable COVID Normal 119 0.55   
 8 Probable COVID Early walking difficultly 75 0.34   
 9 Probable COVID Need a person, crutch or frame to h… 23 0.11   
10 Probable COVID Able to stand for transfers 1 0

# A tibble: 10 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_sc… alsfrs.do\_you\_have\_any\_difficulty\_c… n Prop  
 <fct> <fct> <int> <dbl>  
 1 No COVID Normal 1171 0.51  
 2 No COVID Slow 515 0.23  
 3 No COVID Mild unsteadiness or fatigue 343 0.15  
 4 No COVID Need assistance of a person or a ra… 183 0.08  
 5 No COVID Cannot climb stairs 73 0.03  
 6 Probable COVID Normal 93 0.42  
 7 Probable COVID Slow 46 0.21  
 8 Probable COVID Mild unsteadiness or fatigue 55 0.25  
 9 Probable COVID Need assistance of a person or a ra… 12 0.05  
10 Probable COVID Cannot climb stairs 13 0.06

Adding missing grouping variables: `covid\_probable\_case\_incl\_screening`

[1] "covid\_probable\_case\_incl\_screening"   
 [2] "ess.felt\_excessively\_sleepy\_past"   
 [3] "ess.sitting\_and\_reading"   
 [4] "ess.watching\_tv"   
 [5] "ess.sitting\_inactive\_in\_a\_public\_place"   
 [6] "ess.break\_passenger\_car\_hour"   
 [7] "ess.afternoon\_rest\_circumstances\_lying"   
 [8] "ess.sitting\_and\_talking\_to\_someone"   
 [9] "ess.sitting\_quietly\_after\_a\_lunch\_without\_alcohol"  
[10] "ess.car\_minutes\_stopped\_traffic"   
[11] "ess.insomnia"   
[12] "ess.narcolepsy"   
[13] "ess.rem\_sleep\_behaviour\_disorder"   
[14] "ess.restless\_legs\_syndrome"   
[15] "ess.sleep\_apnea"   
[16] "ess.sleep\_terrors"   
[17] "ess.sleepwalking"   
[18] "ess.other"   
[19] "ess.none"

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.felt\_excessively\_sleepy\_pa… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID No 14546 0.7   
2 No COVID Yes 6117 0.3   
3 Probable COVID No 427 0.51  
4 Probable COVID Yes 412 0.49

# A tibble: 8 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.sitting\_and\_reading n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Would never doze 1263 0.21  
2 No COVID Slight chance of dozing 2470 0.4   
3 No COVID Moderate chance of dozing 1563 0.26  
4 No COVID High chance of dozing 809 0.13  
5 Probable COVID Would never doze 66 0.16  
6 Probable COVID Slight chance of dozing 182 0.45  
7 Probable COVID Moderate chance of dozing 103 0.25  
8 Probable COVID High chance of dozing 57 0.14

# A tibble: 8 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.watching\_tv n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Would never doze 997 0.16   
2 No COVID Slight chance of dozing 2386 0.39   
3 No COVID Moderate chance of dozing 1741 0.290  
4 No COVID High chance of dozing 973 0.16   
5 Probable COVID Would never doze 56 0.14   
6 Probable COVID Slight chance of dozing 166 0.41   
7 Probable COVID Moderate chance of dozing 133 0.33   
8 Probable COVID High chance of dozing 52 0.13

# A tibble: 8 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_scree… ess.sitting\_inactive\_in\_a\_public\_… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Would never doze 3871 0.64   
2 No COVID Slight chance of dozing 1530 0.25   
3 No COVID Moderate chance of dozing 492 0.08   
4 No COVID High chance of dozing 197 0.03   
5 Probable COVID Would never doze 237 0.580  
6 Probable COVID Slight chance of dozing 116 0.290  
7 Probable COVID Moderate chance of dozing 37 0.09   
8 Probable COVID High chance of dozing 17 0.04

# A tibble: 8 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.break\_passenger\_car\_hour n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Would never doze 1955 0.32  
2 No COVID Slight chance of dozing 2177 0.36  
3 No COVID Moderate chance of dozing 1147 0.19  
4 No COVID High chance of dozing 812 0.13  
5 Probable COVID Would never doze 145 0.36  
6 Probable COVID Slight chance of dozing 135 0.33  
7 Probable COVID Moderate chance of dozing 70 0.17  
8 Probable COVID High chance of dozing 57 0.14

# A tibble: 8 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_scree… ess.afternoon\_rest\_circumstances\_… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Would never doze 578 0.09  
2 No COVID Slight chance of dozing 1421 0.23  
3 No COVID Moderate chance of dozing 1724 0.28  
4 No COVID High chance of dozing 2381 0.39  
5 Probable COVID Would never doze 29 0.07  
6 Probable COVID Slight chance of dozing 113 0.28  
7 Probable COVID Moderate chance of dozing 111 0.27  
8 Probable COVID High chance of dozing 155 0.38

# A tibble: 8 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screeni… ess.sitting\_and\_talking\_to\_some… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Would never doze 5377 0.88  
2 No COVID Slight chance of dozing 584 0.1   
3 No COVID Moderate chance of dozing 104 0.02  
4 No COVID High chance of dozing 42 0.01  
5 Probable COVID Would never doze 339 0.83  
6 Probable COVID Slight chance of dozing 50 0.12  
7 Probable COVID Moderate chance of dozing 17 0.04  
8 Probable COVID High chance of dozing 2 0

# A tibble: 8 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_sc… ess.sitting\_quietly\_after\_a\_lunch\_wi… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Would never doze 2688 0.44  
2 No COVID Slight chance of dozing 2234 0.37  
3 No COVID Moderate chance of dozing 806 0.13  
4 No COVID High chance of dozing 372 0.06  
5 Probable COVID Would never doze 183 0.45  
6 Probable COVID Slight chance of dozing 137 0.34  
7 Probable COVID Moderate chance of dozing 60 0.15  
8 Probable COVID High chance of dozing 27 0.07

# A tibble: 8 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.car\_minutes\_stopped\_traffic n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Would never doze 5426 0.89  
2 No COVID Slight chance of dozing 518 0.08  
3 No COVID Moderate chance of dozing 102 0.02  
4 No COVID High chance of dozing 52 0.01  
5 Probable COVID Would never doze 361 0.88  
6 Probable COVID Slight chance of dozing 30 0.07  
7 Probable COVID Moderate chance of dozing 10 0.02  
8 Probable COVID High chance of dozing 7 0.02

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.insomnia n Prop  
 <fct> <chr> <int> <dbl>  
1 No COVID Insomnia 259 0.02  
2 No COVID Not Insomnia 12153 0.98  
3 Probable COVID Insomnia 26 0.04  
4 Probable COVID Not Insomnia 625 0.96

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.narcolepsy n Prop  
 <fct> <chr> <int> <dbl>  
1 No COVID Narcolepsy 6 0  
2 No COVID Not Narcolepsy 12406 1  
3 Probable COVID Narcolepsy 1 0  
4 Probable COVID Not Narcolepsy 650 1

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.rem\_sleep\_behaviour\_disord… n Prop  
 <fct> <chr> <int> <dbl>  
1 No COVID Not REM sleep behaviour disord… 12392 1  
2 No COVID REM sleep behaviour disorder 20 0  
3 Probable COVID Not REM sleep behaviour disord… 648 1  
4 Probable COVID REM sleep behaviour disorder 3 0

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.restless\_legs\_syndrome n Prop  
 <fct> <chr> <int> <dbl>  
1 No COVID Not Restless legs syndrome 12108 0.98  
2 No COVID Restless legs syndrome 304 0.02  
3 Probable COVID Not Restless legs syndrome 625 0.96  
4 Probable COVID Restless legs syndrome 26 0.04

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.sleep\_apnea n Prop  
 <fct> <chr> <int> <dbl>  
1 No COVID Not Sleep apnea 12224 0.98  
2 No COVID Sleep apnea 188 0.02  
3 Probable COVID Not Sleep apnea 633 0.97  
4 Probable COVID Sleep apnea 18 0.03

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.sleep\_terrors n Prop  
 <fct> <chr> <int> <dbl>  
1 No COVID Not Sleep terrors 12349 0.99  
2 No COVID Sleep terrors 63 0.01  
3 Probable COVID Not Sleep terrors 645 0.99  
4 Probable COVID Sleep terrors 6 0.01

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.sleepwalking n Prop  
 <fct> <chr> <int> <dbl>  
1 No COVID Not Sleepwalking 12381 1   
2 No COVID Sleepwalking 31 0   
3 Probable COVID Not Sleepwalking 644 0.99  
4 Probable COVID Sleepwalking 7 0.01

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.other n Prop  
 <fct> <chr> <int> <dbl>  
1 No COVID Not Other: 12293 0.99  
2 No COVID Other: 119 0.01  
3 Probable COVID Not Other: 636 0.98  
4 Probable COVID Other: 15 0.02

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.none n Prop  
 <fct> <chr> <int> <dbl>  
1 No COVID None 11555 0.93  
2 No COVID Not None 857 0.07  
3 Probable COVID None 571 0.88  
4 Probable COVID Not None 80 0.12

Adding missing grouping variables: `covid\_probable\_case\_incl\_screening`

[1] "covid\_probable\_case\_incl\_screening"   
[2] "midas.headaches\_suffered\_past\_month"   
[3] "midas.days\_past\_month\_miss\_work\_school"   
[4] "midas.days\_past\_month\_work\_school\_half\_productivity"  
[5] "midas.days\_past\_month\_miss\_housework"   
[6] "midas.days\_past\_month\_housework\_half\_productivity"   
[7] "midas.days\_past\_month\_miss\_social\_activities"

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screeni… midas.headaches\_suffered\_past\_m… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID No 13442 0.65  
2 No COVID Yes 7227 0.35  
3 Probable COVID No 367 0.44  
4 Probable COVID Yes 469 0.56

# A tibble: 0 x 4  
# Groups: covid\_probable\_case\_incl\_screening [0]  
# … with 4 variables: covid\_probable\_case\_incl\_screening <fct>,  
# midas.days\_past\_month\_miss\_work\_school <fct>, n <int>, Prop <dbl>

# A tibble: 0 x 4  
# Groups: covid\_probable\_case\_incl\_screening [0]  
# … with 4 variables: covid\_probable\_case\_incl\_screening <fct>,  
# midas.days\_past\_month\_work\_school\_half\_productivity <fct>, n <int>,  
# Prop <dbl>

# A tibble: 0 x 4  
# Groups: covid\_probable\_case\_incl\_screening [0]  
# … with 4 variables: covid\_probable\_case\_incl\_screening <fct>,  
# midas.days\_past\_month\_miss\_housework <fct>, n <int>, Prop <dbl>

# A tibble: 0 x 4  
# Groups: covid\_probable\_case\_incl\_screening [0]  
# … with 4 variables: covid\_probable\_case\_incl\_screening <fct>,  
# midas.days\_past\_month\_housework\_half\_productivity <fct>, n <int>,  
# Prop <dbl>

# A tibble: 0 x 4  
# Groups: covid\_probable\_case\_incl\_screening [0]  
# … with 4 variables: covid\_probable\_case\_incl\_screening <fct>,  
# midas.days\_past\_month\_miss\_social\_activities <fct>, n <int>, Prop <dbl>

Adding missing grouping variables: `covid\_probable\_case\_incl\_screening`

[1] "covid\_probable\_case\_incl\_screening" "nmss.ability\_taste\_food\_smell"   
[3] "nmss.severe\_taste\_smell\_loss"

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening nmss.ability\_taste\_food\_smell n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID No 20093 0.97  
2 No COVID Yes 565 0.03  
3 Probable COVID No 410 0.49  
4 Probable COVID Yes 425 0.51

# A tibble: 12 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening nmss.severe\_taste\_smell\_loss n Prop  
 <fct> <fct> <int> <dbl>  
 1 No COVID No loss 88 0.16  
 2 No COVID Minimal 105 0.19  
 3 No COVID Mild 149 0.26  
 4 No COVID Moderate 118 0.21  
 5 No COVID Severe 66 0.12  
 6 No COVID I cannot taste or smell at all 39 0.07  
 7 Probable COVID No loss 12 0.03  
 8 Probable COVID Minimal 79 0.19  
 9 Probable COVID Mild 130 0.31  
10 Probable COVID Moderate 91 0.21  
11 Probable COVID Severe 71 0.17  
12 Probable COVID I cannot taste or smell at all 42 0.1

Adding missing grouping variables: `covid\_probable\_case\_incl\_screening`

[1] "covid\_probable\_case\_incl\_screening"   
[2] "nmsw.drink\_problems\_choking\_difficulty"  
[3] "nmsw.regularly\_night\_pass\_urine"   
[4] "nmsw.sex\_difficult\_finding"   
[5] "nmsw.weak\_standing\_feeling\_light"   
[6] "nmsw.acting\_moving\_sleep\_talking"   
[7] "nmsw.double\_vision"

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_scree… nmsw.drink\_problems\_choking\_diffi… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID No 19665 0.95  
2 No COVID Yes 973 0.05  
3 Probable COVID No 720 0.86  
4 Probable COVID Yes 115 0.14

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening nmsw.regularly\_night\_pass\_urine n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID No 13242 0.64  
2 No COVID Yes 7398 0.36  
3 Probable COVID No 507 0.61  
4 Probable COVID Yes 328 0.39

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening nmsw.sex\_difficult\_finding n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID No 18475 0.91  
2 No COVID Yes 1831 0.09  
3 Probable COVID No 725 0.88  
4 Probable COVID Yes 96 0.12

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening nmsw.weak\_standing\_feeling\_lig… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID No 15584 0.76  
2 No COVID Yes 5050 0.24  
3 Probable COVID No 512 0.61  
4 Probable COVID Yes 323 0.39

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening nmsw.acting\_moving\_sleep\_talki… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID No 18442 0.9   
2 No COVID Yes 2161 0.1   
3 Probable COVID No 688 0.83  
4 Probable COVID Yes 144 0.17

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening nmsw.double\_vision n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID No 19853 0.96  
2 No COVID Yes 776 0.04  
3 Probable COVID No 763 0.91  
4 Probable COVID Yes 71 0.09

Adding missing grouping variables: `covid\_probable\_case\_incl\_screening`

[1] "covid\_probable\_case\_incl\_screening"   
[2] "tinnitus.ears\_noises\_minutes\_head"   
[3] "tinnitus.ears\_noises\_minutes\_head\_frequency"  
[4] "tinnitus.noises\_worry\_worst\_upset"

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screeni… tinnitus.ears\_noises\_minutes\_he… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID No 16694 0.81   
2 No COVID Yes 3954 0.19   
3 Probable COVID No 592 0.71   
4 Probable COVID Yes 244 0.290

# A tibble: 9 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_scre… tinnitus.ears\_noises\_minutes\_head\_… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Never 30 0.01  
2 No COVID Not now 268 0.07  
3 No COVID Some of the time 1545 0.39  
4 No COVID Now a lot of the time 631 0.16  
5 No COVID Now most or all of the time 1480 0.37  
6 Probable COVID Not now 17 0.07  
7 Probable COVID Some of the time 117 0.48  
8 Probable COVID Now a lot of the time 37 0.15  
9 Probable COVID Now most or all of the time 73 0.3

# A tibble: 8 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screeni… tinnitus.noises\_worry\_worst\_ups… n Prop  
 <fct> <fct> <int> <dbl>  
1 No COVID Not at all 944 0.24  
2 No COVID Slightly 1971 0.5   
3 No COVID Moderately 888 0.22  
4 No COVID Severely 149 0.04  
5 Probable COVID Not at all 50 0.2   
6 Probable COVID Slightly 110 0.45  
7 Probable COVID Moderately 74 0.3   
8 Probable COVID Severely 10 0.04

# Scoring for neuro measures

# ALSfrs

Note: Using an external vector in selections is ambiguous.  
ℹ Use `all\_of(als.col.names)` instead of `als.col.names` to silence this message.  
ℹ See <https://tidyselect.r-lib.org/reference/faq-external-vector.html>.  
This message is displayed once per session.

# A tibble: 19 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening als.sum.score n Prop  
 <fct> <dbl> <int> <dbl>  
 1 No COVID 1 3 0   
 2 No COVID 2 959 0.43  
 3 No COVID 3 369 0.16  
 4 No COVID 4 396 0.18  
 5 No COVID 5 213 0.09  
 6 No COVID 6 131 0.06  
 7 No COVID 7 108 0.05  
 8 No COVID 8 53 0.02  
 9 No COVID 9 9 0   
10 No COVID 10 9 0   
11 No COVID 11 3 0   
12 Probable COVID 2 76 0.35  
13 Probable COVID 3 35 0.16  
14 Probable COVID 4 43 0.2   
15 Probable COVID 5 30 0.14  
16 Probable COVID 6 13 0.06  
17 Probable COVID 7 8 0.04  
18 Probable COVID 8 9 0.04  
19 Probable COVID 9 3 0.01

# ESS

Note: Using an external vector in selections is ambiguous.  
ℹ Use `all\_of(ess.col.names)` instead of `ess.col.names` to silence this message.  
ℹ See <https://tidyselect.r-lib.org/reference/faq-external-vector.html>.  
This message is displayed once per session.

# A tibble: 48 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening ess.col.names n Prop  
 <fct> <dbl> <int> <dbl>  
 1 No COVID 2 69 0.03  
 2 No COVID 3 69 0.03  
 3 No COVID 4 159 0.06  
 4 No COVID 5 183 0.07  
 5 No COVID 6 256 0.1   
 6 No COVID 7 225 0.09  
 7 No COVID 8 265 0.11  
 8 No COVID 9 225 0.09  
 9 No COVID 10 233 0.09  
10 No COVID 11 161 0.06  
# … with 38 more rows

[1] "nmsw.drink\_problems\_choking\_difficulty\_numeric"  
[2] "nmsw.regularly\_night\_pass\_urine\_numeric"   
[3] "nmsw.sex\_difficult\_finding\_numeric"   
[4] "nmsw.weak\_standing\_feeling\_light\_numeric"   
[5] "nmsw.acting\_moving\_sleep\_talking\_numeric"   
[6] "nmsw.double\_vision\_numeric"

Note: Using an external vector in selections is ambiguous.  
ℹ Use `all\_of(nmsw.col.names)` instead of `nmsw.col.names` to silence this message.  
ℹ See <https://tidyselect.r-lib.org/reference/faq-external-vector.html>.  
This message is displayed once per session.

## CFS

[1] "cfs.do\_you\_have\_problems\_with\_tiredness\_numeric"   
 [2] "cfs.do\_you\_need\_to\_rest\_more\_numeric"   
 [3] "cfs.do\_you\_feel\_sleepy\_or\_drowsy\_numeric"   
 [4] "cfs.do\_you\_have\_problems\_starting\_things\_numeric"  
 [5] "cfs.do\_you\_lack\_energy\_numeric"   
 [6] "cfs.strength\_muscles\_numeric"   
 [7] "cfs.do\_you\_feel\_weak\_numeric"   
 [8] "cfs.do\_you\_have\_difficulty\_concentrating\_numeric"  
 [9] "cfs.make\_slips\_speaking\_tongue\_numeric"   
[10] "cfs.correct\_word\_find\_difficult\_numeric"   
[11] "cfs.how\_is\_your\_memory\_numeric"

Note: Using an external vector in selections is ambiguous.  
ℹ Use `all\_of(cfs.col.names)` instead of `cfs.col.names` to silence this message.  
ℹ See <https://tidyselect.r-lib.org/reference/faq-external-vector.html>.  
This message is displayed once per session.

Note: Using an external vector in selections is ambiguous.  
ℹ Use `all\_of(cfs.col.names.physio)` instead of `cfs.col.names.physio` to silence this message.  
ℹ See <https://tidyselect.r-lib.org/reference/faq-external-vector.html>.  
This message is displayed once per session.

Note: Using an external vector in selections is ambiguous.  
ℹ Use `all\_of(cfs.col.names.psych)` instead of `cfs.col.names.psych` to silence this message.  
ℹ See <https://tidyselect.r-lib.org/reference/faq-external-vector.html>.  
This message is displayed once per session.

`summarise()` ungrouping output (override with `.groups` argument)

# A tibble: 2 x 4  
 covid\_probable\_case\_incl\_screening mean\_total mean\_physical mean\_psychological  
 <fct> <dbl> <dbl> <dbl>  
1 No COVID 13.5 8.67 4.79  
2 Probable COVID 15.9 10.3 5.61

CFS cut-off scores require individual symptom-level scores to be binary. Script below recodes variables to binary.

[1] "cfs.correct\_word\_find\_difficult\_binary"   
 [2] "cfs.do\_you\_have\_problems\_with\_tiredness\_binary"   
 [3] "cfs.do\_you\_feel\_sleepy\_or\_drowsy\_binary"   
 [4] "cfs.do\_you\_feel\_weak\_binary"   
 [5] "cfs.do\_you\_have\_difficulty\_concentrating\_binary"  
 [6] "cfs.do\_you\_have\_problems\_starting\_things\_binary"  
 [7] "cfs.do\_you\_lack\_energy\_binary"   
 [8] "cfs.do\_you\_need\_to\_rest\_more\_binary"   
 [9] "cfs.how\_is\_your\_memory\_numeric\_binary"   
[10] "cfs.make\_slips\_speaking\_tongue\_binary"   
[11] "cfs.strength\_muscles\_binary"

Note: Using an external vector in selections is ambiguous.  
ℹ Use `all\_of(cfs.col.names.bi)` instead of `cfs.col.names.bi` to silence this message.  
ℹ See <https://tidyselect.r-lib.org/reference/faq-external-vector.html>.  
This message is displayed once per session.

# A tibble: 4 x 4  
# Groups: covid\_probable\_case\_incl\_screening [2]  
 covid\_probable\_case\_incl\_screening cfs.sum\_score\_case n Prop  
 <fct> <chr> <int> <dbl>  
1 No COVID Fatigue 3430 0.28  
2 No COVID No fatigue 8774 0.72  
3 Probable COVID Fatigue 377 0.49  
4 Probable COVID No fatigue 398 0.51

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| covid\_probable\_case\_incl\_screening | Sample | cfs.sum\_score\_case | n | Prop |
| No COVID | EDGI | Fatigue | 74 | 0.48 |
| No COVID | EDGI | No fatigue | 80 | 0.52 |
| No COVID | GLAD | Fatigue | 2293 | 0.49 |
| No COVID | GLAD | No fatigue | 2355 | 0.51 |
| No COVID | NBR | Fatigue | 1063 | 0.14 |
| No COVID | NBR | No fatigue | 6339 | 0.86 |
| Probable COVID | EDGI | Fatigue | 6 | 0.55 |
| Probable COVID | EDGI | No fatigue | 5 | 0.45 |
| Probable COVID | GLAD | Fatigue | 284 | 0.66 |
| Probable COVID | GLAD | No fatigue | 144 | 0.34 |
| Probable COVID | NBR | Fatigue | 87 | 0.26 |
| Probable COVID | NBR | No fatigue | 249 | 0.74 |