

Impact of Gamma COVID-19 variant on the prognosis of hospitalized pregnant and postpartum women with cardiovascular disease

Codes and outputs

16/11/2023

Description

This file presents the documentation of the analysis of article “Impact of Gamma COVID-19 variant on the prognosis of pregnant and postpartum women with cardiovascular disease” with authors Carolina Testa, Luciana Godoi, Nátaly Monroy, Maria Rita Bortolotto, Agatha Rodrigues and Rossana Francisco.

R packages used, functions and dataset import

The data are analyzed using the free-software R (<https://www.R-project.org>) in version 4.3.1. Next, we present and load the libraries used in the data analysis process.

```
#loadlibrary <- function(x) {  
#   if (!require(x, character.only = TRUE)) {  
#     install.packages(x, dependencies = TRUE)  
#     if (!require(x, character.only = TRUE))  
#       stop("Package not found")  
#   }  
#}
```

```
packages <- c(  
  "dplyr",  
  "MatchIt",  
  "lubridate",  
  "readr",  
  "readxl",  
  "ggplot2",  
  "kableExtra",  
  "tables",  
  "questionr",  
  "car",  
  "data.table",  
  "magrittr",  
  "tidyverse",  
  "readxl",  
  "summarytools",  
  "modelsummary",
```

```

    "RColorBrewer",
    "zoo",
    "WeightIt",
    "jtools",
    "cobalt",
    "weights",
    "cleaner"
  )

lapply(packages, require, character.only = TRUE)

data <- read_csv("dados_cardiopatia_v2.csv", na = c("NA"))

```

We searched the SIVEP-influenza database on May 5, 2021 for cases reported in the period between the eighth epidemiological week of 2020 (which corresponds to the beginning of the COVID-19 epidemic in Brazil), and the 17th epidemiological week of 2021 (immediately before the start of vaccination of pregnant and postpartum women, which began on the 18th epidemiological week of 2021), between February 16, 2020 and May 1, 2021.

There are 10784 confirmed and hospitalized cases of COVID-19 in pregnant and postpartum women aged 10 to 55 years. We identify 61.07% of these notifications without any information about the presence or absence of cardiovascular diseases (CVD_by_year).

```

#Creating the CVD_by_year variable
data<- data %>%
  mutate(CVD = case_when(CARDIOPATI == 1 ~ "yes", CARDIOPATI == 2 ~ "no", TRUE ~ NA_character_ ))

#Changing the column name - ano to years
data <- data %>%
  rename("year" = "ano")

with(data, ctable(CVD, year, prop = "c", chisq = FALSE, useNA = "no"))

```

```

## Cross-Tabulation, Column Proportions
## CVD * year
## Data Frame: data
##
## -----
##      year      2020      2021      Total
## CVD
## no      2032 ( 83.3%)  1463 ( 83.1%)  3495 ( 83.3%)
## yes      406 ( 16.7%)   297 ( 16.9%)   703 ( 16.7%)
## Total    2438 (100.0%)  1760 (100.0%)  4198 (100.0%)
## -----

```

The next selection consists of selecting only pregnant and postpartum women with CVD, hospitalized with confirmed COVID-19 in the years 2020 and 2021. For this, we select the cases where CVD variable **yes**:

```

data <- data %>%
  dplyr::mutate(
    dt_sin_pri = as.Date(DT_SIN_PRI, format = "%d/%m/%Y"),
    dt_evoluca = as.Date(DT_EVOLUCA, format = "%d/%m/%Y"),
    dt_notific = as.Date(DT_NOTIFIC, format = "%d/%m/%Y"),
  )

```

```
)

### Filtering only patients with CVD.

data <- data %>%
  filter(CVD == "yes")

freq(x = data$year,
     markdown = FALSE,
     title = "Frequency of CVD cases in the years 2020 and 2021",
     header = FALSE,
     quote = FALSE)
```

```
## Frequency of CVD cases in the years 2020 and 2021
```

```
##
##
##
##      Item      Count      Percent      Cum. Count      Cum. Percent
## ---  -
## 1      2020        406      57.75%          406          57.75%
## 2      2021        297      42.25%          703          100.00%
```

The variable CRITERIO presents the criterion used for the final classification of the confirmed cases of COVID-19, 1 - laboratory, 2 - clinical epidemiological, 3 - clinical and 4 - clinical by image (chest x-ray/tomography).

```
with(data, freq(CRITERIO), useNA="yes")
```

```
##
##
## **Frequency table**
##
## Class:      numeric
## Length:     703
## Available:  692 (98.44%, NA: 11 = 1.56%)
## Unique:     4
##
## Mean:       1.23
## SD:         0.77 (CV: 0.63, MAD: 0)
## Five-Num:   1 | 1 | 1 | 1 | 4 (IQR: 0, CQV: 0)
## Outliers:   57 (8.24%)
##
##
## |  | Item | Count | Percent | Cum. Count | Cum. Percent |
## |:-|-----:|-----:|-----:|-----:|-----:|
## |1 | 1 | 635 | 91.76% | 635 | 91.76% |
## |2 | 4 | 44 | 6.36% | 679 | 98.12% |
## |3 | 3 | 11 | 1.59% | 690 | 99.71% |
## |4 | 2 | 2 | 0.29% | 692 | 100.00% |
```

We note that some observations with the variable CRITERIO as 2 - clinical epidemiological, 3 - clinical and 4 - clinical by image (chest x-ray/tomography) or empty cell had positive laboratory results. To evaluate this cases, we considered a new variable named as Final_criterion.


```
round(prop.table(table(data$Final_criterion, useNA="ifany"))*100, 2)
```

```
##
##           clinical      clinical by image clinical epidemiological
##           1.14          6.26          0.14
##           laboratory      <NA>
##           91.89          0.57
```

One can see below the functions that will be used in the data analysis.

```
#funções para medidas-resumo
Mean_ <- function(x)
  mean(x, na.rm = TRUE)
Median_ <- function(x)
  median(x, na.rm = TRUE)
SD <- function(x)
  sd(x, na.rm = TRUE)
Min <- function(x)
  base::min(x, na.rm = TRUE)
Max <- function(x)
  base::max(x, na.rm = TRUE)
q25 <- function(x)
  stats::quantile(x, p = 0.25, na.rm = TRUE)
q75 <- function(x)
  stats::quantile(x, p = 0.75, na.rm = TRUE)
IQR <- function(x)
  round(q75(x) - q25(x), 2)
n <- function(x)
  sum(!is.na(x))
```

Data treatment

```
## CVD in the years 2020 and 2021

data <- data %>% mutate(CVD_by_year = case_when(year == "2020" ~ "2020",
  year == "2021" ~ "2021",
  TRUE ~ NA_character_))

## Ethnicity
data <- data %>%
  mutate(ethnicity = case_when(CS_RACA == 1 ~ "white",
    CS_RACA == 2 ~ "black",
    CS_RACA == 3 ~ "yellow",
    CS_RACA == 4 ~ "brown",
    CS_RACA == 5 ~ "indigenous",
    TRUE ~ NA_character_))

## Schooling
data <- data %>%
  mutate(education = case_when(CS_ESCOL_N == 0 ~ "No schooling",
    CS_ESCOL_N == 1 ~ "1st to 5th grade",
```

```

        CS_ESCOL_N == 2 ~ "6th to 9th grade",
        CS_ESCOL_N == 3 ~ "High school",
        CS_ESCOL_N == 4 ~ "Higher education",
        TRUE ~ NA_character_)

data$education <- factor(data$education,
                        levels = c("No schooling", "1st to 5th grade", "6th to 9th grade",
                                   "High school", "Higher education"))

## Age group
data <- data %>%
  mutate(
    age_group = case_when(
      NU_IDADE_N <= 19 ~ "<20",
      NU_IDADE_N >= 20
      & NU_IDADE_N <= 34 ~ "20-34",
      NU_IDADE_N > 34 ~ ">=35",
      TRUE ~ NA_character_
    )
  )
data$age_group <-
  factor(data$age_group, levels = c("<20", "20-34", ">=35"))

## Residence area
data <- data %>%
  mutate(zone = case_when(CS_ZONA ==1 ~ "Urban",
                          CS_ZONA == 2 ~ "Rural",
                          CS_ZONA == 3 ~ "Periurban",
                          TRUE ~ NA_character_))

## Hospital-acquired infection
data <- data %>%
  mutate(hospital_infection = case_when(NOSOCOMIAL ==1 ~ "yes",
                                         NOSOCOMIAL == 2 ~ "no",
                                         TRUE ~ NA_character_))

## Fever
data <- data %>%
  mutate(fever = case_when(FEBRE == 1 ~ "yes",
                           FEBRE == 2 ~ "no",
                           TRUE ~ NA_character_))

## Cough
data <- data %>%
  mutate(cough = case_when(TOSSE == 1 ~ "yes",
                           TOSSE == 2 ~ "no",
                           TRUE ~ NA_character_))

## Sore throat
data <- data %>%
  mutate(sore_throat = case_when(GARGANTA == 1 ~ "yes",
                                  GARGANTA == 2 ~ "no",

```

```

TRUE ~ NA_character_))

## Dyspnea
data <- data %>%
  mutate(dyspnea = case_when(DISPNEIA == 1 ~ "yes",
                             DISPNEIA == 2 ~ "no",
                             TRUE ~ NA_character_))

## Respiratory distress
data <- data %>%
  mutate(resp_dist = case_when(DESC_RESP == 1 ~ "yes",
                                DESC_RESP == 2 ~ "no",
                                TRUE ~ NA_character_))

## Saturation
data <- data %>%
  mutate(saturation = case_when(SATURACAO == 1 ~ "yes",
                                 SATURACAO == 2 ~ "no",
                                 TRUE ~ NA_character_))

## Diarrhea
data <- data %>%
  mutate(diarrhea = case_when(DIARREIA == 1 ~ "yes",
                               DIARREIA == 2 ~ "no",
                               TRUE ~ NA_character_))

## Vomit
data <- data %>%
  mutate(vomit = case_when(VOMITO == 1 ~ "yes",
                           VOMITO == 2 ~ "no",
                           TRUE ~ NA_character_))

## Abdominal pain
data <- data %>%
  mutate(abd_pain = case_when(DOR_ABD == 1 ~ "yes",
                              DOR_ABD == 2 ~ "no",
                              TRUE ~ NA_character_))

## Fatigue
data <- data %>%
  mutate(fatigue = case_when(FADIGA == 1 ~ "yes",
                             FADIGA == 2 ~ "no",
                             TRUE ~ NA_character_))

## Loss of smell
data <- data %>%
  mutate(loss_smell = case_when(PERD_OLFT == 1 ~ "yes",
                                 PERD_OLFT == 2 ~ "no",
                                 TRUE ~ NA_character_))

## Loss of taste

```

```

data <- data %>%
  mutate(loss_taste = case_when(PERD_PALA == 1 ~ "yes",
                                PERD_PALA == 2 ~ "no",
                                TRUE ~ NA_character_))

## Any respiratory symptom

df <- select(data,dyspnea,fatigue, saturation, resp_dist)
soma <- function(x){
  if (sum(is.na(x))==4)
    return(NA_character_)
  else
    return(sum(!is.na(x) & x=="yes"))
}
data$qt_sintomas_resp_aux <- apply(df,1,soma)

## Presence of respiratory symptoms

data <- data %>%
  mutate(resp_symp = case_when(qt_sintomas_resp_aux >=1 ~ "yes",
                                qt_sintomas_resp_aux ==0 ~ "no",
                                TRUE ~ NA_character_))

## Number of respiratory symptoms
data <- data %>%
  mutate(qt_resp_symp = case_when(qt_sintomas_resp_aux == 4 ~ "4 symptoms",
                                   qt_sintomas_resp_aux == 3 ~ "3 symptoms",
                                   qt_sintomas_resp_aux == 2 ~ "2 symptoms",
                                   qt_sintomas_resp_aux == 1 ~ "1 symptom",
                                   qt_sintomas_resp_aux == 0 ~ "No respiratory symptom",
                                   TRUE ~ NA_character_))

data$qt_resp_symp <-
  ordered(data$qt_resp_symp, levels = c("No respiratory symptom", "1 symptom", "2 symptoms", "3 symptoms", "4 symptoms"))

## Any symptom

df <- select(data,dyspnea,fatigue, saturation, resp_dist,fever,cough,sore_throat,diarrhea,
             vomit,abd_pain,loss_smell,loss_taste)
soma <- function(x){
  if (sum(is.na(x))==12)
    return(NA_character_)
  else
    return(sum(!is.na(x) & x=="yes"))
}
data$qt_sintomas_aux <- apply(df,1,soma)

## Presence of any symptom

data <- data %>%
  mutate(symp = case_when(qt_sintomas_aux >=1 ~ "yes",
                           qt_sintomas_aux == 0 ~ "no",
                           TRUE ~ NA_character_))

```



```

## Number of any symptom
data <- data %>%
  mutate(qt_symp = case_when(qt_sintomas_aux == 12 ~ "12 symptoms",
                             qt_sintomas_aux == 11 ~ "11 symptoms",
                             qt_sintomas_aux == 10 ~ "10 symptoms",
                             qt_sintomas_aux == 9 ~ "9 symptoms",
                             qt_sintomas_aux == 8 ~ "8 symptoms",
                             qt_sintomas_aux == 7 ~ "7 symptoms",
                             qt_sintomas_aux == 6 ~ "6 symptoms",
                             qt_sintomas_aux == 5 ~ "5 symptoms",
                             qt_sintomas_aux == 4 ~ "4 symptoms",
                             qt_sintomas_aux == 3 ~ "3 symptoms",
                             qt_sintomas_aux == 2 ~ "2 symptoms",
                             qt_sintomas_aux == 1 ~ "1 symptom",
                             qt_sintomas_aux == 0 ~ "No symptom",
                             TRUE ~ NA_character_))

data$qt_symp <-
  ordered(data$qt_symp, levels = c("No symptom", "1 symptom", "2 symptoms", "3 symptoms", "4 symptoms",

## Hematologic
data <- data %>%
mutate(hematologic = case_when(HEMATOLOGI == 1 ~ "yes",
                              HEMATOLOGI == 2 ~ "no",
                              TRUE ~ NA_character_))

## Immunodeficiencies
data <- data %>%
mutate(imunodepre = case_when(IMUNODEPRE == 1 ~ "yes",
                              IMUNODEPRE == 2 ~ "no",
                              TRUE ~ NA_character_))

## Liver diseases
data <- data %>%
mutate(hepatic = case_when(HEPATICA == 1 ~ "yes",
                          HEPATICA == 2 ~ "no",
                          TRUE ~ NA_character_))

## Asthma
data <- data %>%
mutate(asthma = case_when(ASMA == 1 ~ "yes",
                         ASMA == 2 ~ "no",
                         TRUE ~ NA_character_))

## Diabetes
data <- data %>%
mutate(diabetes = case_when(DIABETES == 1 ~ "yes",
                          DIABETES == 2 ~ "no",
                          TRUE ~ NA_character_))

## Neuropathies
data <- data %>%
mutate(neurologic = case_when(NEUROLOGIC == 1 ~ "yes",
                              NEUROLOGIC == 2 ~ "no",
                              TRUE ~ NA_character_))

## Lung diseases
data <- data %>%
mutate(pneumologic = case_when(PNEUMOPATI == 1 ~ "yes",

```

```

PNEUMOPATI == 2 ~ "no",
TRUE ~ NA_character_))

## Kidney disease
data <- data %>%
mutate(renal = case_when(RENAL == 1 ~ "yes",
                        RENAL == 2 ~ "no",
                        TRUE ~ NA_character_))

## Obesity
data <- data %>%
mutate(obesity = case_when(OBESIDADE == 1 ~ "yes",
                          OBESIDADE == 2 ~ "no",
                          TRUE ~ NA_character_))

## At least one associated disease
df <- select(data,obesity,hematologic,hepatic,asthma,diabetes,neurologic,pneumologic,imunodepre,renal)
soma <- function(x){
  if (sum(is.na(x))==9)
    return(NA_character_)
  else
    return(sum(!is.na(x) & x=="yes"))
}
data$qt_comorb_aux <- apply(df,1,soma)

data <- data %>%
  mutate(comorbidities = case_when(qt_comorb_aux >=1 ~ "yes",
                                   qt_comorb_aux ==0 ~ "no",
                                   TRUE ~ NA_character_))

## Number of associated diseases
data <- data %>%
  mutate(qt_comorb = case_when(qt_comorb_aux== 9 ~ "9 comorbidities",
                              qt_comorb_aux== 8 ~ "8 comorbidities",
                              qt_comorb_aux == 7 ~ "7 comorbidities",
                              qt_comorb_aux== 6 ~ "6 comorbidities",
                              qt_comorb_aux == 5 ~ "5 comorbidities",
                              qt_comorb_aux== 4 ~ "4 comorbidities",
                              qt_comorb_aux == 3 ~ "3 comorbidities",
                              qt_comorb_aux == 2 ~ "2 comorbidities",
                              qt_comorb_aux == 1 ~ "1 comorbidity",
                              qt_comorb_aux == 0 ~ "No comorbidity",
                              TRUE ~ NA_character_))

data$qt_comorb <-
  factor(data$qt_comorb, levels = c("No comorbidity", "1 comorbidity", "2 comorbidities", "3 comorbidities"))

data <- data %>%
  mutate(comorbidities_grupo3 = case_when(qt_comorb_aux == 0 ~ "No comorbidity",
                                           qt_comorb_aux == 1 ~ "1 comorbidity",
                                           qt_comorb_aux == 2 ~ "2 comorbidities",
                                           qt_comorb_aux > 2 ~ ">2 comorbidities",
                                           TRUE ~ NA_character_))

data$comorbidities_grupo3 <-

```

```

ordered(data$comorbidities_grupo3, levels = c("No comorbidity", "1 comorbidity", "2 comorbidities", "3 comorbidities"))

## ICU
data <- data %>%
  mutate(icu = case_when(UTI == 1 ~ "yes",
                        UTI == 2 ~ "no",
                        TRUE ~ NA_character_))

# Ventilatory support
data <- data %>%
  mutate(ven_support = case_when(SUPPORT_VEN == 1 ~ "yes, invasive",
                                SUPPORT_VEN == 2 ~ "yes, noninvasive",
                                SUPPORT_VEN == 3 ~ "No",
                                TRUE ~ NA_character_))

## Evolution
data <- data %>%
  mutate(evolution = case_when(EVOLUCAO == 1 ~ "recovery",
                              EVOLUCAO == 2 ~ "death",
                              EVOLUCAO == 3 ~ "death",
                              TRUE ~ NA_character_))

data$evolution <-
  ordered(data$evolution, levels = c("recovery", "death"))

## Orotracheal intubation
data <- data %>%
  mutate(intubation = case_when(SUPPORT_VEN == 1 ~ "yes",
                                SUPPORT_VEN == 2 ~ "no",
                                SUPPORT_VEN == 3 ~ "no",
                                TRUE ~ NA_character_))

## Time elapsed between the start of symptoms and the outcome (days)
data <- data %>%
  dplyr::mutate(
    dt_sin_pri = as.Date(DT_SIN_PRI, format = "%d/%m/%Y"),
    dt_evoluca = as.Date(DT_EVOLUCA, format = "%d/%m/%Y"),
    days_symp_evol = as.numeric(dt_evoluca-dt_sin_pri))

## Days of hospitalization in ICU
data <- data %>%
  dplyr::mutate(
    dt_entuti = as.Date(DT_ENTUTI, format = "%d/%m/%Y"),
    dt_saiduti = as.Date(DT_SAIDUTI, format = "%d/%m/%Y"),
    icu_days = as.numeric(dt_saiduti-dt_entuti)
  )

```

Epidemiologic characteristics

Ethnicity

```
with(data, ctable(ethnicity,CVD_by_year, prop = "c", useNA = "no", chisq = FALSE))
```

```
## Cross-Tabulation, Column Proportions
## ethnicity * CVD_by_year
## Data Frame: data
##
## -----
##           CVD_by_year      2020      2021      Total
## ethnicity
##   black          32 ( 9.4%)    20 ( 7.8%)    52 ( 8.8%)
##   brown         181 (53.4%)   108 (42.4%)   289 (48.7%)
## indigenous        1 ( 0.3%)     1 ( 0.4%)     2 ( 0.3%)
##   white         124 (36.6%)   125 (49.0%)   249 (41.9%)
##   yellow         1 ( 0.3%)     1 ( 0.4%)     2 ( 0.3%)
##   Total          339 (100.0%)  255 (100.0%)  594 (100.0%)
## -----
```

```
fisher.test(data$ethnicity, data$CVD_by_year)
```

```
##
## Fisher's Exact Test for Count Data
##
## data: data$ethnicity and data$CVD_by_year
## p-value = 0.01964
## alternative hypothesis: two.sided
```

Schooling

```
with(data, ctable(education,CVD_by_year, prop = "c", useNA = "no", chisq = FALSE))
```

```
## Cross-Tabulation, Column Proportions
## education * CVD_by_year
## Data Frame: data
##
## -----
##           CVD_by_year      2020      2021      Total
## education
##   No schooling          1 ( 0.6%)    1 ( 0.7%)    2 ( 0.6%)
##   1st to 5th grade      20 (11.0%)   19 (13.9%)   39 (12.3%)
##   6th to 9th grade      30 (16.6%)   29 (21.2%)   59 (18.6%)
##   High school           95 (52.5%)   70 (51.1%)  165 (51.9%)
##   Higher education       35 (19.3%)   18 (13.1%)   53 (16.7%)
##   Total                181 (100.0%)  137 (100.0%) 318 (100.0%)
## -----
```

```
fisher.test(data$education, data$CVD_by_year)
```

```
##
## Fisher's Exact Test for Count Data
##
## data: data$education and data$CVD_by_year
## p-value = 0.4768
## alternative hypothesis: two.sided
```

Age (Years)

```
datasummary((CVD_by_year) ~ NU_IDADE_N*(n+Mean_+SD+Median_+Min+Max+q25+q75+IQR),
  data = data, output = 'markdown')
```

CVD_by_year	n	Mean_	SD	Median_	Min	Max	q25	q75	IQR
2020	406.00	33.96	8.11	34.00	15.00	55.00	28.00	39.00	11.00
2021	297.00	34.96	8.49	35.00	19.00	55.00	29.00	40.00	11.00

```
t.test(NU_IDADE_N ~CVD_by_year, data = data)
```

```
##
## Welch Two Sample t-test
##
## data: NU_IDADE_N by CVD_by_year
## t = -1.5695, df = 620.86, p-value = 0.1171
## alternative hypothesis: true difference in means between group 2020 and group 2021 is not equal to 0
## 95 percent confidence interval:
## -2.2469820 0.2507803
## sample estimates:
## mean in group 2020 mean in group 2021
## 33.95813 34.95623
```

Below, we present the frequency distribution of the variable age for the pregnant and postpartum women.

```
table(data$NU_IDADE_N)
```

```
##
## 15 16 17 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41
## 1 1 1 9 7 12 12 21 15 25 29 24 23 21 36 34 31 32 31 49 26 32 30 36 20 23
## 42 43 44 45 46 47 48 49 50 51 52 53 54 55
## 15 11 9 15 7 8 10 6 5 7 4 7 9 9
```

Age group

```
with(data, ctable(age_group,CVD_by_year, prop = "c", useNA = "no", chisq = FALSE))
```

```
## Cross-Tabulation, Column Proportions
## age_group * CVD_by_year
## Data Frame: data
##
## -----
##           CVD_by_year      2020      2021      Total
## age_group
##   <20              10 (  2.5%)      2 (  0.7%)     12 (  1.7%)
##   20-34             208 ( 51.2%)    145 ( 48.8%)    353 ( 50.2%)
##   >=35             188 ( 46.3%)    150 ( 50.5%)    338 ( 48.1%)
##   Total            406 (100.0%)    297 (100.0%)    703 (100.0%)
## -----
```

```
fisher.test(data$age_group, data$CVD_by_year)
```

```
##
## Fisher's Exact Test for Count Data
##
## data: data$age_group and data$CVD_by_year
## p-value = 0.1282
## alternative hypothesis: two.sided
```

Residence area

```
with(data, ctable(zone,CVD_by_year, prop = "c", useNA = "no", chisq = FALSE))
```

```
## Cross-Tabulation, Column Proportions
## zone * CVD_by_year
## Data Frame: data
##
## -----
##           CVD_by_year      2020      2021      Total
## zone
## Periurban          2 (  0.5%)      3 (  1.1%)      5 (  0.8%)
## Rural              15 (  4.0%)     13 (  4.9%)     28 (  4.4%)
## Urban             356 ( 95.4%)    250 ( 94.0%)    606 ( 94.8%)
## Total            373 (100.0%)    266 (100.0%)    639 (100.0%)
## -----
```

```
fisher.test(data$zone, data$CVD_by_year)
```

```
##
## Fisher's Exact Test for Count Data
##
## data: data$zone and data$CVD_by_year
## p-value = 0.6207
## alternative hypothesis: two.sided
```

Gestational moment

```
ctable(data$classi_gesta_puerp, data$CVD_by_year, prop="c", OR=TRUE, useNA = "no", chisq = TRUE)
```

```
## Cross-Tabulation, Column Proportions
## classi_gesta_puerp * CVD_by_year
## Data Frame: data
##
## -----
##           CVD_by_year      2020      2021      Total
##   classi_gesta_puerp
##           1tri           20 ( 4.9%)   27 ( 9.1%)   47 ( 6.7%)
##           2tri           74 (18.2%)   70 (23.6%)  144 (20.5%)
##           3tri          173 (42.6%)  111 (37.4%)  284 (40.4%)
##           IG_ig           18 ( 4.4%)   16 ( 5.4%)   34 ( 4.8%)
##           puerp          121 (29.8%)   73 (24.6%)  194 (27.6%)
##           Total          406 (100.0%)  297 (100.0%) 703 (100.0%)
## -----
##
## -----
##   Chi.squared   df   p.value
## -----
##      10.0234     4     0.04
## -----
```

Hospital-acquired infection

```
with(data, ctable(CVD_by_year, hospital_infection, prop = "r", useNA = "no", chisq = FALSE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * hospital_infection
## Data Frame: data
##
## -----
##           hospital_infection      no      yes      Total
##   CVD_by_year
##           2020           291 (97.7%)   7 (2.3%)   298 (100.0%)
##           2021           240 (98.4%)   4 (1.6%)   244 (100.0%)
##           Total           531 (98.0%)  11 (2.0%)   542 (100.0%)
## -----
```

```
fisher.test(data$hospital_infection, data$CVD_by_year)
```

```
##
## Fisher's Exact Test for Count Data
##
## data: data$hospital_infection and data$CVD_by_year
## p-value = 0.7616
```

```
## alternative hypothesis: true odds ratio is not equal to 1
## 95 percent confidence interval:
## 0.1470473 2.7652021
## sample estimates:
## odds ratio
## 0.6933153
```

Symptom

Fever

```
with(data, ctable(CVD_by_year, fever, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * fever
## Data Frame: data
##
##
## -----
##          fever          no          yes          Total
## CVD_by_year
##      2020          147 (39.2%)      228 (60.8%)      375 (100.0%)
##      2021           88 (33.1%)      178 (66.9%)      266 (100.0%)
##      Total          235 (36.7%)      406 (63.3%)      641 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      2.2513      1   0.1335
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.30      0.94      1.81
## -----
```

Cough

```
with(data, ctable(CVD_by_year, cough, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * cough
## Data Frame: data
##
##
## -----
##          cough          no          yes          Total
```



```
## CVD_by_year
##      2020      99 (26.0%)  282 (74.0%)  381 (100.0%)
##      2021      59 (21.2%)  219 (78.8%)  278 (100.0%)
##      Total     158 (24.0%)  501 (76.0%)  659 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      1.7463      1  0.1863
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      1.30      0.90    1.88
## -----
```

Sore throat

```
with(data, ctable(CVD_by_year, sore_throat, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * sore_throat
## Data Frame: data
##
## -----
##      sore_throat      no      yes      Total
## CVD_by_year
##      2020      252 (74.6%)   86 (25.4%)  338 (100.0%)
##      2021      173 (74.9%)   58 (25.1%)  231 (100.0%)
##      Total      425 (74.7%)  144 (25.3%)  569 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      0      1      1
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      0.98      0.67    1.44
## -----
```

Dyspnea

```
with(data, ctable(CVD_by_year, dyspnea, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * dyspnea
## Data Frame: data
##
##
## -----
##           dyspnea           no           yes           Total
## CVD_by_year
##      2020           122 (32.4%)       255 (67.6%)       377 (100.0%)
##      2021           54 (19.6%)       222 (80.4%)       276 (100.0%)
##      Total           176 (27.0%)       477 (73.0%)       653 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      12.6091     1     4e-04
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##           1.97           1.36           2.84
## -----
```

1st trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "1tri")

with(df4, ctable(CVD_by_year, dyspnea, prop="r", useNA = "no", chisq = FALSE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * dyspnea
## Data Frame: df4
##
##
## -----
##           dyspnea           no           yes           Total
## CVD_by_year
##      2020           6 (33.3%)       12 (66.7%)       18 (100.0%)
##      2021           5 (19.2%)       21 (80.8%)       26 (100.0%)
##      Total           11 (25.0%)       33 (75.0%)       44 (100.0%)
## -----
```

```
fisher.test(df4$CVD_by_year, df4$qt_resp_symp)
```

```
##
```

```
## Fisher's Exact Test for Count Data
##
## data: df4$CVD_by_year and df4$qt_resp_symp
## p-value = 0.3471
## alternative hypothesis: two.sided
```

2nd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "2tri")

with(df4, ctable(CVD_by_year, dyspnea, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * dyspnea
## Data Frame: df4
##
## -----
##      dyspnea      no      yes      Total
## CVD_by_year
##      2020      17 (24.6%)  52 (75.4%)  69 (100.0%)
##      2021       9 (14.1%)  55 (85.9%)  64 (100.0%)
##      Total     26 (19.5%) 107 (80.5%) 133 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      1.7365    1  0.1876
## -----
```

3rd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "3tri")

with(df4, ctable(CVD_by_year, dyspnea, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * dyspnea
## Data Frame: df4
##
## -----
##      dyspnea      no      yes      Total
## CVD_by_year
##      2020      70 (42.9%)  93 (57.1%) 163 (100.0%)
##      2021      22 (21.8%)  79 (78.2%) 101 (100.0%)
```

```
##           Total           92 (34.8%)   172 (65.2%)   264 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      11.3864    1    7e-04
## -----
```

Puerperium

```
df4 <- data %>%
  filter(classi_gesta_puerp == "puerp")

with(df4, ctable(CVD_by_year, dyspnea, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * dyspnea
## Data Frame: df4
##
## -----
##           dyspnea           no           yes           Total
## CVD_by_year
##      2020           24 (22.0%)      85 (78.0%)      109 (100.0%)
##      2021           13 (18.3%)      58 (81.7%)       71 (100.0%)
##      Total           37 (20.6%)     143 (79.4%)      180 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      0.1706    1    0.6796
## -----
```

Respiratory distress

```
with(data, ctable(CVD_by_year, resp_dist, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * resp_dist
## Data Frame: data
##
## -----
##           resp_dist           no           yes           Total
## CVD_by_year
##      2020           161 (44.1%)      204 (55.9%)      365 (100.0%)
##      2021            87 (34.4%)      166 (65.6%)      253 (100.0%)
```

```
##           Total                248 (40.1%)   370 (59.9%)   618 (100.0%)
## -----
##
## -----
##  Chi.squared   df   p.value
## -----
##      5.481      1   0.0192
## -----
##
## -----
##  Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.51      1.08      2.10
## -----
```

1st trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "1tri")

with(df4, ctable(CVD_by_year, resp_dist, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * resp_dist
## Data Frame: df4
##
## -----
##      resp_dist      no      yes      Total
##  CVD_by_year
##      2020      8 (42.1%)  11 (57.9%)  19 (100.0%)
##      2021     10 (47.6%)  11 (52.4%)  21 (100.0%)
##      Total     18 (45.0%)  22 (55.0%)  40 (100.0%)
## -----
##
## -----
##  Chi.squared   df   p.value
## -----
##      0.001      1   0.9746
## -----
```

2nd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "2tri")

with(df4, ctable(CVD_by_year, resp_dist, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
```

```
## CVD_by_year * resp_dist
## Data Frame: df4
##
##
## -----
##      resp_dist      no      yes      Total
## CVD_by_year
##      2020      25 (37.3%)  42 (62.7%)  67 (100.0%)
##      2021      18 (30.5%)  41 (69.5%)  59 (100.0%)
##      Total      43 (34.1%)  83 (65.9%) 126 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      0.379      1  0.5381
## -----
```

3rd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "3tri")

with(df4, ctable(CVD_by_year, resp_dist, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * resp_dist
## Data Frame: df4
##
##
## -----
##      resp_dist      no      yes      Total
## CVD_by_year
##      2020      85 (53.8%)  73 (46.2%) 158 (100.0%)
##      2021      32 (35.6%)  58 (64.4%)  90 (100.0%)
##      Total     117 (47.2%) 131 (52.8%) 248 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      6.9421      1  0.0084
## -----
```

Puerperium

```
df4 <- data %>%
  filter(classi_gesta_puerp == "puerp")

with(df4, ctable(CVD_by_year, resp_dist, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * resp_dist
## Data Frame: df4
##
##
## -----
##      resp_dist      no      yes      Total
## CVD_by_year
##   2020      38 (36.5%)   66 (63.5%)  104 (100.0%)
##   2021      22 (31.4%)   48 (68.6%)   70 (100.0%)
##   Total      60 (34.5%)  114 (65.5%)  174 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##    0.2838    1  0.5942
## -----
```

Saturation

```
with(data, ctable(CVD_by_year, saturation, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * saturation
## Data Frame: data
##
##
## -----
##      saturation      no      yes      Total
## CVD_by_year
##   2020      179 (49.7%)   181 (50.3%)   360 (100.0%)
##   2021       82 (30.8%)   184 (69.2%)   266 (100.0%)
##   Total      261 (41.7%)   365 (58.3%)   626 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##    21.6955    1    0
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##    2.22      1.59      3.09
## -----
```

1st trimester

```
df4 <- data %>%  
  filter(classi_gesta_puerp == "1tri")  
  
with(df4, ctable(CVD_by_year, saturation, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions  
## CVD_by_year * saturation  
## Data Frame: df4  
##  
##  
## -----  
##           saturation           no           yes           Total  
## CVD_by_year  
##   2020             7 (41.2%)    10 (58.8%)    17 (100.0%)  
##   2021             6 (25.0%)    18 (75.0%)    24 (100.0%)  
##   Total            13 (31.7%)    28 (68.3%)    41 (100.0%)  
## -----  
##  
## -----  
## Chi.squared   df   p.value  
## -----  
##    0.5715      1   0.4496  
## -----
```

2nd trimester

```
df4 <- data %>%  
  filter(classi_gesta_puerp == "2tri")  
  
with(df4, ctable(CVD_by_year, saturation, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions  
## CVD_by_year * saturation  
## Data Frame: df4  
##  
##  
## -----  
##           saturation           no           yes           Total  
## CVD_by_year  
##   2020            24 (35.3%)    44 (64.7%)    68 (100.0%)  
##   2021            18 (28.6%)    45 (71.4%)    63 (100.0%)  
##   Total            42 (32.1%)    89 (67.9%)   131 (100.0%)  
## -----  
##  
## -----  
## Chi.squared   df   p.value  
## -----  
##    0.405      1   0.5245  
## -----
```


3rd trimester

```
df4 <- data %>%  
  filter(classi_gesta_puerp == "3tri")  
  
with(df4, ctable(CVD_by_year, saturation, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions  
## CVD_by_year * saturation  
## Data Frame: df4  
##  
##  
## -----  
##          saturation          no          yes          Total  
## CVD_by_year  
##    2020          100 (65.8%)    52 (34.2%)    152 (100.0%)  
##    2021           30 (31.6%)    65 (68.4%)     95 (100.0%)  
##    Total          130 (52.6%)   117 (47.4%)    247 (100.0%)  
## -----  
##  
## -----  
## Chi.squared   df   p.value  
## -----  
##    26.0894     1     0  
## -----
```

Puerperium

```
df4 <- data %>%  
  filter(classi_gesta_puerp == "puerp")  
  
with(df4, ctable(CVD_by_year, saturation, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions  
## CVD_by_year * saturation  
## Data Frame: df4  
##  
##  
## -----  
##          saturation          no          yes          Total  
## CVD_by_year  
##    2020          40 (38.1%)    65 (61.9%)    105 (100.0%)  
##    2021          24 (34.3%)    46 (65.7%)     70 (100.0%)  
##    Total          64 (36.6%)   111 (63.4%)    175 (100.0%)  
## -----  
##  
## -----  
## Chi.squared   df   p.value  
## -----  
##     0.1242     1   0.7245  
## -----
```

Diarrhea

```
with(data, ctable(CVD_by_year, diarrhea, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * diarrhea
## Data Frame: data
##
##
## -----
##           diarrhea           no           yes           Total
## CVD_by_year
##      2020           292 (87.7%)   41 (12.3%)   333 (100.0%)
##      2021           199 (85.8%)   33 (14.2%)   232 (100.0%)
##      Total           491 (86.9%)   74 (13.1%)   565 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      0.2872     1     0.592
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.18       0.72     1.93
## -----
```

Vomit

```
with(data, ctable(CVD_by_year, vomit, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * vomit
## Data Frame: data
##
##
## -----
##           vomit           no           yes           Total
## CVD_by_year
##      2020           293 (88.3%)   39 (11.7%)   332 (100.0%)
##      2021           198 (86.8%)   30 (13.2%)   228 (100.0%)
##      Total           491 (87.7%)   69 (12.3%)   560 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      0.1356     1     0.7127
```

```
## -----
##
## -----
## Odds Ratio    Lo - 95%    Hi - 95%
## -----
##      1.14          0.68      1.89
## -----
```

Fatigue

```
with(data, ctable(CVD_by_year, fatigue, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * fatigue
## Data Frame: data
##
## -----
##           fatigue           no           yes           Total
## CVD_by_year
##      2020           131 (71.2%)    53 (28.8%)    184 (100.0%)
##      2021           163 (67.9%)    77 (32.1%)    240 (100.0%)
##      Total           294 (69.3%)   130 (30.7%)   424 (100.0%)
## -----
##
## -----
## Chi.squared    df    p.value
## -----
##      0.3838         1    0.5356
## -----
##
## -----
## Odds Ratio    Lo - 95%    Hi - 95%
## -----
##      1.17          0.77      1.77
## -----
```

1st trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "1tri")

with(df4, ctable(CVD_by_year, fatigue, prop="r", useNA = "no", chisq = FALSE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * fatigue
## Data Frame: df4
##
## -----
```

```
##           fatigue           no           yes           Total
## CVD_by_year
##      2020           8 (72.7%)      3 (27.3%)     11 (100.0%)
##      2021          15 (68.2%)      7 (31.8%)     22 (100.0%)
##      Total          23 (69.7%)     10 (30.3%)     33 (100.0%)
## -----
```

```
fisher.test(df4$CVD_by_year, df4$qt_resp_symp)
```

```
##
## Fisher's Exact Test for Count Data
##
## data: df4$CVD_by_year and df4$qt_resp_symp
## p-value = 0.3471
## alternative hypothesis: two.sided
```

2nd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "2tri")

with(df4, ctable(CVD_by_year, fatigue, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * fatigue
## Data Frame: df4
##
## -----
##           fatigue           no           yes           Total
## CVD_by_year
##      2020          23 (63.9%)     13 (36.1%)     36 (100.0%)
##      2021          34 (60.7%)     22 (39.3%)     56 (100.0%)
##      Total          57 (62.0%)     35 (38.0%)     92 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      0.0074      1   0.9314
## -----
```

3rd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "3tri")

with(df4, ctable(CVD_by_year, fatigue, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * fatigue
## Data Frame: df4
##
##
## -----
##          fatigue          no          yes          Total
## CVD_by_year
##      2020          59 (73.8%)   21 (26.2%)   80 (100.0%)
##      2021          58 (69.0%)   26 (31.0%)   84 (100.0%)
##      Total         117 (71.3%)   47 (28.7%)  164 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      0.243      1     0.622
## -----
```

Puerperium

```
df4 <- data %>%
  filter(classi_gesta_puerp == "puerp")

with(df4, ctable(CVD_by_year, fatigue, prop="r", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * fatigue
## Data Frame: df4
##
##
## -----
##          fatigue          no          yes          Total
## CVD_by_year
##      2020          35 (74.5%)   12 (25.5%)   47 (100.0%)
##      2021          46 (70.8%)   19 (29.2%)   65 (100.0%)
##      Total          81 (72.3%)   31 (27.7%)  112 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      0.0474      1     0.8276
## -----
```

Loss of smell

```
with(data, ctable(CVD_by_year, loss_smell, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * loss_smell
## Data Frame: data
##
##
## -----
##           loss_smell           no           yes           Total
## CVD_by_year
##   2020           140 (76.9%)    42 (23.1%)    182 (100.0%)
##   2021           168 (71.8%)    66 (28.2%)    234 (100.0%)
##   Total           308 (74.0%)   108 (26.0%)   416 (100.0%)
## -----
##
## -----
## Chi.squared  df    p.value
## -----
##      1.1466    1    0.2843
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.31      0.84     2.05
## -----
```

Loss of taste

```
with(data, ctable(CVD_by_year, loss_taste, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * loss_taste
## Data Frame: data
##
##
## -----
##           loss_taste           no           yes           Total
## CVD_by_year
##   2020           136 (74.7%)    46 (25.3%)    182 (100.0%)
##   2021           177 (74.4%)    61 (25.6%)    238 (100.0%)
##   Total           313 (74.5%)   107 (25.5%)   420 (100.0%)
## -----
##
## -----
## Chi.squared  df    p.value
## -----
##      0         1      1
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.02      0.65     1.59
```

```
## -----
```

Abdominal pain

```
with(data, ctable(CVD_by_year, abd_pain, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
```

```
## CVD_by_year * abd_pain
```

```
## Data Frame: data
```

```
##
```

```
##
```

```
## -----
```

	abd_pain	no	yes	Total
CVD_by_year				
2020		156 (88.1%)	21 (11.9%)	177 (100.0%)
2021		207 (90.8%)	21 (9.2%)	228 (100.0%)
Total		363 (89.6%)	42 (10.4%)	405 (100.0%)

```
## -----
```

```
##
```

```
## -----
```

Chi.squared	df	p.value
0.4965	1	0.481

```
## -----
```

```
##
```

```
## -----
```

Odds Ratio	Lo - 95%	Hi - 95%
0.75	0.40	1.43

```
## -----
```

```
##
```

```
## Odds Ratio Lo - 95% Hi - 95%
```

```
## -----
```

```
## 0.75 0.40 1.43
```

```
## -----
```

Now we are going to analysis the variable `resp_symp` indicating the presence of at least one respiratory symptom (Dyspnea, Fadigue, Saturation, Respiratory distress). Empty cells are considered missing data (<NA>). The variable `qt_resp_symp` indicates the number of respiratory symptoms of each case.

Frequency table indicating the cases of respiratory symptoms by year.

```
with(data, ctable(CVD_by_year, resp_symp, prop="r", OR=TRUE, useNA = "no", chisq = TRUE)
)
```

```
## Cross-Tabulation, Row Proportions
```

```
## CVD_by_year * resp_symp
```

```
## Data Frame: data
```

```
##
```

```
##
```

```
## -----
```

	resp_symp	no	yes	Total
CVD_by_year				
2020		78 (19.9%)	314 (80.1%)	392 (100.0%)
2021		27 (9.4%)	259 (90.6%)	286 (100.0%)
Total		105 (15.5%)	573 (84.5%)	678 (100.0%)

```
## -----
##
## -----
##   Chi.squared   df   p.value
## -----
##    13.0287      1    3e-04
## -----
##
## -----
##   Odds Ratio    Lo - 95%    Hi - 95%
## -----
##     2.38        1.49       3.80
## -----
```

Frequency table of number of respiratory symptoms by year.

```
with(data, ctable(qt_resp_symp, CVD_by_year, prop="c", useNA = "no", chisq = TRUE)
)
```

```
## Cross-Tabulation, Column Proportions
## qt_resp_symp * CVD_by_year
## Data Frame: data
##
## -----
##               CVD_by_year      2020      2021      Total
## qt_resp_symp
## No respiratory symptom      78 ( 19.9%)    27 (  9.4%)    105 ( 15.5%)
##      1 symptom              82 ( 20.9%)    51 ( 17.8%)    133 ( 19.6%)
##      2 symptoms             107 ( 27.3%)    69 ( 24.1%)    176 ( 26.0%)
##      3 symptoms             103 ( 26.3%)    96 ( 33.6%)    199 ( 29.4%)
##      4 symptoms              22 (  5.6%)    43 ( 15.0%)    65 (  9.6%)
##      Total                  392 (100.0%)   286 (100.0%)   678 (100.0%)
## -----
##
## -----
##   Chi.squared   df   p.value
## -----
##    31.4283      4      0
## -----
```

1st trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "1tri")

with(df4, ctable(qt_resp_symp, CVD_by_year, prop="c", useNA = "no", chisq = FALSE))
```

```
## Cross-Tabulation, Column Proportions
## qt_resp_symp * CVD_by_year
## Data Frame: df4
```



```
##
## -----
##               CVD_by_year      2020      2021      Total
##      qt_resp_symp
## No respiratory symptom      4 ( 20.0%)      4 ( 15.4%)      8 ( 17.4%)
##           1 symptom        5 ( 25.0%)      3 ( 11.5%)      8 ( 17.4%)
##           2 symptoms        3 ( 15.0%)      8 ( 30.8%)     11 ( 23.9%)
##           3 symptoms        7 ( 35.0%)      6 ( 23.1%)     13 ( 28.3%)
##           4 symptoms        1 (  5.0%)      5 ( 19.2%)      6 ( 13.0%)
##           Total            20 (100.0%)     26 (100.0%)     46 (100.0%)
## -----
```

```
fisher.test(df4$CVD_by_year, df4$qt_resp_symp)
```

```
##
## Fisher's Exact Test for Count Data
##
## data: df4$CVD_by_year and df4$qt_resp_symp
## p-value = 0.3471
## alternative hypothesis: two.sided
```

2nd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "2tri")

with(df4, ctable(qt_resp_symp, CVD_by_year, prop="c", useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Column Proportions
## qt_resp_symp * CVD_by_year
## Data Frame: df4
##
## -----
##               CVD_by_year      2020      2021      Total
##      qt_resp_symp
## No respiratory symptom      7 (  9.7%)      5 (  7.4%)     12 (  8.6%)
##           1 symptom       14 ( 19.4%)     10 ( 14.7%)     24 ( 17.1%)
##           2 symptoms       22 ( 30.6%)     17 ( 25.0%)     39 ( 27.9%)
##           3 symptoms       23 ( 31.9%)     25 ( 36.8%)     48 ( 34.3%)
##           4 symptoms        6 (  8.3%)     11 ( 16.2%)     17 ( 12.1%)
##           Total           72 (100.0%)     68 (100.0%)    140 (100.0%)
## -----
##
## -----
##      Chi.squared   df   p.value
## -----
##      3.0832        4     0.544
## -----
```

3rd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "3tri")

with(df4, ctable(qt_resp_symp, CVD_by_year, prop="c", useNA = "no", chisq = TRUE))

## Cross-Tabulation, Column Proportions
## qt_resp_symp * CVD_by_year
## Data Frame: df4
##
##
## -----
##               CVD_by_year      2020      2021      Total
## qt_resp_symp
## No respiratory symptom      50 ( 29.8%)    11 ( 10.5%)    61 ( 22.3%)
##      1 symptom              39 ( 23.2%)    20 ( 19.0%)    59 ( 21.6%)
##      2 symptoms             41 ( 24.4%)    29 ( 27.6%)    70 ( 25.6%)
##      3 symptoms             34 ( 20.2%)    30 ( 28.6%)    64 ( 23.4%)
##      4 symptoms              4 (  2.4%)    15 ( 14.3%)    19 (  7.0%)
##      Total                 168 (100.0%)   105 (100.0%)   273 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      26.6071    4       0
## -----
```

Puerperium

```
df4 <- data %>%
  filter(classi_gesta_puerp == "puerp")

with(df4, ctable(qt_resp_symp, CVD_by_year, prop="c", useNA = "no", chisq = TRUE))

## Cross-Tabulation, Column Proportions
## qt_resp_symp * CVD_by_year
## Data Frame: df4
##
##
## -----
##               CVD_by_year      2020      2021      Total
## qt_resp_symp
## No respiratory symptom      16 ( 14.0%)    4 (  5.6%)    20 ( 10.8%)
##      1 symptom              19 ( 16.7%)   15 ( 20.8%)    34 ( 18.3%)
##      2 symptoms             37 ( 32.5%)   13 ( 18.1%)    50 ( 26.9%)
##      3 symptoms             33 ( 28.9%)   30 ( 41.7%)    63 ( 33.9%)
##      4 symptoms              9 (  7.9%)   10 ( 13.9%)    19 ( 10.2%)
##      Total                 114 (100.0%)    72 (100.0%)   186 (100.0%)
```

```
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      10.4342    4  0.0337
## -----
```

Similar to the analysis of any respiratory symptom, we are going to create the variable `symp` indicating the presence of at least one symptom (Dyspnea, Fatigue, Saturation, Respiratory distress, Fever, Cough, Sore throat, Diarrhea, Vomit, Abdominal pain, Loss of smell, Loss of taste). Empty cells are considered missing data (<NA>).

Frequency table indicating the cases with at least 1 symptom versus no symptom by year.

```
with(data, ctable(CVD_by_year, symp, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * symp
## Data Frame: data
##
##
## -----
##          symp          no          yes          Total
## CVD_by_year
##      2020          18 (4.4%)      387 (95.6%)      405 (100.0%)
##      2021           6 (2.1%)      286 (97.9%)      292 (100.0%)
##      Total          24 (3.4%)      673 (96.6%)      697 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      2.2397    1  0.1345
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      2.22          0.87      5.66
## -----
```

```
fisher.test(data$symp, data$CVD_by_year)
```

```
##
## Fisher's Exact Test for Count Data
##
## data:  data$symp and data$CVD_by_year
## p-value = 0.09602
## alternative hypothesis: true odds ratio is not equal to 1
## 95 percent confidence interval:
##  0.8289675 6.9045943
## sample estimates:
```

```
## odds ratio
## 2.214729
```

Frequency table of number of symptoms by year.

```
with(data, ctable(qt_symp, CVD_by_year, prop="c", useNA = "no", chisq=FALSE, OR=TRUE))
```

```
## Cross-Tabulation, Column Proportions
```

```
## qt_symp * CVD_by_year
```

```
## Data Frame: data
```

```
##
```

```
## -----
```

	CVD_by_year	2020	2021	Total
qt_symp				
No symptom	18 (4.4%)	6 (2.1%)	24 (3.4%)	
1 symptom	37 (9.1%)	16 (5.5%)	53 (7.6%)	
2 symptoms	70 (17.3%)	32 (11.0%)	102 (14.6%)	
3 symptoms	83 (20.5%)	54 (18.5%)	137 (19.7%)	
4 symptoms	71 (17.5%)	48 (16.4%)	119 (17.1%)	
5 symptoms	53 (13.1%)	54 (18.5%)	107 (15.4%)	
6 symptoms	36 (8.9%)	23 (7.9%)	59 (8.5%)	
7 symptoms	21 (5.2%)	29 (9.9%)	50 (7.2%)	
8 symptoms	8 (2.0%)	12 (4.1%)	20 (2.9%)	
9 symptoms	5 (1.2%)	11 (3.8%)	16 (2.3%)	
10 symptoms	2 (0.5%)	4 (1.4%)	6 (0.9%)	
11 symptoms	1 (0.2%)	1 (0.3%)	2 (0.3%)	
12 symptoms	0 (0.0%)	2 (0.7%)	2 (0.3%)	
Total	405 (100.0%)	292 (100.0%)	697 (100.0%)	

```
## -----
```

```
fisher.test(data$qt_symp, data$CVD_by_year, simulate.p.value = TRUE)
```

```
##
```

```
## Fisher's Exact Test for Count Data with simulated p-value (based on
```

```
## 2000 replicates)
```

```
##
```

```
## data: data$qt_symp and data$CVD_by_year
```

```
## p-value = 0.0009995
```

```
## alternative hypothesis: two.sided
```

Comorbidities

Hematologic

```
with(data, ctable(CVD_by_year, hematologic, prop = "r", useNA = "no", chisq = FALSE, OR=FALSE))
```

```
## Cross-Tabulation, Row Proportions
```

```
## CVD_by_year * hematologic
```

```
## Data Frame: data
```

```
##
```

```
## -----
##          hematologic          no          yes          Total
## CVD_by_year
##      2020          284 (97.3%)      8 (2.7%)  292 (100.0%)
##      2021          223 (99.1%)      2 (0.9%)  225 (100.0%)
##      Total          507 (98.1%)     10 (1.9%)  517 (100.0%)
## -----
```

```
fisher.test(data$hematologic, data$CVD_by_year)
```

```
##
## Fisher's Exact Test for Count Data
##
## data: data$hematologic and data$CVD_by_year
## p-value = 0.1984
## alternative hypothesis: true odds ratio is not equal to 1
## 95 percent confidence interval:
##  0.03268656 1.62030450
## sample estimates:
## odds ratio
##  0.3189996
```

Diabetes

```
ctable(data$CVD_by_year, data$diabetes, chisq=TRUE, prop="r", OR=TRUE, useNA = "no")
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * diabetes
## Data Frame: data
##
## -----
##          diabetes          no          yes          Total
## CVD_by_year
##      2020          210 (67.5%)    101 (32.5%)    311 (100.0%)
##      2021          162 (66.7%)     81 (33.3%)    243 (100.0%)
##      Total          372 (67.1%)    182 (32.9%)    554 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      0.0149      1    0.9028
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      1.04      0.73    1.49
## -----
```

Obesity

```
ctable(data$CVD_by_year, data$obesity, chisq=TRUE, prop="r", OR=TRUE, useNA = "no")
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * obesity
## Data Frame: data
##
##
## -----
##      obesity      no      yes      Total
## CVD_by_year
##      2020      232 (78.4%)   64 (21.6%)  296 (100.0%)
##      2021      168 (70.6%)   70 (29.4%)  238 (100.0%)
##      Total      400 (74.9%)  134 (25.1%)  534 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      3.8549      1  0.0496
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      1.51      1.02      2.24
## -----
```

1st trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "1tri")

with(df4, ctable(CVD_by_year, obesity, prop="r", chisq=TRUE, OR=TRUE, useNA = "no"))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * obesity
## Data Frame: df4
##
##
## -----
##      obesity      no      yes      Total
## CVD_by_year
##      2020      8 (57.1%)   6 (42.9%)  14 (100.0%)
##      2021     12 (60.0%)   8 (40.0%)  20 (100.0%)
##      Total     20 (58.8%)  14 (41.2%)  34 (100.0%)
## -----
##
## -----
```

```
## Chi.squared df p.value
## -----
## 0 1 1
## -----
##
## -----
## Odds Ratio Lo - 95% Hi - 95%
## -----
## 0.89 0.22 3.55
## -----
```

2nd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "2tri")

with(df4, ctable(CVD_by_year, obesity, prop="r", chisq=TRUE, OR=TRUE, useNA = "no"))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * obesity
## Data Frame: df4
##
## -----
##      obesity      no      yes      Total
## CVD_by_year
## 2020      43 (78.2%)  12 (21.8%)  55 (100.0%)
## 2021      38 (67.9%)  18 (32.1%)  56 (100.0%)
## Total      81 (73.0%)  30 (27.0%) 111 (100.0%)
## -----
##
## -----
## Chi.squared df p.value
## -----
## 1.0219 1 0.3121
## -----
##
## -----
## Odds Ratio Lo - 95% Hi - 95%
## -----
## 1.70 0.72 3.97
## -----
```

3rd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "3tri")

with(df4, ctable(CVD_by_year, obesity, prop="r", chisq=TRUE, OR=TRUE, useNA = "no"))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * obesity
## Data Frame: df4
##
##
## -----
##      obesity      no      yes      Total
## CVD_by_year
##      2020      104 (81.2%)  24 (18.8%)  128 (100.0%)
##      2021      55 (66.3%)  28 (33.7%)   83 (100.0%)
##      Total     159 (75.4%)  52 (24.6%)  211 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      5.3079    1  0.0212
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      2.21      1.17      4.17
## -----
```

Puerperium

```
df4 <- data %>%
  filter(classi_gesta_puerp == "puerp")

with(df4, ctable(CVD_by_year, obesity, prop="r", chisq=TRUE, OR=TRUE, useNA = "no"))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * obesity
## Data Frame: df4
##
##
## -----
##      obesity      no      yes      Total
## CVD_by_year
##      2020      63 (75.9%)  20 (24.1%)   83 (100.0%)
##      2021      52 (80.0%)  13 (20.0%)   65 (100.0%)
##      Total     115 (77.7%)  33 (22.3%)  148 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      0.1562    1  0.6927
## -----
##
## -----
```



```
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      0.79      0.36      1.73
## -----
```

Asthma

```
ctable(data$CVD_by_year, data$asthma, chisq=TRUE, prop="r", OR=TRUE, useNA = "no")
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * asthma
## Data Frame: data
##
## -----
##           asthma          no          yes          Total
## CVD_by_year
##      2020          266 (91.1%)   26 (8.9%)   292 (100.0%)
##      2021          206 (92.0%)   18 (8.0%)   224 (100.0%)
##      Total          472 (91.5%)   44 (8.5%)   516 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      0.0365     1   0.8485
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      0.89      0.48      1.67
## -----
```

Liver diseases

```
ctable(data$CVD_by_year, data$hepatic, chisq=FALSE, prop="r", OR=FALSE, useNA = "no")
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * hepatic
## Data Frame: data
##
## -----
##           hepatic          no          yes          Total
## CVD_by_year
##      2020          283 (99.0%)   3 (1.0%)   286 (100.0%)
##      2021          222 (99.1%)   2 (0.9%)   224 (100.0%)
##      Total          505 (99.0%)   5 (1.0%)   510 (100.0%)
## -----
```

```
fisher.test(data$hepatic, data$CVD_by_year)
```

```
##
## Fisher's Exact Test for Count Data
##
## data: data$hepatic and data$CVD_by_year
## p-value = 1
## alternative hypothesis: true odds ratio is not equal to 1
## 95 percent confidence interval:
## 0.07041066 7.48788375
## sample estimates:
## odds ratio
## 0.850119
```

Neuropathies

```
ctable(data$CVD_by_year, data$neurologic, chisq=TRUE, prop="r", OR=TRUE, useNA = "no")
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * neurologic
## Data Frame: data
##
##
## -----
##      neurologic      no      yes      Total
## CVD_by_year
##      2020      281 (98.3%)    5 (1.7%)  286 (100.0%)
##      2021      217 (96.9%)    7 (3.1%)  224 (100.0%)
##      Total      498 (97.6%)   12 (2.4%)  510 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      0.5237    1  0.4693
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      1.81      0.57    5.79
## -----
```

Lung diseases

```
ctable(data$CVD_by_year, data$pneumologic, chisq=TRUE, prop="r", OR=TRUE, useNA = "no")
```

```
## Cross-Tabulation, Row Proportions
```

```
## CVD_by_year * pneumologic
## Data Frame: data
##
##
## -----
##      pneumologic      no      yes      Total
## CVD_by_year
##      2020      282 (96.6%)  10 (3.4%)  292 (100.0%)
##      2021      221 (98.7%)   3 (1.3%)  224 (100.0%)
##      Total      503 (97.5%)  13 (2.5%)  516 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      1.4758    1  0.2244
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      0.38      0.10    1.41
## -----
```

Immunodeficiencias

```
ctable(data$CVD_by_year, data$imunodepre, chisq=TRUE, prop="r", OR=TRUE, useNA = "no")
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * imunodepre
## Data Frame: data
##
##
## -----
##      imunodepre      no      yes      Total
## CVD_by_year
##      2020      279 (96.5%)  10 (3.5%)  289 (100.0%)
##      2021      216 (96.9%)   7 (3.1%)  223 (100.0%)
##      Total      495 (96.7%)  17 (3.3%)  512 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      0        1    1
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      0.90      0.34    2.41
## -----
```

Kidney disease

```
ctable(data$CVD_by_year, data$renal, chisq=TRUE, prop="r", OR=TRUE, useNA = "no")
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * renal
## Data Frame: data
##
## -----
##          renal          no          yes          Total
## CVD_by_year
##      2020          276 (96.2%)   11 (3.8%)   287 (100.0%)
##      2021          214 (95.1%)   11 (4.9%)   225 (100.0%)
##      Total          490 (95.7%)   22 (4.3%)   512 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      0.1335      1   0.7149
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.29      0.55      3.03
## -----
```

Now we are going to analysis the variable `comorbidities` indicating the presence of at least one comorbidities versus no comorbidity. Empty cells are considered missing data (<NA>). The variable `qt_resp_symp` indicates the number of respiratory symptoms of each case.

```
freq(x = data$comorbidities,
      markdown = TRUE,
      title = "Frequency table to the presence of comorbidities",
      header = FALSE,
      quote = FALSE)
```

```
##
##
## **Frequency table to the presence of comorbidities**
##
##
##
## |   |Item| Count| Percent| Cum. Count| Cum. Percent|
## |:-|:---|:-----|:-----:|:-----:|:-----:|
## |1 |yes |   319|   53.79%|       319|       53.79%|
## |2 |no  |   274|   46.21%|       593|      100.00%|
```

```
with(data, ctable(CVD_by_year, comorbidities, prop="r", useNA = "no", chisq = TRUE, OR = TRUE))
```

```
## Cross-Tabulation, Row Proportions
```

```
## CVD_by_year * comorbidities
```

```
## Data Frame: data
```

```
##
```

```
##
```

```
## -----
```

	comorbidities	no	yes	Total
CVD_by_year				
2020	161 (48.3%)	172 (51.7%)	333 (100.0%)	
2021	113 (43.5%)	147 (56.5%)	260 (100.0%)	
Total	274 (46.2%)	319 (53.8%)	593 (100.0%)	

```
## -----
```

```
##
```

```
## -----
```

Chi.squared	df	p.value
1.213	1	0.2707

```
## -----
```

```
##
```

```
## -----
```

```
##
```

```
## -----
```

Odds Ratio	Lo - 95%	Hi - 95%
1.22	0.88	1.69

```
## -----
```

```
##
```

```
## -----
```

```
##
```

```
freq(x = data$comorbidities_grupo3,
      markdown = TRUE,
      title = "Frequency table to the number of comorbidities",
      header = FALSE,
      quote = FALSE)
```

```
##
```

```
##
```

```
## **Frequency table to the number of comorbidities**
```

```
##
```

```
##
```

```
##
```

```
##
```

	Item	Count	Percent	Cum. Count	Cum. Percent
1	No comorbidity	274	46.21%	274	46.21%
2	1 comorbidity	229	38.62%	503	84.82%
3	2 comorbidities	71	11.97%	574	96.80%
4	>2 comorbidities	19	3.20%	593	100.00%

```
with(data, ctable(comorbidities_grupo3,CVD_by_year, prop="c", useNA = "no", chisq = TRUE, OR = TRUE))
```

```
## Cross-Tabulation, Column Proportions
```

```
## comorbidities_grupo3 * CVD_by_year
```

```
## Data Frame: data
##
##
## -----
##          CVD_by_year      2020      2021      Total
## comorbidities_grupo3
##      No comorbidity      161 ( 48.3%)  113 ( 43.5%)  274 ( 46.2%)
##      1 comorbidity      121 ( 36.3%)  108 ( 41.5%)  229 ( 38.6%)
##      2 comorbidities      41 ( 12.3%)   30 ( 11.5%)   71 ( 12.0%)
##      >2 comorbidities      10 (  3.0%)    9 (  3.5%)   19 (  3.2%)
##          Total      333 (100.0%)  260 (100.0%)  593 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      1.9466    3  0.5836
## -----
```

```
fisher.test(data$comorbidities_grupo3, data$CVD_by_year)
```

```
##
## Fisher's Exact Test for Count Data
##
## data: data$comorbidities_grupo3 and data$CVD_by_year
## p-value = 0.577
## alternative hypothesis: two.sided
```

```
freq(x = data$qt_comorb,
     markdown = TRUE,
     title = "Frequency table to the number of comorbidities expanded",
     header = FALSE,
     quote = FALSE,
     na.rm = FALSE,
     sort.count = FALSE)
```

```
##
##
## **Frequency table to the number of comorbidities expanded**
##
##
##
## |  | Item | Count | Percent | Cum. Count | Cum. Percent |
## |:-|:-----|:-----|:-----|:-----|:-----|
## |1| 1 | 274 | 38.98% | 274 | 38.98% |
## |2| 2 | 229 | 32.57% | 503 | 71.55% |
## |3| 3 | 71 | 10.10% | 574 | 81.65% |
## |4| 4 | 14 | 1.99% | 588 | 83.64% |
## |5| 5 | 3 | 0.43% | 591 | 84.07% |
## |6| 6 | 1 | 0.14% | 592 | 84.21% |
## |7| 7 | 1 | 0.14% | 593 | 84.35% |
## |8| NA | 110 | 15.65% | 703 | 100.00% |
```

```
with(data, ctable(qt_comorb,CVD_by_year, prop="c", useNA = "no"))
```

```
## Cross-Tabulation, Column Proportions
```

```
## qt_comorb * CVD_by_year
```

```
## Data Frame: data
```

```
##
```

```
## -----
##          CVD_by_year      2020      2021      Total
## qt_comorb
## No comorbidity      161 ( 48.3%)    113 ( 43.5%)    274 ( 46.2%)
## 1 comorbidity       121 ( 36.3%)    108 ( 41.5%)    229 ( 38.6%)
## 2 comorbidities      41 ( 12.3%)     30 ( 11.5%)     71 ( 12.0%)
## 3 comorbidities       6 (  1.8%)      8 (  3.1%)     14 (  2.4%)
## 4 comorbidities       3 (  0.9%)      0 (  0.0%)      3 (  0.5%)
## 5 comorbidities       1 (  0.3%)      0 (  0.0%)      1 (  0.2%)
## 6 comorbidities       0 (  0.0%)      0 (  0.0%)      0 (  0.0%)
## 7 comorbidities       0 (  0.0%)      0 (  0.0%)      0 (  0.0%)
## 8 comorbidities       0 (  0.0%)      0 (  0.0%)      0 (  0.0%)
## 9 comorbidities       0 (  0.0%)      1 (  0.4%)      1 (  0.2%)
## Total              333 (100.0%)    260 (100.0%)    593 (100.0%)
## -----
```

```
fisher.test(data$qt_comorb, data$CVD_by_year, simulate.p.value=TRUE)
```

```
##
```

```
## Fisher's Exact Test for Count Data with simulated p-value (based on
```

```
## 2000 replicates)
```

```
##
```

```
## data: data$qt_comorb and data$CVD_by_year
```

```
## p-value = 0.3008
```

```
## alternative hypothesis: two.sided
```

Outcome - recovery x death

ICU

```
with(data, ctable(CVD_by_year, icu, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
```

```
## CVD_by_year * icu
```

```
## Data Frame: data
```

```
##
```

```
##
```

```
## -----
##          icu          no          yes          Total
## CVD_by_year
## 2020         251 (65.7%)    131 (34.3%)    382 (100.0%)
## 2021         151 (53.4%)    132 (46.6%)    283 (100.0%)
## Total         402 (60.5%)    263 (39.5%)    665 (100.0%)
## -----
```

```
##
## -----
##   Chi.squared    df    p.value
## -----
##      9.8608       1    0.0017
## -----
##
## -----
##   Odds Ratio    Lo - 95%    Hi - 95%
## -----
##      1.67       1.22       2.29
## -----
```

1st trimester

```
df43 <- data %>%
  filter(classi_gesta_puerp == "1tri")

with(df43, ctable(CVD_by_year, icu, prop="r", useNA = "no", OR=TRUE, chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * icu
## Data Frame: df43
##
## -----
##           icu           no           yes           Total
## CVD_by_year
##      2020          12 (60.0%)      8 (40.0%)      20 (100.0%)
##      2021          17 (68.0%)      8 (32.0%)      25 (100.0%)
##      Total          29 (64.4%)     16 (35.6%)      45 (100.0%)
## -----
##
## -----
##   Chi.squared    df    p.value
## -----
##      0.0594       1    0.8074
## -----
##
## -----
##   Odds Ratio    Lo - 95%    Hi - 95%
## -----
##      0.71       0.21       2.41
## -----
```

2nd trimester

```
df43 <- data %>%
  filter(classi_gesta_puerp == "2tri")
```



```
with(df43, ctable(CVD_by_year, icu, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * icu
## Data Frame: df43
##
##
## -----
##           icu           no           yes           Total
## CVD_by_year
##   2020         43 (60.6%)    28 (39.4%)    71 (100.0%)
##   2021         34 (51.5%)    32 (48.5%)    66 (100.0%)
##   Total         77 (56.2%)    60 (43.8%)   137 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##    0.7998      1   0.3712
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##    1.45       0.73      2.85
## -----
```

3rd trimester

```
df43 <- data %>%
  filter(classi_gesta_puerp == "3tri")
with(df43, ctable(CVD_by_year, icu, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * icu
## Data Frame: df43
##
##
## -----
##           icu           no           yes           Total
## CVD_by_year
##   2020        118 (73.3%)    43 (26.7%)   161 (100.0%)
##   2021         55 (51.4%)    52 (48.6%)   107 (100.0%)
##   Total        173 (64.6%)    95 (35.4%)   268 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
```

```
##      12.5211      1      4e-04
## -----
##
## -----
## Odds Ratio      Lo - 95%      Hi - 95%
## -----
##      2.59      1.55      4.34
## -----
```

Puerperium

```
df43 <- data %>%
  filter(classi_gesta_puerp == "puerp")

with(df43, ctable(CVD_by_year, icu, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * icu
## Data Frame: df43
##
## -----
##          icu          no          yes          Total
## CVD_by_year
##      2020          65 (57.0%)  49 (43.0%)  114 (100.0%)
##      2021          36 (51.4%)  34 (48.6%)   70 (100.0%)
##      Total          101 (54.9%)  83 (45.1%)  184 (100.0%)
## -----
##
## -----
## Chi.squared    df    p.value
## -----
##      0.3447      1    0.5571
## -----
##
## -----
## Odds Ratio      Lo - 95%      Hi - 95%
## -----
##      1.25      0.69      2.28
## -----
```

Days of hospitalization in ICU

O gráfico de dispersão apresenta a quantidade de dias de internação de cada paciente em UTI no ano de 2021 e sua associação com a presença ou não de cardiopata.

```
df <- data[data$UTI==1 & !is.na(data$UTI) & !is.na(data$icu_days),]

datasummary((CVD_by_year) ~ icu_days*(n+Mean_+SD+Median_+Min+Max+q25+q75+IQR),
  data = df, output = 'markdown')
```

CVD_by_year	n	Mean_	SD	Median_	Min	Max	q25	q75	IQR
2020	66.00	13.67	16.39	8.00	0.00	105.00	3.25	17.75	14.50
2021	85.00	14.95	13.10	12.00	0.00	62.00	5.00	20.00	15.00

```
wilcox.test(icu_days ~CVD_by_year, data = df)
```

```
##
## Wilcoxon rank sum test with continuity correction
##
## data: icu_days by CVD_by_year
## W = 2477, p-value = 0.2188
## alternative hypothesis: true location shift is not equal to 0
```

Ventilatory support

```
with(data, ctable(CVD_by_year, ven_support, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * ven_support
## Data Frame: data
##
##
## -----
##          ven_support      No  yes, invasive  yes, noninvasive      Total
## CVD_by_year
##      2020          172 (46.1%)    62 (16.6%)    139 (37.3%)    373 (100.0%)
##      2021           69 (24.7%)    84 (30.1%)    126 (45.2%)    279 (100.0%)
##      Total          241 (37.0%)    146 (22.4%)    265 (40.6%)    652 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      35.1521    2      0
## -----
```

Orotracheal intubation

```
with(data, ctable(CVD_by_year, intubation, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * intubation
## Data Frame: data
##
##
## -----
##          intubation      no      yes      Total
```

```
## CVD_by_year
##      2020      311 (83.4%)      62 (16.6%)      373 (100.0%)
##      2021      195 (69.9%)      84 (30.1%)      279 (100.0%)
##      Total      506 (77.6%)      146 (22.4%)      652 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      15.936      1      1e-04
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      2.16      1.49      3.14
## -----
```

1st trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "1tri")

with(df4, ctable(CVD_by_year, intubation, prop="r", OR=FALSE, useNA = "no", chisq = FALSE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * intubation
## Data Frame: df4
##
## -----
##      intubation      no      yes      Total
## CVD_by_year
##      2020      15 (83.3%)      3 (16.7%)      18 (100.0%)
##      2021      17 (73.9%)      6 (26.1%)      23 (100.0%)
##      Total      32 (78.0%)      9 (22.0%)      41 (100.0%)
## -----
```

```
fisher.test(df4$intubation, df4$CVD_by_year)
```

```
##
## Fisher's Exact Test for Count Data
##
## data: df4$intubation and df4$CVD_by_year
## p-value = 0.7061
## alternative hypothesis: true odds ratio is not equal to 1
## 95 percent confidence interval:
##      0.3047912 12.6661457
## sample estimates:
## odds ratio
##      1.740908
```

2nd trimester

```
df4 <- data %>%  
  filter(classi_gesta_puerp == "2tri")  
  
with(df4, ctable(CVD_by_year, intubation, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions  
## CVD_by_year * intubation  
## Data Frame: df4  
##  
##  
## -----  
##          intubation          no          yes          Total  
## CVD_by_year  
##      2020          54 (79.4%)   14 (20.6%)   68 (100.0%)  
##      2021          46 (70.8%)   19 (29.2%)   65 (100.0%)  
##      Total         100 (75.2%)   33 (24.8%)  133 (100.0%)  
## -----  
##  
## -----  
## Chi.squared   df   p.value  
## -----  
##      0.9076      1   0.3407  
## -----  
##  
## -----  
## Odds Ratio   Lo - 95%   Hi - 95%  
## -----  
##      1.59      0.72     3.53  
## -----
```

3rd trimester

```
df4 <- data %>%  
  filter(classi_gesta_puerp == "3tri")  
  
with(df4, ctable(CVD_by_year, intubation, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions  
## CVD_by_year * intubation  
## Data Frame: df4  
##  
##  
## -----  
##          intubation          no          yes          Total  
## CVD_by_year  
##      2020          144 (91.1%)   14 ( 8.9%)  158 (100.0%)  
##      2021           78 (72.2%)   30 (27.8%)  108 (100.0%)  
##      Total         222 (83.5%)   44 (16.5%)  266 (100.0%)
```

```
## -----
##
## -----
##   Chi.squared   df   p.value
## -----
##    15.2868      1    1e-04
## -----
##
## -----
##   Odds Ratio   Lo - 95%   Hi - 95%
## -----
##     3.96       1.98      7.90
## -----
```

Puerperium

```
df4 <- data %>%
  filter(classi_gesta_puerp == "puerp")

with(df4, ctable(CVD_by_year, intubation, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * intubation
## Data Frame: df4
##
## -----
##           intubation           no           yes           Total
##   CVD_by_year
##       2020             85 (75.2%)    28 (24.8%)    113 (100.0%)
##       2021             44 (64.7%)    24 (35.3%)     68 (100.0%)
##       Total            129 (71.3%)    52 (28.7%)    181 (100.0%)
## -----
##
## -----
##   Chi.squared   df   p.value
## -----
##     1.8078      1    0.1788
## -----
##
## -----
##   Odds Ratio   Lo - 95%   Hi - 95%
## -----
##     1.66       0.86      3.19
## -----
```

```
df4 <- data %>%
  filter(intubation == "yes")

with(df4, ctable(CVD_by_year, evolution, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

Fixed cases of intubated women, we present the distribution of evolution.

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * evolution
## Data Frame: df4
##
##
## -----
##          evolution      recovery      death      Total
## CVD_by_year
##      2020           24 (38.7%)   38 (61.3%)   62 (100.0%)
##      2021           35 (41.7%)   49 (58.3%)   84 (100.0%)
##      Total           59 (40.4%)   87 (59.6%)  146 (100.0%)
## -----
##
## -----
## Chi.squared  df    p.value
## -----
##      0.0358      1    0.8499
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      0.88      0.45      1.73
## -----
```

Outcome - recovery x death

```
with(data, ctable(CVD_by_year, evolution, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * evolution
## Data Frame: data
##
##
## -----
##          evolution      recovery      death      Total
## CVD_by_year
##      2020           343 (84.5%)   63 (15.5%)  406 (100.0%)
##      2021           221 (74.4%)   76 (25.6%)  297 (100.0%)
##      Total           564 (80.2%)  139 (19.8%)  703 (100.0%)
## -----
##
## -----
## Chi.squared  df    p.value
## -----
##     10.3434      1    0.0013
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
```

```
## -----
##      1.87      1.29      2.72
## -----
```

1st trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "1tri")

with(df4, ctable(CVD_by_year, evolution, prop="r", OR=FALSE, useNA = "no", chisq = FALSE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * evolution
## Data Frame: df4
##
## -----
##      evolution      recovery      death      Total
## CVD_by_year
##      2020           17 (85.0%)    3 (15.0%)    20 (100.0%)
##      2021           22 (81.5%)    5 (18.5%)    27 (100.0%)
##      Total           39 (83.0%)    8 (17.0%)    47 (100.0%)
## -----
```

```
fisher.test(df4$evolution, df4$CVD_by_year)
```

```
##
## Fisher's Exact Test for Count Data
##
## data: df4$evolution and df4$CVD_by_year
## p-value = 1
## alternative hypothesis: true odds ratio is not equal to 1
## 95 percent confidence interval:
##  0.2133741 9.4226736
## sample estimates:
## odds ratio
##  1.281057
```

2nd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "2tri")

with(df4, ctable(CVD_by_year, evolution, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * evolution
## Data Frame: df4
##
```



```
##
## -----
##          evolution      recovery      death      Total
## CVD_by_year
##      2020              59 (79.7%)   15 (20.3%)   74 (100.0%)
##      2021              53 (75.7%)   17 (24.3%)   70 (100.0%)
##      Total            112 (77.8%)   32 (22.2%)  144 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      0.1435      1   0.7049
## -----
##
## -----
## Odds Ratio    Lo - 95%    Hi - 95%
## -----
##      1.26       0.57       2.77
## -----
```

3rd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "3tri")

with(df4, ctable(CVD_by_year, evolution, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * evolution
## Data Frame: df4
##
## -----
##          evolution      recovery      death      Total
## CVD_by_year
##      2020            155 (89.6%)   18 (10.4%)  173 (100.0%)
##      2021             87 (78.4%)   24 (21.6%)  111 (100.0%)
##      Total           242 (85.2%)   42 (14.8%)  284 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      5.8903      1   0.0152
## -----
##
## -----
## Odds Ratio    Lo - 95%    Hi - 95%
## -----
##      2.38       1.22       4.62
## -----
```

Puerperium

```
df4 <- data %>%
  filter(classi_gesta_puerp == "puerp")

with(df4, ctable(CVD_by_year, evolution, prop="r", OR=TRUE, useNA = "no", chisq = TRUE))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * evolution
## Data Frame: df4
##
##
## -----
##          evolution      recovery      death      Total
## CVD_by_year
##      2020          98 (81.0%)   23 (19.0%)   121 (100.0%)
##      2021          49 (67.1%)   24 (32.9%)    73 (100.0%)
##      Total         147 (75.8%)   47 (24.2%)   194 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      4.0448      1   0.0443
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      2.09      1.07      4.07
## -----
```

Time elapsed between the start of symptoms and the outcome (days)

```
df <- data[!is.na(data$days_symp_evolution) & !is.na(data$CVD_by_year),]

datasummary((CVD_by_year) ~ days_symp_evolution*(n+Mean_+SD+Median_+Min+Max+q25+q75+IQR),
  data = df, output = 'markdown')
```

CVD_by_year	n	Mean_	SD	Median_	Min	Max	q25	q75	IQR
2020	397.00	16.52	12.98	14.00	0.00	113.00	9.00	19.00	10.00
2021	291.00	20.59	14.47	16.00	1.00	117.00	12.00	26.00	14.00

```
t.test(days_symp_evolution ~ CVD_by_year, data = df)
```

```
##
## Welch Two Sample t-test
##
```

```
## data:  days_symp_evol by CVD_by_year
## t = -3.8099, df = 584.26, p-value = 0.0001537
## alternative hypothesis: true difference in means between group 2020 and group 2021 is not equal to 0
## 95 percent confidence interval:
##  -6.175218 -1.974167
## sample estimates:
## mean in group 2020 mean in group 2021
##      16.51637      20.59107
```

Time elapsed between the start of symptoms and the outcome (days) considering only death cases

```
df <- data[!is.na(data$days_symp_evol) & !is.na(data$CVD_by_year),]
df <- df %>%
  filter(evolution == "death")

datasummary((CVD_by_year) ~ days_symp_evol*(n+Mean_+SD+Median_+Min+Max+q25+q75+IQR),
  data = df, output = 'markdown')
```

CVD_by_year	n	Mean_	SD	Median_	Min	Max	q25	q75	IQR
2020	63.00	19.56	16.03	17.00	0.00	113.00	11.00	24.50	13.50
2021	76.00	23.24	12.85	21.50	3.00	60.00	13.00	32.00	19.00

```
wilcox.test(days_symp_evol ~CVD_by_year, data = df)
```

```
##
## Wilcoxon rank sum test with continuity correction
##
## data:  days_symp_evol by CVD_by_year
## W = 1897, p-value = 0.03553
## alternative hypothesis: true location shift is not equal to 0
```

Considering only recovered cases

```
df <- data[!is.na(data$days_symp_evol) & !is.na(data$CVD_by_year),]
df <- df %>%
  filter(evolution == "recovery")

datasummary((CVD_by_year) ~ days_symp_evol*(n+Mean_+SD+Median_+Min+Max+q25+q75+IQR),
  data = df, output = 'markdown')
```

CVD_by_year	n	Mean_	SD	Median_	Min	Max	q25	q75	IQR
2020	334.00	15.94	12.27	13.00	0.00	85.00	8.00	18.00	10.00
2021	215.00	19.66	14.91	16.00	1.00	117.00	11.00	21.50	10.50

```
t.test(days_symp_evol ~CVD_by_year, data = df)
```

```
##
## Welch Two Sample t-test
##
## data: days_symp_evol by CVD_by_year
## t = -3.0465, df = 393.04, p-value = 0.002471
## alternative hypothesis: true difference in means between group 2020 and group 2021 is not equal to 0
## 95 percent confidence interval:
## -6.108616 -1.316785
## sample estimates:
## mean in group 2020 mean in group 2021
## 15.94311 19.65581
```

Propensity Score Matching (PSM):

The analysis that will be made in this section aims to understand the effect of having cardiovascular disease in the years 2020 and 2021 on some variables of interest such as symptoms and outcome. In order to make these groups similar with respect to the distribution of some variables that may bring confusion to the study, we will make use of the Propensity Score Matching (PSM) technique. The variables we will control in the analysis are: race, gestational moment, obesity, diabetes and age.

First, we present the difference result between the groups regarding the control variables before the PSM. We consider as “balanced” the cases with mean difference greater than 0.05. As we can see, for most categories of control variables the groups are not balanced before the matching.

```
data$cardio <- ifelse(data$CVD_by_year=="2021",1,0)
```

```
bal.tab(cardio ~ ethnicity + classi_gesta_puerp + obesity + diabetes + NU_IDADE_N, data = data, estimand = "ATE")
```

```
## Balance Measures
##
##          Type Diff.Un      M.Threshold.Un
## ethnicity_black      Binary -0.0160      Balanced, <0.05
## ethnicity_brown      Binary -0.1104 Not Balanced, >0.05
## ethnicity_indigenous  Binary  0.0010      Balanced, <0.05
## ethnicity_white      Binary  0.1244 Not Balanced, >0.05
## ethnicity_yellow      Binary  0.0010      Balanced, <0.05
## ethnicity:<NA>        Binary -0.0236      Balanced, <0.05
## classi_gesta_puerp_1tri Binary  0.0416      Balanced, <0.05
## classi_gesta_puerp_2tri Binary  0.0534 Not Balanced, >0.05
## classi_gesta_puerp_3tri Binary -0.0524 Not Balanced, >0.05
## classi_gesta_puerp_IG_ig Binary  0.0095      Balanced, <0.05
## classi_gesta_puerp_puerp Binary -0.0522 Not Balanced, >0.05
## obesity_yes          Binary  0.0779 Not Balanced, >0.05
## obesity:<NA>          Binary -0.0723 Not Balanced, >0.05
## diabetes_yes         Binary  0.0086      Balanced, <0.05
## diabetes:<NA>        Binary -0.0522 Not Balanced, >0.05
## NU_IDADE_N           Contin.  0.1203 Not Balanced, >0.05
##
## Balance tally for mean differences
##          count
## Balanced, <0.05      7
```

```
## Not Balanced, >0.05      9
##
## Variable with the greatest mean difference
##      Variable Diff.Un      M.Threshold.Un
## ethnicity_white 0.1244 Not Balanced, >0.05
##
## Sample sizes
##      Control Treated
## All      406      297
```

As one can see, all variables categories are balanced after PSM.

```
## Estimating the weights of each sampling unit
fit <- weightit(cardio ~ ethnicity + classi_gesta_puerp + obesity + diabetes + NU_IDADE_N, use.mlogit = 1,
               method = "ps", estimand = "ATE")

data$weight <- fit$weights

bal.tab(fit, m.threshold = 0.05, disp.v.ratio = TRUE)
```

```
## Balance Measures
##
##      Type Diff.Adj      M.Threshold V.Ratio.Adj
## prop.score      Distance -0.0020 Balanced, <0.05      0.9038
## ethnicity_black  Binary   0.0013 Balanced, <0.05      .
## ethnicity_brown  Binary  -0.0011 Balanced, <0.05      .
## ethnicity_indigenous Binary   0.0000 Balanced, <0.05      .
## ethnicity_white  Binary  -0.0002 Balanced, <0.05      .
## ethnicity_yellow Binary   0.0000 Balanced, <0.05      .
## ethnicity:<NA>    Binary  -0.0012 Balanced, <0.05      .
## classi_gesta_puerp_1tri Binary -0.0019 Balanced, <0.05      .
## classi_gesta_puerp_2tri Binary   0.0010 Balanced, <0.05      .
## classi_gesta_puerp_3tri Binary   0.0023 Balanced, <0.05      .
## classi_gesta_puerp_IG_ig Binary   0.0005 Balanced, <0.05      .
## classi_gesta_puerp_puerp Binary -0.0019 Balanced, <0.05      .
## obesity_yes      Binary  -0.0019 Balanced, <0.05      .
## obesity:<NA>      Binary  -0.0028 Balanced, <0.05      .
## diabetes_yes      Binary   0.0017 Balanced, <0.05      .
## diabetes:<NA>     Binary  -0.0011 Balanced, <0.05      .
## NU_IDADE_N        Contin. -0.0024 Balanced, <0.05      1.0355
##
## Balance tally for mean differences
##      count
## Balanced, <0.05      17
## Not Balanced, >0.05      0
##
## Variable with the greatest mean difference
##      Variable Diff.Adj      M.Threshold
## obesity:<NA> -0.0028 Balanced, <0.05
##
## Effective sample sizes
##      Control Treated
## Unadjusted 406.      297.
## Adjusted   389.97  281.58
```

Symptom analysis after PSM:

```
with(data, ctable(CVD_by_year, fever, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

Fever

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * fever
## Data Frame: data
##
##
## -----
##          fever          no          yes          Total
## CVD_by_year
##      2020      250.2 (38.3%)  403.8 (61.7%)  653.9 (100.0%)
##      2021      204.8 (33.1%)  414.3 (66.9%)  619.2 (100.0%)
##      Total      455.0 (35.7%)  818.1 (64.3%) 1273.1 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      3.4846      1  0.0619
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      1.25      1.00      1.58
## -----
```

```
with(data, ctable(CVD_by_year, cough, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

Cough

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * cough
## Data Frame: data
##
##
## -----
##          cough          no          yes          Total
## CVD_by_year
##      2020      165.9 (24.9%)  499.1 (75.1%)  665.0 (100.0%)
##      2021      143.0 (21.9%)  510.8 (78.1%)  653.8 (100.0%)
##      Total      308.9 (23.4%) 1009.9 (76.6%) 1318.8 (100.0%)
## -----
##
```

```
## -----
## Chi.squared  df  p.value
## -----
##      1.5718      1  0.2099
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.19      0.92      1.53
## -----
```

```
with(data, ctable(CVD_by_year, sore_throat, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

Sore throat

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * sore_throat
## Data Frame: data
##
## -----
##      sore_throat      no      yes      Total
## CVD_by_year
##      2020      445.2 (74.5%)  152.0 (25.5%)  597.2 (100.0%)
##      2021      398.5 (75.4%)  129.8 (24.6%)  528.3 (100.0%)
##      Total      843.6 (75.0%)  281.8 (25.0%)  1125.5 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      0.0737      1  0.7861
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      0.95      0.73      1.25
## -----
```

```
with(data, ctable(CVD_by_year, dyspnea, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

Dyspnea

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * dyspnea
```

```
## Data Frame: data
##
##
## -----
##           dyspnea           no           yes           Total
## CVD_by_year
##      2020           210.5 (31.9%)   448.9 (68.1%)   659.4 (100.0%)
##      2021           126.1 (19.6%)   517.7 (80.4%)   643.8 (100.0%)
##      Total           336.6 (25.8%)   966.6 (74.2%)  1303.2 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      25.2595    1     0
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.93      1.49      2.48
## -----
```

```
with(data, ctable(CVD_by_year, resp_dist, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

Respiratory distress

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * resp_dist
## Data Frame: data
##
##
## -----
##           resp_dist           no           yes           Total
## CVD_by_year
##      2020           277.0 (43.3%)   362.9 (56.7%)   639.9 (100.0%)
##      2021           203.8 (34.3%)   389.5 (65.7%)   593.3 (100.0%)
##      Total           480.8 (39.0%)   752.4 (61.0%)  1233.2 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      9.9707    1   0.0016
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.46      1.16      1.84
## -----
```



```
with(data, ctable(CVD_by_year, saturation, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = wei
```

Saturation

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * saturation
## Data Frame: data
##
##
## -----
##          saturation          no          yes          Total
## CVD_by_year
##      2020          305.4 (48.2%)  327.7 (51.8%)  633.1 (100.0%)
##      2021          203.7 (32.8%)  416.7 (67.2%)  620.4 (100.0%)
##      Total          509.1 (40.6%)  744.4 (59.4%) 1253.5 (100.0%)
## -----
##
## -----
## Chi.squared  df    p.value
## -----
##      30.178    1        0
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      1.91      1.52    2.40
## -----
```

```
with(data, ctable(CVD_by_year, diarrhea, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weigh
```

Diarrhea

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * diarrhea
## Data Frame: data
##
##
## -----
##          diarrhea          no          yes          Total
## CVD_by_year
##      2020          514.3 (87.2%)   75.7 (12.8%)  590.0 (100.0%)
##      2021          460.6 (86.9%)   69.4 (13.1%)  530.0 (100.0%)
##      Total          975.0 (87.1%)  145.0 (12.9%) 1120.0 (100.0%)
## -----
##
## -----
## Chi.squared  df    p.value
```

```
## -----
##      0.0016      1      0.9677
## -----
##
## -----
## Odds Ratio    Lo - 95%    Hi - 95%
## -----
##      1.02      0.72      1.45
## -----
```

```
with(data, ctable(CVD_by_year, vomit, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

Vomit

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * vomit
## Data Frame: data
##
## -----
##      vomit      no      yes      Total
## CVD_by_year
##      2020      512.8 (87.4%)      74.0 (12.6%)      586.9 (100.0%)
##      2021      457.0 (87.6%)      64.8 (12.4%)      521.7 (100.0%)
##      Total      969.8 (87.5%)      138.8 (12.5%)      1108.6 (100.0%)
## -----
##
## -----
## Chi.squared    df    p.value
## -----
##      1e-04      1      0.9914
## -----
##
## -----
## Odds Ratio    Lo - 95%    Hi - 95%
## -----
##      0.98      0.69      1.40
## -----
```

```
with(data, ctable(CVD_by_year, fatigue, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

Fatigue

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * fatigue
## Data Frame: data
##
```

```
##
## -----
##           fatigue           no           yes           Total
## CVD_by_year
##      2020           236.5 (71.0%)    96.6 (29.0%)    333.1 (100.0%)
##      2021           376.7 (68.1%)    176.3 (31.9%)    553.0 (100.0%)
##      Total           613.2 (69.2%)    272.9 (30.8%)    886.0 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      0.6837     1   0.4083
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.15       0.85     1.54
## -----
```

```
with(data, ctable(CVD_by_year, loss_smell, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = wei
```

Loss of smell

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * loss_smell
## Data Frame: data
##
##
## -----
##           loss_smell           no           yes           Total
## CVD_by_year
##      2020           252.4 (76.8%)    76.3 (23.2%)    328.7 (100.0%)
##      2021           388.5 (72.4%)    147.9 (27.6%)    536.3 (100.0%)
##      Total           640.9 (74.1%)    224.2 (25.9%)    865.1 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      1.7957     1   0.1802
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.26       0.92     1.73
## -----
```

```
with(data, ctable(CVD_by_year, loss_taste, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = wei
```

Loss of taste

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * loss_taste
## Data Frame: data
##
##
## -----
##          loss_taste          no          yes          Total
## CVD_by_year
##      2020          245.2 (74.3%)      84.8 (25.7%)      330.0 (100.0%)
##      2021          406.1 (74.3%)      140.5 (25.7%)      546.5 (100.0%)
##      Total          651.3 (74.3%)      225.2 (25.7%)      876.5 (100.0%)
## -----
##
## -----
## Chi.squared  df    p.value
## -----
##           0      1      1
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##           1.00      0.73      1.37
## -----
```

```
with(data, ctable(CVD_by_year, abd_pain, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weigh
```

Abdominal pain

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * abd_pain
## Data Frame: data
##
##
## -----
##          abd_pain          no          yes          Total
## CVD_by_year
##      2020          282.5 (88.0%)      38.6 (12.0%)      321.2 (100.0%)
##      2021          472.1 (90.5%)      49.7 ( 9.5%)      521.8 (100.0%)
##      Total          754.6 (89.5%)      88.3 (10.5%)      842.9 (100.0%)
## -----
##
## -----
## Chi.squared  df    p.value
```

```
## -----
##      1.0674      1      0.3015
## -----
##
## -----
## Odds Ratio      Lo - 95%      Hi - 95%
## -----
##      0.77      0.49      1.20
## -----
```

Any respiratory symptom Now we are going to create the variable `resp_symp` indicating the presence of at least one respiratory symptom (Dyspnea, Fadigue, Saturation, Respiratory distress). Empty cells are considered missing data (<NA>). The variable `qt_resp_symp` indicates the number of respiratory symptoms of each case.

```
with(data, ctable(CVD_by_year, resp_symp, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * resp_symp
## Data Frame: data
##
## -----
##      resp_symp      no      yes      Total
## CVD_by_year
##      2020      129.7 (19.0%)      553.6 (81.0%)      683.4 (100.0%)
##      2021      64.8 ( 9.7%)      605.6 (90.3%)      670.4 (100.0%)
##      Total      194.6 (14.4%)      1159.2 (85.6%)      1353.7 (100.0%)
## -----
##
## -----
## Chi.squared      df      p.value
## -----
##      23.1341      1      0
## -----
##
## -----
## Odds Ratio      Lo - 95%      Hi - 95%
## -----
##      2.19      1.59      3.01
## -----
```

```
with(data, ctable(CVD_by_year, qt_resp_symp, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * qt_resp_symp
## Data Frame: data
##
## -----
##      qt_resp_symp      No respiratory symptom      1 symptom      2 symptoms      3 symptoms
## CVD_by_year
```

```
##          2020          129.7 (19.0%)   139.3 (20.4%)   187.9 (27.5%)   184.6 (27.0%)
##          2021          64.8 ( 9.7%)   123.5 (18.4%)   166.0 (24.8%)   219.5 (32.7%)
##          Total         194.6 (14.4%)   262.9 (19.4%)   353.9 (26.1%)   404.1 (29.9%)
## -----
##
## -----
##  Chi.squared   df   p.value
## -----
##    48.5609     4     0
## -----
```

Any symptom Similar to the analysis of any respiratory symptom, we are going to create the variable `symp` indicating the presence of at least one symptom (Dyspnea, Fatigue, Saturation, Respiratory distress, Fever, Cough, Sore throat, Diarrhea, Vomit, Abdominal pain, Loss of smell, Loss of taste). Empty cells are considered missing data (<NA>).

```
with(data, ctable(CVD_by_year, symp, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * symp
## Data Frame: data
##
## -----
##          symp          no          yes          Total
##  CVD_by_year
##    2020          29.6 (4.2%)   673.2 (95.8%)   702.8 (100.0%)
##    2021          14.7 (2.1%)   673.3 (97.9%)   688.0 (100.0%)
##    Total          44.3 (3.2%)  1346.5 (96.8%)  1390.8 (100.0%)
## -----
##
## -----
##  Chi.squared   df   p.value
## -----
##    4.2484     1   0.0393
## -----
##
## -----
##  Odds Ratio   Lo - 95%   Hi - 95%
## -----
##    2.02        1.07      3.81
## -----
```

Outcome analysis after PSM:

ICU

```
with(data, ctable(CVD_by_year, icu, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

```
## Cross-Tabulation, Row Proportions
```

```
## CVD_by_year * icu
## Data Frame: data
##
##
## -----
##           icu           no           yes           Total
## CVD_by_year
##   2020      432.1 (64.8%)   235.0 (35.2%)   667.1 (100.0%)
##   2021      361.1 (53.7%)   311.0 (46.3%)   672.1 (100.0%)
##   Total      793.2 (59.2%)   545.9 (40.8%)  1339.2 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##    16.4544    1    0
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##     1.58      1.27      1.97
## -----
```

```
df43 <- data %>%
  filter(classi_gesta_puerp == "1tri")

with(df43, ctable(CVD_by_year, icu, prop="r", useNA = "no", OR=TRUE, chisq = TRUE, weights = weight))
```

1st trimester

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * icu
## Data Frame: df43
##
##
## -----
##           icu           no           yes           Total
## CVD_by_year
##   2020      26.1 (53.0%)   23.1 (47.0%)   49.2 (100.0%)
##   2021      29.5 (66.7%)   14.7 (33.3%)   44.2 (100.0%)
##   Total      55.6 (59.5%)   37.8 (40.5%)   93.4 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##    1.2866    1  0.2567
## -----
##
## -----
```

```
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      0.56      0.24      1.30
## -----
```

```
df43 <- data %>%
  filter(classi_gesta_puerp == "2tri")

with(df43, ctable(CVD_by_year, icu, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

2nd trimester

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * icu
## Data Frame: df43
##
##
## -----
##      CVD_by_year      icu      no      yes      Total
##      2020      81.3 (59.0%)      56.6 (41.0%)      137.8 (100.0%)
##      2021      72.0 (53.1%)      63.7 (46.9%)      135.7 (100.0%)
##      Total      153.3 (56.0%)      120.3 (44.0%)      273.6 (100.0%)
## -----
##
## -----
##      Chi.squared      df      p.value
## -----
##      0.7397      1      0.3898
## -----
##
## -----
##      Odds Ratio      Lo - 95%      Hi - 95%
## -----
##      1.27      0.79      2.05
## -----
```

```
df43 <- data %>%
  filter(classi_gesta_puerp == "3tri")

with(df43, ctable(CVD_by_year, icu, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

3rd trimester

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * icu
## Data Frame: df43
```



```
##
##
## -----
##          icu          no          yes          Total
## CVD_by_year
##   2020          193.8 (73.1%)    71.3 (26.9%)    265.1 (100.0%)
##   2021          144.7 (52.8%)    129.4 (47.2%)    274.1 (100.0%)
##   Total          338.5 (62.8%)    200.7 (37.2%)    539.1 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##    22.9669    1    0
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##    2.43       1.70      3.49
## -----
```

```
df43 <- data %>%
  filter(classi_gesta_puerp == "puerp")

with(df43, ctable(CVD_by_year, icu, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

Puerperium

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * icu
## Data Frame: df43
##
##
## -----
##          icu          no          yes          Total
## CVD_by_year
##   2020          106.1 (57.5%)    78.4 (42.5%)    184.5 (100.0%)
##   2021           96.1 (51.5%)    90.4 (48.5%)    186.5 (100.0%)
##   Total          202.2 (54.5%)    168.9 (45.5%)    371.0 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##    1.1027    1  0.2937
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
```

```
##      1.27      0.84      1.92
## -----
```

Days of hospitalization in ICU

```
d_yes <- data %>%
  filter(CVD_by_year == "2021" & !is.na(icu_days))
d_no <- data %>%
  filter(CVD_by_year == "2020" & !is.na(icu_days))

wtd.t.test(d_yes$icu_days, d_no$icu_days, weight = d_yes$weight, weighty = d_no$weight)
```

```
## $test
## [1] "Two Sample Weighted T-Test (Welch)"
##
## $coefficients
##      t.value      df      p.value
## 0.2410558 124.1731707 0.8099094
##
## $additional
## Difference      Mean.x      Mean.y      Std. Err
## 0.5983917 14.6992781 14.1008864 2.4823782
```

Ventilatory support

```
with(data, ctable(CVD_by_year, ven_support, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = w))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * ven_support
## Data Frame: data
##
## -----
##      ven_support      No      yes, invasive      yes, noninvasive      Total
## CVD_by_year
##      2020      287.6 (44.4%)      110.5 (17.0%)      250.2 (38.6%)      648.3 (100.0%)
##      2021      173.2 (26.2%)      192.9 (29.2%)      294.3 (44.6%)      660.4 (100.0%)
##      Total      460.7 (35.2%)      303.4 (23.2%)      544.5 (41.6%)      1308.6 (100.0%)
## -----
##
## -----
##      Chi.squared      df      p.value
## -----
##      54.2171      2      0
## -----
```

Orotracheal intubation

```
with(data, ctable(CVD_by_year, intubation, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = we
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * intubation
## Data Frame: data
##
##
## -----
##          intubation          no          yes          Total
## CVD_by_year
##      2020          537.8 (83.0%)    110.5 (17.0%)    648.3 (100.0%)
##      2021          467.5 (70.8%)    192.9 (29.2%)    660.4 (100.0%)
##      Total          1005.3 (76.8%)    303.4 (23.2%)    1308.6 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      26.4768    1      0
## -----
##
## -----
## Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      2.01      1.54    2.62
## -----
```

1st trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "1tri")

with(df4, ctable(CVD_by_year, intubation, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weigl
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * intubation
## Data Frame: df4
##
##
## -----
##          intubation          no          yes          Total
## CVD_by_year
##      2020          36.6 (82.8%)    7.6 (17.2%)    44.2 (100.0%)
##      2021          29.7 (72.3%)    11.4 (27.7%)    41.1 (100.0%)
##      Total          66.3 (77.8%)    19.0 (22.2%)    85.2 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
```

```
##      0.8266      1      0.3632
## -----
##
## -----
## Odds Ratio      Lo - 95%      Hi - 95%
## -----
##      1.85      0.65      5.23
## -----
```

2nd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "2tri")

with(df4, ctable(CVD_by_year, intubation, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * intubation
## Data Frame: df4
##
## -----
##          intubation          no          yes          Total
## CVD_by_year
##      2020          103.0 (78.0%)      29.0 (22.0%)      131.9 (100.0%)
##      2021          95.9 (71.9%)      37.6 (28.1%)      133.5 (100.0%)
##      Total          198.9 (74.9%)      66.5 (25.1%)      265.4 (100.0%)
## -----
##
## -----
## Chi.squared      df      p.value
## -----
##      1.0342      1      0.3092
## -----
##
## -----
## Odds Ratio      Lo - 95%      Hi - 95%
## -----
##      1.39      0.80      2.43
## -----
```

3rd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "3tri")

with(df4, ctable(CVD_by_year, intubation, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))
```

```
## Cross-Tabulation, Row Proportions
```

```
## CVD_by_year * intubation
## Data Frame: df4
##
##
## -----
##          intubation          no          yes          Total
## CVD_by_year
##      2020          237.1 (91.4%)    22.3 ( 8.6%)    259.4 (100.0%)
##      2021          203.2 (73.8%)    72.3 (26.2%)    275.4 (100.0%)
##      Total          440.3 (82.3%)    94.5 (17.7%)    534.8 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      27.4083    1      0
## -----
##
## -----
## Odds Ratio    Lo - 95%    Hi - 95%
## -----
##      3.79        2.27        6.31
## -----
```

Puerperium

```
df4 <- data %>%
  filter(classi_gesta_puerp == "puerp")

with(df4, ctable(CVD_by_year, intubation, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weight))

## Cross-Tabulation, Row Proportions
## CVD_by_year * intubation
## Data Frame: df4
##
##
## -----
##          intubation          no          yes          Total
## CVD_by_year
##      2020          136.4 (74.8%)    45.9 (25.2%)    182.3 (100.0%)
##      2021          117.6 (65.8%)    61.2 (34.2%)    178.8 (100.0%)
##      Total          254.0 (70.3%)    107.1 (29.7%)    361.1 (100.0%)
## -----
##
## -----
## Chi.squared  df  p.value
## -----
##      3.1202    1  0.0773
## -----
##
## -----
## Odds Ratio    Lo - 95%    Hi - 95%
```

```
## -----
##      1.55      0.98      2.44
## -----
```

Outcome - cure x death

```
with(data, ctable(CVD_by_year, evolution, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weigh
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * evolution
## Data Frame: data
##
##
## -----
##      evolution      recovery      death      Total
## CVD_by_year
##      2020      597.0 (84.7%)  107.5 (15.3%)  704.4 (100.0%)
##      2021      520.4 (74.2%)  181.0 (25.8%)  701.4 (100.0%)
##      Total      1117.4 (79.5%)  288.4 (20.5%)  1405.8 (100.0%)
## -----
##
## -----
##      Chi.squared  df  p.value
## -----
##      23.3272      1      0
## -----
##
## -----
##      Odds Ratio  Lo - 95%  Hi - 95%
## -----
##      1.93      1.48      2.52
## -----
```

1st trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "1tri")

with(df4, ctable(CVD_by_year, evolution, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weigh
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * evolution
## Data Frame: df4
##
##
## -----
##      evolution      recovery      death      Total
## CVD_by_year
##      2020      42.2 (85.9%)  7.0 (14.1%)  49.2 (100.0%)
```

```
##           2021           38.6 (81.2%)    9.0 (18.8%)    47.6 (100.0%)
##           Total           80.8 (83.5%)   15.9 (16.5%)   96.7 (100.0%)
## -----
##
## -----
##  Chi.squared   df   p.value
## -----
##      0.12      1   0.7291
## -----
##
## -----
##  Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.41      0.48      4.15
## -----
```

2nd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "2tri")

with(df4, ctable(CVD_by_year, evolution, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weigh
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * evolution
## Data Frame: df4
##
## -----
##           evolution           recovery           death           Total
##  CVD_by_year
##    2020           115.4 (80.6%)    27.8 (19.4%)    143.1 (100.0%)
##    2021           109.0 (76.1%)    34.2 (23.9%)    143.2 (100.0%)
##    Total           224.4 (78.4%)    62.0 (21.6%)    286.3 (100.0%)
## -----
##
## -----
##  Chi.squared   df   p.value
## -----
##      0.6038      1   0.4371
## -----
##
## -----
##  Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      1.30      0.74      2.29
## -----
```

3rd trimester

```
df4 <- data %>%
  filter(classi_gesta_puerp == "3tri")

with(df4, ctable(CVD_by_year, evolution, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weigh
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * evolution
## Data Frame: df4
##
##
## -----
##          evolution      recovery      death      Total
## CVD_by_year
##      2020      254.6 (89.7%)   29.1 (10.3%)   283.7 (100.0%)
##      2021      222.8 (78.4%)   61.3 (21.6%)   284.1 (100.0%)
##      Total      477.3 (84.1%)   90.4 (15.9%)   567.8 (100.0%)
## -----
##
## -----
## Chi.squared   df   p.value
## -----
##      12.7646     1     4e-04
## -----
##
## -----
## Odds Ratio   Lo - 95%   Hi - 95%
## -----
##      2.41       1.50       3.88
## -----
```

Puerperium

```
df4 <- data %>%
  filter(classi_gesta_puerp == "puerp")

with(df4, ctable(CVD_by_year, evolution, prop="r", OR=TRUE, useNA = "no", chisq = TRUE, weights = weigh
```

```
## Cross-Tabulation, Row Proportions
## CVD_by_year * evolution
## Data Frame: df4
##
##
## -----
##          evolution      recovery      death      Total
## CVD_by_year
##      2020      158.6 (81.5%)   36.0 (18.5%)   194.6 (100.0%)
##      2021      129.3 (67.2%)   63.1 (32.8%)   192.5 (100.0%)
##      Total      288.0 (74.4%)   99.1 (25.6%)   387.1 (100.0%)
## -----
##
```



```
## -----
## Chi.squared   df   p.value
## -----
##      9.641      1   0.0019
## -----
##
## -----
## Odds Ratio    Lo - 95%    Hi - 95%
## -----
##      2.15      1.34      3.44
## -----
```

Time elapsed between the start of symptoms and the outcome (days) after PSM

```
d_yes <- data %>%
  filter(CVD_by_year == "2021" & !is.na(days_symp_evolution))
d_no <- data %>%
  filter(CVD_by_year == "2020" & !is.na(days_symp_evolution))

# Performing weighted Student's t-tests to compare the CVD_by_year and non-CVD_by_year groups with respect to days_symp_evolution
wtd.t.test(d_yes$days_symp_evolution, d_no$days_symp_evolution, weight = d_yes$weight, weighty = d_no$weight)

## $test
## [1] "Two Sample Weighted T-Test (Welch)"
##
## $coefficients
##      t.value      df      p.value
## 3.296454e+00 5.936898e+02 1.037562e-03
##
## $additional
## Difference      Mean.x      Mean.y      Std. Err
##    3.534656    20.343870    16.809215    1.072260
```

Considering only death cases

```
df <- data[!is.na(data$days_symp_evolution) & !is.na(data$CVD_by_year),]

df <- df %>%
  filter(evolution == "death")

d_yes <- df %>%
  filter(CVD_by_year == "2021" & !is.na(days_symp_evolution))
d_no <- df %>%
  filter(CVD_by_year == "2020" & !is.na(days_symp_evolution))

# Fixed the death cases, we perform a weighted Student's t-tests to compare the CVD and non-CVD groups with respect to days_symp_evolution
wtd.t.test(d_yes$days_symp_evolution, d_no$days_symp_evolution, weight = d_yes$weight, weighty = d_no$weight)

## $test
```

```
## [1] "Two Sample Weighted T-Test (Welch)"
##
## $coefficients
##      t.value      df      p.value
##  1.3940660 118.5131408  0.1659059
##
## $additional
## Difference      Mean.x      Mean.y      Std. Err
##   3.427876   23.140228   19.712352   2.458905
```

Considering only cure cases

```
df <- data[!is.na(data$days_symp_evol) & !is.na(data$CVD_by_year),]

df <- df %>%
  filter(evolution == "recovery")
```

```
d_yes <- df %>%
  filter(CVD_by_year == "2021" & !is.na(days_symp_evol))
d_no <- df %>%
  filter(CVD_by_year == "2020" & !is.na(days_symp_evol))
```

Fixed the cure cases, we perform a weighted Student's t-tests to compare the CVD and non-CVD groups w
wtd.t.test(d_yes\$days_symp_evol, d_no\$days_symp_evol, weight = d_yes\$weight, weighty = d_no\$weight)

```
## $test
## [1] "Two Sample Weighted T-Test (Welch)"
##
## $coefficients
##      t.value      df      p.value
##  2.51019701 404.32379328  0.01245601
##
## $additional
## Difference      Mean.x      Mean.y      Std. Err
##   3.075640   19.345014   16.269375   1.225258
```