Pràctica 1

Clara Albert

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Importació de les dades

```
library(haven)
demo=read_sas("uab_demo3.sas7bdat", NULL)

drugs=read_sas("uab_drugs3.sas7bdat")

atc=read_sas("uab_atc_drugs3.sas7bdat")

datos=merge(demo,merge(drugs,atc,by=c("PatNo","ControlCas","MatchCC")),
by=c("PatNo","ControlCas","MatchCC"))
dim(datos)
```

```
## [1] 655 100
```

Passos inicials - Qualitat de les dades

Preparació de les dades

Hem de decidir si les variables són factors. Creem un vector amb arguments TRUE i FALSE per si la variable té menys de 5 possibles atributs. Aquelles que tinguin menys de 5 són les que convertirem a factor. NFractura i CountActualGE4 tot i que ens las converteixi a factor són variables numèriques i per tant les tornem a canviar manualment. La ADO_glitazonaDias tot i que tingui menys de 5 atributs és una variable numèrica, ja que ens dona els dies que ha estat prenent aquell medicament.

```
cols.to.factor <- sapply(datos, function(col) length(unique(col)) < 5);
head(cols.to.factor)
```

```
##      PatNo ControlCas    MatchCC       Edat       Sexe        PES
##      FALSE       TRUE      FALSE      FALSE       TRUE      FALSE
```

```
datos[cols.to.factor] <- lapply(datos[ cols.to.factor] , factor)

datos$NFractura = as.numeric(datos$NFractura)
datos$CountActualGE4 = as.numeric(datos$CountActualGE4)
datos$ADO_glitazonaDias = as.numeric(datos$ADO_glitazonaDias)

str(datos)
```

```
## 'data.frame':    655 obs. of  100 variables:
##  $ PatNo                          : num  100 102 104 105 106 107 108
110 112 113 ...
```

```
##  $ ControlCas                    : Factor w/ 2 levels "0","1": 1 1 1
2 2 1 1 1 1 1 ...
##  $ MatchCC                       : num  15 15 15 15 16 16 16 16 16
17 ...
##  $ Edat                          : num  92 91 92 91 79 79 79 79 79
87 ...
##  $ Sexe                          : Factor w/ 2 levels "F","M": 2 2 2
2 1 1 1 1 1 1 ...
##  $ PES                           : num  NA 70 71 NA 72 NA NA NA 56
NA ...
##  $ TALLA                         : num  NA NA NA NA 158 ...
##  $ IMC                           : num  NA NA NA NA 28.8 ...
##  $ ALCOHOL                       : Factor w/ 3 levels "0","1","2": 1
1 1 1 1 1 1 1 1 1 ...
##  $ Smoker                        : Factor w/ 3 levels "0","1","2": 3
1 1 3 1 1 1 1 1 1 ...
##  $ Artritis_reumatoide           : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ Fractura                      : Factor w/ 2 levels "0","1": 1 1 1
1 2 1 1 1 1 1 ...
##  $ NFractura                     : num  1 1 1 1 3 1 1 1 1 1 ...
##  $ Diabetis                      : Factor w/ 2 levels "0","1": 1 2 1
1 2 2 1 2 1 2 ...
##  $ tipus_diabetis                : Factor w/ 3 levels "0","1","2": 1
3 1 1 3 3 1 3 1 3 ...
##  $ Densitometries                : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ Osteporosi                    : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ neoplasia                     : Factor w/ 2 levels "0","1": 1 2 1
2 1 1 1 2 1 1 ...
##  $ HiperTiroidisme               : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 2 ...
##  $ Malnutricio                   : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ Malabsorcio                   : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ Malaltia_Hep_Cro              : Factor w/ 2 levels "0","1": 1 1 1
2 1 1 1 1 1 1 ...
##  $ CountActualGE4                : num  1 2 1 2 2 1 1 1 2 2 ...
##  $ OthRiskFract                  : Factor w/ 2 levels "0","1": 1 2 1
2 1 1 1 2 1 2 ...
##  $ ADO_glitazonaDias             : num  1 1 1 1 2 1 1 1 1 1 ...
##  $ ADO_no_glitazona              : Factor w/ 2 levels "0","1": 1 2 1
1 2 1 1 1 1 1 ...
##  $ ADO_no_glitazonaDias          : num  0 599 0 0 75 0 0 0 0 0 ...
##  $ Bisf                          : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ BisfDias                      : num  0 0 0 0 0 0 0 0 0 0 ...
##  $ CortInh                       : Factor w/ 2 levels "0","1": 1 2 1
```

```
1 1 1 1 1 1 1 ...
##  $ CortSist                      : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ CortSistDias                  : num  0 0 0 0 0 0 0 0 0 0 ...
##  $ ADepreISRS                    : Factor w/ 2 levels "0","1": 1 1 1
1 2 1 1 1 2 1 ...
##  $ ADepreISRSDias                : num  0 0 0 0 313 0 0 0 608 0 ...
##  $ ADepreNoISRS                  : Factor w/ 2 levels "0","1": 1 1 1
1 2 1 1 1 1 1 ...
##  $ ADepreNoISRSDias              : num  0 0 0 0 237 0 0 0 0 0 ...
##  $ insulina                      : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 2 1 1 ...
##  $ insulinaDias                  : num  0 0 0 0 0 0 0 321 0 0 ...
##  $ CortSistIniBf3m               : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ CortSistExpLt3m               : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ CortSistExpCat                : Factor w/ 3 levels "0","1","2": 1
1 1 1 1 1 1 1 1 1 ...
##  $ CortInhIniBf3m                : Factor w/ 2 levels "0","1": 1 2 1
1 1 1 1 1 1 1 ...
##  $ CortInhExpLt3m                : Factor w/ 2 levels "0","1": 1 2 1
1 1 1 1 1 1 1 ...
##  $ CortInhExpCat                 : Factor w/ 3 levels "0","1","2": 1
2 1 1 1 1 1 1 1 1 ...
##  $ ADepreISRS6m                  : Factor w/ 2 levels "0","1": 1 1 1
1 2 1 1 1 2 1 ...
##  $ ADepreNoISRS6m                : Factor w/ 2 levels "0","1": 1 1 1
1 2 1 1 1 1 1 ...
##  $ ActualBisfosfonats            : Factor w/ 3 levels "0","1","2": 1
1 1 1 1 1 1 1 1 1 ...
##  $ Actualantidepressiu_no_ISRS   : num  0 0 0 0 1 0 0 0 0 0 ...
##  $ Actualosteoporosi_no_bisfosfonat: Factor w/ 4 levels
"0","1","2","3": 1 1 1 1 1 1 1 1 1 1 ...
##  $ ActualCortis_inhalats         : num  0 1 0 0 0 0 0 0 0 0 ...
##  $ Actualantiulceros_IBP         : Factor w/ 4 levels
"0","1","2","3": 1 2 2 2 2 1 1 1 1 2 ...
##  $ ActualCortis_sistemics        : Factor w/ 3 levels "0","1","2": 1
1 1 1 1 1 1 1 1 1 ...
##  $ Actualantidepressiu_ISRS      : Factor w/ 3 levels "0","1","2": 1
1 1 1 3 1 1 1 2 1 ...
##  $ Actualinsulina                : Factor w/ 4 levels
"0","1","2","3": 1 1 1 1 1 1 1 2 1 1 ...
##  $ ActualADO_glitazona           : Factor w/ 2 levels "0","1": 1 1 1
1 2 1 1 1 1 1 ...
##  $ PrevioCortis_sistemics        : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ Previoantidepressiu_no_ISRS   : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ PrevioCortis_inhalats         : Factor w/ 1 level "0": 1 1 1 1 1
```

```
1 1 1 1 1 ...
##  $ Previoantiulceros_IBP          : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ Previoantidepressiu_ISRS       : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ PrevioADO_glitazona            : Factor w/ 1 level "0": 1 1 1 1 1
1 1 1 1 1 ...
##  $ PrevioBisfosfonats             : Factor w/ 1 level "0": 1 1 1 1 1
1 1 1 1 1 ...
##  $ ActPrevBisfosfonats            : Factor w/ 3 levels "0","1","2": 1
1 1 1 1 1 1 1 1 1 ...
##  $ ActPrevCortis_inhalats         : num  0 1 0 0 0 0 0 0 0 0 ...
##  $ ActPrevantiulceros_IBP         : Factor w/ 4 levels
"0","1","2","3": 1 2 2 2 2 1 1 1 1 2 ...
##  $ ActPrevCortis_sistemics        : Factor w/ 3 levels "0","1","2": 1
1 1 1 1 1 1 1 1 1 ...
##  $ ActPrevantidepressiu_ISRS      : Factor w/ 3 levels "0","1","2": 1
1 1 1 3 1 1 1 2 1 ...
##  $ ActPrevinsulina                : Factor w/ 4 levels
"0","1","2","3": 1 1 1 1 1 1 1 2 1 1 ...
##  $ ActPrevADO_glitazona           : Factor w/ 2 levels "0","1": 1 1 1
1 2 1 1 1 1 1 ...
##  $ Previoinsulina                 : Factor w/ 1 level "0": 1 1 1 1 1
1 1 1 1 1 ...
##  $ N_SN                           : Factor w/ 2 levels "0","1": 1 2 1
2 2 1 1 1 2 2 ...
##  $ R_SN                           : Factor w/ 2 levels "0","1": 1 2 1
1 1 1 1 1 1 1 ...
##  $ H_SN                           : Factor w/ 2 levels "0","1": 1 1 2
1 1 1 1 1 1 2 ...
##  $ N06_SN                         : Factor w/ 2 levels "0","1": 1 1 1
1 2 1 1 1 2 1 ...
##  $ H02_SN                         : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ H01_SN                         : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ R03B_SN                        : Factor w/ 2 levels "0","1": 1 2 1
1 1 1 1 1 1 1 ...
##  $ N06A_SN                        : Factor w/ 2 levels "0","1": 1 1 1
1 2 1 1 1 2 1 ...
##  $ R03BB_SN                       : Factor w/ 2 levels "0","1": 1 2 1
1 1 1 1 1 1 1 ...
##  $ N06AB_SN                       : Factor w/ 2 levels "0","1": 1 1 1
1 2 1 1 1 2 1 ...
##  $ N06AX_SN                       : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ N06AA_SN                       : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ R03BA_SN                       : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
```

```
##  $ N06AB10_SN                      : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 2 1 ...
##  $ N06AX05_SN                      : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ N06AB04_SN                      : Factor w/ 2 levels "0","1": 1 1 1
1 2 1 1 1 1 1 ...
##  $ N06AX03_SN                      : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ N06AB05_SN                      : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ N06AA09_SN                      : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ N06AX16_SN                      : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ N06AB06_SN                      : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ N06AX11_SN                      : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ N06AB03_SN                      : Factor w/ 2 levels "0","1": 1 1 1
1 1 1 1 1 1 1 ...
##  $ H_Dias                          : num  0 0 201 0 0 0 0 0 0 100 ...
##  $ R03_Dias                        : num  0 612 0 0 0 0 0 0 0 0 ...
##  $ H02_Dias                        : num  0 0 0 0 0 0 0 0 0 0 ...
##  $ R03A_Dias                       : num  0 411 0 0 0 0 0 0 0 0 ...
##  $ R03B_Dias                       : num  0 612 0 0 0 0 0 0 0 0 ...
##  $ R03BB_Dias                      : num  0 612 0 0 0 0 0 0 0 0 ...
##   [list output truncated]
```

A més a més, realitzem un summary per veure si hi ha alguna dada que no està preparada per l'anàlisi.

```
summary(datos)
```

```
##      PatNo       ControlCas    MatchCC          Edat       Sexe
##  Min.   : 36.0   0:524      Min.   :  6   Min.   :51.00   F:520
##  1st Qu.:265.5   1:131      1st Qu.: 38   1st Qu.:78.00   M:135
##  Median :495.0              Median : 71   Median :84.00
##  Mean   :494.0              Mean   : 71   Mean   :82.17
##  3rd Qu.:722.5              3rd Qu.:104   3rd Qu.:88.00
##  Max.   :952.0              Max.   :136   Max.   :95.00
##
##       PES              TALLA           IMC         ALCOHOL Smoker
##  Min.   : 35.50   Min.   :136   Min.   :15.82   0:588   0:619
##  1st Qu.: 57.50   1st Qu.:149   1st Qu.:24.52   1: 62   1: 22
##  Median : 66.00   Median :155   Median :26.74   2:  5   2: 14
##  Mean   : 67.17   Mean   :155   Mean   :27.73
##  3rd Qu.: 75.00   3rd Qu.:160   3rd Qu.:31.22
##  Max.   :105.30   Max.   :181   Max.   :42.69
##  NA's   :286      NA's   :442   NA's   :444
##  Artritis_reumatoide Fractura   NFractura     Diabetis tipus_diabetis
##  0:649               0:598    Min.   :1.000   0:492    0:492
```

```
##  1:  6               1: 57    1st Qu.:1.000   1:163    1:  4
##                               Median :1.000            2:159
##                               Mean   :1.099
##                               3rd Qu.:1.000
##                               Max.   :4.000
##
##  Densitometries Osteporosi neoplasia HiperTiroidisme Malnutricio
Malabsorcio
##  0:647          0:625      0:582     0:648           0:651       0:654
##  1:  8          1: 30      1: 73     1:  7           1:  4       1:  1
##
##
##
##
##
##  Malaltia_Hep_Cro CountActualGE4 OthRiskFract ADO_glitazonaDias
##  0:643            Min.   :1.00   0:558        Min.   :1.000
##  1: 12            1st Qu.:1.00   1: 97        1st Qu.:1.000
##                   Median :1.00                Median :1.000
##                   Mean   :1.49                Mean   :1.009
##                   3rd Qu.:2.00                3rd Qu.:1.000
##                   Max.   :2.00                Max.   :4.000
##
##  ADO_no_glitazona ADO_no_glitazonaDias Bisf       BisfDias
CortInh
##  0:582            Min.   :   0.00      0:623   Min.   :   0.00   0:615
##  1: 73            1st Qu.:   0.00      1: 32   1st Qu.:   0.00   1: 40
##                   Median :   0.00              Median :   0.00
##                   Mean   :  89.36              Mean   :  35.55
##                   3rd Qu.:   0.00              3rd Qu.:   0.00
##                   Max.   :2939.00              Max.   :2373.00
##
##  CortSist  CortSistDias      ADepreISRS ADepreISRSDias    ADepreNoISRS
##  0:644    Min.   :   0.000   0:579      Min.   :   0.00   0:577
##  1: 11    1st Qu.:   0.000   1: 76      1st Qu.:   0.00   1: 78
##           Median :   0.000              Median :   0.00
##           Mean   :   9.913              Mean   :  81.88
##           3rd Qu.:   0.000              3rd Qu.:   0.00
##           Max.   :2466.000              Max.   :3202.00
##
##  ADepreNoISRSDias  insulina  insulinaDias     CortSistIniBf3m
CortSistExpLt3m
##  Min.   :   0.00   0:625    Min.   :   0.00   0:646           0:646
##  1st Qu.:   0.00   1: 30    1st Qu.:   0.00   1:  9           1:  9
##  Median :   0.00            Median :   0.00
##  Mean   :  67.32            Mean   :  28.95
##  3rd Qu.:   0.00            3rd Qu.:   0.00
##  Max.   :2929.00            Max.   :1957.00
##
##  CortSistExpCat CortInhIniBf3m CortInhExpLt3m CortInhExpCat
```

```
ADepreISRS6m
##  0:646          0:625          0:625          0:625         0:598
##  1:  6          1: 30          1: 30          1: 17         1: 57
##  2:  3                                        2: 13
##
##
##
##
##  ADepreNoISRS6m ActualBisfosfonats Actualantidepressiu_no_ISRS
##  0:597          0:624               Min.   :0.0000
##  1: 58          1: 29               1st Qu.:0.0000
##                 2:  2               Median :0.0000
##                                     Mean   :0.1405
##                                     3rd Qu.:0.0000
##                                     Max.   :6.0000
##
##  Actualosteoporosi_no_bisfosfonat ActualCortis_inhalats
Actualantiulceros_IBP
##  0:584                            Min.   :0.0000        0:449
##  1: 60                            1st Qu.:0.0000        1:199
##  2:  8                            Median :0.0000        2:  6
##  3:  3                            Mean   :0.1023        3:  1
##                                   3rd Qu.:0.0000
##                                   Max.   :4.0000
##
##  ActualCortis_sistemics Actualantidepressiu_ISRS Actualinsulina
##  0:647                   0:591                   0:625
##  1:  7                   1: 60                   1: 24
##  2:  1                   2:  4                   2:  5
##                                                  3:  1
##
##
##
##  ActualADO_glitazona PrevioCortis_sistemics
Previoantidepressiu_no_ISRS
##  0:652               0:654                 0:651
##  1:  3               1:  1                 1:  4
##
##
##
##
##
##  PrevioCortis_inhalats Previoantiulceros_IBP Previoantidepressiu_ISRS
##  0:655                 0:653                 0:653
##                        1:  2                 1:  2
##
##
##
##
##
##
```

```
##  PrevioADO_glitazona PrevioBisfosfonats ActPrevBisfosfonats
##  0:655               0:655              0:624
##                                         1: 29
##                                         2:  2
##
##
##
##
##  ActPrevCortis_inhalats ActPrevantiulceros_IBP ActPrevCortis_sistemics
##  Min.   :0.0000         0:447                  0:646
##  1st Qu.:0.0000         1:201                  1:  8
##  Median :0.0000         2:  6                  2:  1
##  Mean   :0.1023         3:  1
##  3rd Qu.:0.0000
##  Max.   :4.0000
##
##  ActPrevantidepressiu_ISRS ActPrevinsulina ActPrevADO_glitazona
Previoinsulina
##  0:589                     0:625           0:652                0:655
##  1: 62                     1: 24           1:  3
##  2:  4                     2:  5
##                            3:  1
##
##
##
##  N_SN    R_SN    H_SN    N06_SN  H02_SN  H01_SN  R03B_SN N06A_SN
R03BB_SN
##  0:333   0:587   0:610   0:517   0:643   0:654   0:629   0:539   0:634
##  1:322   1: 68   1: 45   1:138   1: 12   1:  1   1: 26   1:116   1: 21
##
##
##
##
##
##  N06AB_SN N06AX_SN N06AA_SN R03BA_SN N06AB10_SN N06AX05_SN N06AB04_SN
##  0:578    0:619    0:642    0:646    0:637       0:637       0:638
##  1: 77    1: 36    1: 13    1:  9    1: 18       1: 18       1: 17
##
##
##
##
##
##  N06AX03_SN N06AB05_SN N06AA09_SN N06AX16_SN N06AB06_SN N06AX11_SN
N06AB03_SN
##  0:651      0:637      0:647      0:643      0:637      0:648
0:645
##  1:  4      1: 18      1:  8      1: 12      1: 18      1:  7      1:
10
##
##
```

```
##
##
##
##      H_Dias           R03_Dias          H02_Dias          R03A_Dias
##  Min.   :   0.00   Min.   :   0.00   Min.   :   0.000   Min.   :
0.00
##  1st Qu.:   0.00   1st Qu.:   0.00   1st Qu.:   0.000   1st Qu.:
0.00
##  Median :   0.00   Median :   0.00   Median :   0.000   Median :
0.00
##  Mean   :  42.89   Mean   :  50.29   Mean   :   9.913   Mean   :
33.62
##  3rd Qu.:   0.00   3rd Qu.:   0.00   3rd Qu.:   0.000   3rd Qu.:
0.00
##  Max.   :2466.00   Max.   :3098.00   Max.   :2466.000   Max.
:2804.00
##
##    R03B_Dias         R03BB_Dias        R03BA_Dias
##  Min.   :   0.00   Min.   :   0.00   Min.   :   0
##  1st Qu.:   0.00   1st Qu.:   0.00   1st Qu.:   0
##  Median :   0.00   Median :   0.00   Median :   0
##  Mean   :  23.81   Mean   :  15.15   Mean   :  10
##  3rd Qu.:   0.00   3rd Qu.:   0.00   3rd Qu.:   0
##  Max.   :3098.00   Max.   :1765.00   Max.   :3098
##
```

Veiem que totes les dades són vàlides i estan preparades. A més a més, les dades que són factors tenim que no hi ha cap nivell que no hagi d'estar.

Missing values

```
apply(is.na(datos),2,sum)
```

```
##                             PatNo                         ControlCas
##                                 0                                 0
##                           MatchCC                              Edat
##                                 0                                 0
##                              Sexe                               PES
##                                 0                               286
##                             TALLA                               IMC
##                               442                               444
##                           ALCOHOL                            Smoker
##                                 0                                 0
##              Artritis_reumatoide                           Fractura
##                                 0                                 0
##                        NFractura                           Diabetis
##                                 0                                 0
##                     tipus_diabetis                     Densitometries
##                                 0                                 0
##                         Osteporosi                          neoplasia
##                                 0                                 0
```

```
##                  HiperTiroidisme                       Malnutricio
##                                0                                 0
##                      Malabsorcio                  Malaltia_Hep_Cro
##                                0                                 0
##                   CountActualGE4                      OthRiskFract
##                                0                                 0
##                ADO_glitazonaDias                  ADO_no_glitazona
##                                0                                 0
##             ADO_no_glitazonaDias                              Bisf
##                                0                                 0
##                         BisfDias                           CortInh
##                                0                                 0
##                         CortSist                      CortSistDias
##                                0                                 0
##                       ADepreISRS                    ADepreISRSDias
##                                0                                 0
##                     ADepreNoISRS                  ADepreNoISRSDias
##                                0                                 0
##                          insulina                      insulinaDias
##                                0                                 0
##                  CortSistIniBf3m                   CortSistExpLt3m
##                                0                                 0
##                   CortSistExpCat                   CortInhIniBf3m
##                                0                                 0
##                   CortInhExpLt3m                    CortInhExpCat
##                                0                                 0
##                     ADepreISRS6m                  ADepreNoISRS6m
##                                0                                 0
##               ActualBisfosfonats      Actualantidepressiu_no_ISRS
##                                0                                 0
## Actualosteoporosi_no_bisfosfonat            ActualCortis_inhalats
##                                0                                 0
##             Actualantiulceros_IBP           ActualCortis_sistemics
##                                0                                 0
##         Actualantidepressiu_ISRS                   Actualinsulina
##                                0                                 0
##               ActualADO_glitazona           PrevioCortis_sistemics
##                                0                                 0
##      Previoantidepressiu_no_ISRS            PrevioCortis_inhalats
##                                0                                 0
##             Previoantiulceros_IBP         Previoantidepressiu_ISRS
##                                0                                 0
##               PrevioADO_glitazona               PrevioBisfosfonats
##                                0                                 0
##               ActPrevBisfosfonats           ActPrevCortis_inhalats
##                                0                                 0
##           ActPrevantiulceros_IBP          ActPrevCortis_sistemics
##                                0                                 0
##         ActPrevantidepressiu_ISRS                  ActPrevinsulina
##                                0                                 0
```

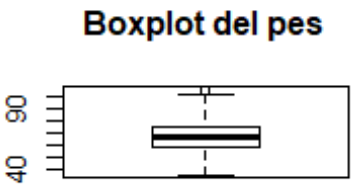
```
##              ActPrevADO_glitazona                     Previoinsulina
##                                 0                                  0
##                              N_SN                               R_SN
##                                 0                                  0
##                              H_SN                             N06_SN
##                                 0                                  0
##                            H02_SN                             H01_SN
##                                 0                                  0
##                           R03B_SN                            N06A_SN
##                                 0                                  0
##                          R03BB_SN                           N06AB_SN
##                                 0                                  0
##                          N06AX_SN                           N06AA_SN
##                                 0                                  0
##                          R03BA_SN                         N06AB10_SN
##                                 0                                  0
##                        N06AX05_SN                         N06AB04_SN
##                                 0                                  0
##                        N06AX03_SN                         N06AB05_SN
##                                 0                                  0
##                        N06AA09_SN                         N06AX16_SN
##                                 0                                  0
##                        N06AB06_SN                         N06AX11_SN
##                                 0                                  0
##                        N06AB03_SN                             H_Dias
##                                 0                                  0
##                           R03_Dias                           H02_Dias
##                                 0                                  0
##                          R03A_Dias                          R03B_Dias
##                                 0                                  0
##                        R03BB_Dias                         R03BA_Dias
##                                 0                                  0
```

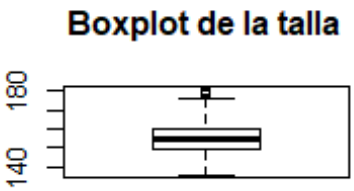
Mirem quants valors falten per columna i veiem que les variables pes, talla i IMC són les úniques que tenen missings.

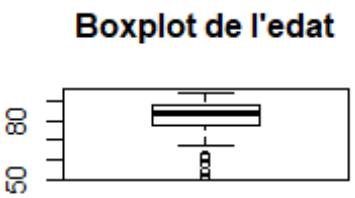
```
table(datos$ControlCas)
```

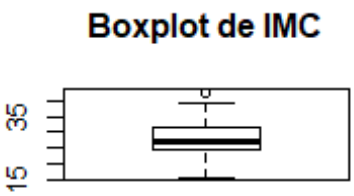
```
##
##   0   1
## 524 131
```

```
par(mfrow=c(2,2))
boxplot(datos$PES, main="Boxplot del pes")
boxplot(datos$TALLA, main="Boxplot de la talla")
boxplot(datos$Edat, main="Boxplot de l'edat")
boxplot(datos$IMC, main="Boxplot de IMC")
```









Anàlisi comparativa de les dades basals

Per comparar els dos grups utilitzarem la funció compareGroups on les proves estadístiques que utilitzarem seran:

- Per a variables categòriques: N i percentatge
- Per a variables numèriques: mediana i primer i tercer quartil

A més a més, el mètode per obtenir el p-valor serà el 4 que fa un test de Shapiro-Wilks per decidir si la variable està distribuïda de forma normal o no.

```
library(compareGroups)
tabla<-
compareGroups(ControlCas~Edat+Sexe+PES+TALLA+IMC+ALCOHOL+Smoker+Artritis_
reumatoide+Fractura+NFractura+Diabetis+tipus_diabetis+Densitometries+Oste
porosi+neoplasia+HiperTiroidisme+Malnutricio+Malabsorcio+Malaltia_Hep_Cro
+CountActualGE4+OthRiskFract,data = datos, include.miss = TRUE, method =
4, compute.prop = FALSE, compute.ratio = TRUE, chisq.test.perm = FALSE)

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'Sexe' are removed since no observation in that/those
levels

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
```

```
## Some levels of 'ALCOHOL' are removed since no observation in
that/those levels

## Warning in chisq.test(xx, correct = FALSE): Chi-squared approximation
may be
## incorrect

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'Smoker' are removed since no observation in that/those
levels

## Warning in chisq.test(xx, correct = FALSE): Chi-squared approximation
may be
## incorrect

## Warning in chisq.test(xx, correct = FALSE): Chi-squared approximation
may be
## incorrect

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'Artritis_reumatoide' are removed since no observation
in that/
## those levels

## Warning in chisq.test(xx, correct = FALSE): Chi-squared approximation
may be
## incorrect

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'Fractura' are removed since no observation in
that/those levels

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'Diabetis' are removed since no observation in
that/those levels

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'tipus_diabetis' are removed since no observation in
that/those
## levels

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'Densitometries' are removed since no observation in
that/those
## levels
```

```
## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'Osteporosi' are removed since no observation in
that/those
## levels

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'neoplasia' are removed since no observation in
that/those levels

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'HiperTiroidisme' are removed since no observation in
that/those
## levels

## Warning in chisq.test(xx, correct = FALSE): Chi-squared approximation
may be
## incorrect

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'Malnutricio' are removed since no observation in
that/those
## levels

## Warning in chisq.test(xx, correct = FALSE): Chi-squared approximation
may be
## incorrect

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'Malabsorcio' are removed since no observation in
that/those
## levels

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'Malaltia_Hep_Cro' are removed since no observation in
that/those
## levels

## Warning in chisq.test(xx, correct = FALSE): Chi-squared approximation
may be
## incorrect

## Warning in compare.i(X[, i], y = y, selec.i = selec[i], method.i =
method[i], :
## Some levels of 'OthRiskFract' are removed since no observation in
that/those
## levels
```

```
(resultatstabla<-createTable(tabla,show.all = TRUE,show.n = TRUE))

##
## --------Summary descriptives table by 'ControlCas'---------
##
##
_____________________________________________________________________________
_____________
##                          [ALL]              0                1
p.overall  N
##                          N=655            N=524            N=131
##
-----------------------------------------------------------------------------
------------
## Edat                  84.0 [78.0;88.0] 84.0 [78.0;88.0] 84.0
[78.0;88.0]   0.948   655
## Sexe:
1.000   655
##     F                   520 (79.4%)      416 (79.4%)      104 (79.4%)
##     M                   135 (20.6%)      108 (20.6%)       27 (20.6%)
## PES                   66.0 [57.5;75.0] 66.8 [57.9;75.9] 65.0
[57.0;71.0]   0.161   369
## TALLA                  155 [149;160]    155 [150;160]    152 [147;159]
0.055   213
## IMC                   26.7 [24.5;31.2] 26.7 [24.5;31.2] 27.4
[24.7;29.3]   0.937   211
## ALCOHOL:
0.038   655
##     0                   588 (89.8%)      465 (88.7%)      123 (93.9%)
##     1                    62 (9.47%)       56 (10.7%)       6 (4.58%)
##     2                    5 (0.76%)        3 (0.57%)        2 (1.53%)
## Smoker:
0.002   655
##     0                   619 (94.5%)      502 (95.8%)      117 (89.3%)
##     1                    22 (3.36%)       16 (3.05%)       6 (4.58%)
##     2                    14 (2.14%)       6 (1.15%)        8 (6.11%)
## Artritis_reumatoide:
1.000   655
##     0                   649 (99.1%)      519 (99.0%)      130 (99.2%)
##     1                    6 (0.92%)        5 (0.95%)        1 (0.76%)
## Fractura:
<0.001   655
##     0                   598 (91.3%)      522 (99.6%)       76 (58.0%)
##     1                    57 (8.70%)       2 (0.38%)        55 (42.0%)
## NFractura            1.00 [1.00;1.00] 1.00 [1.00;1.00] 1.00
[1.00;2.00]  <0.001   655
## Diabetis:
0.007   655
##     0                   492 (75.1%)      406 (77.5%)       86 (65.6%)
##     1                   163 (24.9%)      118 (22.5%)       45 (34.4%)
```

```
## tipus_diabetis:
0.009   655
##     0                  492 (75.1%)      406 (77.5%)       86 (65.6%)
##     1                   4 (0.61%)        4 (0.76%)        0 (0.00%)
##     2                  159 (24.3%)      114 (21.8%)       45 (34.4%)
## Densitometries:
<0.001   655
##     0                  647 (98.8%)       524 (100%)      123 (93.9%)
##     1                   8 (1.22%)        0 (0.00%)        8 (6.11%)
## Osteporosi:
<0.001   655
##     0                  625 (95.4%)      511 (97.5%)      114 (87.0%)
##     1                   30 (4.58%)       13 (2.48%)       17 (13.0%)
## neoplasia:
0.514   655
##     0                  582 (88.9%)      463 (88.4%)      119 (90.8%)
##     1                   73 (11.1%)       61 (11.6%)       12 (9.16%)
## HiperTiroidisme:
0.033   655
##     0                  648 (98.9%)      521 (99.4%)      127 (96.9%)
##     1                   7 (1.07%)        3 (0.57%)        4 (3.05%)
## Malnutricio:
0.027   655
##     0                  651 (99.4%)      523 (99.8%)      128 (97.7%)
##     1                   4 (0.61%)        1 (0.19%)        3 (2.29%)
## Malabsorcio:
1.000   655
##     0                  654 (99.8%)      523 (99.8%)       131 (100%)
##     1                   1 (0.15%)        1 (0.19%)        0 (0.00%)
## Malaltia_Hep_Cro:
0.071   655
##     0                  643 (98.2%)      517 (98.7%)      126 (96.2%)
##     1                   12 (1.83%)       7 (1.34%)        5 (3.82%)
## CountActualGE4       1.00 [1.00;2.00] 1.00 [1.00;2.00] 2.00
[2.00;2.00]  <0.001   655
## OthRiskFract:
0.564   655
##     0                  558 (85.2%)      449 (85.7%)      109 (83.2%)
##     1                   97 (14.8%)       75 (14.3%)       22 (16.8%)
##
------------------------------------------------------------------------
------------
```

Identificació de les variables a usar en l'anàlisi interferencial

Al nostre model introduirem les variables que el seu p-valor sigui inferior a 0.05 i l'edat i el sexe tot i que no siguin significatives. En aquest cas són: Smoker, Fractura, NFractura, Diabetis, tipus_diabetis, Densitometries, Osteporosi, HiperTiroidisme i Malnutricio.

Com Fractura i NFractures están molt correlacionades només introduirem Fractura. Pasa el mateix amb les variables Diabetis i tipus_diabetis, on en aquest cas tindrem en compte tipus_diabetis.

Anàlisi inferència de risc crus i ajustat

El model que usarem serà un model de regressió logística condicional, ja que els controls i els casos estan aparellats per la variable MatchCC. Per tant, la nostra estratificació serà a partir de la variable MatchCC.

La variable resposta serà ControlCas.

```
library(survival)
library(Epi)
```

Selecció de variables pel nostre model Farem el model de regressió logística condicional amb les següents variables:

Models crus

```
#Models individuals
(mod_Smoker=clogistic(ControlCas~Smoker, strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ Smoker, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##          coef exp(coef) se(coef)    z      p
## Smoker1 0.509      1.66    0.499 1.02 0.3100
## Smoker2 2.177      8.82    0.689 3.16 0.0016
##
## Likelihood ratio test=12.2  on 2 df, p=0.0022, n=145
```

```
(mod_Fractura=clogistic(ControlCas~Fractura, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ Fractura, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##           coef exp(coef) se(coef)    z       p
## Fractura1 5.38       218     1.01 5.33 9.6e-08
```

```
##
## Likelihood ratio test=166  on 1 df, p=0, n=280
```

```
(mod_tipus_diabetis=clogistic(ControlCas~tipus_diabetis, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ tipus_diabetis, strata =
strata(MatchCC),
##     data = datos)
##
##
##
##
##                    coef exp(coef) se(coef)       z      p
## tipus_diabetis1 -9.156  0.000106  107.819 -0.0849 0.9300
## tipus_diabetis2  0.671  1.956325    0.223  3.0100 0.0026
##
## Likelihood ratio test=10.6  on 2 df, p=0.00491, n=465
```

```
(mod_Densitometries=clogistic(ControlCas~Densitometries, strata(MatchCC),
data=datos))#No Significatiu
```

```
##
## Call:
## clogistic(formula = ControlCas ~ Densitometries, strata =
strata(MatchCC),
##     data = datos)
##
##
##
##
##                  coef exp(coef) se(coef)     z    p
## Densitometries1   13    461457      120 0.109 0.91
##
## Likelihood ratio test=25.8  on 1 df, p=3.88e-07, n=40
```

```
(mod_Osteporosi=clogistic(ControlCas~Osteporosi, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ Osteporosi, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##              coef exp(coef) se(coef)    z       p
## Osteporosi1 2.01      7.47    0.435 4.62 3.8e-06
```

```
##
## Likelihood ratio test=22.9  on 1 df, p=1.67e-06, n=125
```

```
(mod_HiperTiroidisme=clogistic(ControlCas~HiperTiroidisme,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ HiperTiroidisme, strata =
strata(MatchCC),
##     data = datos)
##
##
##
##
##                   coef exp(coef) se(coef)    z     p
## HiperTiroidisme1 1.67      5.33    0.764 2.19 0.028
##
## Likelihood ratio test=4.65  on 1 df, p=0.031, n=35
```

```
(mod_Malnutricio=clogistic(ControlCas~Malnutricio, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ Malnutricio, strata =
strata(MatchCC),
##     data = datos)
##
##
##
##
##               coef exp(coef) se(coef)    z     p
## Malnutricio1 2.48        12     1.15 2.15 0.031
##
## Likelihood ratio test=5.6  on 1 df, p=0.0179, n=20
```

```
(mod_CountActualGE4=clogistic(ControlCas~CountActualGE4, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ CountActualGE4, strata =
strata(MatchCC),
##     data = datos)
##
##
##
##
##                 coef exp(coef) se(coef)    z       p
## CountActualGE4  1.5      4.49     0.23 6.55 5.9e-11
```

```
##
## Likelihood ratio test=50  on 1 df, p=1.58e-12, n=590
```

```
(mod_CortInh=clogistic(ControlCas~CortInh, strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ CortInh, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##           coef exp(coef) se(coef)    z      p
## CortInh1 0.875       2.4    0.327 2.68 0.0073
##
## Likelihood ratio test=6.52  on 1 df, p=0.0107, n=200
```

```
(mod_CortSist=clogistic(ControlCas~CortSist, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ CortSist, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##           coef exp(coef) se(coef)    z     p
## CortSist1  1.2      3.33    0.606 1.99 0.047
##
## Likelihood ratio test=3.61  on 1 df, p=0.0573, n=55
```

```
(mod_ADepreISRS=clogistic(ControlCas~ADepreISRS, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ ADepreISRS, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##             coef exp(coef) se(coef)    z       p
## ADepreISRS1 1.64      5.15    0.281 5.83 5.4e-09
##
## Likelihood ratio test=35.1  on 1 df, p=3.12e-09, n=285
```

```
(mod_ADepreISRSDias=clogistic(ControlCas~ADepreISRSDias, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ ADepreISRSDias, strata =
strata(MatchCC),
##     data = datos)
##
##
##
##
##                   coef exp(coef) se(coef)    z      p
## ADepreISRSDias 0.00066         1 0.000247 2.67 0.0076
##
## Likelihood ratio test=6.97  on 1 df, p=0.00828, n=285
```

```
(mod_insulina=clogistic(ControlCas~insulina, strata(MatchCC),
data=datos))#No Significatiu
```

```
##
## Call:
## clogistic(formula = ControlCas ~ insulina, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##            coef exp(coef) se(coef)    z     p
## insulina1 0.733      2.08      0.4 1.84 0.066
##
## Likelihood ratio test=3.09  on 1 df, p=0.0789, n=140
```

```
(mod_insulinaDias=clogistic(ControlCas~insulinaDias, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ insulinaDias, strata =
strata(MatchCC),
##     data = datos)
##
##
##
##
##                  coef exp(coef) se(coef)    z     p
## insulinaDias 0.00121         1 0.000474 2.56 0.011
##
## Likelihood ratio test=6.48  on 1 df, p=0.0109, n=140
```

```
(mod_H_SN=clogistic(ControlCas~H_SN, strata(MatchCC), data=datos))
```

```
##
## Call:
```

```
## clogistic(formula = ControlCas ~ H_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##        coef exp(coef) se(coef)    z     p
## H_SN1 0.746      2.11    0.331 2.25 0.024
##
## Likelihood ratio test=4.69  on 1 df, p=0.0303, n=200
```

```
(mod_N_SN=clogistic(ControlCas~N_SN, strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##       coef exp(coef) se(coef)    z       p
## N_SN1 1.46      4.32    0.227 6.46 1.1e-10
##
## Likelihood ratio test=48.4  on 1 df, p=3.54e-12, n=620
```

```
(mod_N06A_SN=clogistic(ControlCas~N06A_SN, strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06A_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##          coef exp(coef) se(coef)    z       p
## N06A_SN1 1.52      4.58    0.239 6.38 1.8e-10
##
## Likelihood ratio test=41.8  on 1 df, p=1.04e-10, n=400
```

```
(mod_N06AA09_SN=clogistic(ControlCas~N06AA09_SN, strata(MatchCC),
data=datos))#No Significatiu
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AA09_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
```

```
##
##              coef exp(coef) se(coef)      z   p
## N06AA09_SN1 -0.56     0.571     1.07 -0.523 0.6
##
## Likelihood ratio test=0.31  on 1 df, p=0.575, n=40
```

```
(mod_N06AB03_SN=clogistic(ControlCas~N06AB03_SN, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AB03_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##             coef exp(coef) se(coef)    z     p
## N06AB03_SN1 1.39         4    0.632 2.19 0.028
##
## Likelihood ratio test=4.46  on 1 df, p=0.0346, n=50
```

```
(mod_N06AB04_SN=clogistic(ControlCas~N06AB04_SN, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AB04_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##             coef exp(coef) se(coef)   z     p
## N06AB04_SN1  1.5       4.5    0.486 3.1 0.002
##
## Likelihood ratio test=9.03  on 1 df, p=0.00265, n=85
```

```
(mod_N06AB05_SN=clogistic(ControlCas~N06AB05_SN, strata(MatchCC),
data=datos))#No Significatiu
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AB05_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##              coef exp(coef) se(coef)    z    p
## N06AB05_SN1 0.718      2.05    0.511 1.41 0.16
```

```
##
## Likelihood ratio test=1.81  on 1 df, p=0.178, n=85
```

```
(mod_N06AB06_SN=clogistic(ControlCas~N06AB06_SN, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AB06_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##              coef exp(coef) se(coef)    z     p
## N06AB06_SN1 1.27      3.56    0.506 2.51 0.012
##
## Likelihood ratio test=5.92  on 1 df, p=0.015, n=80
```

```
(mod_N06AB10_SN=clogistic(ControlCas~N06AB10_SN, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AB10_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##              coef exp(coef) se(coef)    z     p
## N06AB10_SN1 1.16       3.2    0.474 2.45 0.014
##
## Likelihood ratio test=5.48  on 1 df, p=0.0192, n=90
```

```
(mod_N06AX03_SN=clogistic(ControlCas~N06AX03_SN, strata(MatchCC),
data=datos))#No Significatiu
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AX03_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##               coef exp(coef) se(coef)     z   p
## N06AX03_SN1 0.288      1.33     1.15 0.249 0.8
##
## Likelihood ratio test=0.06  on 1 df, p=0.808, n=20
```

```r
(mod_N06AX05_SN=clogistic(ControlCas~N06AX05_SN, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AX05_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##              coef exp(coef) se(coef)    z     p
## N06AX05_SN1 1.16       3.2    0.474 2.45 0.014
##
## Likelihood ratio test=5.48  on 1 df, p=0.0192, n=90
```

```r
(mod_N06AX11_SN=clogistic(ControlCas~N06AX11_SN, strata(MatchCC),
data=datos))#No significatiu
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AX11_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##              coef exp(coef) se(coef)     z    p
## N06AX11_SN1 0.47       1.6    0.837 0.562 0.57
##
## Likelihood ratio test=0.29  on 1 df, p=0.588, n=35
```

```r
(mod_N06AX16_SN=clogistic(ControlCas~N06AX16_SN, strata(MatchCC),
data=datos))#No Significatiu
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AX16_SN, strata = strata(MatchCC),
##     data = datos)
##
##
##
##
##              coef exp(coef) se(coef)    z     p
## N06AX16_SN1 1.12      3.05    0.611 1.83 0.068
##
## Likelihood ratio test=3.08  on 1 df, p=0.0792, n=55
```

```r
#Els models que no estan indicats son significatius

#S'hauria de fer una taula amb caoeficients i p-valors?
```

Model ajustat Per saber quines variables afegim al nostre model ajustat mirem la taula descriptiva entre els dos grups i afegim aquelles variables que hi hagui més diferència entre els dos grups. En el nostre cas, aquestes variables són: Fractura, densitometries, osteporosi i ContActualGE4 (aquelles variables que el p-valor és més petit que 0.001) tot i que per fer el model ajustat només introduim Fractura i Osteporosi.

```
(mod_Smoker=clogistic(ControlCas~Smoker+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ Smoker + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##              coef exp(coef) se(coef)    z       p
## Smoker1     0.93      2.53    0.595 1.56 1.2e-01
## Smoker2     2.10      8.15    0.838 2.50 1.2e-02
## Fractura1   5.30    201.18    1.013 5.24 1.6e-07
## Osteporosi1 1.54      4.66    0.549 2.80 5.1e-03
##
## Likelihood ratio test=183  on 4 df, p=0, n=435
```

```
(mod_Fractura=clogistic(ControlCas~Fractura+Osteporosi, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ Fractura + Osteporosi, strata =
strata(MatchCC),
##     data = datos)
##
##
##
##
##              coef exp(coef) se(coef)    z       p
## Fractura1   5.28    197.21    1.010 5.23 1.7e-07
## Osteporosi1 1.54      4.66    0.549 2.80 5.1e-03
##
## Likelihood ratio test=174  on 2 df, p=0, n=345
```

```
(mod_tipus_diabetis=clogistic(ControlCas~tipus_diabetis+Fractura+Osteporo
si, strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ tipus_diabetis + Fractura +
##     Osteporosi, strata = strata(MatchCC), data = datos)
```

```
##
##
##
##
##                   coef exp(coef) se(coef)       z       p
## tipus_diabetis1 -7.816  4.03e-04  145.230 -0.0538 9.6e-01
## tipus_diabetis2  0.978  2.66e+00    0.289  3.3837 7.2e-04
## Fractura1        5.386  2.18e+02    1.017  5.2939 1.2e-07
## Osteporosi1      1.703  5.49e+00    0.554  3.0719 2.1e-03
##
## Likelihood ratio test=185  on 4 df, p=0, n=590
```

```
(mod_Densitometries=clogistic(ControlCas~Densitometries+Fractura+Osteporo
si, strata(MatchCC), data=datos))#No Significatiu
```

```
##
## Call:
## clogistic(formula = ControlCas ~ Densitometries + Fractura +
##     Osteporosi, strata = strata(MatchCC), data = datos)
##
##
##
##
##                   coef exp(coef) se(coef)      z       p
## Densitometries1 11.24  75991.18   136.32 0.0824 9.3e-01
## Fractura1        5.20    180.91     1.01 5.1387 2.8e-07
## Osteporosi1      1.53      4.63     0.55 2.7856 5.3e-03
##
## Likelihood ratio test=177  on 3 df, p=0, n=350
```

```
(mod_Osteporosi=clogistic(ControlCas~Osteporosi+Fractura,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ Osteporosi + Fractura, strata =
strata(MatchCC),
##     data = datos)
##
##
##
##
##              coef exp(coef) se(coef)    z       p
## Osteporosi1 1.54      4.66    0.549 2.80 5.1e-03
## Fractura1   5.28    197.21    1.010 5.23 1.7e-07
##
## Likelihood ratio test=174  on 2 df, p=0, n=345
```

```
(mod_HiperTiroidisme=clogistic(ControlCas~HiperTiroidisme+Fractura+Ostepo
rosi, strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ HiperTiroidisme + Fractura +
##     Osteporosi, strata = strata(MatchCC), data = datos)
##
##
##
##
##                   coef exp(coef) se(coef)     z       p
## HiperTiroidisme1 0.91      2.49    1.225 0.744 4.6e-01
## Fractura1        5.27    194.17    1.011 5.214 1.9e-07
## Osteporosi1      1.56      4.76    0.552 2.830 4.7e-03
##
## Likelihood ratio test=174  on 3 df, p=0, n=355
```

```
(mod_Malnutricio=clogistic(ControlCas~Malnutricio+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ Malnutricio + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##              coef exp(coef) se(coef)   z       p
## Malnutricio1 1.40      4.07    1.403 1.0 3.2e-01
## Fractura1    5.26    192.37    1.011 5.2 1.9e-07
## Osteporosi1  1.54      4.65    0.549 2.8 5.1e-03
##
## Likelihood ratio test=174  on 3 df, p=0, n=355
```

```
(mod_CountActualGE4=clogistic(ControlCas~CountActualGE4+Fractura+Osteporo
si, strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ CountActualGE4 + Fractura +
##     Osteporosi, strata = strata(MatchCC), data = datos)
##
##
##
##
##                coef exp(coef) se(coef)    z       p
## CountActualGE4 1.10      3.01    0.282 3.90 9.5e-05
## Fractura1      5.07    159.52    1.018 4.98 6.3e-07
## Osteporosi1    1.71      5.56    0.570 3.01 2.6e-03
##
## Likelihood ratio test=190  on 3 df, p=0, n=630
```

```
(mod_CortInh=clogistic(ControlCas~CortInh+Fractura+Osteporosi,
strata(MatchCC), data=datos))

##
## Call:
## clogistic(formula = ControlCas ~ CortInh + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##             coef exp(coef) se(coef)    z       p
## CortInh1    1.01      2.74    0.426 2.37 1.8e-02
## Fractura1   5.32    203.56    1.012 5.25 1.5e-07
## Osteporosi1 1.62      5.05    0.553 2.93 3.4e-03
##
## Likelihood ratio test=179  on 3 df, p=0, n=445

(mod_CortSist=clogistic(ControlCas~CortSist+Fractura+Osteporosi,
strata(MatchCC), data=datos))

##
## Call:
## clogistic(formula = ControlCas ~ CortSist + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##             coef exp(coef) se(coef)    z       p
## CortSist1   1.45      4.26    0.705 2.06 4.0e-02
## Fractura1   5.30    200.53    1.011 5.24 1.6e-07
## Osteporosi1 1.58      4.87    0.552 2.87 4.1e-03
##
## Likelihood ratio test=177  on 3 df, p=0, n=380

(mod_ADepreISRS=clogistic(ControlCas~ADepreISRS+Fractura+Osteporosi,
strata(MatchCC), data=datos))

##
## Call:
## clogistic(formula = ControlCas ~ ADepreISRS + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##             coef exp(coef) se(coef)    z       p
## ADepreISRS1 1.57      4.78    0.374 4.19 2.8e-05
## Fractura1   5.18    178.40    1.015 5.11 3.3e-07
## Osteporosi1 1.59      4.88    0.558 2.84 4.5e-03
```

```
##
## Likelihood ratio test=191  on 3 df, p=0, n=485
```

```
(mod_ADepreISRSDias=clogistic(ControlCas~ADepreISRSDias+Fractura+Osteporo
si, strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ ADepreISRSDias + Fractura +
##     Osteporosi, strata = strata(MatchCC), data = datos)
##
##
##
##
##                    coef exp(coef) se(coef)     z       p
## ADepreISRSDias 0.00023      1.00 0.000313 0.735 4.6e-01
## Fractura1      5.24451    189.52 1.011430 5.185 2.2e-07
## Osteporosi1    1.54029      4.67 0.549143 2.805 5.0e-03
##
## Likelihood ratio test=174  on 3 df, p=0, n=485
```

```
(mod_insulina=clogistic(ControlCas~insulina+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ insulina + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##              coef exp(coef) se(coef)    z       p
## insulina1   1.11      3.04    0.498 2.23 2.5e-02
## Fractura1   5.32    205.24    1.012 5.26 1.4e-07
## Osteporosi1 1.54      4.66    0.549 2.80 5.1e-03
##
## Likelihood ratio test=178  on 3 df, p=0, n=425
```

```
(mod_insulinaDias=clogistic(ControlCas~insulinaDias+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ insulinaDias + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##                  coef exp(coef) se(coef)    z       p
```

```
## insulinaDias 0.00142      1.00 0.000569 2.49 1.3e-02
## Fractura1    5.31038    202.43 1.011576 5.25 1.5e-07
## Osteporosi1  1.53850      4.66 0.549449 2.80 5.1e-03
##
## Likelihood ratio test=180  on 3 df, p=0, n=425
```

```
(mod_H_SN=clogistic(ControlCas~H_SN+Fractura+Osteporosi, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ H_SN + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##              coef exp(coef) se(coef)    z       p
## H_SN1       0.728      2.07    0.414 1.76 7.9e-02
## Fractura1   5.280    196.42    1.011 5.22 1.8e-07
## Osteporosi1 1.592      4.91    0.551 2.89 3.9e-03
##
## Likelihood ratio test=176  on 3 df, p=0, n=460
```

```
(mod_N_SN=clogistic(ControlCas~N_SN+Fractura+Osteporosi, strata(MatchCC),
data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N_SN + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##             coef exp(coef) se(coef)    z       p
## N_SN1       1.18      3.27    0.283 4.18 2.9e-05
## Fractura1   5.12    167.01    1.016 5.04 4.7e-07
## Osteporosi1 1.54      4.65    0.577 2.67 7.7e-03
##
## Likelihood ratio test=193  on 3 df, p=0, n=640
```

```
(mod_N06A_SN=clogistic(ControlCas~N06A_SN+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06A_SN + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
```

```
##
##
##             coef exp(coef) se(coef)    z       p
## N06A_SN1    1.17      3.21    0.317 3.67 2.4e-04
## Fractura1   5.07    158.89    1.013 5.00 5.7e-07
## Osteporosi1 1.59      4.90    0.566 2.81 5.0e-03
##
## Likelihood ratio test=187  on 3 df, p=0, n=525
```

```
(mod_N06AA09_SN=clogistic(ControlCas~N06AA09_SN+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AA09_SN + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##              coef exp(coef) se(coef)      z       p
## N06AA09_SN1 -1.68     0.186     2.45 -0.688 4.9e-01
## Fractura1    5.34   209.123     1.03  5.172 2.3e-07
## Osteporosi1  1.54     4.656     0.55  2.798 5.1e-03
##
## Likelihood ratio test=174  on 3 df, p=0, n=355
```

```
(mod_N06AB03_SN=clogistic(ControlCas~N06AB03_SN+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AB03_SN + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##             coef exp(coef) se(coef)    z       p
## N06AB03_SN1 1.10      3.02    0.908 1.22 2.2e-01
## Fractura1   5.26    192.70    1.011 5.21 1.9e-07
## Osteporosi1 1.57      4.80    0.551 2.85 4.4e-03
##
## Likelihood ratio test=175  on 3 df, p=0, n=365
```

```
(mod_N06AB04_SN=clogistic(ControlCas~N06AB04_SN+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AB04_SN + Fractura + Osteporosi,
```

```
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##              coef exp(coef) se(coef)     z       p
## N06AB04_SN1 0.411      1.51    0.783 0.526 6.0e-01
## Fractura1   5.241    188.90    1.013 5.176 2.3e-07
## Osteporosi1 1.547      4.70    0.549 2.815 4.9e-03
##
## Likelihood ratio test=174  on 3 df, p=0, n=380
```

```
(mod_N06AB05_SN=clogistic(ControlCas~N06AB05_SN+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AB05_SN + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##              coef exp(coef) se(coef)     z       p
## N06AB05_SN1 0.539      1.71    0.679 0.794 4.3e-01
## Fractura1   5.274    195.22    1.010 5.220 1.8e-07
## Osteporosi1 1.538      4.66    0.549 2.801 5.1e-03
##
## Likelihood ratio test=174  on 3 df, p=0, n=395
```

```
(mod_N06AB06_SN=clogistic(ControlCas~N06AB06_SN+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AB06_SN + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##             coef exp(coef) se(coef)    z       p
## N06AB06_SN1 1.51      4.52    0.599 2.52 1.2e-02
## Fractura1   5.31    201.65    1.011 5.25 1.5e-07
## Osteporosi1 1.49      4.45    0.559 2.67 7.6e-03
##
## Likelihood ratio test=180  on 3 df, p=0, n=395
```

```
(mod_N06AB10_SN=clogistic(ControlCas~N06AB10_SN+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AB10_SN + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##              coef exp(coef) se(coef)    z       p
## N06AB10_SN1 1.56      4.74    0.650 2.40 1.7e-02
## Fractura1   5.33    206.70    1.014 5.26 1.5e-07
## Osteporosi1 1.54      4.68    0.551 2.80 5.1e-03
##
## Likelihood ratio test=179  on 3 df, p=0, n=390
```

```
(mod_N06AX03_SN=clogistic(ControlCas~N06AX03_SN+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AX03_SN + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##               coef exp(coef) se(coef)      z       p
## N06AX03_SN1 -2.53      0.08    3.276 -0.771 4.4e-01
## Fractura1    5.33    206.81    1.023  5.213 1.9e-07
## Osteporosi1  1.53      4.63    0.548  2.796 5.2e-03
##
## Likelihood ratio test=174  on 3 df, p=0, n=355
```

```
(mod_N06AX05_SN=clogistic(ControlCas~N06AX05_SN+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AX05_SN + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##               coef exp(coef) se(coef)      z       p
## N06AX05_SN1 -0.431      0.65    0.916 -0.471 6.4e-01
## Fractura1    5.355    211.56    1.026  5.217 1.8e-07
## Osteporosi1  1.529      4.61    0.549  2.784 5.4e-03
##
## Likelihood ratio test=174  on 3 df, p=0, n=385
```

```
(mod_N06AX11_SN=clogistic(ControlCas~N06AX11_SN+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AX11_SN + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##               coef exp(coef) se(coef)      z       p
## N06AX11_SN1 -1.54     0.215     1.93 -0.796 4.3e-01
## Fractura1    5.41   223.297     1.05  5.142 2.7e-07
## Osteporosi1  1.54     4.656     0.55  2.796 5.2e-03
##
## Likelihood ratio test=174  on 3 df, p=0, n=360
```

```
(mod_N06AX16_SN=clogistic(ControlCas~N06AX16_SN+Fractura+Osteporosi,
strata(MatchCC), data=datos))
```

```
##
## Call:
## clogistic(formula = ControlCas ~ N06AX16_SN + Fractura + Osteporosi,
##     strata = strata(MatchCC), data = datos)
##
##
##
##
##               coef exp(coef) se(coef)     z       p
## N06AX16_SN1 0.791      2.21    0.862 0.918 3.6e-01
## Fractura1   5.275    195.39    1.010 5.220 1.8e-07
## Osteporosi1 1.557      4.75    0.550 2.830 4.7e-03
##
## Likelihood ratio test=174  on 3 df, p=0, n=370
```

Hi ha més casos amb osteoporosi i en fractures que els controls, per tant seria important ajustar el model per fractura.

Si comparem els estimadors de beta del model cru amb l'ajustat si hi ha més del 20% estan actuant com a factors de confusió.