Data Challenge

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## R Markdown

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When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

options(repos = c(CRAN = "https://cran.rstudio.com/"))

install.packages("tidyverse")

## Installing package into 'C:/Users/Lbash/AppData/Local/R/win-library/4.2'  
## (as 'lib' is unspecified)

## package 'tidyverse' successfully unpacked and MD5 sums checked  
##   
## The downloaded binary packages are in  
## C:\Users\Lbash\AppData\Local\Temp\Rtmp0KDEyQ\downloaded\_packages

install.packages("readr")

## Installing package into 'C:/Users/Lbash/AppData/Local/R/win-library/4.2'  
## (as 'lib' is unspecified)

## package 'readr' successfully unpacked and MD5 sums checked  
##   
## The downloaded binary packages are in  
## C:\Users\Lbash\AppData\Local\Temp\Rtmp0KDEyQ\downloaded\_packages

install.packages("ggplot2")

## Installing package into 'C:/Users/Lbash/AppData/Local/R/win-library/4.2'  
## (as 'lib' is unspecified)

## package 'ggplot2' successfully unpacked and MD5 sums checked  
##   
## The downloaded binary packages are in  
## C:\Users\Lbash\AppData\Local\Temp\Rtmp0KDEyQ\downloaded\_packages

install.packages("corrplot")

## Installing package into 'C:/Users/Lbash/AppData/Local/R/win-library/4.2'  
## (as 'lib' is unspecified)

## package 'corrplot' successfully unpacked and MD5 sums checked  
##   
## The downloaded binary packages are in  
## C:\Users\Lbash\AppData\Local\Temp\Rtmp0KDEyQ\downloaded\_packages

install.packages("caret")

## Installing package into 'C:/Users/Lbash/AppData/Local/R/win-library/4.2'  
## (as 'lib' is unspecified)

## package 'caret' successfully unpacked and MD5 sums checked  
##   
## The downloaded binary packages are in  
## C:\Users\Lbash\AppData\Local\Temp\Rtmp0KDEyQ\downloaded\_packages

install.packages("randomForest")

## Installing package into 'C:/Users/Lbash/AppData/Local/R/win-library/4.2'  
## (as 'lib' is unspecified)

## package 'randomForest' successfully unpacked and MD5 sums checked  
##   
## The downloaded binary packages are in  
## C:\Users\Lbash\AppData\Local\Temp\Rtmp0KDEyQ\downloaded\_packages

install.packages("xgboost")

## Installing package into 'C:/Users/Lbash/AppData/Local/R/win-library/4.2'  
## (as 'lib' is unspecified)

## package 'xgboost' successfully unpacked and MD5 sums checked  
##   
## The downloaded binary packages are in  
## C:\Users\Lbash\AppData\Local\Temp\Rtmp0KDEyQ\downloaded\_packages

install.packages("pROC")

## Installing package into 'C:/Users/Lbash/AppData/Local/R/win-library/4.2'  
## (as 'lib' is unspecified)

## package 'pROC' successfully unpacked and MD5 sums checked  
##   
## The downloaded binary packages are in  
## C:\Users\Lbash\AppData\Local\Temp\Rtmp0KDEyQ\downloaded\_packages

install.packages("sklearn.metrics")

## Installing package into 'C:/Users/Lbash/AppData/Local/R/win-library/4.2'  
## (as 'lib' is unspecified)

## Warning: package 'sklearn.metrics' is not available for this version of R  
##   
## A version of this package for your version of R might be available elsewhere,  
## see the ideas at  
## https://cran.r-project.org/doc/manuals/r-patched/R-admin.html#Installing-packages

# 1. Preprocessing and EDA  
# A. Read the dataset  
library(readr)  
champs\_data <- read\_csv("C:\\Users\\Lbash\\Downloads\\champs.csv")

## Rows: 444 Columns: 381  
## ── Column specification ────────────────────────────────────────────────────────  
## Delimiter: ","  
## chr (140): packet\_version\_id, id\_ver\_nmb, champs\_id, dp\_004, dp\_012, dp\_013,...  
## dbl (149): dp\_001, dp\_002, dp\_003, dp\_005, dp\_006, dp\_007, dp\_008, dp\_009, d...  
## lgl (92): dp\_113, dp\_025, dp\_031, dp\_035, dp\_041, dp\_043, dp\_045, dp\_051, d...  
##   
## ℹ Use `spec()` to retrieve the full column specification for this data.  
## ℹ Specify the column types or set `show\_col\_types = FALSE` to quiet this message.

# B. Get the number of rows and columns  
nrow(champs\_data)

## [1] 444

ncol(champs\_data)

## [1] 381

# C. Enumerate the columns  
names(champs\_data)

## [1] "packet\_version\_id"   
## [2] "id\_ver\_nmb"   
## [3] "champs\_id"   
## [4] "dp\_001"   
## [5] "dp\_002"   
## [6] "dp\_003"   
## [7] "dp\_004"   
## [8] "dp\_005"   
## [9] "dp\_006"   
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## [376] "dpf\_012\_\_\_ch01424"   
## [377] "dpf\_012\_\_\_ch01875"   
## [378] "dpf\_012\_\_\_ch00010"   
## [379] "dpf\_013"   
## [380] "dpf\_014"   
## [381] "crf\_060302\_decode\_panel\_feedback\_form\_complete"

# D. Rename the columns  
library(tidyverse)

## ── Attaching core tidyverse packages ──────────────────────── tidyverse 2.0.0 ──  
## ✔ dplyr 1.1.1 ✔ purrr 1.0.1  
## ✔ forcats 1.0.0 ✔ stringr 1.5.0  
## ✔ ggplot2 3.5.1 ✔ tibble 3.2.1  
## ✔ lubridate 1.9.2 ✔ tidyr 1.3.0  
## ── Conflicts ────────────────────────────────────────── tidyverse\_conflicts() ──  
## ✖ dplyr::filter() masks stats::filter()  
## ✖ dplyr::lag() masks stats::lag()  
## ℹ Use the ]8;;http://conflicted.r-lib.org/conflicted package]8;; to force all conflicts to become errors

champs\_data <- champs\_data %>%  
 rename(case\_type = dp\_013,  
 Underlying\_Cause = dp\_108,  
 maternal\_condition = dp\_118)  
  
# E. Rename the values  
champs\_data$case\_type <- recode(champs\_data$case\_type,  
 "CH00716" = "Stillbirth",  
 "CH01404" = "Death in the first 24 hours",  
 "CH01405" = "Early Neonate (1 to 6 days)",  
 "CH01406" = "Late Neonate (7 to 27 days)",  
 "CH00718" = "Infant (28 days to less than 12 months)",  
 "CH00719" = "Child (12 months to less than 60 months)")  
  
# F. Show the proportion of null values in each column  
sapply(champs\_data, function(x) sum(is.na(x)) / length(x))

## packet\_version\_id   
## 0.000000000   
## id\_ver\_nmb   
## 0.000000000   
## champs\_id   
## 0.000000000   
## dp\_001   
## 0.000000000   
## dp\_002   
## 0.000000000   
## dp\_003   
## 0.000000000   
## dp\_004   
## 0.128378378   
## dp\_005   
## 0.168918919   
## dp\_006   
## 0.168918919   
## dp\_007   
## 0.184684685   
## dp\_008   
## 0.191441441   
## dp\_009   
## 0.263513514   
## dp\_010   
## 0.367117117   
## dp\_011   
## 0.560810811   
## dp\_012   
## 0.000000000   
## case\_type   
## 0.000000000   
## dp\_153   
## 0.461711712   
## dp\_016   
## 0.000000000   
## dp\_017   
## 0.936936937   
## dp\_154   
## 0.972972973   
## dp\_155   
## 0.063063063   
## dp\_014   
## 0.993243243   
## Underlying\_Cause   
## 0.000000000   
## dp\_109   
## 0.074324324   
## dp\_110   
## 0.930180180   
## dp\_111   
## 0.997747748   
## dp\_112   
## 0.981981982   
## dp\_113   
## 1.000000000   
## dp\_114   
## 0.988738739   
## dp\_115   
## 0.997747748   
## dp\_116   
## 0.945945946   
## dp\_117   
## 0.945945946   
## dp\_157   
## 0.200450450   
## dp\_018   
## 0.630630631   
## dp\_019   
## 0.635135135   
## dp\_020   
## 0.806306306   
## dp\_021   
## 0.995495495   
## dp\_022   
## 0.914414414   
## dp\_023   
## 0.995495495   
## dp\_024   
## 0.959459459   
## dp\_025   
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## dp\_026   
## 0.957207207   
## dp\_027   
## 0.957207207   
## dp\_156   
## 0.684684685   
## dp\_028   
## 0.795045045   
## dp\_029   
## 0.813063063   
## dp\_030   
## 0.876126126   
## dp\_031   
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## 0.952702703   
## dp\_033   
## 0.997747748   
## dp\_034   
## 0.986486486   
## dp\_035   
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## dp\_036   
## 0.977477477   
## dp\_037   
## 0.977477477   
## dp\_038   
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## dp\_039   
## 0.885135135   
## dp\_040   
## 0.939189189   
## dp\_041   
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## dp\_042   
## 0.972972973   
## dp\_043   
## 1.000000000   
## dp\_044   
## 0.993243243   
## dp\_045   
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## dp\_046   
## 0.986486486   
## dp\_047   
## 0.986486486   
## dp\_048   
## 0.936936937   
## dp\_049   
## 0.943693694   
## dp\_050   
## 0.979729730   
## dp\_051   
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## dp\_052   
## 0.988738739   
## dp\_053   
## 1.000000000   
## dp\_054   
## 0.997747748   
## dp\_055   
## 1.000000000   
## dp\_056   
## 0.990990991   
## dp\_057   
## 0.990990991   
## dp\_058   
## 0.972972973   
## dp\_059   
## 0.977477477   
## dp\_060   
## 0.997747748   
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## dp\_064   
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## dp\_065   
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## dp\_067   
## 0.995495495   
## dp\_068   
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## dp\_069   
## 0.990990991   
## dp\_070   
## 1.000000000   
## dp\_071   
## 1.000000000   
## dp\_072   
## 1.000000000   
## dp\_073   
## 1.000000000   
## dp\_074   
## 1.000000000   
## dp\_075   
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## dp\_076   
## 1.000000000   
## dp\_077   
## 1.000000000   
## dp\_078   
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## dp\_079   
## 0.997747748   
## dp\_080   
## 1.000000000   
## dp\_081   
## 1.000000000   
## dp\_082   
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## dp\_083   
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## dp\_102   
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## dp\_103   
## 1.000000000   
## dp\_104   
## 1.000000000   
## dp\_105   
## 1.000000000   
## dp\_106   
## 1.000000000   
## dp\_107   
## 1.000000000   
## maternal\_condition   
## 0.556306306   
## dp\_119   
## 0.581081081   
## dp\_158   
## 0.621621622   
## dp\_162   
## 0.556306306   
## dp\_120   
## 0.617117117   
## dp\_121   
## 0.846846847   
## dp\_122   
## 0.950450450   
## dp\_123   
## 0.995495495   
## dp\_124   
## 0.454954955   
## dp\_125   
## 0.801801802   
## dp\_126   
## 0.948198198   
## dp\_127   
## 0.993243243   
## dp\_128   
## 1.000000000   
## dp\_129   
## 1.000000000   
## dp\_130   
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## dp\_131   
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## dp\_132   
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## dp\_133   
## 1.000000000   
## dp\_134   
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## dp\_137   
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## dp\_138   
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## dp\_135   
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## dp\_136   
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## dp\_139   
## 0.202702703   
## dp\_140   
## 1.000000000   
## dp\_141   
## 1.000000000   
## dp\_142   
## 0.076576577   
## dp\_143   
## 0.984234234   
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## dp\_159\_\_\_ch01390   
## 0.000000000   
## dp\_159\_\_\_ch01391   
## 0.000000000   
## dp\_159\_\_\_ch01392   
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## dp\_159\_\_\_ch01393   
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## dp\_159\_\_\_ch01394   
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## dp\_159\_\_\_ch01398   
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## dp\_159\_\_\_ch01399   
## 0.000000000   
## dp\_159\_\_\_ch01400   
## 0.000000000   
## dp\_159\_\_\_ch01401   
## 0.000000000   
## dp\_159\_\_\_ch01402   
## 0.000000000   
## dp\_159\_\_\_ch01403   
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## dp\_160   
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## dp\_144\_\_\_ch01389   
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## dp\_144\_\_\_ch01390   
## 0.000000000   
## dp\_144\_\_\_ch01391   
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## dp\_144\_\_\_ch01392   
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## dp\_144\_\_\_ch01393   
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## dp\_144\_\_\_ch01398   
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## dp\_144\_\_\_ch01399   
## 0.000000000   
## dp\_144\_\_\_ch01400   
## 0.000000000   
## dp\_144\_\_\_ch01401   
## 0.000000000   
## dp\_144\_\_\_ch01402   
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## dp\_144\_\_\_ch01403   
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## dp\_145\_\_\_ch01389   
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## dp\_145\_\_\_ch01390   
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## dp\_145\_\_\_ch01392   
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## dp\_145\_\_\_ch01399   
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## dp\_145\_\_\_ch01400   
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## dp\_145\_\_\_ch01401   
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## dp\_145\_\_\_ch01402   
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## dp\_145\_\_\_ch01403   
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## dp\_146\_\_\_ch01389   
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## dp\_146\_\_\_ch01401   
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## dp\_146\_\_\_ch01402   
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## dp\_147\_\_\_ch01399   
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## dp\_147\_\_\_ch01401   
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## dp\_147\_\_\_ch01402   
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## dp\_148\_\_\_ch01398   
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## dp\_148\_\_\_ch01399   
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## dp\_148\_\_\_ch01400   
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## dp\_148\_\_\_ch01401   
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## dp\_148\_\_\_ch01402   
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## dp\_148\_\_\_ch01403   
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## dp\_149\_\_\_ch01391   
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## dp\_149\_\_\_ch01392   
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## dp\_149\_\_\_ch01393   
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## dp\_149\_\_\_ch01396   
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## dp\_149\_\_\_ch01397   
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## dp\_149\_\_\_ch01398   
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## dp\_149\_\_\_ch01399   
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## dp\_149\_\_\_ch01400   
## 0.000000000   
## dp\_149\_\_\_ch01401   
## 0.000000000   
## dp\_149\_\_\_ch01402   
## 0.000000000   
## dp\_149\_\_\_ch01403   
## 0.000000000   
## dp\_150   
## 0.887387387   
## dp\_151   
## 0.000000000   
## dp\_163\_\_\_ch01885   
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## dp\_163\_\_\_ch01887   
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## dp\_163\_\_\_ch01888   
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## dp\_163\_\_\_ch01889   
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## dp\_163\_\_\_ch01890   
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## dp\_163\_\_\_ch01891   
## 0.000000000   
## dp\_163\_\_\_ch01892   
## 0.000000000   
## dp\_163\_\_\_ch01893   
## 0.000000000   
## dp\_163\_\_\_ch01894   
## 0.000000000   
## dp\_163\_\_\_ch01895   
## 0.000000000   
## dp\_161   
## 0.844594595   
## dp\_152   
## 0.418918919   
## crf\_080002\_decode\_panel\_form\_complete   
## 0.000000000   
## dpi\_001   
## 0.002252252   
## dpi\_002   
## 0.002252252   
## dpi\_003   
## 0.002252252   
## dpi\_098   
## 0.002252252   
## qualifier\_10   
## 0.018018018   
## modifier\_10   
## 0.966216216   
## dpi\_026   
## 0.632882883   
## qualifier\_01   
## 0.637387387   
## modifier\_01   
## 0.882882883   
## dpi\_034   
## 0.797297297   
## qualifier\_02   
## 0.801801802   
## modifier\_02   
## 0.941441441   
## dpi\_042   
## 0.878378378   
## qualifier\_03   
## 0.880630631   
## modifier\_03   
## 0.981981982   
## dpi\_050   
## 0.936936937   
## qualifier\_04   
## 0.936936937   
## modifier\_04   
## 0.993243243   
## dpi\_058   
## 0.975225225   
## qualifier\_05   
## 0.975225225   
## modifier\_05   
## 0.997747748   
## dpi\_066   
## 0.990990991   
## qualifier\_06   
## 0.990990991   
## modifier\_06   
## 1.000000000   
## dpi\_074   
## 0.997747748   
## qualifier\_07   
## 0.997747748   
## modifier\_07   
## 1.000000000   
## dpi\_082   
## 1.000000000   
## qualifier\_08   
## 1.000000000   
## modifier\_08   
## 1.000000000   
## dpi\_090   
## 1.000000000   
## qualifier\_09   
## 1.000000000   
## modifier\_09   
## 1.000000000   
## dpi\_100   
## 0.560810811   
## dpi\_136   
## 0.921171171   
## qualifier\_11   
## 0.565315315   
## modifier\_11   
## 1.000000000   
## dpi\_102   
## 0.617117117   
## dpi\_137   
## 0.932432432   
## qualifier\_12   
## 0.623873874   
## modifier\_12   
## 0.997747748   
## dpi\_104   
## 0.849099099   
## dpi\_138   
## 0.981981982   
## qualifier\_13   
## 0.849099099   
## modifier\_13   
## 1.000000000   
## dpi\_106   
## 0.950450450   
## dpi\_139   
## 0.995495495   
## qualifier\_14   
## 0.952702703   
## modifier\_14   
## 1.000000000   
## dpi\_108   
## 0.995495495   
## dpi\_140   
## 1.000000000   
## qualifier\_15   
## 0.995495495   
## modifier\_15   
## 1.000000000   
## dpi\_110   
## 0.454954955   
## qualifier\_16   
## 0.463963964   
## modifier\_16   
## 0.995495495   
## dpi\_112   
## 0.801801802   
## qualifier\_17   
## 0.801801802   
## modifier\_17   
## 0.990990991   
## dpi\_114   
## 0.948198198   
## qualifier\_18   
## 0.948198198   
## modifier\_18   
## 0.993243243   
## dpi\_116   
## 0.993243243   
## qualifier\_19   
## 0.993243243   
## modifier\_19   
## 0.997747748   
## dpi\_118   
## 1.000000000   
## qualifier\_20   
## 1.000000000   
## modifier\_20   
## 1.000000000   
## dpi\_120   
## 1.000000000   
## qualifier\_21   
## 1.000000000   
## modifier\_21   
## 1.000000000   
## dpi\_122   
## 1.000000000   
## qualifier\_22   
## 1.000000000   
## modifier\_22   
## 1.000000000   
## dpi\_124   
## 1.000000000   
## qualifier\_23   
## 1.000000000   
## modifier\_23   
## 1.000000000   
## dpi\_126   
## 1.000000000   
## qualifier\_24   
## 1.000000000   
## modifier\_24   
## 1.000000000   
## dpi\_128   
## 1.000000000   
## qualifier\_25   
## 1.000000000   
## modifier\_25   
## 1.000000000   
## crf\_080006\_decode\_panel\_icd10\_form\_complete   
## 0.000000000   
## dpf\_003   
## 0.504504505   
## dpf\_004\_\_\_ch01869   
## 0.000000000   
## dpf\_004\_\_\_ch01870   
## 0.000000000   
## dpf\_004\_\_\_ch01871   
## 0.000000000   
## dpf\_004\_\_\_ch00061   
## 0.000000000   
## dpf\_005   
## 0.993243243   
## dpf\_006   
## 0.590090090   
## dpf\_007   
## 0.590090090   
## dpf\_009   
## 0.590090090   
## dpf\_010   
## 0.644144144   
## dpf\_011   
## 0.590090090   
## dpf\_012\_\_\_ch00038   
## 0.000000000   
## dpf\_012\_\_\_ch00039   
## 0.000000000   
## dpf\_012\_\_\_ch00040   
## 0.000000000   
## dpf\_012\_\_\_ch00041   
## 0.000000000   
## dpf\_012\_\_\_ch00042   
## 0.000000000   
## dpf\_012\_\_\_ch00043   
## 0.000000000   
## dpf\_012\_\_\_ch01424   
## 0.000000000   
## dpf\_012\_\_\_ch01875   
## 0.000000000   
## dpf\_012\_\_\_ch00010   
## 0.000000000   
## dpf\_013   
## 0.590090090   
## dpf\_014   
## 0.599099099   
## crf\_060302\_decode\_panel\_feedback\_form\_complete   
## 0.000000000

# 2. Descriptive Data analysis  
# A. Magnitude and proportion of each infant underlying cause for child death  
table(champs\_data$case\_type)

##   
## Child (12 months to less than 60 months)   
## 42   
## Death in the first 24 hours   
## 69   
## Early Neonate (1 to 6 days)   
## 49   
## Infant (28 days to less than 12 months)   
## 27   
## Late Neonate (7 to 27 days)   
## 18   
## Stillbirth   
## 239

prop.table(table(champs\_data$case\_type))

##   
## Child (12 months to less than 60 months)   
## 0.09459459   
## Death in the first 24 hours   
## 0.15540541   
## Early Neonate (1 to 6 days)   
## 0.11036036   
## Infant (28 days to less than 12 months)   
## 0.06081081   
## Late Neonate (7 to 27 days)   
## 0.04054054   
## Stillbirth   
## 0.53828829

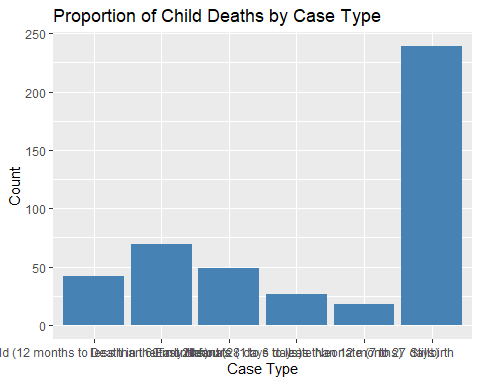
# B. Proportion and magnitude of the maternal factors contributing to child death  
table(champs\_data$maternal\_condition)

##   
## Abruptio placenta   
## 1   
## Abruption placenta   
## 3   
## Antepartum hemorrhage   
## 2   
## Breech presentation   
## 1   
## Chorioamnionitis   
## 2   
## Chronic liver disease   
## 1   
## Cord prolapse   
## 1   
## Eclampsia   
## 9   
## Eclampsia /HELLP Syndrome   
## 1   
## Eclampsia/HELLP   
## 1   
## Fetus affected by antepartum hemorrahge   
## 1   
## Fetus affected by breech presentation   
## 2   
## Fetus affected by cord prolapse   
## 2   
## Fetus affected by gestational hypertensive disorder   
## 1   
## Fetus affected by malpresentation (Face) , malposition and disproportion during labor and delivery   
## 1   
## Fetus affected by malpresentation, breech delivery and extraction   
## 1   
## Fetus affected by malpresentation, malposition and disproportion during labor and delivery   
## 2   
## Fetus affected by maternal hypertensive disorder   
## 1   
## Fetus affected by other and unspecified morphological and functional abnormalities of placenta Placental: dysfunction, infarction   
## 1   
## Fetus affected by placenta previa   
## 1   
## Fetus affected by placenta separation (abruption placenta 50%)   
## 1   
## Fetus affected by placenta separation (Abruption placenta with hypovolemic shock)   
## 1   
## Fetus affected by placenta separation (abruption placenta)   
## 2   
## Fetus affected by placenta separation (Abruption placenta)   
## 2   
## Fetus affected by placenta separation (abruption placentae)   
## 1   
## Fetus affected by placenta separation (Abruption placentae)   
## 1   
## Fetus affected by placental separation and hemorrhage (Abruption placentae)   
## 1   
## Fetus affected by prolapsed cord   
## 1   
## Fetus affected by twin-to-twin placental transfusion syndrome   
## 1   
## Fetus and newborn affected by abruption placentae   
## 1   
## Fetus and newborn affected by breech delivery and extraction   
## 1   
## Fetus and newborn affected by chorioamnionitis   
## 3   
## Fetus and newborn affected by complications of placenta, cord and membranes   
## 1   
## Fetus and newborn affected by disproportion during labor and delivery   
## 1   
## Fetus and newborn affected by disproportion during labor and delivery(due to hydrocephalus)   
## 1   
## Fetus and newborn affected by malpresentation and obstructed labor   
## 1   
## Fetus and newborn affected by maternal diabetes   
## 1   
## Fetus and newborn affected by maternal infectious and parasitic diseases (HIV)   
## 1   
## Fetus and newborn affected by multiple pregnancy   
## 1   
## Fetus and newborn affected by multiple pregnancy: Quadruplet (pregnancy),   
## 1   
## Fetus and newborn affected by multiple pregnancy: Quadruplet pregnancy   
## 1   
## Fetus and newborn affected by multiple pregnancy: Twin pregnancy   
## 2   
## Fetus and newborn affected by multiple pregnancy: Triplets   
## 1   
## Fetus and newborn affected by multiple pregnancy: Twin (pregnancy)   
## 3   
## Fetus and newborn affected by oligohydramnios   
## 1   
## Fetus and newborn affected by other and unspecified morphological and functional abnormalities of placenta   
## 1   
## Fetus and newborn affected by other and unspecified morphological and functional abnormalities of placenta (placenta infarction)   
## 1   
## Fetus and newborn affected by other and unspecified morphological and functional abnormalities of placenta: placental infarction   
## 1   
## Fetus and newborn affected by other forms of placental separation and haemorrhage   
## 2   
## Fetus and newborn affected by other forms of placental separation and hemorrhage   
## 5   
## Fetus and newborn affected by other forms of placental separation and hemorrhage (Abruptio placentae)   
## 1   
## Fetus and newborn affected by other forms of placental separation and hemorrhage (Abruption placenta)   
## 11   
## Fetus and newborn affected by other forms of placental separation and hemorrhage (Abruption placentae)   
## 2   
## Fetus and newborn affected by other forms of placental separation and hemorrhage (Antepartum haemorrhage / placenta praevia)   
## 1   
## Fetus and newborn affected by other forms of placental separation and hemorrhage (Antepartum haemorrhage)   
## 2   
## Fetus and newborn affected by other forms of placental separation and hemorrhage (Antepartum hemorrhage)   
## 1   
## Fetus and newborn affected by other forms of placental separation and hemorrhage: Abruptio placentae   
## 2   
## Fetus and newborn affected by other malpresentation (transverse lie)   
## 1   
## Fetus and newborn affected by other malpresentation, malposition and disproportion during labour and delivery (transverse lie, neglected shoulder presentation)   
## 1   
## Fetus and newborn affected by other malpresentation, malposition, and disproportion during labor and delivery   
## 6   
## Fetus and newborn affected by other specified complications of labour and delivery - prolonged labour   
## 1   
## Fetus and newborn affected by other specified complications of labour and delivery (Uterus rupture) (P03.8)   
## 1   
## Fetus and newborn affected by placenta previa   
## 2   
## Fetus and newborn affected by placental separation and hemorrhage   
## 3   
## Fetus and newborn affected by precipitate delivery, Rapid second stage   
## 1   
## Fetus and newborn affected by premature rupture of membranes   
## 1   
## Fetus and newborn affected by preterm labor   
## 1   
## Fetus and newborn affected by prolapsed cord   
## 2   
## Gestational hypertension disorder   
## 1   
## Maternal sickness: Fetus and newborn affected by unspecified maternal condition   
## 1   
## Newborn affected by preterm labour   
## 1   
## Obstructed labor   
## 1   
## Pre-existing diabetes mellitus, insulin-dependent   
## 1   
## Pre-labor rapture of membrane   
## 1   
## Pre-labour preterm rupture of membranes   
## 1   
## Precipitated labour   
## 1   
## preeclampsia   
## 3   
## Preeclampsia   
## 36   
## Premature & prolonged rupture of membrane   
## 1   
## Premature rupture of membrane   
## 2   
## Premature rupture of membrane onset labor after 24h   
## 1   
## Premature rupture of membrane onset of labour after 24h   
## 1   
## Premature rupture of membranes, onset of labour after 24 hours   
## 2   
## Premature rupture of membranes, unspecified   
## 1   
## Preterm labor   
## 1   
## Preterm labour   
## 2   
## Preterm rupture of membranes   
## 2   
## Prolonged pregnancy   
## 1   
## RH Negative   
## 1   
## Severe preeclampsia   
## 1   
## Twin pregnancy   
## 12   
## Undetermined   
## 2   
## Uterine rupture   
## 3

prop.table(table(champs\_data$maternal\_condition))

##   
## Abruptio placenta   
## 0.005076142   
## Abruption placenta   
## 0.015228426   
## Antepartum hemorrhage   
## 0.010152284   
## Breech presentation   
## 0.005076142   
## Chorioamnionitis   
## 0.010152284   
## Chronic liver disease   
## 0.005076142   
## Cord prolapse   
## 0.005076142   
## Eclampsia   
## 0.045685279   
## Eclampsia /HELLP Syndrome   
## 0.005076142   
## Eclampsia/HELLP   
## 0.005076142   
## Fetus affected by antepartum hemorrahge   
## 0.005076142   
## Fetus affected by breech presentation   
## 0.010152284   
## Fetus affected by cord prolapse   
## 0.010152284   
## Fetus affected by gestational hypertensive disorder   
## 0.005076142   
## Fetus affected by malpresentation (Face) , malposition and disproportion during labor and delivery   
## 0.005076142   
## Fetus affected by malpresentation, breech delivery and extraction   
## 0.005076142   
## Fetus affected by malpresentation, malposition and disproportion during labor and delivery   
## 0.010152284   
## Fetus affected by maternal hypertensive disorder   
## 0.005076142   
## Fetus affected by other and unspecified morphological and functional abnormalities of placenta Placental: dysfunction, infarction   
## 0.005076142   
## Fetus affected by placenta previa   
## 0.005076142   
## Fetus affected by placenta separation (abruption placenta 50%)   
## 0.005076142   
## Fetus affected by placenta separation (Abruption placenta with hypovolemic shock)   
## 0.005076142   
## Fetus affected by placenta separation (abruption placenta)   
## 0.010152284   
## Fetus affected by placenta separation (Abruption placenta)   
## 0.010152284   
## Fetus affected by placenta separation (abruption placentae)   
## 0.005076142   
## Fetus affected by placenta separation (Abruption placentae)   
## 0.005076142   
## Fetus affected by placental separation and hemorrhage (Abruption placentae)   
## 0.005076142   
## Fetus affected by prolapsed cord   
## 0.005076142   
## Fetus affected by twin-to-twin placental transfusion syndrome   
## 0.005076142   
## Fetus and newborn affected by abruption placentae   
## 0.005076142   
## Fetus and newborn affected by breech delivery and extraction   
## 0.005076142   
## Fetus and newborn affected by chorioamnionitis   
## 0.015228426   
## Fetus and newborn affected by complications of placenta, cord and membranes   
## 0.005076142   
## Fetus and newborn affected by disproportion during labor and delivery   
## 0.005076142   
## Fetus and newborn affected by disproportion during labor and delivery(due to hydrocephalus)   
## 0.005076142   
## Fetus and newborn affected by malpresentation and obstructed labor   
## 0.005076142   
## Fetus and newborn affected by maternal diabetes   
## 0.005076142   
## Fetus and newborn affected by maternal infectious and parasitic diseases (HIV)   
## 0.005076142   
## Fetus and newborn affected by multiple pregnancy   
## 0.005076142   
## Fetus and newborn affected by multiple pregnancy: Quadruplet (pregnancy),   
## 0.005076142   
## Fetus and newborn affected by multiple pregnancy: Quadruplet pregnancy   
## 0.005076142   
## Fetus and newborn affected by multiple pregnancy: Twin pregnancy   
## 0.010152284   
## Fetus and newborn affected by multiple pregnancy: Triplets   
## 0.005076142   
## Fetus and newborn affected by multiple pregnancy: Twin (pregnancy)   
## 0.015228426   
## Fetus and newborn affected by oligohydramnios   
## 0.005076142   
## Fetus and newborn affected by other and unspecified morphological and functional abnormalities of placenta   
## 0.005076142   
## Fetus and newborn affected by other and unspecified morphological and functional abnormalities of placenta (placenta infarction)   
## 0.005076142   
## Fetus and newborn affected by other and unspecified morphological and functional abnormalities of placenta: placental infarction   
## 0.005076142   
## Fetus and newborn affected by other forms of placental separation and haemorrhage   
## 0.010152284   
## Fetus and newborn affected by other forms of placental separation and hemorrhage   
## 0.025380711   
## Fetus and newborn affected by other forms of placental separation and hemorrhage (Abruptio placentae)   
## 0.005076142   
## Fetus and newborn affected by other forms of placental separation and hemorrhage (Abruption placenta)   
## 0.055837563   
## Fetus and newborn affected by other forms of placental separation and hemorrhage (Abruption placentae)   
## 0.010152284   
## Fetus and newborn affected by other forms of placental separation and hemorrhage (Antepartum haemorrhage / placenta praevia)   
## 0.005076142   
## Fetus and newborn affected by other forms of placental separation and hemorrhage (Antepartum haemorrhage)   
## 0.010152284   
## Fetus and newborn affected by other forms of placental separation and hemorrhage (Antepartum hemorrhage)   
## 0.005076142   
## Fetus and newborn affected by other forms of placental separation and hemorrhage: Abruptio placentae   
## 0.010152284   
## Fetus and newborn affected by other malpresentation (transverse lie)   
## 0.005076142   
## Fetus and newborn affected by other malpresentation, malposition and disproportion during labour and delivery (transverse lie, neglected shoulder presentation)   
## 0.005076142   
## Fetus and newborn affected by other malpresentation, malposition, and disproportion during labor and delivery   
## 0.030456853   
## Fetus and newborn affected by other specified complications of labour and delivery - prolonged labour   
## 0.005076142   
## Fetus and newborn affected by other specified complications of labour and delivery (Uterus rupture) (P03.8)   
## 0.005076142   
## Fetus and newborn affected by placenta previa   
## 0.010152284   
## Fetus and newborn affected by placental separation and hemorrhage   
## 0.015228426   
## Fetus and newborn affected by precipitate delivery, Rapid second stage   
## 0.005076142   
## Fetus and newborn affected by premature rupture of membranes   
## 0.005076142   
## Fetus and newborn affected by preterm labor   
## 0.005076142   
## Fetus and newborn affected by prolapsed cord   
## 0.010152284   
## Gestational hypertension disorder   
## 0.005076142   
## Maternal sickness: Fetus and newborn affected by unspecified maternal condition   
## 0.005076142   
## Newborn affected by preterm labour   
## 0.005076142   
## Obstructed labor   
## 0.005076142   
## Pre-existing diabetes mellitus, insulin-dependent   
## 0.005076142   
## Pre-labor rapture of membrane   
## 0.005076142   
## Pre-labour preterm rupture of membranes   
## 0.005076142   
## Precipitated labour   
## 0.005076142   
## preeclampsia   
## 0.015228426   
## Preeclampsia   
## 0.182741117   
## Premature & prolonged rupture of membrane   
## 0.005076142   
## Premature rupture of membrane   
## 0.010152284   
## Premature rupture of membrane onset labor after 24h   
## 0.005076142   
## Premature rupture of membrane onset of labour after 24h   
## 0.005076142   
## Premature rupture of membranes, onset of labour after 24 hours   
## 0.010152284   
## Premature rupture of membranes, unspecified   
## 0.005076142   
## Preterm labor   
## 0.005076142   
## Preterm labour   
## 0.010152284   
## Preterm rupture of membranes   
## 0.010152284   
## Prolonged pregnancy   
## 0.005076142   
## RH Negative   
## 0.005076142   
## Severe preeclampsia   
## 0.005076142   
## Twin pregnancy   
## 0.060913706   
## Undetermined   
## 0.010152284   
## Uterine rupture   
## 0.015228426

# C. Proportion of the child death by the case type  
  
ggplot(champs\_data, aes(x = case\_type)) +  
 geom\_bar(fill = "steelblue") +  
 labs(x = "Case Type", y = "Count", title = "Proportion of Child Deaths by Case Type")



# 3. Correlation analysis  
# Check the data types of the   
if (!require(corrplot)) {  
 install.packages("corrplot")  
 library(corrplot)  
}

## Loading required package: corrplot

## corrplot 0.92 loaded

str(champs\_data)

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## .. )  
## - attr(\*, "problems")=<externalptr>

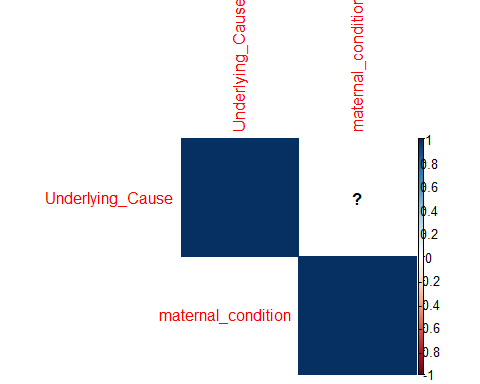
# Convert the columns to numeric if possible  
champs\_data$Underlying\_Cause <- as.numeric(champs\_data$Underlying\_Cause)

## Warning: NAs introduced by coercion

champs\_data$maternal\_condition <- as.numeric(champs\_data$maternal\_condition)

## Warning: NAs introduced by coercion

# Create the correlation matrix  
corr\_matrix <- cor(champs\_data[, c("Underlying\_Cause", "maternal\_condition")])  
  
# Create the correlation plot  
corrplot(corr\_matrix, method = "color", type = "upper")



summary(cars)

## speed dist   
## Min. : 4.0 Min. : 2.00   
## 1st Qu.:12.0 1st Qu.: 26.00   
## Median :15.0 Median : 36.00   
## Mean :15.4 Mean : 42.98   
## 3rd Qu.:19.0 3rd Qu.: 56.00   
## Max. :25.0 Max. :120.00

## Including Plots

You can also embed plots, for example:



Note that the echo = FALSE parameter was added to the code chunk to prevent printing of the R code that generated the plot.