Project-mva.R

zb117

2020-02-20

```
library(tidyverse)
```

```
## -- Attaching packages --------------- tidyverse 1.3.0 --
## v ggplot2 3.2.1     v purrr   0.3.3
## v tibble  2.1.3     v dplyr   0.8.3
## v tidyr   1.0.2     v stringr 1.4.0
## v readr   1.3.1     v forcats 0.4.0
## -- Conflicts ------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(knitr)
library(kableExtra)
```

```
##
## Attaching package: 'kableExtra'
## The following object is masked from 'package:dplyr':
##
##     group_rows
```

```
library(treemap)
library(ggthemes)
library(highcharter)
```

```
## Registered S3 method overwritten by 'quantmod':
##   method            from
##   as.zoo.data.frame zoo
## Highcharts (www.highcharts.com) is a Highsoft software product which is
## not free for commercial and Governmental use
```

```
library(summarytools)
```

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

```
## For best results, restart R session and update pander using devtools:: or
remotes::install_github('rapporter/pander')

##

## Attaching package: 'summarytools'

## The following object is masked from 'package:tibble':

##

##     view
```

```
library(corrplot)
```

```
## corrplot 0.84 loaded
```

```
library(formattable)

# Importing dataset

data <-read.csv("/Users/zb117/Desktop/Suicide Rate Analysis.csv")

# Data summary

# We are using str() & head() function to inspect and have a brief overwiew o
f the dataset.

str(data)
```

```
## 'data.frame':    27820 obs. of  12 variables:

##  $ ï..country        : Factor w/ 101 levels "Albania","Antigua and Barbuda
",..: 1 1 1 1 1 1 1 1 1 1 ...

##  $ year              : int  1987 1987 1987 1987 1987 1987 1987 1987 1987 1
987 ...

##  $ sex               : Factor w/ 2 levels "female","male": 2 2 1 2 2 1 1 1
2 1 ...

##  $ age               : Factor w/ 6 levels "15-24 years",..: 1 3 1 6 2 6 3
2 5 4 ...

##  $ suicides_no       : int  21 16 14 1 9 1 6 4 1 0 ...

##  $ population        : int  312900 308000 289700 21800 274300 35600 278800
257200 137500 311000 ...

##  $ suicides.100k.pop : num  6.71 5.19 4.83 4.59 3.28 2.81 2.15 1.56 0.73 0
...

##  $ country.year      : Factor w/ 2321 levels "Albania1987",..: 1 1 1 1 1 1
1 1 1 1 ...

##  $ HDI.for.year      : num  NA NA NA NA NA NA NA NA NA NA ...

##  $ gdp_for_year....  : Factor w/ 2321 levels "1,002,219,052,968",..: 727 7
27 727 727 727 727 727 727 727 727 ...

##  $ gdp_per_capita....: int  796 796 796 796 796 796 796 796 796 796 ...

##  $ generation        : Factor w/ 6 levels "Boomers","G.I. Generation",..:
3 6 3 2 1 2 6 1 2 3 ...
```

```
summary(data)
```

```
##        ï..country         year          sex                age
##  Austria    :  382   Min.   :1985   female:13910   15-24 years:4642
##  Iceland    :  382   1st Qu.:1995   male  :13910   25-34 years:4642
##  Mauritius  :  382   Median :2002                  35-54 years:4642
##  Netherlands:  382   Mean   :2001                  5-14 years :4610
##  Argentina  :  372   3rd Qu.:2008                  55-74 years:4642
##  Belgium    :  372   Max.   :2016                  75+ years  :4642
##  (Other)    :25548
##   suicides_no        population       suicides.100k.pop      country.year
##  Min.   :    0.0   Min.   :     278   Min.   :  0.00    Albania1987:   12
##  1st Qu.:    3.0   1st Qu.:   97498   1st Qu.:  0.92    Albania1988:   12
##  Median :   25.0   Median :  430150   Median :  5.99    Albania1989:   12
##  Mean   :  242.6   Mean   : 1844794   Mean   : 12.82    Albania1992:   12
##  3rd Qu.:  131.0   3rd Qu.: 1486143   3rd Qu.: 16.62    Albania1993:   12
##  Max.   :22338.0   Max.   :43805214   Max.   :224.97    Albania1994:   12
##                                                         (Other)    :27748
##   HDI.for.year            gdp_for_year....  gdp_per_capita....
##  Min.   :0.483   1,002,219,052,968:   12   Min.   :   251
##  1st Qu.:0.713   1,011,797,457,139:   12   1st Qu.:  3447
##  Median :0.779   1,016,418,229    :   12   Median :  9372
##  Mean   :0.777   1,018,847,043,277:   12   Mean   : 16866
##  3rd Qu.:0.855   1,022,191,296    :   12   3rd Qu.: 24874
##  Max.   :0.944   1,023,196,003,075:   12   Max.   :126352
##  NA's   :19456   (Other)          :27748
##            generation
##  Boomers        :4990
##  G.I. Generation:2744
##  Generation X   :6408
##  Generation Z   :1470
##  Millenials     :5844
##  Silent         :6364
##
```

```
head(data)
```

```
##   ï..country year    sex         age suicides_no population suicides.100k.
pop
```

```
## 1    Albania 1987   male 15-24 years          21     312900              6
.71
## 2    Albania 1987   male 35-54 years          16     308000              5
.19
## 3    Albania 1987 female 15-24 years          14     289700              4
.83
## 4    Albania 1987   male   75+ years           1      21800              4
.59
## 5    Albania 1987   male 25-34 years           9     274300              3
.28
## 6    Albania 1987 female   75+ years           1      35600              2
.81
##   country.year HDI.for.year gdp_for_year.... gdp_per_capita....      gener
ation
## 1  Albania1987           NA    2,156,624,900               796    Generat
ion X
## 2  Albania1987           NA    2,156,624,900               796          S
ilent
## 3  Albania1987           NA    2,156,624,900               796    Generat
ion X
## 4  Albania1987           NA    2,156,624,900               796 G.I. Gener
ation
## 5  Albania1987           NA    2,156,624,900               796         Bo
omers
## 6  Albania1987           NA    2,156,624,900               796 G.I. Gener
ation
```

```
# No of Columns in the dataset.
length(data[,-1])
```

```
## [1] 11
```

```
# Cleaning Data
# droppig NA values from suicide nos collumn.
clean_data <- data %>%
filter(suicides_no != "NA" & suicides_no!=0)


# Checking for the missing values in each collumns.
colSums(is.na(clean_data))
```

```
##         ï..country               year                sex                ag
e
##                  0                 0                 0
0
```

```
##         suicides_no         population  suicides.100k.pop        country.yea
r
##                   0                  0                  0
0
##       HDI.for.year   gdp_for_year.... gdp_per_capita....          generatio
n
##              16332                  0                  0
0
```

```
# Cleaning HDI collumn.
clean_data$HDI.for.year <- NULL

# Changing collumn name.
colnames(data)[colnames(data) == "ï..country"] <- "country"

# Data exploration

#Nearly 70% of the data is missing.
sum(is.na(data$HDI.for.year))/length(data$HDI.for.year) * 100
```

```
## [1] 69.9353
```

```
# Qualitative Variable frequencies

# No of occurences of each generation in the dataset.
data %>% group_by(generation) %>%
summarize(nb = n()) %>% kable () %>%
kable_styling(bootstrap_options = "striped", full_width = F)
```

generation	nb
Boomers	4990
G.I. Generation	2744
Generation X	6408
Generation Z	1470

generation	nb
Millenials	5844
Silent	6364

```
# X generation and silent are the most popular.
# Generation Z is the smallest group.
hcbar(x = data$generation, name = "Génération") %>%
hc_add_theme(hc_theme_economist())
```

GénérationBoomersG.I. GenerationGeneration XGeneration ZMillenialsSilent01k2k3k4k5k6k7k

```
# By Age Groups
# Age groups are equally distributed.
hcbar(x = data$age, name = " ge") %>%
hc_add_theme(hc_theme_economist())
```

ge15-24 years25-34 years35-54 years5-14 years55-74 years75+ years01k2k3k4k5k

```
# By Sex
# Both are equally distributed
hcbar(x = data$sex, name = "Sexe") %>%
hc_add_theme(hc_theme_economist())
```

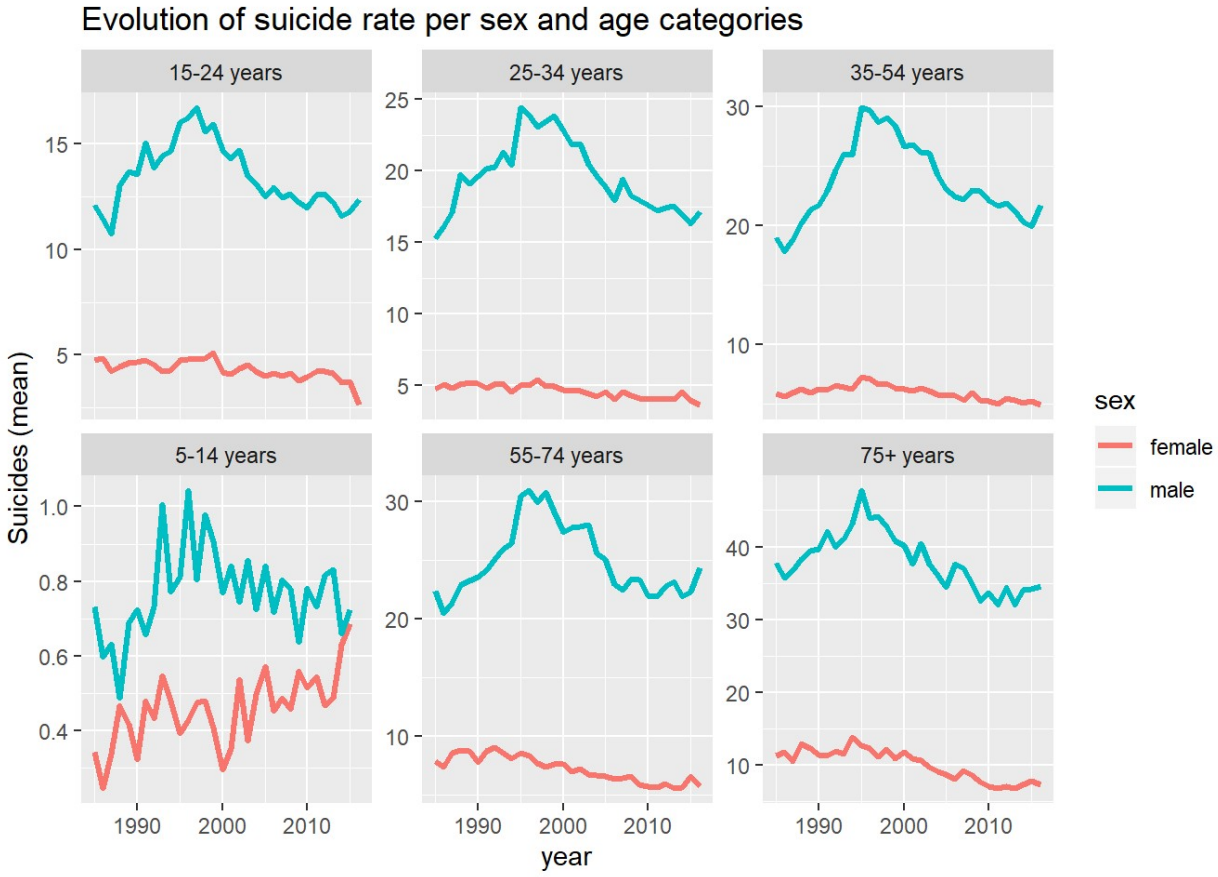
Sexefemalemale02.5k5k7.5k10k12.5k15k

```
# By year
hcbar(x = as.character(data$year), name = "Years") %>%
hc_add_theme(hc_theme_economist())
```

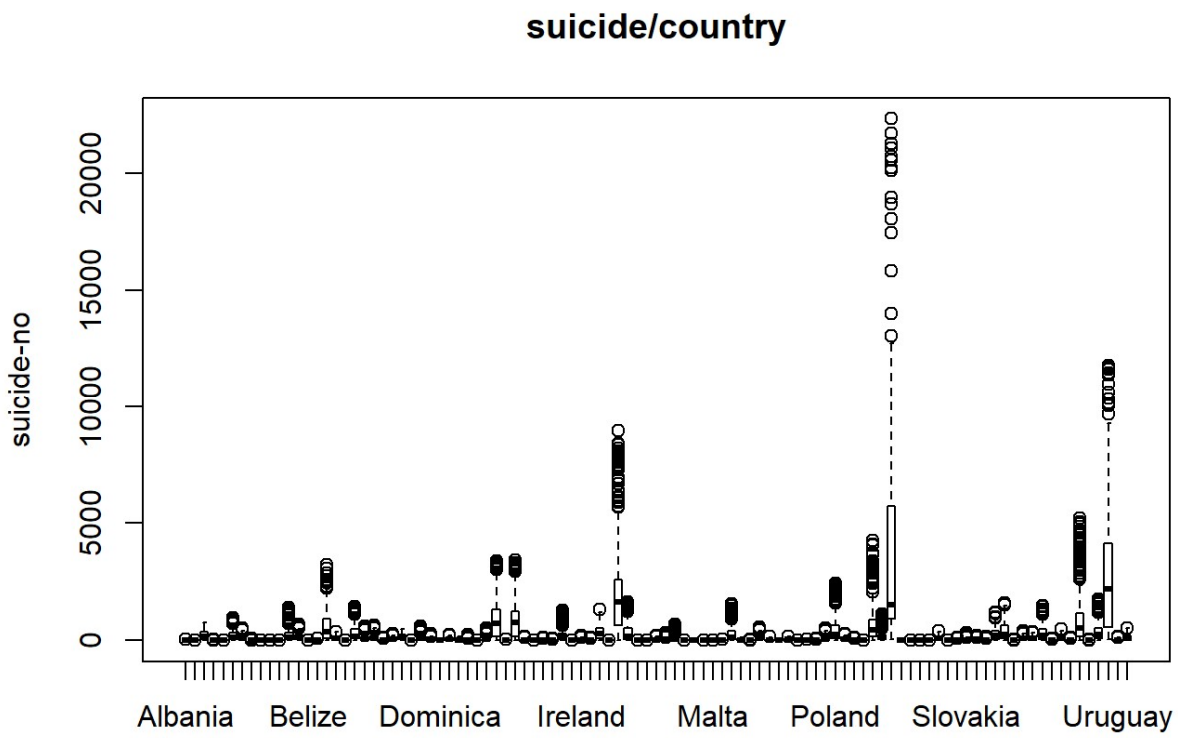
Years1985198619871988198919901991199219931994199519961997199819992000200120022003200420052006200720082009201020112012201320142015201602004006008001000 1200

```
# Suicide rates by Sex and Age group
# For all age groups suicide rate is higher for men than women.
# This means 'sex' variable differentiates the population of dataset.
```

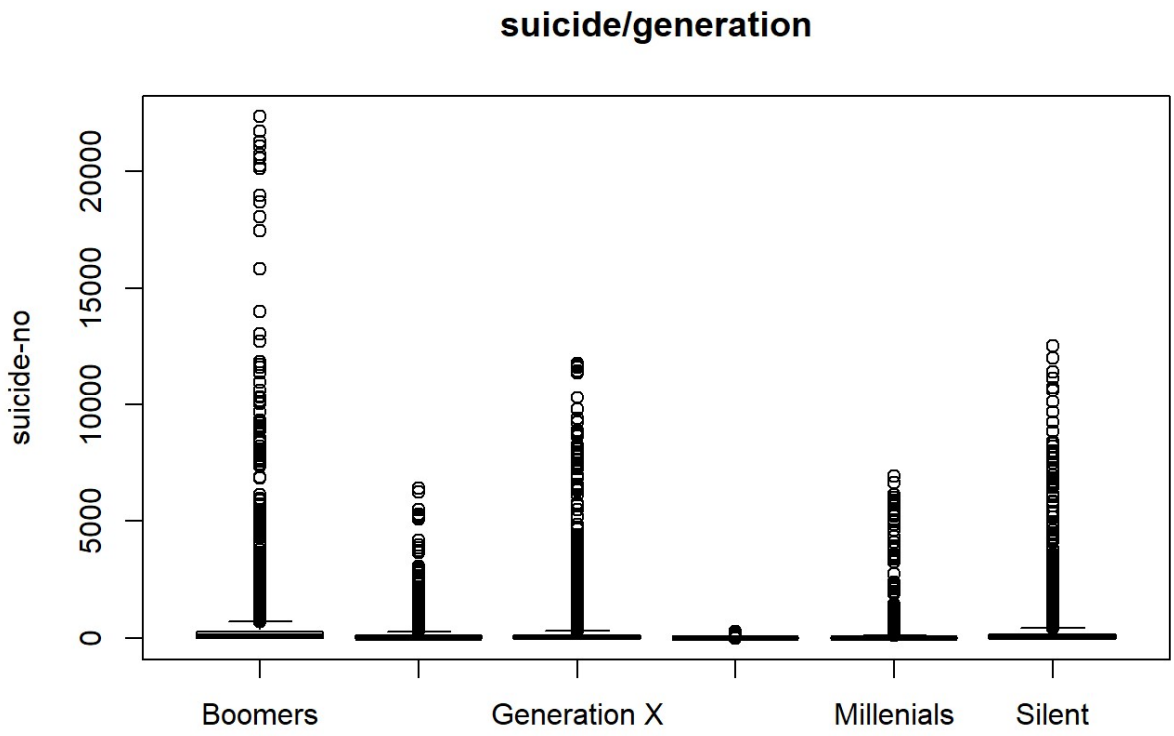
```
data %>% group_by(year,sex, age) %>%
summarize(moy_suicide = mean(suicides.100k.pop)) %>%
ggplot(aes(x= year, y= moy_suicide)) +
geom_line(aes(color = sex), size=1.1) + facet_wrap(~age, scale = "free_y") +
ylab("Suicides (mean)") + ggtitle("Evolution of suicide rate per sex and age categories")
```



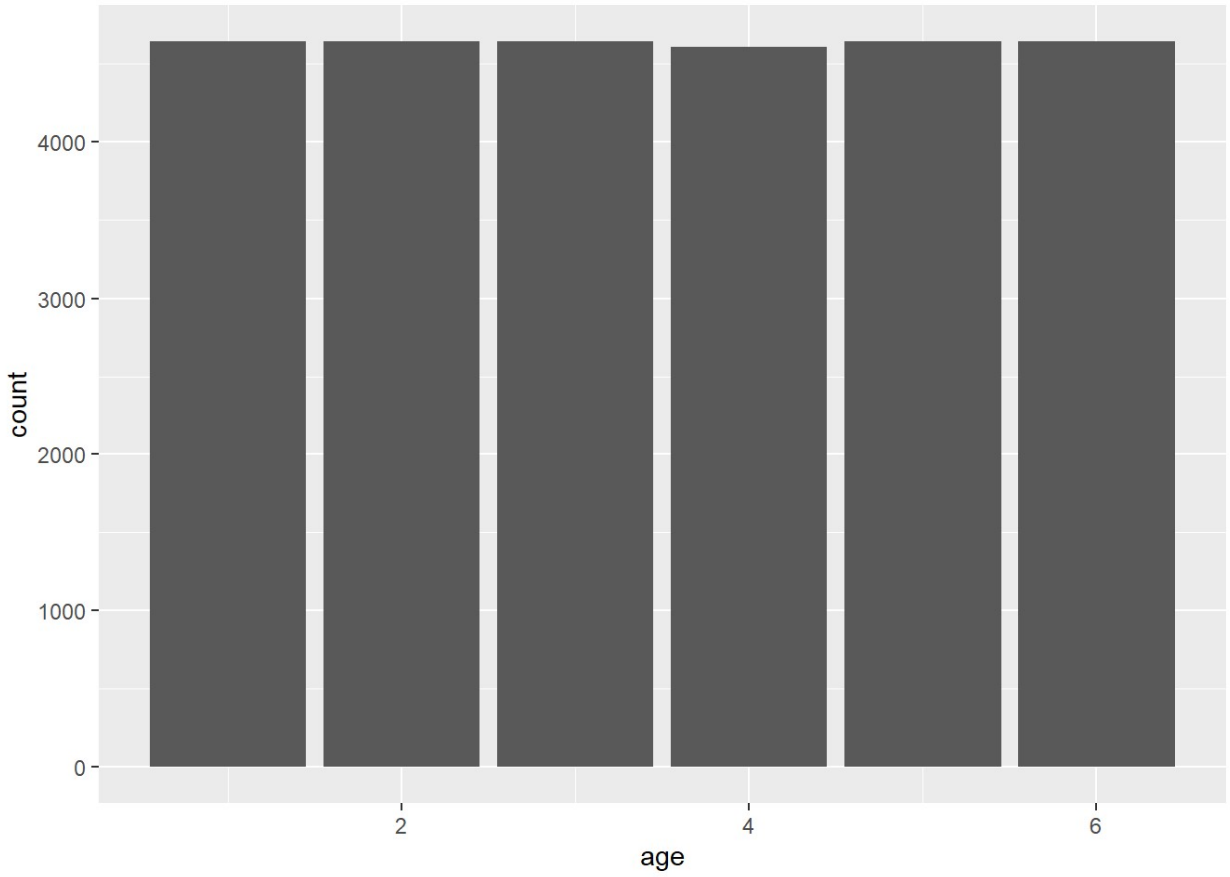

```
#Visualization
plot(data[,1], data[,5],main = "suicide/country", xlab="", ylab="suicide-no")
```



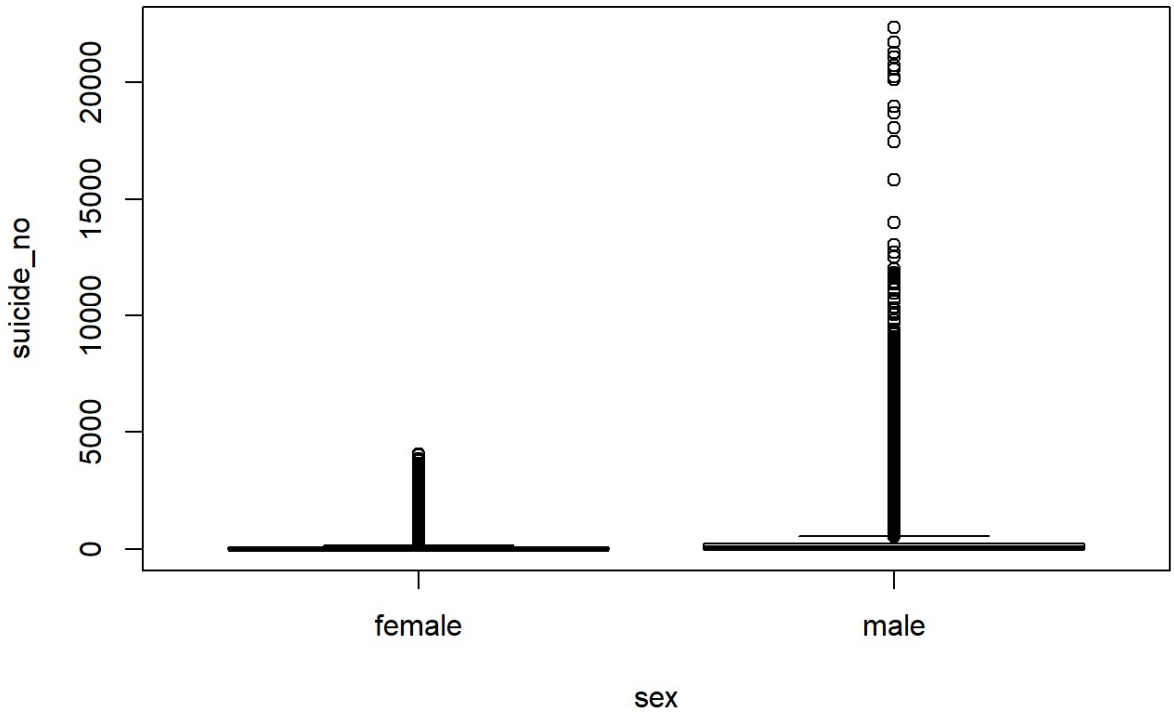

```
plot(data[,12], data[,5],main = "suicide/generation", xlab="", ylab="suicide-
no")
```



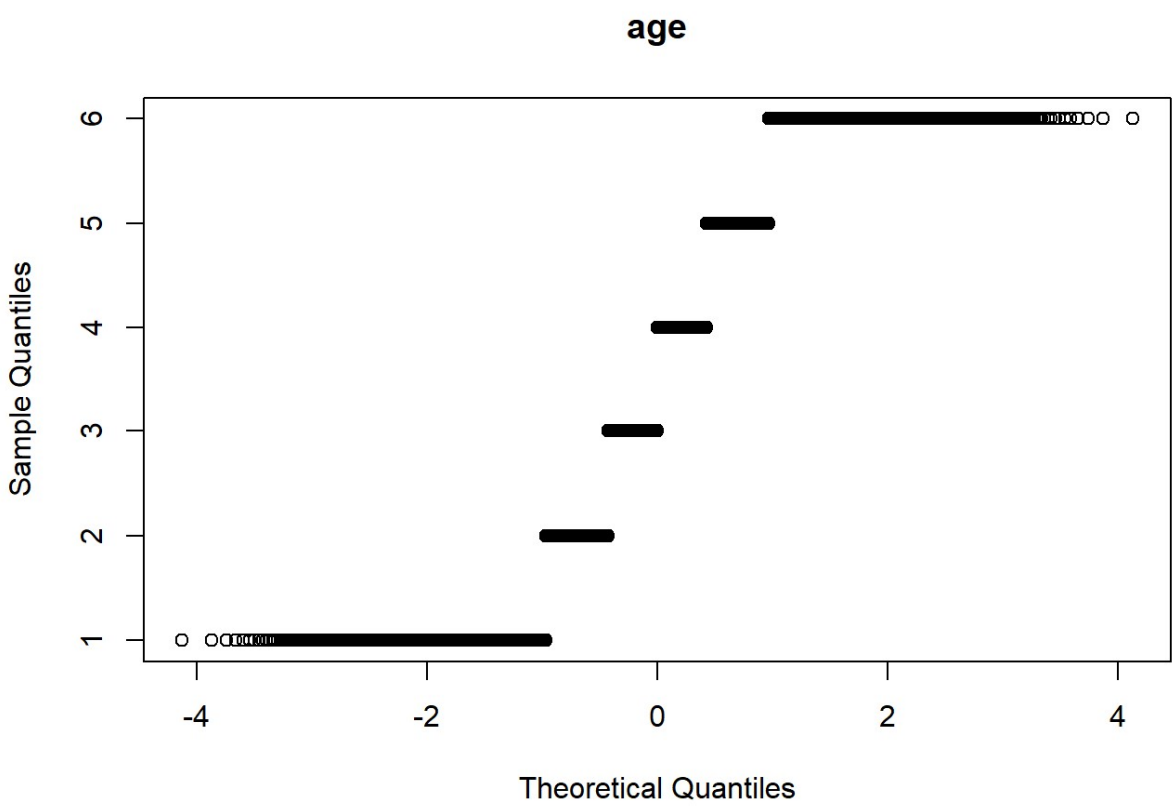

```
#transforming age from character to numeric
data_1<-transform(data, age = as.numeric(age))
ggplot(data_1, aes(x=age))+geom_bar()
```



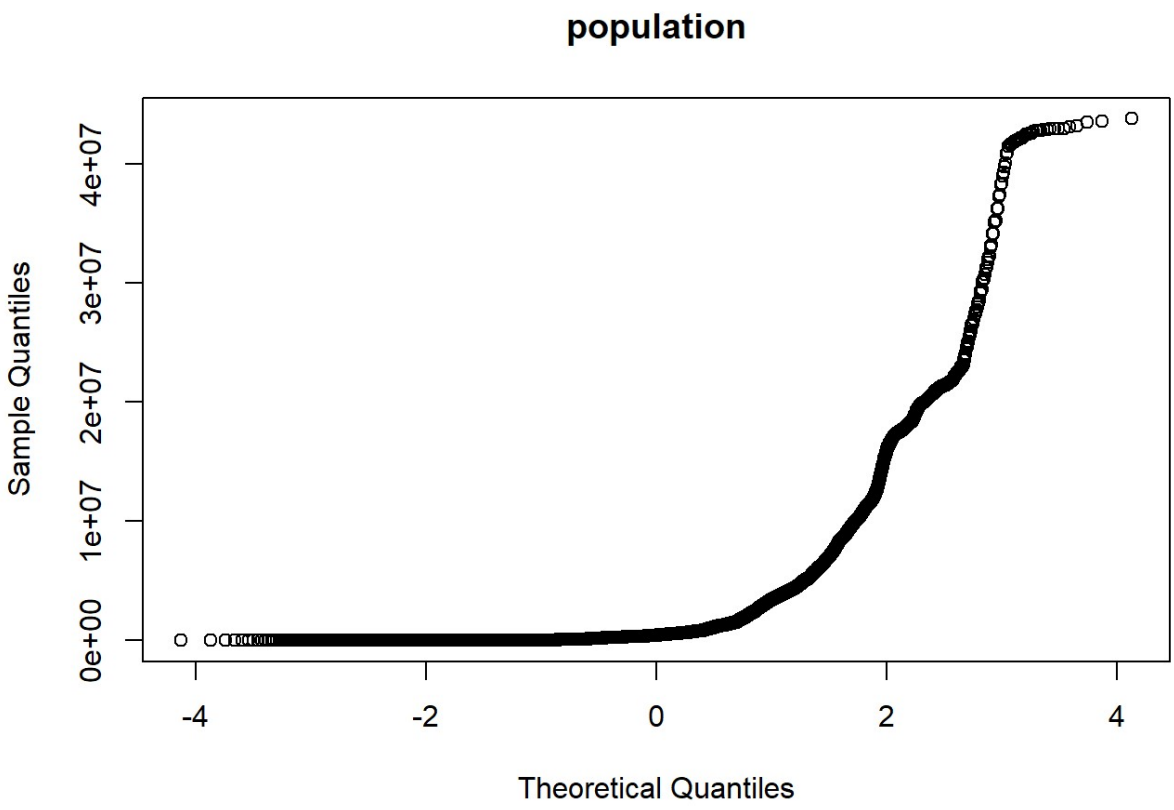

```
plot(data_1$suicides_no~data_1$sex, xlab="sex", ylab = "suicide_no")
```



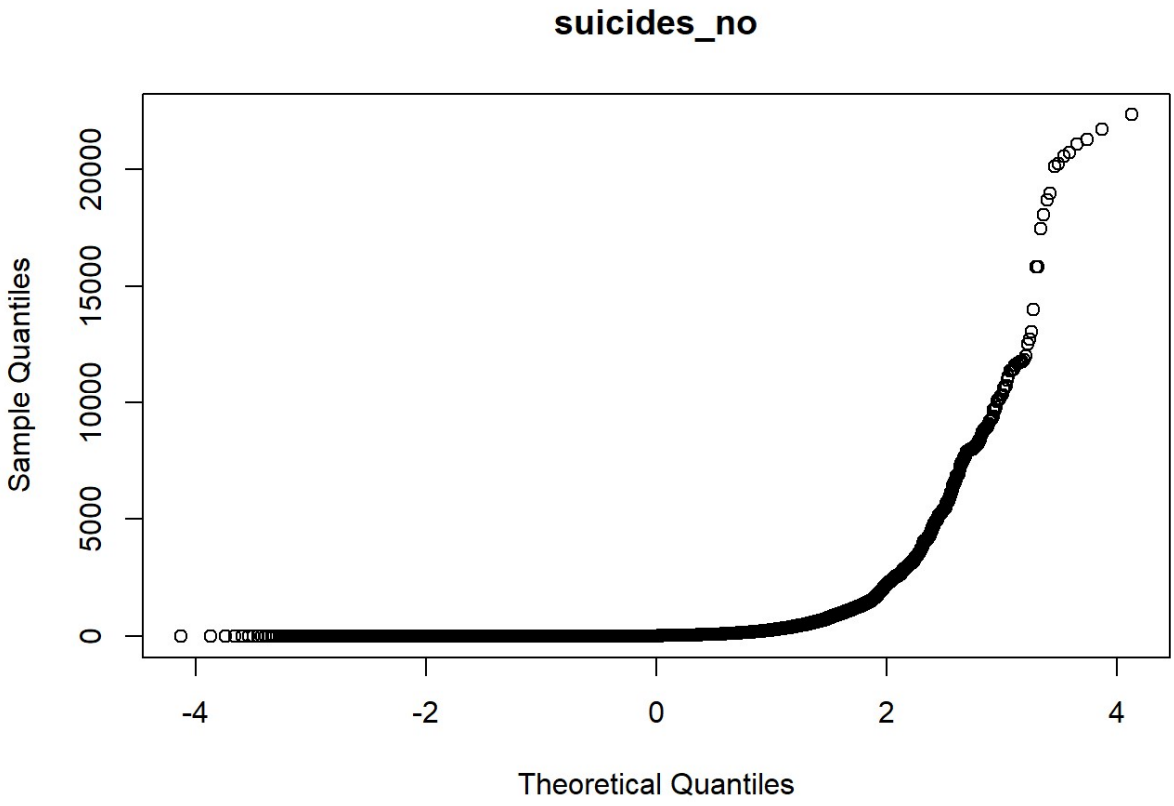

```
qqnorm(data_1[,"age"], main = "age")
```




```
qqnorm(data_1[,"population"], main = "population")
```




```
qqnorm(data_1[,"suicides_no"], main = "suicides_no")
```




```
sd(data_1$suicides_no)
```

```
## [1] 902.0479
```

```
mean(data_1$suicides_no)
```

```
## [1] 242.5744
```

```
#removing suicides outliers
data_1<- subset(data_1, suicides_no< 2948.12)
t.test(data_1$age,data_1$sucides_no, var.equal = TRUE, paired=FALSE)
```

```
##
##  One Sample t-test
##
## data:  data_1$age
## t = 338.65, df = 27410, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  3.483641 3.524202
## sample estimates:
```

```
## mean of x
##  3.503922
```

```
t.test(data_1$gdp_per_capita,data_1$sucides_no, var.equal = TRUE, paired=FALSE)
```

```
##
##  One Sample t-test
##
## data:  data_1$gdp_per_capita
## t = 146.89, df = 27410, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  16514.49 16961.18
## sample estimates:
## mean of x
##  16737.83
```