Transmission Risk Comparison

Remo Schmutz

2022-12-21

Libraries

```
library(tidyverse)
library(ggplot2)
require("knitr")
library(gridExtra)
library(grid)
library(lubridate)
library(dplyr)
library(hms)
library(truncdist)
library(crch)
library(stats)
library(LaplacesDemon)
library(ggstatsplot)
library(MASS)
library(fitdistrplus)
library(truncnorm)
library(tidybayes)
library(ggpubr)
```

Data

```
ch <- readRDS("data-clean/co2-ch.rds") #swiss data
satz <- readRDS("data-clean/co2-sa-tz.rds")

ch <- ch %>%
  filter(co2 > 400) %>%
  arrange(co2)

ch1 <- ch %>%
  filter(school == "School 1")

ch2 <- ch %>%
  filter(school == "School 2")

sa <- satz %>%
  filter(country == "South Africa") %>%
```

```
  filter(co2 < 3000) %>%
  filter(co2 > 400) %>%
  arrange(co2)#south africa data

tz <- satz %>%
  filter(country == "Tanzania") %>%
  filter(co2 < 3000) %>%
  filter(co2 > 400) %>%
  mutate(time_h = hour(date)) %>%
  filter(time_h >= 8) %>%
  arrange(co2) #tanzania data
```

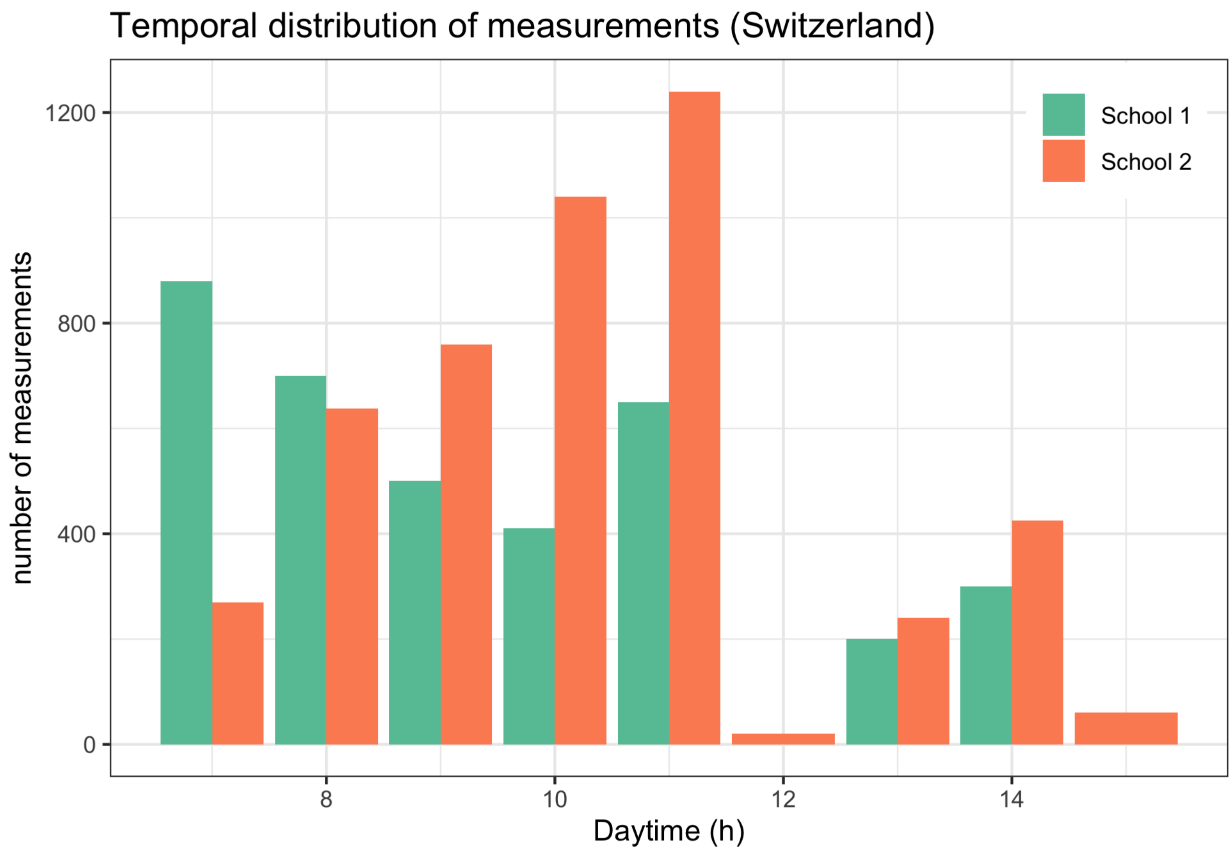
Methods

Indoor Co2 concentration
* mean or distribution from data
* C_o := Outdoor Co2 concentration * from literature https://www.fsis.usda.gov/sites/default/files/media_file/2020-08/Carbon-Dioxide.pdf
* C_a := Volume fraction of CO2 added to exhaled breath during breathing
* Persily and de Jonge [Table 3 and 4] doi: 10.1111/ina.12383
* $\bar{f} := \int_{t=0}^{t=max} f dt$
* integrating over f values from different times (2) or using a distribution based on the data
* I := Number of infectors in the class
* estimated using prevalence of the age group in the country
* q := Quantum per hour
* assuming a distribution from literature
* t := time
* changing this parameter to compare
* n := number of people in the class
* data (Switzerland) or assumption (South Africa, Tanzania)

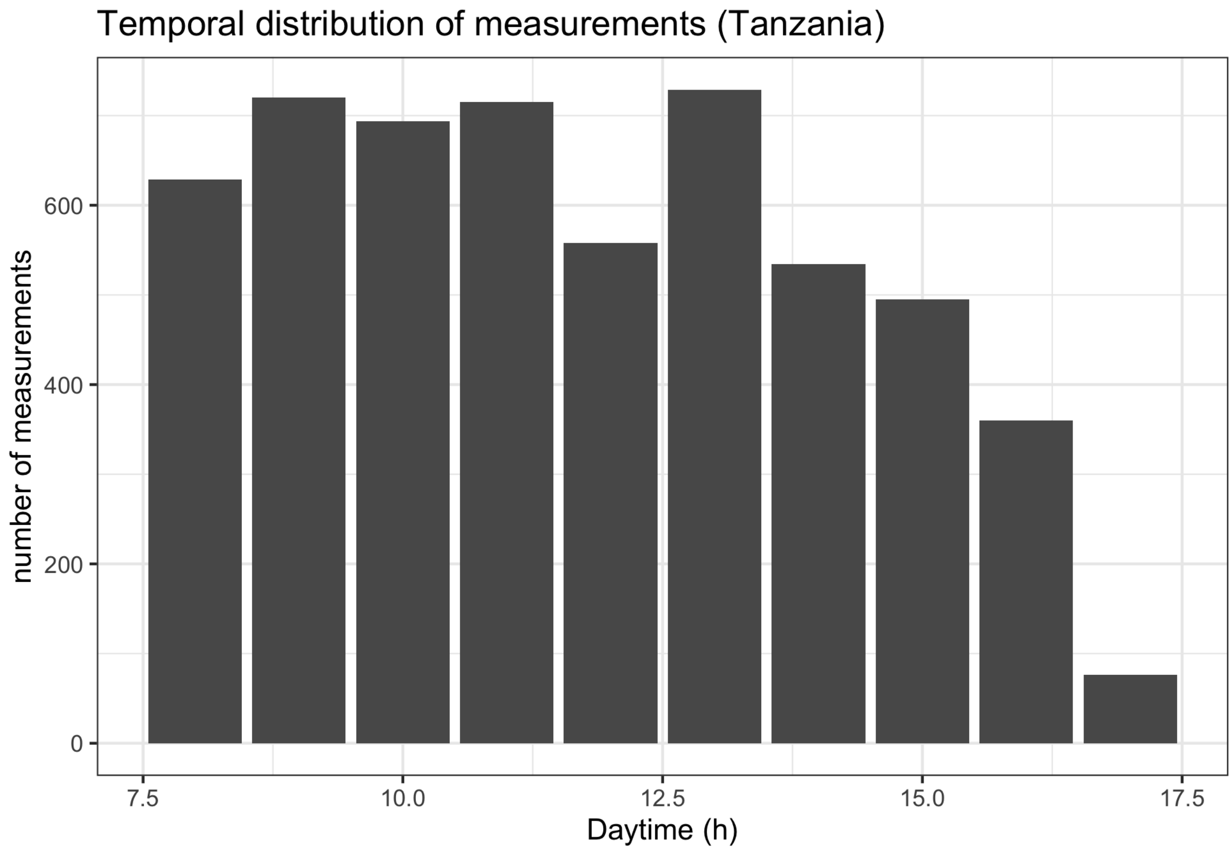
Preprocess

```
ch_hourly <- ch %>%
  mutate(time_h = hour(time)) %>%
  group_by(school, time_h) %>%
  summarize(mean = mean(co2),
            lower = quantile(co2, 0.25),
            upper = quantile(co2, 0.75),
            n_data = n()) %>%
  ungroup()

ch_hourly %>%
  ggplot(aes(x = time_h, y = n_data, fill = school)) +
  geom_bar(stat = "identity", position = position_dodge()) +
  xlab("Daytime (h)") +
  ylab("number of measurements") +
  ggtitle("Temporal distribution of measurements (Switzerland)") +
  theme_bw() +
```

```
  theme(legend.position = c(0.9,0.9), legend.title = element_blank()) +
  scale_color_brewer(palette = "Set2") +
  scale_fill_brewer(palette = "Set2")
```




```
# there is a reasonable number of data points per hour but missing data at hour 12 for school 2 (no les

tz_hourly <- tz %>%
  mutate(time_h = hour(date)) %>%
  group_by(time_h) %>%
  summarize(mean = mean(co2),
            lower = quantile(co2, 0.25),
            upper = quantile(co2, 0.75),
            n_data = n()) %>%
  ungroup()

tz_hourly %>%
  ggplot(aes(x = time_h, y = n_data)) +
  geom_bar(stat = "identity", position = position_dodge()) +
  xlab("Daytime (h)") +
  ylab("number of measurements") +
  ggtitle("Temporal distribution of measurements (Tanzania)") +
  theme_bw() +
  theme(legend.position = c(0.9,0.9), legend.title = element_blank())
```

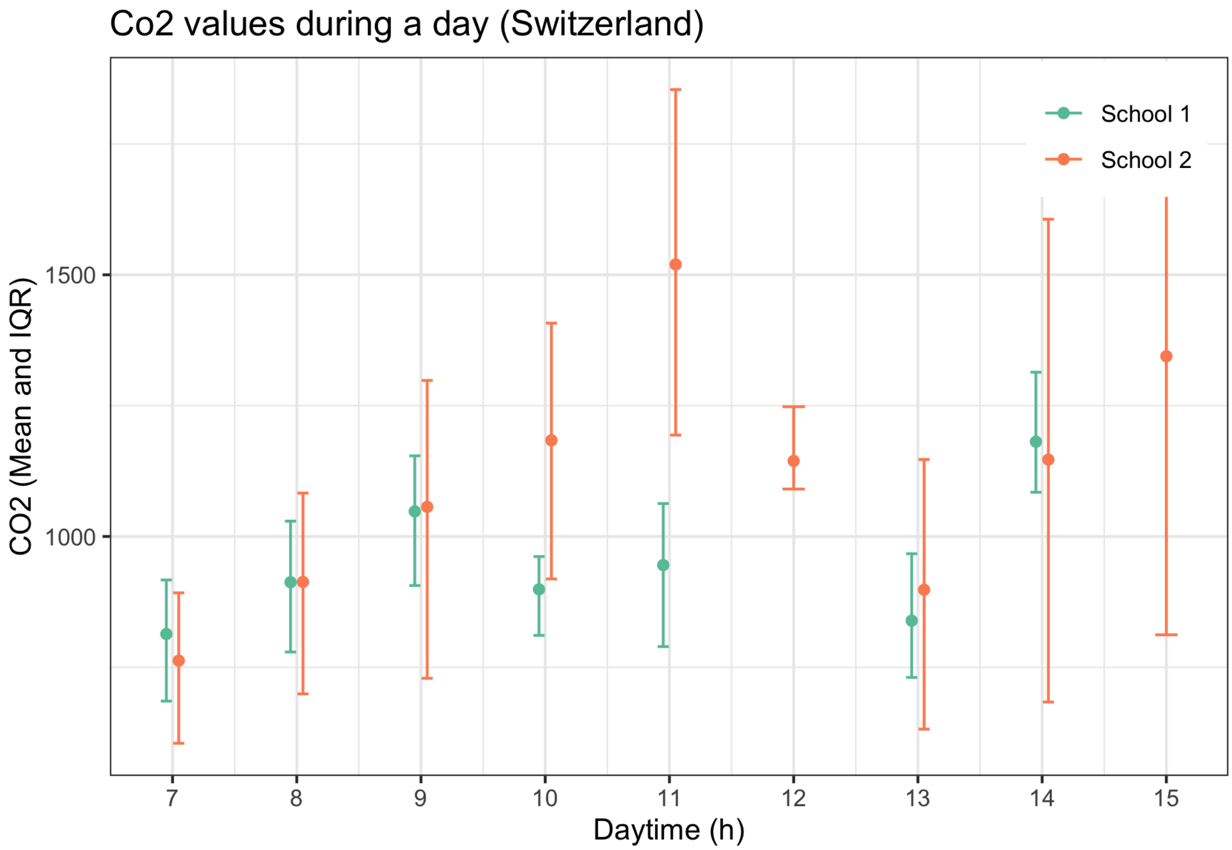



```
# data is measured throughout the day in south africa
```

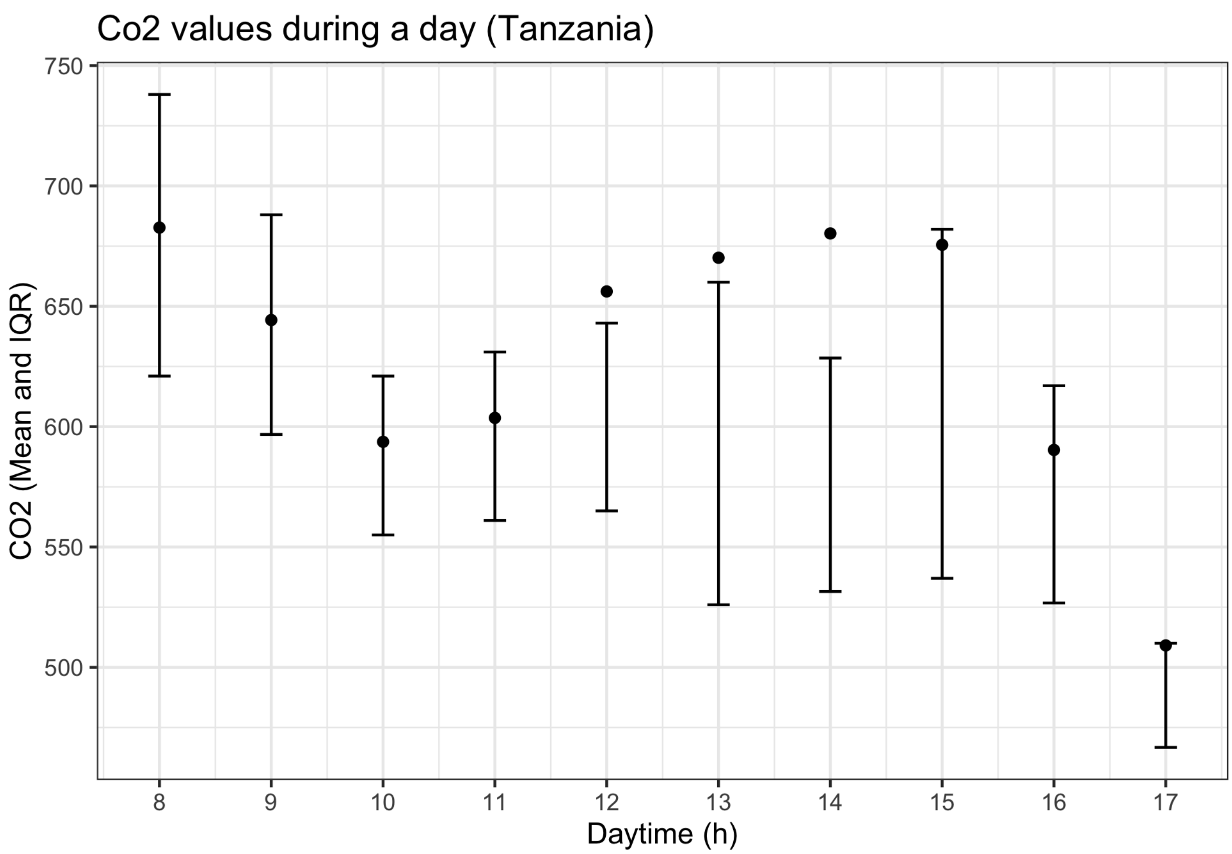
Analysis

Co2 over time

```
ch_hourly %>% #plot co2 during the day (ch)
  ggplot(aes(x = time_h, group = school, color = school)) +
  geom_errorbar(aes(ymin = lower, ymax = upper), width = .2, position =    position_dodge2(width = .2))
  geom_point(aes(y = mean), position = position_dodge2(width = .2)) +
  scale_color_brewer(palette = "Set2") +
  scale_x_continuous(breaks = seq(7, 16, 1)) +
  labs(x = "Daytime (h)", y = "CO2 (Mean and IQR)") +
  theme_bw() +
  theme(legend.position = c(0.9,0.9), legend.title = element_blank()) +
  ggtitle("Co2 values during a day (Switzerland)")
```




```
tz_hourly %>% #plot co2 during the day (tz)
  ggplot(aes(x = time_h)) +
  geom_errorbar(aes(ymin = lower, ymax = upper), width = .2, position =    position_dodge2(width = .2))
  geom_point(aes(y = mean), position = position_dodge2(width = .2)) +
  scale_color_brewer(palette = "Set2") +
  scale_x_continuous(breaks = seq(7, 17, 1)) +
  labs(x = "Daytime (h)", y = "CO2 (Mean and IQR)") +
  theme_bw() +
  theme(legend.position = c(0.9,0.9), legend.title = element_blank()) +
  ggtitle("Co2 values during a day (Tanzania)")
```

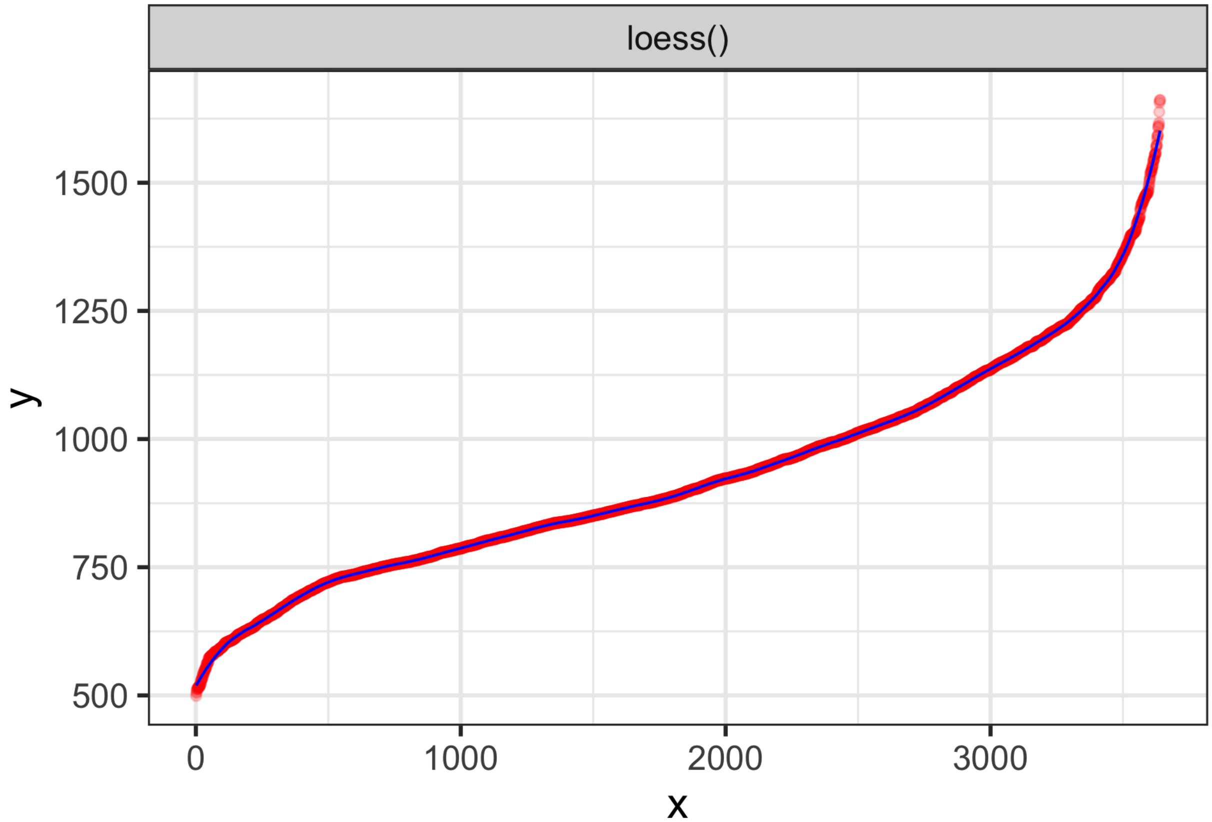



```
#no time data available for south africa
```

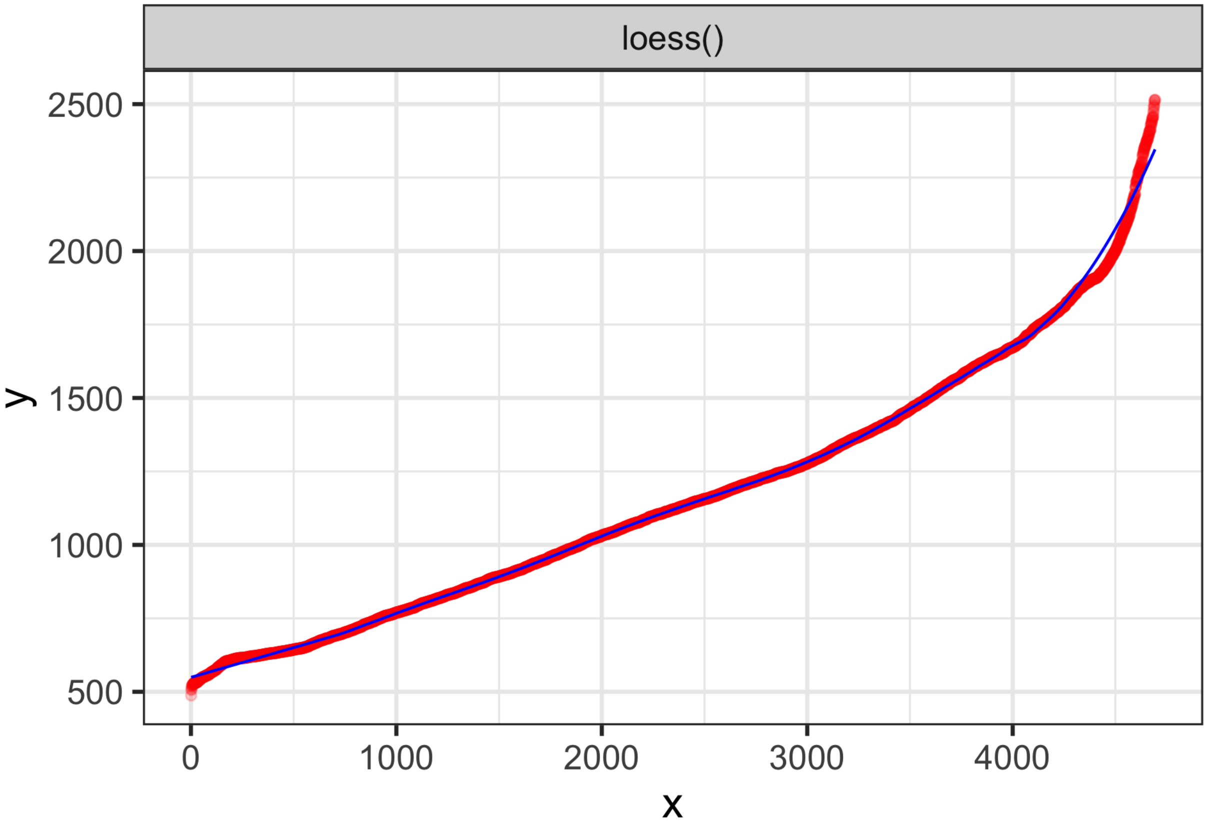
Smoothing Data

```
# CH
##school 1
set.seed(1)

dat_ch1 <- data.frame(
  x = 1:length(ch1$co2),
  y = ch1$co2
)

loessData_ch1 <- data.frame(
  x = 1:length(ch1$co2),
  y = predict(loess(y~x, dat_ch1, span = 0.1)),
  method = "loess()"
) %>%
  mutate(school = "school 1")

ggplot(loessData_ch1, aes(x, y)) +
  geom_point(dat = dat_ch1, aes(x, y), alpha = 0.2, col = "red") +
  geom_line(col = "blue") +
```

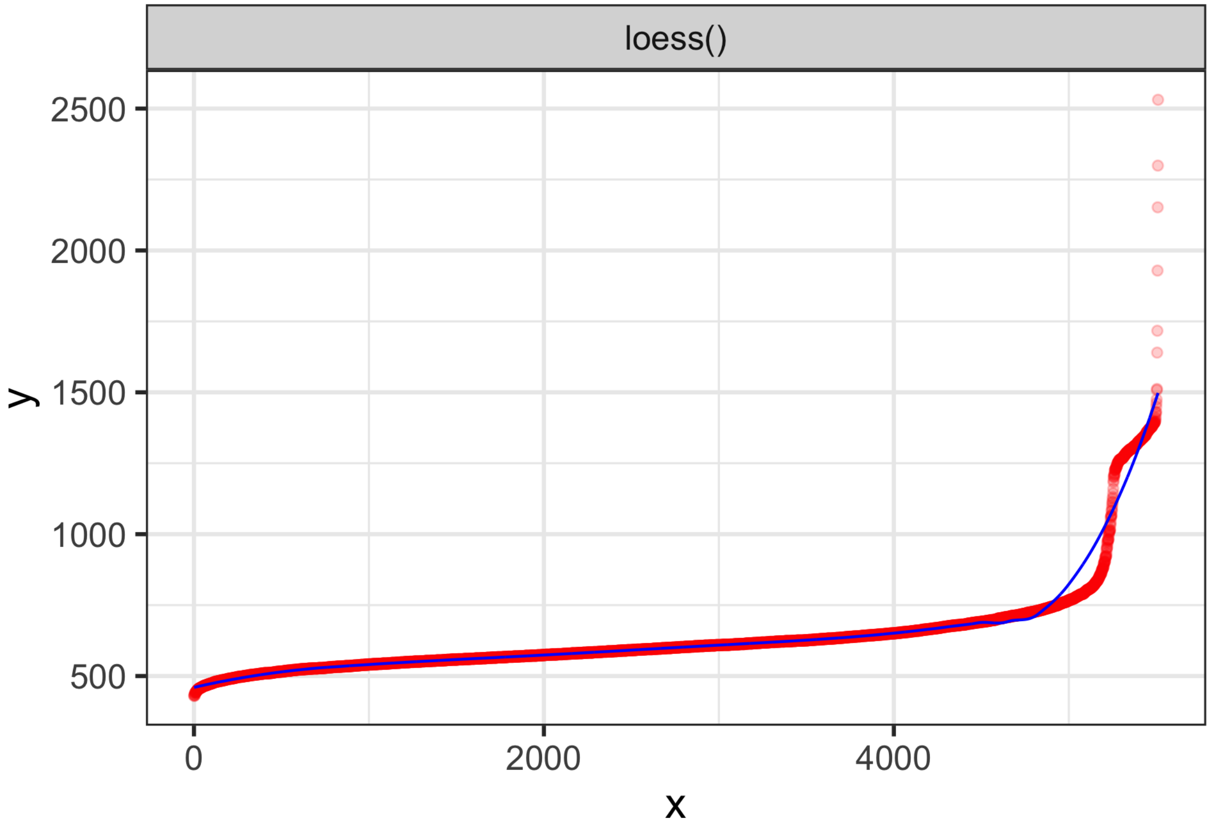
```
  facet_wrap(~method) +
  theme_bw(16)
```



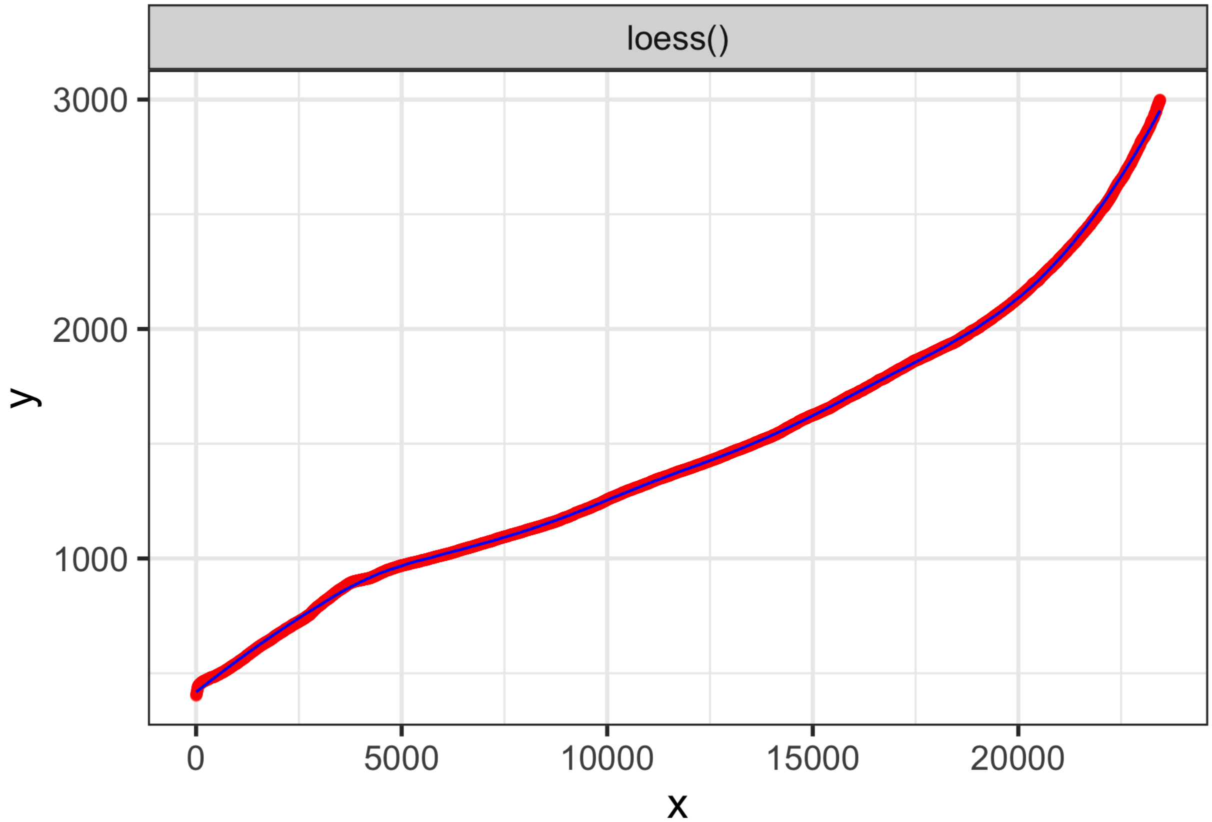

```
##school 2
dat_ch2 <- data.frame(
  x = 1:length(ch2$co2),
  y = ch2$co2
)

loessData_ch2 <- data.frame(
  x = 1:length(ch2$co2),
  y = predict(loess(y~x, dat_ch2, span = 0.3)),
  method = "loess()"
) %>%
  mutate(school = "school 2")

ggplot(loessData_ch2, aes(x, y)) +
  geom_point(dat = dat_ch2, aes(x, y), alpha = 0.2, col = "red") +
  geom_line(col = "blue") +
  facet_wrap(~method) +
  theme_bw(16)
```




```r
loessData_ch <- rbind(loessData_ch1,loessData_ch2)

# TZ
dat_tz <- data.frame(
  x = 1:length(tz$co2),
  y = tz$co2
)

loessData_tz <- data.frame(
  x = 1:length(tz$co2),
  y = predict(loess(y~x, dat_tz, span = 0.3)),
  method = "loess()"
)

ggplot(loessData_tz, aes(x, y)) +
  geom_point(dat = dat_tz, aes(x, y), alpha = 0.2, col = "red") +
  geom_line(col = "blue") +
  facet_wrap(~method) +
  theme_bw(16)
```

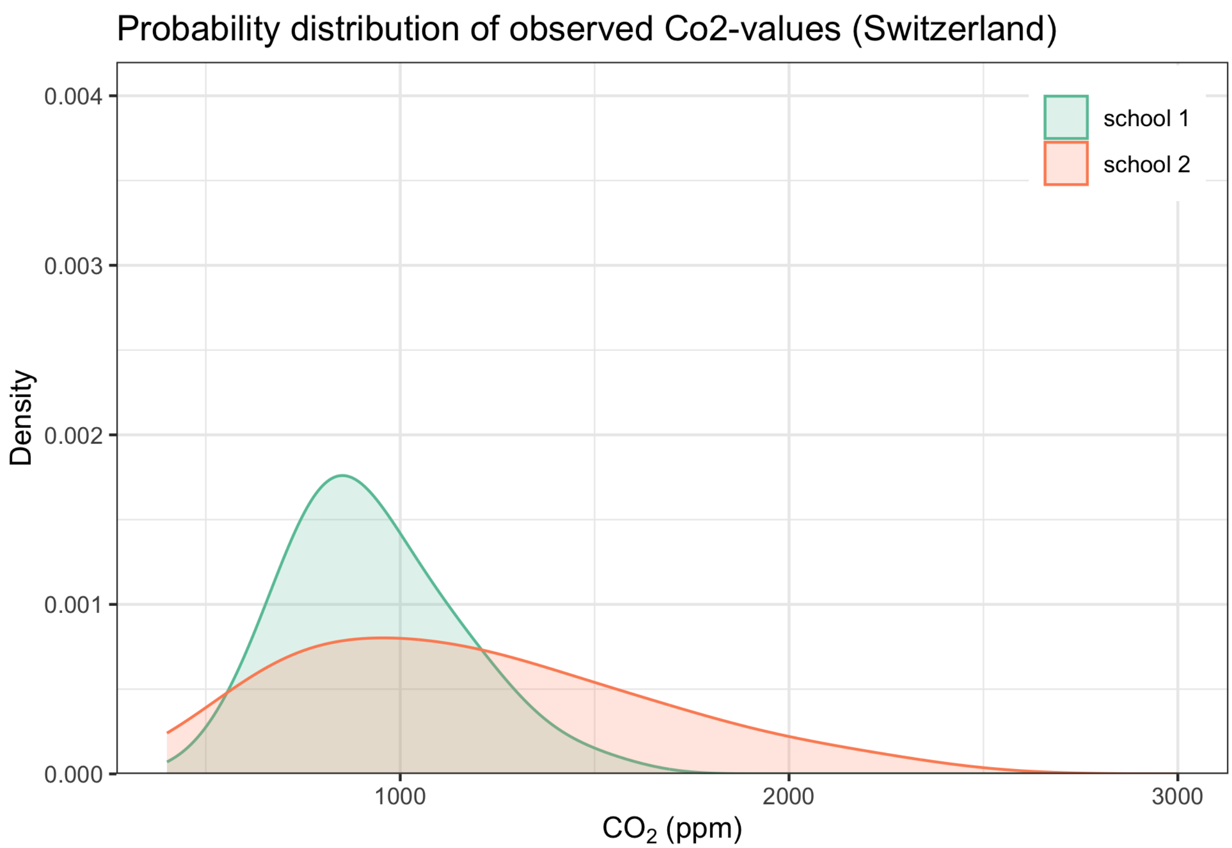



```r
# SA
dat_sa <- data.frame(
  x = 1:length(sa$co2),
  y = sa$co2
)

loessData_sa <- data.frame(
  x = 1:length(sa$co2),
  y = predict(loess(y~x, dat_sa, span = 0.3)),
  method = "loess()"
)

ggplot(loessData_sa, aes(x, y)) +
  geom_point(dat = dat_sa, aes(x, y), alpha = 0.2, col = "red") +
  geom_line(col = "blue") +
  facet_wrap(~method) +
  theme_bw(16)
```

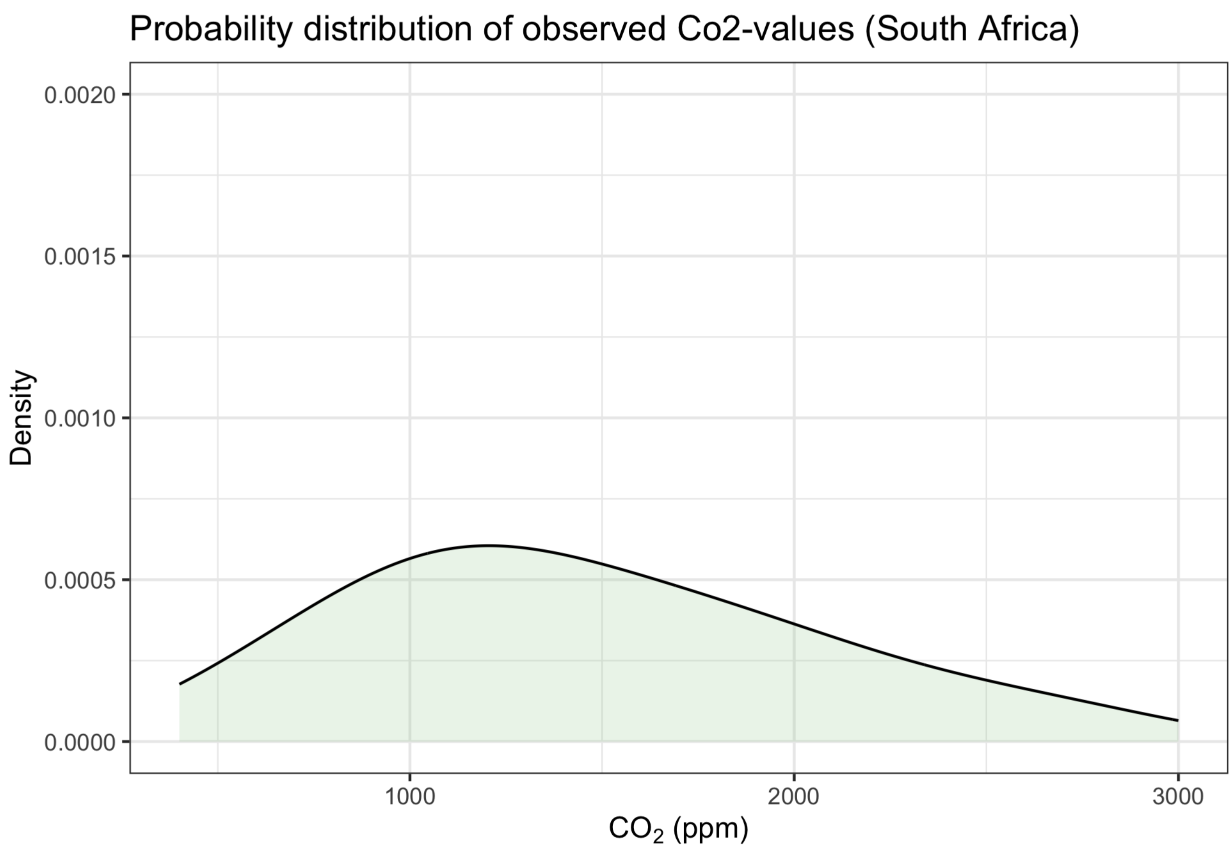


Co2 distribution

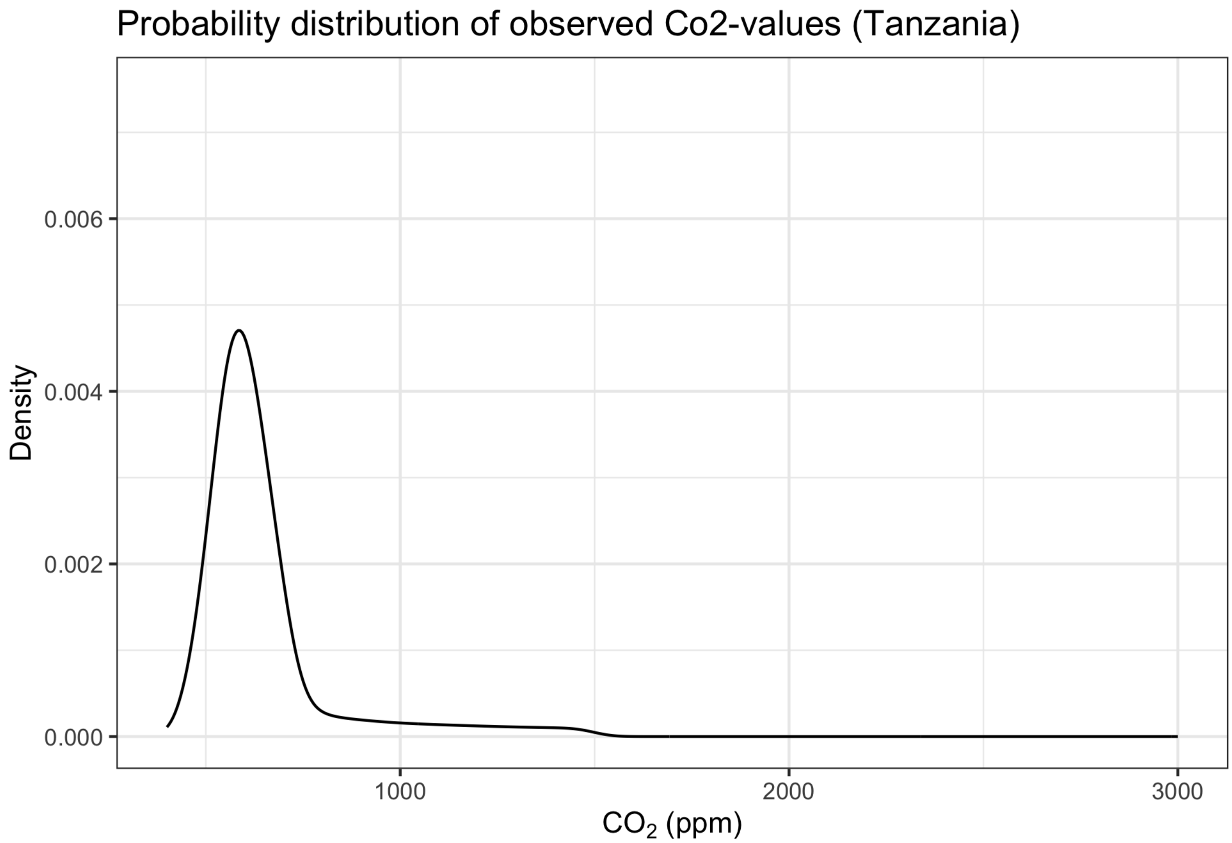
```
loessData_ch %>% #density plot ch
  ggplot(aes(x = y, color = school, fill = school)) +
  geom_density(alpha = .2, kernel = "gaussian", adjust = 3) +
  scale_x_continuous(expand = c(0,0)) +
  scale_color_brewer(palette = "Set2") +
  scale_fill_brewer(palette = "Set2") +
  scale_y_continuous(expand = expansion(mult = c(0, 0.05)),limits = c(0, 0.004)) +
  scale_x_continuous(limits = c(400, 3000)) +
  labs(x = expression(CO[2]*" (ppm)"), y = "Density") +
  theme_bw() +
  theme(legend.position = c(0.9,0.9), legend.title = element_blank()) +
  ggtitle("Probability distribution of observed Co2-values (Switzerland)")
```




```
loessData_sa %>% #density plot sa smooth
  ggplot(aes(x = y)) +
  geom_density(alpha = .2, kernel = "gaussian", adjust = 4, fill = "darkseagreen3") +
  scale_x_continuous(expand = c(0,0)) +
  scale_color_brewer(palette = "Set2") +
  scale_fill_brewer(palette = "Set2") +
  scale_y_continuous(limits = c(0, 0.002)) +
  scale_x_continuous(limits = c(400, 3000)) +
  labs(x = expression(CO[2]*" (ppm)"), y = "Density") +
  theme(legend.position = "none") +
  theme_bw() +
  ggtitle("Probability distribution of observed Co2-values (South Africa)")
```

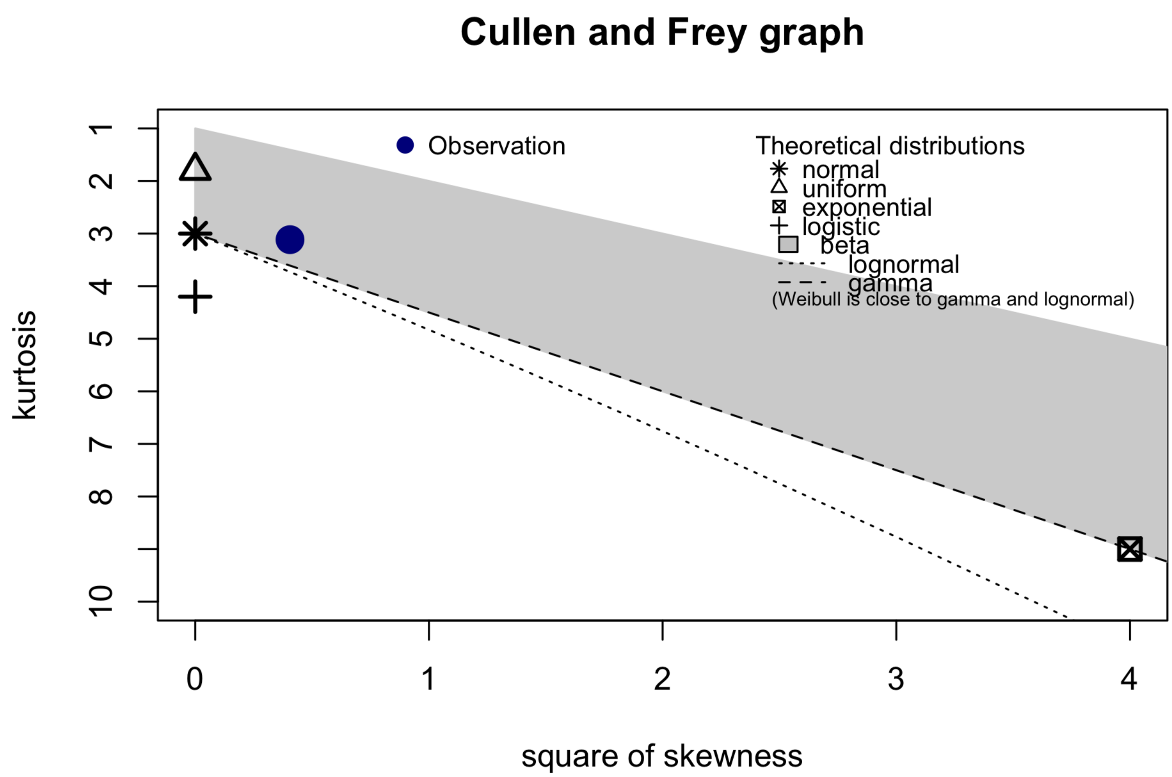



```r
loessData_tz %>% #density plot tz smooth
  ggplot(aes(x = y)) +
  geom_density(alpha = .2, kernel = "gaussian", adjust = 3.2) +
  scale_x_continuous(expand = c(0,0)) +
  scale_color_brewer(palette = "Set2") +
  scale_fill_brewer(palette = "Set2") +
  scale_y_continuous(limits = c(0, 0.0075)) +
  scale_x_continuous(limits = c(400, 3000)) +
  labs(x = expression(CO[2]*" (ppm)"), y = "Density") +
  theme_bw() +
  theme(legend.position = c(0.9,0.9), legend.title = element_blank()) +
  ggtitle("Probability distribution of observed Co2-values (Tanzania)")
```



Distribution co2

```
#C_a
C_a <- ((0.0042)*60)/8 #https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5666301/ mean girls (11-16 and 16-

#C_o
C_o <- 400 #p.p.m (taking a higher estimate because higher values ar possible when a lot of traffic ect
## all schools are directly on the side of a road (no info for tanzania), so i won't make a distinction

#school1
x_ch1 <- ch %>%
  filter(school == "School 1") %>%
  pull(co2)

descdist(x_ch1, discrete = FALSE) #normal distribution fits well
```



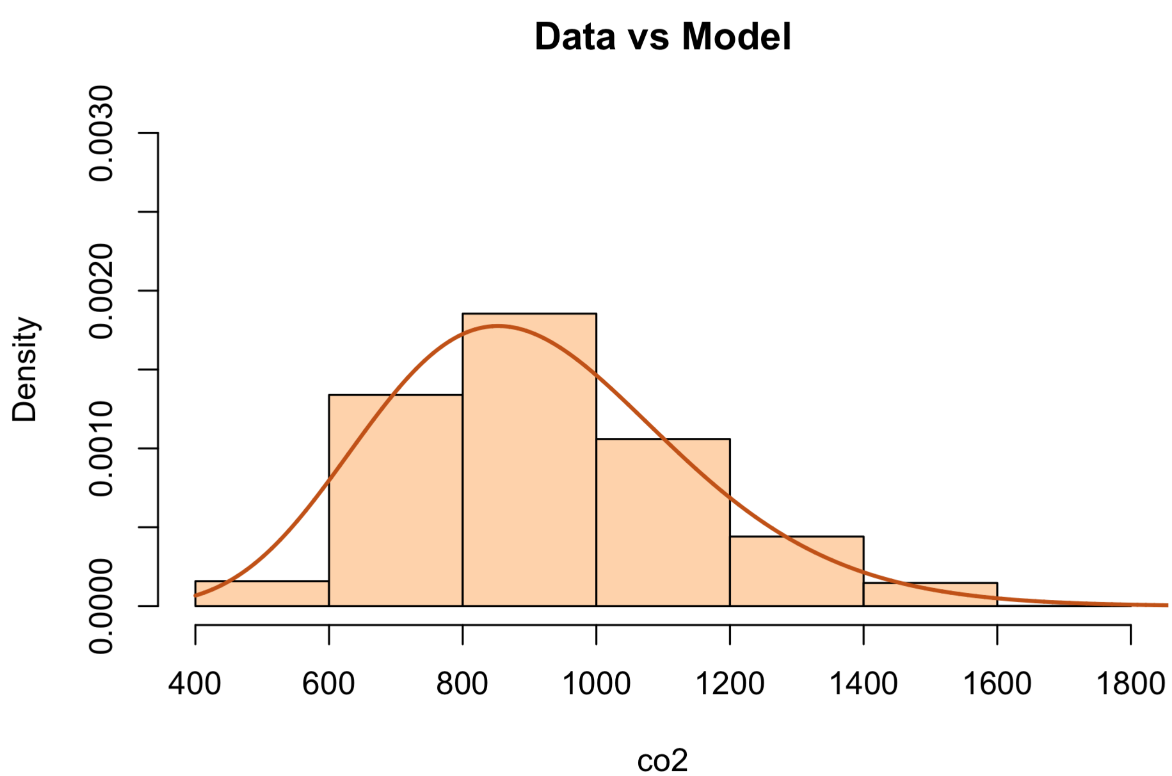

```
## summary statistics
## ------
## min:  499   max:  1661.83
## median:  890.79
## mean:  929.6862
## estimated sd:  211.422
## estimated skewness:  0.6368133
## estimated kurtosis:  3.115236
```

```
fitdistr(x_ch1, "gamma") #get parameters
```

```
##        shape           rate
##   20.0718895973    0.0215899650
##  ( 0.4539806165) ( 0.0004939296)
```

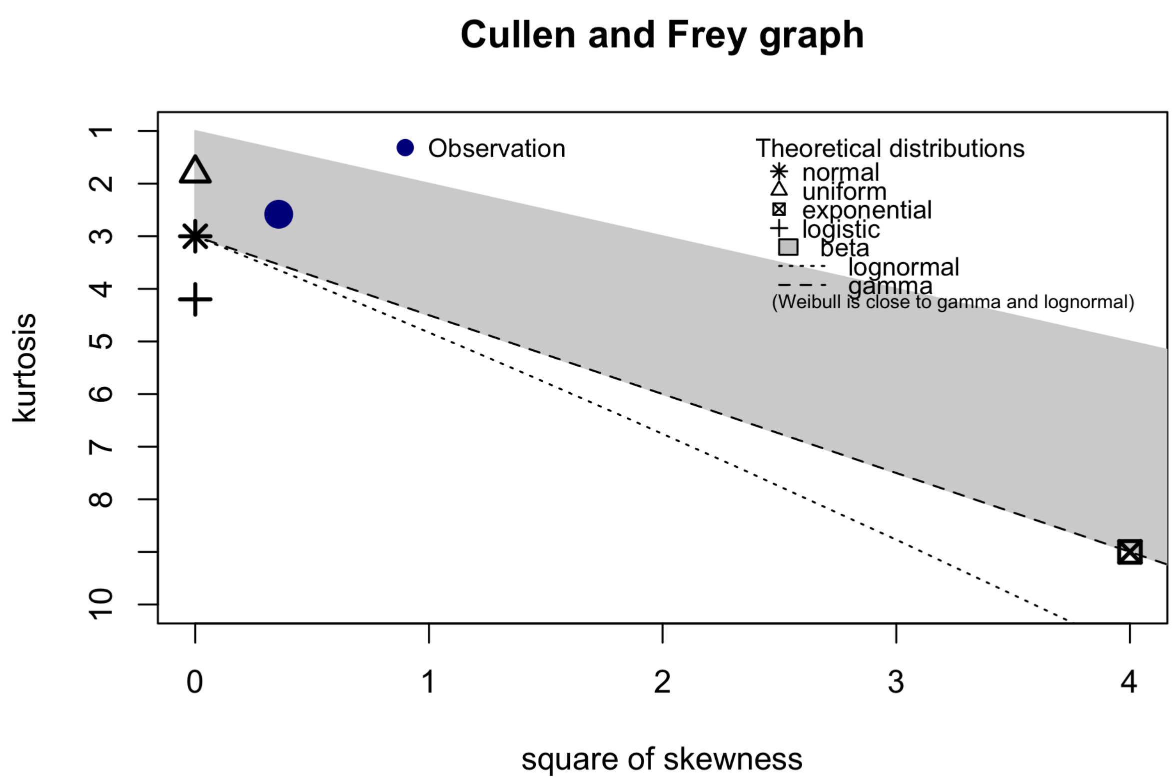
```
x <- seq(400, 3000, by = .1)

co2_distr_ch1 <- data.frame(co2 = seq(400, 3000, .1)) %>%
  mutate(prob = dtrunc(co2, spec = "gamma", a = 400, b = 3000, shape = 15.5, rate = 0.017) )

plot_co2_ch1 <- co2_distr_ch1 %>%
  ggplot(aes(x=x,y=y_ch1)) +
  geom_line(color= "red") +
  ggtitle("Switzerland / School 1")+#plot density
```

```
  labs(x = expression(CO[2]*" (ppm)"), y = "Density") +
  theme_bw() +
  scale_y_continuous(expand = expansion(mult = c(0, 0.05)), limits = c(0, 0.004))  +
  scale_x_continuous(limits = c(400, 3000))

sample_co2_ch1 <- sample(co2_distr_ch1$co2, 10000, replace = TRUE, prob = co2_distr_ch1$prob) #sample c
sample_f_ch1 <- tibble(co2 = sample_co2_ch1, f = ((co2-C_o)/C_a)/1000000) %>% #sample f
  dplyr::select(-co2)

####histogram / density comparison
hist(loessData_ch1$y, # histogram
 col="peachpuff", # column color
 border="black",
 prob = TRUE, # show densities instead of frequencies
 xlab = "co2",
 main = "Data vs Model",
 breaks = 7,
 xlim = c(400,1800),
 ylim = c(0,0.003))
lines(co2_distr_ch1, # density plot
 lwd = 2, # thickness of line
 col = "chocolate3")
```




```
#school 2
x_ch2 <- loessData_ch2 %>%
```

```
  pull(y) #pull filtered data

descdist(x_ch2, discrete = FALSE) #gamma fits ok
```



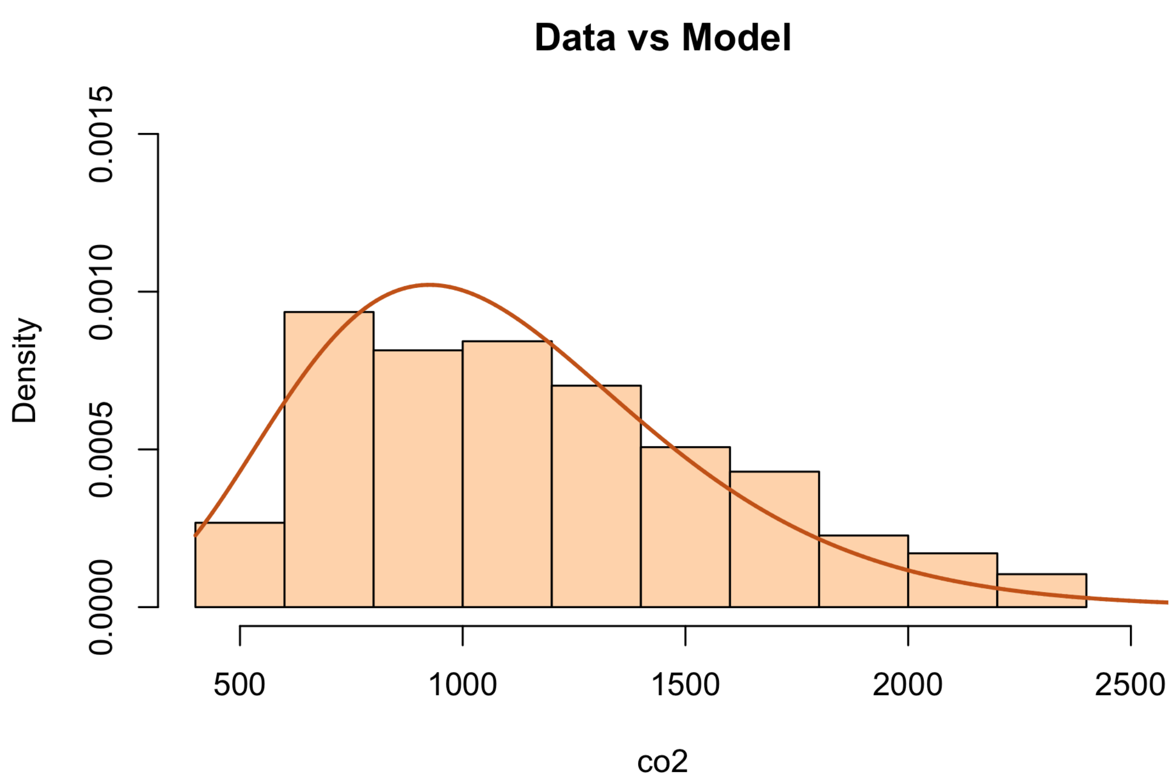

```
## summary statistics
## ------
## min:  549.5165   max:  2346.033
## median:  1120.103
## mean:  1175.967
## estimated sd:  438.1166
## estimated skewness:  0.5976435
## estimated kurtosis:  2.581763
```

```
fitdistr(x_ch2, "gamma") #get parameters
```

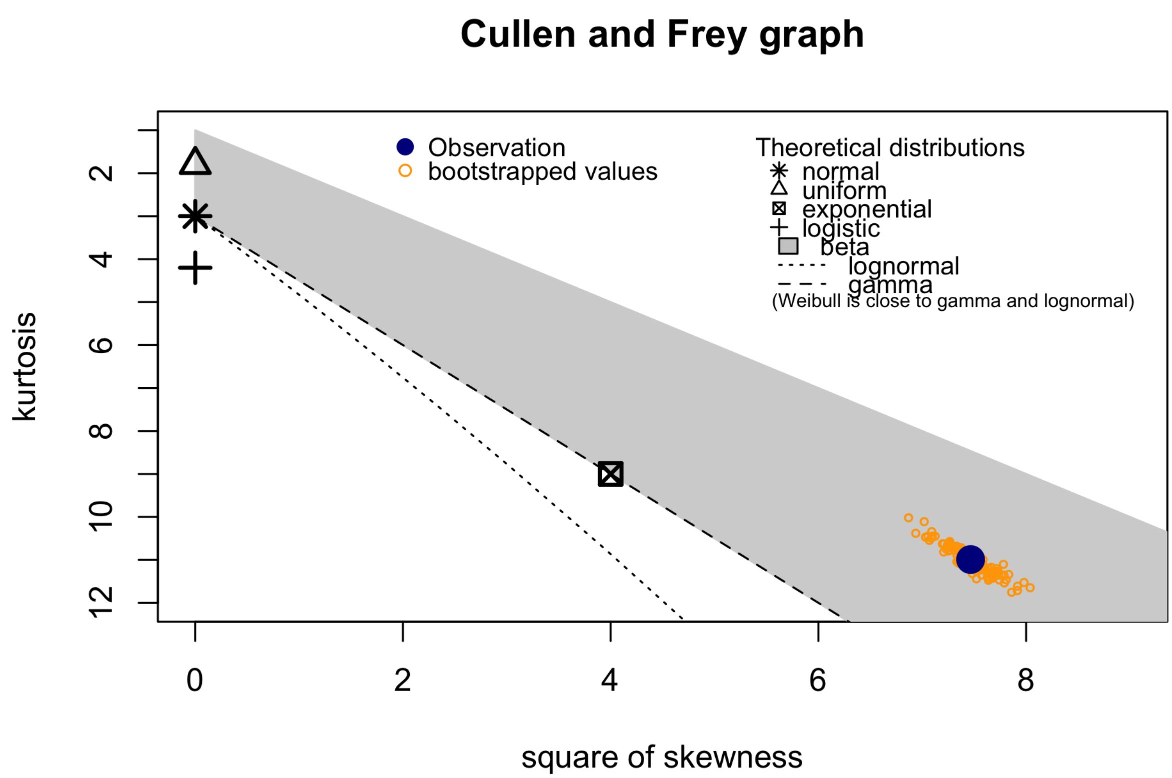
```
##       shape           rate
##   7.3808794499   0.0062764348
##  (0.1338510849) (0.0001162775)
```

```
co2_distr_ch2 <- data.frame(co2 = seq(400, 3000, .1)) %>% #create data frame
  mutate(prob = dtrunc(x, spec = "gamma", a = 400, b = 3000, shape = 6.55, rate = 0.006))
#7.4
plot_co2_ch2 <- co2_distr_ch2 %>% #plots density
  ggplot(aes(x=x,y=y_ch2)) +
```

```
  geom_line(color= "red") +
  ggtitle("Switzerland / School 2")+#plot density
  labs(x = expression(CO[2]*" (ppm)"), y = "Density") +
  theme_bw() +
  scale_y_continuous(expand = expansion(mult = c(0, 0.05)), limits = c(0, 0.004))  +
  scale_x_continuous(limits = c(400, 3000))

sample_co2_ch2 <- sample(co2_distr_ch2$co2, 10000, replace = TRUE, prob = co2_distr_ch2$prob) #sample
sample_f_ch2 <- tibble(co2 = sample_co2_ch2, f = ((co2-C_o)/C_a)/1000000) %>%
  dplyr::select(-co2)

####histogram / density comparison
hist(loessData_ch2$y, # histogram
 col="peachpuff", # column color
 border="black",
 prob = TRUE, # show densities instead of frequencies
 xlab = "co2",
 main = "Data vs Model",
 breaks = 7,
 xlim = c(400,2500),
 ylim = c(0,0.0015))
lines(co2_distr_ch2, # density plot
 lwd = 2, # thickness of line
 col = "chocolate3")
```



```r
#tanzania
x_tz <- loessData_tz %>%
  pull(y)

x_tz <- as.numeric(x_tz)

descdist(x_tz, discrete = FALSE, boot = 100) #gamma fits ok
```

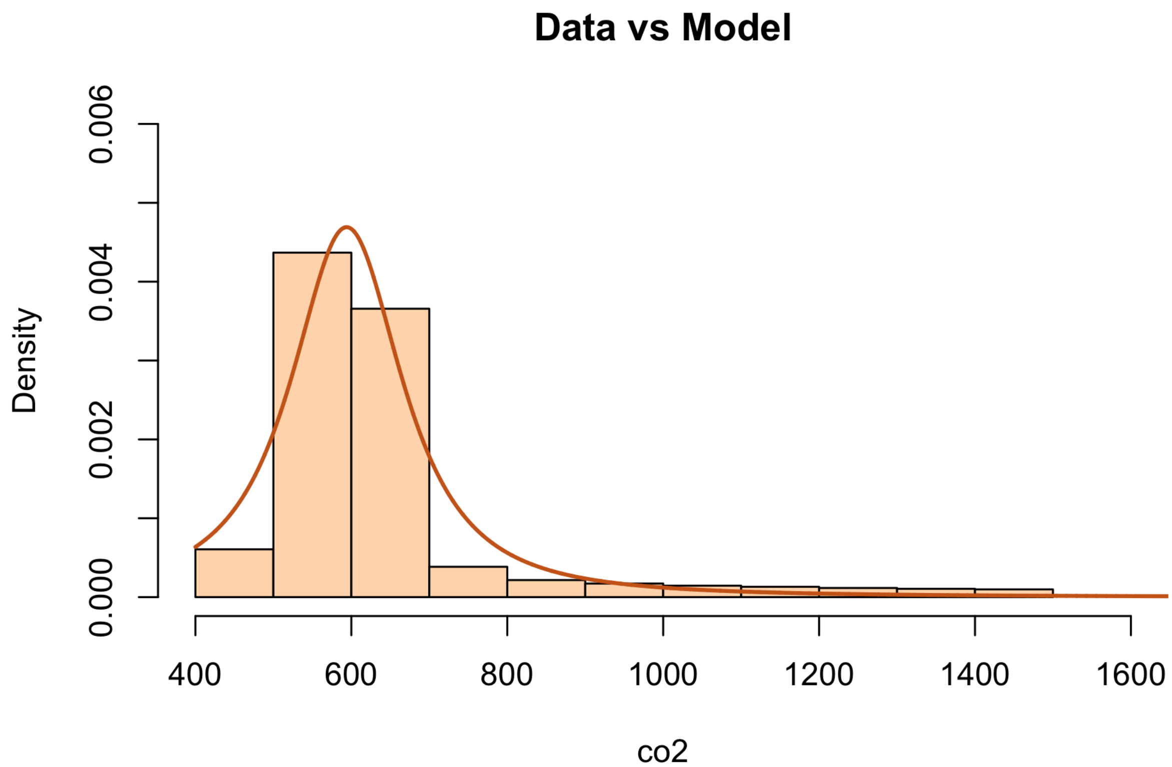



```
## summary statistics
## ------
## min:  460.1963   max:  1497.719
## median:  600.4938
## mean:  644.2189
## estimated sd:  173.3067
## estimated skewness:  2.732294
## estimated kurtosis:  10.99144
```

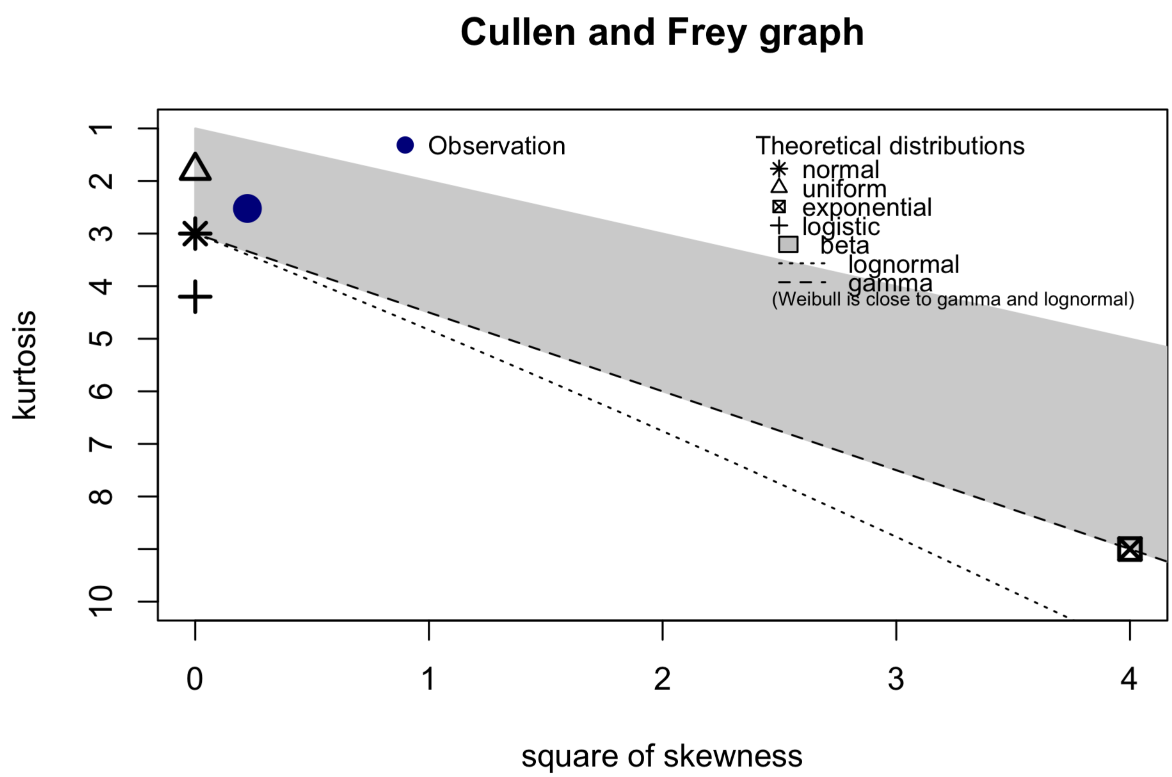
```r
fitdistr(x_tz, "t") #get parameters
```

```
##           m             s              df
##    593.94973711   54.89374964    1.55018887
##   (  1.02944941) (  1.01107831) (  0.04266281)
```

```r
co2_distr_tz <- data.frame(co2 = seq(400, 3000, .1)) %>%
  mutate(prob = dtrunc(x, spec = "st", a = 400, b = 3000, mu = 593.95, sigma = 80, nu = 1.55))

plot_co2_tz <- co2_distr_tz %>%
  ggplot(aes(x=x,y=y_tz)) +
  geom_line(color= "red") +
  labs(x = expression(CO[2]*" (ppm)"), y = "Density") +
  ggtitle("Tanzania") +
  theme_bw() +
  scale_y_continuous(limits = c(0, 0.0075)) +
  scale_x_continuous(limits = c(400, 3000))

sample_co2_tz <- sample(co2_distr_tz$co2, 10000, replace = TRUE, prob = co2_distr_tz$prob) #sample
sample_f_tz <- tibble(co2 = sample_co2_tz, f = ((co2-C_o)/C_a)/1000000) %>%
  dplyr::select(-co2)

####histogram / density comparison
hist(loessData_tz$y, # histogram
 col="peachpuff", # column color
 border="black",
 prob = TRUE, # show densities instead of frequencies
 xlab = "co2",
 main = "Data vs Model",
 breaks = 14,
 xlim = c(400, 1600),
 ylim = c(0,0.006))
lines(co2_distr_tz, # density plot
 lwd = 2, # thickness of line
 col = "chocolate3")
```




```
#south africa
x_sa <- loessData_sa %>%
  pull(y)

x_sa <- as.numeric(x_sa)

descdist(x_sa, discrete = FALSE) #normal/gamma fits ok -> after comparison --> gamma is better
```



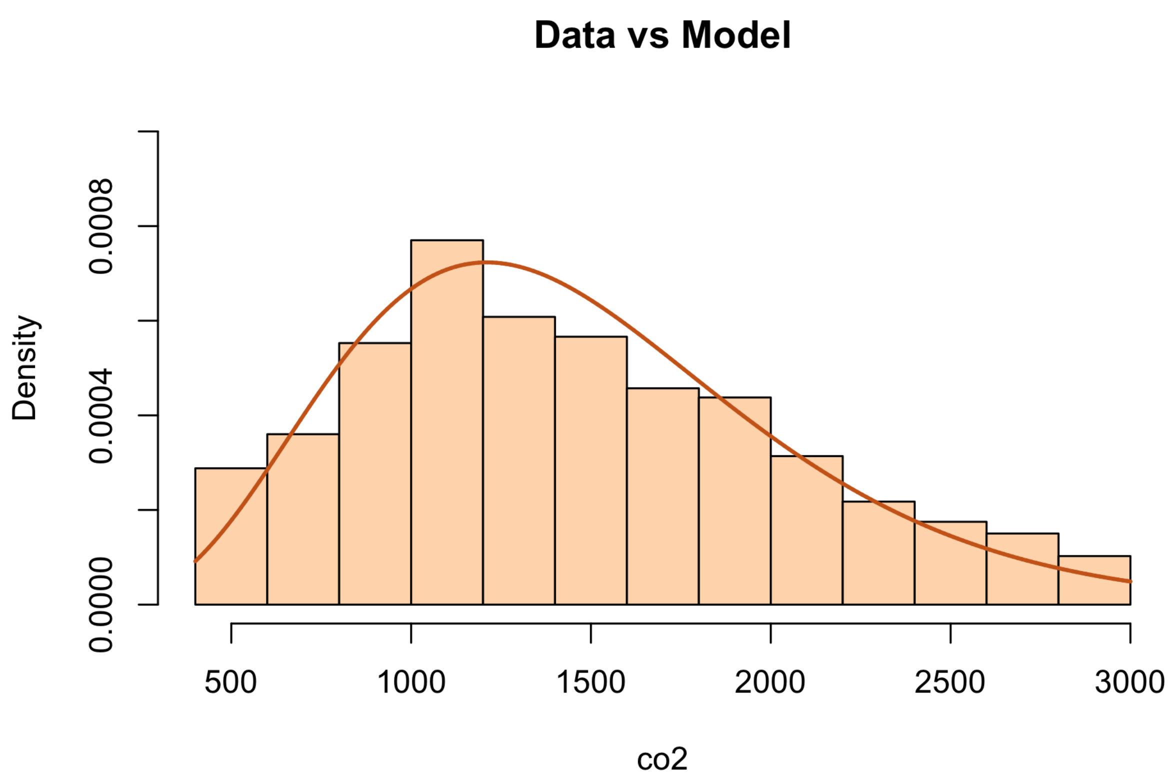

```
## summary statistics
## ------
## min:  418.1935   max:  2952.034
## median:  1375.813
## mean:  1457.681
## estimated sd:  596.2569
## estimated skewness:  0.4724284
## estimated kurtosis:  2.521861
```

```
fitdistr(x_sa, "gamma") #get parameters
```

```
##        shape           rate
##   5.71414583529   0.00392003036
##  (0.04226574725) (0.00002930491)
```

```
co2_distr_sa <- data.frame(co2 = seq(400, 3000, .1)) %>%
  mutate(prob = dtrunc(x, spec = "gamma", a = 400, b = 3000, shape = 5.72, rate = 0.0039))

plot_co2_sa <- co2_distr_sa %>%
  ggplot(aes(x=x,y=y_sa)) +
  geom_line(color= "red") +
  labs(x = expression(CO[2]*" (ppm)"), y = "Density") +
  ggtitle("South Africa") +
  theme_bw() +
```

```
  scale_y_continuous(limits = c(0, 0.002)) +
  scale_x_continuous(limits = c(400, 3000))

sample_co2_sa <- sample(co2_distr_sa$co2, 10000, replace = TRUE, prob = co2_distr_sa$prob) #sample
sample_f_sa <- tibble(co2 = sample_co2_sa, f = ((co2-C_o)/C_a)/1000000) %>%
  dplyr::select(-co2)

####histogram / density comparison
hist(loessData_sa$y, # histogram
 col="peachpuff", # column color
 border="black",
 prob = TRUE, # show densities instead of frequencies
 xlab = "co2",
 main = "Data vs Model",
 breaks = 10,
 xlim = c(400, 3000),
 ylim = c(0,0.001))
lines(co2_distr_sa, # density plot
 lwd = 2, # thickness of line
 col = "chocolate3")
```




```
#ggarrange(plot_co2_ch1, plot_co2_ch2, plot_co2_sa, plot_co2_tz,
     #     labels = c("A", "B", "C", "D"),
      #    ncol = 2, nrow = 2)
```

Quanta

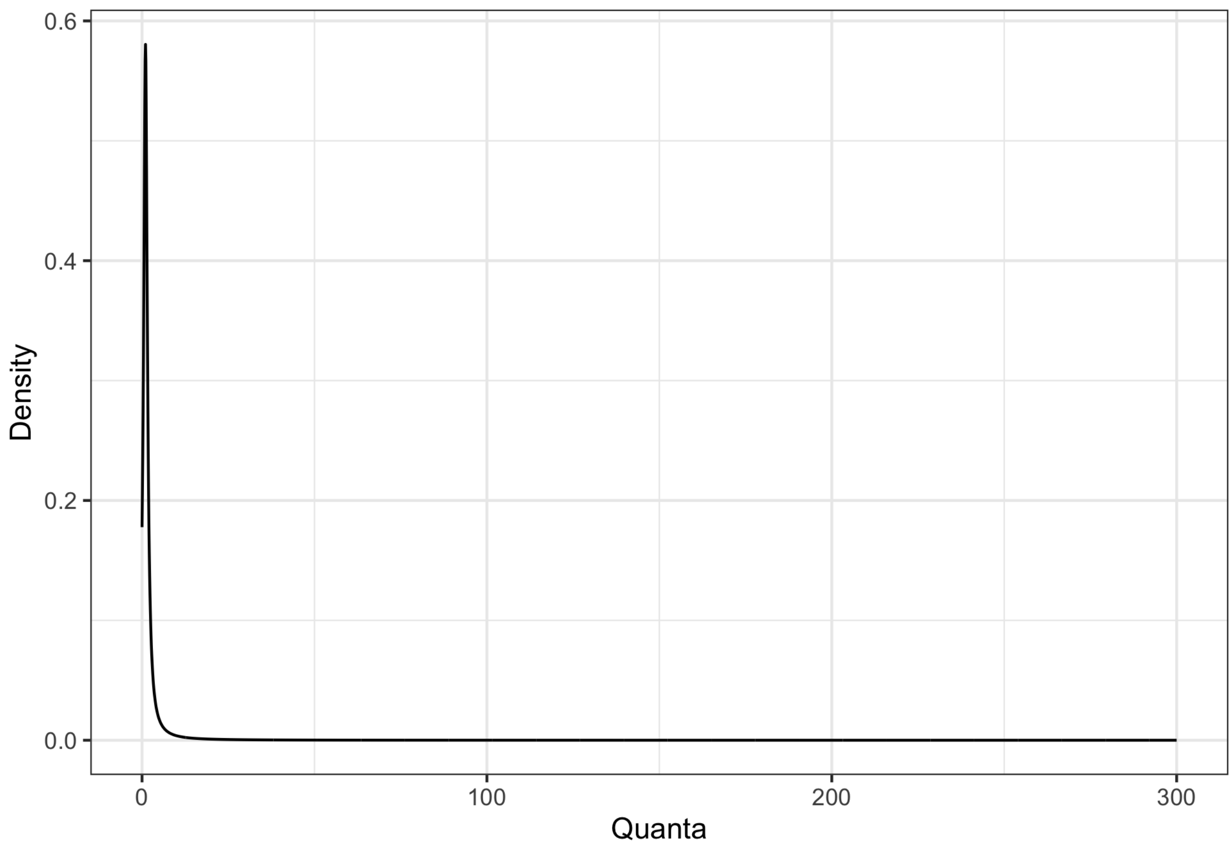
I'll use the following studies for calculating the meanparameter:

Riley (1962): 130 patients, q: 1.25 Escombe (2008): 117 patients, q: 8.2 Nardell (1991) : 1 patients, q: 12.5 Andrews (2014) : 571 patients, q: 0.89

```
q <- (1.25*130+8.2*117+12.5+0.89*571)/(130+117+1+571) #weighted mean from different studies

#Escombe Table 2
mean_one_inf <- mean(c(12,3,5.5,1.8,18,12)) #mean quanta of pers. which infected one pig
mean_two_inf <- mean(c(2.9,40)) #mean quanta of pers. which infected two pigs

q_inf_persons <- c(12,3,2.9,5.5,1.8,18,40,12,226,52,mean_two_inf,rep(mean_one_inf,11))
q_sample_total_norm <- c(q_inf_persons, rtruncnorm(117-length(q_inf_persons), a = 0, mean = 1, sd = 1))

fitdistr(q_sample_total_norm, "t") #get parameters
```

```
##          m            s             df
##    1.10137081   0.65998949   0.89845036
##   (0.10037885) (0.09137468) (0.12845296)
```

```
dq <- function(x) {
  dtrunc(x, spec = "st", a = 0, b = 300, mu = 1, sigma = 0.67, nu = 0.90) #parameters from fitdistr
}

rq_distr <- data.frame(quanta = seq(0, 300, .1)) %>%
  mutate(prob = dq(quanta))

rq_distr %>%
  ggplot(aes(x = quanta, y = prob)) +
  geom_line()+
  theme_bw() +
  xlab("Quanta") +
  ylab("Density")#Distribution of the quanta model
```




```
sample_q <- sample(rq_distr$quanta, 10000, replace = TRUE, prob = rq_distr$prob) #sample q for calculat
sample_q
```

```
##     [1]   3.5   1.2   2.0   2.3   1.3   0.9   1.4   0.7   5.3   1.5   1.1   0.3
##    [13]   1.1   1.1   1.0   1.4   0.6   0.2   1.4   0.4   1.2   1.7   0.7   1.3
##    [25]   1.3   0.7   1.1   0.6   0.8   1.9   0.9   0.9   4.6   3.7   2.2   1.4
##    [37]   1.4  10.3   0.4   1.0   0.6  37.0   2.2   1.6  36.8   1.1   1.7   0.8
##    [49]   0.5   0.8   0.8   0.8   3.5   1.0   1.5  28.2   0.8   0.2   0.7   5.6
##    [61]   0.7   0.0   2.2   4.9   1.2   0.3   0.8   0.9   1.5   0.5   1.6   4.8
##    [73]   1.4   0.5   4.2   1.2   0.7   0.7   1.2   1.4   3.9   0.0   2.0   1.1
##    [85]   1.8   1.7   4.4   4.4   0.9   3.6   1.8   0.9   2.2   2.6   0.7   1.7
##    [97]  13.0   0.5   1.2   1.1   2.3   0.3   0.9   0.3   1.5   1.2   0.4   1.0
##   [109]   0.8   1.8   0.4   1.3   0.7   0.9   1.2   0.3   1.8   0.7   3.0   0.7
##   [121]   0.2   0.5   4.0   0.6   2.4   4.2   1.1   1.4   1.9   1.4   1.5   0.9
##   [133]   1.3   3.4   3.1   0.0   2.2   0.5   5.3  17.7   0.9   2.1   1.2   0.9
##   [145]   1.2   0.3   1.0   1.0   1.2   4.2   2.1   4.6   1.0  20.0   0.6   1.1
##   [157]   1.3   0.7   0.5   0.6   0.0   2.1   1.8   1.2   1.1   0.2   1.1   0.7
##   [169] 107.4   2.3  10.2   1.4   0.0   5.2   1.3   1.6   0.9  10.3   1.7   0.7
##   [181]   1.8   1.5   4.3  44.3   0.8   1.0   3.0   1.5   0.8   1.4   1.0   0.1
##   [193]   1.8   0.7   1.0   1.7   1.3   0.9   0.8   0.6   1.2   0.7   0.6   1.0
##   [205]   1.1   9.3   1.4   0.6   1.2   0.9   0.7   1.3  93.9   1.3   2.7   1.4
##   [217]   1.2   0.2   1.8   0.5   1.3   3.7   0.4   1.7   0.8   1.5   0.5   2.1
##   [229]   0.6   1.5   0.1   2.0   1.5   2.5   1.2   1.1   0.9   1.2   0.9   0.9
##   [241]   0.8   3.7   1.2   0.0   2.4   1.5   1.5   1.3   0.2   0.2   1.4  29.9
##   [253]   1.3   0.5   0.1   2.9   1.0   0.1   4.5   1.6   0.1  24.7   1.2   1.3
```

```
##  [265]   0.6   1.8   0.8 156.6   1.1   1.6   1.4   1.4  22.5   0.5   1.0   0.8
##  [277]   1.3   1.5   0.3   1.3   1.3   0.7  10.6   0.7   6.3   1.1   1.3   0.5
##  [289]   1.9   1.7   2.7   1.2   0.0   1.3   4.4   0.3   0.9   1.2   1.5   0.7
##  [301]   3.8   3.1   1.0   0.0   1.8   1.4   2.5   0.8  10.7   5.9   1.2   1.2
##  [313]   1.5   0.2   2.7   1.4   7.9   1.1   0.8   1.0   0.8   1.4   0.9   1.2
##  [325]   1.6   3.6   4.9   3.1   0.3   0.5   1.4   0.2   1.0   1.6   5.4   5.0
##  [337]   0.7   0.0   1.9   2.4   0.4   2.9   1.9   0.0   1.2   0.6   3.8   3.4
##  [349]   1.0   1.9   6.6   0.0   1.5   1.1   0.1   2.0   1.8   1.4   0.3   0.6
##  [361]   0.9   4.4   1.3   1.6   0.7   9.1   1.1   1.4   1.7  38.8   1.2   0.1
##  [373]   3.2   0.9   1.5   1.3   0.2   0.7   0.3   6.0  23.6   1.1   2.3   8.0
##  [385]   1.5   0.8   0.6   0.7   1.8   0.5   0.5   1.6   1.5   1.4   1.8  37.4
##  [397]   0.1   2.1   0.5  16.1   1.1  11.9   1.5 231.2   1.1   0.4   0.5   0.1
##  [409]   1.0   1.1   2.1   1.7   0.1   1.3  10.2   1.1   1.0   0.2   1.3   1.1
##  [421]   1.4   0.5   0.8   1.5  44.4   5.6   1.2   1.7   2.1   0.5   1.5   1.1
##  [433]   1.2   3.3   0.1   0.1   1.3   1.1   0.8   0.9   1.2   0.8   1.6   0.7
##  [445]   1.2   1.0   0.9   1.5   1.8   1.6   0.0   1.1   1.7   1.1   1.3   0.5
##  [457]   0.5   0.2   1.9   1.5  18.9   2.3   1.4   0.0   3.9   3.0   1.6   0.2
##  [469]   2.6   0.5   3.4   0.4  37.5   0.6   1.6   0.3   1.4   0.9   1.6   0.9
##  [481]   2.2   1.4   1.1   3.2   0.6   0.8   1.2   0.5   2.0   0.9   3.2   1.4
##  [493]   0.9   5.0   1.1   3.0   3.1   1.8   1.5   0.5   1.0   0.5   1.0   1.7
##  [505]   1.5   1.7   3.8   1.2   0.0   0.9   2.7   1.0   0.8   0.3   0.2   3.0
##  [517]   0.9   0.8   1.8   1.5   0.8   9.6   8.5   6.9   0.7   1.0   1.7   0.6
##  [529]   0.9   3.5   1.4   2.6   0.4   2.1   0.9   4.7   1.3   1.5   0.2  40.7
##  [541]   4.4   2.0   1.1   0.9   2.3   1.1   1.4   1.8   1.3   1.3   0.7   0.6
##  [553]   3.6  10.9   1.1   6.4   1.6   0.8   0.9   4.2  11.2   2.2   0.9   1.9
##  [565]   0.4   1.1   1.3   2.5   1.8   1.1   1.5   0.6   1.6   1.3   0.3   1.0
##  [577]   6.0   1.7   1.3   1.5   0.1   2.4  80.4   1.3   1.4   0.1   0.8   1.7
##  [589]   1.4   1.7   1.3   2.2   1.6   1.0   1.5   1.1   0.9   4.6   2.3   3.0
##  [601]   0.8   0.2   1.0   0.5   1.7   0.9   1.5   0.5   0.3   1.4   0.4   2.4
##  [613]   0.3   1.0   2.1   1.3   0.2   1.4   1.0   9.0   0.5   1.7   2.2   0.9
##  [625]   1.5   2.7   1.1   1.7   8.8   4.9   0.5   0.9   0.6   1.3   1.1   1.4
##  [637]   0.6   2.1   1.3   0.8   0.6   1.7   2.5   1.0   0.9   4.8   0.2   1.4
##  [649]   0.9   1.6   9.4   0.8   1.0   0.5   0.7   5.4   2.5   1.1   1.2   1.0
##  [661]   0.8   1.4   2.8   0.7   1.1   0.8   0.4   1.4   1.1   0.6   1.4   0.5
##  [673]   4.2  42.7   1.3   2.7   1.5   1.0   7.5   0.4   1.2   1.2   1.5   0.9
##  [685]   0.6   2.7   1.4   1.2   1.8   1.9   1.3   1.1   0.8   0.1   3.4  37.5
##  [697]   1.8   0.7   4.8   1.7   0.8   1.3   0.7   1.7   1.2   0.3   1.7   0.9
##  [709]   0.9   0.5   0.3   0.7   1.2   1.9   0.2   1.9   0.2   0.5   1.5   1.7
##  [721]   1.1   0.7   1.1   0.6   0.3   0.4  11.6  34.1   2.4   0.1   9.4   1.9
##  [733]   0.7   0.5   0.5   1.1   2.5   0.7   0.5   2.6   1.4   1.2   1.7  10.3
##  [745]   0.6   1.1   0.7   2.0   4.0   1.2   0.3   1.2   2.5   2.1   2.3   1.0
##  [757]   0.8   1.6   1.0   1.3   1.6   1.0   0.3   1.2  25.2   1.2   0.9   1.2
##  [769]   1.0   1.2   1.0   1.0   1.0   0.9   1.6   1.0   2.5   1.1  44.0   9.6
##  [781]   0.7   1.0   1.2   0.1   1.4   0.2   1.4   1.2   3.4   0.4   1.3   1.2
##  [793]   1.0   1.1   1.2   0.9   0.4   1.1   1.5   2.2   0.5   1.9  20.8   0.7
##  [805]   2.2   0.9   0.0   0.5   1.2   6.0   0.7   5.2   1.4   7.4   1.3   0.6
##  [817]   0.4   0.9  16.3   2.9   4.6   1.1   1.1   1.0   0.9   4.1   0.5   1.4
##  [829]   2.7   0.6   2.2   3.9   2.6   1.7   0.6   1.4   1.8   1.1   1.0  47.2
##  [841]   0.3   7.4   1.2   0.6   1.7   1.5   1.0   1.5   3.5   6.3   3.1   2.4
##  [853]  23.8   3.8   1.3   0.9   1.5   1.7   1.1   1.2   2.3   0.4   1.4   0.9
##  [865]   1.5  64.7   1.1   1.5   0.9   1.9   1.1   1.5   1.5   0.9   1.5   2.2
##  [877]   1.2   1.6   0.5   0.6   0.7   1.0   1.6   1.6   0.1   0.7   0.1   1.1
##  [889]   2.0   1.3   3.1   1.0   0.9   1.8   1.3   0.9   1.5   0.9   1.3  22.0
##  [901]   1.7   1.3   2.1   0.5   1.2   0.6   1.0   2.2  18.6   0.5   1.3   0.5
```

```
##  [913]   1.0   1.0   1.0   0.6   3.7   1.0   0.6   1.4   0.8  14.2  62.0   2.3
##  [925]   2.2   1.2   2.9   1.6   1.0   0.5   1.3   1.7   0.7   1.2   0.5   0.4
##  [937]   1.0   1.0   1.0   1.1   3.4   1.3   2.3  16.1   6.8   1.1   2.9   1.6
##  [949]   0.9   0.6   0.8  92.6   0.9   2.4   2.5   2.9   2.3   0.2   1.1   1.7
##  [961]   6.1   0.9   0.2   1.0   0.1   0.6   1.4   1.4   0.9   1.2   1.3   0.5
##  [973]   1.1   1.4   1.1   2.0   1.8   1.7   1.5   1.2   0.2   1.5   1.7   0.8
##  [985]   0.9   3.4   0.9   6.7   2.7   0.9   1.1   1.5   2.5   1.0   3.1   4.0
##  [997]   1.1   1.4   1.8   6.6   1.2   1.5   0.6   1.5   4.9   1.0   0.5   1.4
## [1009]   1.0   0.4   0.5   0.4   1.4   0.8   0.5   1.7   0.9   1.0   2.6   4.6
## [1021]   2.2   0.6   5.5   1.1   1.8   1.0   0.8   1.2   1.2  22.2   2.3   0.7
## [1033]   0.2   2.1   2.7   0.7   3.4   2.3   0.4   0.7   1.0   0.8   1.1   2.2
## [1045]  27.2   0.9   1.0   0.0   1.0   2.3  17.0   0.9   0.9   0.9   0.9   0.2
## [1057]   1.9   0.5   0.8   0.8   0.5   1.1   0.7   0.9   1.9   0.8   4.8   0.5
## [1069]   2.0   0.9   1.0   0.0   1.4   3.2   1.0   6.6   0.6   1.0   0.7   0.9
## [1081]   1.8   0.9   1.6   2.2   1.0   2.0   1.4   1.4   2.5   1.7   0.9   1.6
## [1093]   0.7   0.0   3.6   0.8   1.2   1.0   1.3   1.1   0.5   1.9   0.3   2.5
## [1105]   1.9   2.1   1.6   5.3   0.0   1.1   1.1   0.0   0.6   3.0   1.2   2.3
## [1117]   1.1   1.1   3.6   2.2   5.4   0.9   1.1   1.6   3.3   1.7   1.1  15.4
## [1129]   0.9   6.9   0.4   1.2   2.8   0.4   2.5   0.4   1.0   1.2   1.6   2.0
## [1141]   2.5   5.5  55.5   3.0   2.5   8.0   0.3   2.5   1.1   5.7   0.5   1.2
## [1153]   0.6   0.6   0.3   1.1   4.3   1.3   0.3  21.2   1.1   2.8   1.2   0.6
## [1165]   1.9   1.7   1.1   1.3   2.6   7.7   0.6   0.2   1.3   1.7   4.5   1.4
## [1177]  12.0   1.3   1.1   0.8   1.4   1.5   0.9   0.5   2.8   1.3   2.0   0.3
## [1189]   3.7   4.8   1.1   0.9   0.3   2.3   1.7   2.1   1.2   1.8   0.9  24.7
## [1201]   0.6   1.5   1.7   0.6   0.5   0.0   0.9   0.6   1.9   1.2   1.1   1.3
## [1213]   0.5   2.3   1.2   4.2   0.7  16.8   0.0   1.5   0.7   0.4   8.3   0.6
## [1225]   0.9  40.2   1.6   0.1   1.5   1.6   0.8   1.5   2.3   3.4   1.2   1.4
## [1237]   0.8   0.9   0.4   1.6   1.4   1.0   1.6   1.1   1.4   0.6   1.2   2.2
## [1249]   0.4  10.3   1.2   2.6   1.0   1.6   1.0   1.7   0.9  13.4   3.8   1.7
## [1261]   3.1   1.5   1.9   0.6   2.7   1.2   1.3   3.1   0.8   1.9   0.8   2.3
## [1273]   1.2   0.1   1.1   1.4  28.9 100.9   0.5   1.1   0.8   1.2   0.5   1.4
## [1285]   4.2   1.5   1.6   1.1   0.5   3.1   0.9   0.6   1.2   1.3   0.9   2.9
## [1297]   2.8   1.4   1.3   1.5   3.9   1.7   5.7   1.1   1.4   0.9   2.5   1.4
## [1309]   0.5   3.0  36.4   1.1   1.4   1.7   1.6   0.9   0.9  27.3   1.3   1.2
## [1321]   0.4   2.6   1.8   0.2   0.4   0.3   1.3   1.5   1.3   1.2   2.7   1.0
## [1333]   0.6   1.9   0.6   2.0   1.3   1.0   3.1   1.3   1.1   1.5   1.0   0.6
## [1345]  24.0   1.5   4.7   1.1   1.4   0.5   2.0   1.0   5.3   1.0   1.9   0.8
## [1357]   1.1  31.3   0.0   1.0  20.6   0.7   1.8   1.0   1.1   2.4   0.7   1.3
## [1369]   1.4   4.9   0.4   2.1   2.6   1.4   0.4  14.5   1.9   1.1   0.9   3.7
## [1381]   0.7   0.0   0.5   0.9   2.1   1.7   1.0   1.2   0.2   2.1   0.2  24.8
## [1393]   0.4   0.5   1.3   0.5   0.8   0.4   0.3   1.4   0.6   1.2   3.0   3.5
## [1405]   0.8   1.1   2.1   0.6   1.7   1.4   1.7   0.3   1.7   2.6   2.6   1.3
## [1417]   1.1   0.1   2.2  25.8   0.8   1.2   0.2   1.9   2.4   0.5   0.9   0.3
## [1429]   1.3  15.7   0.9   3.5   1.5   6.0   1.2   1.2   1.2   1.2   1.9   0.7
## [1441]  10.3  12.1   2.3   2.3  10.3   1.5   0.0   0.5   1.3   1.1   1.7   2.7
## [1453]   3.8   1.8   2.6   1.2   0.9   1.4   0.0   0.5   0.4   0.5   1.4   0.8
## [1465]   0.5   1.3   6.3   1.4   1.4   1.1   0.2   2.2   2.0   0.9   1.2   2.0
## [1477]   0.7   6.1   1.4   2.0   1.1   3.8   1.8   2.8   1.4   1.1   0.9   2.0
## [1489]   1.3   2.6  10.4   1.0   6.7   2.0   2.5   0.5   0.9   0.9   2.8   1.3
## [1501]   1.2   0.5   0.3   0.3   0.6   0.7   2.5   0.5   1.3   1.0   0.9   0.7
## [1513]   1.9   0.2   7.1   0.4   1.0   1.4   1.0   1.2   0.7   1.7   1.2   1.3
## [1525]   1.2   0.6   7.5   1.1   1.2   0.6   0.2   0.8   1.0   0.6   0.0   3.4
## [1537]   1.2 162.3   1.5   0.9   0.3   0.5   7.2   0.9   4.1   0.8   0.7   1.5
## [1549]   1.7   0.5   2.7   4.1   1.0   0.3   6.3   0.7   0.2   1.5   2.3   0.5
```

```
## [1561]   0.7   0.4   1.8   0.4   1.2   2.4   0.5   0.5   1.3   1.4   8.5   2.4
## [1573]   0.4   1.0   0.8   1.3   0.7   0.4   1.2   4.4   8.9   1.2   2.9   1.3
## [1585]   1.2   1.1   0.6   1.6   1.6  37.2   0.7   1.8   1.4   1.7   0.7   2.5
## [1597]   1.0   1.9   2.9 109.0   0.6   0.7   0.6   2.3   1.3   1.2   1.3   2.0
## [1609]   1.3   1.9   1.3   1.2  38.8   1.5   0.7   0.2   1.1   3.5   0.4   0.2
## [1621]   0.7   1.2   0.9   3.2   1.2   0.6   0.7   2.3   0.0   0.9   0.4   1.2
## [1633]   1.5   1.8   0.8   1.6   1.3   0.7   2.4   0.7   1.0   1.2   1.1   3.8
## [1645]   0.3   0.5   0.4   1.4   0.8   1.4   2.7   0.9   1.5   2.3   2.8   2.4
## [1657]   1.3   1.4   0.8   2.5   1.7   1.8   1.0   5.6   0.8   0.9   0.8   1.5
## [1669]   1.4   0.8   1.0   1.9   2.6   0.2   1.4   1.4   0.4   1.4   1.2   2.0
## [1681]   1.1   0.6   0.9   1.0   0.6   1.3   1.4   4.1   2.3   1.6   3.4   1.2
## [1693]   1.3   1.0   2.5   0.3   1.6   0.8   1.2   1.2   0.8   2.0   0.0   0.5
## [1705]   4.0   0.8   2.8   0.8   0.8   0.8   1.4   2.6   3.5   1.7   1.0   9.0
## [1717]   0.8   1.7   0.9   0.2   0.8   1.2   1.2   1.0   0.8   2.3   1.8   1.7
## [1729]   0.3   1.4   0.6   1.0   0.7   1.8   1.1   1.2   3.0   3.9   0.7   2.4
## [1741]   0.6   0.4   1.9   0.8   0.9   3.7   0.4   2.7   1.5   0.6   0.6   0.7
## [1753]   1.3   0.9   1.2   0.4   0.6   1.6   0.3   0.7  16.7   2.8   1.1   1.1
## [1765]   1.2   0.9   2.1   0.4   0.6   1.3   0.9   0.1   2.9   2.9   1.7   0.9
## [1777]   0.4   0.6   0.3   0.8   0.7   0.0   0.3   1.2   1.5   1.3   1.9   2.3
## [1789]   0.8   1.2   1.6   1.4   0.6   4.4   0.7   1.1   3.8   5.9   4.9   1.0
## [1801]   0.7   1.9   0.7   1.7   1.4   2.2   0.8   0.8   3.2   4.5   2.1   0.4
## [1813]   1.4   0.5   1.4   0.7   0.9   0.9   2.4   1.2   1.6   1.0   0.7   1.0
## [1825]   0.7   0.9   7.9   0.4   2.5   0.8   1.9   0.9   1.0   3.2   0.7   1.7
## [1837]   0.2   1.7   1.1   1.2   0.5   0.3   1.2   2.4   1.1   0.5   0.2   0.8
## [1849]   2.0   3.4   0.5  11.2   1.1   1.4   1.1   0.7   0.2   0.8   0.7   1.4
## [1861]   0.9   5.6   1.0   0.8   1.0   0.4   1.3   3.3   8.2   2.5  13.5   1.4
## [1873]   2.1   0.9   1.0   1.1  14.9   1.7   1.0   1.3   2.6   1.0   2.2   2.0
## [1885]  15.2   1.1   3.0   3.7   1.6   1.2   1.1   1.6   1.0   1.1   0.5   2.4
## [1897]   3.2   1.0   0.9   1.1   9.8   1.2   0.1   2.4   1.7   3.1   0.6   1.2
## [1909]   0.1   3.2   2.5   0.9   1.3   1.5   0.9   0.8   2.8   1.6   0.9   0.8
## [1921]   1.3  10.9   2.1  11.8   0.6   0.9   1.2 203.1   6.2   0.6   0.8   2.0
## [1933]   0.8   0.0   1.1   2.4   0.5   0.8   0.8   0.8   0.3   1.4   1.5   4.2
## [1945]   0.6   1.3   0.6   1.5   1.6   0.5   1.2   0.0   0.7   2.4   1.3   1.7
## [1957]   1.3   2.1   1.7   0.9   1.0   2.1   0.8   3.0   1.0   0.6   0.4   0.7
## [1969]  32.2   2.1   0.6   1.3   1.8   1.6   0.0   0.8   1.2   7.1  18.3   0.7
## [1981]   1.3   3.6   1.0   0.1   0.9   1.4   0.0   1.5   2.0   1.2   5.1   0.2
## [1993]   1.0   1.6   1.0   1.2   1.1   1.1   0.5   1.7   4.8   3.7   1.3   0.7
## [2005]   4.1   8.3   4.3   0.2   1.1   0.6   1.5   0.2   2.4  12.8   0.5   6.8
## [2017]   1.6   1.0   0.6   1.4   2.0   0.1   0.5   1.7   0.3   1.8   1.1   3.2
## [2029]   1.6   0.7   1.0   0.4   8.4   0.1   1.4   2.5   1.4   1.9   2.9   1.4
## [2041]   1.0   1.2   1.3   2.2   4.8   1.5   8.6   0.7   1.5   1.3   0.7   0.0
## [2053]   1.9   1.3   1.1   1.4   4.3   1.4   1.4   2.9   2.2   4.3  11.5   2.3
## [2065]   0.7   0.9   1.7   2.5   2.5   2.7   1.1   1.7   1.2   0.5   0.7   1.5
## [2077]   1.3   0.1   2.8   1.3   0.8   1.1   0.6   0.7   0.7   1.7   1.2   2.2
## [2089]   1.1   0.9   0.9   1.7   0.9   0.9   3.4   3.2   1.3   0.0   0.9 119.4
## [2101]   1.4   0.8   5.8   1.1   1.2   4.0   3.0   1.1   1.3   3.5   8.4   0.8
## [2113]   2.1   2.2   0.3   1.5   1.3   0.3   0.0   0.7   0.2   1.9   2.8   0.9
## [2125]   9.7   2.1   0.6   1.4   1.1   1.4   1.3   1.0   0.2   0.4   1.8  39.1
## [2137]   2.0   3.6   1.1   1.5   0.2   3.3   0.6   0.5   0.7   1.3   1.2   1.4
## [2149]   1.6   1.2   0.3   2.0   3.8   0.8 102.6   0.7   1.5   1.2   1.9   0.9
## [2161]   1.6   2.5   1.8   5.6   1.5   0.7   1.6   1.9   1.0   0.4   2.3   3.7
## [2173]   0.5   1.4  13.0  16.5   1.7   3.4   0.8   2.4   1.3   0.5   1.4   0.9
## [2185]   6.0   1.0   0.9   1.6   2.2   1.1   0.2   1.5   0.9   0.5   9.3   2.3
## [2197]   0.9   0.0   1.1   0.1   1.2   3.6   0.2   1.4   2.1   0.4   4.8   2.2
```

```
## [2209]   0.6   6.1   1.1   1.5   1.3   1.3   4.2   1.2   1.2   2.8   1.5   3.3
## [2221]   1.6   1.6   0.7   1.2   2.2   3.0   0.4   0.9   4.1   2.8   0.7   0.6
## [2233]   0.5   1.2   4.1   1.8   0.9   1.0   1.5   1.1   0.6   1.2   0.0   2.3
## [2245]   1.0   7.8   0.7   0.5   0.2   3.9   0.8   0.0   2.5   2.7   0.9   1.3
## [2257]   0.3   0.2   0.7   1.2   1.5   3.0   2.2  11.7   0.0   0.6   1.0   0.5
## [2269]   1.4   0.6   0.2   0.8   0.0   1.2   2.5   2.6   0.8  18.7   0.4   0.5
## [2281]   0.6   1.8   2.5   2.4   1.0   0.4   1.4   0.8   0.6   1.5   1.5   1.1
## [2293]   0.2   1.5  88.8   1.0   1.0   0.7   5.5   1.2   1.0   2.7   2.1   1.3
## [2305]   2.4   0.3   1.9   5.1   1.6   1.6   3.5  43.4   1.9   1.6   1.1   0.6
## [2317]   1.5   1.5   1.1   0.9   0.6   1.0   2.7   0.8   1.3   1.0   0.4   0.7
## [2329]   1.3   1.4   2.0   1.5   1.1   4.7   0.6   0.7   0.7   2.1   3.1   0.8
## [2341]   1.8   1.2   0.1   1.0   0.8   0.6   4.7   0.4   3.0   4.3   9.6   2.0
## [2353]   0.9   0.6   1.1   3.1   0.7   1.2   1.2   0.4   1.9   5.8   0.2   2.8
## [2365]   5.5   0.9   1.1   4.5   2.2   2.5   1.3   0.2   0.1   0.6   4.4   0.9
## [2377]   0.5   3.9   1.2   0.7   0.7   0.0   0.0   1.1   1.5   0.8   0.6   0.3
## [2389]   1.1   1.3  11.4   0.4   1.3   1.5   0.2   0.4   2.2   2.2   1.3   1.6
## [2401]   1.3   3.2   1.5   0.9   0.9   0.5   3.0   9.7   1.1   0.8   1.7   2.4
## [2413]   1.2   1.6   1.5   1.5   1.8   2.2   0.8   1.3   0.8   1.4  10.1   1.0
## [2425]   2.2   2.8   1.3   2.2   1.2  12.4  30.2   2.1   1.5   1.1   1.2   1.6
## [2437]   1.5   1.7   3.2   5.8   2.3   0.8   0.6   1.4   0.8   2.0   1.2   0.2
## [2449]   0.5 122.9   0.1   0.4   0.5   0.4   0.7   2.1   5.7   1.5   2.7   1.0
## [2461]   1.5   1.5   0.7   0.8   0.5   2.7   0.9   0.5   0.3   0.5   0.9   0.8
## [2473]   0.4   1.3   1.1   1.3   1.0   3.1   1.2   1.0   1.6   1.2   1.2   1.8
## [2485]   1.1   7.2   1.3   0.4   2.7   0.8   1.2   2.2   0.1   3.0   4.0   0.0
## [2497]   1.2   0.6   1.0   2.4   0.4   0.9   0.6   0.3   1.2   1.7   0.4   7.2
## [2509]   6.2   1.1   1.0   0.9   0.3   6.5   0.1   1.8   2.7   1.7   0.5   0.5
## [2521]   2.2   1.3   0.9   1.2   1.3   1.5   1.3   1.9   4.5   2.1   0.9   0.7
## [2533]   1.3   3.9   0.7   1.8   1.6  20.1   0.4   3.0   2.2   1.2   2.5   1.8
## [2545]   0.1   2.5   2.2   0.5   1.3   1.7   0.5   0.5   3.5   0.7   0.4   0.5
## [2557]   1.3   1.1   2.1   0.8   0.7   1.4   5.2   1.3   0.7   1.5   1.8   0.6
## [2569]   2.3   0.8   0.1   0.9   1.6  14.2   1.1   0.8   0.3   0.2   3.1   1.7
## [2581]   0.2   2.2   5.4  10.5  24.1   1.3   0.7   0.7   2.7   4.3   0.8   0.9
## [2593]   1.1   0.6   0.6   1.6   1.1   1.8   0.2   0.9   0.1   0.4  16.5   1.2
## [2605]   1.3   0.4   2.1   1.4   1.0   3.0   3.5   2.0   1.4   0.8   0.4   1.5
## [2617]   0.5   0.9   0.7   1.7   0.7   1.0   1.3   0.1   2.8   1.0   1.5   1.7
## [2629]   2.6   1.2   1.5   1.0   0.6   0.7   1.4   0.8   1.1   2.1   1.3   1.8
## [2641]   0.7   1.9   1.5   0.9   1.3   1.0   2.0   0.8   2.0   1.3   1.9   0.4
## [2653]   0.2   0.8   1.0   1.8   2.7   3.2   0.7   0.8   0.9   6.9   2.2   1.1
## [2665]   1.8   0.4   1.8   2.3   0.9   4.1   1.1   1.4   0.6   1.4   2.0   1.9
## [2677]   3.0   0.9   0.3   0.4   0.9   1.0   1.4   1.9   2.3   1.1   0.5  18.3
## [2689]   1.4   1.7   0.7   3.8   2.2   0.9   0.5   1.2   1.1   3.7   2.7  11.4
## [2701]   0.6   1.6   0.5   0.3   0.9   0.7   0.7   2.4   0.4   0.7   0.6   1.2
## [2713]   1.0  88.4   0.7   5.6   0.4   0.7   1.3   0.1   1.7   1.1   1.5   0.0
## [2725]   1.2   2.8   0.1   1.3   2.0   0.2   0.0   0.2  19.9   0.8   0.9   2.1
## [2737]   3.0   0.8   0.3   1.2   0.9   1.9   0.5   1.0   1.3   3.0   1.0   0.4
## [2749]   2.8   1.5   1.1   1.9   0.5   0.9   0.6   1.4   1.0   0.2   1.1   1.6
## [2761]   0.8   0.7   2.5   1.6   1.3  10.3   1.0   1.1   1.3   0.6   0.4   0.8
## [2773]   0.4   0.1   0.3 119.6   1.2   2.1   2.3   2.3   0.4   0.8   2.5   1.2
## [2785]   0.4   0.5   1.3   1.3   1.0   0.8   1.3   0.4   0.0   0.1   1.6   1.5
## [2797]   0.8   0.6   1.0   0.0   4.0   0.4   1.0   1.4   1.5   0.4   1.0   1.9
## [2809]   0.7   1.2   0.5   0.6   2.2   1.2   0.9   3.0   3.2   0.8   1.3   1.5
## [2821]   0.6   1.5   2.5   1.4   6.3  79.7   3.2   4.5   1.7   0.7   0.6   3.3
## [2833]   0.4   0.0   0.0   1.1   1.0   0.3   1.2   9.3   1.6   1.2   0.9   0.9
## [2845]   1.4   2.2   1.6   3.1   0.3   0.6  10.5   1.5   0.0   0.7   0.5   0.8
```

```
## [2857]  3.3  0.3  0.7  0.5  0.6  2.1  1.0  0.7  0.7  0.9  2.7  2.2
## [2869]  9.2  1.2  1.0  2.4  0.7  1.4  8.1  3.0  4.7  1.2  1.3  3.6
## [2881]  1.1  1.2  2.2  1.0  3.0  0.0  0.4  1.3  1.5  2.5  0.9  0.7
## [2893]  1.0  0.8  1.2  1.5  0.6  0.7  1.1  0.5  4.4  1.1  0.8  2.7
## [2905]  0.9  1.4  3.1  0.2  0.7  1.6  0.1  0.1  1.0  1.0  0.6  1.6
## [2917]  0.3  6.6  3.3  1.3  1.6  2.1  0.5  0.3  3.5  1.1  0.7  0.4
## [2929]  1.2  0.0  2.2  1.3  0.5  1.5  0.5  1.4  0.5  2.3  2.7 13.3
## [2941]  2.7 19.7  1.3  1.2  0.7  0.7  0.8  1.3  0.6  2.5  1.8  2.2
## [2953]  1.9  1.0 20.3  2.6  2.3  1.3  0.1  1.8  1.2  0.4  2.1  0.4
## [2965]  1.1  1.4  4.1  1.6  0.2 11.4  0.6  1.2  1.1  0.4  1.0  1.8
## [2977]  1.4  0.8  1.9  1.0  2.0  0.5  1.2  1.5  0.1  4.8  7.9  1.1
## [2989]  0.7  0.3  1.5  2.2  1.2  3.5  2.7  2.0  1.4  1.2  0.5  1.4
## [3001]  0.9  0.8  0.4  2.4  1.0  0.8  0.9  1.3  5.9  1.1  1.1  4.7
## [3013]  1.3  3.5  0.7  0.8  3.0  0.0  0.7  1.8  1.2  1.0  2.2  0.6
## [3025]  5.3  2.7  4.3  0.0  0.1  0.6  2.6  0.5  0.1  5.0  0.7  0.9
## [3037]  1.2  1.5  5.3  1.8  3.0  2.8  0.8  1.6  1.6  0.9  1.2  0.8
## [3049]  0.0  1.1  0.1  0.9  3.7  0.7  0.6  1.3  5.1  1.5  1.3  1.2
## [3061]  0.4  0.5  1.4  0.4  2.1  0.7  0.9  0.8  1.0  3.3  0.4  0.4
## [3073]  1.2  0.2  0.9  0.9  1.2  1.6  5.9  0.1  2.3  1.0  0.9  0.9
## [3085]  0.2 11.0  0.0  1.2 50.0  7.9  0.9  1.7  1.5  2.9  1.0  1.4
## [3097]  1.1  6.3  2.4  8.2  1.8  6.6  1.6  1.5  0.1  1.5  1.1  2.2
## [3109]  2.9  0.8  1.1  3.8  0.4  2.0  2.8  1.3  0.7  1.5  0.7  1.7
## [3121]  7.5  0.9  6.0  1.1  3.6  2.5  1.0  1.0  0.2  1.3  2.3  2.4
## [3133]  0.7  0.5  0.0  0.5  0.9  0.1  1.3  0.9  1.6  1.4  0.8  0.3
## [3145] 39.7  1.5  1.3  1.3  0.5  0.5  1.6  1.3 15.4  0.8  1.4  1.1
## [3157]  0.6  1.4  1.5  1.1  2.0  0.9  0.5  1.3  1.9  5.3  1.4  6.0
## [3169]  1.2  0.9  1.1  1.7  1.3  1.0  0.2  2.3  0.8  4.8  8.3 14.3
## [3181]  1.4  1.9  1.3  0.8  1.3  3.1  0.3  0.4  0.8  1.3  1.3  1.4
## [3193]  0.3  1.5  0.9  0.7  0.5  0.3  0.5  4.9  1.6  1.4  0.0  1.2
## [3205]  0.6  7.5  2.3  0.1  0.9  1.6  0.4  1.9  1.3  1.9  3.5  3.0
## [3217]  0.6  1.5  2.4  2.2  0.8  0.4  0.8  0.7  6.2  0.6  0.4  1.9
## [3229]  1.2  0.8  2.2  2.9  2.0  1.1  0.2  1.0  1.1  0.9  0.6  1.3
## [3241]  1.0  2.9  2.3  1.9  1.3  0.8  2.0  1.1  3.0  1.3  1.7  0.1
## [3253]  0.6  2.2  2.1  0.5  1.4  0.7 25.5  0.9  0.1  0.7  3.2  0.3
## [3265]  2.7  1.4  1.0  1.4  1.8  1.2  0.2  0.5  1.7  0.5  0.8  1.5
## [3277]  1.9  0.5  1.0  1.8  1.4  1.0  1.1  0.9  0.6  1.3  0.4  3.5
## [3289]  1.5  3.0  1.3 15.6  2.3  1.7  1.0  0.5  1.3  1.3  0.9  0.1
## [3301]  0.8  6.4  1.7  1.1  1.5  0.1  1.2  0.2  2.1 23.1  1.2  1.1
## [3313]  0.7  0.9  1.2  2.5  1.5  1.1  3.2  7.1  4.9  1.4  0.8  1.6
## [3325]  3.9  0.5  1.0  0.6  2.2  0.5  1.0  0.4  0.2  1.0 11.4  0.7
## [3337]  0.8  6.1  1.6  6.2  0.7  1.2  0.8  1.5  0.9 30.7  0.8  0.6
## [3349]  1.5  2.0  1.6  0.5  0.8  0.3  2.2  1.0  1.0  1.9  0.5  2.3
## [3361] 12.3  0.8  0.0 21.6  1.0  1.1  1.3  0.6  7.8  0.8  2.0  0.9
## [3373]  1.0  0.2  0.6  2.3  1.4  0.1  0.1  9.0  1.1  2.2  0.8  0.7
## [3385]  2.1  1.4  4.5  0.6  3.3  1.5  1.1  1.6  2.8  0.8  2.1  1.2
## [3397]  2.1  0.9  1.8  2.3  1.0  0.3  2.6 56.7  0.8  0.2  1.1  0.8
## [3409]  1.7  1.0  0.8  1.7  1.5  1.2  1.6  2.2  0.6  1.0  0.3  1.1
## [3421]  2.0  2.5  2.2  1.8  6.8  1.5  1.0  1.6  0.4  3.0  3.9  0.4
## [3433]  1.1  0.1  1.3  0.4  0.6  0.1  7.0  0.9  1.2  1.5  0.9  0.7
## [3445]  1.3  1.9  1.7  0.8  3.5  0.8  4.0  1.8  1.0  1.1  4.8  0.6
## [3457]  0.2 43.9  2.8  1.1  0.8  1.2  1.8  1.6  1.7  0.7  0.7  1.3
## [3469]  3.5  0.5  0.8  5.9  0.8  9.7  0.3  0.9  0.8  1.9  0.7  3.4
## [3481]  3.1  1.4  3.0  1.1  1.4  1.3  0.2  0.7  0.7  1.3  1.9  0.7
## [3493]  1.2  1.6  1.5  0.8  1.4  1.6  0.6  1.3  1.1  1.0  2.9  1.6
```

```
## [3505]   0.8   0.8   1.7   1.0   4.4   0.3   1.0   1.0   0.8   2.0   2.3   1.2
## [3517]   0.6   3.7   2.7  98.5   0.2   0.4   0.3   1.2   3.2   0.3   2.2   1.7
## [3529]   0.7   1.3   1.3   1.3   1.0   5.4   0.3   2.2   0.8   1.0   2.4   1.0
## [3541]   0.9   0.7   0.9   0.9   8.9   0.8   3.0   1.5   0.9   0.1   3.1   0.0
## [3553]   0.5   1.2   0.7   1.0   2.8   1.7   1.5   1.3   1.4   6.4   2.3   1.0
## [3565]   2.7   0.3   0.1   1.9   0.8  13.5   0.2   6.9   0.3   1.5   1.1   1.4
## [3577]   0.3   0.5   1.2  10.2   0.8   1.1   1.4   0.5   2.5   1.1   0.0   2.8
## [3589]   1.2   2.2   1.8   0.7   3.8   0.5   2.5  17.7   2.6  47.3   0.9   3.4
## [3601]   0.0   0.3   0.3   0.8   1.0   0.0   0.8   1.3   1.1   2.0   1.3   1.3
## [3613]   1.4   4.8   0.7   0.8   0.9   3.3   0.7  18.9   1.2   2.4   0.8   0.6
## [3625]   0.6   1.0   2.1   5.3   0.6   0.8   2.8   1.3   0.9   0.5   0.7   1.3
## [3637]   2.6   1.2   1.1   0.5   1.3   0.0   0.8   1.4   0.5   3.8   1.2   0.2
## [3649]   3.1   2.0   0.5   1.8   0.8   1.1   1.5   1.8   0.2   0.6   1.0   2.7
## [3661]  11.6   3.0   3.3   5.9   0.9   0.8   0.8   0.7   1.9   1.7   1.4   0.9
## [3673]   1.0   0.4   1.3   1.1   1.0   1.1   3.4   0.3   0.9   1.0   1.4   0.4
## [3685]   1.2   3.0   2.1   0.3   1.6   2.5   2.0   1.6   1.9   1.2   2.2   1.5
## [3697]   1.8   0.7   1.4   1.1   4.7   1.8   1.1   1.6   0.7   1.4   1.2   0.2
## [3709]   0.3   1.3   0.9   1.1   1.2   0.9   1.3   3.1   0.8  10.8   1.6   0.6
## [3721]   1.6   1.7   0.8   1.2   1.6   1.3   4.0   1.6   1.5   2.1   1.1   1.5
## [3733]   0.9   4.3   1.0  36.5   0.8   5.2   0.2   1.5   1.3   0.6   0.2   9.2
## [3745]   2.7   1.3   0.9   1.5   1.8   0.9   0.3   0.4   0.9   0.7   1.2   0.6
## [3757]   0.7   1.4  14.7   1.0   1.9   3.6   1.0   2.7   1.5   0.5   0.7   2.0
## [3769]   1.1   1.5   7.9   0.9 261.3   1.4   1.0  16.2   1.6   5.0   1.4   0.4
## [3781]   1.1   1.4   1.2   1.9   1.6   0.8   0.3   4.3   0.4   1.9   1.3 118.3
## [3793]   1.4   0.3   0.6   0.7   2.9   0.6   1.0   1.3   1.3   0.5   1.6   3.7
## [3805]   1.2   0.7   1.2   0.5  11.5   0.5   5.3   0.9   2.1   2.0   7.9   2.1
## [3817]   1.4   0.0  62.6   0.8   0.2   0.8   1.4   1.4   2.3   1.6   1.0   0.9
## [3829]   0.9   1.1  48.9   0.6   0.5   1.0   1.1   0.6   0.0   0.3   1.9  27.7
## [3841]   1.2   3.2   0.7   0.0   1.8   0.7   1.0   2.4   5.8   1.7   0.5   0.6
## [3853]   0.6   0.0   1.9   0.8   0.4   1.4   1.1   1.1   0.0   0.9   6.5   1.4
## [3865]   0.9   1.1   1.3   0.0   1.0   3.8   0.7   9.2   1.4   1.6   1.9   0.1
## [3877]   2.0   2.3   5.5   0.6   1.0   0.6   1.4   0.3   0.1   0.9   1.0   0.7
## [3889]   1.5   0.5   0.8   2.2   0.9   0.5   1.0   7.8   1.3   0.7   1.1   2.5
## [3901]   4.0   2.0   2.2   2.9   2.7   0.7   0.5   1.2   1.5   1.7   2.7   6.5
## [3913]   2.1   2.9   0.3   1.1   3.1   4.8   1.9   0.6   2.4   1.1   1.1   1.2
## [3925]   1.0   0.1   1.7   1.1   4.6  31.1   0.9   5.4   2.2   0.4   4.9   4.8
## [3937]   1.0   0.9   2.3   0.7   0.6   0.6   1.1   0.7   1.1   0.4   1.2   5.8
## [3949]   1.6   1.0   0.8   0.4   0.5   1.8   1.0   0.6   1.6  25.1   2.1   0.9
## [3961]   2.7   0.9   1.3   9.8   1.3   1.6   1.7   1.2   4.3   1.2   0.5   1.3
## [3973]   0.5   1.2   2.4   4.4   0.8   2.0   1.7   1.4   0.8   0.6   0.8   3.3
## [3985]   0.5   0.7   4.9   0.8   1.3   0.6   0.7   0.5   3.6   0.5   0.2   1.4
## [3997]   0.0   2.0   1.8   2.0   0.2   2.1   0.5   0.9   0.4   1.7   0.2   0.3
## [4009]   0.2   1.9   0.7   0.8   1.1   0.9   4.9   0.9   1.2   1.0   1.4   1.3
## [4021]   1.0  16.3   0.7   0.5   1.3   7.3   1.6   2.5   1.0   1.0   1.3   6.3
## [4033]   1.4   0.3   0.8   0.9   1.3   2.0   0.2   0.8   1.4   1.0   0.8   1.8
## [4045]   1.0   0.5   2.0   2.5   0.1   1.1   1.2   1.8   0.7   1.5   1.1   1.2
## [4057]   3.2   0.1  26.3   1.0   1.4   1.0   0.6   1.0   0.2   1.3   0.8   1.7
## [4069]   1.3   9.9   0.4   1.2   0.7   1.2   2.3   1.7   0.9   1.0   0.0   1.1
## [4081]   0.2   0.9   1.0   1.1   1.3   1.1   1.1   0.8   8.2   1.8   0.4   1.2
## [4093]   0.3   3.1   1.3   4.3   0.6   1.8   2.6   1.7   2.2   0.4   1.3   2.2
## [4105]   4.0   0.7   0.9   2.8   0.3   0.9   0.7   1.5   4.5   0.4   1.9   1.5
## [4117]   0.6   0.7   0.6   0.8   2.8   8.0   9.6   4.4   0.4   0.6   3.8   0.0
## [4129]   0.1   0.8   2.9   1.4   2.4   1.2   1.0   0.4   0.2   0.9   0.0  13.0
## [4141]   0.8   0.9   0.3   0.6   2.6   0.7   2.2   0.2   1.6   1.4   2.4   1.1
```

```
## [4153]   0.6   1.8   5.6   1.7   0.6   2.2   1.7   1.8   5.4   0.9   1.2   1.6
## [4165]   9.1   0.9   0.6   0.9   1.1   2.2   2.6   2.0   1.5   1.4   1.5   1.3
## [4177]   1.7   1.0   1.0   6.9   1.0   3.7   1.9   0.6   0.3   2.4   0.5  34.2
## [4189]   1.0   2.2   2.7  34.3  10.0   0.0  17.2   1.7   0.0   0.9   1.3   0.8
## [4201]   2.0   1.0   3.6   1.0   0.3   1.0   0.9   0.9   1.0   1.0   1.4   1.5
## [4213]   1.4   0.8   0.1   1.3   0.8   0.2   1.1   0.5   0.9   1.5   3.8   1.6
## [4225]   0.7   1.5   5.9   0.1   4.7   2.7   0.2   1.7   1.3  15.3   1.5   0.6
## [4237]   0.8   3.2   0.7   1.0   1.1   1.2   1.2  37.5   1.0   1.9   2.5   2.2
## [4249]   1.8   2.2   0.8   0.4   9.9   1.0   1.4   0.3   2.9   1.7   0.9   2.7
## [4261]   1.8   1.0   0.3   1.9   1.2   1.1  10.4   0.0   1.3   0.5   0.3   2.0
## [4273]   1.1  29.9  20.2   0.7   1.1   0.6   1.1   0.2   0.7   0.4   1.0   1.5
## [4285]   0.7   1.0   1.0   0.7   1.0   2.4   1.1   1.3   0.9   1.2   0.0   1.1
## [4297]   0.1   0.7  12.8   0.5   0.2   2.6   0.5   0.6   4.0   0.3   4.8   2.3
## [4309]   0.6   0.7   0.8   1.1   2.0  21.4   1.0   1.0   1.3   0.6   6.3   0.3
## [4321]   1.7   0.6   1.1   1.4   1.6   0.6   1.5   2.1   0.2   0.9   1.6   3.5
## [4333]   2.7   1.7   1.4   1.8   1.8   1.7  73.8   0.3   2.8   1.0   0.6   3.6
## [4345]   0.7   1.5   3.5   0.6   4.7   7.7   1.8   8.1   6.3   1.7   0.1   1.2
## [4357]   6.2   1.6   1.2   0.7   1.3   1.8   1.5   5.1   6.6   1.2  11.4   0.8
## [4369]   1.5   0.5   6.3   1.0   1.2   1.7   3.8   0.9   0.8   0.2   3.1   1.3
## [4381]   0.6   1.1   0.5   2.2   1.5   7.1   1.5   1.4   1.2   1.0   0.9   1.0
## [4393]   1.5   1.1   1.5   1.4   1.1   1.3   0.2   1.2   1.0   0.2   1.8   1.4
## [4405]   0.8   0.4   1.5   2.3   1.1   0.9   2.2   0.7   0.7   0.6   0.1   1.4
## [4417]   1.4   1.1   1.3   1.3   1.5   1.5  16.0   0.1   1.6   0.7   2.1   0.6
## [4429]   0.6   1.9   1.7   2.0   1.4   1.5   6.9   1.1   0.6   0.4   1.9   0.2
## [4441]   1.1   1.3   0.6   0.7   0.9   1.5   3.7   0.8   2.1   0.9   0.5   1.4
## [4453]   2.1   0.2   0.7   2.0   2.0   1.3   2.1   1.2   6.9   1.3   2.1 209.7
## [4465]   5.3   2.6   7.6   1.1   0.8   3.3   1.4   1.7   1.6   0.8   4.5   3.2
## [4477]   4.9   2.6   1.5   1.0   0.7   3.1   2.8   2.5   1.0   1.6   1.2   1.0
## [4489]   0.7   0.1   1.4   1.2   1.5   1.4   1.8   0.3   2.7   0.7   0.7   1.1
## [4501]   1.3   0.9   0.7   3.4   1.0   0.7   0.8   1.0   0.0   4.1   0.2   0.6
## [4513]   2.0   1.0   0.6   2.0   2.2   4.0   0.9   1.9   6.8   2.1   2.1   1.3
## [4525]   1.0   1.0   0.7   4.5   3.1   0.9   0.0   1.1   0.4   0.7   8.1   1.5
## [4537]   1.0   6.8   0.6   0.5   0.5   2.1   0.6   1.1   2.9   1.1   1.6   2.4
## [4549]   1.1   0.0   1.1   0.2   1.0   1.3   1.4   0.2   0.4   1.3   0.4   0.4
## [4561]   7.1  13.5   1.0   2.1   0.7   1.5   1.1   0.6   1.0   1.3   2.9   1.1
## [4573]   0.7   1.0   0.7   1.3   2.1   0.6   1.7   0.5   0.9   0.5   1.1   1.4
## [4585]   0.9   0.6   2.2   0.7   1.2   1.1   1.2   2.7   0.4   1.3   0.0   0.9
## [4597]   1.5   1.7   0.6   1.6   1.3   1.0   2.2   1.1   1.1   1.4  11.8   1.7
## [4609]   0.4   1.8   1.2   2.1   4.1   0.5 157.3   1.2  10.8   0.8   0.5   2.6
## [4621]   1.4   3.9   1.6  16.5   1.5   0.1   0.3   1.3   2.1   1.2   0.7   3.1
## [4633]   0.9   0.2   3.1   0.3   1.5   1.5   0.5   1.1   1.1   1.2   8.3   1.5
## [4645]   1.1   0.2   0.3   2.6   1.1   1.3   0.4   1.1   1.2   8.2   1.8   0.3
## [4657]   1.4   2.6   1.8   1.3   1.4   0.4   1.6   2.3   1.3   0.0   0.8   1.6
## [4669]   5.7   1.6   0.4   0.8   0.8   1.5   0.1   3.0   1.9   1.9   3.7   0.4
## [4681]   1.1   1.6   1.3   2.9   0.4   2.0  21.1   4.3   1.0   1.1   0.9   0.0
## [4693]   0.8   1.1   0.4   1.0   1.1   1.2   2.1   1.8   0.8   0.9   1.8   0.3
## [4705]   0.9   3.1   3.4   0.7   0.8   2.2   0.8   0.4   1.5   0.4   0.7   1.2
## [4717]   1.2   1.7   1.2   4.4   0.9   0.7   1.2   1.7   5.6   0.0   0.2   0.8
## [4729]   1.2   0.7   1.0   1.2   0.7   1.3   1.5   0.4   1.5   0.4   0.6   0.8
## [4741]   0.2   1.3   0.7   1.7   0.3   0.8   1.7   1.5   2.1  15.4   1.8   2.7
## [4753]   0.5   7.5   5.7   0.9   0.7   1.4   0.4   0.7   4.4   2.0   1.6   1.1
## [4765]   1.7   2.1   1.3   1.1   1.4   0.5   1.2   0.5   1.1   1.6   1.1   8.2
## [4777]   1.6   3.2   2.1   0.8   1.4   0.6   1.6   0.9   5.9   0.2   2.1   0.9
## [4789]   1.4   0.9   6.8   2.2   0.7  10.7   1.8  15.7   0.6   0.9   0.9   0.1
```

```
## [4801]  0.8  1.2  2.2  5.9  1.1  1.0  0.4  2.2  0.9 11.4  0.2  2.2
## [4813]  2.5  0.6  1.3  1.9  0.9  1.0  1.0  0.9 25.9  0.6  2.1  1.3
## [4825]  1.1  0.6  1.0  0.8  1.0  2.1  1.0  0.5  0.5  0.6  0.8  0.8
## [4837]  1.2 22.7  0.1  1.3  2.1  3.0  1.0  1.3  4.8  0.8 14.3  5.1
## [4849]  1.0  8.7  1.4  0.3  0.8  1.0  1.0  1.1  0.8  1.1  0.5  1.4
## [4861]  0.5  0.8  0.6  0.7  2.4  3.8  0.2  0.1  0.5  1.0  0.3  1.0
## [4873]  0.2  1.0  0.7  8.4  1.1  1.3  8.1  2.5  1.3  0.3  1.0  1.3
## [4885]  0.6  2.1  0.3  1.1  2.2  1.1  1.5  1.2  1.2  2.1  0.4 11.2
## [4897]  0.1  0.8  1.1  0.6  1.4  2.4  3.2  0.6  1.8  0.6  2.2  1.7
## [4909]  1.0  2.8  1.1 16.7  8.1  1.6  0.4  0.5  2.5  2.4  0.8  0.9
## [4921]  0.5  1.0  1.6  5.5  0.5  0.3  1.0  3.3  1.1  0.8  0.8  2.3
## [4933]  1.9  1.7  1.0  2.2  1.0  3.0  1.5  7.9  0.3  0.6  0.7  1.2
## [4945]  1.1  1.7  2.2  0.3  0.8  0.9  9.9  1.7  1.2  1.2  1.3  1.3
## [4957]  0.2  0.8  3.2  0.5  0.3 80.2  1.0 18.9  1.6  2.3  1.4  0.9
## [4969]  1.4  0.6  1.5  2.5  1.1  4.2  3.2  2.0  3.5  0.7  1.4  1.3
## [4981]  2.6  0.9  5.9  1.7  1.0  1.4  1.0  1.5  2.0  0.8  2.6  0.7
## [4993]  0.3  3.3  1.7  2.8  4.8  1.0  1.0  0.2  0.6  7.1  0.4  1.8
## [5005]  1.4  2.1  1.9  0.6  1.0  1.2  0.4  0.8  0.9  1.1  0.8  1.0
## [5017]  0.1  1.6  1.0  6.2  1.7  0.9  0.2  3.3  0.8  2.6  1.0  0.6
## [5029]  2.5  0.3  1.4  3.8  0.8  1.0  0.5  4.4  1.0  1.6 25.3  0.5
## [5041]  0.9  1.1 63.8  1.3  1.6  1.7  0.5  0.3  0.0  0.6  0.5  1.4
## [5053]  2.2  1.1  1.4  0.7  1.6  1.7  8.2  0.8  1.4  0.8  1.2  1.4
## [5065]  9.1  1.2  0.2  0.4  0.0  0.6  2.0  6.3  1.7  1.0  1.5  0.7
## [5077]  0.9  2.3  0.8  1.5  1.0  1.3  1.2  2.6  0.6  2.1  2.1  0.2
## [5089]  0.8  2.8  1.2  1.2 10.3  0.7  4.7  5.3  1.5  0.9 96.6  0.9
## [5101]  0.8  0.9  1.4  1.3  2.3  1.0  2.7  1.4  2.3  0.8  0.8  2.4
## [5113]  1.3  2.0  1.9  0.9  3.0  1.3  0.8  3.7  1.4 12.1  1.6 18.0
## [5125]  1.6  0.9  0.5  0.6  3.2  2.9  0.7  1.3  0.7  2.3  2.0 12.8
## [5137]  1.2  1.3  0.9  0.9  0.7  1.8  2.4  0.8  4.7  1.4  3.1  1.4
## [5149]  0.9  1.7  0.9  1.3  1.1  0.8  1.0  1.1 26.9  1.6  1.0  1.2
## [5161]  0.7 10.5  2.7  0.5  1.2  3.1  0.8 18.6  1.4  0.7  4.2  5.4
## [5173]  0.6  1.5  1.4  1.4  2.3  2.1  1.8  0.8  0.5  0.0  0.3 35.0
## [5185]  1.1  1.3  5.8  2.3  0.1  0.6  1.4  1.5  1.0  1.5  1.4  3.3
## [5197]  7.8  0.6  1.2  1.3  0.9  0.2  0.4  1.3  1.0  3.1  2.9  4.2
## [5209]  0.9  1.4  0.5  4.2  0.9  0.6  0.9  2.4  1.2  1.5  1.1  1.3
## [5221]  1.9  0.0  0.5  0.7  1.2  1.4  0.7  3.6  1.7  1.1  2.1  1.0
## [5233]  1.1  0.7  0.0  1.0  0.1  0.7  0.0  1.4  1.8  2.5  1.0  1.1
## [5245]  4.5  0.9  0.5  1.4  0.5 15.0  1.3  0.2  0.8  1.3  1.1  1.2
## [5257]  1.1  1.4  0.3  0.2  0.0  3.6  3.8  1.2  0.9  1.6  0.3  1.3
## [5269] 10.6  1.3  1.6  0.3  3.8  0.7  1.1  1.9  1.1  1.2  2.2  4.0
## [5281]  1.2  1.0  1.6  1.5  1.0  1.3  1.3  1.8  0.8  1.1  1.4  0.2
## [5293]  0.5  0.7  3.8  0.1  1.0  1.2  3.9  2.3  1.0  0.8  3.0  0.7
## [5305]  0.9  1.6  1.2  1.3  0.4  1.0 13.8  0.8  1.3  1.5  1.3  7.6
## [5317]  1.6  0.8  1.4  2.3  0.8  1.5  0.8  0.8  1.4  1.6  2.0  0.3
## [5329]  1.0 32.2  0.1  1.0  0.5  5.7  1.7  0.2  0.3 30.1  0.3  0.9
## [5341]  0.9  0.9  0.6  3.7  1.8  0.3  1.0  0.9  2.2  9.8  1.2  0.9
## [5353]  0.5  1.7  0.8  1.2  1.8  2.4  0.9  1.3 31.5  2.4  1.5  2.2
## [5365]  1.2  0.8  0.9  2.3  0.6  1.8  2.5  1.2  3.9  5.5  4.2  0.6
## [5377]  2.1  0.9  0.9  1.4  4.3  1.3  1.0  1.4  3.2  0.9  1.5  3.2
## [5389]  1.6  3.5  0.1  0.1  0.5  2.6  3.1  2.8  1.0  0.9 33.4  1.2
## [5401]  0.9  2.0  1.7  0.8  1.2  0.6  1.5  1.0  3.9  0.5  0.5  1.9
## [5413]  1.6  0.5  1.1  2.2  1.3  1.7  0.9  1.3  2.3  2.5  0.8  3.5
## [5425]  2.9  0.7  2.3  1.8  3.4  3.4  0.1  0.5  1.3  0.9 65.9  0.4
## [5437]  2.6  2.0  0.5  0.2  0.6  0.5  1.1  1.9  0.2 16.9  0.8  0.1
```

```
## [5449]   1.5   0.3   6.5   0.6   1.1   0.8   5.4   0.9   1.2   1.1   1.4   0.5
## [5461]   1.9   0.7   2.8   2.5   0.5   1.1   1.3   1.0 200.2   2.2   0.9   0.8
## [5473]   2.1   1.1   0.1   1.3   1.4   1.1   9.5   0.5   2.0   1.8   1.3   0.4
## [5485]   1.0   0.1   2.6  11.9   3.6   2.1   0.6   1.7   1.6   0.3   0.9   1.3
## [5497]   0.5   0.9   4.3   2.4   1.8   4.2   0.9   1.4   0.7   1.7   2.2   2.4
## [5509]   1.1   4.0   1.1   0.7   2.7   1.2   1.3   0.6   3.1   1.3   4.5   5.6
## [5521]   1.0   0.4   0.6   0.0   1.8   0.9   0.2   0.9  19.9   1.0   2.1  15.4
## [5533]   2.6   1.5   0.7   0.8   0.7   0.8   1.7   0.7   0.4   0.4   2.2   2.7
## [5545]   0.4   1.5   4.0   0.8   3.0   0.9   0.6   0.4   0.7   1.1   0.6   1.4
## [5557]   1.0   1.7   1.0   1.0   1.0   1.9   2.4   0.7   1.2   2.3   1.9   2.5
## [5569]   1.3   2.8   0.7   1.2   0.6   2.2   1.3   0.6   1.7   2.8   1.3   0.3
## [5581]   1.6   2.1   1.5   1.1   2.2   0.5   2.5   1.2   3.0   0.1   0.9   3.7
## [5593]   0.9  10.6   3.4   0.3   2.3   1.6   2.4   4.1   1.8   1.2   1.3   1.5
## [5605]   0.4   3.4   0.1   3.3   5.1   1.0   0.2   0.7   0.4   1.6   1.2   6.2
## [5617]   1.2   1.1   1.2   0.9   0.7   1.2   2.0   0.8   1.2   6.8   1.2   0.6
## [5629]   1.0   0.7   1.5   0.9   1.4   0.9   1.6   1.2   0.9   2.8   0.9   1.1
## [5641]   0.3   0.3   1.9   0.6   1.4   2.4   1.0   1.1   5.3   1.1   1.3   1.3
## [5653]   1.2   1.0   1.6   7.7   0.9   3.7   1.3   1.6   2.1   0.1   1.4   1.4
## [5665]   1.5   1.1   1.2   4.2   1.2   1.6   0.7   6.1   1.7   3.3   0.6   0.7
## [5677]   0.6   0.6   0.6   1.0   0.6   1.0   3.1   0.8   1.1   2.9   1.5  21.6
## [5689]   0.0   0.2   1.8   1.2   1.0   0.7   0.4   0.5   0.7   0.9   0.9   1.1
## [5701]   1.1   8.5   1.6   0.1   0.7   0.9   2.7   4.9   5.2   1.3   1.0   1.2
## [5713]   1.4   0.0   1.2   1.0   1.8   1.0   1.1   0.4   0.9   0.4   2.2   1.7
## [5725]   2.0   1.1   0.4   0.8   1.6   0.7   1.2   5.7   2.0   1.0   1.7   1.1
## [5737]   0.1   6.1   0.9   1.2   0.3   0.4   0.8   1.6   1.1   0.9   1.1   6.0
## [5749]   1.1   0.7   0.0   1.8   0.7   1.8   0.9   0.9   0.6   1.0   0.5   1.7
## [5761]   1.6   0.5   1.9   1.0   0.8   2.6   8.3   0.7   1.0   4.6   7.1   2.0
## [5773]   1.0  15.4   1.1   1.0   5.0   0.5   1.8   2.8   0.8   1.3   0.9   0.7
## [5785]  17.2   0.9   1.2   1.7   0.3   5.6   1.4   6.0   0.8   1.3   1.0   2.5
## [5797]   1.1   0.9   0.6   1.0   0.9   0.1   1.1   0.6   0.8   1.3   2.5   1.3
## [5809]   3.0   0.8   3.3   1.5   0.6   0.8   3.7   1.2   5.7   1.7   1.7  23.6
## [5821]   1.0   0.8   7.8   0.4   1.2   3.0   1.3   1.6   1.4   1.2   0.7   1.0
## [5833]   2.4   0.5   2.2   0.3   0.6   0.6   1.9   1.0   1.1  14.1   0.6   0.2
## [5845]   1.3  14.6   2.5   1.2   0.2  18.9   1.7   3.4   2.1   0.8   2.6   1.5
## [5857]   1.8   0.9   1.8   1.3   4.1   0.3   3.3   0.9   0.7   1.0   0.0   0.5
## [5869]   1.2   1.9   8.2   1.1   1.0   4.7   0.0   1.2   1.3   0.6  19.6   1.5
## [5881]   3.3   1.1   0.8   1.3   2.6   1.4   0.7   0.1   1.1   5.0   0.4   1.2
## [5893]   3.3   1.6   0.5   0.9   2.3   0.4   1.8   1.0   3.4   0.7   0.8   3.6
## [5905]   1.0   3.2   0.3   0.4   1.0   1.4   1.5   0.9   1.8   1.4   3.5   2.0
## [5917]   1.6   0.3   6.3   0.1   0.4   0.3   4.3   3.5   1.8   0.5   0.0   5.9
## [5929]   1.2   0.8   1.0   1.0   1.2   3.1  13.0   1.0   2.2   6.6   0.4   0.7
## [5941]   1.3   2.3   1.0   0.7   1.5   0.7   0.6   0.7   1.4   5.0   0.7   6.9
## [5953]   1.5   0.1   0.6  11.9   3.5   1.0   1.6   0.5   1.8   0.6   3.4   0.9
## [5965]   1.0   0.8   1.0   1.3   2.2   0.9   2.6   2.6   0.0   1.3   0.4   0.8
## [5977]   0.4   1.0   0.0   1.1   1.0   1.2   1.0   1.3   0.8   1.4   1.7   0.7
## [5989]   0.9   0.7   1.0   0.7   3.2   1.2   9.9   0.9   2.5   0.5   4.7   1.4
## [6001]   1.0   4.3   1.5   1.5   0.6  25.2   5.3   0.8   0.8   3.8   0.7   0.3
## [6013]   0.3   1.4   2.4   1.9   1.5   1.0   7.9  40.2   1.0   4.1   1.1   1.6
## [6025]   1.2   1.5   0.5   1.1  15.0   1.2   2.1   4.8   4.2   0.6   2.4   0.3
## [6037]   0.1   3.2   0.1   2.7   1.5   1.5   0.9   1.0   2.9   2.7   1.3   0.4
## [6049]   1.1   2.9   1.6   1.6   2.4   1.0   0.8 156.8   2.0   0.7   1.0   4.0
## [6061]   4.1   0.5   0.6   3.0   4.0   1.2   2.2   1.4   0.4   0.4   0.6   2.0
## [6073]   1.0   1.0   0.6   0.5   2.9   0.2   1.5   1.0   1.3   0.6   0.6   0.5
## [6085]   0.3   3.3   0.5   0.7   1.8   1.9   0.9   2.4   0.9   0.7   2.6   1.6
```

```
## [6097]   1.2   1.4   3.4   0.2   0.5   0.8   1.4   0.5   1.1   7.8   0.5   0.1
## [6109]   2.4   0.6   5.5   2.0   0.4   1.3   1.4   0.7   1.1   0.4   5.4   2.9
## [6121]   6.9   1.4   8.2   1.9   1.1   0.9   1.3   1.6   0.8   3.4  14.5   1.8
## [6133]   0.7   0.1   0.9   0.6   1.0   1.6   0.8   0.3   0.5   1.7   0.4   1.3
## [6145]   0.0   1.4   0.5   0.5   0.8   0.3   0.8   1.5   0.7   4.7   0.8   1.2
## [6157]   1.0   1.8   2.4   1.0   0.5   0.9   1.7   0.3   0.9   7.8   0.2   0.4
## [6169]   3.2   0.6   1.2   4.7   0.7   0.6   1.3   0.4   1.9   1.6   0.6   0.6
## [6181]   2.1   0.5   0.8   1.6   1.2   0.7   0.8   0.3   1.0   1.7   8.8   0.4
## [6193]   1.1   1.1  14.4   3.8   0.7   0.7   0.0   2.1   5.0   0.3   1.4   0.0
## [6205]   3.5   2.6   1.6   2.0   0.6   0.8   1.1   5.6   1.4   0.6   1.2   0.6
## [6217]   3.3   1.3   0.4   0.2   0.1   1.2   2.4   1.2   1.1   1.2   2.1   0.6
## [6229]   0.9   0.5   1.5   1.1   0.4   7.4   6.1   0.6   2.5   1.0   0.9   2.3
## [6241]   0.3   0.6   1.2   0.2   0.7   0.2   0.7   0.9   1.0   1.7   0.3   1.3
## [6253]   1.0   1.3   2.0   0.3   0.6   0.6   0.8   1.4   2.0   0.3   1.3   1.2
## [6265]   1.0   9.0   1.4   6.1   0.1   1.2   0.7   1.8   0.4   4.3   1.0   1.1
## [6277]   7.1   1.4   1.3   0.8   4.7   0.5   2.0   1.4   1.4   1.1   0.3   0.9
## [6289]   0.9   2.2   1.2   1.1   1.3   3.2   0.3   1.0   1.2   0.8   0.6   0.3
## [6301]   2.2   1.0   0.9   0.6   7.5   1.7   1.0   0.7   8.0   0.3   1.1   1.3
## [6313]   0.1   0.7   0.4   1.4   1.1   1.6   1.1   4.3   1.3   0.0   1.4   1.2
## [6325]   2.1   8.4   1.6   1.3   1.0   1.5   0.5   0.0   1.1   1.7   1.0   1.0
## [6337]   1.6   0.9   1.3   0.6   1.9   0.4   0.1   0.7   0.8   0.1   0.8   2.8
## [6349]   1.9   1.3   1.4   0.9   2.2   0.3   1.3   1.2   4.9   0.7   1.1   0.4
## [6361]   0.0 138.6   1.9   5.3   6.2  26.8  18.0   1.7   1.3   1.7   1.3   5.6
## [6373]   0.5   2.6   0.6   1.0   1.2   3.6   1.2   0.2   1.7   1.5   0.5   1.1
## [6385]   1.4   0.4   0.6  44.2   0.7   0.4   1.0   0.7   2.3   0.9   1.0   1.0
## [6397]   0.6   1.1  11.6   0.7   0.6   2.4   0.0   4.7   0.1   1.7   0.8   2.0
## [6409]   0.0   1.6   1.0   0.9   1.5   1.0   0.8   1.4   1.0   1.9   0.8   1.7
## [6421]   5.8   1.0   0.0   0.2   0.1   0.9   0.7   0.8   1.2   0.8   0.6   1.2
## [6433]   3.9   2.5   0.6   0.5   1.0   0.9   1.3   1.4   1.0   4.1   0.9   0.9
## [6445]   0.3   1.7   5.2   1.5  41.3   1.3   3.2   2.5   0.5   0.2  13.6   1.6
## [6457]   1.1   0.1   1.9  21.1   1.4   0.6   1.1   0.3   1.0   1.5   2.1  43.3
## [6469]   2.4   0.6   1.4   0.7   5.1   1.0   2.3   0.8   0.7   2.0   2.0   0.8
## [6481]   0.9   1.8   6.9   0.7   0.7   1.5   2.3   4.7   0.4   2.4   1.1   1.2
## [6493]   2.4   2.3   0.7   1.0   0.5   0.9   0.5   0.8   1.4   1.9   0.7   5.4
## [6505]   2.7   0.0   1.0   0.1   6.1   0.1   3.3   1.4   3.4   0.1   0.2   1.0
## [6517]   0.9   1.4   1.2   0.3   1.3   1.3   1.7   1.0   1.5   1.3   0.0 187.9
## [6529]   1.4   0.7   0.4   0.5   0.0   1.9   2.2   0.2   0.1   1.1   0.2   0.8
## [6541]   1.8   2.4   2.1   1.5   0.9   1.4   0.9   0.5   1.2   0.0   2.3   1.8
## [6553]   1.1   0.8   0.5   1.5   1.0   1.4   1.3  18.0   0.5   0.0   0.7   4.2
## [6565]   1.1   2.8   0.6   0.9   1.4   0.8   1.0   0.1   2.7   1.7   2.5   3.4
## [6577]   4.3   3.2   0.1   1.4   5.1   0.7   1.3   2.9   1.5   1.0   0.6   0.7
## [6589]   0.1   0.7   0.2   0.7   4.2   2.0  11.1   1.1   0.7   1.2   5.3   1.0
## [6601]   2.7   3.6   0.6  17.0   1.1   0.6   2.4   1.3   1.0   0.7   1.0   1.2
## [6613]   5.6   0.4   0.7   1.7   1.1  11.9   1.3   1.8   1.5   0.1   0.9   1.6
## [6625]   0.6   0.4   2.8   1.7   1.2   0.2   0.5   1.5   2.4   2.9   1.8   0.5
## [6637]   1.4   2.9   1.3   8.1   1.4   0.0   0.8   0.4   0.3   1.7   0.8   1.2
## [6649]   1.8   1.2   1.8   1.1   0.3   8.0   0.7   1.8   1.6   0.5   0.1   1.1
## [6661]   0.4   1.7   1.9   1.2   2.2   3.3   1.2   1.1   0.5   1.0   1.3   0.6
## [6673]   0.5   7.2   4.6   0.9   1.0   1.0   0.7  26.7   1.1   1.8   1.3   0.5
## [6685]   1.0   1.1   1.1   0.4   0.9   1.4   1.2   3.5   3.1   0.0   1.0   0.7
## [6697]   2.0  15.8   2.4   1.3   1.1   0.4   1.3   3.1   2.1   2.4   0.6   0.4
## [6709]  10.3   0.7   0.2   1.3   1.8   1.1   0.0   0.8   1.0   0.3   0.3   1.3
## [6721]   1.7   1.5   0.6   0.9   1.8   0.4   0.8   1.2   1.3   0.5   1.4   1.2
## [6733]   0.5   1.2   0.5   2.9   0.9   1.6   2.2   1.3   0.9   1.9   2.3   0.5
```

```
## [6745]   1.6   2.7   0.5   0.1   0.6   4.2   0.3   1.6   0.8   1.6   0.7   0.7
## [6757]   0.6   1.8   2.1   1.0   2.0   1.5   0.0   2.1   0.8   1.9   0.8   1.2
## [6769]   0.8   2.3   0.7   0.9   1.1   1.0   4.0   0.3   1.0   1.8   0.0   0.9
## [6781]   1.4   0.2   0.6   0.8   0.6   1.6   0.6   1.2   8.2   1.3   0.4   0.8
## [6793]   2.7   1.3   2.8   1.1   1.0   3.2   1.0   2.8   0.6   0.2   1.1   7.0
## [6805]   0.9   2.1  11.4   1.1   0.7   1.1   1.2   1.5   2.7   1.1   1.1   0.8
## [6817]   0.7  31.6   0.5   2.1   2.2   3.2   1.3   0.0   1.9   0.5   0.5   0.9
## [6829]   0.8   0.5   6.2   1.6   0.7   0.9   1.1   2.3   4.4   0.3   1.2   1.9
## [6841]   0.6   0.8   0.6   1.4   2.5   2.2   2.3   0.9   1.3   1.1  11.7   0.7
## [6853]   1.0   1.2   1.2   0.8   2.8   0.6   1.4   6.2   0.7   1.0   1.6   3.5
## [6865]   0.9   0.2   5.8   0.8   3.8   1.0   1.1   1.0   6.6   1.8   1.1   1.2
## [6877]   0.4   0.6   0.9   0.8   0.7   0.4   0.7   2.0   1.0   1.4   1.3   0.1
## [6889]  45.3   1.5   0.3   0.9   0.6   1.1   1.6   4.7   1.2   1.0   1.8   1.8
## [6901]  28.7   0.4   1.3   1.9   0.4   0.4   0.8   0.2   0.4   1.9   0.8   1.4
## [6913]   3.8   1.0   2.4   4.2   0.7   1.4   1.1   1.7   3.6   3.4   1.5   0.7
## [6925]   2.1   1.1   0.8   0.6   2.9   0.5   1.6   0.6   4.2   2.3   1.3   1.1
## [6937]   9.3   1.1   1.0   1.0   1.9   1.5   0.7   2.5  92.2   1.8   0.6   1.1
## [6949]   0.6  43.3   1.4   1.8   3.4   2.8   1.2   1.1   3.2   0.3   2.0   2.2
## [6961]   1.0   3.3   1.3   1.1   1.0   0.3   1.0   0.7   1.6   3.7   1.3   0.4
## [6973]   3.0   8.2   0.7   1.5   0.5   0.8   1.4   1.5   0.8   0.6   5.3   1.8
## [6985]   1.9   1.4   2.3   1.2   3.7   2.0   1.1   2.8   1.9   5.0   2.0   0.9
## [6997]   0.6   1.5   0.2   1.4   1.1   1.2  21.1  16.8   5.9   3.3   2.1   1.0
## [7009]   0.6   1.6   2.0   2.6   0.8   1.5   1.5   1.6   0.4   5.6   0.9   1.0
## [7021]   2.0   0.3  16.7   1.9   1.6   0.9   3.3   0.6   0.0   0.8   2.7   0.2
## [7033]   0.5   0.8   0.1   3.9   1.6   1.8   0.9   3.2   3.4   1.2   0.9   1.2
## [7045]   4.1   1.2  10.8   3.6   0.5   2.6   2.6   0.7   1.4   1.5   0.9   0.9
## [7057]   1.9   1.4   0.6   1.5   0.0   1.2   1.8   0.4   0.1   1.0   1.4   8.6
## [7069]   1.3   0.8   2.5   1.8   1.1   0.9   1.9   1.9   2.0   1.2   0.7   0.4
## [7081]   0.9   2.3   0.5   1.1   1.1   0.1   1.4   0.9   2.0   1.0   1.3   0.8
## [7093]  16.2   1.2   1.3   1.8   2.4   0.7   9.0   0.8   1.7   0.2   0.5  15.7
## [7105]   1.4   1.6   3.2   1.5   4.1   1.1   1.5   1.1   0.8   1.8   0.9   4.3
## [7117]   0.6   1.1   0.6   1.1   1.1   1.5   0.7   0.7   1.9 183.7  10.3   7.8
## [7129]   1.7   0.2   0.8   1.6   0.5   2.0   1.1   1.4   2.2   0.9   1.3   1.0
## [7141]   1.1   1.2   2.3   1.7   1.8  23.1   1.8   0.3   1.1   1.2   1.4   0.8
## [7153]   0.5   0.9   1.5   1.1   2.9   0.6   0.7   1.7   1.4   0.9   0.6   1.1
## [7165]   5.4   1.0   0.8   0.7   1.3   0.6   1.6   1.7   0.6   2.3   1.3   2.2
## [7177]   2.7   2.9   1.5   0.6   0.9   0.8   2.0   5.2   2.3   0.8   6.1   2.0
## [7189]   1.0   8.0   1.2   3.3   1.5   2.4   1.3   1.0   1.1   0.6   2.5   0.6
## [7201]   1.9   3.7   0.3   1.3   1.3   0.6   1.1   0.5   1.7   0.8   3.8   2.7
## [7213]   1.2   1.4   0.7   1.4   2.3   0.8   0.7   1.4   2.2   1.5   3.6   1.0
## [7225]   0.0   0.0   0.8   6.5   1.3   1.7   2.4   0.3   0.8   0.1   0.7   0.8
## [7237]  27.6   0.8   1.9   3.5   1.1   5.3   0.8   2.7   0.8   1.2   1.5   0.5
## [7249]   0.2   1.0   0.3   0.7   1.2   0.7   0.3   1.2   1.9   1.1   9.4   0.2
## [7261]   1.1   0.8   1.1   6.3   3.3   1.1   1.3  98.2   0.9   2.0   1.7   1.8
## [7273]   0.3   0.0   2.9   4.9   0.8   1.6   2.2   1.5   1.2   0.9   1.5   2.4
## [7285]   1.5   0.9   0.7   2.5   1.1   0.7   1.5   1.3   3.5   0.7   1.8   1.1
## [7297]   1.1   3.5   0.4   0.7   3.6   0.2   6.2   3.1   1.7   0.8   0.9   1.2
## [7309]   7.3   0.6   1.1   1.5   0.3   1.4   1.9   2.2   1.4 144.8   4.3   1.1
## [7321]   1.1   1.4   1.5   8.3   0.7   0.3   3.1   1.2   2.2   6.5   2.6   0.4
## [7333]   0.9   1.4   0.9   0.7   0.7   2.7   1.7   0.9   1.4   1.6   1.2   0.2
## [7345]   2.8   1.2   0.8   0.2   0.6   0.2   1.4   0.2   1.5   2.0   0.9   1.0
## [7357]   1.0   1.0   0.8   4.3   1.4   1.8   0.8   0.5   0.2   1.2   1.3   2.3
## [7369]   1.7   3.9   1.4   1.3   1.6   1.2   1.0   0.8   0.5   1.1   6.7   1.3
## [7381]   0.6   1.4   1.7   0.1   0.6   0.8   0.9   1.4   5.5   0.4   1.4   0.9
```

```
## [7393] 1.2 0.9 6.7 0.6 0.2 1.5 1.1 0.9 0.0 2.0 2.1 1.9
## [7405] 1.2 0.6 1.1 0.2 1.2 0.9 3.0 0.9 2.6 1.8 0.8 4.8
## [7417] 2.1 0.8 0.7 1.2 0.6 4.9 1.3 34.1 0.2 0.6 0.7 0.5
## [7429] 0.7 2.2 1.0 1.1 0.7 1.0 1.3 0.4 1.9 0.0 0.5 2.6
## [7441] 1.4 2.3 0.3 1.7 0.6 0.7 0.2 0.9 0.5 1.2 1.3 1.1
## [7453] 0.3 3.7 0.6 2.4 0.7 12.4 3.9 1.7 13.6 0.8 10.7 0.6
## [7465] 0.0 1.3 2.5 3.1 0.9 1.4 0.5 0.9 0.8 0.5 4.3 1.7
## [7477] 2.2 1.7 0.3 0.8 0.3 1.0 0.3 1.1 2.0 0.8 0.6 0.7
## [7489] 2.9 1.0 1.3 0.7 2.0 0.7 0.9 0.9 2.2 0.4 0.7 0.3
## [7501] 1.7 0.3 3.1 2.2 2.8 1.2 0.8 0.9 4.0 2.3 0.6 2.1
## [7513] 0.2 0.9 0.7 0.8 0.3 0.5 1.4 0.5 1.2 1.2 13.4 0.1
## [7525] 0.9 1.4 0.9 13.9 0.5 0.9 5.0 1.2 1.9 1.2 0.8 0.4
## [7537] 1.7 0.7 0.7 0.9 1.6 1.4 1.7 0.7 4.9 1.9 1.1 0.5
## [7549] 1.0 2.1 0.5 0.7 0.8 0.8 4.2 4.5 1.0 0.8 0.4 1.2
## [7561] 1.2 1.7 0.7 1.1 0.9 1.7 4.9 1.3 6.3 1.1 2.1 0.4
## [7573] 2.4 1.3 1.9 1.1 1.1 11.4 2.0 0.3 1.0 0.9 1.3 0.7
## [7585] 0.6 0.9 2.3 1.8 0.6 0.5 3.7 0.6 1.4 3.1 1.2 1.0
## [7597] 2.3 1.0 1.6 1.5 1.0 1.5 8.0 1.3 2.0 1.0 0.6 0.2
## [7609] 0.6 0.6 1.5 0.9 1.4 1.2 0.2 0.9 0.1 0.9 0.7 0.5
## [7621] 3.2 1.4 8.7 14.6 3.4 0.7 0.2 1.4 0.8 0.8 1.3 0.0
## [7633] 1.2 1.0 2.4 1.3 1.5 3.4 0.2 2.7 0.3 1.6 16.0 1.3
## [7645] 1.4 9.5 1.5 0.7 2.1 1.7 0.4 0.8 0.1 3.4 5.5 0.7
## [7657] 1.5 1.2 1.2 0.5 0.9 3.9 1.0 0.4 3.4 0.8 1.4 67.7
## [7669] 0.5 1.0 0.5 2.1 0.7 0.2 2.0 1.2 0.9 3.5 1.0 1.2
## [7681] 0.8 2.5 1.6 3.0 9.9 0.8 0.9 44.6 1.2 6.1 1.6 0.2
## [7693] 1.2 1.2 1.6 1.1 0.4 0.5 1.4 1.1 0.9 1.1 2.2 0.0
## [7705] 0.1 0.7 1.4 0.0 0.7 0.3 1.2 1.8 2.0 2.0 0.5 2.6
## [7717] 1.6 0.4 0.1 1.1 6.4 0.9 1.2 1.4 1.1 1.7 3.3 0.9
## [7729] 6.1 1.4 0.2 10.0 9.7 1.2 1.2 0.2 1.3 4.4 0.5 0.3
## [7741] 0.5 0.6 1.5 1.8 0.5 7.9 2.3 2.1 1.2 11.6 3.4 5.1
## [7753] 2.2 0.3 0.4 3.6 2.0 0.5 1.4 1.1 0.7 4.7 3.5 1.4
## [7765] 0.8 1.0 65.4 9.7 2.6 0.8 1.9 3.4 1.2 0.9 0.7 12.1
## [7777] 1.7 0.5 2.5 0.0 0.8 0.7 0.9 1.8 0.3 8.4 1.7 0.5
## [7789] 0.5 0.5 2.8 0.9 1.2 2.2 0.8 2.6 4.7 0.6 2.9 0.4
## [7801] 1.7 1.2 1.4 3.5 1.1 1.2 7.4 5.9 3.6 0.0 0.9 0.6
## [7813] 0.6 1.0 0.8 0.8 4.0 5.4 1.8 1.3 0.3 1.3 28.0 1.1
## [7825] 1.4 0.5 1.4 0.9 16.5 0.5 1.6 0.6 1.1 0.7 0.6 1.6
## [7837] 0.6 1.0 4.9 1.0 3.4 0.6 4.0 1.4 1.9 1.6 0.8 13.8
## [7849] 0.8 1.9 1.4 1.7 2.6 3.5 10.5 0.7 1.6 0.8 13.7 0.1
## [7861] 1.9 13.1 3.4 1.2 0.2 1.6 1.2 1.1 0.1 3.8 1.5 1.5
## [7873] 0.9 1.8 1.4 1.6 0.5 1.6 1.9 1.4 3.6 0.9 1.9 0.6
## [7885] 1.2 4.5 1.1 1.4 1.9 1.7 1.1 0.6 0.8 1.0 0.8 5.5
## [7897] 5.2 0.9 2.0 0.9 0.8 1.7 0.7 0.8 6.8 1.3 0.6 0.9
## [7909] 3.4 0.5 1.2 2.4 1.2 1.8 0.8 19.4 2.0 0.7 0.6 1.6
## [7921] 0.5 7.3 1.9 0.6 0.7 1.4 4.3 2.1 1.0 1.0 4.3 1.6
## [7933] 0.8 0.8 7.7 1.2 1.0 5.8 9.6 0.9 0.3 0.3 1.1 1.3
## [7945] 0.9 1.2 1.3 3.6 1.7 0.9 0.5 1.7 0.9 5.2 0.9 0.6
## [7957] 0.8 3.6 2.2 3.5 0.4 1.4 1.2 1.1 1.8 0.9 1.0 1.6
## [7969] 1.1 1.8 1.5 2.5 1.6 0.0 1.0 0.8 1.3 3.7 0.5 0.3
## [7981] 1.6 1.3 3.1 1.1 0.3 14.3 2.0 0.4 1.5 0.7 1.4 0.5
## [7993] 1.8 0.9 1.5 0.8 5.0 17.8 0.9 0.7 1.8 0.8 1.3 1.0
## [8005] 5.2 1.2 1.1 1.7 0.1 1.7 0.2 2.7 0.2 1.6 1.3 2.7
## [8017] 0.9 1.1 2.6 1.7 0.8 2.2 1.1 6.1 1.6 1.9 4.5 0.9
## [8029] 1.5 16.8 0.8 1.0 4.7 1.1 1.8 5.8 0.8 0.8 2.8 0.5
```

```
## [8041]   0.6   0.7   0.0   1.5   1.7  19.8   1.9   1.4   4.1   1.2   0.9   2.0
## [8053]   1.7   1.4   0.9   1.5   0.3   3.3   1.9   1.5   0.4   0.8   0.9   5.0
## [8065]   0.6   0.9   3.9   1.6   0.8   1.5   0.7   0.8   4.2   1.1   2.2   0.9
## [8077] 146.3   0.5  13.2   1.1   0.9   0.7   2.7   1.7   1.5   0.3   0.9   1.0
## [8089]   0.7   1.4   1.1   1.1   5.0   0.9   0.8   0.8   2.3   0.4   0.7   1.5
## [8101]   0.6   3.1   1.0   0.1   0.9   0.4   0.3   0.3   1.1   1.3   0.6   0.3
## [8113]   0.9   4.0   1.2   1.8   0.9   0.9   0.6   0.0   2.5   1.2   1.2   0.7
## [8125]   3.1   1.8   1.3   0.5   0.5   0.9   7.7   2.3   1.3  12.8   1.8   1.6
## [8137]   1.0   0.9   1.2   0.6   1.2   1.2  13.6  15.6   4.4   4.0   1.6   1.4
## [8149]   1.3   4.9   1.0   1.9   0.3   2.5   1.9   0.4   3.7   2.5   1.1   2.0
## [8161]   0.4   2.4   1.4   1.0   7.6  10.7   2.2   0.5   2.1   2.5   1.1   2.2
## [8173]   2.1  25.7   1.9   1.1   0.8   2.0   7.6   0.7   0.8   0.8   0.5   0.8
## [8185]   0.7   0.5   3.1   5.6   0.6   1.5   0.6   1.2   7.0   0.3   1.3   1.6
## [8197]   0.9   1.3   1.1   0.8   0.5   0.7   0.2   1.4   1.1   0.2   1.8   1.0
## [8209]   0.9   3.2   1.2   0.9   2.0   1.1   4.6   0.8   3.7   1.1   1.8   2.0
## [8221]   0.5   4.9   8.2   1.2   0.8   0.6   0.5   0.6   1.6   0.3   4.2   1.7
## [8233]   2.7   1.1  38.8   0.1   1.6   0.9   1.1   2.7   1.1   1.2   0.3   0.4
## [8245]   3.1   0.6   0.8   1.3   2.2   0.9   0.3   0.9   1.0  11.2   2.2   1.0
## [8257]   0.5   3.9   1.5   1.3   0.2   1.1   1.9   1.0   1.3   1.0   2.0   1.0
## [8269]   1.1   6.7   0.1  17.6   4.7   2.0   0.9   3.4   1.0   1.5   2.5   1.4
## [8281]   1.6   0.9   0.9   0.9   0.6   0.4   0.9   3.7   1.5   1.4   2.6   1.5
## [8293]   3.7  10.0  28.2   0.7   2.0   1.1   2.0 103.7   1.6   0.9   1.1   1.7
## [8305]   1.0   1.0   1.0   2.1   1.5   1.5   1.1   2.5   0.2   0.9   0.8   1.2
## [8317]   1.9   0.5   0.8   1.2   0.6   0.9   1.6   4.2   1.1   6.3   2.5   0.8
## [8329]   2.5   1.0   3.2   0.6   0.2   0.7   0.2   1.3   7.0   0.1   0.2   1.8
## [8341]   0.7   1.8   9.3   1.7   0.3   0.9   1.2   1.2   0.2   1.3   1.0   0.5
## [8353]   0.3   0.7   1.7   1.8   0.9   2.3   0.6   1.3   2.1   3.3   1.4   2.7
## [8365]   1.2   0.6   3.2   3.0   2.8   1.0   2.8   0.9   2.4   1.1   1.1   0.7
## [8377]   1.0   0.5   0.1   1.2  78.6   1.0   1.3   1.4   3.6   0.5  13.4   0.5
## [8389]   2.8   0.0   0.9   4.4   1.5   0.3   1.0   1.3   0.5   2.1   0.9   1.6
## [8401]   0.9   1.7   0.6   0.8   0.3   1.1   0.5   0.5   1.6   1.8   1.8   1.6
## [8413]   2.5   1.2  45.2   1.3   0.8   0.8   0.8   1.3   0.0   0.4   1.5   0.0
## [8425]   0.5   4.7   0.2   0.8   4.9   3.0   1.1   0.1   2.9   0.8   1.8   1.9
## [8437]   0.4   1.9   0.5   2.8   0.8   1.4   3.4   9.4   1.0   1.2   4.6   2.9
## [8449]   1.7   0.8   5.6   5.2   1.2   0.7   0.7  16.8   0.5   1.3   2.4   1.0
## [8461]   3.0   1.3   2.2   1.3   2.4   6.4   0.6   2.1   0.8   0.2   0.2   3.9
## [8473]   1.2   0.4  28.7   1.2   0.7   9.9   0.8   1.3  11.6   1.1   0.9   0.9
## [8485]   0.5   0.4   1.5   1.6   0.6   1.3   1.0   3.0  30.4   1.0   0.4   6.9
## [8497]   0.8   0.0   1.3   3.7   3.1   0.9   1.6   1.3   1.4   2.5   0.4   1.3
## [8509]   1.7   2.4   1.4   3.3   1.2   0.9   0.7   1.3   1.9   5.2   1.1   1.7
## [8521]   1.3   0.4   3.6   5.2   1.0   2.2   1.4   0.0  24.2   5.1   4.1   1.2
## [8533]   6.6   1.4   0.3   1.0   2.5   3.4   2.6   1.8   0.8   1.7   1.3   4.0
## [8545]   0.4   0.4   2.9   2.8   2.2   4.1   1.2   2.5   1.6   1.0   1.0   0.4
## [8557]   0.7   1.1   4.1   2.9   0.9   1.0   1.5   0.4   1.2   1.9   1.7   2.9
## [8569]   2.5   1.0   2.7   0.4   0.6   4.7   1.4   0.0   2.1   1.3   0.6   0.9
## [8581]   2.9   0.4   0.6   0.7   1.2   0.5   1.9   1.0   0.0   5.3   1.1   6.9
## [8593]   1.0   2.3   1.3   1.4   0.4   1.9   3.2   0.6   1.2   1.2   3.5   0.3
## [8605]   0.8   0.3   3.9   1.3   2.4   2.8   7.8  15.6   0.8   1.5   2.9   0.6
## [8617]   1.7   0.4   1.1   1.6   4.6   0.8   0.8   0.8   2.5   1.0   0.3   0.7
## [8629]   1.3   0.0   1.8   0.9   1.4   4.5   0.8   1.0   1.1   1.0   5.8   0.5
## [8641]   0.9   1.3   0.7   1.6   1.5   0.6   9.7   1.8   1.7   2.0   1.2   3.1
## [8653]   0.9   2.7   1.8   1.3   1.1   1.3   1.1   1.1   1.1   0.9   0.3   1.1
## [8665]   1.8   0.7   1.3   0.3   1.7   0.6  24.0   2.4   1.5   1.3   0.4   0.5
## [8677]   0.7   7.1   0.9   2.8   3.4   2.0   1.0   1.4   0.6   0.3   2.3   2.0
```

```
## [8689]   1.5   1.2   1.3   0.8   0.2   0.7   1.7   1.6   0.3   1.5   3.1   2.5
## [8701]   1.1   1.2   0.7   0.9   5.1   0.5   0.6   3.4   1.6   1.2   7.5   2.3
## [8713]   0.7   2.1   3.1   6.7   0.8   0.9   0.5   0.6   0.4   0.3   1.6   0.2
## [8725]   6.2   0.2   0.2   1.3   1.5   1.5   0.6   0.3   2.8   1.4   3.0   0.6
## [8737]   7.2   1.1   0.6   2.8   6.2   0.1   1.7   1.0   1.0   0.5   3.9  13.7
## [8749]   1.4   1.3   6.4   6.2   2.5   1.1   2.0   1.3   2.3   0.9   1.6   2.1
## [8761]   0.6   0.9   0.3   0.0   2.0   2.1   4.4  44.0   1.3   1.5   1.1   1.3
## [8773]   1.5   8.9   0.7   1.2   0.9   1.3   1.4   0.6   6.4   3.0   2.4   1.4
## [8785]   1.1   3.0   0.7   0.7   1.9   0.5   1.0   5.8   5.0   1.5   2.6   1.8
## [8797]   0.9   1.1   0.4   1.5   0.5   0.4   0.6   0.0   5.3   0.4   1.3   5.9
## [8809]   2.5   1.8   1.7   0.3   4.8   1.0   0.7   1.3   1.0   1.3  13.2   1.1
## [8821]   0.8   1.0   0.8   0.7   1.4   1.0   0.5   1.1   1.8   2.1   1.1   0.5
## [8833]   0.6   0.7   0.3   0.8   1.3   0.8   1.6   0.4   0.3   2.0   0.9   0.7
## [8845]   1.6   1.7   1.0   1.0   2.2 168.9   1.6   1.4   0.3   1.0  15.5   0.5
## [8857]   1.8   1.9   1.6   2.6   4.8   1.3   0.3  13.0  15.8   0.5   1.1   0.1
## [8869]   1.4   1.3   1.2   0.0   1.6   1.7   1.0   0.2   4.6   1.6   0.2   2.4
## [8881]   0.8   1.1   0.5   2.1   5.8   0.7   1.2   1.2   1.0   1.3   2.5   1.5
## [8893]   1.2   1.4   0.3   0.8   1.2   1.5   1.2   1.9   0.7   1.2   2.9   1.0
## [8905]   1.0   0.9   0.4   0.4   0.8   5.4   0.6   3.9   4.2   0.0   0.6   1.9
## [8917]   1.8  30.0   1.3   0.5   3.3   1.1   0.8   1.4  16.6   1.9   2.6   1.3
## [8929]   1.7   0.7   2.1   1.2   2.7   0.1   2.1   0.6   0.7   1.7  18.3   0.6
## [8941]   0.5   1.3   3.5   1.2   1.5   0.4   3.8   1.8   0.3   1.2   0.6   0.8
## [8953]   0.0   2.3   0.9   0.8   1.3   1.0   2.9   0.1   2.5   2.7   1.9   1.1
## [8965]   1.5   0.9   0.9   1.7   1.1   1.1   1.0   1.8   1.2   0.6   1.4   2.2
## [8977]   1.2   1.4   1.3   0.5   0.8   1.3   1.0   1.1   1.3   2.2   1.2   2.2
## [8989]   0.7   1.2   2.7   1.8   0.9   1.8   0.7   0.5   0.7   1.8   1.2   2.7
## [9001]   1.8   1.9   0.9   0.4   0.0   1.3   3.9  14.0   4.4   0.9   3.2   1.4
## [9013]   0.1   0.5   2.6   1.5   1.0   5.2   0.9   1.9   0.4   1.0   0.9   1.6
## [9025]   0.9   0.8   0.2   1.7   1.3   0.8   1.9   0.4   1.1   4.7   1.9   0.6
## [9037]   5.3   0.8   1.3   1.0   1.0   1.5   7.2   1.0   1.9   0.7  14.9   0.0
## [9049]   1.1   0.6   0.8   3.0   1.3   2.2   1.1   1.5  25.1   0.1   1.4   1.2
## [9061]   0.4   0.3   1.0   0.4   0.6   0.3   2.4   0.8  20.4   3.8   0.4   1.4
## [9073]   0.9   0.4   2.5   1.6  48.5   0.2   0.6   2.2   1.0   1.0   7.4   1.1
## [9085]   1.6   0.5   2.0   0.3  21.4   0.4   2.2   5.4   2.2   0.2   1.5   1.2
## [9097]   2.1   1.4   1.5   0.7   1.4   1.3   0.6   1.0   1.1   1.1   0.9   1.9
## [9109]   1.0   2.2   0.5   1.5   0.8   0.5   2.1   0.7   0.4   0.3   2.3   1.6
## [9121]   0.9   1.5   2.3   1.0   0.8   0.7   1.1   8.5   0.1   0.3   0.6   0.0
## [9133]   3.4   0.7   1.3   0.3   1.6   1.4   1.0   0.8   0.8   0.9   1.5   0.5
## [9145]   0.2   1.6   1.8   1.1   0.2   0.8   1.0   1.5   0.9   1.8   1.6   3.1
## [9157]   0.7   0.9   2.0   0.9   1.6   5.3   0.8   1.2   1.5   1.6   1.6   2.3
## [9169]   0.5  12.9   2.1   1.3   1.2   0.0   1.4   2.6   1.1   1.0   0.7   3.5
## [9181]   3.2   1.6   1.2   1.0   2.4   1.5   1.0   1.6   1.1   1.8   1.9   1.2
## [9193]   0.3   1.1   2.2   2.5   0.5   1.5   1.5   0.9   2.3   3.4   0.9   0.9
## [9205]   0.2   0.0   1.8   0.9   1.2   1.0   2.5   0.9   5.0   1.9   1.9  10.4
## [9217]   1.0   0.2   1.5   0.1   2.3   0.5   0.2   0.9   0.3   0.9   1.0   0.9
## [9229]   0.0   3.5   1.1   1.3   0.5   0.6   0.7   3.1   0.9   0.7   1.5   1.0
## [9241]   1.3   2.1   1.2   0.4   2.3   0.2   1.3   1.4  28.6   5.9   2.2   2.5
## [9253]   0.8   3.7   2.4   1.8   1.8   1.2   9.2   1.6   0.2   2.4   0.9   2.8
## [9265]   0.0   5.2   1.8   0.4   0.6   1.7   2.3   1.0  82.1   1.1   0.9   1.7
## [9277]   1.4   1.0   5.1   1.0   4.2   2.4   0.6   0.4   3.2   0.2   0.5   2.9
## [9289]   5.6   1.7   4.1   1.3   1.0   0.7   4.3   4.4   1.4   1.5   4.6   0.8
## [9301]   1.1   3.8   2.3   0.4   1.4   0.6   2.4   3.7   5.8   4.4   1.1   1.6
## [9313]   0.8   0.5   0.8   2.6   0.6   0.5   1.5   0.9   0.8   1.0   2.5   1.3
## [9325]   1.1   0.3   1.4   3.0   1.2   0.9   1.5   0.1   4.3   0.3   0.9   0.9
```

```
## [9337]  1.6  1.6  0.8  0.6  0.7  0.7  0.2  1.2  1.2  0.7  0.1  1.0
## [9349]  2.5  1.7  0.9  2.2  0.8  0.9  1.3  1.6  0.5  1.2  1.2  0.5
## [9361]  0.8  1.2  1.5  1.8  1.0  2.2  0.8  1.0  3.8  0.7  1.6  1.5
## [9373] 16.3  1.5  0.9  0.9  2.9  0.7  2.8  3.1  0.7  1.7  1.2  1.1
## [9385]  0.0  0.8  2.3  1.2  1.2  0.7  3.0 45.3  0.8  0.0  1.7  1.3
## [9397]  0.6  1.9  1.2  2.7  2.2  1.5  1.4  1.1  0.9  1.1  1.2  0.3
## [9409]  1.8  2.6  1.7  0.1  0.1  0.5  1.5  1.0  1.7  0.0  0.6 16.8
## [9421]  0.6  7.4  6.5  1.1  3.9  0.7  1.3  1.0  3.6  3.0  0.7  2.2
## [9433]  1.5  1.0  1.2  0.1  0.7  1.2  1.3  0.9  0.2  1.3  5.3  0.0
## [9445]  1.2  2.7  4.5  0.8  1.3  2.3  0.6  1.3  0.1  0.1  0.4  3.8
## [9457]  2.1  2.6  2.6  4.0  2.5  1.5  0.5  1.3  1.8  1.8  0.8  1.1
## [9469]  0.5  1.2  0.0  0.7  1.4  1.3  0.3  1.0  4.6  1.1  1.2  0.4
## [9481]  0.9  0.8  0.4 34.7  1.8  4.2  5.4  1.9  4.3  3.4  2.7  6.1
## [9493]  0.9  0.6  1.1  1.9  0.9  1.3  1.0  0.7  1.6  0.4  1.1  1.6
## [9505]  1.3  0.8  1.5  1.1  1.5  1.2  1.0  3.7 18.1  0.9  3.9  0.7
## [9517]  1.2  1.7  0.3  1.0  1.3  1.5  1.3  1.1  6.9  1.7  1.2  2.0
## [9529]  1.6  0.9  0.1  4.3  1.4  1.9 30.2  1.2  2.2  0.9  1.1  1.8
## [9541] 27.6  1.3  1.3  0.4  0.4  5.2  1.1  1.2  0.0  0.3  1.1  0.7
## [9553]  1.8  0.3  1.8  0.3  0.8  1.3  0.2  1.2  0.7  0.9  1.4  1.8
## [9565]  0.4  1.9  3.2 39.3  3.3  3.7  2.7  1.0  1.1  1.1  0.5  1.7
## [9577]  1.3  0.6  0.0  1.5  0.0  1.7  1.8  0.9  0.7  0.9  0.9  0.5
## [9589]  2.2  0.5  1.7  1.2  1.8  1.7 11.2  6.9  1.3  1.4  0.2  0.4
## [9601]  0.5  3.5  1.8  6.4  2.4  1.1  1.7  0.7  1.2  0.9  0.9  7.8
## [9613]  1.0  1.4  1.6  0.8  1.0  0.1  3.3  2.3  0.4  0.1  0.8  0.2
## [9625]  1.7  0.7  1.6  2.0  0.6  0.7  1.2  1.1  1.8  2.3  1.1  0.9
## [9637]  1.8  0.7  2.3  1.2  1.5  0.6  0.9  0.7  0.8  2.1  1.2  1.1
## [9649]  1.4  0.9  0.3  0.7  1.2  0.2  0.6  2.1  3.9  3.9  1.8  1.5
## [9661]  1.1  0.7  0.5  0.5  5.6  1.2  0.8  1.2  2.3  2.4  1.2  0.1
## [9673]  1.0  0.9  0.9  0.6  1.6  3.1  1.2  1.0  0.6  0.9  1.2  1.6
## [9685]  0.7  0.1  1.5  0.4  1.4  0.3  1.8  2.7  1.0  1.9  2.4  0.9
## [9697]  0.5  0.8  0.7  3.7  3.8  1.4  0.4  2.3  0.9  1.1  1.5  1.1
## [9709]  0.3 12.1  0.2  0.9  0.9  0.8  0.9  1.6  0.7  1.2  0.5  1.6
## [9721]  0.5  2.0  0.1  1.8  1.0  0.6  1.1  0.1  0.8  0.9  0.3  0.8
## [9733]  1.2  2.5  1.1  1.5  0.2  1.0  1.3  0.7  0.6 11.6  1.1  0.1
## [9745]  1.1  0.8 11.2  0.7  0.0  0.4  5.0  0.7  1.4  3.7  0.7  0.7
## [9757]  1.5  0.8  1.1  0.4  1.4  1.3  2.2  3.1  0.2  2.7  0.5  3.8
## [9769]  3.2  1.9  0.1  6.1  1.5  3.0  1.9  2.9  0.3  0.8  1.3  0.6
## [9781]  0.3  0.4  0.3 32.2  3.3  3.0  1.1  0.0  1.7  1.0  4.4  3.1
## [9793]  1.3  4.9  0.7  0.9  1.6  1.2  1.0  1.4  5.1  0.0  0.4  5.3
## [9805]  0.5  1.4  1.0  1.9  0.8  4.9  2.3  1.1  0.6  0.3  0.5  0.6
## [9817]  1.3  1.0  1.4  1.5  8.9  2.0  0.8  2.0  4.1  0.0  1.7  0.8
## [9829]  6.3  0.7  0.8  1.4  1.8  1.6  1.5  0.7  1.9  0.9  1.2  1.5
## [9841]  1.3  4.7  1.5  0.0  1.1  1.1  1.4  1.3  0.2  1.5  3.0  1.5
## [9853]  0.0  1.4  2.4  1.1  1.5  1.2  1.8  0.4  1.7  2.4  1.3  0.3
## [9865]  0.4  1.1  0.8  7.6  0.2  0.0  0.9  0.8  3.0  0.7  5.5  0.9
## [9877]  1.0  1.7 36.4  2.0  1.0  1.5  0.6  0.7  1.1  2.4  1.6  0.5
## [9889]  0.1  1.3  1.0  2.8  1.5  0.6  1.2  1.3  2.0  1.2  1.1  0.6
## [9901] 59.8  1.0  1.4  1.6  0.3  0.0  1.1  1.1  1.2  0.4  0.8  0.4
## [9913]  0.3  2.3  3.0  0.3  3.1  2.1  9.9  1.6  6.9  5.1  1.1  1.4
## [9925]  1.5  0.5  0.7  1.1  0.4  1.7  0.7  1.1  1.3  1.1 10.2  1.0
## [9937]  1.0  1.1  1.1  0.5  1.5  0.6  0.8  2.0  1.6  1.2  1.4  1.2
## [9949]  1.3  1.0  0.8  1.0  3.1  1.0  0.8 12.1  1.2  0.9  0.7  1.9
## [9961]  2.6  1.2  1.7  0.2  4.4  0.8  2.0  3.0  9.6  0.0  0.8  0.7
## [9973]  4.6 14.1  2.6  0.3  0.5  1.0  3.5  0.5  1.6  1.5  0.4  5.6
```

```
## [9985]   9.9   0.5   0.7   0.3  14.4   0.8   2.0   2.6   2.5   0.8  13.6   5.8
## [9997]   1.8   1.0   1.1   1.6
```

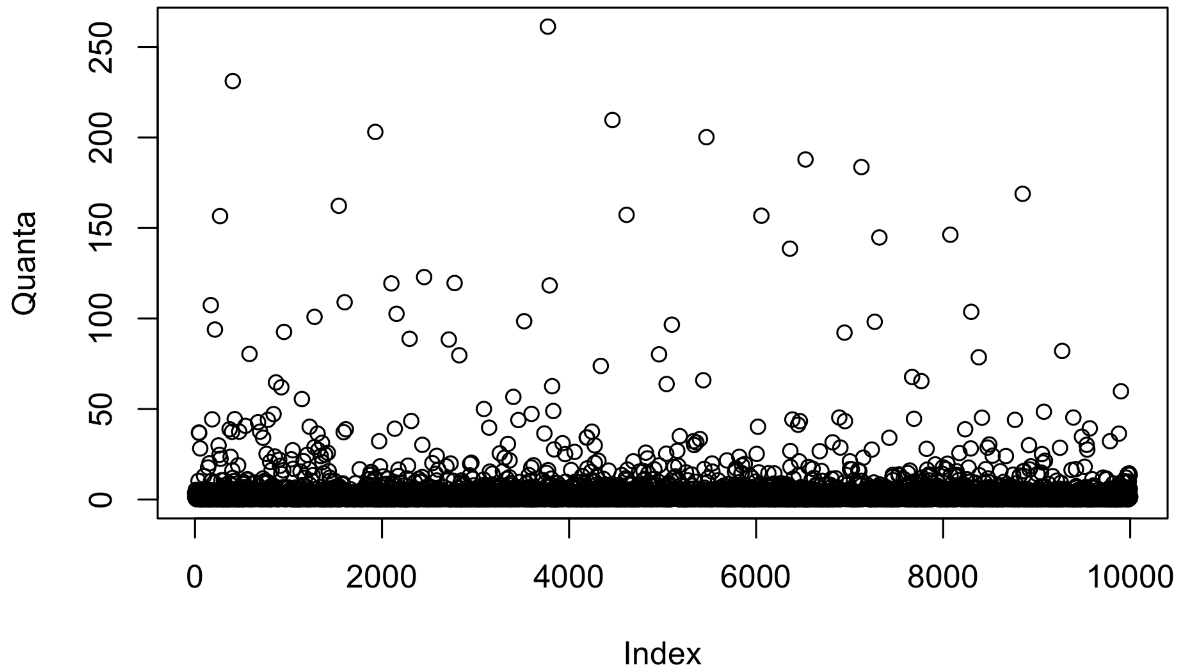
```
tb_sample <- tibble(sample = sample_q) %>%
  count(sample > 10) %>%
  mutate(prob = n/10000) #what is the ratio of datapoints over 10?

q_under_10 <- tb_sample[1,3, drop = TRUE]
q_under_10 # approx. 96% of data points are below 10
```

```
## [1] 0.9645
```

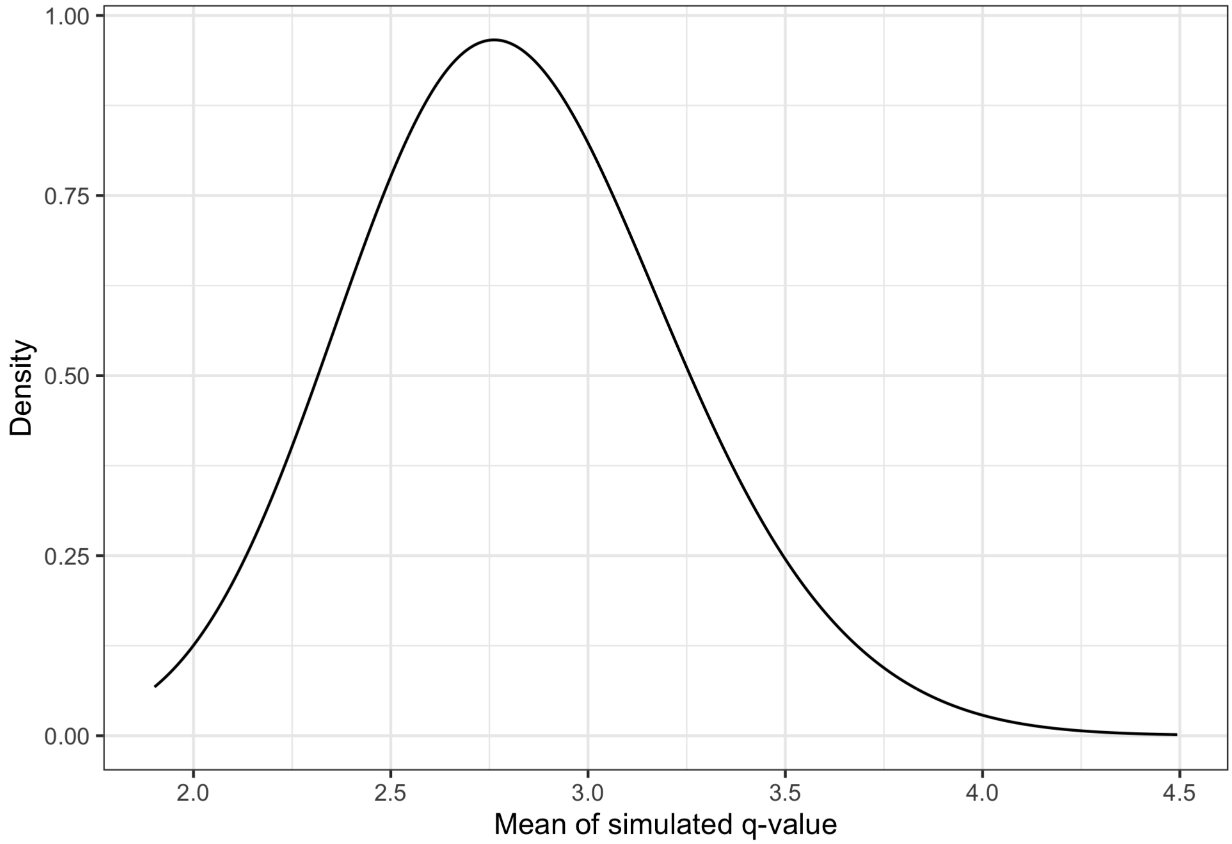
```
mean(sample_q) #mean of the sample should be between 2 and 3
```

```
## [1] 2.71343
```

```
plot(sample_q, ylab="Quanta")
```

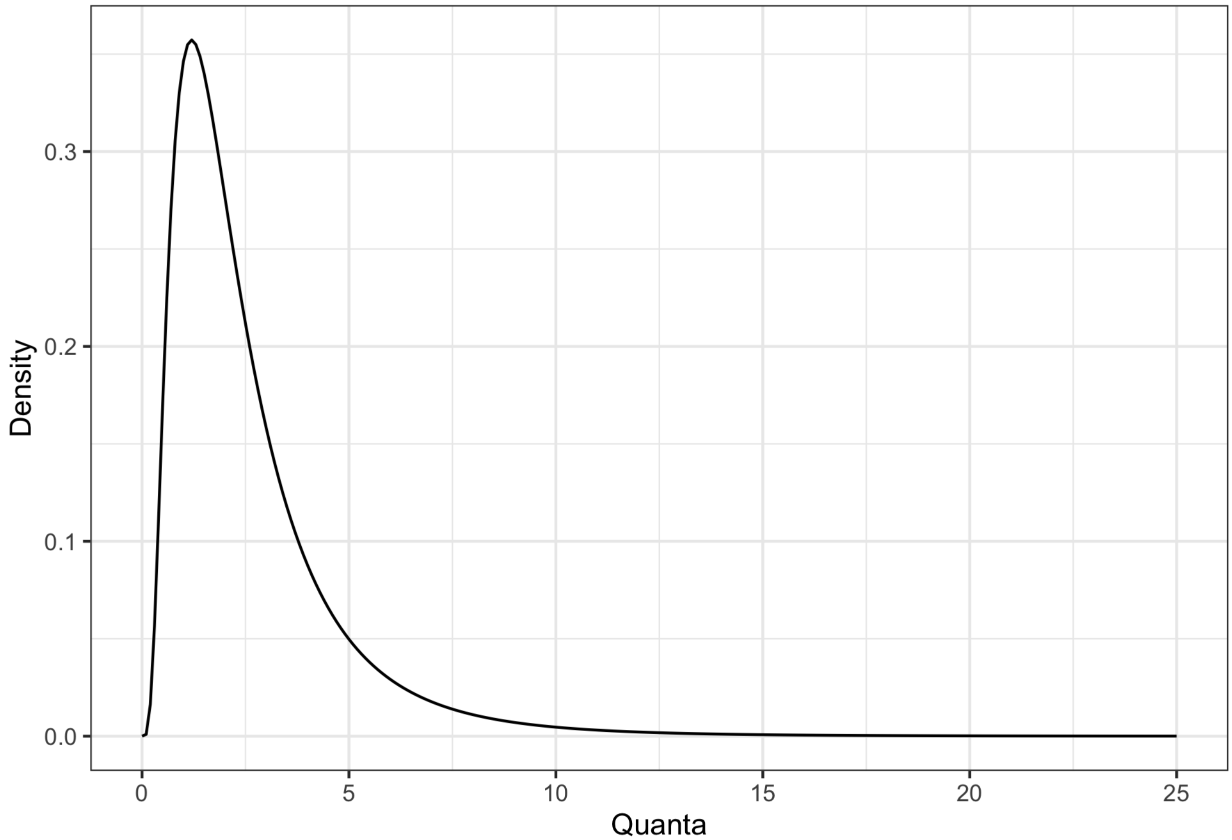



```
thousand_sample <- replicate(10000, mean(sample(rq_distr$quanta, 1000, replace = TRUE, prob = rq_distr$p
#for calculating the distribution of the mean over lots of simulations
ggplot() + geom_density(mapping = aes(thousand_sample), alpha = .2, kernel = "gaussian", adjust = 5) +
  xlab("Mean of simulated q-value") +
  ylab("Density") +
  theme_bw()
```




```
#Mean is in the desired area
```

```
## Buonanno et al. provide an estimation for the quanta (like in MCID)
#"light activity, speaking"
cov_q <- function(x) {
  dtrunc(x, spec = "lnorm", a = 0, meanlog = 0.698, sdlog = 0.720)
}

cov_q_distr <- data.frame(quanta = seq(0, 25, .1)) %>%
  mutate(prob = cov_q(quanta))

cov_q_distr %>%
  ggplot(aes(x = quanta, y = prob)) +
  geom_line() +
  theme_bw() +
  ylab("Density") +
  xlab("Quanta")
```




```
sample_q_cov <- sample(cov_q_distr$quanta, 10000, replace = TRUE, prob = cov_q_distr$prob)
```

Rest of the parameters

```
#n
n_ch <- 20
n_sa <- 30 #Powerpoint
n_tz <- 50 #Powerpoint

#I tuberculosis
prev_ch <- 4.14/100000
#https://www.bag.admin.ch/bag/de/home/zahlen-und-statistiken/zahlen-zu-infektionskrankheiten.exturl.htm

prev_sa <- 513/100000
# tendenziell zu hoch da 15-25
 #https://worldhealthorg.shinyapps.io/tb_profiles/?_inputs_&entity_type=%22country%22&lan=%22EN%22&iso2
# Ansteckungen in Altersgruppe 5-24 durch Population in dieser Altersgruppe (nicht 15-24 genommen, da s
prev_tz <- 208/100000
#https://data.worldbank.org/indicator/SH.TBS.INCD?locations=TZ

I_ch <- prev_ch*n_ch #prevalence per class (per year)
I_sa <- prev_sa*n_sa
I_tz <- prev_tz*n_tz
```

```
#I Covid
I_ch_cov <- 0.05*n_ch
40000/8700000
```

```
## [1] 0.004597701
```

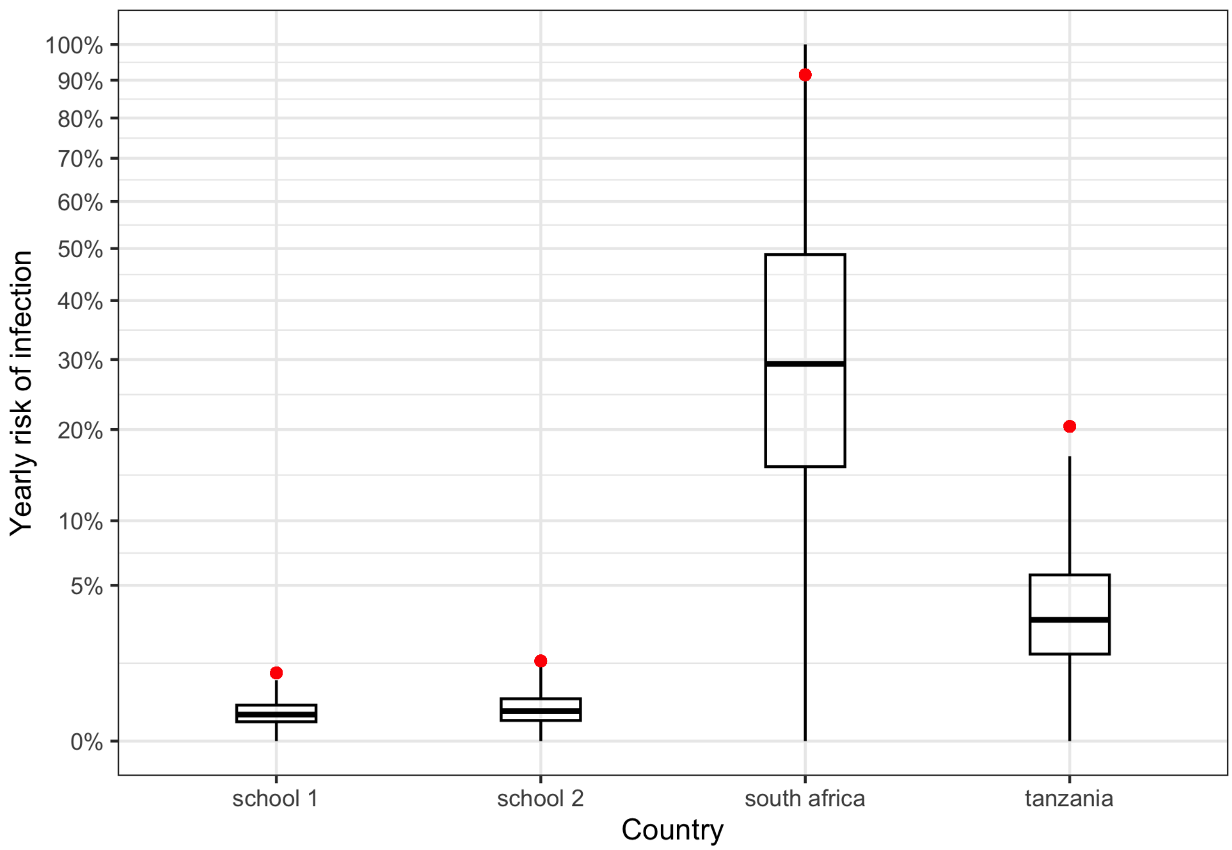
```
month <- 8*5*4
year <- 8*5*4*12
```

```
#preparing datasets for plotting
df_ch1 <- tibble(school = c(rep("school 1", 10000)), f = sample_f_ch1, q_tb = sample_q, q_cov = sample_
  mutate(P_year = 1 - exp(-(f*I_ch*q_tb*year)/n_ch)) %>%
  mutate(P_year_one = 1 - exp(-(f*1*q_tb*year)/n_ch)) %>%
  mutate(P_month_one_cov = 1 - exp(-(f*1*q_cov*month)/n_ch)) %>%
  mutate(P_month_two_cov = 1 - exp(-(f*2*q_cov*month)/n_ch)) %>%
  mutate(five_quantil = unname(quantile(P_year$f, probs = seq(0, 1, 1/20)))[2]) %>%
  mutate(ninefive_quantil = unname(quantile(P_year$f, probs = seq(0, 1, 1/20)))[20])

df_ch2 <- tibble(school = c(rep("school 2", 10000)), f = sample_f_ch2, q_tb = sample_q, q_cov = sample_
  mutate(P_year = 1 - exp(-(f*I_ch*q_tb*year)/n_ch)) %>%
  mutate(P_year_one = 1 - exp(-(f*1*q_tb*year)/n_ch)) %>%
  mutate(P_month_one_cov = 1 - exp(-(f*1*q_cov*month)/n_ch)) %>%
  mutate(P_month_two_cov = 1 - exp(-(f*2*q_cov*month)/n_ch)) %>%
  mutate(five_quantil = unname(quantile(P_year$f, probs = seq(0, 1, 1/20)))[2]) %>%
  mutate(ninefive_quantil = unname(quantile(P_year$f, probs = seq(0, 1, 1/20)))[20])

df_tz <- tibble(school = c(rep("tanzania", 10000)), f = sample_f_tz, q_tb = sample_q, q_cov = sample_q_
  mutate(P_year = 1 - exp(-(f*I_tz*q_tb*year)/n_tz)) %>%
  mutate(P_year_one = 1 - exp(-(f*1*q_tb*year)/n_tz)) %>%
  mutate(P_month_one_cov = 1 - exp(-(f*1*q_cov*month)/n_tz)) %>%
  mutate(P_month_two_cov = 1 - exp(-(f*2*q_cov*month)/n_ch)) %>%
  mutate(five_quantil = unname(quantile(P_year$f, probs = seq(0, 1, 1/20)))[2]) %>%
  mutate(ninefive_quantil = unname(quantile(P_year$f, probs = seq(0, 1, 1/20)))[20])

df_sa <- tibble(school = c(rep("south africa", 10000)), f = sample_f_sa, q_tb = sample_q, q_cov = sampl
  mutate(P_year = 1 - exp(-(f*I_sa*q_tb*year)/n_sa)) %>%
  mutate(P_year_one = 1 - exp(-(f*1*q_tb*year)/n_sa)) %>%
  mutate(P_month_one_cov = 1 - exp(-(f*1*q_cov*month)/n_sa)) %>%
  mutate(P_month_two_cov = 1 - exp(-(f*2*q_cov*month)/n_ch)) %>%
  mutate(five_quantil = unname(quantile(P_year$f, probs = seq(0, 1, 1/20)))[2]) %>%
  mutate(ninefive_quantil = unname(quantile(P_year$f, probs = seq(0, 1, 1/20)))[20])

df_complet <- bind_rows(df_ch1, df_ch2, df_sa, df_tz)
```

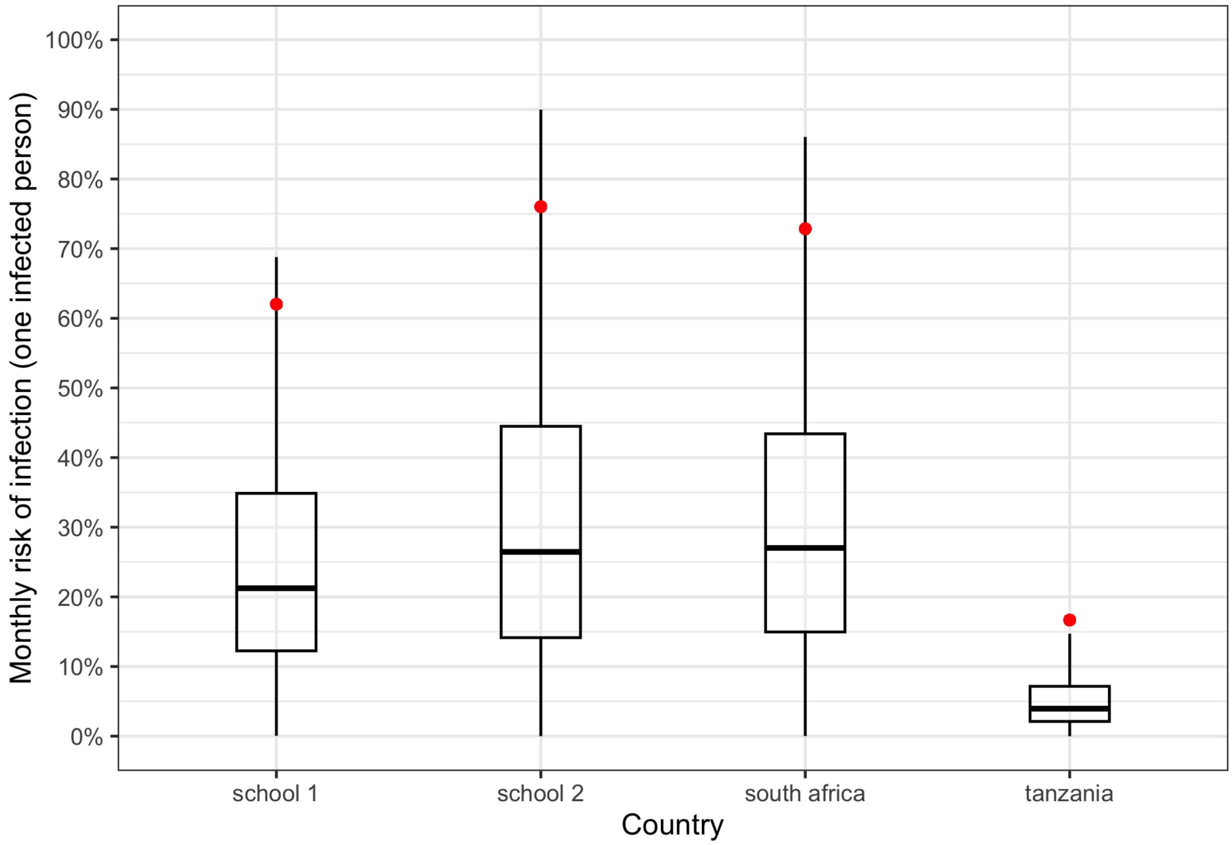
Plots of the transmission risk

```
df_complet %>%
  ggplot(aes(x = school, y=P_year$f))+
  scale_y_continuous(labels = scales::percent_format(scale = 100), breaks = c(0,0.05,0.1,0.2,0.3,0.4,0.5
  xlab("Country") +
```

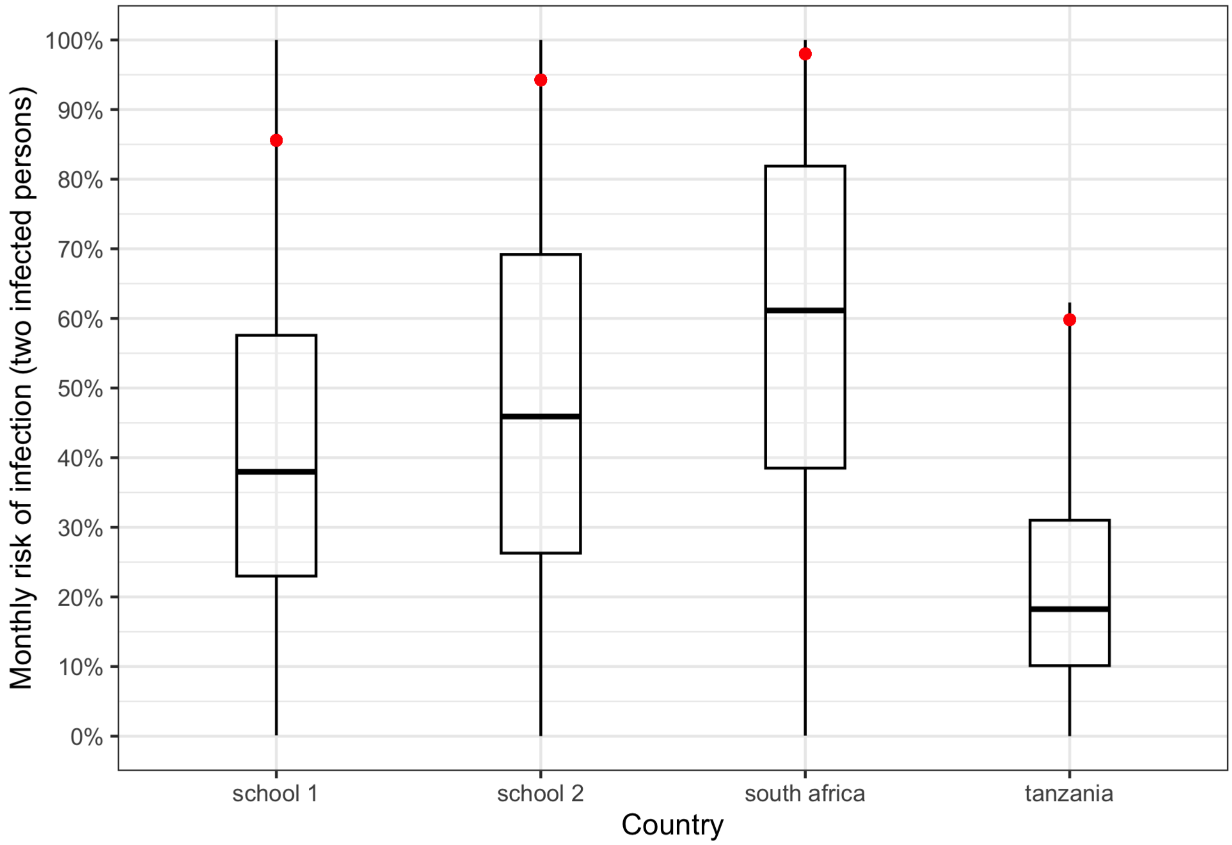
```
  ylab("Yearly risk of infection") +
  theme_bw() +
  geom_boxplot(width=0.3, color="black", alpha=0.2, outlier.shape = NA) +
  geom_point(aes(x=1,y=unname(quantile(df_ch1$P_year$f, probs = 0.95))),colour="red") +
  geom_point(aes(x=2,y=unname(quantile(df_ch2$P_year$f, probs = 0.95))),colour="red") +
  geom_point(aes(x=3,y=unname(quantile(df_sa$P_year$f, probs = 0.95))),colour="red") +
  geom_point(aes(x=4,y=unname(quantile(df_tz$P_year$f, probs = 0.95))),colour="red")
```




```
df_complet %>%
  ggplot(aes(x = school, y=P_month_one_cov$f))+
  scale_y_continuous(labels = scales::percent_format(scale = 100), breaks = c(0,0.1,0.2,0.3,0.4,0.5,0.6
  xlab("Country") +
  ylab("Monthly risk of infection (one infected person)") +
  theme_bw() +
  geom_boxplot(width=0.3, color="black", alpha=0.2, outlier.shape = NA) +
  geom_point(aes(x=1,y=unname(quantile(df_ch1$P_month_one_cov$f, probs = 0.95))),colour="red") +
  geom_point(aes(x=2,y=unname(quantile(df_ch2$P_month_one_cov$f, probs = 0.95))),colour="red") +
  geom_point(aes(x=3,y=unname(quantile(df_sa$P_month_one_cov$f, probs = 0.95))),colour="red") +
  geom_point(aes(x=4,y=unname(quantile(df_tz$P_month_one_cov$f, probs = 0.95))),colour="red")
```

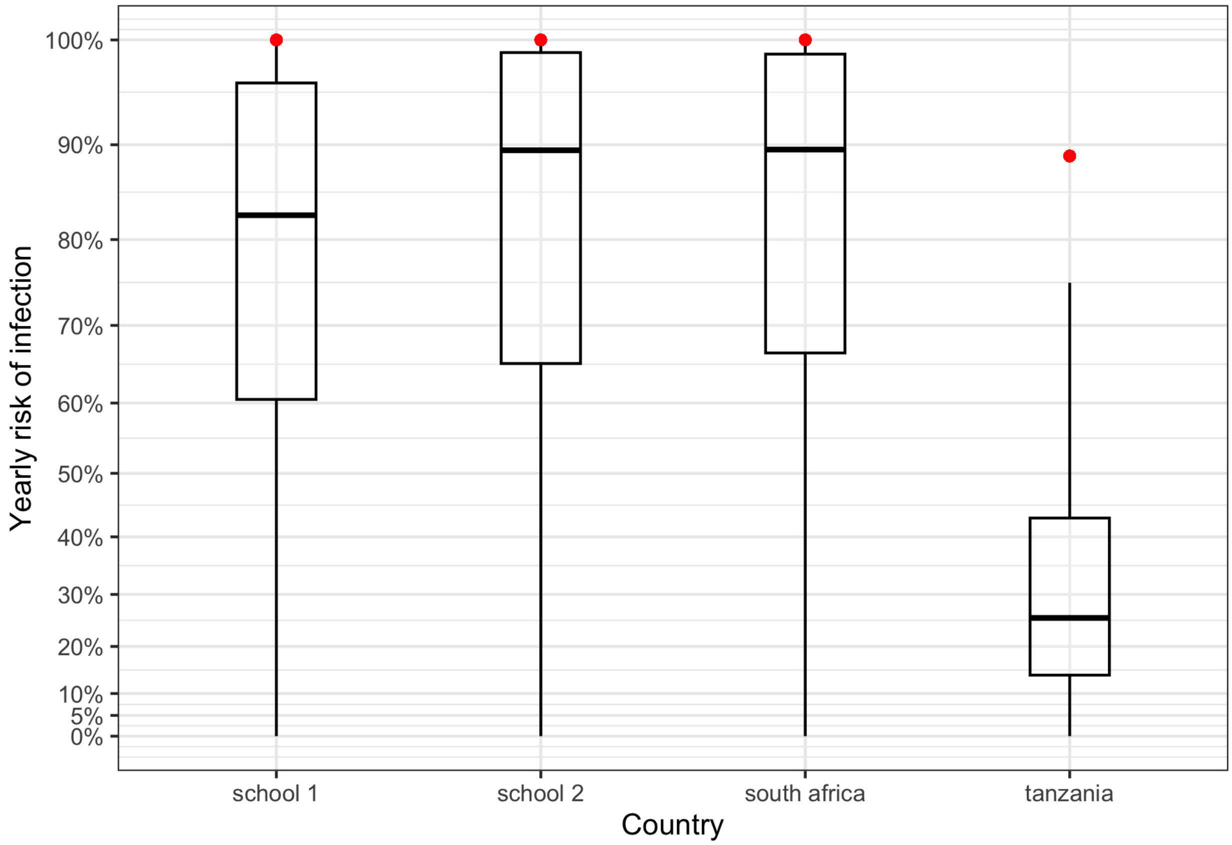



```
df_complet %>%
  ggplot(aes(x = school, y=P_month_two_cov$f))+
  scale_y_continuous(labels = scales::percent_format(scale = 100), breaks = c(0,0.1,0.2,0.3,0.4,0.5,0.6
  xlab("Country") +
  ylab("Monthly risk of infection (two infected persons)") +
  theme_bw() +
  geom_boxplot(width=0.3, color="black", alpha=0.2, outlier.shape = NA) +
  geom_point(aes(x=1,y=unname(quantile(df_ch1$P_month_two_cov$f, probs = 0.95))),colour="red") +
  geom_point(aes(x=2,y=unname(quantile(df_ch2$P_month_two_cov$f, probs = 0.95))),colour="red") +
  geom_point(aes(x=3,y=unname(quantile(df_sa$P_month_two_cov$f, probs = 0.95))),colour="red") +
  geom_point(aes(x=4,y=unname(quantile(df_tz$P_month_two_cov$f, probs = 0.95))),colour="red")
```



Now I will compare the risks of infection, assuming that the prevalence is the same for every country and also assuming that the class size is the same. The prevalence per country is not used. This is to highlight the influence of air quality.

```
df_complet %>%
 ggplot(aes(x = school, y=P_year_one$f))+
  scale_y_continuous(labels = scales::percent_format(scale = 100), breaks = c(0,0.05,0.1,0.2,0.3,0.4,0.5
  xlab("Country") +
  ylab("Yearly risk of infection") +
  theme_bw() +
  geom_boxplot(width=0.3, color="black", alpha=0.2, outlier.shape = NA) +
  geom_point(aes(x=1,y=unname(quantile(df_ch1$P_year_one$f, probs = 0.95))),colour="red") +
  geom_point(aes(x=2,y=unname(quantile(df_ch2$P_year_one$f, probs = 0.95))),colour="red") +
  geom_point(aes(x=3,y=unname(quantile(df_sa$P_year_one$f, probs = 0.95))),colour="red") +
  geom_point(aes(x=4,y=unname(quantile(df_tz$P_year_one$f, probs = 0.95))),colour="red")
```


Yearly risk of infection
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
5%
0%
school 1
school 2
south africa
tanzania
Country