Exemplos de mortalidade, com dados e métodos no Rmarkdown

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Esses códigos vieram das aulas da Monica Alexander! Para mais detalhes e outros exemplos geniais, por favor olhe o github dela: https://github.com/MJAlexander!

Lendo o dado

Pacotes:

```
library(tidyverse)
library(here)
library(RColorBrewer)
```

Dados: Mortalidade do Canadá http://www.bdlc.umontreal.ca/CHMD/. Nesse exemplo ela usa os dados de Ontario

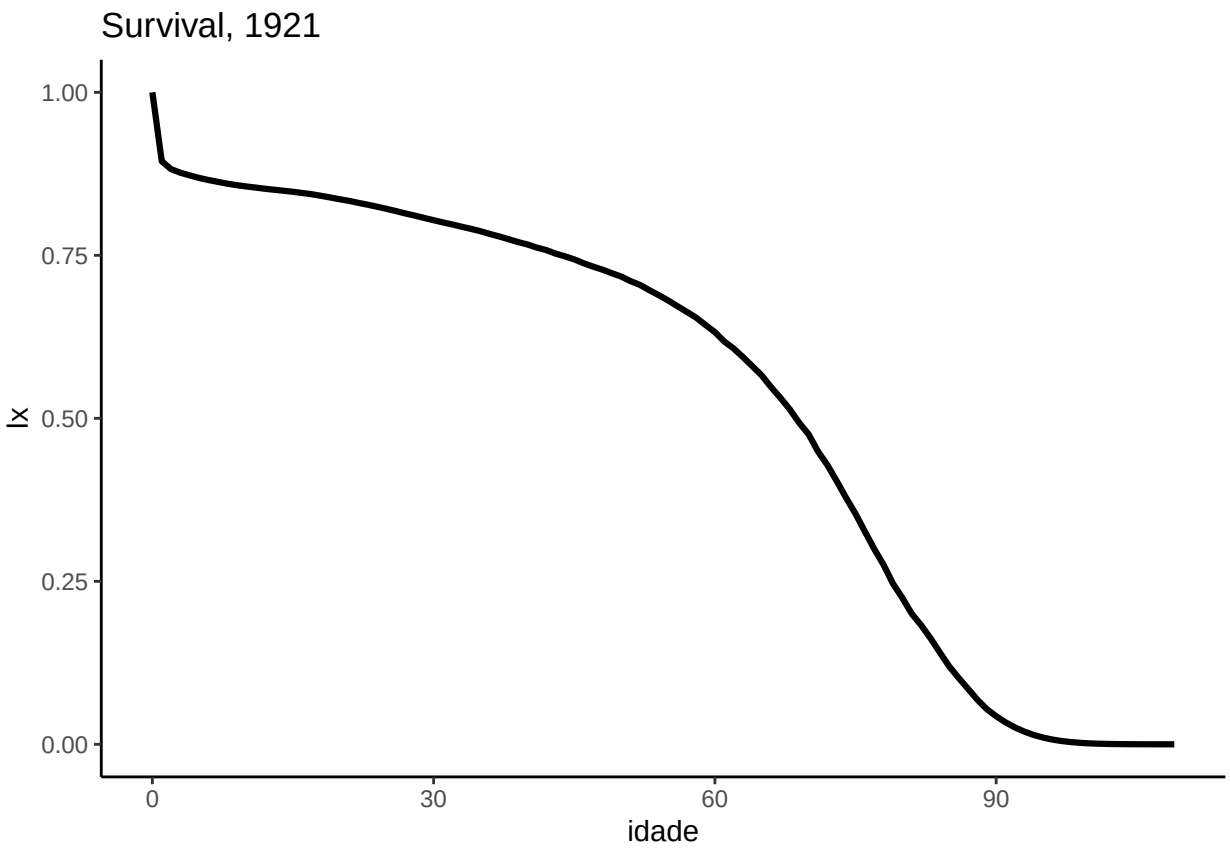
```
dm <- read.csv("Ontario.csv", header=T, sep=",")
head(dm)
```

```
##   Year Age      mx      qx   ax     lx    dx    Lx      Tx    ex
## 1 1921   0 0.11376 0.10569 0.33 100000 10569 92905 5801139 58.01
## 2 1921   1 0.01370 0.01360 0.50  89431  1217 88823 5708235 63.83
## 3 1921   2 0.00631 0.00629 0.50  88215   554 87938 5619412 63.70
## 4 1921   3 0.00464 0.00462 0.50  87660   405 87458 5531474 63.10
## 5 1921   4 0.00447 0.00446 0.50  87255   389 87060 5444017 62.39
## 6 1921   5 0.00367 0.00366 0.50  86866   318 86707 5356956 61.67
```

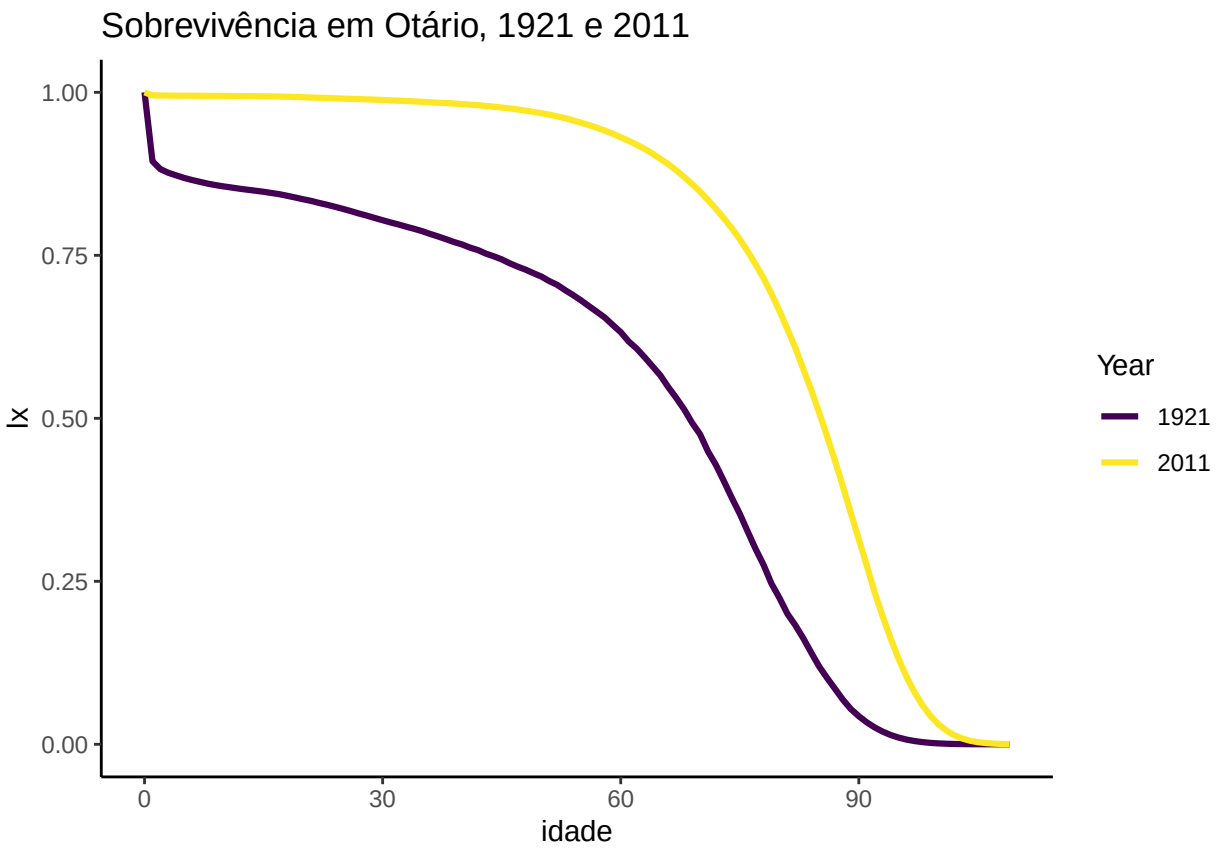
Tabela de vida: curvas

Sobrevivência (lx)

```
library(dplyr)
library(tidyverse)

dm2<-dm %>%
  filter(Year==1921) %>%
  select(Age, lx)

dm2$Age<-as.numeric(as.character(dm2$Age))

  ggplot(dm2, aes(Age, lx/100000)) + geom_line(lwd = 1.1) +
  ylab("lx") + xlab("idade") +
  ggtitle("Survival, 1921") + theme_classic()+ scale_color_viridis_d()
```

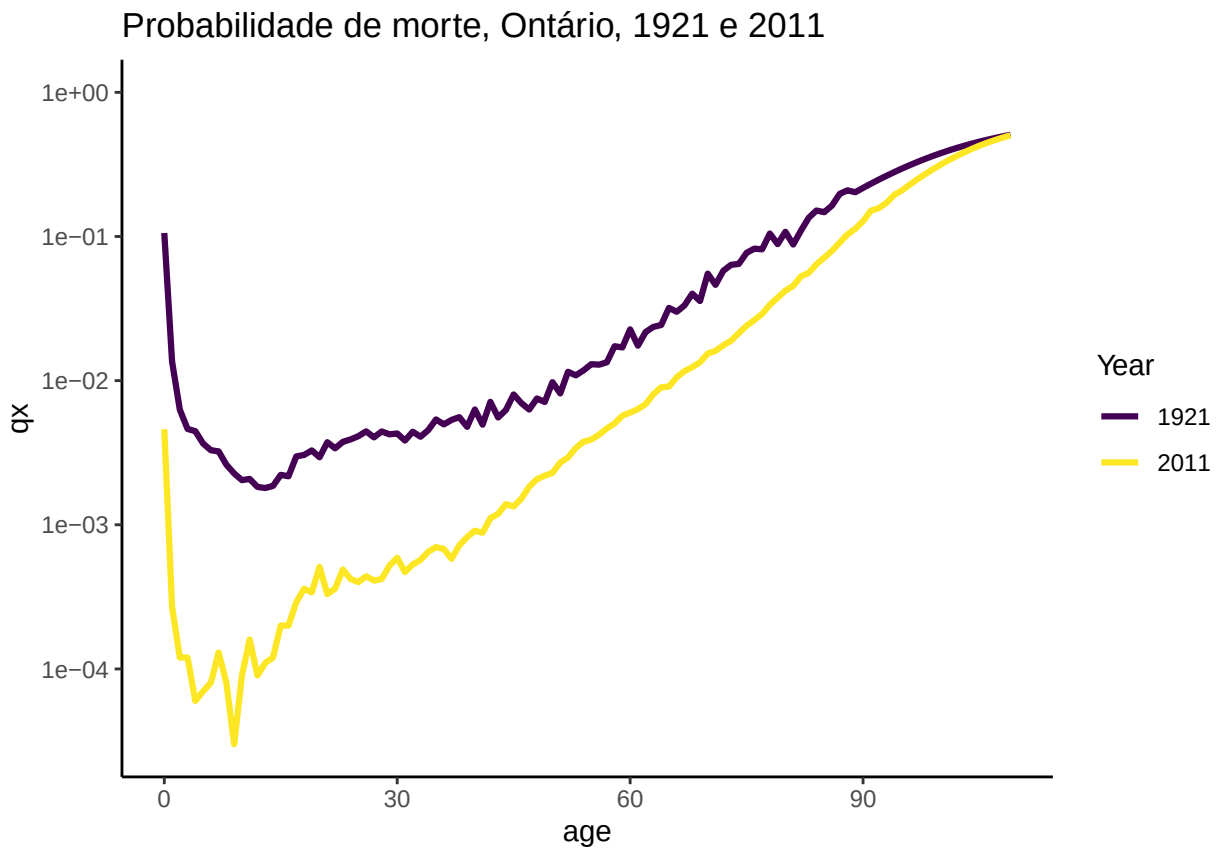



```
dm3<-dm %>%
  filter(Year==1921|Year==2011) %>%
  mutate(Year = factor(Year))

dm3$Age<-as.numeric(as.character(dm3$Age))

  ggplot(dm3,aes(Age, lx/100000, color = Year)) + geom_line(lwd = 1.1) +
  ylab("lx") + xlab("idade") +
  ggtitle("Sobrevivência em Otário, 1921 e 2011") + theme_classic()+scale_color_viridis_d()
```



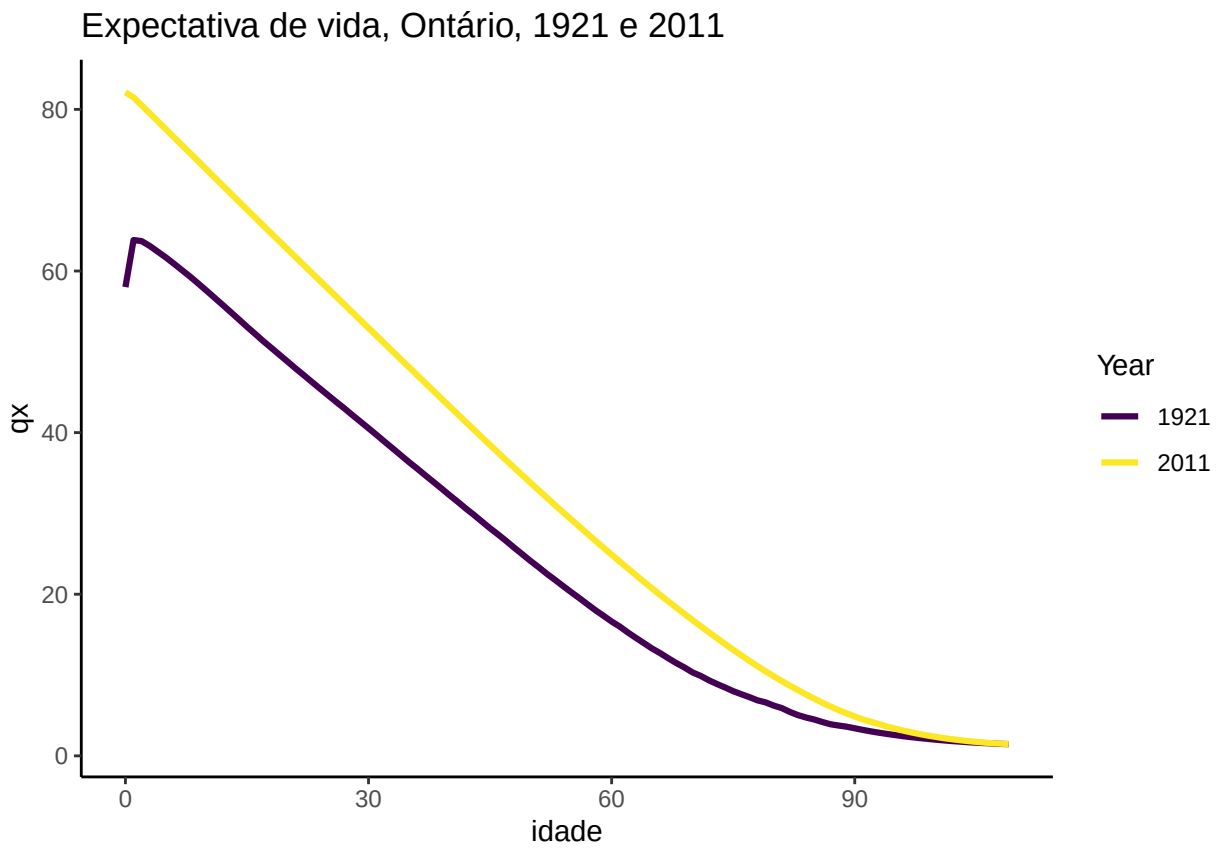
Probabilidade de morte (nqx)

```
dm4<-dm %>%
  filter(Year==1921|Year==2011) %>%
  mutate(Year = factor(Year))

dm4$Age<-as.numeric(as.character(dm4$Age))

  ggplot(dm4, aes(Age, qx, color = Year)) + geom_line(lwd = 1.1) +
  ylab("qx") + xlab("age") +
  ggtitle("Probabilidade de morte, Ontário, 1921 e 2011") +
  scale_y_log10()+ theme_classic()+ scale_color_viridis_d()
```



Expectativa de vida (ex)

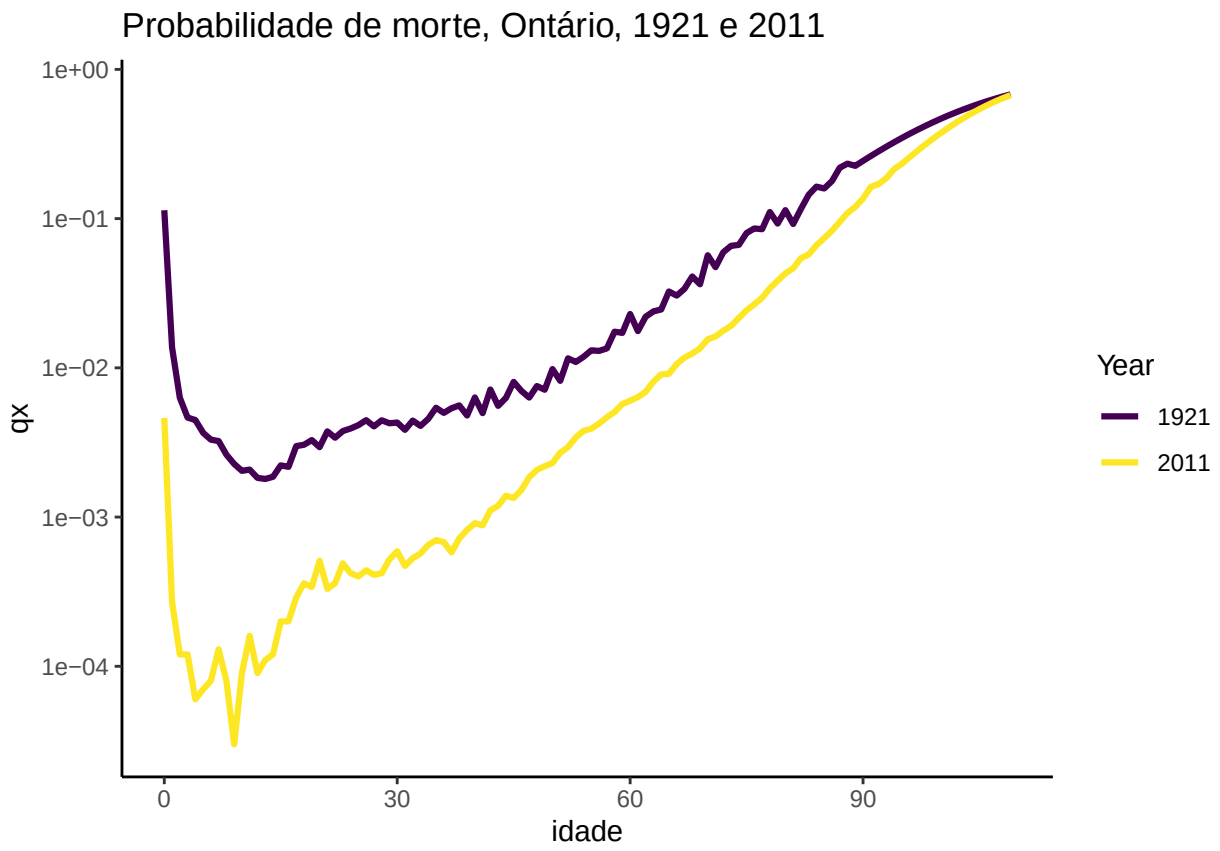
```
dm5<-dm %>%
  filter(Year==1921|Year==2011) %>%
  mutate(Year = factor(Year))

dm5$Age<-as.numeric(as.character(dm5$Age))

  ggplot(dm5, aes(Age, ex, color = Year)) + geom_line(lwd = 1.1) +
  ylab("qx") + xlab("idade") +
  ggtitle("Expectativa de vida, Ontário, 1921 e 2011") + theme_classic()+scale_color_viridis_d()
```



Modelos de Gompertz

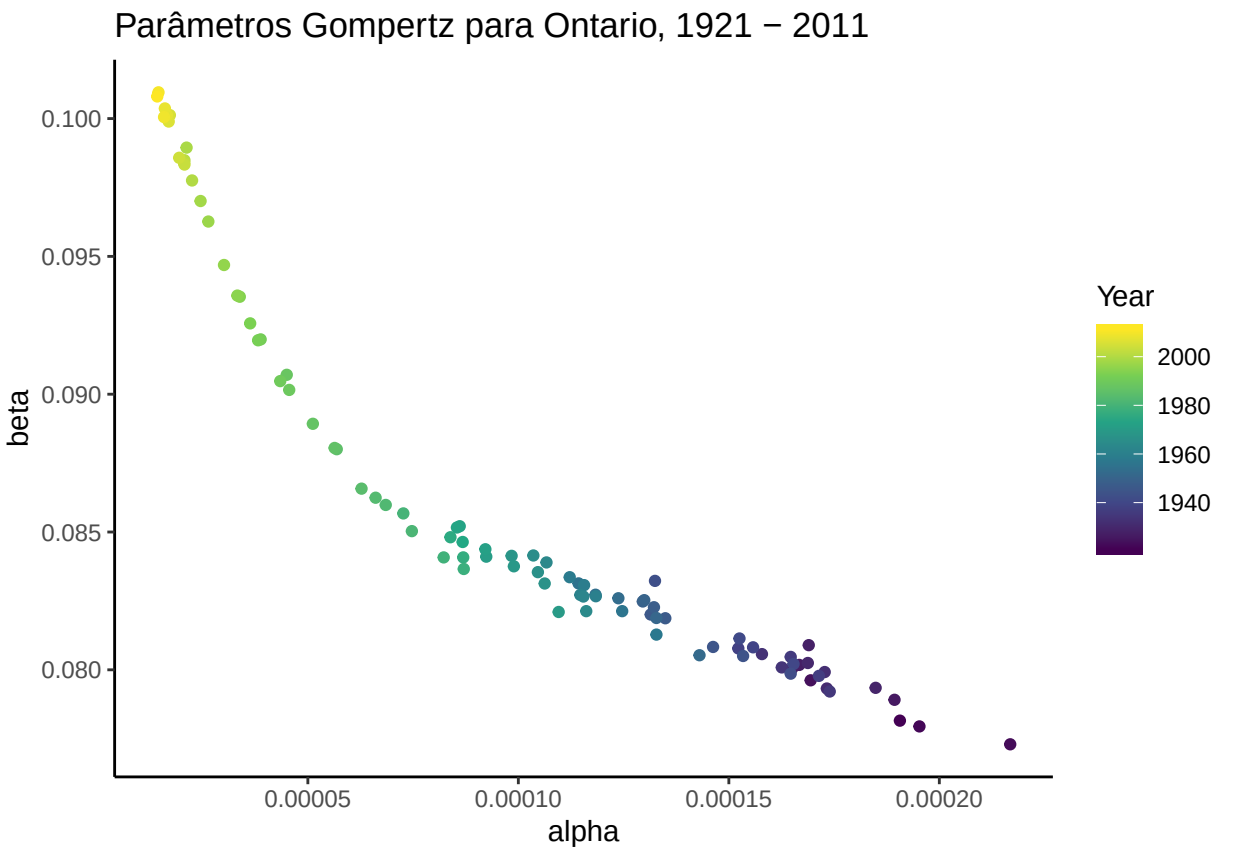
Plotando!

```
dm6<-dm %>%
  filter(Year==1921|Year==2011) %>%
  mutate(Year = factor(Year))

dm6$Age<-as.numeric(as.character(dm6$Age))

  ggplot(dm6, aes(Age, mx, color = Year)) + geom_line(lwd = 1.1) +
  ylab("qx") + xlab("idade") +
  ggtitle("Probabilidade de morte, Ontário, 1921 e 2011") +
  scale_y_log10()+ theme_classic()+scale_color_viridis_d()
```



Ajuste Gompertz

```
dm %>%
  mutate(age = as.numeric(as.character(Age))) %>%
  filter(age>49) %>%
  select(Year, age, mx) %>%
  mutate(log_mx = log(mx)) %>%
  group_by(Year) %>%
  summarise(alpha = exp((lm(log_mx~age))$coefficients[1]), beta = (lm(log_mx~age))$coefficients[2]) %>%
  ggplot(aes(alpha, beta, color = Year)) + geom_point() +
  ggtitle("Parâmetros Gompertz para Ontario, 1921 - 2011")+ theme_classic()+scale_color_viridis_c()
```



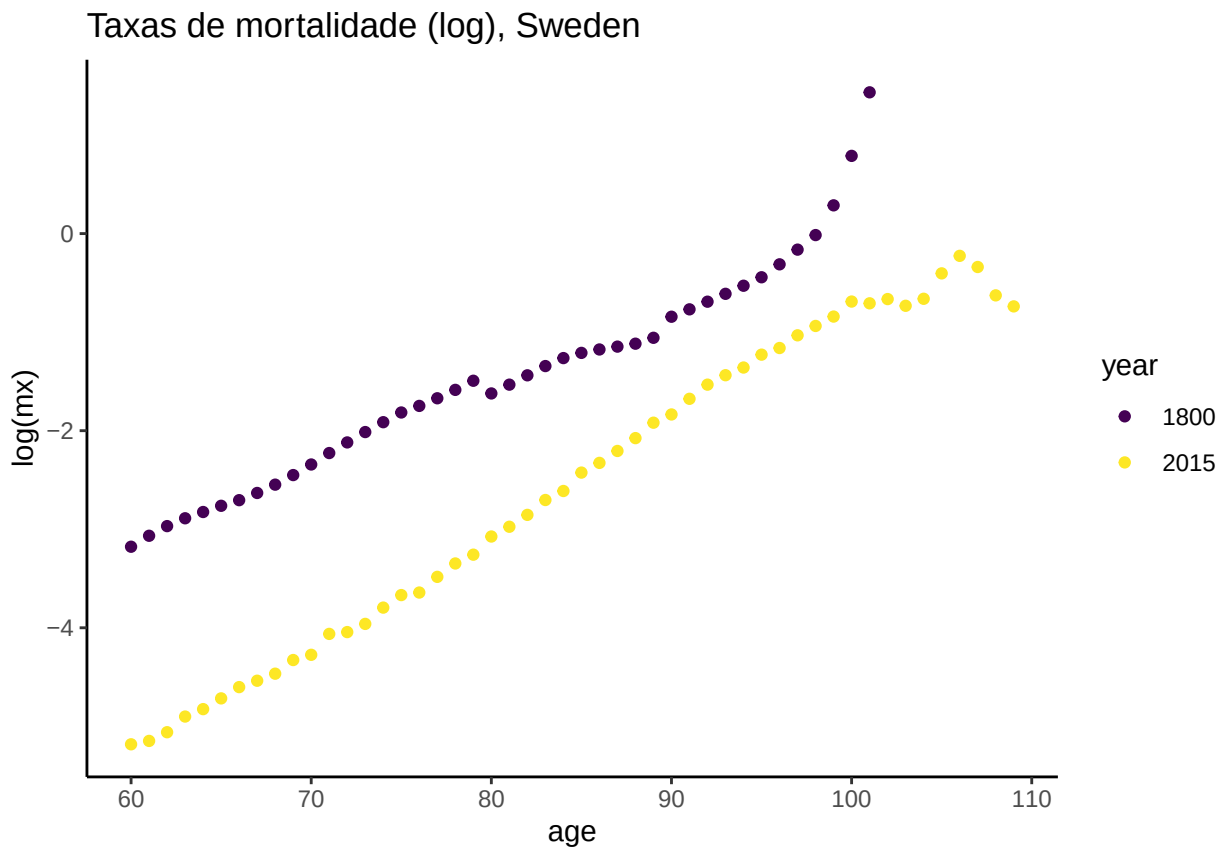
Evidência do plateau de mortalidade?

Suécia: longa série e qualidade excelente de dados.

```
ds <- read.table("SWE_Mx_1x1.txt", header=T)
head(ds)
```

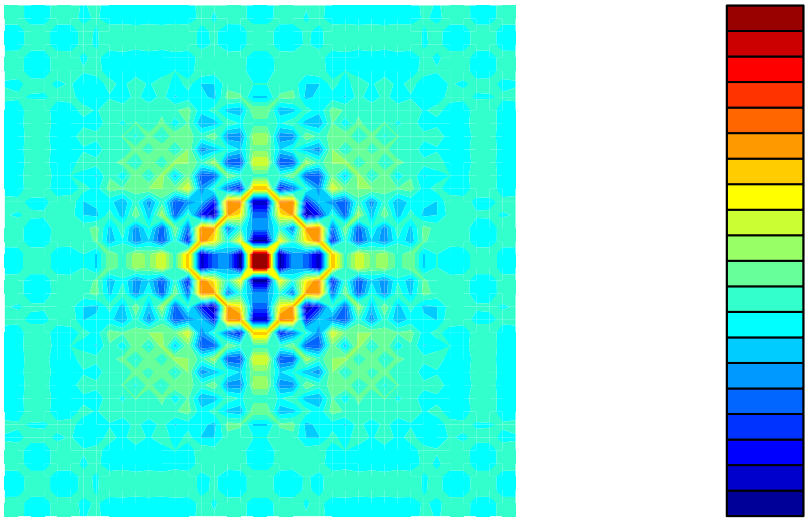
```
##   Year Age   Female     Male    Total
## 1 1751   0 0.212235 0.241105 0.226774
## 2 1751   1 0.049412 0.052949 0.051169
## 3 1751   2 0.032247 0.034587 0.033409
## 4 1751   3 0.026006 0.027883 0.026936
## 5 1751   4 0.023696 0.025692 0.024681
## 6 1751   5 0.018761 0.020801 0.019766
```

```
ds %>%
  filter(Year==2015|Year==1800) %>%
  mutate(age = as.numeric(as.character(Age)), mx = as.numeric(as.character(Total)), year = as.factor(Ye
  filter(age>59) %>%
  ggplot(aes(age, log(mx), color = year)) + geom_point() +
  ggtitle("Taxas de mortalidade (log), Sweden") + theme_classic()+scale_color_viridis_d()
```

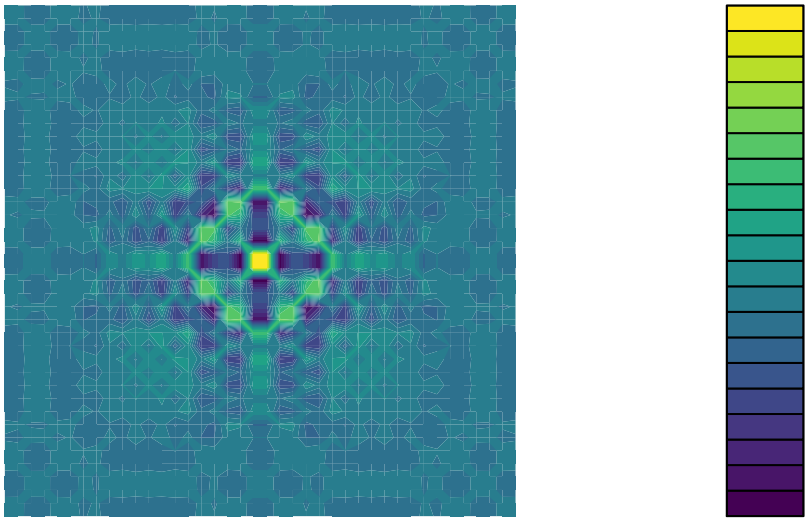


Gráficos chatos??

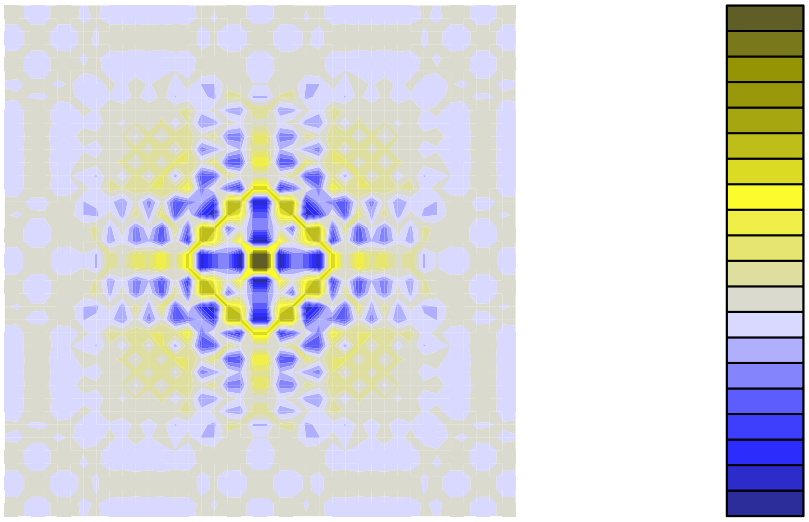
```
library(matlab)
with_palette <- function(palette) {
  x <- y <- seq(-8 * pi, 8 * pi, len = 40)
  r <- sqrt(outer(x^2, y^2, "+"))
  filled.contour(cos(r^2) * exp(-r / (2 * pi)),
    axes = FALSE,
    color.palette = palette,
    asp = 1
  )
}

with_palette(jet.colors)
```



```
library(viridis)
with_palette(viridis)
```



```
library(dichromat)
library(purrr)
with_palette(
  compose(
    partial(dichromat, type = "deutan"),
    jet.colors
    )
)
```



```
with_palette(
  compose(
    partial(dichromat, type = "protan"),
    jet.colors
    )
)
```