

Nightingale R Script

2025-06-24

To start we read in the data and put the tidyverse and other packages in the library. Remember you must install each package once and only once on your machine.

```
# install.packages("tidyverse")
# install.packages("reshape")
# install.packages("RColorBrewer")

library(tidyverse)
library(reshape)
library(RColorBrewer)

# install.packages("HistData")
library(HistData)
```

The HistData package contains the Nightingale data.

```
?Nightingale
View(Nightingale)
dim(Nightingale)

#export the dataset as csv
write.csv(Nightingale, file = "Nightingale.csv")
```

Select just the columns we want to work with. Then melt the data so it is tidy, each death rate is an observation on its own row.

```
Night <- Nightingale[,c(1,8:10)]
View(Night)

melted <- melt(Night, "Date")
View(melted)
dim(melted)

names(melted) <- c("Date", "Cause", "Deaths")
melted$Cause <- sub("\\.rate", "", melted$Cause)
```

Add in new columns for the regime and month. Subset by before and after Nightingale's intervention.

```
melted$Regime <- rep(c(rep('Before', 12), rep('After', 12)), 3)
Night <- melted
```

```
Night$Month <- format(Night$Date, "%b %Y")
```

```
# subsets by Regime
```

```
Night1 <- subset(Night, Regime == "Before")
```

```
Night2 <- subset(Night, Regime == "After")
```

First make a stacked bar chart for the before regime. Then make it a coxcomb by adding in polar coordinate system.

```
# Before plot
```

```
cxc1 <- ggplot(Night1, aes(x = reorder(Month, Date), y=Deaths, fill = Cause)) +
```

```
# do it as a stacked bar chart first
```

```
  geom_bar(width = 1, stat="identity", color="black") +
```

```
# set scale so area ~ Deaths
```

```
  scale_y_sqrt() +
```

```
  xlab("Month") +
```

```
  theme(axis.text.x = element_text(angle = 30, hjust = 1)) +
```

```
  theme(axis.text.y = element_blank()) +
```

```
  scale_fill_manual(values = c("deepskyblue","black","red"))
```

```
cxc1
```

```
# A coxcomb plot = bar chart + polar coordinates
```

```
cxc1 + coord_polar(start=3*pi/2) +
```

```
  ggtitle("Causes of Mortality in the Army in the East") +
```

```
  xlab("")
```

```
### Can you make the "After" plot?
```

To make side by side faceted charts need to make x-axis scale the same.

```
# x-axis scales are different and coord_polar does not support free scales
```

```
# so remove year from months
```

```
Night$Mon <- format(Night$Date, "%b")
```

```
cxc <- ggplot(Night, aes(x = reorder(Mon, Date), y=Deaths, fill = Cause)) +
```

```
# do it as a stacked bar chart first
```

```
  geom_bar(width = 1, stat="identity", color="black") +
```

```
# set scale so area ~ Deaths
```

```
  scale_y_sqrt() +
```

```
  facet_grid(. ~ Regime) +
```

```
  xlab("Month") +
```

```
  theme(axis.text.x = element_text(angle = 60, hjust = 1)) +
```

```
  theme(axis.text.y = element_blank()) +
```

```
  scale_fill_manual(values = c("deepskyblue","black","red"))
```

```
cxc
```

```
# A coxcomb plot = bar chart + polar coordinates
```

```
cxc + coord_polar(start=3*pi/2) +
```

```
  ggtitle("Causes of Mortality in the Army in the East") +
```

```
  xlab("")
```

The End!