Assignment 3

Jacob Jameson

Due Feb 27

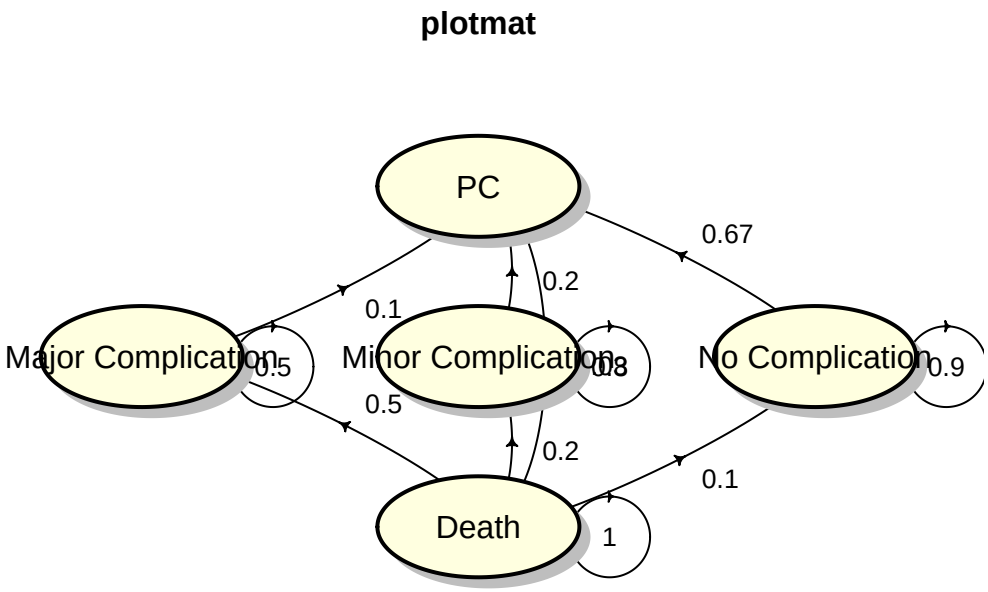
1. Construct this decision-analytic model in TreeAge (or another software package) using the information provided in the paper.

```
library(expm)
library(markovchain)
library(diagram)
library(pracma)

stateNames <- c("PC","Major Complication",
                "Minor Complication", "No Complication", 'Death')

model <- matrix(c(0, 0.10, 0.20, 0.67, 0.03,
                  0, 0.5, 0, 0, 0.5,
                  0, 0, 0.8, 0, 0.2,
                  0, 0, 0, 0.9, 0.1,
                  0, 0, 0, 0, 1), nrow=5, byrow  =TRUE)

row.names(model) <- stateNames; colnames(model) <- stateNames
model
```

```
##                     PC Major Complication Minor Complication No Complication
## PC                   0                 0.1                 0.2            0.67
## Major Complication   0                 0.5                 0.0            0.00
## Minor Complication   0                 0.0                 0.8            0.00
## No Complication      0                 0.0                 0.0            0.90
## Death                0                 0.0                 0.0            0.00
##                     Death
## PC                   0.03
## Major Complication   0.50
## Minor Complication   0.20
## No Complication      0.10
## Death                1.00
```

```
plotmat(model, pos = c(1,3,1),
        lwd = 1, box.lwd = 2,
        cex.txt = 0.8,
        box.size = 0.1,
        box.type = "circle",
        box.prop = 0.5,
        box.col = "light yellow",
        arr.length=.1,
```

```
        arr.width=.1,
        self.cex = .4,
        self.shifty = -.01,
        self.shiftx = .13,
        main = "plotmat")
```



2. Calculate the life expectancy for each strategy for at least one of the age/gender groups. Note: for background mortality, use the 2018 US life tables. These are published by the National Center for Health Statistics:

- Go to https://www.cdc.gov/nchs/products/life_tables.html
- Click on the pdf link for the "United States Life Tables, 2020" (NVSR Volume 71, Number 1)
- On pages 17 and 19 in this document (Tables 2 and 3, top of page) there are links to download 2020 life tables for men and women respectively.
- In these spreadsheets, the first column (qx) provides annual mortality probabilities.

3. Compare your results with those shown in Table 3 of the paper, and discuss potential reasons for any discrepancies (besides the different life tables).

4. Perform one-way sensitivity analysis on 2 of the key variables.