Nelson Aaelen Estimator in r

B.M Njuguna

2022-07-03

Nelson Aaelen Estimate

An alternative estimate of the survior function is known as **Nelson Aalen Estimate**.

in r we use the **nelsonaaelen** function from the **mice** package to calculate the estimates as follows;

```
#Entering the data
require(mice)
times=c(6,6,6,6,7,9,10,10,11,13,16,17,19,20,22,23,25,32,32,34,35)
status<-c(1,1,1,0,1,0,1,0,0,1,1,0,0,0,1,1,0,0,0,0,0)

state<-factor(status,levels =c(0,1),labels=c("censored","UnCensored"))

leukemiaPatients <- data.frame(times, status, state)

estimate <- nelsonaalen(data = leukemiaPatients, timevar = times, statusvar = status)
estimate
```

```
##  [1] 0.1502506 0.1502506 0.1502506 0.1502506 0.2090742 0.2090742 0.2757408
##  [8] 0.2757408 0.2757408 0.3590742 0.4499832 0.4499832 0.4499832 0.4499832
## [15] 0.5928404 0.7595071 0.7595071 0.7595071 0.7595071 0.7595071 0.7595071
```

You can also view the estimate of different times as follows;

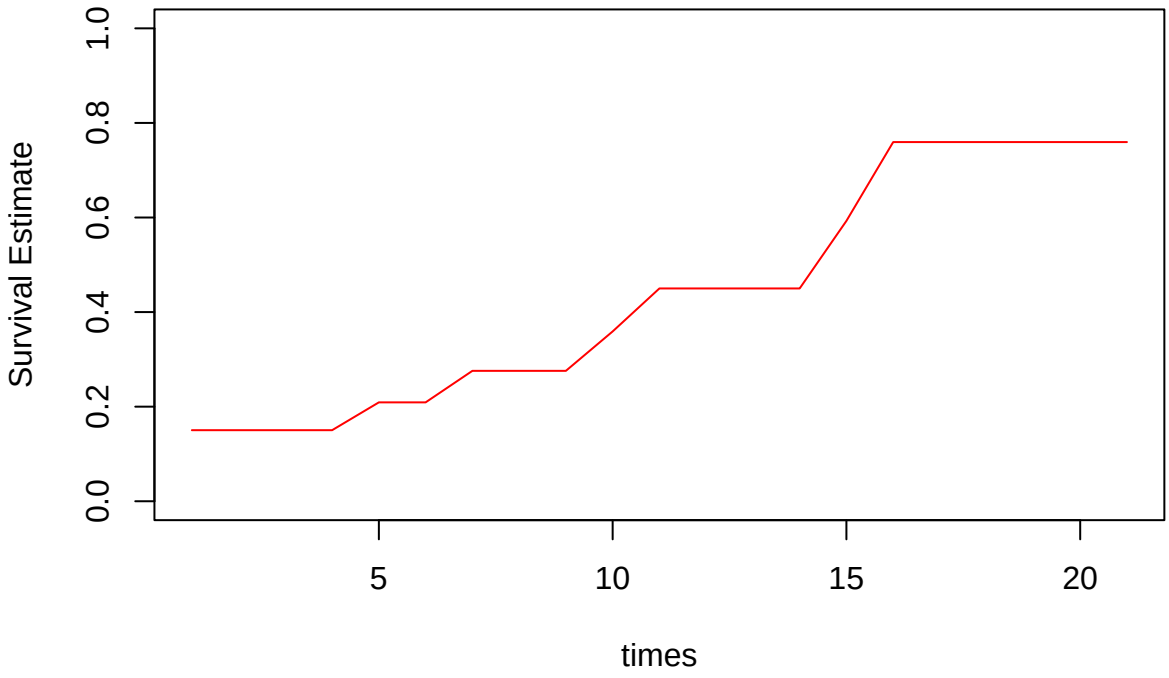
```
leukemiaPatientsEsimates <- data.frame(times, status, state, estimate, exp(-(estimate)))

colnames(leukemiaPatientsEsimates) <- c("times", "status", "state", "Nelson Aalen Estimate(Hazard Estima
leukemiaPatientsEsimates
```

```
##    times status      state Nelson Aalen Estimate(Hazard Estimate)
## 1      6      1 UnCensored                                0.1502506
## 2      6      1 UnCensored                                0.1502506
## 3      6      1 UnCensored                                0.1502506
## 4      6      0   censored                                0.1502506
## 5      7      1 UnCensored                                0.2090742
## 6      9      0   censored                                0.2090742
## 7     10      1 UnCensored                                0.2757408
## 8     10      0   censored                                0.2757408
## 9     11      0   censored                                0.2757408
## 10    13      1 UnCensored                                0.3590742
## 11    16      1 UnCensored                                0.4499832
## 12    17      0   censored                                0.4499832
## 13    19      0   censored                                0.4499832
## 14    20      0   censored                                0.4499832
## 15    22      1 UnCensored                                0.5928404
```

```
## 16    23      1 UnCensored                          0.7595071
## 17    25      0   censored                          0.7595071
## 18    32      0   censored                          0.7595071
## 19    32      0   censored                          0.7595071
## 20    34      0   censored                          0.7595071
## 21    35      0   censored                          0.7595071
##    Survivor Estimate
## 1          0.8604923
## 2          0.8604923
## 3          0.8604923
## 4          0.8604923
## 5          0.8113351
## 6          0.8113351
## 7          0.7590096
## 8          0.7590096
## 9          0.7590096
## 10         0.6983226
## 11         0.6376388
## 12         0.6376388
## 13         0.6376388
## 14         0.6376388
## 15         0.5527550
## 16         0.4678970
## 17         0.4678970
## 18         0.4678970
## 19         0.4678970
## 20         0.4678970
## 21         0.4678970
```

The Hazard plot is as follows;

```
require(ggplot2)
plot(estimate,type="l",cex=.5,col = "red",xlab = "times",ylab = "Survival Estimate",ylim = c(0.0,1.0))
```


Survival Estimate
0.0
0.2
0.4
0.6
0.8
1.0
5
10
15
20
times