

Practical exercises in STK4080 2019

Practical exercise 1

In this exercise (and later exercises) we will consider survival of patients who have been operated for malignant melanoma (cancer of the skin). A brief description of the data is given at <https://www.uio.no/studier/emner/matnat/math/STK4080/h14/melanoma-data-description.html>

You may read the data into R by the command:

```
path="http://www.uio.no/studier/emner/matnat/math/STK4080/h14/melanoma.txt"
melanoma=read.table(path,header=T)}
```

The following commands provide Nelson-Aalen plots for female melanoma patients

```
library(survival)
fit.f=coxph(Surv(lifetime,status==1)~1,data=melanoma,subset=(sex==1))
surv.f=survfit(fit.f)
plot(surv.f,fun="cumhaz", mark.time=F,xlim=c(0,10),ylim=c(0,0.80), main="Females",
xlab="Years since operation",ylab="Cumulativehazard")
```

- a) Perform the commands and interpret the Nelson-Aalen plot. Make sure that you understand the commands!
- b) Make a Nelson-Aalen plot for males and compare with the plot for females. Also make a plot that shows the Nelson-Aalen estimates for both genders.
- c) Make Nelson-Aalen plots for patients with ulceration present and absent and interpret the plots. (Ulceration is "present" if the surface of the tumor viewed in a microscope show signs of ulcers and "absent" otherwise.)
- d) Make Nelson-Aalen plots for the three thickness groups 0-1 mm, 2-5 mm, 5+ mm and interpret the plots.