

APTS - Survival Analysis

Lab Session 1

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Before starting, you will have to download the package ‘survival’ in R :

```
install.packages("survival")  
library("survival")
```

1. A study was conducted on the effects of ploidy on the prognosis of patients with cancers of the mouth. Patients were selected who had a paraffin-embedded sample of the cancerous tissue taken at the time of surgery. Follow-up survival data were obtained for each patient. The tissue samples were examined using a flow cytometer to determine if the tumor had an aneuploid (abnormal) or diploid (normal) DNA profile. The data can be found as follows in R :

```
install.packages("KMsurv")  
library("KMsurv")  
data(tongue)
```

Explanation about the data set can be found at

<https://cran.r-project.org/web/packages/KMsurv/KMsurv.pdf>

- (a) Plot the survival functions and their standard errors for both the diploid and aneuploid groups (in separate graphs).
- (b) Estimate the median time to death, and find a 95% confidence interval for the median survival time for both the diploid and aneuploid groups. Interpret the results.

Hint : Use ‘survfit’ in R (and type ‘help(survfit.formula)’ for more details).

2. Consider data on the times until staphylococcus infection of burn patients, also available in the ‘KMsurv’ package as follows :

```
data(burn)
```

- (a) Using the log-rank test, test the hypothesis of no difference in the time to staphylococcus infection between patients whose burns were cared for with a routine bathing care method versus those whose body cleansing was initially performed using 4% chlorhexidine gluconate. Use a two-sided test and a 0.05 significance level.
- (b) Solve the same exercise by stratifying on the percentage of surface area burned (0-29%, 30-50%, 51-100%).

Hint : Use ‘survdif’ in R.