

APTS - Survival Analysis

Lab Session 2

Ingrid Van Keilegom

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1. Consider the data on the times until staphylococcus infection of burn patients considered in Lab 1.
 - (a) Test the hypothesis that the distribution of the times to staphylococcus infection are the same in the two disinfectant groups, supposing that a Cox model fits the data well. Compare your results with those of Lab 1.
 - (b) Included in the data set is a covariate that measures the total surface area burned. Test the hypothesis that the distributions of the times to staphylococcus infection are the same in the two disinfectant groups, adjusting for the total area burned and supposing again that the Cox model is valid. Use the Wald and the likelihood ratio test. Compare your results with those of question (a).
 - (c) Using the latter Cox model, plot the survival function for an individual who has 25% of the total body area burned for the two bathing solutions.
 - (d) Find 95% confidence intervals for the survival functions for the two bathing solutions at 20 days for a patient with 25% of total surface area of body burned.

Hint : Use `coxph` in R.

2. Consider the dataset `larynx` present in the `KMsurv` package `KMsurv` (`library("KMsurv")` and `data(larynx)`). The description of the dataset can be found at the address <http://artax.karlin.mff.cuni.cz/r-help/library/KMsurv/html/larynx.html>
 - (a) Fit a Weibull AFT model including the variables *age* and *stage* as covariates.
 - (b) Give the value of the acceleration factor for an individual of age 50 in the first stage of the disease.
 - (c) Is the Weibull model the best AFT model for these data ? Use the AIC criterion.

Hint : Use the function `survreg` of the package `survival` in R.