Seminar Advanced Topics in Survival Analysis

Jun.-Prof. Dr. Dennis Dobler
dobler@statistik.tu-dortmund.de
TU Dortmund University

General Information

Suitable study subjects (modules): B.Sc. Statistik (BS12), M.Sc. Statistik (MS4), M.Sc. Data Science (MD4), M.Sc. Econometrics (ME7)

ECTS: 4

Language: English

Requirements: familiarity with the contents of the course Survival Analysis

Days: one or two talks per week, after some weeks of preparation

Presentations: about one hour

Hand in: report of a few pages length

Jun.-Prof. Dr. Dennis Dobler —
dobler@statistik.tu-dortmund.de

2 / 5

The road so far

- simple survival models
- competing risks models
- more general multistate models (mainly Markov models)
- continuous-time models
- discrete-time models
- nonparametric models (e.g. Aalen)
- semiparametric models (e.g. Cox)
- parametric models (e.g. AFT, frailty)
- resampling methods (basics)
- ...

Jun.-Prof. Dr. Dennis Dobler —
dobler@statistik.tu-dortmund.de

3 / 5

Ideas for the seminar talks (potentially combinations):

- martingale theory and its applications in survival analysis
- more on kernel estimation of hazard rates
- more on tests (more samples, more theory)
- two-sample problems, e.g., generalized pairwise comparisons

Jun.-Prof. Dr. Dennis Dobler —
dobler@statistik.tu-dortmund.de

4 / 5

Ideas for the seminar talks (potentially combinations):

- martingale theory and its applications in survival analysis
- more on kernel estimation of hazard rates
- more on tests (more samples, more theory)
- two-sample problems, e.g., generalized pairwise comparisons
- more on time-simultaneous confidence bands
- more on frailty models
- more on non-Markov multistate models
- more on resampling (also more theory)

Jun.-Prof. Dr. Dennis Dobler —
dobler@statistik.tu-dortmund.de

4 / 5

Ideas for the seminar talks (potentially combinations):

- martingale theory and its applications in survival analysis
- more on kernel estimation of hazard rates
- more on tests (more samples, more theory)
- two-sample problems, e.g., generalized pairwise comparisons
- more on time-simultaneous confidence bands
- more on frailty models
- more on non-Markov multistate models
- more on resampling (also more theory)
- (regression) models based on inverse probability of censoring weighting (IPCW)
- pseudo-value regression in survival analysis
- nested case-control designs

Jun.-Prof. Dr. Dennis Dobler —
dobler@statistik.tu-dortmund.de

4 / 5

Ideas for the seminar talks (potentially combinations):

- martingale theory and its applications in survival analysis
- more on kernel estimation of hazard rates
- more on tests (more samples, more theory)
- two-sample problems, e.g., generalized pairwise comparisons
- more on time-simultaneous confidence bands
- more on frailty models
- more on non-Markov multistate models
- more on resampling (also more theory)
- (regression) models based on inverse probability of censoring weighting (IPCW)
- pseudo-value regression in survival analysis
- nested case-control designs
- Bayesian survival analysis
- dependent censoring

Jun.-Prof. Dr. Dennis Dobler —
dobler@statistik.tu-dortmund.de

4 / 5

Ideas for the seminar talks (potentially combinations):

- martingale theory and its applications in survival analysis
- more on kernel estimation of hazard rates
- more on tests (more samples, more theory)
- two-sample problems, e.g., generalized pairwise comparisons
- more on time-simultaneous confidence bands
- more on frailty models
- more on non-Markov multistate models
- more on resampling (also more theory)
- (regression) models based on inverse probability of censoring weighting (IPCW)
- pseudo-value regression in survival analysis
- nested case-control designs
- Bayesian survival analysis
- dependent censoring
- various estimands, e.g., restricted mean survival times (simple survival), restricted mean time lost (competing risks), relative treatment effect
- causality in survival analysis

Jun.-Prof. Dr. Dennis Dobler —
dobler@statistik.tu-dortmund.de

4 / 5

References (only some book references)

- PK Andersen, ∅Borgan, N Keiding, RD Gill (1993).
  Statistical Models based on Counting Processes. Springer.

- T Martinussen, TH Scheike (2006).
  Dynamic regression models for survival data. Springer.

- OO Aalen, O Borgan, and HK Gjessing (2008).
  Survival and event history analysis: a process point of view. Springer.

- PK Andersen, H Ravn (2023).
  Models for multi-state survival data: rates, risks, and pseudo-values. CRC Press.

Jun.-Prof. Dr. Dennis Dobler —
dobler@statistik.tu-dortmund.de

5 / 5