Ph.D. in "Life Course Research" – Socio-demographic curriculum

Academic Year 2024-2025

Advanced survival analysis

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Objectives

The aim of the course is to introduce to the broad family of extended Cox Model. The approach will be model-oriented with a consistent focus on real-world data. These models will be developed along two main directions: the first focuses on solutions for handling non-proportional hazards (NPH) models while the second concerns competing risks and multistate models.

March 31st, 2025 10am - 13pm
Introduction to regression survival models. Violations of the PH assumptions in the Cox Model (ATTANASIO)

April 1st, 2025 9.30 am- noon
NPH models: Time-dependent covariates; Time-effects covariates; stratification; heavyside functions
Discrete-time models (ATTANASIO)
15 pm-17 pm
Lab in R on NPH models (BATTAGLIA)

April 2nd, 2025 10 am – 13 pm
Landmark analysis
Competing Risks: Naïve and unbiased Survival Estimator; Competing Risks Models (FIOCCO)

April 3rd, 2025 9.30 am – 13 pm
Regression in competing risks models and Multistate Models (FIOCCO)
15 pm-17 pm
Lab in R on Competing Risks Models (BATTAGLIA)

Discussion (Attanasio, Fiocco, Battaglia)

Suggested references

- Klein, J.P., Moeschberger, M.L. (2003), Survival Analysis – Techniques for censored and truncated data, Springer

- Putter, H., Fiocco, M. and Geskus, R. B. (2007), Tutorial in biostatistics: competing risks and multi-state models. Statistics in Medicine, 26: 2389–2430
- Geskus, R.B., 2016. Data analysis with competing risks and intermediate states (Vol. 10, No. 10543406.2016, p. 1107709). Boca Raton: CRC press.

Requirements

First course in survival analysis (survival data and censoring; survival functions estimators; test comparison survival functions; Cox model)