SATELLITE WORKSHOP: MULTI-STATE MODELS WITH R

24th January 2019

Santiago de Compostela

Description

This course will focus on methodological and practical issues in the scope of competing risks and multi-state models. Basic concepts, models, estimation algorithms and statistical software will be reviewed. Simulation exercises and real data analyses will be provided in order to enlighten the interpretation and to facilitate the understanding. Both nonparametric methods and semiparametric approaches will be considered.

Speakers

The course will be delivered by Jacobo de Uña Álvarez (University of Vigo) and Luís Filipe Meira Machado (University of Minho).

LIMITED NUMBER OF SPACES AVAILABLE

COURSE TIMETABLE

[15:00 – 15:45] Introduction. Survival function and hazard function. Right-censoring and left-truncation. Competing risks. Markov and non-Markov multi-state models. Time-homogeneity and time inhomogeneity. Motivating examples (real data).

[15:45 – 16:30] Competing risks. The competing risks multi-state model. Non-identifiability in the latent failure time model. Cause-specific hazards (transition intensities) and sub-distribution hazards. Cumulative incidence functions. Simulating competing risks data. Nonparametric estimation.

[16:30 – 16:45] Break

[16:45 – 17:45] Proportional hazards regression models. Proportional cause-specific hazards model. Proportional sub-distribution hazards model.

[17:45 – 18:30] Illness-death model (and beyond), part I. The progressive illness-death model. Occupation probabilities, transition probabilities, cumulative incidence functions and sojourn distributions. Nonparametric estimation: Markov vs non-Markov.

[18:30 – 18:45] Break

[18:45 – 19:30]] Illness-death model (and beyond), part II. Simulating Markov, semi-Markov and non-Markov data. Regression models. Direct binomial regression with time-varying coefficients. General multi-state models.

[19:30 – 20:30] More on software. Sample of R packages: survival, cmprsk, etm, mvna, mstate, timereg, idmTPreg, TP.idm, survdim, msm, survminer.

Course on Multi-state Models with R

Jacobo de Uña Álvarez (U. Vigo) | Luís Filipe Meira Machado (U. Minho)

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Jacobo de Uña Álvarez is Professor in Statistics at the University of Vigo since 2010. His educational background includes a BSc in Mathematics (1995) and a PhD in Mathematical Statistics (1998), both at the University of Santiago de Compostela. In 1998 he launched at the University of Vigo the *Statistical Inference, Decision and OR* (SiDOR) research group, which involves more than 30 people nowadays, including permanent researchers, posdocs, Ph.D. students and technical staff. SiDOR was distinguished by the Government of Galicia in 2008 because of its competitiveness. Jacobo de Uña's main research area is nonparametric and semiparametric statistics and its application to Survival Analysis and multi-state models. Recent examples are nonparametric estimation under dependent censoring and truncation, Cox regression with interval sampling, or the estimation of a non-Markov transition probability matrix from truncated and censored data. Another research area in which he is also involved is multiple testing. Ha has supervised eight PhD thesis. Along the years he has collaborated with leading researchers worldwide, his papers appearing in journals like *Biometrics*, *Statistical Methods in Medical Research*, *Statistics in Medicine*, *Journal of Multivariate Analysis*, *Journal of Nonparametric Statistics* and *Journal of Statistical Software*, among many others. Jacobo de Uña is Associate Editor of *Biometrics* (2014-2018), *Annals of the Institute of Statistical Mathematics* (2011-), *Brazilian Journal of Probability and Statistics* (2015-) and *Test* (2018-). He currently chairs the Department of Statistics and OR at the University of Vigo and the *Biostatistics and Epidemiology* unit at the Biomedical Research Center in Vigo.

Luís Meira Machado is Assistant Professor in the Department of Mathematics and Applications of University of Minho, Portugal. Luís research interests are in the areas of survival analysis, having a specific interest in multi-state models, nonparametric estimation, ROC curves, generalized additive models, and computational statistics. His main scientific contributions are in multi-state models (including the estimation of transition probabilities), in computational statistics (including the development of R packages) and in smoothing methods (including presmoothing and additive models). He has authored or co-authored more than 33 journal articles or book chapters, 8 packages in the CRAN R repository, and more than 70 conference communications. He has supervised 1 doctoral thesis and 3 post-doc researchers. He participates or has participated in several research projects funded by FCT (Portuguese Science Foundation), being the coordinator in one of them. He was a member of the scientific committee and invited sessions organizer in various scientific conferences. He has participated in the organizing committees of several national and international scientific conferences, being the chair in one of them.