Swiss Epidemiology Winter School 2020

Parametric Competing Risks and Multi-state models

23 – 25 January 2020

Faculty	**Prof. Paul Lambert** Department of Health Sciences, University of Leicester, United Kingdom Department of Epidemiology and Biostatistics, Karolinska Institutet Stockholm, Sweden **Dr. Michael Crowther** Department of Health Sciences, University of Leicester, United Kingdom
Venue	**CH – 3823 Wengen | SWITZERLAND** Hotel Edelweiss (see map on http://www.epi-winterschool.org/hotels)
Description	This course will focus on the use of parametric survival models when analysing data with competing risks and then extending to multi-state models. Multi-state models are increasingly being used to model complex disease profiles. By modelling transitions between disease states, accounting for competing events at each transition, we can gain an improved understanding of patients prognosis and how risk factors impact over the whole disease pathway. We will place emphasis on the use of flexible parametric survival models that incorporate restricted cubic splines on the log hazard or log cumulative hazard scale. This will include models with time-dependent effects (non-proportional hazards). We will use an efficient and generalizable simulation method to obtain clinically useful and directly interpretable predictions, which are particularly useful for more complex models, but also explain when analytical approaches can be used. We will also discuss assumptions of the models, including the Markov assumption and how this can be relaxed. The course will be taught using Stata making use of the multistate package.
Objectives	By the end of this course participants will have: • An understanding of how to fit and interpret flexible parametric survival models, including Royston-Parmar models. • An understanding of fitting and interpreting time-dependent effects. • An understanding of competing risks models and how to estimate cumulative incidence functions using parametric models. • An understanding of how to construct, analyse and interpret a multi-state model. • An understanding of the variety of useful measures that can be obtained from multistate models. • Practical experience of fitting the models using Stata®.

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Target audience	Course participants should be familiar with standard survival models, such as the Cox model and/or parametric survival models (e.g. Weibull) and be interested in extending their knowledge to the more complex issues of competing risks and multistate models. The course will discuss the theory but emphasis will be placed on applying and interpreting the methods.
Outline	The course will run over three days and consist of lectures, group work and computer practical sessions. We start early in the morning with a review of the previous day. During the extended break in the afternoon participants review course materials, catch up on emails or go skiing. We reconvene at 4:30 pm for the computer sessions. ***Thursday, 23 January (8:00 – 12:00 | 16:30 – 18:30)*** • Brief Review of time-to-event data including the Cox model • Flexible Parametric Survival Models • Modelling competing risks • Estimating cumulative incidence functions ***Friday, 24 January (8:00 – 12:00 | 16:30 – 18:30)*** • Introduction to multistate models • The illness death model • The Markov assumption • Stacked versus separate models • Extending the simulation approach for multistate models • Performing contrasts between groups ***Saturday, 25 January (8:00 – 12:00 | 16:30 – 18:30)*** • Expected length of stay in different states • Resetting the clock and semi-Markov models • Shared covariate effects between transitions • Standardisation in multistate models
Credits	1.0 ECTS
To bring along	Students should bring their own portable computers. A course license for Stata® will be available, to be installed before arrival. University of Bern IT staff onsite can provide help upon request per e-mail (it@ispm.unibe.ch)
Course book	Patrick Royston and Paul C. Lambert (2011) *Flexible Parametric Survival Analysis Using Stata: Beyond the Cox Model*, Stata Press
Course fee	SSPH+ students: CHF 700 Academic: CHF 900 Industry: CHF 2000
Registration	You can register on the Winter School website www.epi-winterschool.org.
Accomodation	Participants must book their accommodations themselves. Please see our recommendations on www.epi-winterschool.org/hotels for special prices.

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