Data analysis with competing risks and multiple states

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Abstract

In the end we all die, but not all from the same cause, nor with the same life histories. This course will be devoted to the analysis of different types of events that can occur either exclusively (competing risks) or sequentially (multi-state models).

The morning session is devoted to competing risks analysis. Competing risks take the spectrum of event types into account. The main difficulty is the choice of the correct quantity to be estimated. When do we need a competing risks analysis? Do we want to estimate cause-specific or subdistribution hazards? What do we need to assume with respect to the censoring by the competing event? The actual analysis is much easier because software to perform the computations has become readily available.

Multi-state models are the topic of the afternoon session. They extend competing risks models to the analysis of what happens beyond some first event, by allowing individuals to progress through different states. Estimation in multi-state models is reasonably straightforward, at least as long as all transitions are observed without uncertainty. Arguably the most interesting use of multi-state modles is for dynamic prediction. This aspect will be discussed in some detail; dynamic prediction using multi-state models will be contrasted with more recent developments such as landmarking.

Prerequisites for participants: Participants are expected to have a fair knowledge of the techniques from classical survival analysis, including time-dependent covariables and left truncation.

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