

Extension of frailty models for recurrent or clustered survival data with prediction

Virginie Rondeau

*Department of Biostatistics at the National Health and Medical Research
Institute of the University Bordeaux Segalen, France*



Abstract

Simple shared frailty models have been largely developed and applied for recurrent or clustered survival data in the literature. However, extensions of frailty models are less common in publications and are not well represented in classical software. We are aiming at filling this gap by considering extensions of frailty models (such as additive frailty models, nested frailty models or joint frailty models) and by presenting an implementation of these models using the R package **frailtypack**. Particular interest will be given to joint frailty models in order to jointly analyse recurrent events such as cancer relapses and a dependent terminal event (death or loss to follow-up). Prediction tools associated with this package will be presented, too.

The first part of this course will introduce general frailty models, the estimation methods and the research questions they may address.

The second part of this course will be dedicated to the joint frailty models with illustration on real data. The estimation and the predictive dynamic tools that can be derived from them will be exposed, with methods to evaluate their performance.

Emphasis is given, via examples on real data, of the ability of extended frailty models to describe a very broad range of practical situations. Each concept will be illustrated through implementation of these models using the R package **frailtypack**.

Prerequisites for participants: Good knowledge on survival analysis

Virginie Rondeau is a researcher at the Department of Biostatistics at the National Health and Medical Research Institute of the University Bordeaux Segalen since 2001. Dr. Rondeau's interests include statistical modeling, survival analysis, correlated survival data, prognostic models. She has been heavily involved in collaborations in the areas of cancer recurrences and environmental health effects.