



## Flexible Parametric Survival Models

January 19-21, 2015

### Faculty

Professor Paul Lambert  
University of Leicester and Karolinska Institutet

### Place

Room Bühlstube, Wengen (see map on <http://www.epi-winterschool.org/hotels>)

### Introduction

The majority of time-to-event (survival) analyses make use of the Cox proportional hazards model, with researchers generally being less keen on using parametric survival models due to the restrictive assumptions about the shape of the underlying hazard/survival functions. This course will make use of splines to fit flexible parametric survival models giving sufficient flexibility in the shape of the hazard function, but with the various advantages of adopting a parametric approach. The models covered will include using regression splines in Poisson regression, but the majority of time will be spent on Royston-Parmar models. These models can be used to fit proportional hazards models, but can also fit models on a number of other scales (e.g. proportional odds models). One of the advantages of the models is the ease at which time-dependent effects (e.g. for non-proportional hazards) can be fitted. A further advantage of parametric models is the ability to make various useful predictions, for example time-dependent hazard ratios, differences in hazard functions or differences in survival functions. On the final day of the course the concept of competing risks will be introduced and how the advantages of parametric models carry over to these models.

### Course objectives

By the end of this short course participants will have

- An understanding of how to fit and interpret flexible parametric survival models, including Poisson models and Royston-Parmar models.
- An understanding of fitting and interpreting time-dependent effects.
- An understanding of a variety of useful predictions from the models, including a variety of ways to quantify differences between groups.
- An understanding of fitting and interpreting parametric competing risks models
- Practical experience of fitting the models using Stata.

### What you have to bring

Students will bring their own portable computers. A course license of Stata® will be available if required, to be installed by University of Bern IT staff on arrival.

## Outline of the course

The course will run over three days and consists of lectures in the morning and computer practicals during the evening. During the extended break in the afternoon, participants review course materials, catch up on emails or go skiing.

*Monday, January 19<sup>th</sup> (8:30 – 12:00 | 17:00 – 19:00)*

- Review of time-to-event data including Cox and Poisson regression.
- The use of splines in regression models
- Royston-Parmar models
- Stata Practical
- Review of Day 1

*Tuesday, January 20<sup>th</sup> (8:30 – 12:00 | 17:00 – 19:00)*

- Modelling time-dependent effects.
- Useful predictions.
- Quantifying differences.
- Stata Practical
- Review of Day 2

*Wednesday, January 21<sup>st</sup> (8:30 – 12:00 | 17:00 – 19:00)*

- Adjusted survival curves and standardization
- Accounting for competing risks in time-to-event models
- Stata Practical
- Review of Day 3 and course evaluation.

## Credit

1.5 ECTS

## Maximum number of participants

The maximum number of participants on this course will be 18.

## Course Book

Patrick Royston and Paul C. Lambert (2011) *Flexible Parametric Survival Analysis Using Stata: Beyond the Cox Model*, Stata Press

## Course fee (includes course book)

Academic: CHF 950

Industry: CHF 1900

## Registration

Registration on the Winter School website [www.epi-winterschool.org](http://www.epi-winterschool.org).

## Course hotels

The participants have to book their accommodation themselves (see map and recommendation on [www.epi-winterschool.org/hotels](http://www.epi-winterschool.org/hotels)).