



# Two-part DSBS Course

## Survival Analysis in Clinical Trials

Part 1: 17-18 January 2017

Part 2: 31 January - 1 February 2017

Hosted by Lundbeck A/S

### **Lecturers**

**Per Kragh Andersen**, Section of Biostatistics,  
University of Copenhagen

**Henrik Ravn**, Biostatistics, Novo Nordisk A/S

The course will be centered around real-life data examples from clinical trials, including withdrawal patterns and adverse events.

It will be possible to sign up only for the first, the second or both parts of the course.

The first part, 17-18 January, will be an introduction to survival analysis – concepts and results, extending into analysis of competing risks.

The second part, 31 January- 1 February, will cover analysis of recurrent events, including events with duration and/or severity, and competing risks.

The course will consist of lectures and exercises. Participants must bring their own laptop.

**Venue** Lundbeck A/S  
Ottiliavej 9  
2500 Valby

### **Registration**

The course fee is DKK 2000 per part, corresponding to DKK 4000 for the full course.

Please register for the first, the second or both parts of the course.

### **Deadline 6 January 2016**

To register, please send a mail to

[commres1351@Lundbeck.com](mailto:commres1351@Lundbeck.com)

Joint registration by department is warmly welcomed.

There is a limit on the number of attendees. The first come, first serve principle will be applied.

# Survival Analysis in Clinical Trials

## Course plan

### Part 1: 17-18 January 2017

<b>Day 1</b> 17 January 2017	Standard survival analysis
	Independent censoring
	Kaplan-Meier
	Nelson-Aalen
	Occurrence/exposure rates
	Log-rank test
	Cox model
	Other models:
	Restricted mean life time
	Risk difference at given time points
	Accelerated failure time models
SAS PROC LIFETEST and PHREG	

<b>Day 2</b> 18 January 2017	Competing risks
	Cause-specific hazard (Nelson-Aalen)
	Cumulative incidence (Aalen-Johansen, not 1-Kaplan-Meier).
	Regression
	Cause-specific hazard function (Cox)
	Hazard model for the sub-distribution (Fine-Gray)
	SAS PROC LIFETEST and PHREG (SAS/Stat 14.1)

### Part 2: 31 January - 1 February 2017

<b>Day 3</b> 31 January 2017	Recap of part 1
	Recurrent events – marginal approaches
	No competing risks and no duration
	Mean function (Nelson-Aalen and robust variance)
	Mean function regression
	SAS PROC PHREG.
	With competing risks (terminating event) and no duration
	With competing risks (terminating event) and duration
	SAS macro

<b>Day 4</b> 1 February 2017	Recurrent events – intensity based models
	Multi-state models
	Frailty models
	Joint models for recurrent and terminating event
	Software: using R-packages mstate and frailtypack