

## Preface

The course in Age-Period-Cohort models at Max Planck Institute for Demographic Research was initiated by an invitation from Jutta Gambe to me. I accepted on the condition that I was allowed to draw on the assistance for preparation and tutoring of practicals from Eva Gelnarova, whom I met when she was a student at the course “Statistical Practise in Epidemiology with R” in Tartu, Estonia in the summer of 2008.

This set of practical exercises were developed in collaboration between us during the first months of 2009. I did the final editing so any faults and errors are my responsibility.

Bendix Carstensen

## Course program

The daily program will have one lecture and one practical each morning and each afternoon.

Lectures will be between 45 and 90 minutes; normally with one or two breaks.

The practicals will follow the lecture to fill the 3-hour slot. Sometimes we may need to push over some of the practical computing to take a bit of the beginning of the next slot.

### Monday 23rd

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09:00 – 09:15	Welcome and introduction.
09:15 – 12:15	Morning slot:
– L1:	Follow-up time and rates from register data
–	Lexis machinery in <code>Epi</code>
–	Follow-up time and rates from population data
– P1:	Danish prime ministers
13:15 – 16:15	Afternoon slot:
– L2:	Likelihood for rates: Cox and Poisson
–	Cox as limit of the Poisson
–	Poisson model for rates: Factor models
–	Practical handling of linear contrasts in R using <code>ci.lin()</code>
– P2:	Rates and survival
–	Tabulation

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**Tuesday 24th**

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- 09:00 – 09:30 **Recap of Monday**
- 09:30 – 12:15 Morning slot:
- L3: The age-period and the age-cohort model.
  - The Age-drift model
  - P3: Age-period model
  - Age-cohort model
  - Age-drift model
- 13:15 – 16:15 Afternoon slot:
- L4: The Age-period-cohort model
  - Parametrizations
  - P4: Age-period-cohort model
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**Wednesday 25th**

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- 09:00 – 09:30 **Recap of Tuesday**
- 09:30 – 12:15 Morning slot:
- L5: Data tabulated by age period *and* cohort.
  - Parametrization revisited: The general case.
  - P5: Age-period-cohort model for triangles
  - L5: The implementation of `apc.fit`.
  - Parametrizations.
  - The residual parametrization.
  - P5: Using the `apc`-functions from `Epi`.
- 13:15 – 16:15 Afternoon slot:
- L6: Several rates compared with APC-models:
  - Estimation and reporting of effects.
  - Parametrization options for several rates.
  - P6: Lung cancer differences by sex
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**Thursday 26th**

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- 09:00 – 16:00 Study free: Working with the assignment.
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**Friday 27th**

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- 09:00 – 09:30 **Recap of Wednesday**
- 09:30 – 12:15 Morning slot:
- L7: Predictions based on APC models
  - Managing splines for prediction
  - P7: Predicting lung cancer
  - Predicting breast cancer
- 13:15 – 15:15 Afternoon slot:
- L8: Overview of course:
  - What can the models be used for and what not.
  - P8: Assignments.
- 15:15 – 15:30 Wrapping up, closure, evaluation and farewell
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