Instructors

Prof. Rolf Groenwold
is professor of Clinical Epidemiology, with a focus on methodology for studies of medical interventions at Leiden University. He is interested in the development and improvement of methods for causal research, in particular methods to assess the effects of medical interventions. He has been awarded several prestigious personal research grants, including funding to develop the statistical methodology required for epidemiologic re-search using routinely collected healthcare data.

Dr. Maarten van Smeden
is a senior researcher at Leiden University Medical Center. He is primarily interested in prediction research and causal inference using observational data. In particular, Dr. Smeden uses advanced statistical modeling to analyze observational healthcare data and is an expert in diagnostic research.

The intensive short courses at BSPH are organized by the Institute of Public Health (IPH).

Institute of Public Health
Prof. Tobias Kurth, MD, ScD, Director

Venue
Charité – Universitätsmedizin Berlin
Campus Virchow-Klinikum

Course Information
Course language: English
ECTS points: 3
Course fees: 510 € for students
750 € for other participants

Registration Information
Tanja Te Gude
Tel. +49 30 450 570 812
tanja.te-gude@charite.de

https://iph.charite.de/en
https://bsph.charite.de
Course description
The intent of this intensive short course on advanced epidemiologic methods is to strengthen the methodological skills of the research community. Upon successful completion of the course, participants will have a deeper understanding of methods in causal and prediction research and increased confidence in how to apply these tools in their everyday research practice.

Audience
The course is designed for students and researchers, public health professionals, epidemiologists, and clinicians with a solid knowledge of epidemiologic principles and a familiarity with multivariable modeling.

Course prerequisites
- Basic knowledge of epidemiology
- Basic familiarity with R statistical software (for a short introduction, see https://www.r-tutorial.nl)

Course materials
- Please bring your own laptop with statistical software R pre-installed. (https://www.r-project.org)
- Lecture slides and course handouts will be posted on the Blackboard e-learning platform.

Course outline
This course will cover topics in causal research (confounding, missing data, time-varying variables, and measurement error), as well as prediction modeling (basics, overfitting, missing data, and misclassification).
Throughout the week, lectures will be alternated with computer exercises.

Learning objectives
By the end of this week, participants should be able to:
- Critically assess the results of epidemiological studies on causal relationships and prediction models.
- Correctly define exposures and learn how to best represent them in models.
- Understand the difference between various sources of bias (confounding, measurement error and missing data) and the way these biases may differentially affect studies on causal relationships and prediction models.
- Describe key assumptions of methods used to control for (time-varying) confounding.
- Describe key assumptions of methods used to handle missing observations.
- Understand the reasons for and consequences of overfitting prediction models.
- Describe recent developments in the fields of causal research and prediction modelling.

Program
17 – 21 August 2020  |  9am – 5pm

Monday, 17 August
am  Causality
pm  Time-varying exposures

Tuesday, 18 August
am  Missing data and measurement error
pm  Observational studies in EHR databases

Wednesday, 19 August
am  Introduction to mediation analysis
pm  The future of causal research

Thursday, 20 August
am  Prediction research
pm  The curse of “overfitting”
How to avoid overfitting

Friday, 21 August
am  Missing data and misclassification
pm  The future of prediction research
Time to work on the take home exam.
The exam must be successfully completed to receive ECTS credits.