

Research Studies Board, FUN

Applied Epidemiology and Statistics III – Causal inference with non-randomised data, MEFTES1

3 credits

Third cycle

General information

The course provides students with general knowledge of methods to use observation data to estimate causal effects. It is primarily intended for doctoral students at the Faculty of Medicine. It is taught part-time. Prior knowledge corresponding to Applied Statistics I and Applied Statistics II is a requirement.

Language of instruction

English.

Aim

The aim of the course is to enable participants to conduct epidemiology and public health research that can provide information about causality even without randomised controlled experiments. Furthermore, the course is to provide participants with the opportunity to review the research of others in order to assess its credibility with regard to causality.

Learning outcomes

On completion of the course, the participants shall be able to

- use theories of causal inference to assess threats to internal and external validity and propose ways of handling them
- apply instrumental variable analysis, difference in differences and regression discontinuity analysis to empirical data
- critically assess results from studies using non-randomised designs

Course content

The course is an introduction to causal inference in non-randomised studies within health sciences research. The objective is to introduce theories of causal inference and convey skills for practical application and critical review of non-randomised study designs. The course includes the following components:

- Theory of causal inference based on the potential outcomes framework
- Internal and external validity and threats to them
- Adjustment of confounding factors and limitations of this approach
- Overview of non-randomised (quasi-experimental) study designs, focusing on
 - instrumental variable analysis
 - difference in differences
 - regression discontinuity analysis

Course design

The teaching consists of lectures including group discussions and computer lab sessions as well as independent study of articles and other distributed material. Instructions and solutions of lab assignments will be provided through the statistics software Stata.

Assessment

The assessment is based on an individual article analysis in writing and an individual take-home exam. For a grade of Pass, the student must have passed both the article discussion and the take-home exam, and participated actively in lectures and computer lab exercises.

Grades

The grades awarded are Pass or Fail.

Reading list

Articles and lecture material will be distributed during the course.