



DEPARTMENT OF MEDICAL EPIDEMIOLOGY AND BIostatISTICS

C8F5519, Biostatistics II: Logistic Regression for Epidemiologists, 1.5 credits (hec)

Biostatistik II: Logistisk regression för epidemiologer, 1,5 högskolepoäng

Third-cycle level / Forskarnivå

Approval

This syllabus was approved by the The Committee for Doctoral Education on 2023-12-08, and was last revised on 2024-05-02. The revised course syllabus is valid from autumn semester 2024.

Responsible department

Department of Medical Epidemiology and Biostatistics, Faculty of Medicine

Prerequisite courses, or equivalent

Knowledge in epidemiology and biostatistics equivalent to Epidemiology I: Introduction to epidemiology and Biostatistics I: Introduction for epidemiologists or corresponding courses

Purpose & Intended learning outcomes

Purpose

The course introduces statistical methods for the analysis of categorical outcome data.

Intended learning outcomes

After successfully completing this course you as a student are expected to be able to:

- choose the appropriate regression model for studying a specific research hypothesis using data collected from an epidemiological study, implement the model using standard statistical packages, assess the goodness of fit, and interpret the results,
- explain the concept of confounding in observational studies and use statistical models to to control/adjust for confounding,
- apply appropriate statistical models to study and interpret effect modification,
- carefully read an epidemiological paper to critically review the methodological aspects of the article, with emphasis on the study assumptions, design, analysis and interpretation

Intended learning outcomes are classified according to Bloom's taxonomy: knowledge, comprehension, application, analysis, synthesis, and evaluation (Bloom, 1956, extended by Anderson and Krathwohl, 2001).

Course content

The course focuses on the formulation and application of the logistic regression model in the analysis of epidemiological studies to estimate relative and absolute effect measures. Topics covered include a brief introduction to binary outcome data, measures of associations in two-by-two tables, univariable and multivariable models, interpretation of parameters for continuous and categorical predictors, flexible modeling of quantitative predictors, confounding and interaction, model fitting and a glance to model diagnostics.

Forms of teaching and learning

Lectures, computer based assignments with applications focusing on analysis of real data sets, using statistical packages such as Stata or R, hand based exercises, group discussions and literature review.

Language of instruction

The course is given in English

Grading scale

Pass (G) /Fail (U)

Compulsory components & forms of assessment

Compulsory components

The individual take-home written examination (summative assessment).

Forms of assessment

The student has to show that the learning outcomes have been achieved to pass the exam. The course grade is based on the individual written examination (summative assessment). The focus of the examination will be on the understanding of the underlying principles of categorical data models and their application to analysis of epidemiological studies, and therefore less emphasis will be given to mathematical details. Students who do not obtain a passing grade in the first examination will be offered a second examination within two months of the final day of the course. Students who do not obtain a passing grade at the first two examinations will be given priority for admission to the next course's offering. If the course is not offered during the following two academic terms then a third examination will be scheduled within 12 months of the final day of the course.

Course literature

No mandatory literature. Any of the below textbooks are recommended reading.

Nicholas P. Jewell: Statistics for Epidemiology. Chapman & Hall/CRC, 2004.

Hosmer DW, Lemeshow S, and Sturdivant, RX. Applied Logistic Regression, 3rd Ed, A Wiley-Interscience Publication, John Wiley & Sons Inc., New York, NY, 2013.

Vittinghoff, E., Glidden, D.V., Shiboski, S.C., McCulloch, C.E. Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models (Statistics for Biology and Health) 3rd Ed. Springer-Verlag, New York, NY, 2017.