



## DEPARTMENT OF GLOBAL PUBLIC HEALTH

### **K9F5314, 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 Committee for Doctoral Education on 2023-12-08, and was last revised on 2026-02-18. The revised course syllabus is valid from autumn semester 2026.

#### ***Responsible department***

Department of Global Public Health, 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 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 examination (summative assessment).

### Forms of assessment

The student must 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 occasion within two months of the final day of the course.

Students may be granted additional examination sessions, up to six in total, subject to discussion with and approval by the examiner.

## 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.