



**Karolinska
Institutet**

Course syllabus for

Biostatistics 2, 7.5 credits

Biostatistik 2, 7.5 hp

This course syllabus is valid from spring 2020.

Please note that the course syllabus is available in the following versions:

Spring2020 , Spring2025

Course code	4FH087
Course name	Biostatistics 2
Credits	7.5 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Public Health Sciences
Level	AV - Second cycle
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Global Public Health
Decided by	Education committee PHS
Decision date	2018-10-09
Course syllabus valid from	Spring 2020

Specific entry requirements

A Bachelor's degree or a professional degree equivalent to a Swedish Bachelor's degree of at least 180 credits in public health science, healthcare or other relevant social sciences subject area. And proficiency in English equivalent to English B/English 6.

Objectives

The objective of this course is to teach the students the biostatistics skills needed to perform statistical analysis of public health and epidemiologic data. The student will develop knowledge to choose, apply and interpret appropriate regression models to conduct his/her present and future research in public health epidemiology.

After successfully completing the course students should be able to:

- Specify and interpret regression models to make inference on a) means and differences in means b) odds/risks and relative odds/risks c) rates and rate ratios
- Explain the difference between univariable and multivariable regression models
- Compare alternative models
- Conduct test of hypothesis after estimation
- Implement different strategies for modelling quantitative predictors
- Assess and present interaction between predictors

- Present the fitted model in written, tabular, and graphical forms

Content

The course covers linear regression, logistic regression, Poisson regression, and popular statistical methods (Kaplan-Meier method, Cox regression) for survival data. Among the topics covered are: hypothesis testing and confidence intervals for regression model parameters, maximum likelihood estimation and least squares criteria, goodness of fit, and predictions.

Teaching methods

The course is a mix of lectures and computing tutorials. In lectures, statistical concepts needed to understand regression models are introduced, illustrated, and discussed in class and group discussions. In computing tutorials, the statistical concepts are illustrated with examples from epidemiological studies and/or epidemiological data. Lectures and tutorials are alternating so as to give the student an opportunity to practice the methods taught in lectures in the computer laboratory. The statistical software used is Stata .

Examination

The acquired knowledge and skills will be examined through class presentations, home projects, and final exam covering both theory and interpretation of statistical results.

Compulsory participation

The course director assesses if and, in that case, how absence can be compensated. Before the student has participated in all compulsory parts or compensated absence in accordance with the course director's instructions, the student's results for the course/respective part will not be registered in LADOK.

Limited number of examinations or practical training sessions

Students who have not passed the regular examination are entitled to participate in five more examinations. If the student is not approved after four examinations, he/she is recommended to retake the course at the next regular course date, and may, after that, participate in two more examinations. If the student has failed six examinations/tests, no additional examination or new admission is provided.

The number of times that the student has participated in one and the same examination is regarded as an examination session. Submission of a blank examination is regarded as an examination. An examination for which the student registered but not participated in, will not be counted as an examination.

Transitional provisions

Examination will be provided during a time of two years after a possible cancellation of the course. Examination can take place according to an earlier literature list during a time of one year after the date when a major renewal of the literature list has been made.

Other directives

Course evaluation will be carried out in accordance with the guidelines established by the Board of Education.

The course language is English.

Literature and other teaching aids

Kirkwood, Betty R.; Sterne, Jonathan A. C.

Essential medical statistics

2. ed. : Malden, Mass. : Blackwell Science, cop. 2003 - x, 501 s.
 ISBN:0-86542-871-9 LIBRIS-ID:8731249

[Library search](#)

Hosmer, David W.; Lemeshow, Stanley; Sturdivant, Rodney X.

Applied logistic regression

3. edition : Hoboken, N.J. : Wiley, 2013 - xvi, 500 s.
 ISBN:9780470582473 (hbk.) LIBRIS-ID:13988873

URL: [Länk](#)

[Library search](#)

Teaching aids

Useful resources to learn Stata:

<https://www.stata.com/links/resources-for-learning-stata/>

Armitage, Peter; Berry, Geoffrey; Matthews, J.N.S.

Statistical methods in medical research

4. ed : Oxford : Blackwell Science, 2002 - xi, 817 s.
 ISBN:0-632-05257-0 LIBRIS-ID:8293285

[Library search](#)

Dupont, William D.

Statistical modeling for biomedical researchers : a simple introduction to the analysis of complex data

2. ed. : Cambridge, UK : Cambridge University Press, 2009. - xx, 522 s.
 ISBN:978-0-521-84952-4 (hardback) LIBRIS-ID:11299500

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