Course syllabus for

Quantitative Research and Methods 2, 6 credits

Kvantitativ forskning och metoder 2, 6 hp
This course syllabus is valid from spring 2026.

Course code	4GB008
Course name	Quantitative Research and Methods 2
Credits	6 credits
Form of Education	Higher Education, study regulation 2007
Main field of study	Global Health
Level	AV - Second cycle
Grading scale	Pass with distinction, Pass, Fail
Department	Department of Learning, Informatics, Management and Ethics
Decided by	Education Committee GPH
Decision date	2024-10-11
Course syllabus valid from	Spring 2026

Specific entry requirements

A Bachelor's degree or a professional degree equivalent to a Swedish Bachelor's degree of at least 180 credits. And proficiency in English equivalent to English B/English 6.

Objectives

After the course, the student should be able to:

Knowledge and understanding

- discuss how the choice of statistical model is governed by the study design
- discuss possible sources of bias in epidemiological studies and the extent to which statistical models can mitigate these
- explain the difference between univariable and multivariable regression models
- distinguish between different estimation methods including parametric and non-parametric methods
- explainthedifferencebetweenhypothesistestingandintervalestimation
- discuss the distinction between explanatory and predictive modelling

Competence and skills

- fit multivariable regression models and conduct hypothesis tests after model estimation
- interpret output from statistical models both in terms of inference, as well as epidemiological

measures of associations and disease occurrence compare alternative statistical models and choose the most appropriate model including investigating possible interactions between predictors
- assess, interpret and present output from statistical analysis
- calculate sample sizes for the types of research questions and designs that are common in global health

Judgement and approach

- reflect on how data is produced, disseminated, used and understood
- critically evaluate the presentation of data following ethical guidelines and quality standard on transparency and reproducibility

Content

This course progresses on earlier courses by emphasising how measures of disease occurrence (e.g., incidence and prevalence) and associations (e.g. risk ratios, incidence rate ratios, odds ratios) can be estimated using statistical models, and how statistical methods can be used to overcome biases in epidemiological studies. Students will interpret and present output from statistical analysis in written, tabular, and graphical forms. The course aims to provide students hands-on data analysis skills using statistical software, including:

- linear regression
- logistic regression
- methods to handle time to event data
- estimation methods (maximum likelihood, least squares)
- hypothesis testing and confidence intervals for regression coefficients
- variable selection and model comparison
- absolute and partial predictions
- ethical guidelines (e.g. by the International Statistical Institute) and quality standards (e.g. STROBE)

Teaching methods

The course consists of lectures, group discussions (seminars and article presentations), computer-based exercises to be solved in groups and individual assignments. An introduction to and support in R is provided. eLearning exercises in form of quizzes will be provided for students to receive feedback on their learning progress.

Examination

That all intended learning outcomes have been achieved is assessed on the basis of 1)a passing grade on the computer-based exercises, 2) the contribution of the student during group discussions and article presentations, and 3) a written examination (grades: fail, pass, pass with distinction). To achieve a pass with distinction for the whole course, the student must obtain a pass in the computer-based exercises, seminars and article presentation, and a pass with distinction in the written exam.

The examiner assesses if, and in that case how, absence from compulsory educational elements can be compensated for. Before the student has participated in the compulsory educational elements or compensated the absence in accordance with the examiner's instructions, the final course results will not be reported. Absence from a compulsory educational component may imply that the student cannot compensate for the missed compulsory educational element until the next time the course is given.

Limitation of number of occasions to write the exam
Students who have not passed the regular examination are entitled to participate in five more examinations. If the student has not passed the exam after four participations, he/she is encouraged to

visit the study advisor. 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 also regarded as an examination. An examination for which the student registered but did not participate in will not be counted as an examination.

If there are special grounds, or a need for adaptation for a student with a disability, the examiner may decide to deviate from the syllabus's regulations on the examination form, the number of examination opportunities, the possibility of supplementation or exemptions from the compulsory section/s of the course etc. Content and learning outcomes as well as the level of expected skills, knowledge and abilities may not be changed, removed or reduced.

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

The course language is English.

Course evaluation is carried out according to the guidelines that are established by the Committee for Higher Education.

Literature and other teaching aids

Mandatory and recommended literature and readings will be available on the learning management system during the course.