Course syllabus for

Systematic Review and Meta-Analysis, 3 credits

Systematisk litteraturöversikt och meta-analys, 3 hp
This course syllabus is valid from autumn 2021.
Please note that the course syllabus is available in the following versions:
Autumn2020 , Autumn2021 , Autumn2023

Course code	4FH099
Course name	Systematic Review and Meta-Analysis
Credits	3 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 Medicine, Solna
Decided by	Utbildningsnämnden GPH
Decision date	2020-03-31
Revised by	Education Committee GPH
Last revision	2021-03-15
Course syllabus valid from	Autumn 2021

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.

That the student has completed courses with approved results equivalent of 45 credits at the Master's Programme in Public Health Sciences, specialisation Public Health Epidemiology.

Objectives

Meta-analyses are becoming the gold standard method of reviewing and summarising the scientific literature, and they have contributed greatly to the current body of scientific knowledge. This course aims to introduce the concepts and procedures of systematic reviews and meta-analyses, and will help students to apply these in practice, by working on an individual project.

At the end of the course the students should be able to:

- Understand and demonstrate the value, principles and the different concepts related to systematic reviews and meta-analyses, in particular compared to other types of studies (incl. narrative

reviews, original research);
- Identify the strengths, limitations and pitfalls of systematic reviews and meta-analysis;
- Independently formulate study hypotheses, and plan and generate a study protocol to perform a systematic review and meta-analysis, justifying the selection of the eligible studies and statistical methodology;
- Apply basic methods of meta-analyses;
- Interpret and critically evaluate scientific studies relevant to the course content.

Content

The content of the course is as follows:

- Basic concepts in systematic reviews and meta-analyses,
- Strengths, problems and limitations of systematic reviews and meta-analyses,
- How to write a study protocol for a systematic review,
- How to perform a systematic literature search (including a practical seminar organised by Karolinska Institutet library),
- Data extraction and quality assessment of included studies,
- Statistical methods used in meta-analyses and interpretation,
- Examination.

This is a hands-on course, covering theoretical concepts and discussion of strengths, limitations and problems of systematic reviews and meta-analyses. We will also discuss publication guidelines, strategies to identify eligible studies, quality assessment of research papers, how to use referens management system to facilitate the systematic search, Excel for data-management, and different statistical methods and programs.

Teaching methods

Interactive lectures, seminars, individual article review, group discussions, practical sessions (one on systematic literature search, one on statistical methods) and homework tasks will be used. The course focuses on active learning, i.e. putting knowledge into practice and critically reflecting upon the knowledge, rather than memorising facts.
Therefore, much of the focus of the course is on the individual project where students are required to develop a partial study protocol including several important aspects covered in the lectures, article reviews and group discussions. Students will critically review and discuss r a scientific article. There will be several group discussions with other students and experienced teachers, with a focus on peer assessment (discussing each other's projects), and the lectures are interactive allowing for critical discussions.

Examination

The examination is based on two assignments:

- a quality assessment of a scientific article relevant to the course content (Pass/Fail)
- an individual written report which consists of a study protocol using the concepts discussed during the course (Pass with Distinction/Pass/Fail)

To obtain the grade Pass for the course, the student must be awarded Pass on both the article assessment and the final written report. To obtain the grade Pass with Distinction the student must be awarded Pass with Distinction on the final written report and Pass on the article assessment. Written reports submitted after the deadline will not be eligible for a Pass with Distinction grade.Compulsory participation
Compulsory attendance includes the scheduled workshops and group sessions, as well as the exam. One is required to come well prepared for each seminar (see reading list). Absence will need to be replaced

by individual assignments following discussion with the course co-ordinator, e.g. article reviews, with written or oral follow-up.

The examiner 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 examiner's instructions, the student's results for each respective part will not be registered. Absence from a compulsory activity may result in that the student cannot compensate the absence 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 regarded as an examination. An examination for which the student registered but not participated 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

Course evaluation will be carried out in accordance with the guidelines established by the Committee for Higher Education.
The course language is English.

Literature and other teaching aids

Mandatory literature

Systematic reviews: practical information on how to conduct systematic literature searches:

Karolinska Institutet library,
https://kib.ki.se/en/search-evaluate/systematic-reviews

Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement.
Moher, D; Liberati, A; Tetzlaff, J; Altman, DG

Institutionen för folkhälsovetenskap,
URL: Länk
PRISMA: http://www.prisma-statement.org/ (flowchart, checklist and PRISMA statement).

Introduction to meta-analysis
Borenstein, Michael; Hedges, Larry V.; Higgins, Julian P. T.; Rothstein, Hannah R.

Chichester : Wiley, 2009 - online resource (xxix, 421 s).
ISBN:9780470743379 LIBRIS-ID:12049433

URL: Table of Contents / Abstracts
Part 3 - Fixed-effect versus random-effects models (complete) Part 4 - Heterogeneity: chapter 15,16 Part 9 - Meta-analysis in context (complete)
Library search

Meta-analysis and the science of research synthesis
Gurevitch, J.,; Koricheva, J.,; Nakagawa, S.; Stewart, G.

Nature international journal of science, 2018
URL: Nature 555, 175-182
Nature 555, 175-182

Recommended literature

Higgins, JPT
Cochrane Handbook for Systematic Reviews of Interventions
Green, S

2018
URL: Länk till KIB
Ingår i:
Cochrane library

New York : Wiley-Interscience, 1998-
ISSN:1465-1858 LIBRIS-ID:4382362
6ed (2018)
Free online http://handbook.cochrane.org/

Egger, Matthias.; Smith, George Davey.; Altman, Douglas G.
Systematic reviews in health care : meta-analysis in context

2nd ed. : London : BMJ, c2001. - xviii, 487 p.
ISBN:9780470693926 LIBRIS-ID:11905513
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Library search