



DEPARTMENT OF NEUROBIOLOGY, CARE SCIENCES AND SOCIETY

H1F3131, Application of Epidemiological Methods in Aging Research, 1.5 credits (hec)

Tillämpning av epidemiologiska metoder i forskning om åldrandet, 1,5

högskolepoäng

Third-cycle level / Forskarnivå

Approval

This syllabus was approved by the The Committee for Doctoral Education on 2023-11-27, and was last revised on 2024-05-02. The revised course syllabus is valid from autumn semester 2024.

Responsible department

Department of Neurobiology, Care Sciences and Society, Faculty of Medicine

Prerequisite courses, or equivalent

Knowledge equivalent to "'Epidemiology I: Introduction to epidemiology'", "'Biostatistics I: Introduction for epidemiologists'" or corresponding courses.

Purpose & Intended learning outcomes

Purpose

The aim of the course is to critically review epidemiological methods with applications to aging research. An increasing share of the population in our countries lives to very advanced age. This calls for a better understanding of the ageing process, identifying possible preventive and treatment strategies to ensure that these extra years of life gained through increased longevity are spent in good health. Geriatric epidemiology approaches these challenges by studying the health and functional status of older populations throughout the entire life span.

Intended learning outcomes

After completion of the course, you as a student should be able to:

- (1) Discuss the pros and cons of different analytic approaches used in geriatric epidemiology, and the possible sources of bias linked to each of these approaches.
- (2) Reason about the challenges in the definition, measurement and clinical assessment of

chronic diseases and multimorbidity.

(3) Explain the main methods to measure physical function, as well as its contribution to the multidimensional health assessment in older people.

(4) Depict the clinical aspects as well as risk and protective factors for dementia and cognitive decline from a life course perspective.

(5) Describe the main determinants of healthy aging and longevity, with a special focus on biological and genetic markers of human aging.

Course content

This one-week course will cover the basics of geriatric epidemiology and the critical appraisal of different study designs used in the field. It will also describe the fundamental dimensions of health in older age (chronic physical and mental diseases, physical function and frailty, and cognitive function) and the challenges linked to their measurement and assessment. Last, the main determinants of aging and longevity will be introduced from the perspective of their applicability in research and clinical practice.

Each theoretical session will be followed by practical sessions related to methodological challenges in each corresponding area. The practical sessions will take place in the afternoons.

Forms of teaching and learning

The course is built on brief state-of-art lectures followed by different activities where doctoral students will be asked to put into practice and critically reflect upon the acquired knowledge.

The proactive participation of the student will be pursued through group discussions, individual presentations, in-class quizzes, and the critical assessment of selected studies..

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) is compulsory.

Forms of assessment

To pass the course, the student has to show that the learning outcomes have been achieved. Assessments methods used are group assignments (formative assessments) along with an individual home examination (summative assessment). Students who do not obtain a passing grade in the first examination will be offered a second chance to resubmit the examination within two months of the final day of the course.

Course literature

Suggested reading:

- (1) Marengoni A, et al. Aging with multimorbidity: a systematic review of the literature. *Ageing Res Rev.* 2011 Sep;10(4):430-9.
- (2) Clegg A, et al. Frailty in elderly people. *Lancet.* 2013 Mar 2;381(9868):752-62.
- (3) Solomon A, et al. Advances in the prevention of Alzheimer's disease and dementia. *J Intern Med.* 2014 Mar;275(3):229-50.
- (4) Rizzuto D, et al. Lifestyle factors related to mortality and survival: a mini-review. *Gerontology.* 2014;60(4):327-35.
- (5) López-Otín C, et al. The Hallmarks of Aging. *Cell.* 2013 Jun 6; 153(6): 1194–1217.