

Syllabus Advanced Core Epidemiology

N°203	Advanced Core Epidemiology
Coordinator	Dr. Judith Mueller Department of Quantitative methods in Public Health (METIS) Ecole des Hautes Etudes en Santé Publique (EHESP, French School of Public Health) judith.mueller@ehesp.fr
Dates	September 3 - October 1, 2019
Credits/ECTS	3 ECTS
Duration	30 hours
Location	Amphitheatre + Rooms, EHESP, 20 avenue George Sand, 93210 LA PLAINE ST DENIS
Description	This module aims at providing students with working knowledge of epidemiology, which will allow them applying epidemiological concepts in a general public health work setting. This includes understanding epidemiological measures, study designs, biases and study validity, diagnostic testing as it relates to screening and use of epidemiological data in decision making and simple models for prediction and evaluation of intervention strategies (decision analysis). The module also aims at consolidating pre-existing knowledge to prepare students for the epidemiology track.
Prerequisites	Introduction to epidemiology (M1 level) Previous reading of K.J. Rothman: Epidemiology – an introduction . 2 nd edition. (few copies available in the library) or other similar epidemiology book at introductory level.
Course learning objectives	Students who successfully complete this course should be able to: <ol style="list-style-type: none"> 1. Explain and apply principal concepts of epidemiological reasoning (validity, causality, power, attributable risk...) 2. Interpret and discuss epidemiological studies, their design and their contribution to public health 3. Perform simple epidemiological analyses (measures of frequency and association; standardization and Mantel-Haenszel; test performance; combining probabilities)
Structure (details of sessions title/speaker/date /duration)	Each module day will include two lectures and a lab session during which the concepts and method presented during the lectures will be worked on. Homeworks will be briefly discussed after the lunch break of each course day. Additional Help! Sessions after class (see schedule) will allow students with major difficulties in following the course to discuss difficulties with teaching assistants and to catch up. An additional review session will be offered before the exam, to allow students ask specific questions to the course coordinator. In-depth preparation of the course material is essential for participation in this review session. <u>September 3</u> <ol style="list-style-type: none"> 1. Introduction to module and entry exam (J. Mueller, 1.5h) 2. Measures of frequency and association, study design (J. Mueller, 1.5h) 3. Causal Interference (E. Counil, 3h) <u>September 10</u> <ol style="list-style-type: none"> 4. Study design and biases (F. Bodeau-Livinec, 1.5 h) 5. Diagnostic tests (J. Mueller, 1.5 h) <u>September 17</u> <ol style="list-style-type: none"> 6. Validity and strategies to control confounding (J. Mueller, 1.5h) 7. Ecological studies (C. Padilla 1.5h)

	<p><u>September 24</u></p> <p>8. Introduction to decision analysis (J. Mueller, 1.5h)</p> <p>9. Clinical trials (J-P. Régnaux 1.5 h)</p> <p><u>October 1</u></p> <p>10. Metaanalysis (JP. Regnaud, 1.5h)</p> <p>11. Outlook on advanced issues (J. Mueller, 1.5h)</p>
Resources	<p>Recommended book for the class: Charles H. Hennekens and Julie Buring: Epidemiology in Medicine [copies in the library]</p> <p>Students may also choose to read other appropriate epidemiology books to prepare for the classes (see in the library). Example of alternatives: K.J. Rothman: Epidemiology – an Introduction . 2nd edition. [copies in the library] K.J. Rothman: Modern Epidemiology [copy in the library; not recommended for students who are not in the epidemiology track]</p> <p>All other readings and materials will be posted on REAL. Readings are available below for each session.</p>
Course requirement	<p>Students are expected to attend all lectures and lab sessions and must hand in homework assignments for the given deadlines (before 9.30h of each module day, except the first). Class attendance will be checked accordingly. Validation of the module may be refused if attendance is judged insufficient.</p> <p>Students are expected to read and analyse recommended book chapters or papers before the courses and to participate actively in group work.</p> <p>Active contribution to discussions during lectures – as invited by the lecturer – is encouraged.</p> <p>Participation in the Help! Sessions is recommended for students feeling that they have difficulties in following the class.</p> <p>Review session: Exam preparation for those who have precise questions after having attended and revised all classes</p>
Grading and assessment	<p>Final exam: 80% of grade Homeworks (4): 20% of grade</p> <p>Final exam without calculator or any other technical device. Students are allowed to bring a 1-page document that they have prepared individually as “authorized cheat sheet” for the exam. Please bring pencil, rubber and ruler. Additional exam sheets will be available for side calculations.</p> <p>Mandatory and graded homework (content of the course day): to be submitted on paper to the lecturer at the following session, just before class at 9.30h. Timely submission and the homework’s readability are in the student’s responsibility.</p> <ul style="list-style-type: none"> - typed in Word and printed out - or handwritten - No submission by email is accepted (=> 0 points).
Course policy	<p>Attendance & punctuality</p> <p>Regular and punctual class attendance is a prerequisite for receiving credit in a course. Students are expected to attend each class. Attendance will be taken at each class.</p> <p>The obligations of attendance and punctuality cover every aspect of the course: - lectures, conferences, group projects, assessments, examinations, as described in EHESP Academic Regulations http://mph.ehesp.fr EHESP Academic Regulation Article. 3).</p> <p>If students are not able to make it to class, they are required to send an email to the instructor and to the MPH program coordinating team explaining their absence prior to the scheduled class date. All supporting documents are provided to the end-of-year panel.</p> <p>Students who miss class are responsible for content. Any student who misses a class has the</p>

	<p>responsibility for obtaining copies of notes, handouts and assignments. If additional assistance is still necessary, an appointment should be scheduled with the instructor. Class time is not to be used to go over material with students who have missed class.</p> <p>Lateness: Students who are more than 10 minutes late may be denied access to a class. Repeated late arrivals may be counted as absences (See http://mph.ehesp.fr EHESP Academic Regulation Article. 3 Attendance & Punctuality)</p> <p>Maximum absences authorized & penalty otherwise Above 20% of absences will be designated a fail for a given class. The students will be entitled to be reassessed in any failed component(s). If they undertake a reassessment or they retake a module this means that they cannot normally obtain more than the minimum pass mark (i.e. 10 out of 20)</p> <p>Exceptional circumstances Absence from any examination or test, or late submission of assignments due to illness, psychological problems, or exceptional personal reasons must be justified; otherwise, students will be penalized, as above mentioned. Students must directly notify their professor or the MPH academic secretariat before the exam or before the assignment deadline. Before accepting the student's justification, the professor or the MPH academic secretariat has the right to request either a certificate from the attending physician or from a psychologist, or from any other relevant person (See http://mph.ehesp.fr EHESP Academic Regulation Article 4 Examinations).</p> <p>Courtesy: All cell phones/pagers MUST be turned off during class time. Students are required to conduct themselves according to professional standards, eating during class time is not permitted during class time, such as course or group work.</p>
Valuing diversity	<p>Diversity enriches learning. It requires an atmosphere of inclusion and tolerance, which oftentimes challenges our own closely-held ideas, as well as our personal comfort zones. The results, however, create a sense of community and promote excellence in the learning environment. This class will follow principles of inclusion, respect, tolerance, and acceptance that support the values of diversity. Diversity includes consideration of: (1) life experiences, including type, variety, uniqueness, duration, personal values, political viewpoints, and intensity; and (2) factors related to "diversity of presence," including, among others, age, economic circumstances, ethnic identification, family educational attainment, disability, gender, geographic origin, maturity, race, religion, sexual orientation and social position.</p>
Course evaluation	<p>EHESP requests that you complete a course evaluation at the end of the school year. Your responses will be anonymous, with feedback provided in the aggregate. Open-ended comments will be shared with instructors, but not identified with individual students. Your participation in course evaluation is an expectation, since providing constructive feedback is a professional obligation. Feedback is critical, moreover, to improving the quality of our courses, as well as for instructor assessment.</p>

Session 1	Module introduction
Speakers	Judith Mueller
Session Outline	Lecture
Learning Objectives	- Understand the organisation of the module
Duration	0.5 hours
Training methods	Lecture

Readings	Required Reading: none
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Session 2	Measures of frequency and association, study design
Speakers	Judith Mueller
Session Outline	Lecture followed by lab session
Learning Objectives	- Know and apply the principal measure of frequency and association, and study designs
Duration	1.5 hours
Training methods	Lecture
Readings	Required reading: corresponding book chapter

Session 3	Causal inference
Speakers	E. Counil
Session Outline	Lecture and case study
Learning Objectives	- Understand and apply arguments for causality based on results of epidemiological studies
Duration	3 hours
Training methods	Lecture and case study
Readings	Required reading: corresponding book chapter

Session 4	Study design and biases
Speakers	F. Bodeau Livinec
Session Outline	Lecture followed by lab session
Learning Objectives	- Recall study designs and their risk for bias - Categories of biases, ways to avoid them during the study development
Duration	1.5 hours
Training methods	Lecture and discussion
Readings	Required reading: corresponding book chapter

Session 5	Diagnostic testing
Speakers	J. Mueller
Session Outline	Lecture followed by lab session
Learning Objectives	<ul style="list-style-type: none"> - Understand concepts of test performance and their application to screening - Calculate sensitivity, specificity, predictive values - Understand and estimate consequences from limited test performance for the validity of epidemiological studies
Duration	1.5 hours
Training methods	Lecture and discussion
Readings	Required reading: corresponding book chapter

Session 6	Validity and strategies to control confounding
Speakers	Judith Mueller
Session Outline	Lecture followed by lab session
Learning Objectives	<ul style="list-style-type: none"> - Internal and external study validity - Confounding - Methods to control confounding, including standardisation
Duration	1.5 hours
Training methods	Lecture and discussion
Readings	Required reading: corresponding book chapter

Session 7	Ecological studies
Speakers	C. Padilla
Session Outline	Lecture followed by lab session
Learning Objectives	<ul style="list-style-type: none"> - Understand how to conduct and interpret an ecological study - Discuss validity and level of evidence in ecological studies
Duration	1.5 hours
Training methods	Lecture and discussion
Readings	Required reading: corresponding book chapter; paper to be announced

Session 8	Introduction to decision analysis
Speakers	J. Mueller
Session Outline	Lecture followed by lab session
Learning Objectives	<ul style="list-style-type: none"> - Understand the principal idea of decision analysis - Conduct a simple combination of probabilities
Duration	1.5 hours

Training methods	Lecture, discussion and lab
Readings	Required reading: Paper to be announced

Session 9	Clinical Trials
Speakers	Jean-Philippe Régnaux
Session Outline	Lecture followed by lab session
Learning Objectives	<ul style="list-style-type: none"> - Understand how to conduct and interpret clinical trial - Discuss types and limitations in clinical trials
Duration	1.5 hours
Training methods	Lecture and discussion
Readings	Required reading: corresponding book chapter ; paper to be announced

Session 10	Metaanalyses
Speakers	JP Regnaux
Session Outline	Lecture followed by lab session
Learning Objectives	<ul style="list-style-type: none"> - Understand how to conduct and interpret a metaanalysis - Discuss limitations of metaanalyses
Duration	1.5 hours
Training methods	Lecture and discussion
Readings	Required reading: corresponding book chapter ; paper to be announced

Session 11	Outlook on advanced issues
Speakers	Judith Mueller
Session Outline	Lecture
Learning Objectives	-
Duration	1.5 hours
Training methods	Lecture and discussion
Readings	Required reading: none