

Syllabus Module 224 – 225 : Analysis in EPIDEMIOLOGY(I) & (II)

| N° 224 & 225 | Analysis in EPIDEMIOLOGY (I) & (II) |
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| Teaching Team | <p>Professor Mary Beth TERRY Professor of Epidemiology Mailman School of Public Health, Columbia University New York, NY, USA mt146@cumc.columbia.edu</p> <p>Teaching Assistants Courtney Dow, MPH PhD INSERM 1153, Equipe EARoH courtney.dow@inserm.fr</p> <p>Amanda Garrison, MPH INSERM 1153, Equipe EPOPé amanda.garrison@inserm.fr</p> |
| Dates | 7 th to 11 th December 2020 & 11 th to 15 th January 2021 |
| Credits/ECTS | 3 ECTS |
| Duration | 5 days of 6 hours ; 5 days of 6 hours |
| Location | EHESP 20 Avenue George Sand 93210 LA PLAINE ST DENIS |
| Description | <p>The course focuses on integrating study design methods with advanced statistical analyses. The lectures focus on methodological issues of study designs covering causal modeling and hypothesis development, variable construct and measurement issues, tabular and multivariable analyses. The purpose of this course is to provide both theoretical and practical experience in analyzing epidemiological data.</p> <p>The main textbooks used are Rothman's Modern Epidemiology and Hosmer and Lemeshow's Logistic and Survival Models. Lectures cover theoretical concepts from confounding, interaction, pseudo risks and rates, and generalized linear models. Computer laboratories use multiple data sets covering topics in linear, logistic (binary and polytomous), Cox Proportional Hazard, Poisson, and Quantile regression methods. Multivariable methods for testing for confounding, interaction, and mediation are taught both in lecture and laboratories.</p> |
| Prerequisites | Concepts Methods & design in Epidemiology |
| Course learning objectives | <p>Students who successfully complete this course will be able to:</p> <ol style="list-style-type: none"> 1. Integrate study design methods and advanced statistical analysis 2. Apply multivariable analyses 3. Clarify methodological issues for modeling and measurement 4. Critically appraise and interpret the findings of epidemiology papers |

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| <p>Structure (details of sessions title/speaker/date /duration)</p> | <p>10 sessions with Dr. Mary Beth Terry, and 10 lab sessions in collaboration with postdoctoral fellow Courtney Dow and doctoral fellow Amanda Garrison</p> <p>Session 1: Introduction The Multivariable Model Absolute versus Relative Measures of Effect Observational Epidemiology and Counterfactuals <i>Lab 1: Applied Epidemiologic Analysis using Stata</i></p> <p>Session 2: Measurement and Bias Overview of Precision versus Bias, Selection Bias, Information Bias, Confounding <i>Lab 2: Mantel-Haenszel</i></p> <p>Session 3: Statistical Interaction, Biological Interaction, Public Health Interaction <i>Lab 3: Confounding & Interaction</i></p> <p>Session 4: Case-control Analysis I Design Categorical Analyses, Logistic Regression Modeling</p> <p>Session 5: Case-control Analysis II Model building Interaction in case-control studies Polytomous modeling <i>Lab 4: Polytomous Logistic Regression</i></p> <p>Session 6: Cohort/Follow-up Analysis I Description, Tabular analysis, Basic survival analysis <i>Lab 5: Kaplan Meier</i></p> <p>Session 7: Cohort/Follow-up Analysis II Cohort/Follow-up Analysis II Non-parametric versus Parametric Approaches, PH Cox Models <i>Lab 6: Cox PH Modeling</i></p> <p>Session 8: Advanced topics Conceptual, Tabular Analyses, Regression Models, Time Varying Covariates <i>Lab 7: Poisson & Relative Risk Regression Lab 8: Time Varying Covariates</i></p> <p>Session 9: Matching and Weighting <i>Lab 9: Matched Analyses Modeling Lab 10: Weighting</i></p> <p>Session 10: Meta-Analysis</p> |
| <p>Resources</p> | <p>The required text for this course is:</p> <p>Rothman K, Greenland S, Lash T. (2008) Modern Epidemiology (3rd edition). Philadelphia: Lippincott-Raven. Referred to as R&G.</p> <p>For theoretical aspects of epidemiological research and data analytic methods the following books are also recommended for reading and have been placed on reserve at the Health Sciences library:</p> <p>1. Hosmer DW (2004), Lemeshow S. Applied Logistic Regression (2nd edition). New York: John Wiley & Sons.</p> <p>Hosmer DW (2008), Lemeshow S. Applied Survival Analysis. New York: John Wiley & Sons.</p> |
| <p>Course requirement</p> | <p>Students are expected to attend all lectures and laboratories. Class attendance will be checked accordingly.</p> <p>Students are expected to read and analyze selected papers for the group work before the courses.</p> |

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| <p>Grading and assessment</p> | <p>Homeworks You will be asked to critical review published papers, interpret study results and analytic output, and answer questions on topics that were covered in the lecture and lab sessions.</p> <p>Computer Assignments</p> <p>Laboratories are designed to provide more informal discussions of conceptual issues, and to provide technical assistance to students. You will be asked to perform certain steps of analysis (and interpret the outputs) on topics that were covered in the lecture session using the dataset(s) provided.</p> <p>Homework assignment: 40% Laboratory Exercises: 20% Final exam: 40%</p> |
| <p>Course policy</p> | <p>Attendance & punctuality 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. 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). 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 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/pages MUST be turned off during class time.</p> <p>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> |

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| Valuing diversity | 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. |
| Course evaluation | 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. |