



Department of Epidemiology and Population Health

Faculty of Health Sciences

Epidemiology Beyond the Basic

EPDH 320 (2 credits)

Course Syllabus

Spring AY 2019/20

COURSE INSTRUCTOR:

Dr Monique Chaaya, Dr. PH. (Johns Hopkins University); MPH (Epidemiology & Biostatistics) & B.Sc. Environmental health (American University of Beirut)

CONTACT DETAILS: VAN DYCK BLDG. / ROOM: 223

Ext: 4649/ (Sec.4640)

Email: mchaaya@aub.edu.lb

Office hours: By appointment

Course schedule: Tuesday (Lecture): 3:30pm-4:45pm and Thursday (Practical): 5:30pm-7:30pm

COURSE DESCRIPTION

The course provides advanced knowledge of epidemiologic studies and covers in details methodological issues concerning the design and the analysis of observational studies (cross sectional, case control and cohort studies). It also introduces design and analysis of randomized clinical trials. The course addresses key validity issues related to selection of study subjects, accuracy of measures of measures, confounding bias, and discusses effect modification. The course is blended and relies on didactic teaching, applications on and class discussion of selected articles, online discussion sessions, and designing of two observational studies. Ethical considerations in epidemiologic research are discussed throughout the course.

SPECIFIC LEARNING OBJECTIVES

By the end of the course, students will be able to:

1. Apply epidemiological principles and methods to design Epidemiological studies.
2. Apply various epidemiological measures of disease occurrence and association for different study designs
3. Evaluate association based on causal and statistical inference
4. Distinguish between confounding and effect modification and apply these concepts to describe the role of variables as potential confounders or effect modifiers.
5. Interpret and summarize results of advanced statistical analyses of epidemiological data.
6. Apply STROBE guidelines to evaluate the reporting of observational epidemiological studies

7. Appraise the quality and validity of epidemiological studies
8. Apply ethical principles in all stages of epidemiological research

CONCENTRATION COMPETENCIES

[EBC3]: Design epidemiological studies to investigate public health research questions

[EBC5]: Apply inferential statistics and advanced statistical approaches such as regression modelling to analyze complex health related data

[EBC6]: Interpret and communicate statistical findings in oral and written format

[EBC8]: Appraise the quality of epidemiological evidence by evaluating studies for bias and other sources of systematic errors

Prerequisites: EPHD 300 and EPHD 310

STRUCTURE OF THE COURSE

The course is made up of both face-to-face and online sessions. Students meet at least once a week with the instructor and are required to attend 21 face-to-face sessions, and complete 5 online activities. During online sessions, students do not attend class but are responsible to perform specific tasks that will meet the objectives of the course and in particular that of the online session. The course covers 6 main topics. The course relies on didactic teaching, applications and class discussion of selected articles in class and online discussion sessions of selected readings from the literature related to the main topics. Ethical considerations will be discussed throughout the course. The course also includes write-up of 3 epidemiological study designs and a class presentation of selected topics of in the Epidemiology literature. Different ways of assessment will be used (homework assignments, participation and discussions, and 2 quizzes).

Technical Assistance and Moodle support

Understanding and navigating through Moodle is critical to successfully completing this workshop. All participants are free to contact the facilitators for any technical problem or question by sending an email to either acps@aub.edu.lb or contacting 3515 – 3516 - 3519- 3589

RECOMMENDED TEXTBOOKS:

A big part of this course is based on the book “**Epidemiology Beyond the Basics**” by Szklo and Nieto, 4th edition, Jones and Bartlett, 2019. Selected book chapters and other mandatory readings are indicated in the class schedule. PDF copies of some readings will be shared on Moodle.

Other textbooks used:

- “The Case-Control Method Design and Applications” by Haroutune Armenian, Oxford 2009
- Epidemiology : “Concepts and Methods” by Oleckno, Waveland Press 2008

POLICIES AND OTHER GENERAL NOTES:

- ‘AUB strives to make learning experiences as accessible as possible. If you anticipate or experience academic barriers due to a disability (including mental health, chronic or temporary medical conditions), please inform me immediately so that we can privately discuss options. In order to help establish reasonable accommodations and facilitate a smooth accommodations process, you are encouraged to contact the Accessible Education Office: accessibility@aub.edu.lb; [+961-1-350000](tel:+961-1-350000), [x3246](tel:+961-1-350000); West Hall, 314’.
- On proper referencing and plagiarism: “Education is demanding and time management is essential. Do not hesitate to use the resources around you but do not cut corners. Cheating and plagiarism will not be tolerated. Please review the Student Code of Conduct in your handbook and familiarize yourself with definitions and penalties (p. 34-35). If you are in doubt about what constitutes plagiarism, ask your instructor because it is your responsibility to know. The American University of Beirut has a strict anti-cheating and anti-plagiarism policy. Penalties include failing marks on the assignment in question, suspension or expulsion from University and a permanent mention of the disciplinary action in the student’s records.”
 - On Netiquette: Netiquette refers to the proper way to communicate electronically with others. Check the following link for Netiquette guidelines: <http://www.albion.com/netiquette/> . You are highly encouraged to take a Netiquette Quiz to test your Netiquette. You can find such a quiz at the following site: <http://www.albion.com/netiquette/netiquiz.html>

DETAILED SCHEDULE

Date	Session Content	Assigned readings/ important Notes	Session Type	Assignment Grade %
Tuesday January 28, 2020	<ul style="list-style-type: none"> • Introduction to EPHD 320: • Introduction to blended learning • Reviewing measures of disease occurrence 	Szklo and Nieto Chap2	F2F	
Thursday January 30, 2020	<ul style="list-style-type: none"> • Reviewing measures of disease association • Application in class • Evaluating associations 	Szklo and Nieto Chap2	F2F	
Tuesday February 4, 2020	<ul style="list-style-type: none"> • Confounding: Discussion of confounding concepts and applications • Feedback from instructor 	Szklo and Nieto chap 5	F2F	
Thursday, February 6, 2020	<ul style="list-style-type: none"> • Applications on confounding <p>Application</p>	Group work	F2F	
Tuesday February 11, 2020	<ul style="list-style-type: none"> • Interaction / effect modification 	Szklo and Nieto chap 6	F2F	
Thursday, February 13, 2020	<ul style="list-style-type: none"> • Applications on Interaction / effect modification • Feedback from instructor <p>Application</p>	Group work	F2F	
Tuesday February 18, 2020	<p>Cross-sectional studies: issues of design</p> <ul style="list-style-type: none"> • Focusing on sampling (including sample size), measurement and biases • Introduce STROBE guidelines 	STROBE article	F2F	
Thursday, February 20, 2020	<p>Cross-sectional studies: Applications</p>	<p>Critical assessment of one paper.</p> <p>Designing a cross-sectional study</p>	<i>Online</i>	10%
Tuesday February 25, 2020	Case-control studies: Issues of design	Armenian's chapter 3 + assigned article on bladder cancer	F2F	

	<ul style="list-style-type: none"> Selection, sources and types of cases and controls , sample size, and biases 			
Thursday, February 27, 2020 Application	<ul style="list-style-type: none"> Class discussion of a published case-control study 	Armenian's chapter 3		
Tuesday March 3, 2020	Case-control studies: Issues of analysis Discussion of results from a published article	Armenian's chapter 6	F2F	
Thursday, March 5, 2020 Application	Discussion of 2 published case-control studies	Armenian's chapter 3+ Chaar's article	Online	
Tuesday March 10, 2020	Cohort studies: Issues of design	Oleckno, Chapter 11+ Assigned article on a cohort of pregnant women	F2F	
Saturday, March 7	Quiz I covering material of week 1-5			20 %
Thursday, March 12, 2020 Application	Designing a case control study <ul style="list-style-type: none"> Discussion, informal presentation Submission of a written protocol on Moodle after 10 days	Supporting articles on Moodle	Group work in class	10 %
Tuesday March 17, 2020	Cohort studies: Issues of analysis:	Supporting articles on Moodle	F2F	
Thursday, March 19, 2020 Application	Cohort studies Article discussion		F2F	
Tuesday March 24, 2020	Survival Analysis		F2F	
Thursday, March 26, 2020 Application	survival analysis: Hands on application in the computer lab using STATA/ SPSS		Computer lab	5 %

	Homework on survival analysis (individual)		
Tuesday March 31, 2020	Application on cohort studies: Designing a cohort study (Group work)		<i>Online</i> 10 %
Thursday, April 2, 2020	Critical evaluation of literature: Looking at Biases	Szklo and Nieto chap 4	<i>F2F</i>
Tuesday April 7, 2020	Experimental studies: issues of design (Guest Lecturer: DR.. Khalil El Asmar)		F2F
Thursday, April 9, 2020	Experimental studies: issues of analysis (Guest Lecturer: Dr. Khalil El Asmar)		F2F
Tuesday April 14, 2020	Article Discussion		F2F
Thursday, April 16, 2020	Article Discussion		<i>Online/F2F</i>
Tuesday April 21, 2020	Critical evaluation of literature: reviewing 2 articles		<i>F2F student led discussion</i> 10%
Thursday April 23	Synthesizing and Reporting results of epidemiological studies :applications in class	Szklo and Nieto chap9	F2F
Tuesday April 28	TBA		
Thursday April 30	Review		F2F

Quiz II, including questions from an article 25 %

Participation 10 %

REFERENCES AND READINGS

(This is not an exhaustive list of readings)

1. Erik Von Elm, Douglas G Altman, Matthias Egger, Stuart J Pocock, Peter C Gøtzsche, Jan P Vandenbroucke, for the strobe initiative. 2007. The strengthening the reporting of observational studies in epidemiology (strobe) statement: guidelines for reporting observational studies. PLOS Medicine.
<https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.0040296>
2. Haroutune Armenian. 2009. Avoiding bias in case control selection, Chapter 3. In (ed Armenian) The Case-Control Method: Design and Applications. Oxford University Press
3. Gayane Yenokyan. 2009. Analysis of case control data, Chapter 6. In (ed Armenian) The Case-Control Method: Design and Applications. Oxford University Press
4. Haroutune Armenian. 2009. Applications: Outbreak investigation, Chapter 7. In (ed Armenian) The Case-Control Method: Design and Applications. Oxford University Press
5. David A Grimes, Kenneth F Schulz. 2005. Compared to what? Findings controls for case-control studies. Lancet, 365, 1429-33
6. Michael N. Bates Omar A. Rey Mary L. Biggs Claudia Hopenhayn Lee E. Moore David Kalman Craig Steinmaus Allan H. Smith. 2004. Case-Control Study of Bladder Cancer and Exposure to Arsenic in Argentina. American Journal of Epidemiology, Volume 159, Issue 4, 15 February 2004, Pages 381–389, <https://doi.org/10.1093/aje/kwh054>
7. Al-Shaar, L., Chaaya[§], M., Ghosn, N., Mahfoud, Z. (2014). Brucellosis Outbreak in Chouf district-Lebanon, 2009: A case control study. Eastern Mediterranean Health Journal, 20(4), 250-6.
8. Nguyen CL, Nguyen PTH, Chu TK, *et al.* 2017. Cohort profile: maternal lifestyle and diet in relation to pregnancy, postpartum and infant health outcomes in Vietnam: A multicentre prospective cohort study. *BMJ Open*; 7:e016794. doi: 10.1136/bmjopen-2017-016794
9. More articles/book chapters will be added to the list

Table 1. Learning Objectives mapped to concentration competencies

Concentration Competencies	Learning Objectives							
	LO1	LO2	LO3	LO4	LO5	LO6	LO7	LO8
[EBC3]: Design epidemiological studies to investigate public health research questions	X					X		X
[EBC5]: Apply inferential statistics and advanced statistical approaches such as regression modelling to analyze complex health related data		X	X	X				

[EBC6]: Interpret and communicate statistical findings in oral and written format				X	X			
[EBC8]: Appraise the quality of epidemiological evidence by evaluating studies for bias and other sources of systematic errors						X	X	

Table 2: Table Assessment (type and weight) mapped to course learning objectives (LOs) and Concentration competencies

Assessment	Group/Individual work	Percentage	Course Learning Objectives	Distinct Competencies
1. Cross sectional studies: Critical assessment of a published paper and design	individual	10%	LO1, LO3, LO6,LO7	EBC3, EBC6, EBC8
2. Case control studies: Designing a study	Group work	10%	LO1, LO6	EBC3
3. Cohort studies: Designing a study	Group work	10 %	LO1, LO8	EBC3
3. Quiz I	Individual	20%	LO2, LO3, LO4. LO5	EBC5, EBC6, EBC8
4. Homework on survival analysis	Individual	5%	LO2, LO5	EBC5
5. critical evaluation of two articles	Group	10 %	LO6, LO7	EBC8
6. QuizII	Individual	25%	LO2, LO3, LO5, LO7	EBC3, EBC5, EBC6, EBC8
7.Participation	Individual	10 %	LO1, LO3,LO4, LO5, LO7, LO8	EBC3, Ebc6, EBC8

Table -3 Description of Assessment methods, type, Corresponding Learning Objectives and grade percentage

Assessment method	Group / Individual work	LOs covered	Grade percentage
Assessment 1: Cross sectional studies: Critical assessment of one published paper and design of a cross sectional study	Group	LO3,LO6,LO7	10 %
<p>Critical assessment of one published paper using STROBE and material covered in lecture. Students will read one cross sectional study, identify all aspects of study design and assess them in terms of accuracy, clarity, validity and appropriateness, and discuss the appropriateness and clarity of presentation of the analysis and results sections. They will also use the STROBE guidelines to assess the various part of the articles. Students are given rubrics that will be used for grading. (rubrics attached).</p> <p>Students will also prepare a draft design of a cross sectional study.</p>			
Assessment 2 and 4 : Design of an epidemiological study(one case control and one cohort)	Group	<i>LO1, LO6, LO8</i>	<i>20 %(10 % case control and 10 % cohort)</i>
<p>The purpose of these activities is to apply epidemiological principles and methods discussed in class to <u>design one case control study and one cohort study</u> to answer a specific research question that the instructor specifies. Students, in groups, will design an epidemiological study where they have to address thoroughly and critically all aspects of design and analysis, discuss strength and associations of their design and highlight ethical issues relevant to the study. The final product is evaluated based on rubrics shared a priori with students on Moodle</p>			
Assessment 3: Quiz I	<i>Individual</i>	<i>LO2, LO3,LO4,LO5</i>	<i>20 %</i>
<p>This assessment is intended to provide an individual student assessment of the level of apprehension of the material covered in the first five weeks. The quiz consists of few MCQs that test their ability to identify the type of study, measures, and biases. It also includes short problem where they have to apply epidemiological methods (calculation of appropriate measures of association, stratifying data , etc) in order to test presence and strength of association, confounding, determining if there is effect modification is and evaluating strength of association. Small case studies are given to identify design issues of cross sectional and case control studies</p>			
Assessment 5: Homework on survival analysis	Individual	LO2, LO5	5%
<p>It covers weeks 8 and 9 lectures and addresses analysis of cohort studies. This homework assignment involves statistical analysis using real datasets generated from a cohort study with time to event data.</p>			

Assessment method	Group / Individual work	LOs covered	Grade percentage
<p>Students analyze the data using different approaches but most importantly time to event analysis, specifically survival analysis using Kaplan Meier curve and Cox regression analysis. Students will present their results and interpret their findings. SPSS/STATA outputs should be provided.</p>			
Assessment 6: Evaluation of two published articles	Group	LO6, LO7	10 %
<p>Students will evaluate the internal validity of assigned articles and will present their results orally. Instructor and students will evaluate the presentation in terms of content and thoroughness of review.</p>			
Participation	Individual	LO1, LO5, LO3,LO4, LO7	10 %
<p>Students are required to complete assigned readings prior to class to allow engaged participation in class. They will also be asked to comment on specific parts of a published epidemiological study and engage in an online discussion on Moodle Forum and they have to respond to specific questions raised by the instructor</p>			