EPID 7020 Introduction to Epidemiology II
EPIDEMIOLOGIC METHODS

Fall 2008

Meeting Times

Lectures and labs: Tuesday & Thursday 2:00 – 3:15 am; Aderhold 417

Instructors

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Office hours: by appointment

Teaching assistant

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Course description

The primary purpose of this course is to allow students to develop a solid understanding of the theoretical basis and practical tools of epidemiologic research. This course will review and further develop topics introduced in EPID 7010. Strategies for investigation of etiologic hypotheses including study design, data collection, quantitative assessment and control of confounding and other biases, evaluation of effect modification, and interpretation and reporting of study results will be covered in detail. Topics will include analysis of data from cross-sectional, case-control, and cohort study designs.

Primary text and other resources needed

Moyses Szklo and F. Javier Nieto. *Epidemiology: Beyond the Basics*. 2nd edition, Jones & Bartlett Pub., Inc., Sudbury, MA, 2007.

Each student will need to bring a flash drive to all labs. There will not be a course pack as all other materials will be posted on Web CT.

Communication

We encourage students to communicate openly and frequently with the EPID 7020 team throughout the semester. All instructors and the TA will have specific office hours and are available to meet by appointment as well. E-mail is also a good way to communicate, however, any e-mail communication needs to have the words "EPID 7020 …" in the subject line!!! Furthermore, announcements or assignments to the class will be occasionally made via e-mail using the WebCT interface. It is therefore the student's responsibility to actively monitor their university e-mail account.

Course objectives

Students successfully completing the course will be able to:

1. Formulate and justify an etiologic hypothesis or research question based on the current literature.

2. Identify the most appropriate study design for addressing an etiologic hypothesis.

3. Identify the most appropriate approaches to data collection, considering issues of accuracy, participant burden, and resource requirements (cost and personnel).

4. Identify potentially important sources of bias and design the study to avoid these and/or enable quantitative estimation of the potential impact of the bias.

5. Identify and conduct appropriate statistical analyses to address the specific bias of confounding.

6. Understand how to formulate questions of effect modification (i.e., interaction) and how to analyze, report, and interpret tests of effect modification.

7. Understand key approaches, advantages, and disadvantages of data analysis for cross-sectional, case-control, and cohort designs.

8. Conduct a multi-faceted analysis of a research question addressing an etiologic hypothesis which integrates the concepts taught in this course in a practical experience.

Course organization

The **lectures** will typically focus on a specific set of epidemiologic concepts or methods and will be presented by Drs. Vena and Valeika. Students prepare for lectures using the textbook and any other materials as indicated in the course schedule. Students are encouraged to ask questions!

The **lab sessions** will be used to address a number of objectives: including a) supported work on the course project with instructor(s) or TAs present; b) group discussion sessions focusing on the application of a topic previously covered in lectures; c) review of course material at critical junctures or occasionally, the extension of lecture topic into the lab.

Homework assignments will be due at intervals throughout the semester. These will be structured to provide practical experience and serve as a preparation for the exams and will be graded. Homework will be due at 5:00 pm on the due date. Homework assignments will be posted on **WebCT**. Late homework will receive a maximum of half the marks. Homework solutions will be posted after the due date. Please use the following guidelines for your homework documents and file submissions:

1. Submit on time (5:00 pm of due date).
2. Send via WebCT. Electronic submissions are preferred.
3. Document instructions:
    a. Homework answers must be typed.
    b. Put name or initials on filename of document.
    c. Put name on actual document [**on header or footer, so it is on <u>each</u> page**].
    d. Insert page numbers.
    e. Copy and paste items from other files/documents into the Word document. You can copy and paste Excel tables and charts. You can copy and paste SAS code, output and log.
    f. Other Hints: You will want to save SAS output in the future for thesis/dissertation or other work. To reduce white space on your output, use the following in your options statement: formdlim=' '. When you want to save all output from the output window in SAS, save as file type **.rtf**. This is 'rich text format' and is easily read as a Word document. The default is **.lst** [list file], which needs SAS to be vieThur.

Exams. There will be a total of three exams in the course of the semester, one in-class, one take-home, and a final examination (see the course schedule). The final exam date is yet to be determined.

Drs. Vena and Valeika and theTA will discuss the homework and assist with the course projects. They will be available during office hours.

Course project. Each student will be responsible for conducting a multi-faceted analysis of a research question addressing an etiologic hypothesis. The course project has been designed to allow students to integrate the concepts taught in this course and apply them in a practical experience, and will be conducted in three parts. Data will be provided for this project. You **must** use the data set provided. **There will be absolutely no exceptions to this—do not even think about asking us** ☺ !

The topic will be based on a hypothesis or research question that you will determine, based on a sample of options provided and on the data that you will have available. The analyses should not be a blind exercise, but should be motivated by some understanding of the topic area. If the topic is new to you, be sure to become familiar with the concepts (this does not mean you need to conduct a comprehensive literature review, but you should read at least a few relevant papers). Next, make certain you understand the design, objectives, and data collection protocol of the parent dataset. Subsequently, you can either choose a research question from those provided or formulate a research question from the suggested list of variables. Within the dataset, identify a main “exposure” or predictor variable of interest (it can be continuous, categorical, or binary), a binary or continuous outcome (you could take a continuous variable and dichotomize it), and about 5 covariates (3 major covariates in addition to age and race) that are potential confounders or effect modifiers, with the goal of using these variables to address the research question. Among the exposure and other covariates, there should be at least one variable that is either continuous or ordered categorical. If you choose your exposure and outcome, make sure that after you dichotomize your exposure and your outcome the total number of observations in the smallest cell of a 2x2 table is no less than 50.

Each course project part is due at 5 pm of the due date and will be handed in as a hardcopy at a location yet to be determined. Each project part will be graded. Projects may be resubmitted one time to receive additional points.

Evaluation of student performance

Course grades are based on:

Homework	10%	
Class participation	5%	
Course Project	25%	
Presentation & Abstract	5%	
Exam I	15%	(in class)
Exam II	15%	(take home)
Final Exam	25%	(in-class)

Attendance and participation in classes with evidence of adequate preparation to contribute to discussions are essential. Students are expected to come to class prepared to ask and answer questions and contribute to any discussion of that day's topic. Except in exceptional circumstance, a student who misses more than 6 classes cannot expect to receive a final grade higher than C regardless of other grades.

Grading scale

The following grading scale will be used:

90 - 100 = A
86 - 89 = B+
80 - 85 = B
76 - 79 = C+
70 - 75 = C
66 - 69 = D+
60 - 65 = D
< 60 = F

Academic integrity notice:

All academic work must meet the standards contained in "A Culture of Honesty." All students are responsible to inform themselves about those standards before performing any academic work. More detailed information about academic honesty can be found at
http://www.uga.edu/ovpi/honesty/acadhon.htm

It is the responsibility of every student at the University of Georgia to adhere steadfastly to truthfulness and to avoid dishonesty, fraud, or deceit of any type in connection with any academic program. Any student who violates this rule or who knowingly assists another to violate this rule shall be subject to discipline. **Evidence of cheating will result in a failing grade.**

CLASS		DAY	DATE	TOPIC	INSTRUCTOR	READING	DUE
1	Lect.	Tues	8/19	Course overview Review study designs & Hybrid designs	Vena	Ch. 1	
2	Lect.		8/21	Measures of disease occurrence	Vena	Ch. 2 SEARCH	
2	Lect.	Thur	8/21	Measures of association (1) (cohort)	Vena	Ch. 3.1- 3.2 Appendix A3	
3	Lect.	Tues	8/26	Measures of association (2) (case-control)	Vena	Ch. 3.4- 3.5 Appendix A4	HW 1
4	Lab	Tues	8/28	Project overview & SAS workshop	Vena & Valeika	Reichman Baldwin Gould	
		Mon	9/1	Labor Day- No Classes			
5	Lect.	Tues	9/2	Measures of association (3) (case control & cross-sectional) Measures of impact (1)	Vena	Ch. 3.3 Ch. 3.2.2; 3.4.2	
	Lab			Project I workshop	Vena & Valeika		
6	Lect.	Thur	9/4	Measures of impact (2)	Vena	Rockhill Rowe Levine	P 1
	Lab			Confounding (1)	Vena	Ch. 5.1- 5.4	HW 2
7	Lect.	Tues	9/9	Confounding (2)	Vena	Ch. 5.5-5.6 Ch. 7.5-7.6	
8	Lect.	Tues	9/11	Frequency tables, stratification & Intro to Regression	Valeika	Ch. 7.1-7.3 Sorlie	
	Lab			SAS procedures for stratification and adjustment	Valeika		
9	Lect.	Tues	9/16	Confounding (3)	Vena	Hernan Greenland	
10	Lect.	Thur	9/18	Effect modification (1)	Vena	Ch. 6.1-6.4	HW 3 P1 res
	Lab			Effect modification (2)	Vena	---	

CLASS		DAY	DATE	TOPIC	INSTRUCTOR	READING	DUE
11	Lect.	Tues	9/23	Effect modification (3) Evaluation of EM using SAS	Valeika		
12	Lect.	Thur	9/25	Review for Exam	Vena & Valeika		HW 4
	Lab			Group work: Confounding	Vena		
13	Lect	Tues	9/30	Exam 1 In class	Vena	---	EX 1
14	Lect.	Thur	10/2	Effect modification (4)	Vena	Ch. 6.5-6.12 Ch 1.2 Hokanson Bell	
	Lab			Project 2 Workshop	Vena & Valeika		
15	Lect.	Tues	10/7	Reliability and Validity	Vena	Ch. 8	
16	Lect.	Thur	10/09	Bias 1	Vena	Ch. 4.1- 4.3	
	Lab			Bias 2	Vena		
17	Lect.	Tues	10/14	Bias 3	Vena	Ch. 4.4	P2
18	Lect.	Thur	10/16	Logistic regression 1	Valeika	Ch. 7.4.	HW 5
				Exam 2:Take Home handed out			
19	Lect.	Tues	10/21	Logistic regression 2	Valeika	Ch. 7.5-7.7	Exam 2 due
20	Lect.	Thur	10/23	Logistic regression 3	Valeika		HW 6
	Lab			Project 3 Workshop	Valeika and Vena		
21	Lect.	Tues Lab	10/28	Logistic regression 4 Logistic regression using SAS	Valeika		P2 res
22	Lect.	Thur	10/30	Survival 1	Valeika	Ch. 2.2	
23	Lect.	Tues	11/4	Survival 2	Valeika		HW 7

CLASS		DAY	DATE	TOPIC	INSTRUCTOR	READING	DUE
24	Lect.	Thur	11/06	Causality	Vena	Hernan Greenland	P3
	Lab			Group work: Causality		Schiffman Millikan	
25	Lect.	Tues	11/11	Quality assurance and control	Vena	Ch. 8	HW8
26	Lect.	Thur	11/13	Communication	Vena	Ch. 9	P3 res
27	Rev	Tues	11/18	Abstract presentations	All		HW9
28		Thur	11/20	Abstract presentations	All		
29		Tues	12/2	Abstract presentations	All		
30		Thur	12/4	Exam Review	Vena and Valeika		

HW = Homework
P = Project
Ex = Exam