PH663: Principles of Epidemiology I, Fall 2007

Meeting place and time: Biomed T211, Wednesday, 0900-1150

Instructor:
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Office hours:
By appointment only

Course overview:
This is a survey course to introduce students to epidemiologic principles and methods. Topics covered include: outbreak investigation; measures of morbidity and mortality; vital statistics; incidence and prevalence measurements; adjustment of rates; measurements of risk; biological variability; screening; measurements of error; sampling; statistical significance; surveillance; study design; association and causation; and ethical issues in human studies.

Course format:
The course material will be presented mostly in lecture format. Assigned readings to prepare for the weekly lecture are listed in the "tentative course schedule". The single required textbook is: A Study Guide to Epidemiology and Biostatistics, 6th edition, by JR Hebel and RJ McCarter. It may be purchased from the main campus bookstore in Campus Center. Used copies may be available from students who have already taken the class. Copies of previous editions are on reserve in the Wong Audiovisual Room, Sinclair Library. Several exercises will also be assigned. A handbook with course exercises can be purchased at EMA Campus Copy near the main bookstore in Campus Center. The handbook may also be available from previous course students, and is also on reserve in the Wong Audiovisual Room. Exercises will be discussed in class on assigned dates. Students are expected to come to class prepared to discuss the exercises and their answers to the questions in the exercises. Two or three video presentations will be made during the course to demonstrate the application of epidemiologic topics.

Grading:
Students will be graded on their performance on two midterm examinations (each contributing 30% of the grade) and a final examination (worth 40% of the grade). Material will be taken from the lectures, readings, exercises, and videos. Grades will be assigned based on overall course percentage score:

97 - 100%: A+	77 - 79%: C+
93 - 96%: A	73 - 76%: C
90 - 92%: A-	70 - 72%: C-
87 - 89%: B+	
83 - 86%: B	
80 - 82%: B-	

Course learning objectives:

1. Define epidemiology and identify applications of the epidemiologic method.
2. Identify examples of primary, secondary, and tertiary prevention.
3. Describe the contribution of epidemiology to disease prevention and control.
4. Name several sources of population and disease information and identify the major errors inherent in them.
5. Define and interpret the following terms:
   - A. Reliability
   - B. Validity
   - C. Sensitivity
   - D. Specificity
   - E. Positive predictive value
6. Name, apply, calculate and interpret commonly used public health rates.
7. Explain the need for rate adjustment; interpret adjusted rates.
8. Given a summary description of an analytic study:
   - A. Select terms to describe the study design.
   - B. Name and calculate appropriate rates, proportions, and measures of risk.
   - C. Interpret the study results.
   - D. Identify strengths, limitations, and potential sources of bias.
9. Identify three basic epidemiologic study designs and list the strengths and weaknesses in each.
10. Define information bias, selection bias, and confounding and give examples of each.
11. Given a causal hypothesis for a described health problem, select the most appropriate analytic study design to test the hypothesis.
12. Given disease frequency data in graphic or tabular form, interpret the findings and identify trends and patterns in disease occurrence.
13. Interpret trends and patterns in disease occurrence in terms of public health implications.
14. Correctly define and apply the basic vocabularies of infectious and chronic disease epidemiology.
15. Given data from a study of disease etiology, select the most plausible interpretation among several alternatives.
16. List and describe the criteria used to assess whether a statistically significant association between an independent and dependent variable is causal.
17. Differentiate causal, indirect, and artifactual associations, and give examples of each.

Public Health Faculty/Agency Forum core and epidemiology MPH competencies addressed:

Analytic Skills (AS)

- AS1. Define a public health problem
- AS2 Determine appropriate use of data and statistical methods
- AS4 Evaluate the quality and comparability of data and identify gaps in data sources
- AS5 Describe how data illuminate ethical, political, scientific, economic, and overall public health issues
- AS6 Identify research designs used in public health, including advantages and flaws in specific designs, and determine designs appropriate to specific needs

Epidemiology (E)

E1. Identify the epidemiological dimensions of the major causes of morbidity and mortality regionally, nationally and internationally with particular emphasis on chronic and infectious disease.

E2. Identify public health practices for disease control including surveillance, screening, and outbreak investigation.

E6. Demonstrate skills in the conduct of epidemiologic research:

e. Evaluate, interpret and discuss research results in the format required for an epidemiologic research report.

TENTATIVE COURSE SCHEDULE

PH 663, PRINCIPLES OF EPIDEMIOLOGY I

Fall, 2007 (Wednesdays, 9:00-12:00)

Date		Hour 1 (9:00-10:15) Hour 2 (10:30-noon)	
August 22		Introduction Plagues	Film:
August 29	an Epidemic (Chap. 1)*	Lec: Investigation of Snow and Cholera	EX 1:
September 5	Prevalence (Chap. 2, 3)*	Lec: Vital Statistics/Measures Rates and Adjustments (Parts A and B) of Mortality/Incidence &	EX 2:
September 12	EX 2: Rates and Adjustments (Part C: Direct Method Only)		
September 19	**MIDTERM I** (9:00-10:15)		
September 26		Lec: Measurements of Risk (Chap. 4)* Biological Variability (Chap. 5)*	Lec:
October 3		Lec: Screening (Chap. 7)* Measurements of Error	EX 3:
October 10		Lec: Sampling (Chap. 8)* Statistical Significance (Chap. 9)*	Lec:
October 17		Lec: Surveillance Chinese Cancer Epidemiology	Film:
October 24	**MIDTERM II** (9:00-10:15)		
October 31		Lec: Intro to Study Design Study Design–II (Chap. 12, 13, 14)*	Lec:
November 7		Lec: Study Design–III Study Design–IV	Lec:
November 14		EX 6: Cohort Studies EX: Study Design (Chap. 17)*	Revised
November 21		Lec: Ethical issues in Human Studies Association and Causation (Chap. 16)*	Lec:
November 28		Ex 5: Multifactorial Causation What's Killing the Children	Film:
December 5	Review Session -		

December 12 **FINAL EXAM** -

*Refers to Chapters in **A Study Guide to Epidemiology and Biostatistics, Sixth Edition**

Public Health Prevention Levels

Primary Prevention: Prevent the disease before it starts. Goal is to reduce the incidence of the disease.

Secondary Prevention: Early detection and prompt treatment of the disease. Goal is to reduce the prevalence of the disease.

Tertiary Prevention: Limiting disability and assisting with rehabilitation after the disease has occurred and left residual damage. Goal is to reduce the impact or complications of the disease.