Introduction to Epidemiology for Clinical Investigators – 1.0 Credit  
MSCI 322  
Fall Quarter 2015

Class Instruction:
Mondays 5:30-8:30 pm  
Wieboldt Hall Room 421, 339 East Chicago Avenue

Course Instructor:
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Teaching Assistant:  
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Office hours TBD and by appointment

Course Description
This course is an introduction to the field of epidemiology and its application. Epidemiology is the study of the distribution of disease and determinants of disease in human populations. The most commonly used study designs in epidemiology are observational rather than experimental. The course will introduce these study designs and basic analytic methods. Emphasis will be on the appropriate interpretation of epidemiologic evidence, including the attribution of causality when describing an exposure-disease relationship.

Learning Objectives
After completion of the course, students should be able to:

- Describe different type of observational studies and how they are used in epidemiologic research.
- Understand advantages and limitations of each different type of observational study.
- Calculate and interpret absolute and relative measures of association in different epidemiologic studies.
- Recognize and describe sources of error and bias.
- Understand confounding and effect modification.
- Understand internal and external validity.

Texts and Reading


Additional Recommended Texts (Do Not Need to Purchase)

- Nelson K, Williams C. Infectious Disease Epidemiology – 3rd Edition (Hard copy at Galter Library Reserves)
- Alexander K, Kretschmar M, Krickeberg K. Modern Infectious Disease Epidemiology: Concepts, Methods, Mathematical Models, 2010 (Online via Galter Library Website)

Student Evaluation

- Homework Assignments – 25%
- Midterm Examination – 30%
- Final Examination – 35%
- Class Participation – 10%
Final grades – Students will receive a final letter grade upon completion of the course. Final letter grades are based on cumulative points earned and are not graded on a curve. Letter grades are assigned as follows, rounded up to an integer by conventional statistical rounding algorithms:

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Course Evaluation
The Programs in Public Health administers web-based course evaluations to students for each course near the end of the quarter. Your completion of both the unit (course) and faculty evaluation components is required; failure to complete either of the evaluations will result in an incomplete grade until the evaluations are submitted. You will be sent the web link and instructions via email later in the quarter. You will have about two weeks to complete the evaluations before grades are submitted.

Academic Integrity
Every Northwestern faculty member and student belongs to a community of scholars where academic integrity is a fundamental commitment. This class abides by the standards of academic conduct, procedures, and sanctions as set forth by The Graduate School at Northwestern University. Students and faculty are responsible for knowledge of the information provided by The Graduate School on their Web page at http://www.tgs.northwestern.edu/academics/academic-services/integrity/index.html

- Academic misconduct includes, but is not limited to
  1. Receiving or giving unauthorized aid on examinations or homework
  2. Plagiarism
  3. Fabrication
  4. Falsification or manipulation of academic records
  5. Aiding or abetting any of the above

This class follows The Graduate School’s procedure for evaluating alleged academic misconduct, as outlined on the TGS website. http://www.tgs.northwestern.edu/academics/academic-services/integrity/dishonesty/index.html

Faculty reserve the right to use the “Safe Assignment: Plagiarism Detection Tool” that is part of the Course Management System to evaluate student assignments. Information about this tool can be found at http://www.it.northwestern.edu/education/course-management/support/assessments/safeassignment.html

Academic integrity at Northwestern University is based on a respect for individual achievement that lies at the heart of academic culture. Every faculty member and student, both graduate and undergraduate, belongs to a community of scholars where academic integrity is a fundamental commitment. This class abides by the standards of academic conduct, procedures, and sanctions as set forth by The Graduate School at Northwestern University. Students are responsible for knowledge of the information provided by The Graduate School on their Web page at http://www.tgs.northwestern.edu/studentsvcs/ethics/

Additionally, faculty reserve the right to use the “Safe Assignment: Plagiarism Detection Tool” that is part of the Course Management System. Info about this tool is found at http://course-management.northwestern.edu/tips/safe_assignment.html.
September 21

Topics:
- Introduction
- Prevalence, Incidence and Distribution of Disease by Person, Place, and Time
- Prevalence Studies

Lecture Readings
- Fletcher chapters: 1, 2, 3

Homework Readings (due the following Week)
- Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) [http://www.strobe-statement.org](http://www.strobe-statement.org)
- The use of antidepressants and the risk of haemorrhagic stroke: a nested case control study, Douglas et al 2011.
- Influenza vaccination, pneumococcal vaccination and risk of acute myocardial infarction: matched case-control study, Siriwardena et al 2010.

Homework
- None Due

September 28

Topics:
- Predicting and Comparing Risk
- Case-Control Studies

Lecture Readings
- Fletcher chapters: 4, 6

Homework Readings (due the following Week)
- Weekly MMWR from Aug 21, 2015, Vol 64, No 32

Homework
- None Due
October 5

Topics:
- Early History of Infectious Diseases
- Outbreak Epidemiology

Lecture Readings
- Nelson chapters 1-3, 5 OR Alexander chapters 5, 8, 9, 11
  *note these books do not completely overlap; however all essential material will be covered in lecture*

Homework Readings (due the following Week)

Homework
- Assignment #1 Due

October 12

Topics:
- Epidemiology of Infectious Disease Dynamics
- Vaccines

Lecture Readings
- Nelson chapters 4, 6, 11,15 OR Alexander chapters 12, 14, 16
  *note these books do not completely overlap; however all essential material will be covered in lecture*

Homework Readings (due the following Week)
- Maintaining a high physical activity level over 20 years and weight gain, Hankinson et al 2010.

Homework
- Assignment #2 Due
October 19

Topics:
- Confounding and Effect Modification
- Cohort Studies
- Review for Midterm

Lecture Readings
- Fletcher chapter: 5, 7

Homework Readings (due the following Week)
- None

Homework
- None Due

October 26

Topics:
- Cohort
- Confounding and Effect Modification
- Midterm Examination (through October 19 class)

Lecture Readings
- None

Homework Readings (due the following Week)
- XXX
- XXX

Homework
- Assignment #3 Due

November 2

Topics:
- Diagnosis
- Prevention/Screening

Lecture Readings
- Fletcher chapter: 8

Homework Readings (due the following Week)
- XX
- XX

Homework
- None Due
November 9  

Topics:  
- Randomized Control Trials/Efficacy vs Effectiveness  
- Prevention/Screening

Lecture Readings  
- Fletcher chapter: 9, 10

Homework Readings (due the following Week)  

Homework  
- Assignment #4 Due

November 16  

Topics:  
- Chance  
- Causality and Causal Inference  
- Systematic Reviews

Lecture Readings  
- Fletcher chapters: 11, 12

Homework Readings (due the following Week)  
- None

Homework  
- Assignment #5 Due

November 23  

Topics:  
- Data Analysis of Epidemiologic Studies  
- Common Errors in Epidemiologic Study Design, Analysis, Publication and Publication  
- Review

Lecture Readings  
- Fletcher chapter: 13

Homework Readings (due the following Week)  
- None

Homework  
- None Due
Topics:
  - Final Examination