

EPI 2110 – Principles of Epidemiology

Fall 2016 (CRN 14477)

Graduate School of Public Health, University of Pittsburgh

Primary Instructor:

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Purpose:

Epidemiology is a scientific discipline which seeks to identify and describe patterns of disease occurrence, identify determinants of disease, and evaluate disease prevention and health care treatment efforts. With its focus of study in human populations, epidemiology is directly linked with public health research, policy, and practice. This course provides an introduction to the fundamental definitions, terminology, concepts, methods, and critical thinking used in epidemiology. The material presented in this course is designed to lay the foundation for future study and practice in public health activities.

Course Objectives:

Upon completion of this course, the student will be able to:

1. Apply and interpret the basic terminology and definitions of epidemiology.
2. Calculate and interpret basic epidemiology measures.
3. Identify key sources of data for evaluating a health issue in an epidemiologic context.
4. Describe a health issue in terms of its importance and the patterns that characterize its occurrence in the community.
5. Identify the principles and limitations of basic public health programs.
6. Describe the process of identifying determinants of disease, disability, injury, or health care interventions.
7. Draw appropriate inferences from epidemiologic studies investigating the determinants of disease, disability, injury, or health care interventions.
8. Recognize the influence of age, gender, racial, ethnic, and cultural variability on epidemiologic practice and research.
9. Evaluate epidemiologic evidence to formulate reasoned strategies and decisions on health issues in the community.

Course Structure:

To learn the concepts of epidemiology and their proper application, a student should work with the course material in different ways. Therefore, the structure of the course is built around multiple modes of instruction.

- On Tuesday and Thursday evenings, the instruction will be in traditional lecture format with the presentation and discussion surrounding a set of lecture slides and examples. Students are expected to review the lecture slides prior to class to be aware of the fundamental objectives and material. Note: Only selected slides will be reviewed in the lecture. This will leave time for presentation of discussion points that focus on key material. Audio-recordings of the lecture slides will be available for those who may wish to review the material in further detail. Students are encouraged to read appropriate sections of the book for review of complex topics.
- Practice questions will also be posted in Courseweb for most of the lectures to provide further work with the lecture material. Students are expected to review this material and the posted answers to identify their strengths and weaknesses on the related concepts.
- A group project is included in this course to provide students with opportunities to identify real world data related to the epidemiology concepts under discussion. The group project also allows students to work with other students to analyze and interpret epidemiology information.
- In addition, we will be using the time from 7:00 to 7:30pm in L9 Clapp Hall on Tuesdays and Thursdays as a recitation period for the discussion and review of key lecture concepts and problem sets. This learning period is not required, but your attendance is encouraged, particularly if you identify weaknesses in your understanding of the material, the application of the material, or in problem solving.

Course Requirements:

The following requirements pertain to this course.

Completion of **8 homework assignments** will be required in the course to facilitate learning of the concepts presented in the course. The assignments will pertain to lecture-specific topics and will generally cover issues that require quantitative and critical thinking skills. Please consult the schedule at the end of this syllabus to identify the assignments and their due dates and times for receipt. You should return the homework assignments through Courseweb.

Note: Homework exercises will be scored (for grading purposes) on the basis of selected questions within each assignment. Exercises with correct interpretations on these questions will receive full credit for the assignment. Exercises that have incorrect interpretations will be reduced in score. The purpose of the homework assignments is to help you identify areas of strength and weakness in the concepts presented. You will be expected to review posted answer sheets to verify your performance on all questions in the assignment. Help to address an identified weakness can be obtained at the recitation periods, and/or through questions directed to the teaching assistants. **No credit will be given if an assignment is turned in late** (unless prior arrangements have been made).

There is also a **group project participation** requirement in this course. This requirement will begin in week 2 of the course and will proceed until the end of the term. You will be assigned to a specific group, and asked to work together on assignments throughout the term. Assignments will range from gathering and assessing population data, solving various problems, and evaluating a scientific paper. Groups will vary in size from 5-6 students. The group to which you are assigned will be posted on the

Courseweb site in week 2 of the course. Group project assignments will also be posted under the Group Project link on Courseweb. Grades for the group project requirement will be determined on the basis of the quality of returned contributions and by peer assessment.

Four exams will be given during the course to evaluate the level of mastery of the material presented. The first exam on September 22 will be given in L9 Clapp Hall from 5:30pm to 7:30pm. The second exam on October 20 will be given in L9 Clapp Hall from 5:30pm to 7:30pm. The third exam will be given on November 17 in L9 Clapp Hall from 5:30pm to 7:30pm. The final exam will be an in-class exam and will take place in L9 Clapp Hall on December 15. The final exam will begin at 5:30pm and run to 7:30pm. The final exam on December 15 will cover material from the entire semester. Students will be allowed to use notes and the textbook during the exams on September 22, October 20, November 17, and the final exam. Remember, also, to bring a working calculator to these exams. Laptops and cellphones will not be permitted for all exams. There are no make-up exams except under **EXTREME** circumstances (i.e. death in the family).

The exams will be comprised of a variety of question formats. Essay questions will query your ability to problem solve and apply the lecture material to relevant health scenarios. Short answer and multiple choice questions will assess your recognition of key lecture topics and your synthesis of these topics. In addition, the take-home exam will contain a heavy dose of epidemiological problems requiring calculations. The purpose of each of the exams will be to evaluate how well the student recognizes and expresses the concepts of epidemiology, why certain actions are done in epidemiology, and the appropriate application of epidemiologic approaches and methods. This means that, in many circumstances, you will be required to think and state how an epidemiologic principle applies to a given situation, or to identify which given example is the best representation of an epidemiologic principle. The exams are based on critical thinking and not on memorization.

Extra Credit:

As an extra credit exercise you will be offered the opportunity to maintain a regular **personal journal**. This journal is meant to be a tool through which the student can apply the lecture principles and objectives to different public health issues and settings. Throughout the term, discussion questions will be posted after each lecture. Often, the questions will cover controversial issues in epidemiology to which there are not yet any clear answers. Students are encouraged (though not required) to maintain a journal on Courseweb using the posted personal journal to record their responses to the questions throughout the semester. Extra credit will be provided for students who maintain a journal, with one point given for weekly journal entries provided in the first one-half of the course (prior to October 20), and one point given for weekly journal entries provided in the second one-half of the course. Outstanding and creative responses to the practice questions may also be selected by the instructors to be highlighted, anonymously, on a class page posted in Courseweb.

Recommended Text:

Epidemiology, 4th edition, Gordis (2009), Elsevier/Saunders Company (ISBN: 978-1-4160-4002-6).

-purchase only, available online

Epidemiology, 5th edition, Gordis (2014), Elsevier/Saunders Company (ISBN: 978-1-4557-3733-8).

-purchase online

-available as an electronic book (no purchase required) at the Health Sciences Library website

<http://www.hslls.pitt.edu/resources/books/ebooks?s=Epidemiology>

Grading Policy:

Course requirements will be weighted in the following fashion to determine the final course grade.

Homework Exercises:	10%	(@1.25% each)
Group Project Participation	10%	
Exams:	80%	(20% each)

Grades will be assigned using a letter grade as follows:	A:	90% or higher
	B:	80% to < 90%
	C:	70% to < 80%
	F:	< 70%

Students who withdraw from the course must verify that they have been removed from the class roster maintained by the University Registrar. Otherwise, students who remain on the roster and do not complete the designated work will be assigned a failing grade.

Course Expectations:

As a student in this course, you can expect the following:

Epidemiology is a discipline that utilizes a blend of quantitative and qualitative skills and abilities to address important health issues in the community. In epidemiology, heavy emphasis is placed upon describing the importance of health issues through quantitative measures where there are correct and incorrect methods to identifying answers. However, in epidemiology, a professional must also be able to interpret this quantitative information in the context of the community and accepted practices. This interpretation involves the use of critical thinking skills. It is often the case that there is not necessarily one correct answer or only one approach to the proper interpretation of a health problem. Often, a professional must choose among various options by identifying a solution that is the most appropriate for the problem posed given the information available to that person. **Acquiring the knowledge and skills to make reasoned judgments is one of the goals of this course.** For many students, this will be their first experience in making judgments where there is not one concrete answer. As a result, some students may become frustrated, especially if their interpretations are marked off on exams and lose points. Be patient and keep on trying. Making reasoned judgments takes time and practice.

This course includes students from all of the departments in the Graduate School of Public Health, and students from several schools outside of the GSPH. As a result, it contains students from many different cultures and backgrounds and with many different levels of understanding and expertise. You are encouraged to take advantage of the opportunity to meet and work with others in the course. As one of the course requirements, you will be placed into a small group with other class members to work on assigned questions together to facilitate this interaction.

The graduate nature of this class also means that there is the expectation that students will monitor their academic progress and seek help when necessary. Answers to practice exercises and homework assignments will be posted as part of the course material for each lecture. Students are expected to review this material and their own completed work to independently assess their level of understanding of the material. If questions still remain, students should seek input from the teaching assistants or instructors during office hours or the recitation periods. Feedback on the exams will be provided within one week after the completion of the exam.

Academic Integrity:

All students are expected to adhere to the school's standards of academic honesty. Any work submitted by a student for evaluation must represent his/her own intellectual contribution and efforts. You are not permitted to work with other students or other persons on the take-home exam.

The GSPH policy on academic integrity, which is based on the University policy, is available online at <http://www.publichealth.pitt.edu/interior.php?pageID=126>. The policy includes obligations for faculty and students, procedures for adjudicating violations, and other critical information. Please take the time to read this policy.

Students committing acts of academic dishonesty, including plagiarism, collaboration on take-home exams, cheating on in-class exams, misrepresentation of data, and facilitating dishonesty by others, will receive sanctions appropriate to the violation(s) committed. Sanctions include, but are not limited to, reduction of a grade for an assignment or exam, failure of an exam, and failure of the course.

All student violations of academic integrity will also be documented and forwarded to the GSPH Office of Student Affairs. If a sanction for a violation is agreed upon by the student and instructor, then the document of violation will be expunged from the student file upon the student's graduation. If the sanction proposed by the instructor is not agreed upon by the student, then the violation will be referred to the GSPH Academic Integrity Hearing Board, where a final decision on the violation will be rendered. However, the document of the academic violation and the final decision of the Hearing Board will remain in the student's permanent record.

Disability Resources and Services:

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both Dr. Songer and Disability Resources and Services (DRS), 140 William Pitt Union, Phone: (412) 648-7890, drsrecep@pitt.edu, (412) 228-5347 for P3 ASL users, as early as possible in the term. DRS will verify your disability and determine reasonable accommodations for this course. A comprehensive description of the services of that office can be obtained at www.drs.pitt.edu.

Students that require accommodations in the event of a building evacuation should e-mail the Office of Environmental Health and Safety (EHS) at safety@ehs.pitt.edu to request the development of an individualized evacuation plan. When finalized, you should also inform Dr. Songer of the proposed plan for an evacuation.

Office Hours:

Instructor:

Dr. Songer: Fridays, 3:00 – 4:30 pm, Starbucks, Fifth Ave. (under Amos Hall)

Teaching Assistants:

Mr. Mahajan	TBD
Ms. Harris:	TBD
Dr. Garcia Calavaro	TBD
Ms. Gao	TBD

Course Website:

All course materials can be accessed through the Courseweb application used at the University of Pittsburgh (<http://courseweb.pitt.edu>). All enrolled students who have an active University Computer Account have online access to this application. Class materials on this system can be accessed through the links on the left side of the screen after you enter into the course. Click on the **Course Documents** link to gain access the lectures, class handouts, assigned readings, practice exercises, and homework assignments. This material is embedded in the links pertaining to each lecture of the course. The basic structure of the Course Documents link is built around lecture modules. Many different types of materials will be provided in each module, including lecture slides, an audio recording to describe the slides, reading associated with the lecture material, a practice exercise to assess your understanding, personal journal questions, required homework assignments, and occasionally assorted exercises.

Course materials related to the **Group Project** will be located in a separate link on Courseweb. Part of the group project will involve you posting material into a Wiki. Details on posting in Wikis are included in the **Student Help** link in Courseweb. Also, the take-home exam will be posted under the **Exams** link in Courseweb. Finally, all announcements related to the course will be posted using the Courseweb announcement system. You will be expected to monitor Courseweb regularly for these announcements. If changes occur in the course, they will be broadcast through this mechanism.

Audio recordings:

Audio recordings of the lectures are provided to assist students on material that may be confusing or covered quickly in the course. All recordings are posted under their respective lecture links under **Course Documents** on the Courseweb site and available for listening on the Kaltura media space. To my knowledge, these files are not downloadable through Courseweb. The audio files pertain to lectures recorded in the fall of 2012. While the material in the recordings is roughly similar to that presented this year, it can differ in some instances. Be aware that you will be assessed on material as it is presented in the current lectures.

Given that recordings are already provided for each lecture, and to ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

Lecture, Exam, and Assignment Schedule:

Date	Instructor	Class Session/Topic
August 30	Songer	Introduction & Historical Overview of Epidemiology Reading: Textbook (Gordis, 4 th Ed.): Chapter 1 Textbook (Gordis, 5 th Ed.): Chapter 1 LaMorte WW. The Evolution of Epidemiologic Thinking. Available at: http://sphweb.bumc.bu.edu/otlt/mph-modules/ep/ep713_history/EP713_History3.html
September 1	Songer	Epidemiologic Approach to Disease I; Describing Patterns of Disease Reading: Textbook (Gordis, 4 th Ed.): Chapter 2 (pgs 19-20, 29-32) Textbook (Gordis, 5 th Ed.): Chapter 2 (Introduction, Exploring Occurrence of Disease), Chapter 16 (Time Trends in Disease, Migrant Studies)
September 6	Songer	Epidemiologic Approach to Disease II; Assessing Disease in Populations Reading: Textbook (Gordis, 4 th Ed.): Chapters 2, 6 (pgs 20-22, 109-110) Textbook (Gordis, 5 th Ed.): Chapter 2 (Clinical and Subclinical Disease) Textbook (Gordis, 5 th Ed.): Chapter 6 (Introduction)
September 8	Songer	The Infectious Disease Process; The Dynamics of Disease Transmission Reading: Textbook (Gordis, 4 th Ed.): Chapter 2 (pgs 19-20, 22, 26-27) Textbook (Gordis, 5 th Ed.): Chapter 2 (Modes of Transmission, Incubation Period, Carrier Status) <u>Homework Assignment given out (due September 13 at 11:59pm)</u>
September 13	Songer	The Prevention of Infectious Disease and Outbreak Investigation Reading: Textbook (Gordis, 4 th Ed.): Chapter 2 (pgs 22-25, 27-28, 32-35) Textbook (Gordis, 5 th Ed.): Chapter 2 (Endemic, Epidemic and Pandemic, Herd Immunity, Disease Outbreaks, Outbreak Investigation)
September 15	Songer	Epidemiology in Practice; Outbreak Investigation Reading: Textbook (Gordis, 4 th Ed.): Chapter 2 (pgs 28-29, 32-35) Textbook (Gordis, 5 th Ed.): Chapter 2 (Attack Rate, Outbreak Investigation) Torok M. Epidemic Curves Ahead. <i>Focus on Field Epidemiology</i> , Vol 1(5):pgs. 1-6. North Carolina Institute for Public Health. Available at: http://cphp.sph.unc.edu/focus/vol1/issue5/1-5EpiCurves_issue.pdf <u>Homework Assignment given out (due September 20 at 11:59pm)</u>
September 20	Songer	Epidemiologic Transition/Epidemiology in Global Contexts Reading: Textbook (Gordis, 4 th Ed.): Chapter 4 (pgs 79-81) Textbook (Gordis, 5 th Ed.): Chapter 4 (Projecting the Future Burden of Disease) Omran AR. The Epidemiologic Transition. Excerpted in <i>The Bulletin of the WHO</i> , 2001, 79(2). Available at: http://ocw.uci.edu/upload/files/v79n2a11.pdf
September 22	---	Exam 1
September 27	Songer	Chronic Disease Epidemiology and the Web of Causation Reading: Textbook (Gordis, 4 th Ed.): Chapters 14, 19 (pgs 234-36, 333-335) Textbook (Gordis, 5 th Ed.): Chapter 14 (Types of Causal Relationships) Textbook (Gordis, 5 th Ed.): Chapter 19 (Epidemiology and Prevention)

September 29	Songer	Identifying Disease in the Community; Surveillance Reading: Textbook (Gordis, 4 th Ed.): Chapters 3, 4 (pgs 54-55, 70-73) Textbook (Gordis, 5 th Ed.): Chapter 3 (Surveillance, Active and Passive surv.) Textbook (Gordis, 5 th Ed.): Chapter 4 (Problems with Mortality Data)
October 4	Songer	Measures of Disease Frequency; Incidence, Prevalence Reading: Textbook (Gordis, 4 th Ed.): Chapter 3 Textbook (Gordis, 5 th Ed.): Chapter 3 <u>Homework Assignment given out (due October 11 at 11:59pm)</u>
October 6	Songer	Measures of Disease Frequency; Mortality Reading: Textbook (Gordis, 4 th Ed.): Chapters 4, 6 (pgs 59-73, 109-13) Textbook (Gordis, 5 th Ed.): Chapter 4 (Measures of Mortality) Textbook (Gordis, 5 th Ed.): Chapter 6 (Case Fatality, Person Years)
October 11	Songer	Measures of Disease Frequency; Standardization/Age Adjustment Reading: Textbook (Gordis, 4 th Ed.): Chapter 4 (pgs 73-79) Textbook (Gordis, 5 th Ed.): Chapter 4 (Comparing Mortality in Different Pop.) <u>Homework Assignment given out (due October 13 at 11:59pm)</u>
October 13	Songer	Measures of Health Outcomes; Clinical Measures of Prognosis Reading: Textbook (Gordis, 4 th Ed.): Chapters 6, 17 (pgs 112-124, 293-299) Textbook (Gordis, 5 th Ed.): Chapter 6 (Survival, Life Tables, Kaplan-Meier) Textbook (Gordis, 5 th Ed.): Chapter 17 (Studies of Outcome, Efficacy, Effectiveness, Efficiency, Measures of Outcome, Outcomes Research)
October 18	---	Fall Break (no class)
October 20	---	Exam 2
October 25	Songer	Analytical Epidemiology; Hypotheses, Research Designs and Sequence - Descriptive Designs, Ecologic Designs Reading: Textbook (Gordis, 4 th Ed.): (pgs 165-66), Chapter 14 (pgs 227-30) Textbook (Gordis, 5 th Ed.): Chapter 14 (Approaches for Studying Disease Etiology), Chapter 10 (Ecologic Studies) Farrugia P, Petrisor BA, Farrokhlyar F, et al. Research questions, hypotheses, and objectives. <i>Can J Surgery</i> 53(4):278-281, 2010. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2912019/
October 27	Songer	Analytical Epidemiology; Cross-Sectional/Case-Control Designs Reading: Textbook (Gordis, 4 th Ed.): Chapter 10 (pgs 195-98, 177-95) Textbook (Gordis, 5 th Ed.): Chapter 10 (Case-Control, Cross-Sectional Studies)
November 1	Songer	Analytical Epidemiology; Case-Crossover/Cohort Designs Reading: Textbook (Gordis, 4 th Ed.): Chapter 9 Textbook (Gordis, 5 th Ed.): Chapter 9, Chapter 10 (Case-Crossover Design) <u>Homework assignment given out (due back November 8 at 11:59pm)</u>
November 3	Songer	Analytical Epidemiology; Randomized Clinical Trials Reading: Textbook (Gordis, 4 th Ed.): Chapter 7 Textbook (Gordis, 5 th Ed.): Chapter 7, Chapter 8 (Ethical Considerations)

November 8	Songer	Measures of Disease Association; Relative risk, Odds ratio Reading: Textbook (Gordis, 4 th Ed.): Chapter 11 Textbook (Gordis, 5 th Ed.): Chapter 11 <u>Homework assignment given out (due November 10 at 11:59pm)</u>
November 10	Songer	Error in Epidemiologic Studies I; Chance, Bias Reading: Textbook (Gordis, 4 th Ed.): Chapters 8, 10, 15 (pgs 147-52, 187-88, 247-251) Textbook (Gordis, 5 th Ed.): Chapter 8 (Sample Size, Generalizability of Results), Chapter 10 (Information Bias), Chapter 15 (Bias) <u>Homework Assignment given out (due back November 15 at 11:59pm)</u>
November 15	Songer	Error in Epidemiologic Studies II; Confounding, effect modification Reading: Textbook (Gordis, 4 th Ed.): Chapters 14, 15 (pgs 230-34, 251-261) Textbook (Gordis, 5 th Ed.): Chapter 14 (Types of Associations), Chapter 15 (Confounding, Interaction)
November 17	---	Exam 3
November 22	Songer	Critical Evaluation of the Epidemiologic Literature Reading: Vance DE, Talley M, Azuero A, et al. Conducting an Article Critique for a Quantitative Research Study. <i>Nursing: Research and Reviews</i> 3:67-75, 2013 <u>Group Assignment given out (due back December 6 at 11:59pm)</u>
November 24	---	Thanksgiving Holiday (no class)
November 29	Songer	Practice on Interpreting Epidemiologic Results Reading:
December 1	Kuipers	Genetic Epidemiology Reading: Textbook (Gordis, 4 th Ed.): Chapter 16 Textbook (Gordis, 5 th Ed.): Chapter 16
December 6	Songer	Inference from Epidemiologic Studies Measures of Effect; Assessing Public Health Impact Reading: Textbook (Gordis, 4 th Ed.): Chapter 12, Chapter 14 (pgs 236-45) Textbook (Gordis, 5 th Ed.): Chapter 8 (Expressing the Results of RCTs), Chapter 12, Chapter 14(Evidence for a Causal Relationship)
December 8	Songer	Epidemiology in Practice; Population Screening and its Evaluation Reading: Textbook (Gordis, 4 th Ed.): Chapter 5, 18 Textbook (Gordis, 5 th Ed.): Chapter 5, 18 <u>Homework Assignment given out (due back December 13 at 11:59pm)</u>
December 13	Songer	Ethics in Epidemiology Reading: Textbook (Gordis, 4 th Ed.): Chapter 20 Textbook (Gordis, 5 th Ed.): Chapter 20
December 15	--	Final Exam