



Drexel University School of Public Health

Certificate in Epidemiology and Biostatistics

PBHL 703

Design and Analysis of Epidemiologic Studies

3 credit hours

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Course Dates: June 22nd – August 30th, 2009

COURSE DESCRIPTION

This course will expand upon some of the information you learned in PBHL 701 and 702. We will explore a number of epidemiologic concepts and principles more in depth and see how epidemiology works in the “real world”.

PREREQUISITE

Beyond the initial requirements for enrollment in the certificate program, the successful completion of PBHL 701 and 702 is required.

COURSE OBJECTIVES

Upon completion of this course, students should:

1. Have an understanding of infectious disease epidemiology and outbreak investigation.
2. Appreciate the importance of ethical considerations in epidemiologic research.
3. Be able to interpret data/information from epidemiologic studies.
4. Be able to carry out a guided critique of the epidemiologic literature.
5. Be capable of conducting a thorough review of the literature and understanding the process of epidemiologic inquiry.
6. Understand the importance of, and how to conduct, public health surveillance.
7. Appreciate the basics of surveys used to gather epidemiologic data.

TEXTBOOKS AND COURSE MATERIALS

There are no required books for this course. You may draw on course materials from 701 and 702, and, where relevant, chapters or sections from the Gordis and Dawson & Trapp books may be helpful. Readings for this course will be provided as web links or PDF files and you will receive lecture materials via PowerPoint slide presentations (as PDFs) and other written materials.

TEACHING FRAMEWORK

The main structure for presenting the course content is asynchronous online lectures. You can access the online course materials at your own convenience and there are no set times when you are required to be online. Students are expected to devote as much time as necessary to complete course requirements each week. This course allows you to arrange your class "attendance" around your schedule. You will be required to work on the course modules in order, as they will be posted at intervals throughout the course. I strongly encourage communication and collaboration with me and your fellow classmates throughout the course, using the Discussion Board (and email with me). There will be a specific Discussion Board thread for each week of course materials, where I urge you to post questions and comments, and help to answer other students' questions. There may also be other threads posted on the Discussion Board that will encourage you to think about, and comment on, an epidemiological concepts as evidenced in the real world. For example, last year, we had an extensive discussion regarding the salmonella outbreak in summer 2008 (the one originally blamed on tomatoes) and this past Spring we discussed the H1N1 ("swine flu") outbreak.

In each week, the following content is included (under "Materials by Week"):

- 1) **Weekly Brief:** a short introduction of what we will study each week or module. This will be posted as a PDF file.
- 2) **Lecture(s):** PDF versions of PowerPoint slides.
- 3) **Reading Materials:** the reading materials have been chosen to provide you with a nice overview of some classic, as well as current, epidemiology articles. They may also help you as you complete your course assignments (please note that any necessary updates or additions to reading materials will be designated with a new version of the syllabus posted).
- 4) **Assignment** (graded assignment or ungraded, but required, exercise)

COMMUNICATION WITH THE INSTRUCTOR

I can be reached by email (angeb@arcadia.edu) and will get back to your email as soon as I can. I may respond to email questions by sending the response to the entire class via the Discussion Board. This way you can all benefit from the inquiries of other classmates. If the question is a personal one then I will respond only to you.

ASSIGNMENTS AND EVALUATION

There are five **Exercises** (Weeks 1, 2, 4, 8, and 9) and three **Graded Assignments** (Weeks 3, 5, and 6 – the graded assignment for Week 6 will not be due until the end of the course unless you want to turn it in earlier).

You will not receive a specific grade for each **exercise**, but their completion will earn you an **overall exercise score** that will be factored into your final grade (see proportions of the total grade for each assignment below). You will not automatically receive 100% for the exercise score. "**Successful completion of exercises**" has a component regarding the level of effort and understanding that went into the exercise and the completeness of the answers. You will receive comments on each exercise, as well as an answer key, so you can chart your progress.

All assignments are due three days after the week in which they were assigned (Wednesdays), except for the Week 6 assignment (which is due at the end of the course). Due dates are listed in the course schedule section of the syllabus (assignments are due by 11:59 pm EST on the specified due date). All assignments should be turned in to me via email. I recommend cc'ing yourself on the email so you have a record of when you sent it, in case I have a question about the timing or do not receive the assignment. Lack of thorough completion of graded assignments and exercises will result in points being deducted. Answers will be made available after the assignments have been turned in.

Please pay attention to the due dates and let me know if you have any specific circumstances that would affect your ability to complete the assignment in a timely manner. If necessary, alternate dates for completion will be agreed upon by the student and instructor, before the assignment is due.

For the literature review assignment that begins **Week 6** you must cite peer-reviewed articles. You can use the referencing style of your choice, but be consistent with that style. If you do not have a style preference, here are two suggestions:

American Psychological Association: <http://owl.english.purdue.edu/owl/resource/560/01/>

Style used in the *American Journal of Epidemiology* (scroll to the bottom of the page): http://www.oxfordjournals.org/our_journals/aje/for_authors/general.html

EVALUATION METHODS

Final grades are based on graded assignment scores and the successful completion of exercises (refer to definition of “successful completion” above), and will be assigned in the following manner:

Grade	Grade Points	Definition
A	4.0	The student has exceeded the required standards and expectations.
A-	3.7	The student has met the required standards and expectations slightly below the exceptional level.
B+	3.3	The student has met the required standards and expectations slightly above the satisfactory level.
B	3.0	The student has met the required standards and expectations at a satisfactory level.
B-	2.7	The student has met the required standards and expectations slightly below the satisfactory level.
C+	2.3	The student met the required standards and expectations slightly above the marginally acceptable level.
C	2.0	The student has met the required standards and expectations at the marginally acceptable level.
F	0	The student has failed to meet the required performance standards and expectations.

Numerical scores and a final grade will be determined by the graded assignments and completion of the exercises and weighted as follows:

Assignment	Proportion of final grade
Graded Assignment Week 3 (Data Interpretation)	15%
Graded Assignment Week 5 (Critique)	15%
Graded Assignment Week 6 (Literature review)	40%
Successful Completion of Exercises	30%

COURSE SCHEDULE

Week	Topic	Lecture	Readings	Assignment or Exercise
1	Infectious Disease Epidemiology	Lecture: Infectious Disease Introduction Lecture: Outbreak Investigation	Barrett-Connor, E. Infectious and chronic disease epidemiology: Separate and unequal? American Journal of Epidemiology 1979. Taylor, D.N. et al. Salmonellosis associated with marijuana: A multistate outbreak traced by plasmid fingerprinting. NEJM 1982.	Exercise: Outbreak Investigation (Botulism in Argentina) *Due Wednesday, July 1 st
2	Ethics in Epidemiologic Research	Lecture: Ethical Considerations Lecture: Writing an Informed Consent Document	Sugarman J. et al. Evaluating the Quality of Informed Consent. Clinical Trials 2005.	Blackboard Discussion (exercise): Informed Consent Discussion *Post a response to 2 of the “consenting situations” by July 8 th
3	Data Interpretation	Lecture: Displaying and Interpreting Epidemiologic Data (tables) A Guided Interpretation: Vaccine Efficacy Studies (randomized clinical trials)	<i>The following articles are for the guided interpretation on vaccine efficacy studies:</i> Hurwitz E.S. et al. Effectiveness of Influenza Vaccination of Day Care Children in Reducing Influenza-Related Morbidity Among Household Contacts. JAMA 2000. Nichol K.L. et al. Effectiveness of Live, Attenuated Intranasal Influenza Virus Vaccine in Healthy, Working Adults. JAMA 1999. <i>The following articles are for the graded assignment:</i> Calle, E.E. et al. Overweight, Obesity, and Mortality from Cancer in a Prospectively Studied Cohort of U.S. Adults. New Engl J Med. 2003. Pan, S.Y. et al. Association of Obesity and Cancer Risk in Canada. American Journal of Epidemiology 2004.	Graded Assignment I: Interpretation of the association between obesity and cancer. *Due July 15 th

Week	Topic	Lecture	Readings	Assignment or Exercise
4	Critique of Epidemiologic Data I	<p>Lecture: Assessment of Internal and External Validity</p> <p>Lecture: How to Review an Epidemiologic Article</p> <p>Lecture: Causal Inference</p>	<p>Trying to Establish Cause (from PBHL 701): http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/E/Epidemiology.html</p> <p>Cause & Effect (from PBHL 701): http://www.tufts.edu/~gdallal/cause.htm</p> <p>Hill A.B. Association or Causation. 1965</p> <p><i>The following articles are for the exercise:</i> (Hill article)</p> <ol style="list-style-type: none"> 1. Werler, M.M. et al. Periconceptional folic acid exposure and risk of occurrent neural tube defects. JAMA 1993. 2. Milunsky, A. et al. Multivitamin/folic acid supplementation in early pregnancy reduces the prevalence of neural tube defects. JAMA 1989. 3. Feinleib, M. et al. Folate fortification for the prevention of birth defects: case study. Am J Epidemiol 2001. 	<p>Exercise: Folic acid and neural tube defects *Due July 22nd</p>
5	Critique of Epidemiologic Data II (continuation of Week 4)	Finish viewing lectures from last week if not yet completed	<p><i>The following articles are for the graded assignment :</i></p> <ol style="list-style-type: none"> 1. Grodstein, F. et al. Postmenopausal estrogen and progestin use and the risk of cardiovascular disease. NEJM 1996. 2. Writing Group for the Women's Health Initiative Investigators. Risks and benefits of estrogen plus progestin in healthy postmenopausal women. JAMA 2002. 3. Bailar J. Hormone-replacement therapy and cardiovascular diseases. NEJM 2003. 	<p><u>Graded Assignment II:</u> Hormone replacement therapy and Coronary heart disease *Due July 29th</p>

Week	Topic	Lecture	Readings	Assignment or Exercise
6	Literature Searching and the Process of Epidemiologic Inquiry I	Lecture : Directions for Literature Review	<p><i>Examples of literature review articles:</i></p> <ol style="list-style-type: none"> 1. Afable-Munsuz A. & Brindis C.D. Acculturation and the Sexual and Reproductive Health of Latino Youth in the United States: A Literature Review. Perspectives on Sexual and Reproductive Health 2006. 2. Gollub E. L., et al. Effectiveness of health education on Toxoplasma-related knowledge, behaviour, and risk of seroconversion in pregnancy. European Journal of Obstetrics & Gynecology and Reproductive Biology 2008. 3. Smithers L.G., et al. Effect of long-chain PUFA supplementation of preterm infants on disease risk and neurodevelopment: a systematic review of randomized controlled trials. AJCN 2008. 4. van Kesteren N.M.C. et al. Sexual risk behavior among HIV-positive men who have sex with men: A literature review. Patient Education and Counseling 2007. 	<p><u>Graded Assignment III:</u> Literature search *Due August 30th (or earlier)</p>
7	Literature Searching and the Process of Epidemiologic Inquiry II	Lecture: Quantitative Research Steps	<ol style="list-style-type: none"> 1. Guidelines for completing a research protocol for observational studies (University College London Hospitals) 2. CkiD Design Synopsis 3. Project Sugar2 Manual of Operations: TofC 	None
8	Epidemiologic Surveillance I	Lecture: Principles of Epidemiologic Surveillance	<p>Perry, H.N. et al. Planning an integrated disease surveillance and response system: a matrix of skills and activities. BMC Medicine 2007.</p> <p>Thacker, S.B. et al. Surveillance in environmental public health: Issues, systems, and sources. AJPB 1996.</p>	<p>Exercise: Developing Surveillance Systems and Evaluating Surveillance Data (obesity and diabetes) *Due August 19th</p>

Week	Topic	Lecture	Readings	Assignment or Exercise
9	Epidemiologic Surveillance II	Lecture: Sources of Data for Epidemiologic/Public Health Surveillance	Sturtevant, J.L. et al. The new international health regulations: Considerations for global public health surveillance. Disaster Med Public Health Preparedness 2007.	Exercise: Developing Surveillance Systems and Evaluating Surveillance Data (influenza) *Due August 26 th
10	Survey Design and Data Collection	Lecture : Survey Design Lecture: Data Collection for the Behavioral Risk Factor Surveillance System (BRFSS)	None.	(Reminder: Graded Assignment III due by August 30th)

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SCHOOL OF PUBLIC HEALTH**

ONLINE CERTIFICATE PROGRAM: PBHL 703

SCHEDULE: Summer 2009

Week 1: Monday June 22nd – Sunday June 28th

Week 2: June 29th – July 5th

Week 3: July 6th – July 12th

Week 4: July 13th – July 19th

Week 5: July 20th – July 26th

Week 6: July 27th – August 2nd

Week 7: August 3rd – August 9th

Week 8: August 10th – August 16th

Week 9: August 17th – August 23rd

Week 10: August 24th – August 30th