

SYLLABUS

EPID 8070: Environmental and Occupational Epidemiology

Spring 2009 Class Meeting Time and Location:

Wednesdays: 9:30 to 12:00 Dawson Hall Room 206

Guest Instructor: Brian Forrester, MD, MPH

Instructor: John Vena, PhD, Professor and Head
Department of Epidemiology & Biostatistics

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Class Web site:

Course materials and related information will be posted on the course webCT site. Please make use of the web materials and report problems to the instructor. [Check often for changes]

Course Overview

Environmental Epidemiology

The field of Environmental Epidemiology encompasses the investigation of environmental factors and how they affect human health. Environmental epidemiologists study health effects in populations resulting from exposure to physical, chemical, and biological agents. This includes the contribution of social, economic, and cultural factors (e.g., urbanization, transportation, agriculture, manufacturing, energy production) that are related to these exposures. By studying populations in different exposure circumstances, environmental epidemiologists aim to clarify relationships between exogenous agents, social and cultural factors, and health effects in human populations. Recognition of health hazards posed by large-scale industrialization, environmental changes, and ecological disruption, often via indirect pathways, has added an extra dimension to this field.

Occupational Epidemiology

This section of the course provides an introduction to clinical and epidemiologic aspects of occupational health and recognition and prevention of occupational diseases and injury. Case study approaches are used to learn about epidemiologic applications to occupational health.

Course Aims

This class is intended for advanced epidemiology students to become familiar with applications of epidemiology to environmental and occupational problems. The goal of this class is for students to become familiarized with our current understanding of relationships between environmental and occupational exposures and health outcomes through the use of epidemiologic methods. Students should develop a basic knowledge of environmental agents that have been linked with disease in human populations and how epidemiologic investigations

of those agents are performed. They should develop an understanding of different exposure assessment techniques and the advantages and disadvantages of their use. Students should develop a clear understanding of the differences between the major types of analytical epidemiologic study designs as they relate to the study of environmental and occupational exposures, how each type of study is implemented, and the advantages and disadvantages of different approaches used to investigate the health effects of environmental/occupational agents. They should understand important epidemiologic concepts, such as measures of association and causal reasoning. They should be able to identify sources of bias in epidemiologic studies and suggest alternative approaches to reducing or eliminating biases. Another goal of this course is for students to further develop and refine their capacity to read and interpret the epidemiologic literature. The specific objectives of this course are to: 1) instill a thorough knowledge of current environmental and occupational findings to students; 2) help students hone their skills in reading and interpreting the epidemiologic literature; 3) enable students to identify unresolved issues in environmental and occupational epidemiology to be explored with future research; 4) provide students with the basic skills to conduct environmental and occupational epidemiologic investigations and to communicate the findings to others both orally and in writing; and 5) to learn how to be part of an interdisciplinary research team.

Prerequisites

The prerequisites for this class are a graduate level introductory course in Epidemiology (EPID 70i0 or equivalent), and a graduate level introductory course in Biostatistics (BIOS 7010 or equivalent). Other introductory Epidemiology or Biostatistics classes may be considered as substitutes on a case by case basis (contact course instructor).

Course Requirements

Students will be required to: prepare for each class by reading the assigned paper(s); attend weekly lectures and participate in discussions of the reading assignment(s); serve as discussion facilitator for the weekly discussions; and prepare a concise (1-2 page) written critique of five reading assignments. Finally, students will be required to review a chosen topic in environmental or occupational epidemiology and report their findings both orally and in writing. Students are expected to synthesize existing scientific information on their chosen topic and develop a research idea in the form of a grant proposal. There are no mid term or final exams. The grant proposal or research paper and oral presentation will constitute the major portion of the grade. *Check the web site for a separate handout providing instructions for the written proposa/paper.* Students are responsible for attending all scheduled class sessions and participating in class discussions. Students who cannot attend a class should obtain distributed materials from a fellow student and/or check the class web page. Students unable to meet a deadline due to illness or family/personal emergency must contact the instructor before the due date. Alternate arrangements can be made after receipt of a request, supported by appropriate documentation (e.g., a note from your physician).

Professionalism

Environmental Epidemiology is a professional career. A hallmark of professionalism is integrity. Students should exhibit professionalism and integrity in all endeavors related to this class including classroom lectures, assignments, and presentations. Integrity means acting in a manner that is consistent with who we are (i.e., according to one's conscience, or core value system). Professional integrity means acting in accordance with the core values of one's

profession, such as the value of healing in medicine. Note: The biological and environmental science knowledge base varies among enrolled students. Please be aware of this and considerate of others with different educational backgrounds.

Grading

Students will be evaluated based on their: 1) class participation including discussion of reading assignments and their facilitation of class discussions; 2) oral presentation; and 3) written 1-2 page critique of epidemiologic investigations; and 4) a written grant proposal.

The point distribution is as follows:

<u>Course Activity</u>	<u>Points</u>	<u>Distribution</u>
Facilitation and Class participation	75	15%
Written critique(s)	75	15%
Oral presentation	100	20%
<u>Written grant proposal or paper</u>	<u>250</u>	<u>50%</u>
Total Course Points	500	100%

Course grades will be computed as a percentage of 500 points. Plus/minus grading may also be applied.

- A = 90% (450 points or above)
- B = 80% (400 - 449 points)
- C = 70% (350 - 399 points)
- D = 60% (300 - 349 points)
- F = 59% (299 points or below)

Extra Credit

Extra credit may be earned by briefly summarizing (~5 minutes) a recent investigation or news event involving environmental or occupational epidemiology. Bring a newspaper clipping, scientific journal article, or related material and describe the current study or event. Explain the study to the class. What was the purpose? How was the study conducted? Describe the population studied. How were the data collected? What were the results? Why was it important or newsworthy? Why was it interesting to you? You may present as many of these as you want, and you will be awarded a total of up to 10 points for extra credit presentations depending upon the level of detail and amount of information you provide. Please notify the instructor in advance if you have something you want to report for extra credit so that time can be allocated. Also, please submit a copy of the newspaper or journal article to the instructor after your presentation.

Reading Assignments & Class Discussions

Class discussions will cover various topics in environmental and occupational epidemiology. There will be selected readings from the peer-reviewed scientific literature assigned for class

discussion throughout the semester. Class discussions will focus directly on the reading assignment. Students are expected to participate and share their ideas. Note: *there is no such thing as a dumb question*. Assigned papers for weekly discussion will be available on the web site and/or distributed to students in class at regular intervals. Other optional readings may also be distributed in class or posted on the web site.

Textbook

Text 1: Environmental Epidemiology: A Textbook on Study Methods and Public Health Applications. Baker, Dean; Kjellström, Tord; Calderon, Rebecca; Pastides, Harris (Eds). World Health Organization, United States. Environmental Protection Agency. Geneva, 1999.

Full text available on WebCT

Text 2: Case Studies in Occupational Epidemiology by Kyle Steenland, Oxford University Press, 1993.

Each chapter's learning objectives are listed at the beginning of the chapter.

Other recommended textbooks: (available for review in my office):

"Research Methods in Occupational Epidemiology" By Checkoway, Pierce and Kriebel. and "Occupational Health" by Levy and Wegman, 5th Edition, Little, Brown and Co.

Other Useful Reference Textbooks

For your information, attached is a list of texts that in one way or another include literature on environmental and occupational health:

Public Health and Preventive Medicine, Last and Maxcy Rosenau, 13th edition, 1992.

Environmental and Occupational Medicine, W Rom, 2nd edition, 1992.

Human Health Risks from Chemical Exposure: The Great Lakes Ecosystem, W Flint and J Vena (Eds), 1991.

Environmental Medicine, SM Brooks, et al., 1995.

Environmental Medicine, Institute of Medicine, 1995.

Our Planet, our Health, WHO, 1992.

Environmental Epidemiology, R Bertollini, et al., 1996.

Introduction to Environmental Epidemiology, Talbott and Craun, 1995.

Topics in Environmental Epidemiology, Steenland and Savitz, 1997.

Environmental Health, Moeller, 1997.

Environmental Epidemiology and Risk Assessment, Aldrich & Griffith, 1993.

Toxic Chemicals, Health and the Environment, Lowe and Upton, 1987.

Occupational Reference Books

Use as a reference source the 4th Edition Volume Encyclopedia of Occupational Health and Safety International Labour Office, Geneva, 1998. Also, useful reference textbooks include: (1) Hunter's Diseases of Occupations, 8th Edition, Raffle, Adams Baxter Lee, 1994, (2) NIOSH

Publications Catalogs, Multiple Editions USDHEW, (3) Public Health and Preventive Medicine, Last and Maxcy Rosenau, 13th Edition, 1992, (4) Cancer Epidemiology and Prevention, Schottenfeld and Fraumeni, 2nd Edition, 1996, (5) Environmental and Occupational Medicine, W. Rom, 2nd Edition, 1992, (6) Occupational Medicine, 3rd Edition, Carl Zenz, Dickerson and Horvath, Mosby, 1994, (7) Occupational Epidemiology, Richard Monson, 2nd Edition, 1990, (8) Research Methods in Occupational Epidemiology by Harvey Checkoway, 1989; (9) Portraits in Steel, Milton Rogovin and Mike Frisch, 1993. All are available from Dr. Vena.

Journals of Interest

Major Epidemiology journals in field:

Epidemiology
Environmental Health Perspectives
Scandinavian Journal of Work, Environment and Health
Environmental Research
Archives of Environmental Health

Other Epidemiology journals (occasionally publish in field):

American Journal of Epidemiology
American Journal of Public Health
The Annals of New York Academy of Sciences
British Journal of Cancer
Cancer
International Journal of Cancer
International Journal of Epidemiology
Journal of Chronic Diseases
Journal National Cancer Institute
Preventive Medicine
Public Health Reports
Science

Industrial Hygiene, Toxicology and others:

Archives of Environmental Contamination and Toxicology
Archives of Toxicology
Bulletin of Environmental Contamination and Toxicology
Clinical Toxicology
Drug and Chemical Toxicology
Journal of Toxicology and Environmental Health