ENV H 570 A Sp 17: Occupational And Environmental Epidemiology

Jump to Today | Edit

ENV H / EPI 570 Syllabus, Spring 2017

Occupational and Environmental Epidemiology

Tuesday and Thursday, 11:00-12:20

Health Sciences Building, Room T-531

Instructor: Sverre Vedal, MD MSc

Department of Environmental & Occupational Health Sciences, Box 357234

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Course web site: https://canvas.uw.edu/courses/1139051

Office hours: No scheduled office hours. Students can contact instructor by phone or e-mail, or visit his office on an appointment basis.

Lab sessions: Classes on April 4, April 13, April 25, May 2, and May 11 will be held in the Health Sciences Library Classroom A

Prerequisites: Previous introductory courses in epidemiology (e.g., EPI 511, 512, 513) and biostatistics (e.g., BIOST 512 or 518), or permission of instructor

Course overview:

This course is for graduate students who have had introductory courses in epidemiology and biostatistics. A study- and case-oriented approach is used to cover principles of environmental and occupational epidemiology, covering a wide range of study designs and biases, exposures and exposure estimation approaches. While the course will not provide comprehensive coverage of all subject areas in the field, we draw studies and cases from a variety of settings in which environmental or occupational exposures occur. Each class will consist of an overview discussion and an in-depth assessment of one or at most two studies. Five data analysis labs are designed to help students gain more in-depth familiarity with the topics. Additional topics include climate change, gene-environment interaction, biomarkers and the role of epidemiology in policy and causal inference. Assignments consist of: 1) lab write-ups which will include addressing questions pertaining to the relevant study design, and 2) a term paper designed to be a short research proposal (in NIH R21 format) on a topic chosen by the student and approved by the instructor. By the end of the course, students should gain sufficient understanding of epidemiologic methods for environmental and occupational exposures to feel comfortable understanding and evaluating the published epidemiologic literature and, in some instances, designing and conducting original research.

Learning objectives:

1. Demonstrate an ability to critically review environmental and occupational epidemiology literature for in-class discussion.
2. Identify the most suitable epidemiologic study designs for investigating specific exposure-disease associations.
3. Recognize environmental and occupational epidemiology study biases and describe methods for minimizing bias.
4. Describe some of the major chemical, physical, and biological agents that cause environmentally- and occupationally-related diseases.

5. Describe methods for assessing human exposures to hazardous agents, including the use of biomarkers, for epidemiologic research purposes.

6. Describe how genetic makeup influences risk of environmental and occupational exposures and identify the variety of studies used to investigate gene by environment interactions.

7. Recognize challenges and opportunities in carrying out epidemiological studies on climate change.

8. Describe how epidemiologic studies play a role in risk assessment and in influencing public health policy, including exposure standards and guidelines.

9. Describe how epidemiologic findings are used to make causal inferences, and how they can be misused in research and policy arenas.

10. Demonstrate an ability to analyze environmental and occupational data using statistical software in investigating exposure-disease associations.

Course requirements:

1. **Lab write-ups / Homework**. 40%

    a. Present the results of your data analysis and interpret your results for each of the **five lab sessions**; address the questions posed at the end of the assignments – these will also include questions from the relevant class sessions.

    b. Guidelines:

        i. Briefly introduce the context, data, and scientific questions posed

        ii. Very briefly summarize your methods (i.e. analysis approach)

        iii. Clearly and succinctly summarize your results in both tables/figures and text.

        iv. Include a focused discussion of your findings that addresses the scientific questions posed

2. **Class participation**. 20%

    a. Attend and engage in classroom discussion

    b. Discussion will focus on one, or at most two, assigned readings of published studies for each class.

3. **Take-home final examination**. Term paper (Study research proposal). 40%.

    a. Research proposal (similar to NIH R21 format) that includes a review of the literature on a relevant topic and a proposed research design (hypotheses, population sample, design, analysis approach)

    b. Due by start of class Thursday June 1, 2017

    c. Topics must be approved in advance. All students should have identified and vetted their preliminary paper concept by April 27; final topic approval is due no later than May 11.

    d. Maximum length: 12 pages, double-spaced, including tables and figures. Length does not include references, title page or abstract.

Readings (most are available through the course website)

a. **Required**: Selected journal articles are required reading in advance of each class. The class schedule includes the preliminary readings list. The website has the final list of papers and links to the electronic version of each assigned article in the modules section.

b. No required textbook

c. Supplementary reference textbook (not required): Rosenstock L, Cullen MR, Brodkin CA, Redlich CA (eds). *Textbook of Clinical Occupational and Environmental Medicine* 2nd Ed. Philadelphia: WB Saunders, 2005.

Accommodation: To request academic accommodations due to a disability, please contact Disabled Student Services, 448 Schmitz (206) 543-8924 (V/TTY). If you have a letter from Disabled Student Services indicating that you have a disability that requires academic accommodations, please present the letter to the instructor in order to discuss the accommodations you might need in this class.

For the class schedule, including readings and assignments, click here

PDF of the syllabus here

PDF of Health Sciences Building here (http://globalhealth.washington.edu/sites/default/files/uploads/documents/about_us/healthsciencesmap.pdf)

Emergency Evacuation Information here **NEED TO UPDATE**

Course Summary:

Date	Details	
Tue Mar 28, 2017	Course introduction & study designs (SV) (https://canvas.uw.edu/calendar?event_id=1001638&include_contexts=course_1139051)	11am to 12:20pm
Thu Mar 30, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656962)	due by 10:59am
	Study designs (contin) / Bias 1 (https://canvas.uw.edu/calendar?event_id=1001619&include_contexts=course_1139051)	11am to 12:20pm
Tue Apr 4, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656963)	due by 10:59am
	Ecologic / cross-sectional studies (SV) Lab 1: Intro to Stata; Multiple linear regression (https://canvas.uw.edu/calendar?event_id=1001637&include_contexts=course_1139051)	11am to 12:20pm
Thu Apr 6, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656964)	due by 10:59am
	Bias 2: measurement error / selection / healthy worker effect (SV) (https://canvas.uw.edu/calendar?event_id=1001636&include_contexts=course_1139051)	11am to 12:20pm
Tue Apr 11, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656965)	due by 10:59am
	Case-control (CaCo) studies (SV) (https://canvas.uw.edu/calendar?event_id=1001635&include_contexts=course_1139051)	11am to 12:20pm
	Lab 1: Multiple Linear Regressions Submission - due April 11 (https://canvas.uw.edu/courses/1139051/assignments/3656955)	due by 11:59pm
	To do before class	due by 10:59am

	(https://canvas.uw.edu/courses/1139051/assignments/3656966)	
Thu Apr 13, 2017	Lab 2: CaCo studies & logistic regression (SV) (https://canvas.uw.edu/calendar?event_id=1001634&include_contexts=course_1139051)	11am to 12:20pm
Tue Apr 18, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656967)	due by 10:59am
	Cohort studies (SV) (https://canvas.uw.edu/calendar?event_id=1001633&include_contexts=course_1139051)	11am to 12:20pm
Thu Apr 20, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656968)	due by 10:59am
	Cohort / nested CaCo / case-cohort (SV) (https://canvas.uw.edu/calendar?event_id=1001632&include_contexts=course_1139051)	11am to 12:20pm
	Lab 2: CaCo studies & logistic regression - write up due April 20 (https://canvas.uw.edu/courses/1139051/assignments/3656956)	due by 11:59pm
Tue Apr 25, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656969)	due by 10:59am
	Lab 3: Cohort & nested CaCo (Nickel refiners study) (SV) (https://canvas.uw.edu/calendar?event_id=1001631&include_contexts=course_1139051)	11am to 12:20pm
Thu Apr 27, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656970)	due by 10:59am
	Gene x environment (SV) (https://canvas.uw.edu/calendar?event_id=1001630&include_contexts=course_1139051)	11am to 12:20pm
Tue May 2, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656971)	due by 10:59am
	Lab 4: Molecular epi / biomarkers (SV) (https://canvas.uw.edu/calendar?event_id=1001629&include_contexts=course_1139051)	11am to 12:20pm
Thu May 4, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656972)	due by 10:59am
	DNA damage & epigenetics (PB) (https://canvas.uw.edu/calendar?event_id=1001628&include_contexts=course_1139051)	11am to 12:20pm
	Lab 3: Cohort & nested CaCo (Nickel refiners study) - write up due May 4 (https://canvas.uw.edu/courses/1139051/assignments/3656957)	due by 11:59pm
Tue May 9, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656973)	due by 10:59am
	Time series / case-crossover studies (SV) (https://canvas.uw.edu/calendar?event_id=1001627&include_contexts=course_1139051)	11am to 12:20pm
	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656974)	due by 10:59am

Thu May 11, 2017	Lab 5: Time series (Armstrong study) (SV) (https://canvas.uw.edu/calendar?event_id=1001626&include_contexts=course_1139051)	11am to 12:20pm
	Lab 4: Molecular epi / biomarkers - write up due May 11 (https://canvas.uw.edu/courses/1139051/assignments/3656958)	due by 11:59pm
Tue May 16, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656975)	due by 10:59am
	Radiation case study (Chernobyl) (SD) (https://canvas.uw.edu/calendar?event_id=1001625&include_contexts=course_1139051)	11am to 12:20pm
Thu May 18, 2017	Lab 5: Time series (Armstrong study) - write up due May 18 (https://canvas.uw.edu/courses/1139051/assignments/3656959)	due by 10:59am
	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656976)	due by 10:59am
	Panel studies (SV) (https://canvas.uw.edu/calendar?event_id=1001624&include_contexts=course_1139051)	11am to 12:20pm
Tue May 23, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656978)	due by 10:59am
	Climate change (SV) (https://canvas.uw.edu/calendar?event_id=1001623&include_contexts=course_1139051)	11am to 12:20pm
Thu May 25, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656979)	due by 10:59am
	Case series / clusters / surveillance (SV) (https://canvas.uw.edu/calendar?event_id=1001622&include_contexts=course_1139051)	11am to 12:20pm
Tue May 30, 2017	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656980)	due by 10:59am
	Epi in risk assessment and policy (SV) (https://canvas.uw.edu/calendar?event_id=1001621&include_contexts=course_1139051)	11am to 12:20pm
Thu Jun 1, 2017	Term Paper - due June 1 (https://canvas.uw.edu/courses/1139051/assignments/3656961)	due by 10:59am
	To do before class (https://canvas.uw.edu/courses/1139051/assignments/3656981)	due by 10:59am
	Manufactured uncertainty / publication bias (SV) (https://canvas.uw.edu/calendar?event_id=1001620&include_contexts=course_1139051)	11am to 12:20pm