

ENV H 570 A Sp 19: Occupational And Environmental Epidemiology

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ENV H / EPI 570 Syllabus, Spring 2019

Occupational and Environmental Epidemiology

Monday and Friday, 2:30-3:50

Health Sciences Building, Room T-531

Instructor:

Sverre Vedal, MD MSc

Department of Environmental & Occupational Health Sciences, Box 357234

Office: Roosevelt 303; Phone: 206-616-8285

e-mail: svedal@uw.edu

Course web site: <https://canvas.uw.edu/courses/1290729>

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 (in Health Sciences Library, Lab C): April 8, April 19, April 29, May 6, and May 17.

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 combination of lectures and 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, exposure estimation approaches and health effects. 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 and data analysis methods. 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 that 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 in investigating exposure-disease associations using statistical software.

Course requirements:

1. Lab write-ups/Homework 50%

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 may 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. Term paper (Study research proposal). 30%

- 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 Friday June 7, 2019
- c. Topics must be approved in advance. All students should have identified and vetted their preliminary paper concept by May 3; final topic approval is due no later than May 17.
- d. Maximum length: 12 pages, double-spaced, including tables and figures. Length does not include references, title page or abstract.

Readings (most 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 Canvas 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):
 - o Checkoway H, Pearce N, Kriebel D. *Research Methods in Occupational Epidemiology*, 2nd, 2004.
 - o Rosenstock L, Cullen MR, Brodtkin CA, Redlich CA (eds). *Textbook of Clinical Occupational and Environmental Medicine* 2nd Ed. Philadelphia: WB Saunders, 2005.

Classroom Climate: The student experience in this class is important to me (Sverre Vedal, instructor). The UW School of Public Health seeks to ensure that all students are fully included in each course. We strive to

create an environment that reflects community and mutual caring. We encourage students with concerns about classroom climate to talk to your instructor, your advisor, or a member of the departmental (DEOHS) or SPH Diversity Committee and/or your program director.


Access and accommodations

If you have already established accommodations with Disability Resources for Students (DRS), please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course. If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations, you should contact DRS at 206-543-8924 or uwdrs@uw.edu or disability.uw.edu. Qualifying conditions include but are not limited to mental health, attention-related, learning, vision, hearing, physical or health impacts. DRS offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor and DRS. It is policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.

Academic integrity

Students at the University of Washington are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity. The UW School of Public Health (SPH) is committed to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating, and other misconduct are serious violations of the University of Washington Student Conduct Code (WAC 478-120). We expect you to know and follow the university's policies on cheating and plagiarism, and the SPH Academic Integrity Policy. Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the University of Washington Community Standards and Student Conduct website.


Preview of course schedule [here](#)


















 Preview of the course syllabus [here](#)

 PDF of Health Sciences Building [here](#)

http://globalhealth.washington.edu/sites/default/files/uploads/documents/about_us/healthsciencesmap.pdf























Course Summary:

Date	Details
Thu Apr 4, 2019	 To do before class https://canvas.uw.edu/courses/1290729/assignments/4744943 due by 11:29am

Date	Details	
Mon Apr 8, 2019	 To do before class (https://canvas.uw.edu/courses/1290729/assignments/4744944)	due by 2:30pm
Fri Apr 12, 2019	 To do before class (https://canvas.uw.edu/courses/1290729/assignments/4744945)	due by 2:30pm
Mon Apr 15, 2019	 Lab 1: Multiple Linear Regression Submission - due April 15 (https://canvas.uw.edu/courses/1290729/assignments/4744936)	due by 11:29am
	 To do before class (https://canvas.uw.edu/courses/1290729/assignments/4744946)	due by 2:30pm
Thu May 9, 2019	 Lab 3: Cohort & nested CaCo (Nickel refiners study) - write up due May 3 (https://canvas.uw.edu/courses/1290729/assignments/4744938)	due by 11:59pm
	 Bias 2: measurement error / selection / healthy worker effect (SV) (https://canvas.uw.edu/calendar?event_id=1243466&include_contexts=course_1290729)	
	 Case series / clusters / surveillance (SV) (https://canvas.uw.edu/calendar?event_id=1243474&include_contexts=course_1290729)	
	 Case-control (CaCo) studies (SV) (https://canvas.uw.edu/calendar?event_id=1243470&include_contexts=course_1290729)	
	 Climate change (SV) (https://canvas.uw.edu/calendar?event_id=1243468&include_contexts=course_1290729)	
	 Cohort / nested CaCo / case-cohort (SV) (https://canvas.uw.edu/calendar?event_id=1243464&include_contexts=course_1290729)	
	 Cohort studies (SV) (https://canvas.uw.edu/calendar?event_id=1243476&include_contexts=course_1290729)	
	 Course introduction & study designs (SV) (https://canvas.uw.edu/calendar?event_id=1243471&include_contexts=course_1290729)	
	 DNA damage & epigenetics (PB) (https://canvas.uw.edu/calendar?event_id=1243469&include_contexts=course_1290729)	
	 Ecologic / cross-sectional studies (SV) Lab 1: Intro to Stata; Multiple linear regression (https://canvas.uw.edu/calendar?event_id=1243467&include_contexts=course_1290729)	
	 Epi in risk assessment and policy (SV) (https://canvas.uw.edu/calendar?event_id=1243473&include_contexts=course_1290729)	
	 Gene x environment (SV) (https://canvas.uw.edu/calendar?event_id=1243475&include_contexts=course_1290729)	
	 Lab 2: CaCo studies & logistic regression (SV) (https://canvas.uw.edu/calendar?event_id=1243479&include_contexts=course_1290729)	

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-  [Lab 2: CaCo studies & logistic regression - write up due April 26](https://canvas.uw.edu/courses/1290729/assignments/4744937)
(<https://canvas.uw.edu/courses/1290729/assignments/4744937>)
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-  [Lab 3: Cohort & nested CaCo \(Nickel refiners study\) \(SV\)](https://canvas.uw.edu/calendar?event_id=1243483&include_contexts=course_1290729)
(https://canvas.uw.edu/calendar?event_id=1243483&include_contexts=course_1290729)
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-  [Lab 4: Molecular epi / biomarkers \(SV\)](https://canvas.uw.edu/calendar?event_id=1243482&include_contexts=course_1290729) (https://canvas.uw.edu/calendar?event_id=1243482&include_contexts=course_1290729)
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-  [Lab 4: Molecular epi / biomarkers - write up due May 10](https://canvas.uw.edu/courses/1290729/assignments/4744939)
(<https://canvas.uw.edu/courses/1290729/assignments/4744939>)
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-  [Lab 5: Time series \(Armstrong study\) \(SV\)](https://canvas.uw.edu/calendar?event_id=1243477&include_contexts=course_1290729) (https://canvas.uw.edu/calendar?event_id=1243477&include_contexts=course_1290729)
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-  [Lab 5: Time series \(Armstrong study\) - write up due May 22](https://canvas.uw.edu/courses/1290729/assignments/4744940)
(<https://canvas.uw.edu/courses/1290729/assignments/4744940>)
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-  [Manufactured uncertainty / publication bias \(SV\)](https://canvas.uw.edu/calendar?event_id=1243472&include_contexts=course_1290729)
(https://canvas.uw.edu/calendar?event_id=1243472&include_contexts=course_1290729)
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-  [Panel studies \(SV\)](https://canvas.uw.edu/calendar?event_id=1243480&include_contexts=course_1290729) (https://canvas.uw.edu/calendar?event_id=1243480&include_contexts=course_1290729)
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-  [Radiation case study \(Chernobyl\) \(SD\)](https://canvas.uw.edu/calendar?event_id=1243481&include_contexts=course_1290729) (https://canvas.uw.edu/calendar?event_id=1243481&include_contexts=course_1290729)
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-  [Reading for Apr 5](https://canvas.uw.edu/courses/1290729/assignments/4764607) (<https://canvas.uw.edu/courses/1290729/assignments/4764607>)
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-  [Student Research Proposals](https://canvas.uw.edu/courses/1290729/assignments/4744941)
(<https://canvas.uw.edu/courses/1290729/assignments/4744941>)
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-  [Study designs \(contin\) / Bias 1](https://canvas.uw.edu/calendar?event_id=1243465&include_contexts=course_1290729) (https://canvas.uw.edu/calendar?event_id=1243465&include_contexts=course_1290729)
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-  [Term Paper - due May 31](https://canvas.uw.edu/courses/1290729/assignments/4744942)
(<https://canvas.uw.edu/courses/1290729/assignments/4744942>)
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-  [Time series / case-crossover studies \(SV\)](https://canvas.uw.edu/calendar?event_id=1243478&include_contexts=course_1290729) (https://canvas.uw.edu/calendar?event_id=1243478&include_contexts=course_1290729)
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-  [To do before class](https://canvas.uw.edu/courses/1290729/assignments/4744947) (<https://canvas.uw.edu/courses/1290729/assignments/4744947>)
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-  [To do before class](https://canvas.uw.edu/courses/1290729/assignments/4744948) (<https://canvas.uw.edu/courses/1290729/assignments/4744948>)
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-  [To do before class \(https://canvas.uw.edu/courses/1290729/assignments/4744955\)](https://canvas.uw.edu/courses/1290729/assignments/4744955)

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 -  [To do before class \(https://canvas.uw.edu/courses/1290729/assignments/4744959\)](https://canvas.uw.edu/courses/1290729/assignments/4744959)

 -  [To do before class \(https://canvas.uw.edu/courses/1290729/assignments/4744960\)](https://canvas.uw.edu/courses/1290729/assignments/4744960)
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