

EHS C157/C257 RISK ASSESSMENT AND STANDARD SETTING (4 units)

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Fridays 6p-9p CHS 61-262 2017

Aims:

To provide students with opportunities to review the scientific basis for association of selected occupational and environmental exposures with disease. Special emphasis is on critical evaluations of the literature. Attention is also on the interface of science and standard making.

Learning Objectives

This course surveys the general principles, basic mathematical methods, and practices of human health risk assessment. Topics include the place of risk assessment in risk analysis, dose-response modeling, risk management, risk communication, and risk perception.

1. Students will acquire the knowledge of the basis of regulatory guidelines for the occupational environment and the ambient environment for chemical, physical, biological, ergonomic, mechanical, safety, and psychosocial exposure situations with major focus on chemicals
2. Students will learn how to investigate the literature, interpret the information, and articulate their understanding through written and oral reports
3. Students will learn how political and economic processes modify basic science determinations of risk assessment.

The environmental health competencies for Master of Science students are: A1 Retrieve and organize literature; synthesize and critically evaluate scientific literature in environmental health, public health and other relevant fields; A2 Use existing databases to provide background information or data to address research questions and draw appropriate inferences/ estimates from environmental health data; A3 Evaluate seminars and presentations in environmental health and distill the critical and salient issues from them; C1 Use computer systems and analytic software packages; D1 Make reasonable inferences from results of analysis of observational and analytic studies; E1 Prepare presentation materials including outlines, posters, and Powerpoint presentations; E2 Deliver effective oral presentations individually and as part of a team.

The EHS MPH competencies are: C1 Describe major direct and indirect human health and safety effects of major environmental or occupational agents; C2 Describe physiologic and psychosocial factors that affect susceptibility to adverse health outcomes following exposure to environmental hazards; C3 Describe federal and state regulatory programs, guidelines, and authorities that control environmental health issues; C4 Specify current environmental risk assessment methods; C6 Identify key sources of data and use existing databases to provide background or supportive data to address environmental health questions; C7 Discuss various risk management and risk communication approaches, including their relation to issues of environmental justice and equality.

Interdisciplinary/cross-cutting competencies include: Communication and Informatics: Use information technology to access, evaluate, and interpret public health data; Public Health Biology: Explain how genetics and genomics affect disease processes and public health policy and practice

Assignments:

Every two weeks starting week 2, assignments will be posted, the product to be orally presented as well as through a written report.

Final Project

Instead of a final exam, students will be assigned to small groups (2-4 students) to conduct and present a risk assessment for a topic of their own choosing. During the final week of the course each group will have 20 minutes to present their work using a PowerPoint format, followed by 5 minutes for discussion. Written risk assessment reports are also required.

Textbook (Optional):

1. *Quantitative Environmental Risk Analysis for Human Health*, by RA Fjeld, NA Eisenberg, and KL Compton (John Wiley & Sons, Inc., Hoboken, NJ, 2007). ISBN 978-0-471-72243-4.

On Biomedical, Library Reserve.

2. Various Readings to Be Distributed

Timeline

Week	Topic
1 Apr 5	Introduction, Text Chap 1/Dose Response Modeling, Text Chap 11
2 12	Introduction to National Library of Medicine Data Bases for Risk Assessment. Bring laptops.
3 19	a. Uncertainty and Sensitivity Analyses, Text Chap 12 b. Dioxin/Benspyrene Equivalents; Risk Perception/Communication/Management, Text Chap 13,14
4. 26	a. Continued; Modeling and in-Silico, Text Chaps 2-7 b. Assignment 1 presentations
5. May 3	a. Continued b. Assignment 2 presentations
6 10	Assignment 2 presentations continued
7. 17	a. Case Studies for Benzene and Cadmium b. Assignment 3 presentations
8. 24	a. Physical, Biological, Mechanical, Ergonomic, and Psychosocial Stress Exposures; Control Banding b. Assignment 3 presentations contd
9. 31	Oral Presentations for Projects
10. June 7	No Lecture

WEBSITES:

NLM: National Library of Medicine TOXNET: <http://toxnet.nlm.nih.gov/>

NIOSH: <http://www.cdc.gov/NIOSH/> Criteria Documents: http://www.cdc.gov/niosh/pubs/criteria_date_desc_nopubnumbers.html

ATSDR: <http://www.atsdr.cdc.gov/>; Toxicological Profiles: <http://www.atsdr.cdc.gov/toxprofiles/index.asp>

EPA: <http://www.epa.gov/>; Criteria Documents: http://nlquery.epa.gov/epasearch/epasearch?areaname=&areasearchurl=search.html&typeofsearch=epa&search_crumbs=no&result_template=epafiles_default.xsl&allquery=&allin=&phrasequery=criteria+document&phrasein=&anyquery=&anyin=&nonequery=&nonein=&doctype=all&sort=term_relevancy;
Risk assessment: <http://iccvam.niehs.nih.gov/SuppDocs/FedDocs/EPA/EPA-devtox.pdf#search=risk%20assessment>

OSHA: <http://www.osha.gov/>; Risk assessment: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=PREAMBLES&p_id=994

NTP: <http://ntp-server.niehs.nih.gov/>; Scientific reviews on carcinogens: <http://ntp-server.niehs.nih.gov/?objectid=03C9F0A4-B1C2-31DE-ABA8508AE9949C57>

FDA: <http://www.fda.gov/>; Risk Assessment: <http://www.fda.gov/Food/FoodScienceResearch/RiskSafetyAssessment/default.htm>