ENVH 577, CEWA 560, PUBPOL 589: Risk Assessment for Environmental Health Hazards

4 credit, Graded
Elaine Faustman, PhD

Quarter: Autumn 2019
Time: Tuesdays & Thursdays from 8:30 to 10:20 am
Location: More Hall 220

Risk Assessment is a lens through which you will learn to explore and tackle environmental and public health sciences problems and characterize risk within a broad public health context.

Instructor: Dr. Elaine M. Faustman

Office Hours: By appointment
Location: 4225 Roosevelt Way NE, Suite 100, Rm. 208
Telephone: 206-685-2269
Email: faustman@uw.edu
Dr. Elaine M. Faustman, Professor and Director of the Institute of Risk Analysis and Risk Communication, School of Public Health, University of Washington, Seattle. Dr. Faustman directs the Center for Children Health Research and directed the Pacific Northwest Center for the National Children Study and the Oceans and Human Health Center. She is an elected fellow of the American Association for the Advancement of Science and the Society for Risk Analysis. She has served on the USEPA Science Advisory Board and chaired the National Academy of Sciences Committee on Developmental Toxicology. She has also served on the National Advisory Environmental Health Sciences Council, NIEHS-NTP Board of Scientific Counselors and Committee on Alternative Toxicology Methods, National Academy of Sciences Committee on Toxicology and the Institute of Medicine Upper Reference Levels of Nutrient Subcommittee of the Food and Nutrition Board. She has served as the Secretary General for the International Union of Toxicology(IUTOX) and is currently a member of the International Science Council (ICSU) World Data Systems Advisory Board. For over 2 decades she has been involved and directed Stakeholder forums and Community Based Participatory Research for DOE, EPA and NIH. She currently serves on the ICSU CODATA Citizen Sciences Taskgroup. Her research expertise is on integrative scientific approaches including identifying molecular mechanisms of developmental, reproductive, and neurotoxicants, characterizing in vitro techniques for toxicology assessment, and developing biological and exposure based dose-response models. She has over 200 peer reviewed research publications and reports.

**Teaching Assistant:** Orly Stampfer

![Orly Stampfer](image)

**Office hours:** by appointment (please email me and we can set up a time and location convenient for both of us)

**Email:** [ostamp@uw.edu](mailto:ostamp@uw.edu)

Orly Stampfer (pronouns: she/her/hers) is a PhD student in the Department of Environmental and Occupational Health Sciences at University of Washington. She graduated with an MPH from the same department in 2018. Prior to graduate school, Orly worked in environmentally sustainable healthcare and environmental education. For the past three years, Orly has focused on community-engaged air pollution research in partnership with Yakama Nation and Tulalip Tribes. She is interested in rural air pollution issues including wildfire smoke. Orly has experience in both qualitative and quantitative research.
Course description:

1 - Course Description_Objectives 2019.doc
(https://canvas.uw.edu/courses/1318679/files/58480366/download?wrap=1)

Risk Assessment is a transdisciplinary, multifaceted approach to solving public and environmental health science problems because it combines the key principles of exposure sciences (through assessment of exposure), toxicology and epidemiology (through hazard identification), and modeling (through dose-response assessment) to characterize risks from biological, chemical, or physical agents for public health questions. Risk management includes delineating options, making decisions, and taking actions to address the risks identified. Making decisions in the face of significant uncertainty is a key challenge to which risk assessment and risk management approaches can be applied. Risk communication identifies approaches to exchange information about risks to stakeholder groups. Understanding how individuals perceive risk can provide ideas for improved risk communication and for risk evaluation.

Course Description

ENVH 577 “Risk Assessment for Environmental Health Hazards” is a graduate course that introduces students to the fundamentals of environmental risk assessment through a series of lectures, case examples, readings, assignments, and a final group project. Students learn to identify, characterize and predict environmental health risk for a spectrum of public and environmental health science problems. Quantitative prediction methods are taught and students will have an opportunity to use these approaches. Methods for evaluating uncertainty in such predictions are presented. Approaches for preventing and controlling potential risks are also included in the course content and this will involve discussion of legislative and regulatory options as well as risk communication techniques. Students will prepare a risk assessment within a group project setting.

Since risk assessment practice requires a transdisciplinary understanding across technical and social sciences, this course has transdisciplinary student participation which is exemplified by its listing in three schools. It is designed for students in public health in all of the 5 core disciplines. In addition, students in engineering and environmental disciplines (civil and systems) are key participants. It is also designed for students in law, policy, and risk management thus students in public affairs provide essential context for risk application.

Through the use of case examples in all lectures and in the group project, students will become familiar with examples of chemical, physical and biological agents and will be able to understand the sources of such risks within the community. For example, media-specific (air, water, soil) as well as context-specific (food, occupational, medicine, etc.) factors will be included. Natural as well as man-made risks will be assessed. Lectures and student exercises will emphasize the significance of integrating information from core public health disciplines of environmental health, epidemiology, health policy management and social and behavioral sciences. Opportunities to participate in facilitated exercises and group discussions will be encouraged.

Course Credit: The course is a 4 credit course and class time will be used in a balance of didactic lectures as well as participatory exercises and discussion.
Course Objectives and Evaluation

Course Objectives

The course objectives include:

1. Identifying hazards and understanding the methodologies and types of data generated by public health studies (epidemiology, toxicology, etc.) and ecologist.
2. Define risk assessment, describe the what, why and how of risk assessment, i.e., describing and differentiating the public health risks, benefits and costs of a particular action or chemical and thereby developing a framework for decision-making in environmental health and safety.
3. Characterizing the public health risks of a specific hazard by accounting for variables, differing sensitivities and uncertainties of analysis.
4. Identifying factors that contribute to the diversity of the response of human populations to environmental toxicants and physical factors.
5. Prepare and present a group risk assessment project that identifies, characterizes, and manages an environmental, ecological, or occupational risk.
6. Define risk management and identify means to control risk including intervention as well as use of legislative and regulatory guidelines.
7. Effectively communicate environmental and public health risks and prevention strategies to potentially affected communities including culturally diverse populations.
8. Identify social and economic factors that can affect vulnerabilities to environmental hazards.

Course Competencies

Upon completion of this course students shall be able to:

1. Describe and distinguish between risk assessment and management approaches.
2. Describe how risk information from core public health disciplines is integrated to identify potential health risks.
3. Describe how public policy and engineering controls can address and decrease vulnerabilities.
4. Describe and apply both qualitative and quantitative approaches to characterize the magnitude of environmental and public health risks.
6. Identify key areas of uncertainty in risk predictions.
7. Describe risk management approaches for addressing (controlling and preventing) predicted risks including identifying legislative, regulatory and risk communication options.
8. Perform an environmental or public health risk assessment.

Course Evaluation

Graded Assignments

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<tr>
<th>Assignment</th>
<th>Percentage of Grade</th>
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<tbody>
<tr>
<td>Final Exam</td>
<td>25%</td>
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<tr>
<td>Student Project</td>
<td>50%</td>
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<td>Oral Presentation</td>
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and Student Project Critique (20%)

Paper (30%)

Memo to the Governor 20%

Credit/No Credit assignments *

Short Term and Biomarker Assay Review 2%
Quantitative Worksheet examples 2%
Class Participation 1%
(including discussion and breakout groups)

100%

Text Books/Reading Materials

Required

1. ENVH 577 Readings (On Canvas site)

In some cases, you will be asked to select from 1 or more from a group of reading options and the selected reading are considered required assigned reading. However, in other cases readings listed are specified as optional or supplemental and are not considered required. Unless otherwise noted, readings listed serve as suggested readings that the student may wish to read if desired.

Readings/Slide Posting:

All slides will be posted and we will use Panopto to record videos of all classes.

UW School of Public Health Equity Diversity and Inclusion Statement

The University of Washington School of Public Health acknowledges the land we sit and occupy today as the traditional home of the Tulalip (https://www.tulaliptribes-nsn.gov/Home.aspx), Muckleshoot (http://www.muckleshoot.nsn.us/default.aspx), Duwamish (https://www.duwamishtribe.org/), and Suquamish (https://suquamish.nsn.us/) tribal nations. Without them, we would not have access to this working, teaching, and learning environment. We humbly take the opportunity to thank the original caretakers of this land who are still here.

Our School of Public Health is committed to addressing the root causes of health inequities and promoting healthy and safe communities in our region and beyond. As the problem of racial and ethnic disparities in health outcomes continues to persist, policymakers and the general public increasingly look to health professional schools to address these urgent and unacceptable circumstances. As one of the few schools of public health in the Northwest, it is particularly important for us to be up to this challenge.
Underlying all public health research and training activities is an acknowledgement and deeper understanding of the effects that historical, cultural and socioeconomic factors have on the health of communities, especially those who are most underserved. Racism and race-based oppression is all too often a central driver of health disparities. We work to attract and retain students, faculty and staff from diverse backgrounds and perspectives, to build and sustain a positive climate for inclusion and community, and to engender multiple modes of approaching complex problems. We strive to create opportunities for education, research and collaboration that leverage our strengths, similarities and differences. We challenge ourselves to view problems and evaluate solutions through an equity lens. Through each of these efforts, we aim to foster a generation of public health professionals and academicians who are poised to transform health for the better in our communities.

Our historical logo, the Soul Catcher by Marvin Oliver, symbolizes the restoration of health and wellness and reminds us to align our work with the history, traditions, and practices while respecting and supporting the agency of individuals and communities to achieve their desired health outcomes. More information about our logo can be found here (http://sph.washington.edu/about/soulcatcher.asp).

The work of equity, diversity and inclusion is the work of Public Health. We are committed to a future that is free of health inequities, that promotes the highest level of wellness that our communities aim for, and a diverse and inclusive public health workforce that embodies humility, respect, leadership and service on behalf of the diverse communities we are privileged to serve.

**Academic Integrity** ([http://sph.washington.edu/students/academicintegrity](http://sph.washington.edu/students/academicintegrity))

Students at the University of Washington (UW) 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.

**UW Disability Statement** ([http://depts.washington.edu/uwdrs/faculty-resources/syllabus-statement/](http://depts.washington.edu/uwdrs/faculty-resources/syllabus-statement/))

**Access and Accommodations:**

Your experience in this class is important to me. 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 (conditions include but not limited to; mental health, attention-related, learning, vision,
hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu (mailto:uwdrs@uw.edu), or disability.uw.edu. 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(s) and DRS. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.