

ENV HLT 200D: Policy Analysis for Environmental Health Science

UCLA School of Public Health

Course website: <https://ccle.ucla.edu/course/view/18W-ENVHLT200D-1>

Syllabus - Winter 2018 (revised January 22, 2018)

Course information

Time: 9am-10:50am Tuesday/Thursday

Location: 51-279 CHS

Units: 4

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Required Text

Most required readings for this course are available on the internet without charge to UCLA students accessing them from a UCLA-based computer. If any reading is either not available or if a URL is not valid, please notify one of the instructors immediately.

In addition to documents available on the internet, there is one required textbook:

Tufte, E.R., 2006. *Beautiful Evidence*. New York.

Course Goal and Description:

Designed for students in the second year of the Environmental Health Sciences MS and MPH programs, this practice-focused course synthesizes and applies content from prior courses to the analysis of current environmental health policy issues. Students will learn fundamentals of environmental health law, regulatory frameworks, communication strategies, approaches for working with community-based organizations, and a range of policy analysis methods. Course lectures and assignments will focus on different environmental and occupational health and policy aspects of a single case study.

The course will meet for four hours per week in the Winter Quarter. The format is interactive seminar and discussion focusing on problem-solving around a case-study. ENV HLT 200D can be taken either for a letter grade or as S/U. Students in the MS and MPH programs who wish for this course to count towards their degree requirements must take the course for a letter grade. All students (regardless of whether they are taking the course for a letter grade or as S/U) are expected to engage actively in the class discussions, problem solving sessions and team projects.

SKILL DEVELOPMENT

1. Technical writing with an emphasis on the translation of emerging environmental health issues and research for diverse audiences, including policy-makers and the general public;
2. Accessing and using existing data to characterize populations and environmental health risks;
3. Quantitative policy analysis for environmental health, including simulation modeling, risk analysis, cost/benefit analysis and alternatives analysis;

4. Effective environmental health communications (written, visual and verbal) with an emphasis on communicating complex issues under conditions of uncertainty;
5. Working with community-based organizations.

CONTENT KNOWLEDGE

1. Development of environmental health legislation and regulation;
2. Court cases and other factors shaping occupational health regulations;
3. History of hazardous waste and toxics regulation in the U.S.;
4. Regulation of petroleum and natural gas industries;
5. Environmental health within NEPA and CEQA;
6. Using quantitative models to assess potential policy impacts;
7. Application of risk assessment models;
8. Monetizing health risks and benefits for cost/benefit analysis;
9. Scoping assessment for HIA/EIA.

Course Website:

An electronic version of the syllabus, discussion forum and additional guidance on the team projects is available on the course website:

If you are unable to access the course website, please contact Brian Cole (blcole@ucla.edu).

Course Structure:

The class will meet for two two-hour sessions each week. The course format is primarily interactive seminar and discussion with a heavy emphasis on learning from case-studies. Active participation is essential to success in this course. Students are expected to have read all required readings prior to each class session. Reading assignments are listed in the course schedule found at the end of this syllabus; any updates will be posted on the course website.

Learning Objectives and Competencies

Upon completion of this course, students will be able to demonstrate the competencies associated with the Course Learning Objectives below.

COURSE LEARNING OBJECTIVES	ASPH MPH COMPETENCIES 'F' competencies for all MPH students, 'I' competences for EHS MPH students
1. Describe the development of environmental health legislation and regulations in the U.S. and how these are shaped by scientific research and advocacy.	I6.1 (EHS MPH) Describe major types of institutions responsible for occupational or environmental health policy. [100%] I6.2 (EHS MPH) Identify major state, federal, international regulatory programs or authorities for occupational or environmental health. [100%] B5 (EHS MS) Be able to articulate interdisciplinary approaches to solving public health problems. [100%]
2. Describe different types of uncertainty around environmental health risks and how they are handled in policy analysis.	F15 (all MPH) Differentiate between qualitative and quantitative evaluation methods in relation to their strengths, limitations, and appropriate uses, and emphasizes on reliability and validity. [100%] I1 (EHS MPH) Describe major direct and indirect human health and safety effects of major environmental or occupational agents or conditions. [25%] I1.3 (EHS MPH) Identify significant gaps in the current knowledge base concerning health effects of environmental or occupational agents. [50%] I4.2 (EHS MPH) Describe genetic, biological, psychosocial, and socio-economic factors that may affect susceptibility to adverse health outcomes following exposure to environmental hazards. [25%] I5.2 (EHS MPH) Identify areas of uncertainty in exposure and risk assessment processes. [100%] I8.1 (EHS MPH) Describe importance of community and home environments and what contributes to cumulative impacts. [50%] B4 (EHS MS) Identify potential sources of systematic error (bias) as well as random error. [20%]
3. Describe how public policy can reduce or exacerbate environmental health disparities, health equity and environmental justice.	F12 (all MPH) Discuss sentinel events in the history and development of the public health profession and their relevance for practice in the field. [25%] F13 (all MPH) Describe basic principles of ethical analysis (e.g. the Public Health Code of Ethics, human rights framework, other moral theories) as they relate to issues of public health practice and policy. [50%] F16 (all MPH) Explain how the contexts of gender, race, poverty, history, migration, and culture are important in the design of interventions within public health systems. [50%] I1.2 (EHS MPH) Identify the most important disease burdens with major environmental or occupational risk factors and the environmental or occupational risk factors that produce the most disease burden in either the general population or in heavily affected subgroups. [25%] I7.1 (EHS MPH) Define environmental justice and give examples of environmental exposures that are distributed unequally with regard to race/ethnicity and/or socio economic status. [100%] I7.2 (EHS MPH) Explain how equity can be considered in environmental health. [100%] I8.2 (EHS MPH) Define the built environment. [100%]
4. Find and use existing environmental, demographic, economic and health data to assess the extent of environmental health disparities in a population.	F11 (all MPH) Articulate how biological, chemical and physical agents affect human health. [25%] F14 (all MPH) Apply evidence-based principles and the scientific knowledge base to critical evaluation and decision-making in public health. [100%] I12.2 (EHS MPH) Draw upon key information sources and references essential to environmental health practice. [100%] I1.4 (EHS MPH) Be able to construct and interpret models of environmental health

COURSE LEARNING OBJECTIVES	ASPH MPH COMPETENCIES 'F' competencies for all MPH students, 'I' competences for EHS MPH students
	<p>pathways to develop solutions to environmental health problems and exposures. [50%]</p> <p>A1 (EHS MS) Retrieve and organize literature; synthesize and critically evaluate scientific literature in environmental health, public health and other relevant fields. [50%]</p> <p>A2 (EHS MS) Use existing databases to provide background information or data to address research questions and draw appropriate inferences/estimates from environmental health data. [50%]</p> <p>C1 (EHS MS) Use computer systems and analytic software packages. [25%]</p> <p>C2 (EHS MS) Produce working tables, statistical summaries, and effective figures to summarize data. [50%]</p> <p>D1 (EHS MS) Make reasonable inferences from results of analysis of observational and analytic studies. [50%]</p>
<p>5. Develop strategies for effective collaborations between community-based organizations, public agencies and researchers for analysis, advocacy and implementation of policies to support environmental health.</p>	<p>F8 (all MPH) Engage in dialogue and learning from others to advance public health goals. [50%]</p> <p>F9 (all MPH) Demonstrate team building, negotiation, and conflict management skills. [75%]</p> <p>F10 (all MPH) Use collaborative methods for achieving organizational and community health goals. [75%]</p> <p>B5 (EHS MS) Be able to articulate interdisciplinary approaches to solving public health problems. [100%]</p> <p>E4 (EHS MS) Work effectively as part of an interdisciplinary team. [100%]</p>
<p>6. Accurately and effectively communicate the impact of policies on environmental health risks to critical stakeholders individually and as part of a team in written, visual and verbal presentations.</p>	<p>I10.1 (EHS MPH) Organize information and data, prepare technical reports and give oral presentations on environmental contaminants and impacts. [100%]</p> <p>I10.2 (EHS MPH) Communicate effectively with diverse audiences . [50%]</p> <p>I12.1 (EHS MPH) Present cogent and well substantiated arguments for actions to address environmental health concerns. [100%]</p> <p>E1 (EHS MS) Prepare presentation materials including outlines, posters, and Powerpoint presentations. [50%]</p> <p>E2 (EHS MS) Deliver effective oral presentations individually and as part of a team. [100%]</p> <p>E3 (EHS MS) Explain and interpret research findings for students, professionals, the public, and media. [100%]</p>
<p>7. Tailor written communications so that they are appropriate to various target audiences, including technical experts, policy-makers and the lay public.</p>	<p>F4 (all MPH) Collaborate with communication and informatics specialists in the process of design, implementation, and evaluation of public health programs. [25%]</p> <p>F5 (all MPH) Demonstrate effective written and oral skills for communicating with different audiences in the context of professional public health activities. [100%]</p> <p>F6 (all MPH) Use information technology to access, evaluate, and interpret public health data. [75%]</p> <p>F7 (all MPH) Identify public health programs and strategies that are responsive to the diverse cultural values and traditions of the communities being served. [75%]</p> <p>I10.2 (EHS MPH) Communicate effectively with diverse audiences. [50%]</p> <p>I12.1 (EHS MPH) Present cogent and well substantiated arguments for actions to address environmental health concerns. [100%]</p> <p>E3 (EHS MS) Explain and interpret research findings for students, professionals, the public, and media. [100%]</p>
<p>8. Demonstrate the ability to use each of the following to assess the effects of policies on environmental health risks:</p>	<p>I1.4 (EHS MPH) Be able to construct and interpret models of environmental health pathways to develop solutions to environmental health problems and exposures. [50%]</p> <p>I4.1 (EHS MPH) Utilize epidemiological data, with due regard to statistical validity</p>

COURSE LEARNING OBJECTIVES	ASPH MPH COMPETENCIES 'F' competencies for all MPH students, 'I' competences for EHS MPH students
<ul style="list-style-type: none"> Spatial Analysis/Geographic information systems Population-based quantitative modeling, Alternatives analysis, Risk assessment, Cost/benefit analysis, Equity analysis, Health impact assessment. 	<p>and sources bias, in the assessment of impacts of hazardous agents on the health of human populations. [50%]</p> <p>I5.1 (EHS MPH) Use at least three of these assessment methods: quantitative risk assessment; burden of disease using disability-adjusted life years; spatial analysis and geographic information systems; health impact assessment; alternatives assessment. [100%]</p> <p>I6.3 (EHS MPH) Analyze policy contexts and develop responsive policy proposals reflecting environmental health science. [50%]</p> <p>I6.4 (EHS MPH) Define the important constructs used in policy analysis and development including risk, costs, benefits and the contribution of empirical work to them. [100%]</p> <p>I11.1 (EHS MPH) Draw upon scientific knowledge and assessment methods to develop approaches to assess, prevent and control environmental hazards that pose risks to human health and safety. [50%]</p> <p>B2 (EHS MS) Evaluate the scientific merit and feasibility of study designs. [25%]</p> <p>C1 (EHS MS) Use computer systems and analytic software packages. [25%]</p>

Course grading:

ASSIGNMENT	% of grade	Due Date
1. Presentation of reading case-study (individual)	5%	Week 2
2. Op-ed essay (individual)	10%	Week 3
3. Policy brief (individual)	10%	Week 4
4. In-class tutorial presentations (5)	20%	Weeks 4 - 7
5. Policy Analysis and Report (group)	25%	Week 10
6. Report Presentation (group)	5%	Week 9
7. Mock radio-show interview and Q & A (individual)	10%	Week 10
8. Mid-term (covers weeks 1-5)	15%	Week 6

Case Study

Course lectures and assignments, including both individual and group projects, will focus on an in-depth analysis of a single case study. This case study will involve multiple aspects of environmental and occupational health. Individually and in groups, students will examine different environmental and occupational health problems related to the case study and assess the potential for policy-based solutions to address those problems. Students will develop written, verbal and visual communications to communicate these findings to diverse audiences.

Case Study for Winter 2017: *Policy action to reduce arsenic in drinking water in the San Joaquin Valley*

Assignment 1: Presentation of a case-study reading (5% of final grade, due Week 2)

Select one of the case study background readings (see last page of syllabus) and present a 10-minute review to the class that addresses the following:

- Environmental and occupational health issues addressed in the reading;
- Health disparities/Health equity issues (if any);
- Relevant uncertainties and information gaps;
- Current policies relevant to the health issue;
- Government agencies and community-based organizations working on the issue in the case study area;
- How policy actions could better address the problem.

Assignment 2: Op-ed essay (10% of final grade, due Week 3)

Write a 500-800 word essay written in “Op-Ed” style focusing on the environmental or occupational health issue addressed in their reading for Assignment #1. This is a persuasive essay aimed at newspaper readers in a particular community. The essay should aim to either stimulate public discussion of the issue or argue for or against a particular public policy action. Essays should follow op-ed style guidelines recommended by one of the following

- [Tips for Op-Ed Writing \(The Op-Ed Project\)](#)
- [How to write an op-ed article \(Duke University\)](#)
- [How to write an op-ed or column \(Journalist’s Resource\)](#)

Assignment 3: Policy brief (10% of final grade, due Week 4)

Write a 2-page policy brief aimed at informing elected officials about the health issue addressed in Assignment #1. Identify why this is an important health priority, who it affects and recommendations for addressing the problem. Writing should be clear and concise in a style appropriate for a sophisticated, lay audience. Consider emulating formats and styles used in policy briefs from organizations, such as PolicyLink, CPEHN, ChangeLabSolutions. Suggestions for writing an effective policy brief are provided by [ResearchtoAction.org](#).

Assignment 4: Tutorials on a data set or analytic tool for policy analysis (20% of grade, Weeks 4 - 7)

Each student will present five 15- to 20-minute tutorials to the class on a selected aspect of the case study problem, data source or analytic tool (see list below). Presentations must include concrete examples of how this information or tool can be used for Assignment #6. If students would like to present on a topic not listed below, they should discuss with the instructor whether this would be a suitable alternative for their tutorial presentation.

Category	Tutorial Topics
Health effects of arsenic (week 4)	<ol style="list-style-type: none">1. Cancers2. Diabetes3. Neonatal, developmental4. Other - immune system, neurologic
Sources, exposure and control (week 4)	<ol style="list-style-type: none">1. Naturally occurring arsenic, factors associated with high arsenic levels in drinking water supplies2. Techniques for removing arsenic from drinking water, Costs of arsenic removal for small water systems

	<ol style="list-style-type: none"> 3. Other sources of arsenic exposure (e.g. food) 4. Factors contributing to differential vulnerability
GIS Tools for describing and assessing environmental health hazards (week 5)	<ol style="list-style-type: none"> 1. (MABLE/Geocorr and TAMU Geoservices) 2. Tools for mapping Census data 3. USGS's NAWQA database 4. PUR database
SWOT analysis of advocacy organizations active on SJV drinking water arsenic (week 6)	<ol style="list-style-type: none"> 1. Community Water Center 2. Clean Water Action 3. ACWA 4. Environmental Justice Coalition for Water
Review & critique of EPA's Proposed Arsenic Standard Regulatory Impact Assessment (week 7)	<ol style="list-style-type: none"> 1. Selection of endpoints (including emerging research) 2. Effect parameters (i.e. dose-response relationships) 3. Vulnerable populations and exposure assumptions) 4. Alternative Models

Assignment 5: Policy Analysis and Report (25% of final grade, due Week 10)

Working in groups of 3-4 students, identify a major environmental or occupational health problem related to this quarter's case study topic and study area, then assess the potential impact of at least one policy or other intervention aimed at addressing this issue. Reports should include:

- Clear, concise statement of the problem and its origins framed in terms of environmental health;
- Descriptive statistics on the demographic, economic and health characteristics of affected populations in the study area;
- Analysis of current health disparities using appropriate statistical and GIS methods;
- Assessment of potential impacts of policy changes using one or more of the quantitative policy analysis tools presented in class (including review of relevant research literature, discussion of methods and limitations);
- Recommendations for action targeted to specific agencies and public officials.
- A 1-page Executive Summary written for a lay audience (e.g. non-specialist legislative staffer).

Reports should be 12- to 20-pages in length (1.1 spacing) written in the style of a health impact assessment. Additional formatting guidelines will be provided in class. Proposed topics must be presented for instructor approval by Week 3. Analytic tools must be presented for instructor approval by Week 6.

Assignment 6: Report Presentation (5% of final grade, due Week 9)

Each group will develop and present a 10-minute presentation of their policy analysis report. Presenters are encouraged to follow the guidelines offered in the [TEDx Speaker Guide](#). The assumed target audience for the presentation is a group of community members and public officials. Presentation slides should be clear visual depictions of what you are trying to communicate. They should enhance your talk, but at the same time they should be able to stand on their own with little explanation needed. Visualizations should follow guidelines outlined in Tufte's *Beautiful Evidence*.

Assignment 7: Mock radio-show interview and Q & A (10% of final grade, due Week 10)

Each student will participate in a mock 5-minute radio interview on a program similar to [KPCCC's Take Two](#) program addressing an aspect of their group's policy analysis (Assignment 4). Interview topics will be assigned by the instructors one week prior to the interview. In addition to questions from the interviewer, outside guests (academics, public officials and other members of the public) may "call in" with questions. Half of the grade for this assignment will be based on each student's self-assessment after listening to a recording of the interview on ways to improve their performance.

Midterm Exam

The aim of the mid-term is to assess understanding of core concepts, principles and terminology covered in the readings and class discussion in Weeks 1 through 5. The mid-term exam format will be fill-in-the-blank and short answer. Closed book. One 4x5 notecard allowed. 45 minutes.

NO FINAL EXAM

Class Participation:

The class meets four hours per week and is in the format of an interactive seminar. Active participation is essential to success in this course. PLEASE MAKE SURE THAT YOU ARE IN CLASS ON TIME AND THAT YOU HAVE COMPLETED ALL REQUIRED READINGS PRIOR TO COMING TO CLASS. PLEASE COME TO CLASS READY TO LEARN AND BE ENGAGED. Although you are allowed to use computers during class, we are relying on you to exercise restraint and not surf the web, check email or engage in other non-class activities online during class.

Week 1: Health Impact Assessment Framework

Session Agendas

Tuesday, January 9

- Introductions
- Review course scope, expectations and assignments
- Lecture and discussion: Using a Health Impact Assessment (HIA) framework for applied policy analysis

Thursday, January 11

- Lecture and discussion:
 1. Description of the case study region and populations
 2. Policies and regulations supporting environmental and occupational health
- Select readings and topics for Assignments 1-3

Readings (for Weeks 1 and 2)

Health Impact Assessment

Cole, BL, Fielding JE. 2007. Health impact assessment: a tool to help policy makers understand health care beyond health care. *Annual Rev Public Health* 38:393-412.

<http://www.annualreviews.org/doi/pdf/10.1146/annurev.publhealth.28.083006.131942>

Improving Health in the United States: The Role of Health Impact Assessment by Committee on Health Impact Assessment, Board on Environmental Studies and Toxicology, Division on Earth and Life Studies and National Research Council (Oct 28, 2011). Chapter 3: Elements of a Health Impact Assessment. <https://www.ncbi.nlm.nih.gov/books/NBK83540/>

Mindell J, Joffe M. 2003. Health impact assessment in relation to other forms of impact assessment. *J Public Health Medicine* 25, No. 2, pp. 107-113.

<http://jpubhealth.oxfordjournals.org/content/25/2/107.full.pdf>

Nelson, Mary Elizabeth. 1984. Rejection of risk under NEPA: Stress and People Against Nuclear Energy. *The American University Law Review* 33:535-558.

<http://www.wcl.american.edu/journal/lawrev/33/nelson.pdf?rd=1>

Environmental Health Law

IOM (Institute of Medicine). 2011. Law and the Public's Health: Law as a Tool for Improving Population Health. Chapter 3 in *For the Public's Health: Revitalizing Law and Policy to Meet New Challenges*. Washington, DC: The National Academies Press.

<https://www.nap.edu/read/13093/chapter/5>

Jackson, Richard J., and Timothy F. Malloy. "Environmental public health law: Three pillars." *Journal of Law, Medicine & Ethics* 39.1 (2011): S34-S34. <https://dx.doi.org/10.1111/j.1748-720X.2011.00562.x>

NRDC (Natural Resources Defense Council). 2013. An introduction to federal environmental policy. Pp. 4-11, 30-35. <https://www.nrdc.org/sites/default/files/policy-basics-full.pdf>

Korfmacher, Katrina Smith, Maria Ayoob, and Rebecca Morley. "Rochester's lead law: Evaluation of a local environmental health policy innovation." *Env Health Perspectives* 120.2 (2012): 309.

Occupational Health Law

U.S. Court of Appeals, District of Columbia Circuit. 2014. SeaWorld of Florida, LLC v. Thomas Perez.

[https://www.cadc.uscourts.gov/internet/opinions.nsf/5AF8A4C12F19AE2185257CB700516292/\\$file/12-1375-1487925.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/5AF8A4C12F19AE2185257CB700516292/$file/12-1375-1487925.pdf)

Shultz, M., Steinzor, R.I., Shapiro, S.A. and McGarity, T.O., 2013. Workers at Risk: Regulatory Dysfunction at OSHA. KBH Energy Center Research and Publications.

https://repositories.lib.utexas.edu/bitstream/handle/2152/40908/2013_01_01_Workers_Risk.pdf?sequence=2&isAllowed=y

Joyner, A.M., George, L., Hall, M.L., Jacobs, I.J., Kissam, E.D., Latin, S., Parnell, A., Ruiz, V., Shadbeh, N. and Tobacman, J., 2015. Federal farmworker housing standards and regulations, their promise and limitations, and implications for farmworker health. NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy, p.1048291115604390.

<http://new.sagepub.com/content/25/3/334>

Week 2: Legal Foundations for Environmental and Occupational Health

Session Agendas

Tuesday, January 16

- Lecture and discussion: Policies and regulations supporting environmental and occupational health (cont'd)

Thursday, January 18

- Student presentations of background readings on the case study
- Discussion of student interests in topics for group projects

Week 3

Tuesday, January 23

Wk3.1 Arsenic problem overview, logic frameworks, in class exercise: Problem definitions [BC]

Readings

Balazs, C. L., Morello-Frosch, R., Hubbard, A. E., & Ray, I. (2012). Environmental justice implications of arsenic contamination in California's San Joaquin Valley: a cross-sectional, cluster-design examining exposure and compliance in community drinking water systems. *Environmental Health*, 11(1), 84.

Balazs, C. L., & Ray, I. (2014). The drinking water disparities framework: on the origins and persistence of inequities in exposure. *American journal of public health*, 104(4), 603-611.

California State Water Resources Control Board. 2015 State Drinking Water Plan.

Section 2.2 State regulatory program

Section 3.2 Threats to drinking water safety

Section 4.2 Water Quality: Groundwater (small water districts)

Section 4.5 Costs (small water districts)

Thursday, January 25

Wk3.2 Data sources and data tools: Population, setting, exposure and effects [BC]

1. Enviromapper
2. Census/ACS
3. CHIS
4. Health Equity

- a. [WHO Urban Health Equity and Response Tool](#) (Urban Heart)
 - b. [WHO Health Equity Assessment Toolkit](#) (HEAT)
 - c. [Sustainable Communities Index](#)
 - d. [CalEnviroScreen 3.0](#)
 - e. [Connecticut Health Equity Index](#)
5. Demonstration: Using EPA's [SDWIS](#) database to describe local drinking water quality

Readings

Cushing, L., Faust, J., August, L.M., Cendak, R., Wieland, W. and Alexeeff, G., 2015. Racial/Ethnic Disparities in Cumulative Environmental Health Impacts in California: Evidence From a Statewide Environmental Justice Screening Tool (CalEnviroScreen 1.1). *American journal of public health*, 105(11), pp.2341-2348. <http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2015.302643>

National Academies of Sciences, Engineering, and Medicine. 2017. [Appendix B: Community-Level Indicators and Interactive Tools for Health Equity](#). *Communities in action: Pathways to health equity*. Washington, DC: The National Academies Press. doi: 10.17226/24624.

Schwartz, J., Bellinger, D. and Glass, T., 2011. Expanding the scope of risk assessment: methods of studying differential vulnerability and susceptibility. *American journal of public health*, 101(S1), pp.S102-S109.

Week 4

Tuesday, January 30

Health effects of arsenic **[Students]**

5. Cancers
6. Diabetes
7. Neonatal, developmental
8. Other - immune system, neurologic

Readings

Schmidt, C. W. (2014). Low-dose arsenic: in search of a risk threshold. *Environmental health perspectives*, 122(5), A130. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4014411/>

Abdul, K. S. M., Jayasinghe, S. S., Chandana, E. P., Jayasumana, C., & De Silva, P. M. C. (2015). Arsenic and human health effects: A review. *Environmental toxicology and pharmacology*, 40(3), 828-846. <http://www.sciencedirect.com/science/article/pii/S1382668915300946>

Smith, A. H., Marshall, G., Liaw, J., Yuan, Y., Ferreccio, C., & Steinmaus, C. (2012). Mortality in young adults following in utero and childhood exposure to arsenic in drinking water. *Environmental health perspectives*, 120(11), 1527. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3556614/>

Bräuner, E. V., Nordsborg, R. B., Andersen, Z. J., Tjønneland, A., Loft, S., & Raaschou-Nielsen, O. (2014). Long-term exposure to low-level arsenic in drinking water and diabetes incidence: a prospective study of the diet, cancer and health cohort. *Environmental health perspectives*, 122(10), 1059. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4181933/>

Thursday, February 1

Wk4.2 Sources, exposure and control **[Students]**

5. Naturally occurring arsenic, factors associated with high arsenic levels in drinking water supplies
6. Techniques for removing arsenic from drinking water, Costs of arsenic removal for small water systems
7. Other sources of arsenic exposure (e.g. food)
8. Factors contributing to differential vulnerability

Week 5

Tuesday, February 6

Legal tools and challenges, Discussion: Policy options [BC]

Readings

IOM (Institute of Medicine). 2011. Law and the Public's Health: Law as a Tool for Improving Population Health. Chapter 3 in For the Public's Health: Revitalizing Law and Policy to Meet New Challenges. Washington, DC: The National Academies Press.

<https://www.nap.edu/read/13093/chapter/5>

Jackson, Richard J., and Timothy F. Malloy. "Environmental public health law: Three pillars."

Journal of Law, Medicine & Ethics 39.1 (2011): S34-S34. [https://dx.doi.org/10.1111/j.1748-](https://dx.doi.org/10.1111/j.1748-720X.2011.00562.x)

[720X.2011.00562.x](https://dx.doi.org/10.1111/j.1748-720X.2011.00562.x)

NRDC (Natural Resources Defense Council). 2013. An introduction to federal environmental policy.

Pp. 4-11, 30-35. <https://www.nrdc.org/sites/default/files/policy-basics-full.pdf>

Thursday, February 8

Wk5.2 GIS Tools for describing and assessing environmental health hazards [Students]

5. [\(MABLE/Geocorr and TAMU Geoservices](#)

6. [Tools for mapping Census data](#)

7. USGS's [NAWQA](#) database

8. [PUR](#) database

Week 6

Tuesday, February 13

- Mid-term
- SWOT analysis and advocacy organizations active on SJV drinking water arsenic [BC]

Thursday, February 15

- SWOT analysis of and advocacy organizations active on SJV drinking water arsenic [students]
 5. Community Water Center
 6. Clean Water Action
 7. ACWA
 8. Environmental Justice Coalition for Water
- EPA Risk Assessment Guidelines (pt 1 of 2) [BC]

Readings

Goldman, L.R., 2010. The red book: A reassessment of risk assessment. Human and Ecological Risk Assessment: An International Journal, 9(5):1273-1281. <http://dx.doi.org/10.1080/10807030390248492>

Pollard, S.J., Strutt, J.E., MacGillivray, B.H., Hamilton, P.D. and Hrudey, S.E., 2004. Risk analysis and management in the water utility sector: a review of drivers, tools and techniques. Process Safety and Environmental Protection, 82(6), pp.453-462. http://ac.els-cdn.com/S0957582004712021/1-s2.0-S0957582004712021-main.pdf?_tid=f243160c-9de5-11e6-9054-00000aab0f01&acdnt=1477752342_ed59e2bcbf85a9679de10d4ab49203ca

U.S. Environmental Protection Agency. Human Health Risk Assessment (webpages). Main page:
<https://www.epa.gov/risk/human-health-risk-assessment>.

1. [Planning and Scoping process](#)
2. [Hazard Identification](#)
3. [Dose-Response Assessment](#)
4. [Exposure Assessment](#)
5. [Risk Characterization](#)

Week 7

Tuesday, February 20

EPA Risk Assessment Guidelines (pt 2 of 2) [BC]

Thursday, February 22

Review & critique of EPA's Proposed Arsenic Standard Regulatory Impact Assessment [Students]

5. Selection of endpoints (including emerging research)
6. Effect parameters (i.e. dose-response relationships)
7. Vulnerable populations and exposure assumptions)
8. Alternative Models
 - i. <http://www.bayesia.com/2017-conference-macdonald-gibson>
 - ii. https://wwwbrr.cr.usgs.gov/projects/GWC_chemtherm/FinalAbsPDF/smith.pdf

Readings

Ackerman, F. and Heinzerling, L., 2002. Pricing the priceless: Cost-benefit analysis of environmental protection. University of Pennsylvania Law Review, 150(5), pp.1553-1584.
<http://www.jstor.org/stable/pdf/3312947.pdf>

Horvath A, Stokes, J., 2012. Cost-benefit analysis support for California EPA's Green Chemistry Initiative. <http://www.dtsc.ca.gov/SCP/upload/draft-final-report-091312.pdf>

U.S. Environmental Protection Agency. Comparative Risk Framework Methodology and Case Study: Table of Contents, Introduction, Authors, and Executive Summary (pp. xix - xxxvii).
http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=4761 (main page with links to companion documents: <https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=12465&CFID=70715555>)

Week 8: Communicating with Diverse Audiences

Session Agendas

Tuesday, February 27

- Lecture and discussion: Communicating with Diverse Audiences
- Demonstration and discussion: Visualizing quantitative data for policy analysis

Thursday, March 1

- In-class activity: Crafting 30-second videos to communicate environmental and occupational health policy messages

Readings and Videos

Maibach, E.W., Abrams, L.C., and Marosits, M. 2007. Communication and Marketing as Tools to Cultivate the Public's Health: A Proposed "People and Places" Framework. BMC Public Health. 7:1-15.

Lundgren, Regina E., and Andrea H. McMakin. Risk communication: A handbook for communicating environmental, safety, and health risks. John Wiley & Sons, 2013. Electronic version available for UCLA students and faculty at <http://onlinelibrary.wiley.com/book/10.1002/9781118645734>.

- Chapter 7: Determine Purpose and Objectives (pages 85-90)
- Chapter 8: Analyze Your Audience (pages 91-104)
- Chapter 9: Develop Your Message (pages 105-116)

Tufte, E.R., 2006. Beautiful evidence. New York.

- The Fundamental Principles of Analytic Design (pp. 122-139).
- Corruption in Evidence Presentations: Effects Without Causes, Cherry-Picking, Overreaching, Chartjunk, and the Rage to Conclude (pp. 141-155).

Sicola, L. 2014. Want to sound like a leader? Start by saying your name right, Laura Sicola, TEDxPenn. <https://www.youtube.com/watch?v=02EJ1ldC6tE>

Treasure, J. 2014. How to speak so that people want to listen, Julian Treasure, TED talk. <https://www.youtube.com/watch?v=elho2S0Zahl>

Hawkeye Media. 2013. Media Interviews - How Not To Do It - Our collection of media gaffes. <https://www.youtube.com/watch?v=o8DFEkT9IPk>

Walker, T.J. 2015. Media Training - The Complete Media Training Video Course. https://www.youtube.com/watch?v=Z1VFAaMXA_4

Week 9: Partnerships with Community-Based Organizations

Session Agendas

Tuesday, March 6

- Lecture and discussion: Partnerships with Community-based Organizations
- Presentation of group projects

Thursday, March 8

- Presentation of group projects

Readings

Goulet, D. 1986. Three rationalities in development decision-making. World Development, 14(2), 301-317.

Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. Annual review of public health. 1998 May;19(1):173-202..

Minkler M., Vásquez V.B., Tajik M., Petersen D. Promoting environmental justice through community-based participatory research: The role of community and partnership capacity. Health Educ. Behav. 2008;35:119-137.

Week 10

Tuesday, March 13, Thursday, March 15

- Mock Radio Interviews

(no readings)

Case Study Background Readings (for Assignment 1 in-class reports week 2)

Balazs, C.L. and Ray, I., 2014. The drinking water disparities framework: On the origins and persistence of inequities in exposure. *American journal of public health*, 104(4), pp.603-611.

<http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.2013.301664>

Balazs, C.L., Morello-Frosch, R., Hubbard, A.E. and Ray, I., 2012. Environmental justice implications of arsenic contamination in California's San Joaquin Valley: a cross-sectional, cluster-design examining exposure and compliance in community drinking water systems. *Environmental Health*, 11(1), p.1.

<https://ehjournal.biomedcentral.com/articles/10.1186/1476-069X-11-84>

Belitz, K., Fram, M.S. and Johnson, T.D., 2015. Metrics for assessing the quality of groundwater used for public supply, CA, USA: equivalent-population and area. *Environmental science & technology*, 49(14), pp.8330-8338.

Castleton, J.C., 2014. Central California Irrigation Districts: Are They the New Standard Oil. *San Joaquin Agric. L. Rev.*, 24, p.131.

<http://heinonline.org/HOL/Page?handle=hein.journals/sjlar24&id=146>

Das, R., McNary, J., Fitzsimmons, K., Dobraca, D., Cummings, K., Mohle-Boetani, J., Wheeler, C., McDowell, A., Iossifova, Y., Bailey, R. and Kreiss, K., 2012. Occupational coccidioidomycosis in California: outbreak investigation, respirator recommendations, and surveillance findings. *Journal of Occupational and Environmental Medicine*, 54(5), pp.564-571.

<https://www.ncbi.nlm.nih.gov/pubmed/22504958>

Escriva-Bou, A., Gray, B., Green, S., Harter, T., Howitt, R., MacEwan, D., Medellín-Azuara, J., Moyle, P. and Seavy, N., 2017. Water Stress and a Changing San Joaquin Valley.

Feinstein, L., Phurisamban, R., Ford, A., Tyler, C. and Crawford, A., 2017. Section 1: Drought and Domestic Water Shortages. In: *Drought and Equity in California*. http://ejcw.org/wp-content/uploads/2016/08/DroughtAndEquityInCA_Jan_2017.pdf

Ganesh, C. and Smith, J.A., 2017. Climate Change, Public Health, and Policy: A California Case Study. *American journal of public health*, (0), pp.e1-e6.

<http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2017.30404>

Horowitz, A.I., Moomaw, W.R., Liptzin, D., Gramig, B.M., Reeling, C., Meyer, J. and Hurley, K., 2016. A multiple metrics approach to prioritizing strategies for measuring and managing reactive nitrogen in the San Joaquin Valley of California. *Environmental Research Letters*, 11(6), p.064011.

<http://iopscience.iop.org/article/10.1088/1748-9326/11/6/064011/meta>

Jordan, P., Brandt, A., Ferrar, K., Feinstein, L. and Phillips, S., 2015. A Case Study of the Potential Risks Associated with Hydraulic Fracturing in Existing Oil Fields in the San Joaquin Basin. *An Independent Scientific Assessment of Well Stimulation in California*, p.267.

Joyner, A.M., George, L., Hall, M.L., Jacobs, I.J., Kissam, E.D., Latin, S., Parnell, A., Ruiz, V., Shadbeh, N. and Tobacman, J., 2015. Federal farmworker housing standards and regulations, their promise and limitations, and implications for farmworker health. *NEW SOLUTIONS: A Journal of Environmental and Occupational Health Policy*, p.1048291115604390.

<https://www.ncbi.nlm.nih.gov/pubmed/26378154>

Madrid-Salazar, V., 2014. Feeding the World Has Left Our Water Contaminated: Will California's Human Right to Water Act Fix the Problem. *San Joaquin Agric. L. Rev.*, 24, p.211.

<http://heinonline.org/HOL/Page?handle=hein.journals/sjlar24&id=226>

Miller, J., 2011. The Colonization of Kern County. *Orion Magazine*, 30(1), pp. 42- Issue 1, p. 42.

<https://orionmagazine.org/article/the-colonization-of-kern-county/>

Moran T, Choy J, Sanchez C. The Hidden Costs of Groundwater Overdraft. Understanding California's Groundwater. Part of the series "Water in the West." Stanford Woods Institute for the Environment.

<http://waterinthewest.stanford.edu/groundwater/overdraft/>

- Quarré, J., 2014. Defending Water against a Fractured Body of Law: A Case Study of California's Monterey Shale Formation. *J. Env'tl. L. & Litig.*, 29, p.443.
<http://heinonline.org/HOL/Page?handle=hein.journals/jenvll29&id=455>
- Ramos, P., A. Deen, A. Vanderwarker, C. Woelfle-Erskine, Thirsty for Justice: A People's Blueprint for California Water, The Environmental Justice Coalition for Water, 2005 (ejcw.org).
<http://www.issuelab.org/resources/2885/2885.pdf>
- Shonkoff, S.B., Maddalena, R.L., Hays, J., Stringfellow, W., Wettstein, Z.S., Harrison, R., Sandelin, W., McKone, T.E. and Energy, P.H., 2015. Potential Impacts of Well Stimulation on Human Health in California. California Council of Science and Technology and Lawrence Berkeley National Laboratory, An Independent Scientific Assessment of Well stimulation in California, 2.
<http://ccst.us/publications/2015/vol-II-chapter-6.pdf>
- Siegel, C.S. and Siegel, D.S., 2013. The history of DBCP from a judicial perspective. *International journal of occupational and environmental health*. <http://dx.doi.org/10.1179/oeh.1999.5.2.127>
- Vengosh, A., Jackson, R.B., Warner, N., Darrah, T.H. and Kondash, A., 2014. A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States. *Environmental science & technology*, 48(15), pp.8334-8348.
<http://pubs.acs.org/doi/abs/10.1021/es405118y>
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<https://cloudfront.escholarship.org/dist/prd/content/qt69s0f9s0/qt69s0f9s0.pdf>