

ENVIRONMENTAL STUDIES 28: Global Environmental Health

Winter 2018

MWF 10:10 - 11:15

x-period: Th 12:15 - 1:05

Instructor: Bill D. Roebuck, Ph.D.
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(e-mail with 2 to 3 suggested times/I will confirm a time)

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Course Description: Environmental circumstances have dramatic impacts on all organisms. Both natural and synthetic chemicals can be poisonous and many extremely useful products are highly poisonous (e.g., medicines and pesticides). If the environment is defined broadly to include the home, the workplace, and the out-of-doors, as well as various lifestyle factors (e.g., medicines, tobacco use, or exposure to various consumer products), then there is seemingly no end to examples of adverse health issues. This course will focus upon the scientific and public health principles that govern environmental health outcomes for individuals, communities, nations, and the world. Case studies will be used to illustrate these principles. Some of the issues that will be discussed include lead poisoning, mercury in the food web, and the epidemic of tobacco use that is sweeping the world, the global movement of pollutants, and limited choices available for the poorer segments of society. As the course progresses, these cases will increase in complexity with regards to causative agents and health outcomes.

Prerequisites: ENVS 2 or BIO 16 or permission of instructor.

Course Requirements:

		<u>Due</u>
Briefing #1	15 points	23 January
Midterm quiz	15	31 January
Briefing #2	15	6 February
Term paper	25	20 February
Class participation	10	continuous
<u>Final Exam</u>	<u>20</u>	<u>12 March (8 am)</u>
Total 100 points		

Generally, for each of the 6 cases on **Day 1**, the case will be introduced and historical foundations of the issue will be discussed; on **Day 2** will delve deeper into the scientific basis and public health principles so that the case can be understood in a wider context; and on **Day 3** "solutions" and "implications" will be discussed. The principles of toxicology, disease trends, epidemiology, and risk assessment will be introduced as the cases proceed.

REQUIRED TEXT

18W Reading Packet (Wheelock Books). There are approximately 5 articles per case plus 10 addressing basic principles and 6 concluding articles for a total of 46 articles. We will be repeatedly referring to the articles including specifically text, figures and tables in class and on the PowerPoint slides. The reader will be used for the quiz and final. **Having a reader and using it is essential.**

CLASS SCHEDULE

3 January	Introduction to ENVS 28: Global Environmental Health	
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Case #1 Environmental Lead

Death of immigrant child in Manchester, New Hampshire

5 January	Acute lead poisoning	Caron et al., 2001 Riess and Halm, 2007
8 January	Classic lead poisoning: gasoline/ paint & lead shot	Kelly et al., 2011 Bellinger, 2016
10 January	Lead poisoning gets very messy!	Hanna-Attisha et al., 2016 Braveman et al., 2011
11 January	(x-hour) Discussion of Assignments, esp. Briefing #1	
12 January	Principles: Toxicology	Suk et al., 2016
15 January	Martin Luther King Day (no class)	

Case #4 Air Pollution – Indoors and Out-of-Doors

The case: *A woman with children in poor rural community*

17 January	Heavy industry and economic prosperity and life expectancy	Roueche, 1954 Correia et al., 2013
18 January	(x-hour) Principles: Diseases & Trends	Jones et al., 2012 Murray and Lopez, 2013
19 January	Poverty and cooking fires	Po et al, 2010 Bonjour et al., 2013
22 January	Cook stoves and children	Rosenthal et al, 2017 Backes et al, 2013
23 January	Briefing Paper #1 (due at 2pm, 112 Steele Hall)	

Case #3 Mercury in the Food Supply

Pregnant woman in Cree village in northern Quebec

24 January	History of mercury as a poison: Japan, Iraq, and New Mexico Dams and gold mining	Ha et al., 2017 Gibb and O’Leary, 2014
25 January	Biological mechanisms: food web, accumulation, and selective neurotoxin	Davidson et al., 2011
26 January	Discussion of Briefing #2 with Prof. Ross Virginia Climate Change, Circumpolar Health of Food Web and Top Consumers	
29 January	An “uncomfortable” balance of mercury exposures	Kahan, 2013 Larson, 2014
31 January	Quiz (Wednesday)	
1 February	(x-hour) Principles: Epidemiology	Weigler, 2001 Lucas and McMichael, 2005

Case #4 Tobacco Smoke and Environmental Tobacco Smoke

Young woman who recently moved to Beijing from the a rural village

2 February	Cancer statistics, epidemiological evidence, local, national and international trends	Samet, 2013 Jha and Peto, 2014
5 February	Cancer biology	Cairns, 1975 Wild and Kleinjans, 2003
6 February	Briefing Paper #2 (due by 2pm, post to Canvas Site)	
7 February	Global view and cancer control	Chen et al., 2015
8 February	(x-hour) Principles: Risk/Risk Communication	Wilson and Crouch, 1987 Slovic, 1987 Conis, 2010 Manuel, 2014 Rosenbaum, 2015

Case #5 Complications of Pesticide Use

Young boy from farm community twice poisoned

9 February	Hard pesticides (DDT) and “environmental friendly” pesticides	Rogan and Chan, 2005
12 February	More problems with insecticides: cancer, unintended uses; multiple pesticide exposures; north versus south	Hvistendahl, 2013 Cha et al., 2016

14 February Pesticides and children Weiss et al., 2004

Case #6 Malaria and Its Control

The Case: *Mother and child in rural village die*

16 February Mother and child in rural village Desowitz, 1991
Fletcher & Beeching, 2013

19 February Malaria: the disease and its control Huynh et al., 2015

20 February **Research Term Paper (due by 2pm, 112 Steele Hall)**

21 February Social burden and challenge of malaria Roberts, 2016

Concluding Thoughts

23 February Global health challenges: Is the
real challenge poverty? Schroeder, 2007
Dye, 2008
McMichael, 2013

Student Presentations of Selected Briefing and Term Papers

26 February Student presentations

28 February Student presentations

2 March Student presentations

Concluding Thoughts (continued)

5 March Ways forward Deaton, 2016
Woolf and Pernel, 2016
Klass, 2016

12 March Final Exam (exact date, time, location to be determined)

BRIEFING #1 (Paper)

Background. Case studies allow an in-depth exploration of one topic. Each case can serve as a “mirror” to compare and contrast other agents, exposure circumstances, or populations. A limitation of the case study approach is that you will have less knowledge of the very large field of environmental health. This assignment is designed to expand our breadth of knowledge.

Topic: Imagine that you serve on the technical staff of a corporation, government agency, public policy/advocacy group, or media organization. You need to keep your superiors or maybe a reporter abreast of current environmental health issues, old ones which periodically re-surface, or historical issues that serve as important milestones and signals. Concisely, summarize one environmental health issue. The topic may be a very specific chemical/substance, a very specific issue regarding a chemical having numerous environmental health outcomes, or an instructive historical environmental health incident. At every class, I will suggest potential topics.

Approval of Topic: You are advised to discuss your topic with Prof. Roebuck. The major concern is that your topic be sharply focused and not be too broad.

Due Date: 2:00 pm, 23 January. Please deliver the original briefing and one copy to the Environmental Studies Office, 112 Steele Hall.

Paper format:

- PAGE ONE (This first page may be single-spaced.)
 - a. Informative title
 - b. Abstract (80 word maximum)
 - c. Key words (not more than 5)
 - d. Key (**critically important might be a better term**) references (2 to 4) from the peer-reviewed, scholarly journals. It is important to identify the key literature and not just any piece of literature on the topic.

CAUTION: Websites may be used for facts, but they do not substitute for the required peer-reviewed, scientific literature.

- PAGES TWO and THREE
Your Environmental Health Briefing Paper should be no more than 2 pages of text, double-spaced, 12-point font, and 1-inch margins all around.
- Your name must NOT appear on the title page. Put your name on the back of the last page of your article (that is, on the back of page 3 so I do not come across it when reading your paper).
- Selected papers will be discussed in class.

CAUTION: Your writing must be sharply focused: avoid verbose, wordy, and flowery language. directly address the topic with facts and details. **Make every word count** for you have so little space! Your writing must be clear, direct, and specific to the topic. Construction of table or diagram within the page limit may be useful, but only if it saves space.

BRIEFING #2 (PowerPoint presentation with supporting documentation)

Background. Designed to broaden your background in global environmental health, this assignment focuses on the ongoing and apparently rapid global environmental degradation particularly in the Circumpolar North.

Topic: Imagine that you want to deliver a short talk to the 17th International Congress on Circumpolar Health in Copenhagen, Denmark on 12 to 15 August 2018. The circumpolar region is unique in that most chemicals and disease agents are produced, occur, and/or are used in mid-latitude regions of Earth and for a number of reasons they globally distribute into the Arctic. Increased travel and global climate changes are but two possible reasons. Circumstances of circumpolar populations often lead to increased exposure and/or risk when exposed. As with the first Briefing Paper, summarize one environmental health issue. The topic may be a very specific chemical/substance, a very specific issue regarding a chemical having numerous environmental health outcomes, or an instructive historical, environmental health incident. You may also be able to justify a study of non-polar indigenous people that would be instructive to possible future events in the circumpolar region. The focus may be on the ecosystem, animals including humans.

Approval of Topic: It is advisable to consult with Prof. Roebuck regarding your topic. The major concern is that your topic not be too broad.

Due Date: 2:00 pm, 6 February. Upload your PowerPoint presentation and supporting notes to Canvas.

POWER POINT SLIDES – NO MORE THAN 12 (!)

1. Introductory (first) slide
 - Informative title of your presentation
 - Your name
2. References (last) slide
 - Using standard scientific referencing as seen in the articles in your reader, cite no more than 4 sources. Only if important, one source may be a website, news item, or editorial. Otherwise, citations must be from peer-reviewed, scholarly literature.
3. Heart of your presentation – no more than 10 slides
 - Slides must be readable; that is, not cluttered with too much writing or too many multiple images. Make any background motif very simple!
 - Up to 10 images can be “sandwiched” between your introductory slide and the references.

SUPPORTING DOCUMENTATION/EXPLANATION

Some slides such as your introduction and reference list will likely need no comments; however, other slides may need a description for the viewer to fully understand. Submit no more than two pages (double-spaced, 12 point font, 1 inch margins all around) of supporting text as a Word document. ***With your slides and this document, an associate should be able to present your talk!!!!***

IN SUMMARY. Submit one PowerPoint file with no more than 12 slides and a two page Word document supporting your presentation. Selected papers will be presented and discussed in class.

RESEARCH TERM PAPER

Topic: The volume of news and information appears to be increasing; however, the quality is often poor or simply wrong. Usually, we are provided with incomplete information to support the news, much less reach one's own conclusion from the facts if indeed there are facts. Often environmental articles appeal to one's dread fears of disaster, death, and/or outcomes worse than death.

Imagine you are a science reporter for a local news outlet and you contribute to its regular column, "Environmental Health Issues." Write an article for this column. The article must be of current interest and importance and must focus upon the effects of the environment on the health of plants, animals, or human life. It must be based upon and contain primary, peer-reviewed scientific literature. Documentation that the issue is of current interest and its importance must be provided.

Due Date: 2:00 pm, 20 February. Please deliver the original term paper and one copy to the Environmental Studies Office, 113 Steele Hall.

Size of Paper: Items 1, 2, and 3 below must be delivered.

1. Cover letter addressed to the editor (one to two pages, single-spaced) arguing factually regarding the importance of your topic. This letter should include: a) a brief statement explaining why your scientific article must appear in "Environmental Health Issues," b) evidence that the topic is of current interest and importance, and c) a list of critical scientific citations.
2. A title page with an informative title, an abstract no longer than 100 words, and a list of 3 to 5 key words for indexing of your article. Your name must NOT appear on the title page. Sign your name on the back of the last page of your article so that I can read the text without knowing your identity.
3. Your newspaper article for "Environmental Health Issues" absolutely must not be more than 4 pages of text, double-spaced, 12-point type, and 1-inch margins all around. If additional pages of text are submitted, they will likely not be read. The challenge is to convey a written message succinctly and accurately; therefore, the topic must be chosen carefully and sharply focused. Illustrative materials such as charts, graphs, or tables are welcomed and should be attached after the article. These added, supportive materials are not part of the four-page text limit. However, these materials should be an integral part of your article and you should refer to them in your article.

Your grade on the paper will depend upon the thoroughness of your research, your ability to handle the scientific, peer-reviewed literature, the strength of the defense mounted for the article, and the clarity of the writing.

Summary: Submit one original and one copy. Each must contain the cover letter to the editor stating the importance of the work and scientific references; a title page with title, abstract and key words; and the 4-page article. Sign your name on the back of the last page of your article. The original will be returned to the Environmental Studies Office for you to claim during the final exam week.

CLASS PARTICIPATION:

There are two ways to contribute to our collective learning: ONE involves informed classroom discussions that provide greater understanding of environmental health. A good response must go beyond your personal views. TWO, post facts and ideas on Canvas that provide greater understanding of the topic being discussed.

Please note that in both cases, we should be more concerned with factual information and how confident we are of that information than a personal view or the views of a specific media outlet.

In the Discussion in Canvas, I am looking for individual responses of 5 to 6 sentences (i.e., about 80 to 120 words) and a single scientific citation of your source. I expect 5 to 6 responses per student scattered over the term posted on Canvas. You may suggest topics to be discussed on our Canvas site by e-mailing me. I may then post a question for the class to consider.

Electronic devices in class: Numerous studies (see citations on Canvas) show that multitasking on laptops and phones during class invariably leads to poorer academic performance. These devices distract students around you and the lecturer. Electronic devices are not allowed during the quiz and final. These devices should be off so you can fully engage in class and with the material discussed in class.

Policy regarding late assignments: Due dates and times are indicated in the class schedule above. If you know of a conflict with the above schedule, plan on submitting your assignment early. In fairness to those who cannot or do not ask, I rarely grant extensions of the deadlines. Generally, expect loss of half a letter grade per each day late.

Honor Principle: Students are expected to be fully aware of the Academic Honor Principle, that is, "all academic activities will be based on student honor." Consult the ORC or the website <http://www.dartmouth.edu/judicialaffairs/honor/index.html> for details. If you are not clear about your responsibilities or conduct during the assignments or activities speak with Professor Roebuck.

Please: Students with learning, physical, or psychiatric disabilities enrolled in this course that may need disability-related classroom accommodations are encouraged to make an office appointment with me before the end of the second week of the term. All discussions will remain confidential, although the Student Disability Services office may be consulted to discuss appropriate implementation of any accommodation requested.

Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with me before the end of the second week of the term to discuss appropriate accommodations.