

ENVIRONMENTAL STUDIES 28: Global Environmental Health

Spring 2014
MWF 11:15-12:20
X-period: Tu 12:00-12:50

Instructor: Bill D. Roebuck, Ph.D.
Professor of Toxicology, Geisel School of Medicine at Dartmouth
and Adjunct Professor of Environmental Studies, Dartmouth College
Remsen 518/505; 650-1676
Office hours: by appointment at Remsen 518
(simply e-mail with 2 to 3 suggested times/I will confirm a time)

Guest Lecturers:
Courtney Carignan, Ph.D.
Office hours: by appointment (e-mail to suggested times and one will be confirmed)

Subhankar Banerjee, Photographer, author, environmental activist with strong
Interests in the northern landscapes and peoples

Administrative Assistant: Ms. Kim Wind
112 Steele Hall
646-2838

Course Description: Environmental circumstances have dramatic impacts on living 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, 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. Ultimately, trends of environmental diseases coupled with the prevention of these diseases will be emphasized. **Prerequisites:** ENVS 2 or BIO 16 or permission of instructor.

Course Requirements:

		<u>Due</u>
Briefing #1	15 points	10 April
Midterm quiz	15	23 April
Briefing #2	15	1 May
Term paper	25	15 May
Class participation	10	continuous
<u>Final exam</u>	<u>20</u>	<u>30 May</u>

Total 100 points

Generally for each case on Day 1, the specific case will be introduced and historical foundations of the issue will be provided; 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" will be considered. The principles of toxicology, disease trends, epidemiology, biomonitoring, and risk assessment will be introduced as the cases proceed. NOTE: The sequence of cases is as follows: lead (case #1), mercury (case #2), tobacco (case #4), air pollution (case #5), insecticides (case #3), and malaria (case #6).

REQUIRED TEXT

14S Reading Packet (Wheelock Books). There are approximately 6 articles per case plus 11 addressing basic principles and 5 concluding articles for a total of 53 articles. Most articles are selected from the peer-reviewed, scientific literature. We will be repeatedly referring to the articles (in general, or specifically to figures and tables) in class discussions and in the PowerPoint slides. **Having a reader and using it is essential.**

CLASS SCHEDULE

DATE	LECTURE TOPIC	ASSIGNED READINGS
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24 March	Introduction to ENVS 28: Global Environmental Health	
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Case #1 Environmental Lead

Death of immigrant child in Manchester, New Hampshire

26 March	Acute lead poisoning	Caron et al., 2001 Garcia et al., 2012 Meyer et al., 2008
28 March	Classic lead poisoning: gasoline, paint, and dirt	Kelly et al., 2011 Ronchetti et al., 2006 Bellinger, 2008
31 March	Lead poisoning gets very messy!	Riess and Halm, 2007 Braveman et al., 2011
1 April	(x-hour) Discussion of Assignments, esp. Briefing #1	
2 April	Principle: Diseases & Trends	Jones et al., 2012 Bygjerg, 2012 Murray and Lopez, 2013
4 April	Principle: Toxicology	Briggs, 2003

Case #2 Mercury in the Food Supply

Pregnant woman in Cree village in northern Quebec

7 April	History of mercury as a poison: Japan, Iraq, and New Mexico Gold mining	Grandjean et al, 2010 Wade, 2013
8 April	Principle: Epidemiology	Weigler, 2001 Lucas and McMichael, 2005
9 April	Biological mechanisms: food web, accumulation, and selective neurotoxin	Davidson et al., 2011
10 April	Briefing Paper #2 (due at 2pm, 112 Steele Hall)	
11 April	A comfortable balance of mercury ingestion	Kahan, 2013 Poland and Jacobson, 2011
14 April	Principle: Biomonitoring I Dr. Carignan	Landrigan et al, 2012 Calafat et al, 2010

Case #4 Tobacco Smoke and Environmental Tobacco Smoke

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

15 April	Cancer statistics, epidemiological evidence, local, national and international trends	Giovino, 2007 Cole and Fiore, 2014 Bach, 2009
16 April	Principle: Biomonitoring II Dr. Carignan	
18 April	Cancer biology	Cairns, 1975 Wild and Kleinjans, 2003
21 April	Global view and cancer control	Jha and Peto, 2014 Yang et al., 1999
22 April	(x-hour) Principle: Risk & risk communication	Wilson and Crouch, 1987 Slovic, 1987 Conis, 2010
23 April	(x-hour) Quiz	
25 April	Guest: Subhankar Banerjee Photographer, Author and Environmental Activist	

Case #5 Air Pollution – Indoors and Out-of-Doors

The case: *An urban slum dweller in a developing country*

28 April	Heavy industry and economic prosperity	Roueche, 1954 Zhang and Smith, 2007
30 April	Poverty and cooking fires	Backes et al, 2013 Po et al., 2010
1 May	Briefing Paper #2 (due at 2pm, post to Blackboard)	
2 May	Air pollution and life expectancy	Pope et al., 2009

Case #3 Complications of Pesticide Use

Young boy from farm community twice poisoned

5 May	Hard pesticides (DDT) and “environmental friendly” pesticides	Weiss et al., 2004
6 May	(x-hour) (use if behind with lectures)	
7 May	Problems with insecticides: cancer, unintended uses; multiple pesticide exposure; north versus south	Fry, 2006 Eddleston and Phillips, 2004 Hvistendahl, 2013
9 May	Risk assessment and risk communication of an intended poison	Bouwman et al., 2011 Rogan and Chan, 2005

Case #6 Malaria and Its Control

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

12 May	Mother and child in rural village	Desowitz, 1991 Fletcher and Beeching, 2013
13 May	Malaria: the disease and its control	Walther & Walther, 2007
14 May	Social burden and challenge of malaria	Webb, 2009
15 May	Research Term Paper (due at 2pm, 112 Steele Hall)	

Student Presentations of Selected Briefing and Term Papers

16 May	Student presentations (selected topics)
19 May	Student presentations
21 May	Student presentations
23 May	Student presentations
26 May	Memorial Day, no class

Concluding Thoughts

27 May	(x-hour) Global health challenges: Is the real challenge poverty?	Dye, 2008 Hertzman, 2001 Emerson, 2009
28 May	Conclusion: Ways forward	Schroeder, 2007 McMichael et al., 2004
30 May	Final Examination (8am, room to be announced)	

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. The major limitation of the case study approach is that you will have a limited knowledge of the very large field of environmental health. This assignment is designed to expand your 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, 10 April. Please deliver the **original briefing** and **one copy** to the Environmental Studies Office, 112 Steele Hall.

Paper format:

1. 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.

2. PAGES TWO and THREE
Your Environmental Health Briefing Paper should be no more than 2 pages of text, double-spaced, 12-point type and 1-inch margins all around.

CAUTION: Your writing must be sharply focused: avoid flowery language. Directly address the topic with facts and details. **Make every word count** for you have so little space!

3. 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). 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.
4. Selected papers will be discussed in class.

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.

Topic: : Imagine that you want to deliver a short talk to the 16th International Congress on Circumpolar Health in Oulu and Rokua, Finland on 8 to 12 June 2015. 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.

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, 1 May. Upload your PowerPoint presentation and supporting notes to Blackboard.

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: Most people glean environmental health news and information from public media such as TV news, TV specials, talk shows on radio and TV, newspapers, news magazines, and "political action" organizations. Newer sources such as internet web sites, chat groups, and social media are becoming important sources. 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 newspaper 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 importance must be provided.

Due Date: 2:00 pm, 15 May. 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 Blackboard 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.

On Blackboard, I am looking for individual responses of 5 to 6 sentences (i.e., about 80 to 120 words) and a single citation of your source. I expect 5 to 6 responses per student over the term on Blackboard. You may suggest topics to be discussed on our Blackboard 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 Blackboard) show that multitasking on laptops and phones during class invariably leads to poorer academic performance. Additionally, these devices distract students around you and the lecturer. Electronic devices are not allowed during the quiz and final exam. These devices should be off so you can fully engage in 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/~uja/honor/index.html>) for details. If you are not clear about your responsibilities or conduct during the assignments or activities in this course, 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.