GLHLTH 637K (UNDERGRADUATE AND GRADUATE)

Population and Environmental Dynamics Influencing Human Health

Fall 2014

Dates / contact hours:	300 minutes per week for seven weeks; 27 October – 15 December
Academic Credit:	1 course
Areas of Knowledge:	NS, SS
Modes of Inquiry:	CCI (pending)
Course format:	Lecture + Discussion

Instructor's Information

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Office hours by appointment

Prerequisite(s), if applicable

None

Course Description

This is an undergraduate course to introduce students to the interdisciplinary approach referred to as Population, Health and Environment (PHE). PHE is an emerging area practiced by institutions and governments in low- and middle-income countries to implement or study community-level integrated programs, such as reproductive health, food security, and natural resource management. Students taking this course will gain theoretical and empirical knowledge of PHE dynamics from multiple disciplinary perspectives, including those from geography, public health / epidemiology, demography, and economics. Course learning is through seminars, directed readings, class discussions and debates. We will examine several case studies, including specific case studies currently being implemented using PHE approaches in the Philippines and East Africa. At the end of this course, students will be able to understand and communicate (orally and in writing) how PHE factors interact, and describe and interpret research or policy reports pertaining to population, health or environmental issues.

Course Goals / Objectives

The overall goal of this course is to better understand how PHE factors interact from theoretical and practical perspectives with a particular focus on how land use, climate and water/hydrology changes influence population parameters (e.g., migration, fertility, household structure) and the transmission of disease. The objectives are to introduce students to: (1) fundamental concepts in demography and how they are related to environmental characteristics and human health; (2) fundamental concepts of environmental change and their relationship to human health; (3) sources of demographic, health and environmental data; and (4) train students in oral and written evaluation of PHE policies or research programs.

Required Text(s)/Resources

No texts are required. All readings will be made available online (SAKAI) or in-class. The Bibliography lists almost all the required reading for the course

Recommended Text(s)/Resources

Same as above

Additional Materials (optional)

None

Course Requirements / Key Evidences

Students will be expected to do the following:

- Participate regularly in class discussions around PHE topics, assigned readings, and case studies. Part of the class time will be specifically devoted to understanding reading materials;
- Prepare an oral presentation on a topic pertaining to environmental health or infectious disease transmission. This will involve the selection of an appropriate topic, a one-page summary of the topic (a factsheet), and an approved case study to discuss in class. All students will be required to read and contribute to the case study discussion;
- Select a case study and write an in-depth report on the PHE dynamics involved. Suggestions for research gaps or policy recommendations will be discussed in the report;
- All students will participate in team debates on a controversial topic, such as ending all government-sponsored food aid by the World Food Program

Technology Considerations, if applicable

Not applicable

Assessment Information / Grading Procedures

Students will be graded according to the following:

Participation	**10%**
Disease / Environment Presentation	**15%**
Debate	**30%**
Reflection paper	**15%**
Case study	**30%**

Presentation: Each student is required to present a case study on one health or environmental topic (approximately 20 minutes) and design a factsheet associated with that topic. All case studies and topics have been selected by the instructor and the student may include one additional reading if desired. The student is also required to design a 1-page fact sheet about the topic at least 3 days prior to their presentation to summarize the general information about the pathogen or environmental issue they will be presenting. The presentation will focus on the causes and effects of the pathogen/environmental issue as it relates to demographic, economic, environment or health characteristics for a particular case study. It will not be a recount of the factsheet. The instructor will lead the first two discussions as examples.

Case Study: Each student is required to write a detailed case study (4000 word maximum) that focuses on a disease pathogen or environmental toxin affecting a particular region, (human / animal) population, or ecological niche. There are three options for this paper:

(1) If data are available, the student can describe 2-3 hypotheses that can be tested related to P-H-E interactions, describe methods of data acquisition and analysis, conduct the analysis and describe results in terms of their contribution to general knowledge of the subject or policy implications;
(2) If no data are available, a literature review on the topic shall be conducted and summarized, followed by a description of 2-3 important research gaps in the literature associated with P-H-E interactions that are not well understood and a proposal of how one would conduct a study to address these research gaps
(3) Again, if no data are available, but a rich literature exists on the topic pertaining to PHE interactions, the student will summarize the literature and provide policy recommendations to implement interventions to address health or environmental disparities. In addition, the student will propose mechanisms for monitoring and evaluating the interventions recommended.

Case study topics are due by the midterm class. Students must arrange meetings or communicate with the instructor prior to this date to ensure their topic is approved. Case studies are due the final class period.

Debates: Each student in the class will be assigned to a two-person debate team (sometimes 1 or 3 depending on class size). Each team will support one side of a mutually agreed upon resolution, but the side the defended will be randomly selected. Debate topics will be discussed and selected with participation from the class. The debate format will be described in detail in class, but will alternate between pro-con speeches, cross-examination and rebuttal. Winners of the debate will be decided by fellow students.

Debate Voting: After each debate, students not debating will submit their vote to the instructor with 5 reasons to justify their vote. These will be collected at the end of the debate.

Reflection paper: All students will be required to write a reflection essay of the debate in which they participated (1500 word maximum). They will submit who they believe won the arguments presented and why, how their proposed statements could have been improved (e.g., with presentation of evidence, more visuals, better persuasion), and how their opposing team could have improved their arguments.

Diversity and Intercultural Learning (see Principles of DKU Liberal Arts Education)

PHE is inherently a topic that addresses understanding from multiple perspectives. The course describes these perspectives in a traditional academic disciplinary point-of-view, but we will discuss topics from a cultural point-of-view as well. For example, one of the original tenets of PHE approaches was the use of reproductive health and family planning to reduce family size to improve household economic stability. However, this often means the support of programs that provide more access to contraceptives, which are not always acceptable in all countries and cultures. We discuss these challenges and what programs must do to be culturally sensitive yet maintain measures for success.

Course Policies and Guidelines

All activities of this course adhere to the Duke Community Standard (honor code). Additional information is available at http://www.integrity.duke.edu/ugrad/index.html. Duke University is a community dedicated to scholarship, leadership, and service and to the principles of honesty, fairness, respect, and accountability. Citizens of this community commit to reflect upon and uphold these principles in all academic and non-academic endeavors, and to protect and promote a culture of integrity. To uphold the Duke Community Standard:

- I will not lie, cheat, or steal in my academic endeavors;
- I will conduct myself honorably in all my endeavors; and
- I will act if the Standard is compromised.

Other important course policies:

- Attendance is required

- Make-up work will only be considered in extreme circumstances.
- Laptops and other electronic note-taking devices are allowed in class; however, cell phone ringers must be turned off. Recorders are not allowed.
- All assignments are due at midnight on the due date (via email or sakai or handed directly to the instructor). Every hour late will result in a 0.5% deduction, for example, 10 hours late would result in a 5% deduction.

Tentative Course Outline or Schedule

Course Introduction & Outline

Module 1: Impact of Human Population Size, Growth and Distribution

- Importance of population
- Scalar impacts, Urbanization
- Migration & Reproductive Health
- Vulnerability & Resilience

Module 2: Environmental feedbacks on Human/Pathogen Distribution

- Land use change
- Food security / Agriculture / CAFOs
- Water and Air quality
- Climate science

Module 3: Case studies and PHE Debates

Bibliography

Course readings will include the following:

Bloom (2011) "7 Billion and Counting" *Science,* V333: 562-69

Brearley et al (2013) Wildlife disease prevalence in human-modified landscapes, *Biological Reviews*, V88: 427-442

Carr (2009) Population & Deforestation - Why rural migration matters

Cohen et al (2005) "Global burden of disease due to outdoor air pollution" *Journal of Toxicology and Environmental Health*, Part A, V68: 1301-07

Daszak, Cunningham, Hyatt (2001) Anthropogenic environmental change and the emergence of infectious diseases in wildlife, *Acta Tropica*, V78: 103-116

Defries, Rudel etal (2010) "Deforestation drivn by urban pop & agricultural trade" *Science*

de Sherbinin, VanWey, etal (2008) "Rural demographic livelihoods & and the environment" *Global Environmental Change*, V18: 38-53

Ehrlich & Holdren (1971) “Impact of Population Growth” *Science*, V171: 1212-17

Eisenberg etal (2007) "Environmental determinants of Infectious disease: A framework for tracking causal links and guiding PH research" *Environmental Health Perspectives*, V115(8): 1216-23
Feingold et al (2012) "Livestock density as a risk factor for Livestock-associated MRSA, the Netherlands" *Emerging Infectious Diseases*, V18(11): 1841-49
Galea & Vlahov (2005) "Urban health: Evidence, challenges, and directions" *Ann. Rev of Public Health*, V26: 341-65
Gerba, CP (2005), Chap. 98: Pathogens, in Encyclopedia of Hydrological Science, Anderson MG Eds., John Wiley & Sons, NY
Hall, Kaufman & Ricketts (2006) "Defining Urban and Rural Areas in US Epidemiologic Studies" *Journal of Urban Health*, V83(2)
Hewage, Kumara, & Rigg (2011) Connecting and disconnecting people and places: Migrants, Migration, and the HH in Sri Lanka
Kaiser (2011) "Does family planning bring down fertility?" *Science*, V333: 548-9
Kurmi, Lam, Ayres (2012) "Indoor air pollution and the lung in LMIC" *European Respiratory Journal*, V40: 239-54
Lambin et al (2010) "Pathogenic landscapes: interactions between land, people, disease vectors and animal hosts" *International J of Health Geographics*, V9: 54
Loague, K. & Corwin, D (2005), Chap. 94: Point and Non-Point Source Pollution, in Encyclopedia of Hydrological Science, Anderson MG Eds., John Wiley & Sons, NY
Marschke & Berkes (2006) "Exploring strategies that build livelihood resilience: A case study from Cambodia" *Ecology & Society*, V11(1): 42
Miller etal (2010) "Resilience & Vulnerability - Complementary or Conflicting Concepts" *Ecology & Society*, V15(3):11
Moe & Rheingans (2006) Global Challenges in water, sanitation & health, *Journal of Water and Health*, Q4. Suppl: 41-57
Patz etal (2004) "Unhealthy landscapes: Policy recommendations on LUC and Infectious disease emergence" *Environmental Health Perspectives* V112(10)
PHE Case Studies: Kenya, Tanzania, Ethiopia, Philippines
Pimentel etal (2007) “Ecology of increasing diseases: Population growth & Environmental Degradation” *Human Ecology*, V35: 653-68
Pitzer etal (2009) "Demographic variability, vaccination and spatiotemporal dynamics of rotavirus epidemics in the US" *Science*, V325: 290-294 (PLUS SUPPLEMENTAL MATERIAL)
Schantz etal (1992) Neurocysticercosis in an orthodox Jewish Community, NYC, *New England Journal of Medicine*, V327(10): 692-5
Simon (1996) The Ultimate Resource II: People, Materials & Environment, Introduction (http://www.juliansimon.org/writings/Ultimate_Resource/)
Thorne (2007) "Environmental healt impacts of CAFOs: Anticipating hazards, Searching for solutions" *Environmental Health Perspectives*, V115(2): 296-7
Tietelbaum (1975) "Relevance of Demographic Transition Theory for Developing Countries" *Science*, V188: 420-5
UNSTATS (2005) Definition of Urban
Vanwambeke et al (2007) Impact of LU change on malaria and dengue in northern Thailand, *Ecohealth*, V4(1): 37-51

Post / course codes pending
18 February 2014