

Inquiry Immersion 2019-2020: Climate Change and Health Mini Course

Course Co-Directors

Arienne Teherani, PhD, Professor of Medicine

Tom Newman, MD, MPH, Professor Emeritus of Epidemiology & Biostatistics and Pediatrics

Sheri Weiser, MD, MPH, Associate Professor of Medicine

Additional Course Faculty

Robin Cooper, MD, Assistant Clinical Professor of Psychiatry

Stan Glantz, PhD, Professor of Medicine, Truth Initiative Distinguished Professor of Tobacco Control

Katherine Gruenberg, PharmD, Assistant Professor of Medicine

Gina Solomon, MD, MPH, Clinical Professor of Medicine

Mary Williams, MD, Clinical Professor Emeritus of Dermatology

Question

What should health professionals know and do about climate change, sustainability, and health?

Course Overview

Climate change represents the greatest threat to public health of the century. This course will introduce learners to how current patterns of population growth, resource use and pollution are not sustainable, how the environment, especially climate change, impacts health, as well as how the health care system impacts the environment. We seek to prepare future health professionals with deep understanding, skills and motivation to advocate for a more sustainable healthcare system, and for policies and interventions to mitigate and adapt to climate change and other environmental health threats.

Course Learning Objectives

- Describe the mechanisms by which human health is affected by environmental change, for example through changes in disease vectors, exposure to extreme weather, migration and reduced food security.
- Discuss the contribution of human activity and population size to global environmental changes such as climate change, biodiversity loss, pollution and resource depletion
- Identify ways to improve the environmental sustainability of health systems - in individual practice, in health service management, and in the design of care systems
- Identify potential synergies between policies and practices that promote environmental sustainability and those that promote health
- Outline the dependence of human health on global and local ecological systems, which supply essentials such as air, water and a stable climate.
- Understand the impacts of climate change on human health including communicable and non-communicable diseases

- Describe the mechanisms by which human health is affected by environmental change, for example through changes in disease vectors, exposure to extreme weather, migration and reduced food security
- Explain how trends in demographics, technology, climate, and resource availability may affect our ability to provide healthcare into the future
- Discuss ethical tensions between allocating resources to individual patients and protecting the environment upon which the health of the wider community depends
- Explain the concept of externalities in market economies and the need to address them for the market to function properly
- Describe, with examples, the “4-dog defense” to environmental regulation, including commonalities with tobacco, fossil fuels, toxics, and sugar.

Schedule

Date	Mon 1/6 Parnassus S176	Tue 1/7 Parnassus S157	Thurs 1/9 Parnassus Nursing 527	Tuesday 1/14 Mission Bay MH 2110	Thurs 1/16 Parnassus Cole Hall
Time	1:30-4:30 PM	1:30-4:30 PM	1:30-4:30 PM	1:30-4:30 PM	1-3:30 PM
Faculty availability	Tom, Arianne, Gina	Tom, Arianne, Robin, Sheri	Tom, Arianne, Sheri, Stan, Katherine	Tom, Arianne, Mary, Sheri	All Welcome
Topics – Faculty Lead (Minutes)	Introduction to course and to each other – All (30)	Climate and health overview/ check-in – Arianne (20)	Climate and health overview/ check-in - Arianne (20)	Climate and health overview/check-in – Arianne (20)	Showcase – All welcome
	Climate change Jeopardy - Climate science and terminology – Tom (60)	Psychological causes and effects of climate change - Robin (60)	Science, capitalism, and denial - Stan (80)	Climate change and the skin – Mary (60)	
	Overview of health effects, biodiversity, climate and the environment - Arianne (30)	Climate change, infectious diseases and food security – Sheri (80)	Climate change and pharmacy - Katherine (80)	Healthcare system sustainability & healthcare value and rationing – Tom (90)	
	Climate change, the wildfires, and health – Gina (70)			Class close - All (10)	

Session 1: Introduction & Course Overview, Climate Science and Terminology, Overview of Health Effects of Environmental Degradation & Climate Change, and the Wildfires

Session Objectives:

1. Understand the overview, goals, objectives and requirements for the course
2. Recognize basic climate change terminology and science
3. Explain how human activity and population size contribute to global environmental changes such as climate change, biodiversity loss and resource depletion
4. Understand the impacts of climate change on human health including communicable and non-communicable diseases
5. Explain the subsequent environmental impact of wildfires exacerbated by climate change

Optional Reading and Listening:

IPCC Working Group 1, 2013: Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Available at:

https://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_SPM_FINAL.pdf **And/or:** a more readable summary by MEDACT: Climate Science for Health Professionals: A Presentation and Discussion of the IPCC Working Group 1 Report.

https://www.medact.org/wp-content/uploads/2014/02/medact_climate-change-report_WEB2.pdf

The Convention on Biological Diversity and the World Health Organization. Connecting Global Priorities: Biodiversity and Human Health: Summary of the State of Knowledge Review. 2015

Watts N, Amann M, Arnell N, Ayeb-Karlsson S, Belesova K, Boykoff M, et al. The 2019 report of The Lancet Countdown on health and climate change: ensuring that the health of a child born today is not defined by a changing climate. *Lancet*. 2019;394(10211):1836–78.

KQED's The California Report: Homeowners In Fire Prone Areas Struggle To Hold Onto Their Insurance on Apple Podcasts <https://podcasts.apple.com/us/podcast/homeowners-in-fire-prone-areas-struggle-to-hold-onto/id79681292?i=1000458208775>

An Inconvenient Truth (2006) Film, available on Netflix, Amazon, SF Public Library)

Note: a transcript of An Inconvenient Truth is available at the URL below and posted under “optional Reading” for session 1, but it is no substitute for watching the film:

<https://meigakuglobalchallenges.files.wordpress.com/2012/02/an-inconvenient-truth-transcript.pdf>

Pre-class work assignment: *You are not required to read or view the articles above in advance of the session though we highly recommend you listen to the KQED report and watch an Inconvenient Truth*

Session 2: The Environment and Climate Change, Mental Health, and Infectious Diseases

Objectives:

1. Understand the impacts of climate change on human health including communicable and non-communicable diseases (i.e. mental health and infectious diseases)
2. Describe the mechanisms by which human health is affected by environmental change, for example through changes in disease vectors, exposure to extreme weather, migration and reduced food security
3. Explain how the health impacts of environmental change are distributed unequally within and between populations and the disparity between those most responsible and those most affected by change

Required Reading & Viewing:

1. Hayes, K, et al. Climate Change and mental health: risks, impacts and priority actions. [International Journal of Mental Health Systems](https://www.researchgate.net/publication/325514784_Climate_change_and_mental_health_Risks_impacts_and_priority_actions) 12(1) · June 2018
https://www.researchgate.net/publication/325514784_Climate_change_and_mental_health_Risks_impacts_and_priority_actions (<http://link.springer.com/article/10.1007/s10393-007-0141-1>)
2. Altizer S et al. Climate Change and Infectious Diseases: From Evidence to a Predictive Framework. *Science* 2013;341:514-19
3. Wheeler T and von Braun J. Climate change impacts on global food security. *Science* 2013; 341:508-13
4. Rosling H. Population growth and climate change explained by Hans Rosling
<https://www.youtube.com/watch?v=SxbprYjyyU> (3:18 min)

Session 3: Science, Capitalism, and Denial and the Environment & Climate. Pharmacy Climate, and the Environment

Objectives:

1. Describe, with examples, the “4-dog defense” to environmental regulation, including commonalities with tobacco, fossil fuels, toxics, and sugar.
2. Explain the connection between global free-market capitalism and climate change and other threats to health.
3. Provide examples of lessons learned from analysis of industry documents
4. Describe methods used by corporations to neutralize unfavorable science and methods that could be used to counteract them.
5. Describe the relationship between pharmaceuticals and climate change
6. Identify ways to address the environmental concerns of pharmaceuticals.
7. Describe challenges and barriers to implementing sustainable pharmaceutical practices.

Required Reading and Viewing

1. Ong, EK, Glantz, SA. Constructing "Sound Science: and "Good Epidemiology": Tobacco, Lawyers and Public Relations Firms. *AJPH* 2011; 91: 1749-57
2. Oreskes, N. Conway EM. Defeating the merchants of doubt. *Nature* 2010;465: 686-7. (Available at: <http://www.nature.com/nature/journal/v465/n7299/full/465686a.html>)
3. Merchants of Doubt (film)
4. International Pharmaceutical Federation. Green pharmacy practice: Taking responsibility for the environmental impact of medicines. The Hague: International Pharmaceutical Federation; 2015. Available at: <https://www.fip.org/www/streamfile.php?filename=fip/publications/2015-12-Green-Pharmacy-Practice.pdf>. **Read the following sections:**
 - Section 1: Issues to be addressed (Sections 1.1, 1.2, 1.3: pages 5-10)
 - Section 2: Solutions (Sections 2.1, 2.2, 2.3: pages 10-24)

Pre-class work assignment: Discuss one way that pharmaceuticals impact the environment and propose one solution to address this environmental concern.

Optional Readings

1. Green and Sustainable Pharmacy: Ch2 (pgs 11-20), Ch3 (pgs 23-33), Ch4 sections 4.4 through section 4.8 (pgs 42-57) (PDF)
2. Afanasjeva J, Gruenberg K. Pharmacists as environmental stewards: Strategies for minimizing and managing drug waste. *Sustainable Chemistry and Pharmacy*. 2019; 13: Article 100164. (PDF)
3. FIP Statement of Policy: Environmentally sustainable pharmacy practice: Green pharmacy. Available at: <https://www.fip.org/file/1535>

Session 4: Climate change and the Skin. Healthcare Systems, Sustainability, Value and Ethics

Objectives:

1. Understand the impacts of climate change on human health including communicable and non-communicable diseases (i.e. dermatologic conditions)
2. Describe how costs and outcomes of healthcare in the US compare with those of other developed countries
3. Compare the excess cost of US healthcare with the cost of achieving carbon neutrality
4. Discuss ethical tensions between allocating resources to individual patients and protecting the environment upon which the health of the wider community depends
5. Explore organizations promoting greater sustainability in healthcare.

Required Readings

1. Kaffenberger BH, Shetlar D, Norton SA, Rosenbach M. The effect of climate change on skin disease in North America. *J Am Acad Dermatol* [Internet]. 2017;76(1):140–7. Available from: <http://dx.doi.org/10.1016/j.jaad.2016.08.014>
2. Kenny GP et al. Heat stress in older individuals and patients with common chronic diseases. 2010;CMAJ 182:1053-1060
3. Smith CJ. Pediatric thermoregulation: Considerations in the face of global climate change. *Nutrients* 2019; 11, 2010:doi:10.3390/nul1092010
4. Gawande, A. Overkill. America's epidemic of unnecessary care. *New Yorker* 5/11/15 <http://www.newyorker.com/magazine/2015/05/11/overkill-atul-gawande>
5. Annas G 1995 NEJM Reframing the Debate on Health Care Reform by Replacing Our Metaphors
6. DeCamp M, Riggs KR. Navigating ethical tensions in high value care education. *JAMA* 2016; 316:2189-90.
7. The Commonwealth Fund 2015. U.S. Health Care from a Global Perspective. Available at: <http://www.commonwealthfund.org/publications/issue-briefs/2015/oct/us-health-care-from-a-global-perspective>
8. Berwick, DM 2017 JAMA. Moral choices for today's physicians. <https://jamanetwork.com/journals/jama/fullarticle/2665004>
9. Explore websites of these organizations and pick at least 2 things your learned from each one to share with the group:
 - a. Healthcare without harm
 - b. Practice Green Health
 - c. UCSF Office of SustainabilityMake sure you check this one out: <https://practicegreenhealth.org/awards/award-winners/top-25-environmental-excellence-awards>