

A GUIDE TO

CLIMATE & HEALTH CURRICULUM REFORM IN MEDICAL SCHOOLS

2023 Edition



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HOW TO USE THIS GUIDE

MS4SF is a non-partisan, national network of medical students who recognize climate change as an urgent threat to health and social justice, and are catalyzing action to prevent and address the health harms of climate change.

As health professionals, we must be prepared to prevent, diagnose, and manage the health consequences of climate change, as well as to face the unprecedented strain climate change will impose on our health system. We advocate for medical school curriculum reform to include the intersection of climate change, health, and health care delivery.

This Guide serves as a compilation of resources to help facilitate the integration of climate-health curriculum in medical schools. Links and samples for the following curriculum materials are provided:

Written proposals advocating for climate health curricula

Learning objectives and competencies

Lesson materials

Sample syllabi

Patient educational materials

Personal online learning resources

As you adapt these proposals and syllabi to your institution, **we ask that you think critically about how climate change is disproportionately affecting the populations you serve**. Ways you can do this include:

Elevating the **voices of the people in your community who are disproportionately affected by climate change** or environmental degradation.

Highlighting the work of **community organizations and activists** who have long been fighting for climate justice in your area, including co-developing curriculum when possible.

Preparing and reading a **land acknowledgement** before each class on climate and health, acknowledging the **Indigenous tribes** who, for generations, have carefully stewarded the land your medical institution occupies.

Contact information is provided for the person who submitted each material. Feel free to email the point of contact with any questions or for permission to use their material formally. **Please cite this guide if used to develop climate-health materials at your institution.**

MS4SF. *Guide to Climate and Health Curriculum Reform in Medical Schools*. Medical Students for a Sustainable Future; 2023.

If you have been working on a climate-health curriculum and would like to submit it to our guide please email us at the email address below. Visit us at ms4sf.org. Correspondence can be directed to ms4sf.med@gmail.com.

Disclaimer: The resources and authors in this report do not necessarily reflect the views of the institutions with which they are affiliated.

Part 1

PROPOSALS & FRAMEWORKS FOR CURRICULUM REFORM

RELEVANCE TO MEDICAL EDUCATION: LETTER TO DEAN OF EDUCATION

Contact: [Natasha Sood \(nsood@pennstatehealth.psu.edu\)](mailto:nsood@pennstatehealth.psu.edu)

Climate change is the greatest public health and medical crisis of the 21st century, as it is a defining modifier of the global burden of disease (1). We propose introducing a “Climate Change & Health” longitudinal thread into the Phase I, II, and III curriculums to provide medical students with education on the environmental determinants of health. This longitudinal thread will provide an overview of the wide ranging health impacts of climate change and the impact of the health system on the environment.

Over the last 30 years various health associations, international organizations, and physicians have described climate change as a health crisis that health professionals must prepare to face (1). In 2008 and again in 2019, the American Medical Association (AMA) released a policy on “Global Climate Change and Human Health” advocating for research on the health impacts of climate change and inclusion of climate education in medical school curricula (1,2). Numerous other medical organizations including the American College of Physicians, the United Nations, and the World Health Organization have followed suit (3–8). While climate change is undoubtedly a global health challenge, it also presents an opportunity for us as the rising generation of clinicians to protect the health of our future patients. Penn State College of Medicine, in line with our institution’s mission to create holistic, innovative leaders, should take a leading role to incorporate this discipline into medical training. This integrative “Climate Change & Health” curriculum will significantly benefit the student body and the patients we serve.

It is crucial that all clinicians understand how climate change threatens health as it places an unprecedented strain on our health system. For instance, climate change has caused massive flooding in the Midwest and raging fires on the West Coast, crippling patients, health centers, livelihoods, and economies. Our health system continues to be subjected to powerful natural disasters that debilitate our ability to provide care (8). Furthermore, as climate change forces people to flee their homes globally due to rising sea levels, extreme weather events, and droughts, the US health system will see a surge in patients (8,9). Climate change risks exacerbating and widening existing social inequalities and disproportionately affecting the health of vulnerable populations, such as the elderly, children, women, those living with chronic medical conditions, and the socioeconomically disadvantaged.

Beyond the broader health system, climate change impacts individuals’ health. The rapidly rising temperatures due to pollution have resulted in lethal heat waves and more frequent and severe weather events. This has ultimately led to increased rates of vector borne diseases, poor air quality, and has threatened food and water security. Evidence continues to demonstrate that climate change is leading to a sustained increase in respiratory diseases, poor cardiovascular outcomes, kidney failure, adverse birth defects, stroke, lung cancer, Type 2 Diabetes, pneumonia, mental health outcomes, and neurologic and psychological disorders (5,8).

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RELEVANCE TO MEDICAL EDUCATION: LETTER TO DEAN OF EDUCATION

As future physicians we will face the challenge of the century in treating patients in the context of their climate and environmental exposures. As health professionals, if we are not prepared to adequately educate and provide clinical solutions to complications that arise from climate change, we cannot effectively respond to the challenges that lay before us. Over half of Americans report experiencing health impacts from climate change and believe that creating a safe and healthy climate is a moral imperative (10). [In a recent survey](#), ecoAmerica found that over 67% of Americans trust health professionals for information and guidance on climate change, second only to scientists (10). Yet, only 19% of Americans have actually heard about climate change from their physicians (10). We have the

unique privilege to champion action on climate change at the front line. Our medical education needs to prepare us effectively for what lies ahead.

Below, we provide resources for medical students to present to their Curriculum Directors. We have created a longitudinal series spanning the foundations curriculum that offers students a broad understanding of the intersection of climate change and health. Given the already packed curriculum, we consciously chose Learning Objectives that can be incorporated into existing lectures and PBL cases. This thread will offer tangible learning points in all areas of our curriculum and will prove invaluable to students entering any discipline of medicine.

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COVER LETTER FOR CLIMATE-HEALTH: University of Massachusetts Medical School

Contact: Emily Gentile (emily.gentile@umassmed.edu)

Dear UMMS Faculty,

Climate change is shifting the burden of disease on a global scale at an unprecedented rate. Record temperatures, surges in natural disasters, changes in ecosystems, and disruptions in infrastructure will continue to grow throughout our lifetime. It is imperative for UMass to implement a curriculum that encompasses the consequences of climate change from both a clinical and public health perspective. This will ensure that all patients in the Commonwealth will be provided with quality and up-to-date care for generations to come.

One of the most critical areas of focus is the impact of climate change on social determinants of health. By 2100, Massachusetts will experience 33 days per year that will exceed 100°F.¹ This leads to widening economic disparities in lower income neighborhoods, in which temperatures are rising at a disproportionate rate. Within our generation, issues including increases in respiratory disease due to pollution, disrupted water access due to storm surges, and chemical accidents when temperature thresholds for safe storage are surpassed will continue to impact health and safety. The disproportionate impact on vulnerable populations means that students need to develop advocacy skills to demand climate justice. We are urging UMass to integrate such topics into the existing FOMI Determinants of Health (DoH) and Doctoring and Clinical Skills (DCS) courses. Understanding changing climate conditions and their impacts on social determinants of health is crucial for us to become physicians who are capable of addressing emerging disparities in populations that need it most.

The School of Medicine curriculum also needs to address the clinical implications of climate change. We propose that the school accomplish this by directly integrating these issues into lectures, small groups, cases, and assignments presented in DSF, OSD, Brain, HDB, and Cancer Concepts. By delivering the content continuously throughout the FOMI and FOM2 curricula, we will not only ensure that students are well educated on the most current issues related to climate change, but also equip students with the clinical reasoning skills to detect and address these issues when they manifest in novel ways in clinical practice. Examples of how we envision incorporating climate change into current FOMI and FOM2 courses are as follows (please note that this is not a comprehensive list):

Cancer Concepts: Links of sustained warmer weather and the incidence of skin cancer
Infections: increased incidence of vector-borne illnesses, antibiotic resistance

Organs, Systems, and Disease: Air pollution and its relationship with asthma, heat induced kidney injury

Host, Defense, and Blood: Relationships to immune reactivity in a warmer climate

Determinants of Health: Increased influenza-related ER visits as correlated to increased extreme precipitation events, climate advocacy

Brain: Psychological distress related to climate events

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Medical schools across the country have already taken initiative to modify their curricula to address the urgent challenges presented by climate change. According to the AAMC, other institutions have started piloting year-long courses for first year medical students, climate-effect related standardized patient interviews, and optional electives. We are, therefore, urging UMass faculty to take action by delivering climate change content relevant to their course.

The escalating climate crisis presents an unprecedented threat to human health and human life. Formerly perceived as a problem for the future, the effects of climate change are being felt acutely as temperatures rise, record-breaking storms wreak havoc, and uncertainty mounts. In order to continue our role as a leading institution for progressive education, UMass needs to adjust their curriculum to ensure that the intersection of climate change, medicine, public health and public policy is emphasized. Without these additions to the curriculum, students will be inadequately equipped to provide comprehensive and equitable care for patients in this rapidly changing environment.

Sincerely,

Sarah Calove
Joseph Douglass
Emily Gentile
Megan Hansen
Amanda Lee
Bryce Pepin
Christine Yao

FRAMEWORK: CFMS Health and Environment Adaptive Response Task Force Planetary Health Competencies, 2021

Contact: Medical student members of HEART

The Canadian Federation of Medical Students Health & Environment Adaptive Response Task Force created an evidence-based framework that includes 11 competencies centered around three domains: Advancing Planetary Health Justice, Managing and Preventing Health Impacts, and Leading and Collaborating on Mitigation and Adaptation.

The competencies, as well as existing curricular topics where they might fit into the curriculum, can be found [here](#).

Further information about CFMS HEART can be found [here](#).

Part 2

RESOURCES FOR UNDERGRADUATE & GRADUATE MEDICAL EDUCATION

KEY COMPETENCIES FOR HEALTH PROFESSIONAL STUDENTS

Global Consortium on Climate and Health Education

The competencies set published by the Global Consortium on Climate and Health Education (GCCHE) reflects foundational climate and health knowledge, skills, abilities, and attitudes for health professions students to mitigate the health impacts of climate change. The original competencies set was developed and adopted in February 2018 by the GCCHE Advisory Council and Coordinating Committee. The revised set was developed in 2023.

The competencies span five domains, listed below:

1. Knowledge and Analytical Skills
2. Communication and Collaboration
3. Policy
4. Public Health Practice
5. Clinical Practice

[LINK TO COMPETENCIES DOCUMENT HERE](#)

The Lancet Planetary Health: A Framework to Guide Planetary Health Education

A taskforce of thought leaders in planetary health and education was convened by the Planetary Health Alliance to create the Planetary Health Education Framework. The taskforce's work took place between December, 2019, and February, 2021.

The Planetary Health Education Framework considers five foundational domains that they believe comprise the essence of planetary health knowledge, values, and practice, as follows:

1. Interconnection with Nature
2. The Anthropocene and Health
3. Movement Building and Systems Change
4. Systems Thinking and Complexity
5. Equity and Social Justice

[LINK TO COMPETENCIES FRAMEWORK HERE](#)

CLIMATE RESOURCES FOR HEALTH EDUCATION (CRHE)

CRHE is an organization that creates a free, publicly accessible repository with evidence-based resources to accelerate the incorporation of climate change and planetary health information into health educational curricula. The resources span various topics in preclerkship and clerkship medical curricula.

It contains:

- Learning Objectives
- Case Studies
- Slide Decks
- Implementation Guide

[LINK TO CRHE RESOURCE REPOSITORY HERE](#)

SAMPLE LESSON MATERIALS

Medicine for a Changing Planet

Medicine for a Changing Planet is a collection of clinical case studies developed at Stanford and the University of Washington to prepare health professionals to respond to emerging health threats from climate change and other environmental challenges.

[LINK HERE](#)

Brown University: Slide-Based Introduction to Climate Change and

Health Concepts

Developed by Sarah Hsu (sarah_hsu@brown.edu)

[LINK HERE](#)

Columbia University: Course Materials Under the Global Consortium on Climate and Health Education Repository

Topics include general climate and health, microbiology, nutrition, pediatrics, primary care, social determinants of health, and sustainable healthcare.

[LINK HERE](#)

University of Minnesota: Course Materials Under the Global Consortium on Climate and Health Education Repository

This contains various slide-based presentations on topics within climate change and health including air Pollution, severe weather, extreme heat, increasing allergens, changes in vector ecology, water quality impact, environmental degradation, and water and food supply.

[LINK HERE](#)

Virginia Commonwealth University: Course Materials on Organ Systems

This contains various slide-based presentations on topics including infectious disease, psychiatry, pulmonary medicine, gastroenterology, nephrology, and endocrinology.

[LINK HERE](#)

American College of Physicians: Introductory Slide Deck on Climate Change and Health

This contains an introduction to climate change, its impact on health, recommendations on solutions to climate health issues, and case studies.

[LINK HERE](#)

Canadian Federation of Medical Students: Environmental Health Pocket Card

This contains a pocketcard on environmental history talking.

[LINK HERE](#)

National Institute of Environmental Health Sciences: Climate Change and Human Health Lesson Plans

This encompasses materials on lesson plans, clinical case studies, and modules on clinical healthcare and global impacts of climate change on human health.

[LINK HERE](#)

SAMPLE SYLLABI

CLIMATE CHANGE AND HEALTH PRE-CLERKSHIP ELECTIVE SYLLABUS: BROWN UNIVERSITY, 10 WEEKS

Course Description

Climate change will be one of the defining modifiers of the global burden of disease over the course of the 21st century and beyond. This course will provide an overview of the wide ranging health impacts of climate change as well as the impact of healthcare on the environment. Employing a combination of guest speakers, readings, and small group discussions, students will learn how to identify and address the most salient emerging concerns in the era of climate change. Among these topics are heat related morbidity and mortality, changing infectious disease patterns, and extreme weather events.

Objectives

Students will be able to:

1. Describe the science of climate change and the multiple pathways by which climate change may impact human health.
2. Evaluate epidemiological papers investigating the human health effects of projected climate change.
3. Use skills to communicate, orally and in writing, issues related to climate change with members of the medical community, popular press, policy makers, and key stakeholders.
4. Describe the role of healthcare as both a major contributor to climate change and an important opportunity for innovating mitigation and adaptation strategies.

Criteria for Class Credit:

1. Attendance at > 80% of the sessions
2. Attend 1 service learning opportunity
3. Completion of final project
4. Active participation in sessions

Final Assignment:

Create something! And present to the class. Individual projects and group (2-3 people) projects are welcome. Examples include:

1. Write a proposal for a larger project you want to pursue.
2. Write an Op-Ed

3. Make a podcast about a climate change & health topic
4. Volunteer and write a reflection

Service Learning Opportunities

We ask all students to work with a RI community organization that focuses on environmental or climate advocacy for a minimum of 1 hour! Examples include:

1. Plant trees with Groundworks
2. Garden or teach a class with Branch
3. Volunteer in an ECo committee
4. Attend a Sunrise Event
5. Glean with Hope's Harvest RI
6. Any other organization you can think of!

Climate Change and Health Class Schedule

Session 1: Course Introduction Part 1

Session 2: Course Introduction Part 2 and Community Connections

Session 3: Field Trip to RI Resource Recovery Center

Session 4: Respiratory Illness and Climate Change

Session 5: Migration and Climate Change

Session 6: Geriatrics and Climate Change

Session 7: Providence Community Partners in Environmental Equity

Session 8: Healthcare Sustainability and Waste

Session 9: Environment and Reproductive Health

Session 10: Final Presentations & House Potluck

M4 CRASH COURSE ON CLIMATE CHANGE & HEALTH / HEALTHCARE SUSTAINABILITY: BROWN UNIVERSITY, 3 HOURS

Contact: Sarah Hsu at sarah_hsu@brown.edu

Goals/Objectives:

1. Think critically about waste in the healthcare industry
2. Understand your role in contributing to and reducing healthcare waste
3. Learn how to communicate the health risks of climate change to a target audience Identify some salient health risks associated with climate change

Topics:

1. How the healthcare industry contributes to excess waste and climate change
2. Diseases and health concerns associated with progression of climate change

Required Reading/Preparation:

[Summary](#) of the Green New Deal and implications for healthcare

[Climate Change – A Health Emergency](#) NEJM

Class Activities:

Part 1: Intro slide

Why Are We Talking About This? A few facts about the climate impact of the healthcare system

Part 2: Hospital Dumpster Diving Simulation

Time: 1 hour

Large Group (5-10 min)

Discuss Types of Waste

Discuss the differential climate impact of red vs white trash and different types of waste (solid waste, regulated medical waste, pharmaceutical waste)

Explain Small Group Activity

1. Break class into 3 groups
2. Use sterile suturing kit as an example.

Independent Group Time (25 min)

1. Groups independently discuss the materials in each kit
2. Act out how the kit is used to get a feel for unnecessary components
3. What is used and what is just thrown away?
Ex. Curved forceps are only needed for clamping bleeding vessels, removing certain foreign objects and that most injections can use 25 gauge syringe rather than 27, and that there is an extra cup for sterile rinsing when really the plastic container of the kit itself can be used as a rinse container.
4. Where does the waste from each component of the kit end up? (red vs white trash)
Think about supply chain waste (packaging, shipping, water) to bring the product to the hospital.
5. Decide if there are any items that can be diverted from waste, and how that item could be diverted
6. Discuss any ideas for reducing waste, such as making out of different materials, not including certain components, reusing

Part 3: Large Group Discussion (25 - 30 min)

1. Share where groups thought the trash goes, ideas for reducing waste (what are the easy changes to make regarding waste, and what would have the largest impact on waste?)
2. Discussion about what happens in the real world and are there ways to design waste management in hospital better to incentivize correct disposal by staff.
3. Examples of successful sustainable initiatives in healthcare

[Blue wrap recycling](#)

[Green practices in the OR](#)

[Items that can be repurposed](#)

BREAK (10 Minutes)**Part 4: Reinterpreting Urgency**

Time: 1 hour 20 min

Goal: Analyze a scientific paper about climate change and work with a team-member to translate the piece into messaging for a patient, a lawmaker, or a colleague.

3 articles, split the class into 3 groups. Can choose the article that they are interested in, does not matter if more than one group takes the same article, as it will be interesting to see differences in communication.

[Asthma and climate change](#)

[Health impacts of hospital waste](#)

[Climate change and mental health](#)

[Climate Change and vulnerable groups](#)

[Candida Auris association with climate change](#)

Give options for the type of message for each group to produce (groups can choose their preference):

1. Stream of Twitter messages/Social Media/Instagram Story/Post/Listicle
2. Visual/Audio media piece
3. Op-ed
4. Patient pamphlet

Independent working time (60 min)

There should be a concrete deliverable at the end

Need to illustrate an idea around the concept described in the article, but don't have to summarize the article.

Group Presentations (30 min)

Each group to present their concrete deliverable to class as if the class is their target audience

Discuss:

1. Class gives feedback, as if they are the target audience, on the message that they received.
2. What was effective?
3. What could be better?
4. Did it accurately convey the information or the message?
5. Is it at an appropriate reading level?

Part 5: Student presentation on hospital waste audit findings presentation and case vignettes

Ex: You notice excessive red bag waste, what are some changes you would propose to reduce red bag waste? Who would you need to talk to? How would you change the behavior and practices of busy clinicians beyond just education and training?

CLIMATE CHANGE & HEALTH M4 ELECTIVE: PENN STATE, 2 WEEKS

Contact: Natasha Sood at nsood@pennstatehealth.psu.edu

Course Description

Climate change is the greatest health crisis of the 21st century (1). Rising temperatures, poor air quality, severe weather events and compromised access to food and water leads to a direct impact on health, including increased cardio-respiratory diseases, neurological and psychological disorders, and adverse birth outcomes (2,3). These climate changes exacerbate social inequality by disproportionately affecting marginalized and socioeconomically disadvantaged populations (1). Furthermore, the US health system is responsible for >10% of national greenhouse gas emissions largely originating from inpatient healthcare in hospitals and waste production (4,5). In 2013, the US health sector released 614 million metric tons of CO₂ (5). As health professionals committed to “First do no harm”, we share an ethical and moral obligation to critically examine our carbon footprint (6). In today’s healthcare system, it is crucial that clinicians understand how climate change threatens our patients and become climate-smart healthcare advocates. Our interdisciplinary curriculum and partnership with the Health Systems Science Curriculum (HSS) at PSUCOM, Huck Life Sciences, Department of Humanities, PSU-Hershey Sustainability Council, and local environmental advocacy groups will allow for an enriched experience to educate and inspire the next generation of clinicians.

Objectives

Our objectives will be for medical students to describe the health impacts of climate change, to understand the contribution of healthcare in global carbon emissions, and to assess/develop emission reduction methods within our local healthcare system. Our approach will be multifactorial:

1. Describe the multidimensional impacts of climate change on health and healthcare infrastructure.
2. Discuss how the healthcare system contributes to climate change and how it can be more sustainably designed.
3. Evaluate how the healthcare system may respond to emergencies related to climate change.
4. Create an intervention that improves the integration of climate change into health management.
5. Effectively communicate the adverse impacts of climate change on health and healthcare infrastructure to multiple stakeholders. (e.g. health professionals, politicians, administration) through a final presentation to peers.

	Week 1				
Sessions	Monday	Tuesday	Wednesday	Thursday	Friday
	Health Impacts of Climate Change	Clinic Day: Observing Marginalized Communities & Patients Affected with Climate-Related Disorders	Debrief	Clinic Day: Assessing Waste Production, Disposal and Emissions within the PSU Healthcare System (Inpatient, Emergency Department, Facilities & Ops)	Debrief
	Environmental Determinants of Human Health		Sustainability of the American & PSU Healthcare System		Environmental Justice: Climate & Race
	Mental Health Impacts		Sustainability & Climate Smart Healthcare		Environmental Justice: Climate & Refugee Migration
	Connecting Cardiorespiratory Diseases & Air Quality		Mixed Media Project Introduction		Environmental Justice: Climate & Child Health
	Immunocompromised Patients & Pathogen Exposure				Project time

	Week 2				
Sessions	Monday	Tuesday	Wednesday	Thursday	Friday
	Harrisburg Capitol Trip for Environmental Justice Advocacy	Field Trip: Local Agriculture, Water & Recycling Facilities	Extreme Weather and Natural Disasters (Jeff Allen, Emergency Preparedness at PSU Health)	Field Trip: Refugee Resettlement Program Field Trip	Integrative Session: Putting It All Together
			Risk Assessment, Communication & Management		
	Atmospheric & Climate Science	Debrief	Communicable Diseases	Project Time	Project Presentations
	Food & Nutrition in Food Deserts	Project Time	Institution, State & Regional Climate Policy		
	Water Quality in Compromised Communities				

LOOK UP AND LEAD: CLIMATE CHANGE AND HEALTH ELECTIVE FOR M4S: UNIVERSITY OF COLORADO, 2 WEEKS

Contacts: Brittany Denzer (brittany.denzer@cuanschutz.edu), Beth Gillepsie, MD (egelhooff.gillepsie@gmail.com), and Bargavi Chekuri (bhagic@gmail.com)

Course Components

Day 1: Foundations of Climate Science

Overview of Health Impacts of Climate Change
Narrative Medicine: Personal Reflections on CCH (55 words exercise)
Introduction to Climate Science
Climate Action Workshop: Personal Improvement Projects as PDSA Cycles
Science Communication: How to Write an Op-ed

Day 2: Air Quality

Case-Based Learning: Air Quality and Cardiovascular Risk
The Health and Economic Effects of Air Pollution
Case-Based Learning: Climate-related Medico-legal Documentation in Primary Care Plants, Climate and Allergenicity
Planetary health report card: lessons from the field
Climate Solutions Workshop - Advocacy
CU SOM Climate Medicine Dean's Circle Webinar on Hospital Sustainability

Day 3: Heat-Related Illness

Co-benefits of GHG mitigation
Health Care Without Harm: International Climate Policy & Health Sector
Decarbonization Community Engagement for Climate-Smart Cities: Climate Action in Denver
Epidemiology Workshop 1
Epidemiology Workshop 2
Health impacts of extreme heat
Air Quality and Wildfire

Day 4: Extreme Weather

Case-based learning: Extreme weather
Climate-Driven Natural Disasters
Economics of Climate-Related Natural Disasters
Climate and Vulnerability Assessments
US Health Sector Resilience and Federal Policy

Day 5: Interdisciplinary Sessions

PIP & Narrative Medicine (20 min each); Narrative Medicine - Music and 3 Minute Mental Makeover Career Panel
Federal Climate and Health Policy (Panel)
What is 'One Health'?

Day 6: Mental Health

Climate Psychiatry Alliance: Mental Health Impacts of Climate Change
Climate Change and Migrants
Women's Health and Climate Change
Workshop: Utilizing Motivational Interviewing for Climate Change and Health
Education Climate Change Communication
International governance
Workshop: International Governance Simulation

Day 7: Water Security

Case Based Learning: Water security
Harmful Algal Blooms
Climate Change, Toxicology and Water Security
Vulnerable populations: LGBTQ+ impacts
Food and Nutrition in Climate Smart Healthcare

Day 8: Food Security

Case Based Learning- food security/sustainable farming
Climate Change & Food Security
Global Health: Mosquitos, Malaria and Climate Change
PIP/oped check in; narrative medicine (SNL comedy clip)
Climate Change and Indigenous Communities
Climate Action Workshop - Life Cycle Assessments

Day 9: Interdisciplinary Sessions

Climate Context for Minerals and Energy Trends in the US (coffee and light breakfast provided) Understanding Environmental, Social and Governance (ESG) Impact
Disclosures Climate Action Workshop - Mining and Health
Environmental & Climate Justice with Physicians for Social Responsibility
Share OpEds + Course reflection

ENVIRONMENTAL JUSTICE SERIES: GEORGETOWN, 3 SESSIONS

Contacts: Shian Omar (sno10@georgetown.edu), Jessica Hsueh, Lindsey Tully (lmt90@georgetown.edu), Samantha Rizzo (smr321@georgetown.edu), Vasalya Panchumarthi, Ruba Omeira (ro292@georgetown.edu)

Summary:

The Environmental Justice Series is a three-part series discussing topics relating to the intersection of climate change and environmental justice -- two critically important concepts that are not mutually exclusive. The August 2021 pilot series was organized by students who wanted to fill a gap in their medical education. It was created with the intention to combine elements of health justice, environmental inequity, and an understanding of actionable items future health care providers can take to improve the care of their patients.

The importance of this series stems from the fact that although environmental differences and climate change are a global phenomenon, they do not affect populations equally. Since climate change is set to have inevitable and irreversible impacts on our planet--it will invariably transform health systems all over the globe. Additionally, this series provides an opportunity to understand how our own communities are impacted by environmental inequities both on a systemic and historic level, and now also exacerbated due to climate change. It is important for current and future physicians to understand the consequences of the environment on health and how they can modify their care to help their patient population.

Session 1 : Global Perspective

Summary: The Global Perspective session is the first event of the series and serves to provide a broader global perspective on how climate change is contributing to a growing displaced population and directly affecting their health.

Speakers:

Dr. Heval Kelli is a Syrian Kurdish-born physician who co-founded and operated several non-profit organizations focused on medical education, mentorship, and giving back to the refugee community. He conducts and implements preventative cardiology research in underserved communities.

Sandra Smiley is a public health professional, MD candidate at the University of British Columbia in Vancouver, Canada, and a humanitarian aid worker. She has previously worked with Doctors Without Borders (MSF) in a number of countries and is currently conducting research on the mental health dimensions of environmental migration.

Dr. Kayly Ober is the senior advocate and program manager for the Climate Displacement Program at Refugees International. She has over a decade of experience on climate, migration, and displacement issues. She is currently completing her PhD in Geography at the University of Bonn, where her dissertation analyzes policymaking and governance structures around the climate change adaptation-migration nexus.

Moderators: Shian Omar, Georgetown M2024 and Jessica Hsueh, Georgetown M2024

Questions:

1. What does it mean to be a climate refugee and how can we expect this population to evolve in the future? What do you believe future physicians need to know about the health implications of the climate crisis and what to look for in the physical and mental health of the patients they may treat?
2. Dr. Heval Kelli: Drawing from your own experience coming to the United States as a refugee and given your extensive work with and treatment of refugees, could you walk us through both the short and long-term effects displacement can have on a person?
3. Sandra Smiley: As a humanitarian aid worker, what are some experiences that you have had that have highlighted the intersection between climate change and health?
4. Dr. Kayly Ober: What current policies are in place that act as barriers to climate change migration? Are there any examples of policies that effectively monitor/ provide support for climate change migration? How has the COVID-19 pandemic affected climate change migration policy, if at all?
5. How can we best support individuals and communities who are at risk of becoming displaced by climate change?
6. As future physicians, how can we continue educating ourselves on climate change migration so that we are better prepared to serve displaced populations? What advocacy work can we as medical students do? How can research be used as a tool to advocate for climate change driven migration and ensure that our healthcare system is adequately prepared to meet their needs?

Session 2: Local Perspective

Summary:

The Local Perspective session is focused on the impact of climate change, structural, and historical drivers of environmental inequities on the health and wellbeing of patients in the local area. We sought a diverse group of panelists with extensive clinical, research, and legal experience.

Speakers:

Dr. Sacoby Wilson, PhD: Associate Professor, University of Maryland School of Public Health. Dr. Wilson has over 15 years of experience as an environmental health scientist. He works primarily in partnership with community-based organizations to study and address environmental justice and health issues and translate research to action.

Dr. Gaige Hunter Kerr, PhD: Research scientist in School of Public Health at George Washington University. He researches topics related to the inequitable distribution of air pollutants and the health impacts of air pollution. His thesis at Johns Hopkins University focused on characterizing the large-scale meteorology responsible for surface-level ozone pollution variability and extreme events.

Dr. Neelu Tummala, MD: ENT surgeon and clinical assistant professor of surgery at The George Washington University School of Medicine and Health Sciences. She has a special interest in advocacy concerning the health effects of climate change and is an avid writer and speaker on this issue, as seen in many nationwide media outlets. She is the co-founder of Surgeons for a Sustainable Future and is on the Steering Committee for Virginia Clinicians for Climate Action, the Board for the Faith Alliance for Climate Solutions, and the Associate Board of City Year DC.

Ms. Caitlin Cocilova, JD: Attorney at the Washington Legal Clinic for the Homeless, where she works closely with community members and organizers to analyze and deconstruct how local land use and city planning decisions impact housing and homelessness. Prior to joining the Legal Clinic, Caitlin provided bilingual employment and immigration assistance to low-wage workers throughout Western Pennsylvania and represented youth in delinquency proceedings as a student in Georgetown's Juvenile Justice Clinic.

Moderators: Lindsey Tully, Georgetown M2024 and Samantha Rizzo, Georgetown M2024

Questions:

1. (All) How do you define Environmental Justice and where do you see a need for it in your area of work?
2. (Dr. Wilson) Could you share with the group your experiences combating environmental racism and share some of the community partners with whom you have worked?
3. (Ms. Cocilova) How do structural inequalities in the US drive environmental inequalities on a local level and how can we begin to address these inequalities?
4. (Ms. Cocilova) Could you briefly discuss your work with the legal clinic for the homeless?
5. (Ms. Cocilova) How does the regulation of homelessness affect the environmental hazards to which the unhoused community is exposed?
6. (Dr. Tummala) Could you draw on your experience as a physician and discuss in what ways you've seen a patient's living situation and/or environment play a direct role in their health and wellbeing?
7. (Dr. Tummala) In what ways did your clinical work prompt you to get involved with Virginia Clinicians for Climate Action?
8. (Dr. Kerr) Could you describe your findings about the communities that face higher exposures to certain pollutants and what changes have occurred in pollutant exposure in light of the COVID-19 pandemic?
9. (Dr. Kerr) In what other ways has COVID-19 highlighted environmental health disparities within our communities?
10. (Dr. Kerr) In what ways do you think local policies have historically contributed to these results and the current urban landscape, specifically in DC that we see?
11. (Dr. Kerr) In addition to the heavy-duty trucking policies, what other policies and in what ways do you think local policies have historically contributed to these results and the current urban landscape that we see?
12. (Dr. Wilson) How can research be used to advocate for populations vulnerable to environmental injustices?
13. (All) What would you say to audience members wanting to get more involved in Environmental Justice efforts or movements pursuing related issues?
14. (All) What are some examples of environmental activism that can be taken on a local level?
15. (All) Our panelists brought up the importance of community engagement in science. How do you think medical students and learners can engage with their communities about planetary health?

Session 3: Individual Perspective -- Environmental History and Case Studies

Summary:

The final session focuses on an individual perspective and hones in on how to address the respective patient populations through sample cases and a discussion on environmental-history taking.

Speakers:

Dr. Rebecca Philipsborn, MD, is a general pediatrician at Emory University School of Medicine and Children's Healthcare of Atlanta. Her scholarly work focuses on climate change and global child health, and includes efforts to integrate climate change into the medical education curriculum. At Emory, she is the Director of Climate, Health Education, and Clinical Partnerships for the Resilience and Sustainability Collaboratory, Director of the Pediatrics Global Health Track, and Associate Director of the Pediatric Clerkship. She is one of the core faculty members of the Southeast Regional Pediatric Environmental Health Specialty Unit, or PEHSU. Outside of Emory, Dr. Philipsborn serves on the Lancet Countdown on Health and Climate Change US Brief Working Group and the Executive Committee for the American Academy of Pediatrics Council on Environmental Health and Climate Change. She has an MPA in Environmental Science and Policy from Columbia and completed medical school and residency training at Emory.

Dr. Triveni DeFries, MD, MPH, is an Assistant Professor in the Department of Internal Medicine at UCSF. She is the Director of Education & Training for the UCSF HHRI and co-leads the medical HRC. Prior to medical school, she studied Human Rights and Latin American Studies, and completed an MPH in Global Health at Columbia University. She attended UCSF for medical school and residency in Internal Medicine. She has been leading and teaching asylum evaluations through medical school, residency and as faculty. She practices primary care and addiction medicine at SFGH, where she is the Associate Medical Director for the general medicine clinic at SFGH that serves a large immigrant population. She is interested in improving care for immigrant patients by addressing the social determinants of health, especially legal status.

Moderators: Vasalya Panchumarthi, Georgetown M2024 and Ruba Omeira, Georgetown M2024

Outline: Dr. Triveni DeFries presented important components of history-taking with refugee populations. Dr. Rebecca Philipsborn presented environmental-history taking components through the use of case-studies, while discussing the medical impact of climate change and environmental disparities on patients.

Lecture Objectives:

PART 1 -- Taking a History: Refugee and Asylum Seekers, by Dr. Triveni DeFries,

Understand key definitions and current status of the global forced migration crisis

Review key approaches to taking a history when interviewing a refugee or asylum seeker Learn to incorporate a trauma-informed-care approach to history taking with refugee and asylum seekers

Expand awareness of clinical skills used to advocate for asylum seekers

PART 2 -- An Approach to Environmental History Taking, by Dr. Rebecca

Philipsborn Understand how climate change has a multidisciplinary impact on human health

Learn the relationship between climate change, social justice and human rights

Recognize the impact that structural racism has on the distribution of climate change burden Recognize how exposure risk, adaptive capacity and physiological states contribute to increased vulnerability to climate change

Remember, as one cares for patients:

Assess for environmental determinants of health

Talk to patients about exposures

Consider and counsel about medications

Part 3

PATIENT EDUCATIONAL MATERIALS

1. ClimateRx

ClimateRx is a badge intended to serve as a conversation starter with patients and other providers about the relationship between climate and health. The scannable QR code allows patients to browse resources and information and engage in further conversation at their discretion. Learn more [here](#).

2. Climate Council brochure and poster on extreme heat

The U.S. Health Care Climate Council produced a brochure and poster on "Climate Change and Your Health: Extreme Heat". Sign-up to receive the materials [here](#).

3. Inova Health System patient education brochures

The [patient-facing brochures](#) from Inova Health System cover four topics: Healthy Climate | Healthy Children, Healthy Climate | Healthy Heart, Healthy Climate | Healthy Lungs, and Healthy Climate | Healthy Seniors.

4. American College of Physicians patient resource

The American College of Physicians created a [patient facts document](#) on climate change and health, including individual actions.

5. My Green Doctor waiting room brochures

[These brochures](#) are available in English & Spanish. Topics include: "Climate Change: What Can You Do", "Eat Less Red Meat", "Avoiding Mosquitoes", "Save Energy and Money", "Bicycling Benefits", "Wise Appliances Use", "Stressed? Add Nature.", "Summer Sun Safety", "Outdoor Water Tips", "Healthy Gardening", "Choose Tap Water", "Why Organic Foods"

6. UCSF Program on Reproductive Health and the Environment (PRHE)

PRHE has developed a [series of brochures](#) describing common types and routes of exposure to toxic substances, alongside best practices for mitigating risk. Their brochures include: Toxic Matters: Protecting Our Families from Toxic Substances

Work Matters: When You Work With or Around Toxic Chemicals, What You Know Really Matters Pesticides Matter:

Steps to Reduce Exposure and Protect Your Health

What to Eat: A Guide to Your Daily Food Choices

7. Western States Pediatric Environmental Health Specialty Unit (PEHSU) [A Story of Health](#)

is a multimedia ebook that explains core environmental health concepts through the lens of fiction. Chapter topics include health effects of wildfires, infertility/reproductive health, and childhood cancer-leukemia.

8. City-based extreme heat resources

These resources are public-facing websites to help prepare for extreme heat and minimize harm to people at highest risk.

[New York City](#)

[Los Angeles](#)

[Chicago](#)

[Houston \(Harris County\)](#)

[Philadelphia](#)

[Boston](#)

[Miami](#)

[Washington, D.C.](#)

Part 4

PERSONAL ONLINE LEARNING

1. The Global Consortium on Climate Change and Health Resources

- a. For a good list of online courses, see the Global Consortium on Climate and Health Education [website](#).

2. Climate for Health Ambassador Training

- a. This free, self-paced, [online training](#) equips health professionals with the knowledge, hands-on experience, and resources to speak and take action on climate change in their homes, neighborhoods, workplaces, communities, and beyond. The training focuses on six content domains: the health case for climate action & climate basics; impacts on human health and health equity; climate solutions and health benefits; communicating on climate and health; advocacy & education; and making a difference as a climate ambassador. Three continuing education credits are available upon completion of this 4-hour training.

3. Harvard Online Program: The Health Effects of Climate Change

- a. Free [self-paced course](#) offered by Harvard University. Contains 7 modules.

4. Yale Online Program: Climate Change and Health: From Science to Action Specialization

- a. Three six-week [courses](#) (\$50 or audit for free)
- b. If you need CME credit or want an official Climate Change and Health Certificate, use [this link](#) (Cost = \$2,000 for all 3 classes, \$900 for one class)

5. Emory's Virtual Climate Change and Health Zoom Drop-In Classes

- a. Run by Dr. Rebecca Philipsborn at Emory School of Medicine, with live Zoom lectures given by some of the leading US physician climate advocates.
- b. Recordings are available at [this link](#).

6. The CARE Climate and Resilience Academy

- a. Short, [free online courses](#) ranging from 1 to 2 hours to acquire knowledge on community-based adaptation and climate advocacy.
- b. 1-year paid learning journeys for CARE staff that combine e-learning and coaching to apply their acquired learning on climate and resilience to their projects.
- c. Find downloadable "trainer packs" on climate resilience.

7. Andrew Weil Center for Integrative Medicine: Environmental Health: An Integrative

Approach

- a. [Free, 30-day course](#) directed at healthcare providers to better understand the effects of environmental toxicants on human and population health

OTHER LEARNING MATERIALS

1. Podcasts

- a. [Code Green: The Climate-Smart Health Professional](#), hosted by Genny Silva, edited by Liana Haigis, and produced by Natasha Sood and Sarah Hsu (original authors of this guide!)
- b. [Courageous Medicine for the Climate Health Crisis](#), hosted and co-produced by Ashley McClure, MD, co-founder of Climate Health Now, and edited & co-produced by Angela Geronimo
- c. [Attention Humans](#), an educational podcast of the University of Colorado Consortium for Climate Change and Health hosted by former medical students, now resident physicians Jake Fox and Cameron Niswander
- d. [How to Save a Planet](#) (not explicitly about health), a climate change podcast by Gimlet that seeks to bring you smart, inspiring stories about the mess we're in and how we can get ourselves out of it.

2. Books

- a. *Enviromedics: The Impact of Climate Change on Human Health*, by Jay Lemery, MD and Paul Auerbach, MD
- b. *Planetary Health: Protecting Nature to Protect Ourselves*, by Sam Myers and Howard Frumkin
- c. *All We Can Save: Truth, Courage, and Solutions for the Climate Crisis* by Ayana Elizabeth Johnson- an anthology of stories from women at the forefront of the climate movement

Part 5

PLANETARY HEALTH REPORT CARD (PHRC)

2022-2023 Report

Contact: Taylor Diedrich & Isabel Waters, Co-Directors, phreportcard@gmail.com

The Planetary Health Report Card is a medical-student driven initiative designed to inspire medical schools to introduce climate change and planetary health into the medical school curriculum, expand research efforts, engage with communities most affected by climate change and environmental injustice, support passionate students who are trying to organize around planetary health at the institutional level, and implement sustainable practices. Check out the 2022-2023 Summary Report [here](#).

Sections include:

Planetary Health Curriculum

Evaluates integration of relevant planetary health topics in medical school curricula

Interdisciplinary Research in Health and the Environment

Evaluates quality and quantity of the interdisciplinary planetary health research at the medical school and broader institution

Community Outreach and Advocacy

Evaluates medical school engagement in community outreach and advocacy efforts related to planetary health

Support for Student-Led Planetary Health Initiatives

Evaluates institutional support for student-led planetary health initiatives, including funding, fellowships, programming, and student groups

Campus Sustainability

Evaluates medical school campus engagement in sustainability initiatives

To fill out the planetary health report card for your medical school, please visit: phreportcard.org or contact: phreportcard@gmail.com. Note that coordinated evaluation occurs on an annual cycle, with recruitment and onboarding from June to October. Annual results are published on World Earth Day.

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