Teaching Climate Change in Medical School: A Whole-Institution Approach

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“A Green New Deal for Academic Medicine
Disclosures

• No financial COI
• Will discuss work at GWU
• Will mention COVID-19 (But not a lot)
• Not speaking for my entire institution or my federal employer
Case Presentation

Primary Care: COVID-19 Recovery Clinic

Multi-Disciplinary Clinic Offering Specialized Treatment for Patients Recovering from COVID-19

Few neighborhoods have high PM$_{2.5}$-related mortality rates within a predominantly non-black population.

Where PM$_{2.5}$-related mortality rates are elevated, the proportion of black residents also tends to be increased.

Castillo et al., GeoHealth, 2021

https://earthobservatory.nasa.gov/images/149047/an-extra-air-pollution-burden
What is my role?
And how did I get here?
Studies Show Climate Change Could Cause Maine's Lobster Population To Crash


Rockland, Maine, 2014
Yale School of Public Health

Climate Change and Health

Kathryn Conlon, PhD
Robert Dubrow, MD, PhD
Connie Roser-Renouf, PhD

The Department of Medicine

Gary Simon, MD, PhD
Alan Wasserman, MD
GLOBAL CLIMATE CHANGE:

Understanding and Responding to Impacts on Health

Hana Akselrod MD MPH
GW MFA Division of Infectious Diseases
Summary Slide

- Global climate change is ongoing and unavoidable; the question is of extent and specific impacts
- Medical professional societies endorse physician response, leadership, and research on adaptation and mitigation strategies
- GW is uniquely positioned to be a regional leader in this area
- High-impact areas for study and intervention likely include:
  - Cardiovascular events in heat emergencies
  - Exacerbations in respiratory & allergic disease
  - Changing epidemiology of water- and vector-borne infections
  - More profound impacts on vulnerable populations
3. Health Effects of Climate Change

(Lancet, 2015)
Four Horsemen of the Apocalypse (Viktor Vasnetsov, 1887)
“I spend my time teaching my patients not to catastrophize life situations. But what if the situation truly is catastrophic?”
– 35 yo therapist being treated for Lyme disease in November 2021
DEADLY BACTERIA LURK IN COASTAL WATERS. CLIMATE CHANGE INCREASES THE RISKS.
SUMMER HEAT IN
Washington D.C.

Up to
21.0° hotter in the city than in nearby rural areas

Average
4.7° City summers are hotter than rural areas

17 More days above 90°F this year than rural areas

No.6 Biggest difference between urban and rural temperatures


https://doee.dc.gov/climateready
Call for Emergency Action to Limit Global Temperature Increases, Restore Biodiversity, and Protect Health

September 16, 2021
DOI: 10.1056/NEJMc2113200

Canadian woman becomes first person diagnosed as suffering from 'climate change'

"If we’re not looking at the underlying cause, and we’re just treating the symptoms, we’re just gonna keep falling further and further behind," the doctor responsible for the diagnosis said.

By Andrea Houghton - June 8, 2022
Health Care Ethics and Professionalism in the Era of Climate Change

“Climate change is the greatest threat to global health in the 21st century”—that is the World Health Organization’s web-based dispatch for immediate action. The WHO’s director-general adds, “The evidence is overwhelming: climate change endangers human health. Solutions exist and we need to act decisively to change this trajectory.” Expected consequences include the spread of disease, drought, and forced migration due to expected weather events and trends. Despite the gravity and relevance to health of these phenomena, roles of health care professionals in responding to and roles of organizations and governments in implementing policies and action plans have neither been clarified nor, by some, considered. This month’s issue will explore clinical and ethical questions about domestic and global health consequences of climate change and the nature and scope of the obligations that clinicians, organizations, and governments have to address them.
Grand Rounds

• GW Dept. of Medicine, 11/2019
• Attendance: N = 38 surveys filled
  • 29 attending physicians, 9 trainees
  • Internal Medicine + sub-specialties
• Objectives:
  1. Identify the mechanisms by which global climate change impacts the health of patients and populations
  2. Describe specific diseases and at-risk populations which are disproportionately affected by climate change
  3. Describe opportunities for physicians to be involved with adaptation and mitigation

53% of participants identified the issue of climate change as being “extremely important” to them

EFFECT ON FUTURE GENERATIONS
- A great deal: 95%
- A moderate amount: 5%

HOW WORRIED ARE YOU ABOUT CLIMATE CHANGE
- Very worried: 76%
- Somewhat worried: 24%

IMPACT OF CLIMATE CHANGE ON HEALTH
- Very knowledgeable: 54%
- Moderately knowledgeable: 37%
- Not at all knowledgeable: 12%

RELEVANCE TO DIRECT PATIENT CARE
- Very relevant: 3%
- Only a little: 23%
- Not at all: 10%
If your allergies are more severe, more expensive and last longer, blame climate change

My patients feel the burden of global warming and longer growing seasons. Without better climate policies, how far from reality is year-round pollen?

Dr. Neelu Tummala  Opinion contributor
Published 5:00 a.m. ET March 2, 2021 | Updated 7:46 a.m. ET March 2, 2021

Dr. Anjini Keswani, the Director of the Allergy and Sinus Center at The George Washington Medical Faculty Associates, describes how her practice management has changed in recognizing the shift in ragweed pollen symptoms in her patients, with symptoms both starting earlier in the year and lasting longer. Because of these seasonal variations, she has found it necessary to adjust recommendations regarding starting and stopping allergy medications.
Climate Change and Health at GW SMHS: First Class

- **Medical students request education on CCH**
  - Harleen Marwah discusses with Sr. Asst. Dean Deyton

- **Develop module w/in Clinical Public Health curriculum**
  - Developed in Fall 2019
  - Faculty: Akselrod (ID), Lalit Narayan (IM), Sonal Batra (EM)
  - Student leaders: Harleen Marwah, Emily Youner
  - “Beta test” lecture: 4 residents (2 IM, 2 EM)

- **Initial CCH module: 1 hour lecture + 1 hour panel**
  - Medical Society Consortium on Climate and Health resources
  - Panel: physician, public health researcher, science communication educator, journalist, moderator
  - Last session of MS2 fall semester... they still attended
“Thinking about climate change and how it’s going to affect my patients is essential to being a good physician,” explains Marwah, a fourth-year medical student at George Washington University, in Washington, D.C., who was inspired in part by her experience as a youth delegate at international climate meetings in Peru and Paris in 2014 and 2015. “Part of the oath I’ll take when I graduate next year is to do no harm,” she says. Doing no harm inherently implies thinking about this broader responsibility and this broader duty.”
“Young activists around the world are doing whatever it takes to make our voices heard on the climate crisis. Beyond protests and civil disobedience, we are lobbying political leaders for climate action. We are engaging our local governments, civic leaders, teachers, and school administrations. We are demanding climate action in our communities and climate education in our schools.”
“The biggest reason why people don’t act: They don’t know about or understand the climate crisis.

My generation needs to know the unique risks and vulnerabilities we are facing; that must be a part of our education.

Since schools generally aren’t doing this, I started Earth Uprising, a nonprofit that focuses on peer-to-peer climate education.

Until you grown-ups get it together to improve school curricula, young people can teach one another what’s happening to our planet.”
“Without preparation through undergraduate and graduate medical education, we cannot serve as effective climate justice messengers. Ignoring the health implications of environmental racism and climate change not only hurts our BIPOC patients but also our health systems and communities. Our training should alert us to the warning signs of these crises. Our rapid response is long overdue.”
A GUIDE TO

CLIMATE & HEALTH CURRICULUM REFORM IN MEDICAL SCHOOLS

Medical Students for a Sustainable Future

TABLE OF CONTENTS

HOW TO USE THIS GUIDE

PART 1: PROPOSALS FOR CURRICULUM REFORM

• Relevance to Medical Education, Letter to Dean of Education
• Cover Letter for Climate-Health
• Planetary Health Competency & Curriculum Proposal

PART 2: SAMPLE SYLLABUS

• 10 Week Syllabus for Pre-clerkship students
• 3 Hour Crash Course for all levels
• 2 Week Syllabus for M4 elective

PART 3: LESSON MATERIALS

• American College of Physicians Climate Change Toolkit
• General Intro to Climate Change and Health PowerPoint
• UMN Climate Change and Health Slide Decks for block

PART 4: PERSONAL ONLINE LEARNING

• IPCC Climate Change and Health Program
• Harvard Online Program: The Health Effects of Climate Change
• Yale Online Program: Climate Change & Health
• Emory’s Virtual Climate Change and Health Zoom Drop-In Classes
• The CARE Climate and Resilience Academy
• List of Readings on Environmental and Racial Justice

PART 5: PLANETARY HEALTH REPORT CARD

• 2019-2020 Report Card

PART 6: RACE & CLIMATE RESOURCES

• Environmental Racism - Call for Curricula

SUBMIT YOUR CURRICULA
Institutional Change

- Leadership Buy-In
- Extramural Resources
- Cross-Campus Partnerships
- Faculty Development
- Student Advocacy
Student Advocacy

Faculty Development

Leadership Buy-In

Institutional Change

Extramural Resources

Cross-Campus Partnerships
“The US health care system is changing dramatically. Clinicians have an obligation to serve as trusted leaders to assure that changes in health care delivery systems promote individual well-being and community health. That obligation is in our oath.”

Lawrence Deyton
Senior Associate Dean for Clinical Public Health
Murdock Head Professor of Medicine and Health Policy
Clinical Public Health @ GWU SMHS

**STRUCTURE**
- Established 2014
- Dedicated faculty and admin support
- Integrates public health and population health concepts and skills throughout students' four-year medical education
- Patients, Populations, and Systems
- Clinical Public Health Summits
- Learning Labs on COVID-19
- Community service
- MD/MPH option

**CONTENT AREAS**
- Social determinants of health
- Community and population health
- Health system organization
- Prevention and health promotion
- Community service and engagement
- Evidence-based practice
- Interprofessional teamwork
- Clinician advocacy
- Leadership skills
- Health policy
Model: HIV @ GW

SMHS Students Participate in 2017 Clinical Public Health Summit on HIV/AIDS

January 29, 2018
FEATURED NEWS

First CCH Module Student Feedback

Wish there was more coverage of this topic.

Overwhelming, too much material.

Empowering – we can act on this

“The panel was dope.”
GW 2020 Planetary Health Report Card

- MS2 Samuel Duffy
- Method: Searched objectives of existing curriculum components
- Strengths: support for students, core curriculum addresses social determinants and some domains (e.g., infectious disease), MS2 lecture
- Weakness: material not integrated throughout the curriculum, many domains missing

![Image of report card]

<table>
<thead>
<tr>
<th>Section</th>
<th>Raw Score</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planetary Health Curriculum</td>
<td>15 / 28 = 53%</td>
<td>C</td>
</tr>
<tr>
<td>Interdisciplinary Research in Health and Environment</td>
<td>9 / 10 = 90%</td>
<td>A</td>
</tr>
<tr>
<td>Community Outreach and Advocacy in Environment and Health</td>
<td>8 / 13 = 62%</td>
<td>B-</td>
</tr>
<tr>
<td>University Support for Student-led Planetary Health Initiatives</td>
<td>8 / 10 = 80%</td>
<td>A-</td>
</tr>
<tr>
<td>Institutional Grade</td>
<td>Average of four scores above= 71%</td>
<td>B</td>
</tr>
</tbody>
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Eco-Medical Literacy Model

• “The ability to access, understand, integrate and use information about the health-related ecological effects of climate change to deliver and improve medical services.” (Bell, BMC Med Educ, 2010)

• Mapping relevant domains in GW curriculum
  • Immunohematology & Infection
  • Cardiology, Pulmonary, & Renal
  • GI & Liver
  • Brain & Behavior
  • Reproduction & Endocrinology
  • Applied Population Health
  • Practice of Medicine
Eco-Medical Literacy @ GWU SMHS

Potarazu et al., Feb. 2022, presented at Protecting Health in a Changing Climate: Addressing Climate-Related Health Inequities
High-Yield Areas

1) Cardiovascular diseases
2) Respiratory diseases
3) Infectious diseases
4) Mental Health
5) Nutrition and Development
6) Social Determinants of Health
7) Physician Professionalism & Advocacy
GW Curriculum Development Timeline

• 12/2019: Advocacy by Harleen Marwah; MS2 lecture + panel
• Spring-Summer 2020: Planetary Health Report Card completed
• 12/2020: MS2 lecture + panel, integrated with environmental health module of CPH
• Spring-Summer 2021: Eco-Medical Education proposal by Savita Potarazu & team
• Fall 2021: Presented to Curriculum Themes Committee
• 11/2021: MS3 intersession, clinical cases (with Scott Cohen @ VAMC)
• 12/2021: MS2 lecture + panel, integrated with environmental health module of CPH
• Spring 2022: Curriculum review, meeting with course directors
• Next steps: Plan faculty development (with Anjeni Keswani, Neelu Tummala)
Early 2020

Ever Since Then

Where Do New Diseases Come From?

Climate and Health Institute

At the intersection of climate change, human health and equity.

From extreme drought to longer wildfire and pollen seasons, climate change is having a profound impact on human health. In addition, the health burden caused by climate change and its drivers is disproportionate, with some populations more at risk of respiratory and heat-related illnesses, water and food insecurity, disease, forced migration and other consequences of planetary neglect. GW’s Climate & Health Institute seeks new solutions to global health and equity challenges associated with climate change and is addressing those challenges through cross-disciplinary research, training and action.
The Arctic is “the canary in the coal mine. What happens up there in the north is what’s going to happen to the rest of the planet next.”

Robert Orttung
Research Professor of International Affairs, Elliott School of International Affairs

https://magazine.gwu.edu/land-ice-and-fire
Humans Are Driving Climate Change But They Can Also Fight Against It

Health In The Social Cost Of Carbon: Recent Advances To Fill A Critical Gap

Concentrations

MPH@GW Concentration in Climate and Health - Coming Fall 2022!

https://climatehealth.gwu.edu/education
“The climate crisis is a much larger conversation than reducing carbon dioxide emissions, and it is a very different conversation from just extreme weather. We’re facing a shift in every aspect of our global reality.”
“The climate crisis is the largest challenge humans have ever faced. We young people are doing everything we can so please join us. We need your help.”
THE ROLE OF CLIMATE CHANGE IN MEDICAL EDUCATION

With climate change a growing public health emergency, the importance of integrating the health impacts of climate change into clinician education has never been greater. In this panel discussion, we will hear three clinicians discuss how they have incorporated climate change awareness and environmental injustice into their work and into medical education.

PANELISTS:

Rebecca Phillipsborn, MD
Resident Clinician, Clinical Consultant and Global Health Track Director, Presidency Global Health Institute, Assistant Professor, Enjay School of Medicine

Gaurab Basu, MD
Primary Care Physician, Co-Director of the Center for Health Equity Education and Advocacy, Cambridge Health Alliance, Health Equity Fellow, Harvard C-CHANGE, Instructor, Harvard Medical School

Cecilia Sorensen, MD
Emergency Medicine Physician, Director, Global Consortium on Climate and Health Education at Columbia University, Associate Professor, Department of Environmental Health Sciences, Mailman School of Public Health, Associate Professor, Department of Emergency Medicine, Columbia University Irving Medical Center

INTRODUCTORY REMARKS FROM:

Neelu Tummala, MD
ENT Surgeon, Co-Director, Climate and Health Institute

REGISTER HERE
April 8, 2022
12:00-1:00 PM EST

https://climatehealth.gwu.edu/schedule