

# Introduction to the Million Hearts Climate Change & Cardiovascular Disease Collaborative (CCC)

## Webinar Series on Accelerating Healthcare Sector Action on Climate Change and Health Equity (Session Eight)

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Office of Climate Change and Health Equity  
November 3, 2022



Office of  
Climate Change  
and Health Equity

## “A Grand Tour” (Webinar Series)

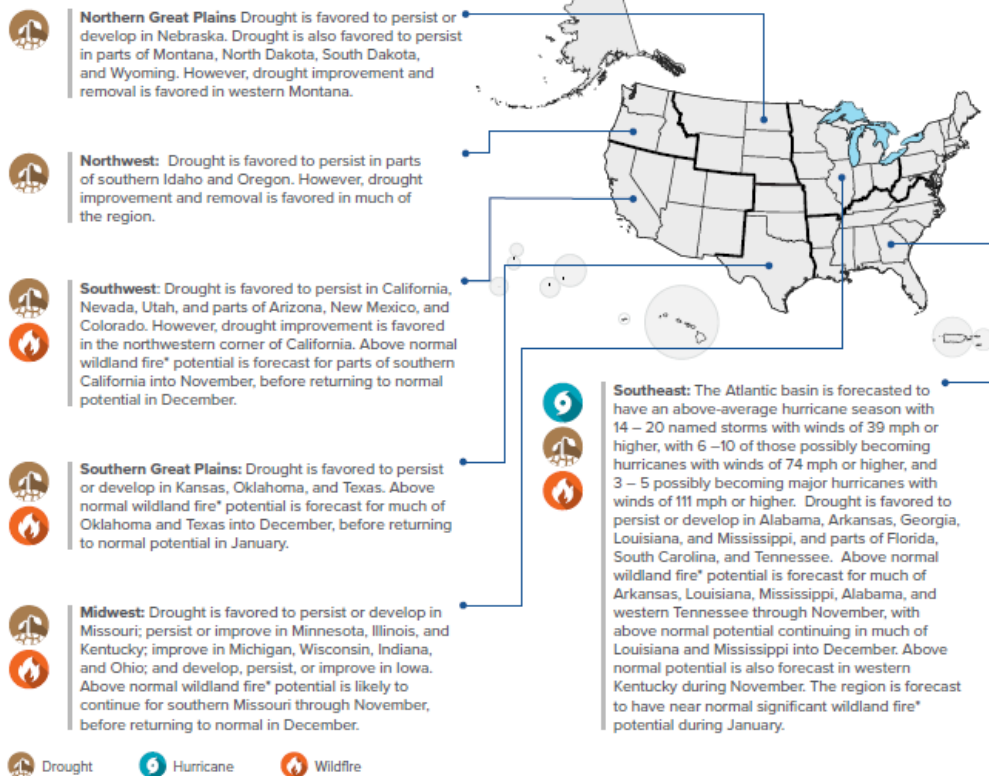
Date	Name	Speakers
July 14 at 12:00 PM	Resilience, Emissions Reduction and Health Equity	Department of Energy, OCCHE
July 21 at 12:00 PM	Financial Supports for Climate Action (and Insights on Applying)	Department of Agriculture, Department of Housing and Urban Development, Department of Treasury
July 28 at 12:00 PM	Emergency Preparedness and Response Supports	Administration for Strategic Preparedness and Response, Federal Emergency Management Agency
<i>August Break</i>		
Sept. 8 at 12:00 PM	EPA Tools and Incentives	Environmental Protection Agency
Sept. 22 at 12:30 PM	Introduction to AHRQ’s Decarbonization Toolkit	Agency for Healthcare Research Quality
Oct. 6 at 12:00 PM	International Perspectives on Resiliency and Decarbonization	United Nations Framework Convention on Climate Change, Race to Zero
Oct. 20 at 12:00 PM	Action Collaborative Tools and Supports	National Academy of Medicine Action Collaborative on Decarbonizing the U.S. Health Sector Leadership
<b>Nov. 3 at 12:00 PM</b>	<b>Introduction to the Million Hearts Climate Change &amp; Cardiovascular Disease Collaborative (CCC)</b>	<b>Centers for Disease Control and Prevention, Environmental Protection Agency, OCCHE</b>
Nov. 17 at 12:00 PM	Federal Health Systems Learning Network Findings and Best Practices	Federal Health Systems Learning Network Findings and Best Practices

# Climate and Health Outlook

ISSUED OCTOBER 2022

The first page of this Climate and Health Outlook includes **prospective forecasts** for November 2022 – January 2023. In the coming months, **most of the contiguous U.S.** will experience temperatures 0.9 – 3.6 °F (0.5 – 2 °C) warmer than normal. Warming winters can cause earlier and longer allergy seasons, aggravating respiratory and allergy conditions. Increasing winter temperatures can also contribute to earlier onset of vector-borne diseases like Lyme disease. Additional regional and hazard-specific information is available on this Outlook's [associated website](#).

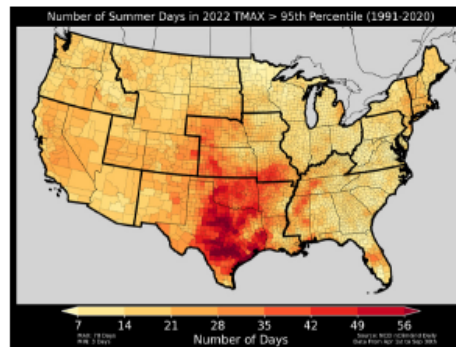
The following pages detail **retrospective information** on how heat and drought affected the U.S. in the summer of 2022.



\*Smoke from wildfires can impact health hundreds of miles from site of the fire.

## Climate and Health Outlook

### Where Was Heat Abnormally High in 2022?



- Region 1: CT, ME, MA, NE, RI, VT
- Region 2: NJ, NY, PR, VI
- Region 3: DE, DC, MD, PA, VA, WV
- Region 4: AL, FL, GA, KY, MS, NC, SC, TN
- Region 5: IL, IN, MI, MN, OH, WI
- Region 6: AR, LA, NM, OK, TX
- Region 7: IA, KS, MO, NE
- Region 8: CO, MT, ND, SD, UT, WY
- Region 9: AZ, CA, HI, NV, AS, MP, FSM, GU, MH, PW
- Region 10: AK, ID, OR, WA

\* Thick lines indicate HHS regional boundaries.

Figure. Temperature is calculated from NOAA's nClimGrid-Daily v1-0-0, a 5km gridded dataset aggregated into counties for the contiguous US. For each day between April 1st to September 30th, a county's temperature in 2022 is compared against its climatological normal from 1991-2020. Temperatures above the 95th percentile are considered abnormally hot for the region.

This map depicts the number of summer days in 2022 (April 1st to September 30th) when a county's maximum temperature exceeded its 95th percentile, thus indicating an abnormally hot day. Much of the southern great plains, including Texas, Oklahoma, Arkansas, Missouri, Kansas and Nebraska experienced more than a month's worth of hot temperatures.

### Oregon Health Plan Responds to Extreme Heat

The Centers for Medicare & Medicaid Services recently approved a [Medicaid 1115 waiver](#) from the Oregon Health Plan to allow coverage of medically necessary air conditioners, heaters, humidifiers, air filtration devices, generators, and refrigeration units when certain requirements are met. Oregon has increasingly struggled with climate change-related health threats. In 2021, record-breaking heat resulted in the loss of over 100 lives (see [July Outlook](#) discussion of the *Health Impacts During the Heat Dome of 2021*). Extreme heat and wildfires have a significant impact on the health and well-being of millions of people in Oregon each year, particularly low-income and historically marginalized groups. To respond to these threats, the Oregon Health Plan is working on establishing a dedicated Medicaid unit to address climate impact on public health. This waiver will allow Oregon to expand its volume and capacity to respond to climate emergencies with cooling and air filtration equipment. The waiver builds on previous state legislation (Senate Bills 1536 and 762), which funded the Oregon Health Authority to provide air conditions and other equipment to Medicaid recipients. During 2022, OHA and its partners identified qualifying individuals who could be at-risk using data like the Oregon [Heat Hazard Report](#). Oregon Health Plan's goal through its waiver and other activities is to prevent injury, illness and/or death due to the extreme or prolonged heat exposure.

### Is Heat Related Illness Worse In 2022 Compared to the Last Four Years?

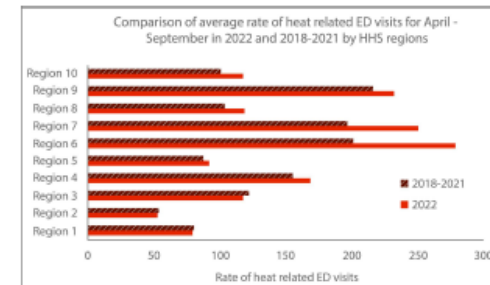


Figure. The CDC National Syndromic Surveillance Program (NSSP) provides daily rates of heat related illness (HRI) by HHS Regions. NSSP is a network comprising CDC representatives, state and local health departments, and academic and private sector health partners jointly collecting and sharing electronic patient encounter data.\*

The graphic above compares the rate of HRI per 100,000 emergency department (ED) visits from April to September in 2022 with the rate observed in 2018-2021 for the same months. The average rate of HRI was calculated by HHS regions for April 1–September 30 for 2022 and 2018-2021 separately after quality control filters were applied to allow comparison across years. The average HRI rates in 2022 were higher in 7 out of 10 HHS regions when compared to the average rates in 2018-2021. Particularly noteworthy were the higher rates of HRI in HHS regions 6 and 7 in 2022.

\* NSSP includes ED visit data from approximately 72% of non-federal U.S. EDs. Fewer than 50% of facilities in CA, Hawaii, Iowa, Minnesota, and Oklahoma report to NSSP. MO discharge data is incomplete.

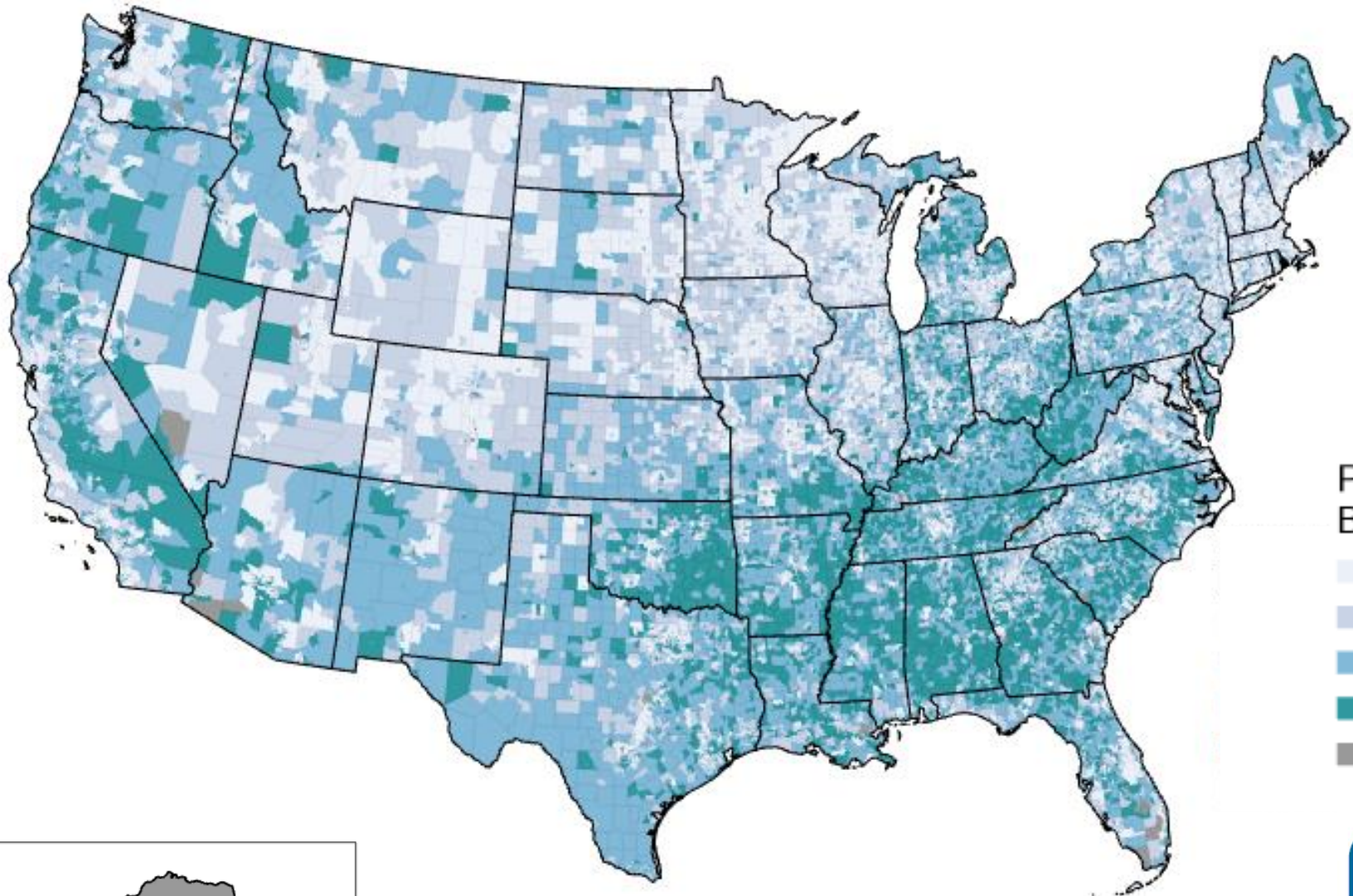
## Inflation Reduction Act-Related Requests for Information or Comment and Listening Sessions

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- ***Input requested by 11/04/2022*** Department of the Treasury and the Internal Revenue Service Seek Public Input on Implementing the Inflation Reduction Act's Clean Energy Tax Incentives
- ***Happening 11/9:*** Environmental Protection Agency National Public Listening Session on Greenhouse Gas Reduction Fund
- ***Closes 11/14/2022*** Department of Agriculture Seeking Public Comment on a New Provision to Provide Assistance to Agricultural Producers Who Have Experienced Discrimination
- ***Closes 11/30/2022*** Department of Energy Request for Information on the Defense Production Act
- ***Closes 12/09/2022*** General Services Administration and Department of Energy RFI for Technologies for Net-Zero Carbon Buildings

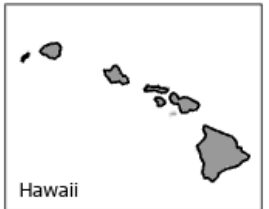
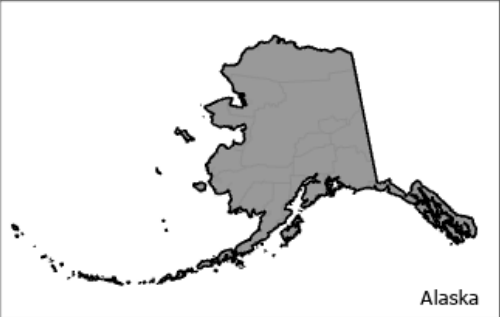


# Environmental Justice Index (EJI)



Percentile Ranks of EJI By Census Tract

- Low ( $\leq .25$ )
- Low to Moderate ( $\leq .50$ )
- Moderate to High ( $\leq .75$ )
- High ( $\leq 1$ )
- No Data



Data source and methodology found at: [www.cdc.gov/dhdsp/maps/atlas/statistical-methods](http://www.cdc.gov/dhdsp/maps/atlas/statistical-methods)

## Polling questions

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1. Which of the following health conditions do you think can be caused or worsened by air pollution?
2. What perspective do you bring to the CCC?



Laurence S. Sperling, M.D., FACC, FAHA, FACP, FASPC is the Executive Director of the Million Hearts Initiative for the Division of Heart Disease and Stroke Prevention at the Centers for Disease Control and Prevention and the Center for Medicare and Medicaid Services. He is the Founder and was the Director of The Heart Disease Prevention Center at Emory Healthcare. He is currently the Katz Professor in Preventive Cardiology at the Emory University School of Medicine, and Professor of Global Health in the Rollins School of Public Health.

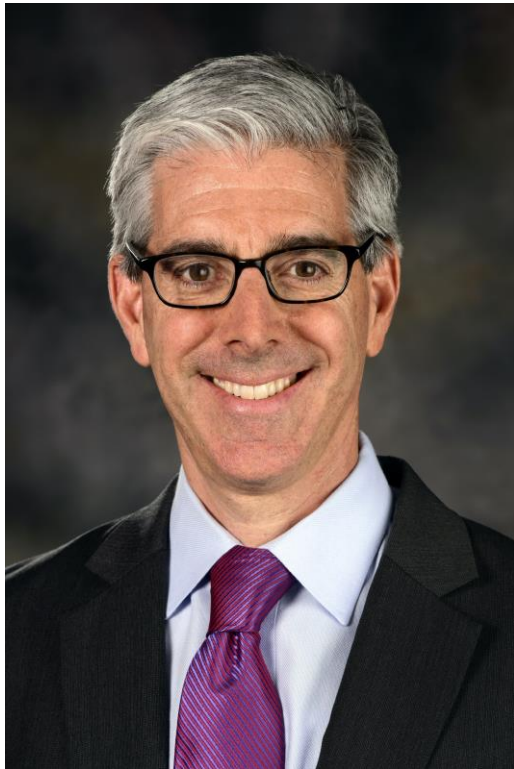
# Million Hearts<sup>®</sup> 2027

**Aim:** Prevent 1 million—or more—heart attacks and strokes in the next 5 years by:

- Promoting evidence-based strategies for cardiovascular disease prevention
- Convening health care and public health champions
- Facilitating meaningful collaboration and resource sharing
- Addressing health equity through specific policies, processes, and practices







Dr. Balbus is the Acting Director of the new Office of Climate Change and Health Equity within OASH. A physician and public health professional with over 25 years of experience working on the health implications of climate change, Dr. Balbus has served as HHS Principal to the U.S. Global Change Research Program and co-chair of the working group on Climate Change and Human Health for the U.S. Global Change Research Program since he joined the federal government in 2009. Before coming over to the new Office, Dr. Balbus served as Senior Advisor for Public Health to the Director of the National Institute of Environmental Health Sciences. He was elected to the National Academy of Medicine in 2021.

## Origins of the Office of Climate Change and Health Equity

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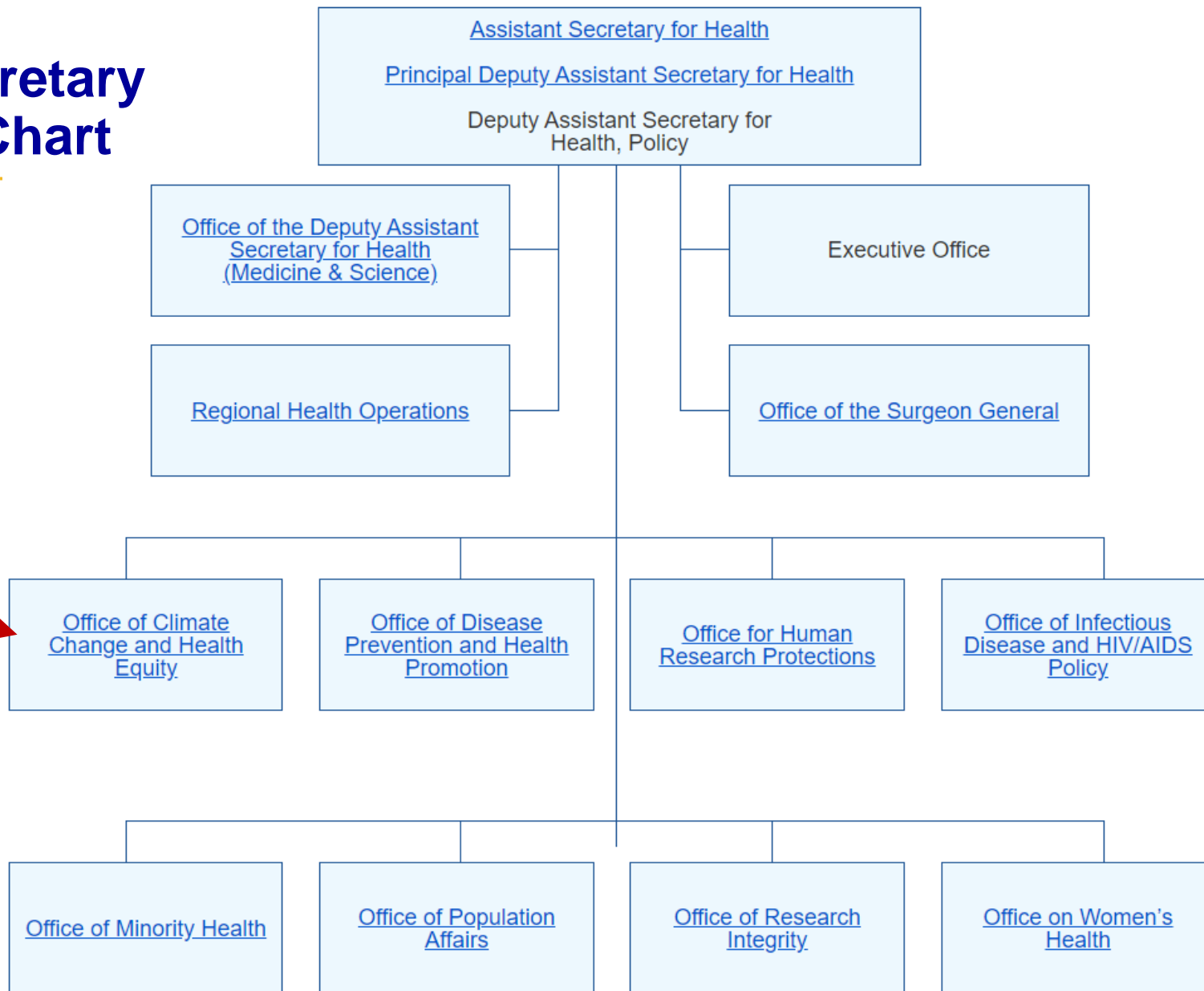
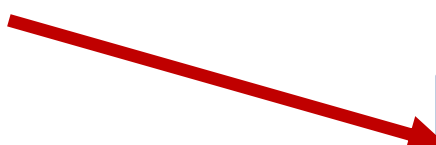
### E.O. 14008 - “Tackling the Climate Crisis”

- HHS mandates (Section 222(d))
  - ✓ Office of Climate Change and Health Equity
  - ✓ Interagency Working Group to Decrease Risk of Climate Change to Children, the Elderly, People with Disabilities, and the Vulnerable
  - ✓ Biennial Health Care System Readiness Advisory Council



# Office of the Assistant Secretary for Health Organizational Chart

**OCCHE is situated alongside critical HHS Offices**



## Office of Climate Change & Health Equity (OCCHE)

Priority 1: Climate & Health Resilience for Most Vulnerable

Priority 2: Climate Actions to Reduce Health Disparities

Priority 3: Health Sector Resilience & Decarbonization



### Resilient Health Systems

- Capturing **community and health system vulnerabilities** and **logging adaptation gaps**
- **Enhancing the resilience of health systems and communities** to climate change effects
- Building on existing networks and plans to **develop a national plan for health adaptation**

### Low-Carbon Health Systems

- Coordinating Federal health system **greenhouse gas accounting and reduction** targets
- Partnership with private health sector to develop an **action plan for reductions** via incentives, technical assistance, policy guidance, applied research, toolkits, training, use of regulatory authorities as needed, etc.



Wayne Cascio serves as Director of the Center for Public Health and Environmental Assessment (CPHEA) within EPA's Office of Research and Development. Wayne is a physician/scientist who earned a B.A. from Johns Hopkins University, and an M.D. from the University of Maryland and is a cardiologist. Currently, in addition to his administrative work he continues to be engaged in the study of the health effects of environmental pollutants for the purpose of informing risk assessment, risk-management decisions, and improving public health through increased environmental health communication and literacy.





# Ambient Air Pollution and Cardiovascular Health:

## Ambient Particulate Matter

*Wayne E. Cascio, MD, FACC, FAHA*

*Director*

*Center for Public Health and Environmental Assessment*

*Office of Research and Development*

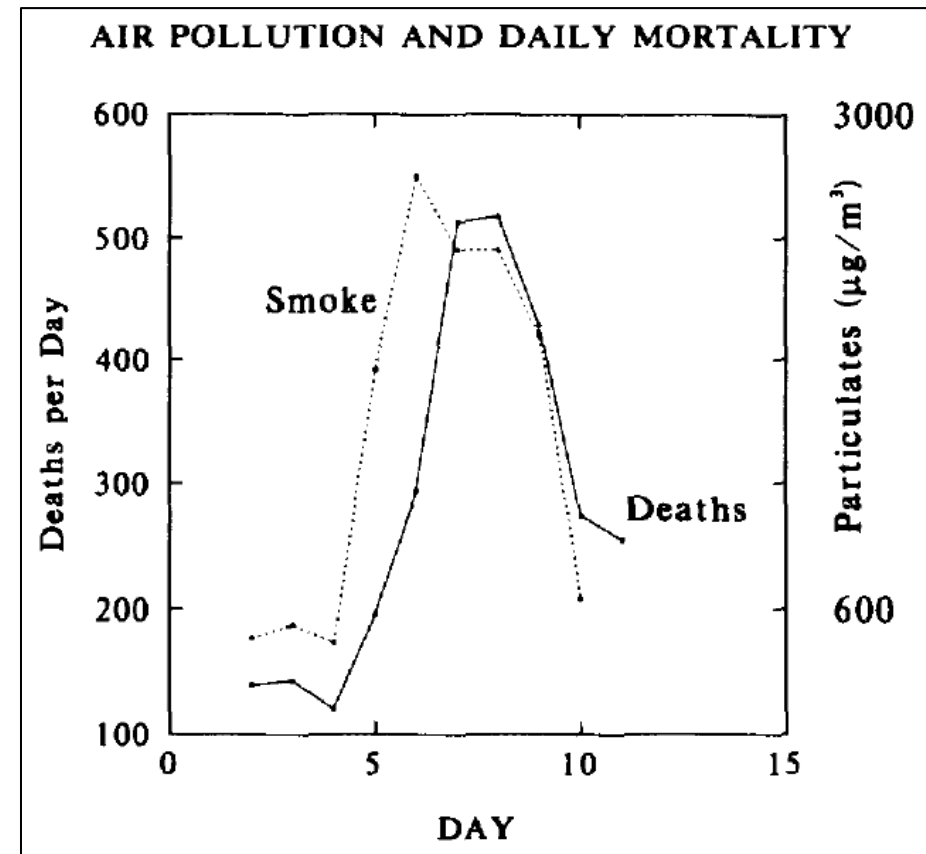
*U.S. Environmental Protection Agency*

*November 3, 2022*

*The views expressed are those of the author and do not necessarily reflect the views or policies of the U.S. EPA.*



Source: Schwartz, 1994 (in London, 1952)

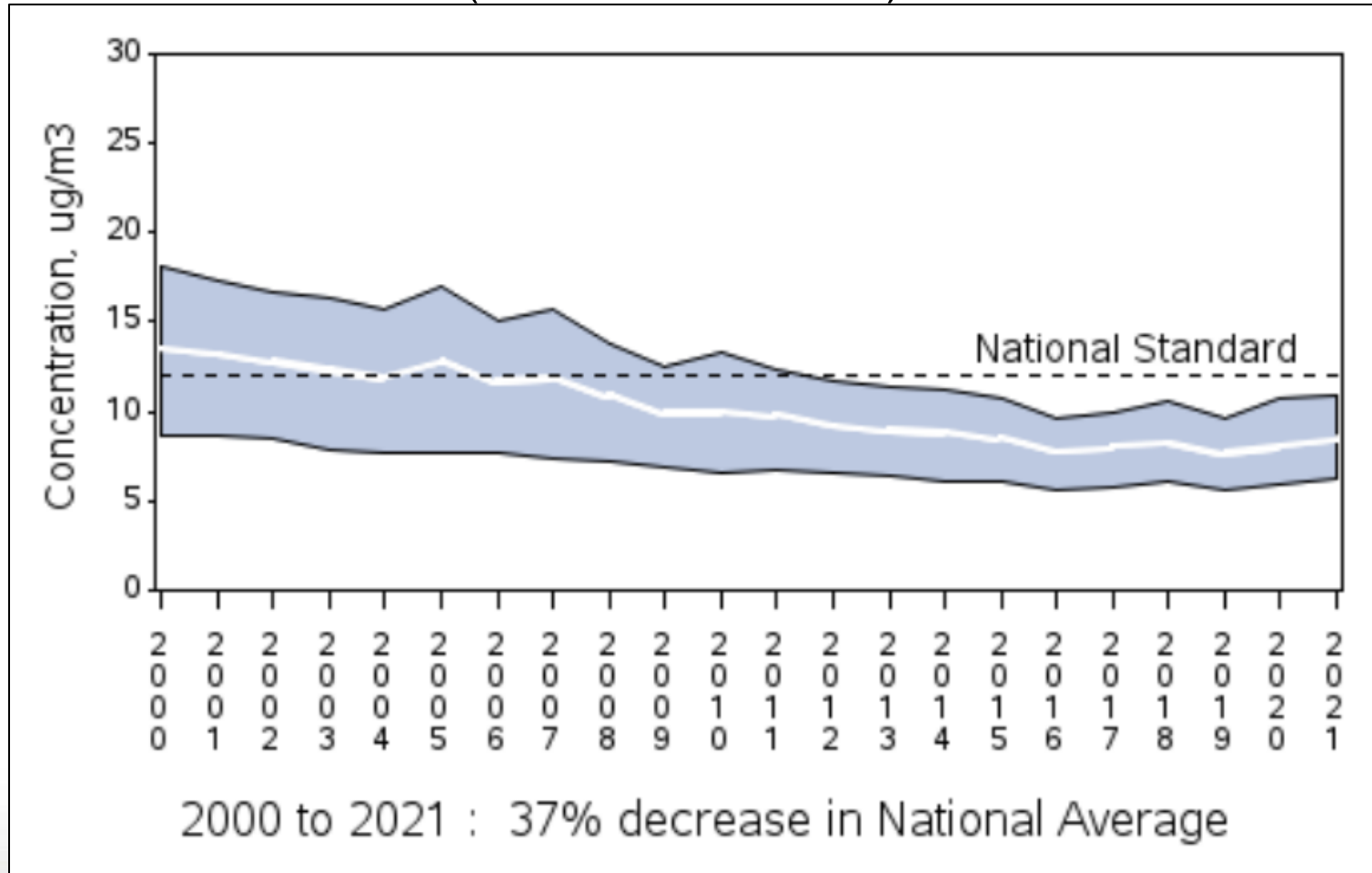


- Initial evidence that adverse health effects (i.e., increases in hospital visits and deaths) were associated with extreme air pollution events. 15



# U.S. PM<sub>2.5</sub> Air Quality, 2000-2021

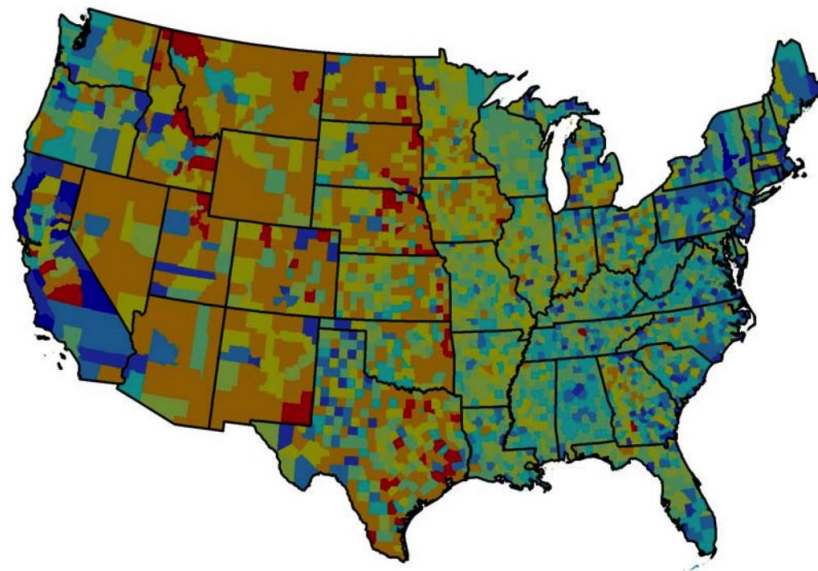
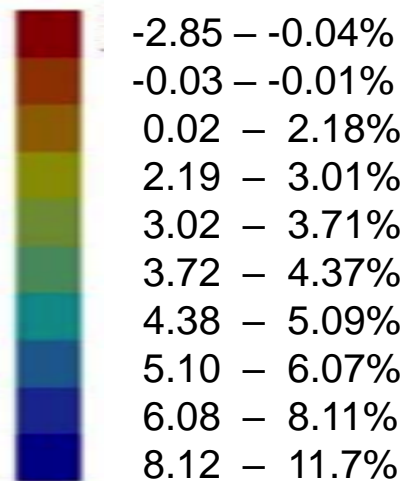
Seasonally-Weighted Annual Average National Trend  
(based on 375 sites)



# Mortality Reduction Attributed to Decreasing PM<sub>2.5</sub> - 1980-2010

*Between 1980 - 2010, PM<sub>2.5</sub> exposures fell by about half, and estimated excess deaths decreased by about a third*

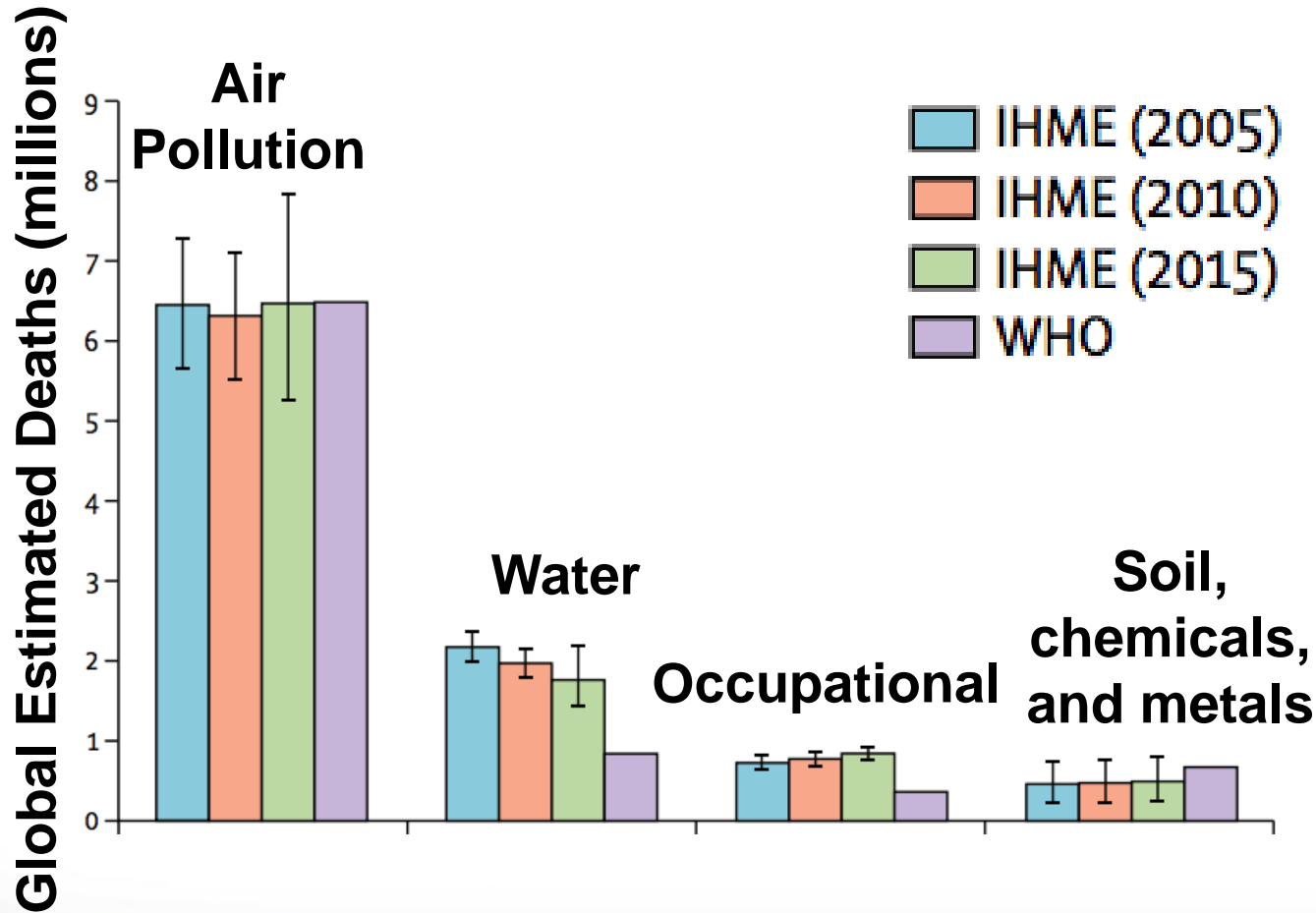
**Change in the %  
of Death Due to PM<sub>2.5</sub>  
Between 1980 - 2010**



- California, Virginia, New Jersey, and Georgia had some of the largest estimated reductions in PM<sub>2.5</sub>-attributable deaths

# Global Estimated Deaths by Pollution, 2015

## Putting Different Pollutants into Perspective



*Among different types of pollutants - **air pollution** is the dominant driver of mortality on the global scale*

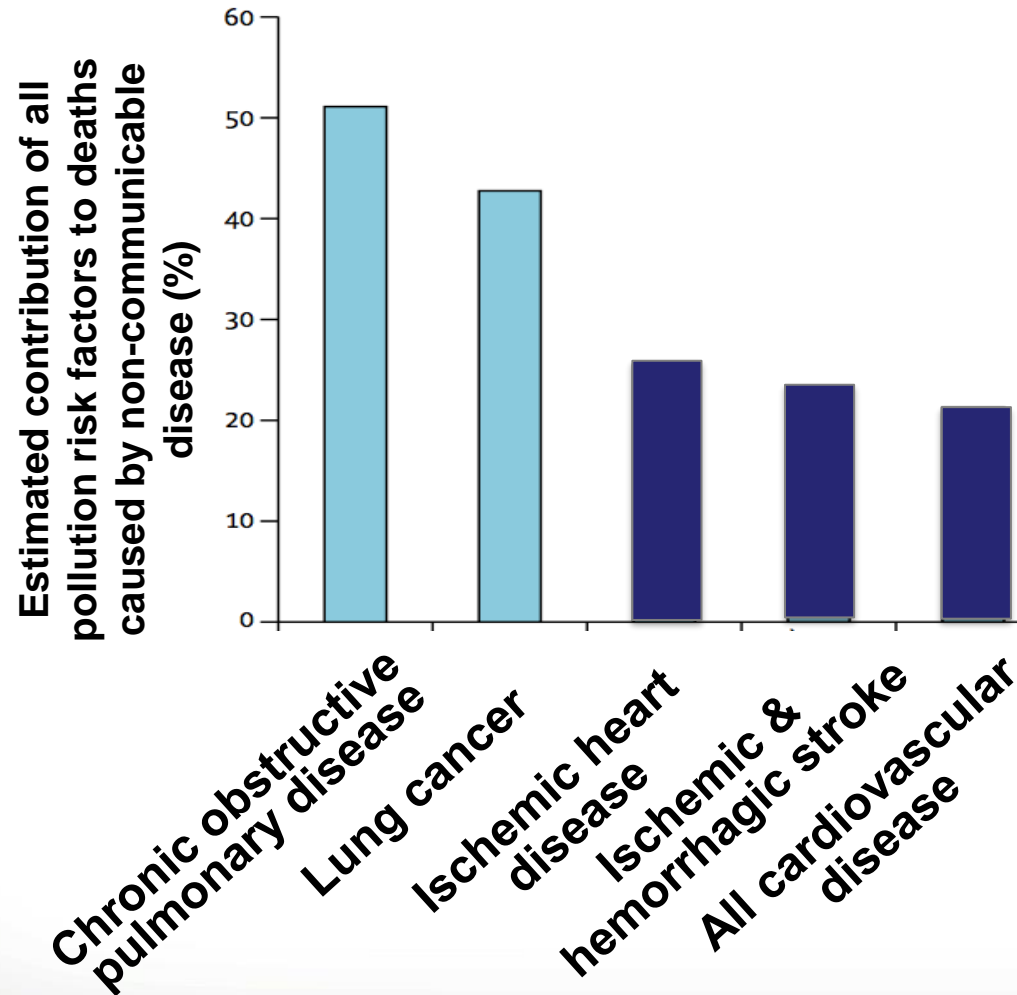
Data from the Global Burden of Disease study and WHO

IHME = Institute for Health Metrics and Evaluation





## Contribution of Pollution to Deaths Caused by Non-communicable Diseases, 2015

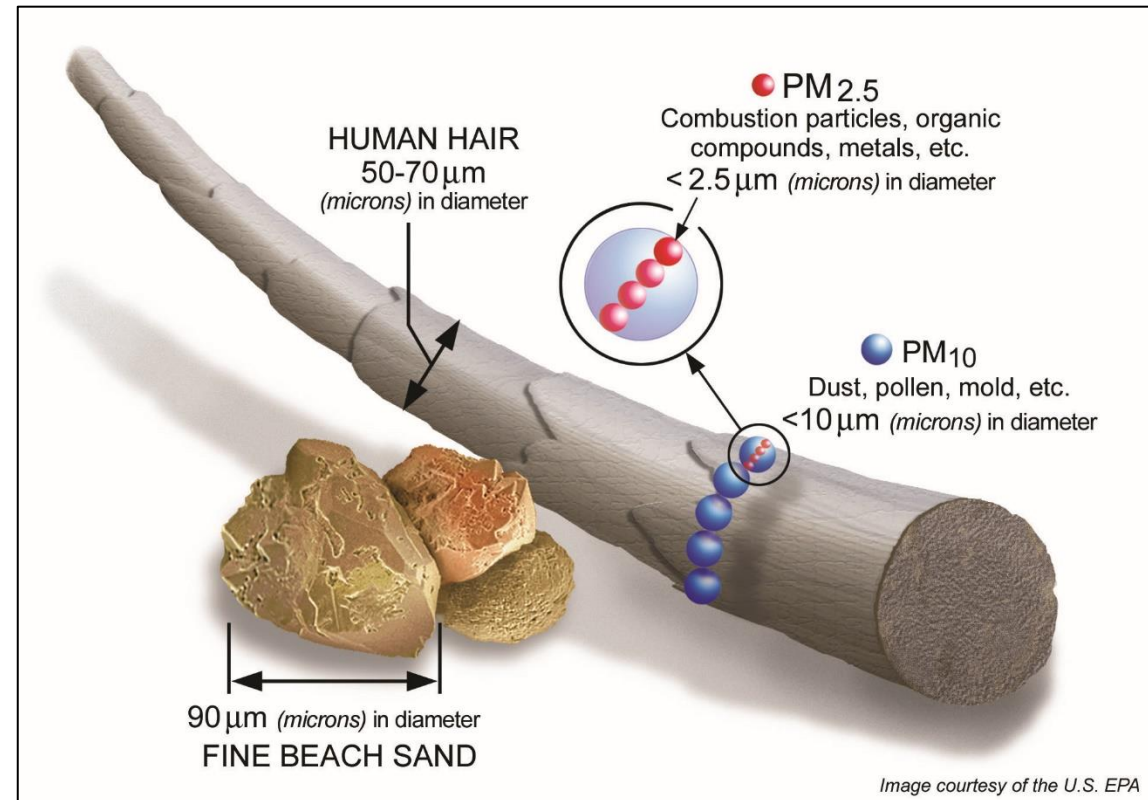


### Pollution contributes to:

- 25% of ischemic heart disease
- Over 20% of ischemic and hemorrhagic stroke
- 20% of all cardiovascular disease

- **Mixture of solid and liquid droplets**

- Primary particles emitted directly from a source (e.g., smokestacks, fires, construction sites)
- Secondary particles produced through atmospheric chemical reactions (e.g.,  $\text{NO}_2$ ,  $\text{SO}_2$ ) emitted by sources such as power plants, automobiles, etc.



- **Particles defined by aerodynamic diameter**

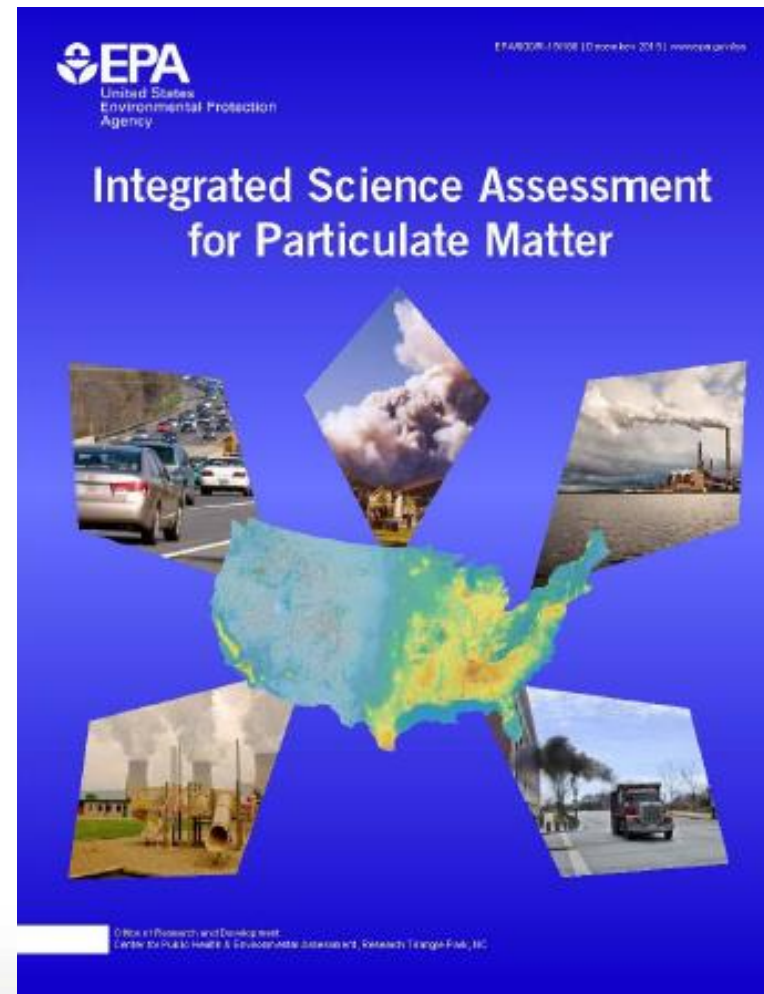
- Fine particles (PM<sub>2.5</sub>), aerodynamic diameter  $\leq 2.5 \mu\text{m}$
- Coarse particles (PM<sub>10-2.5</sub>), aerodynamic diameter  $> 2.5 \mu\text{m}$  and  $\leq 10 \mu\text{m}$
- Ultrafine particles (UFPs), aerodynamic diameter  $\leq 0.1 \mu\text{m}$

Source: <https://www.epa.gov/pm-pollution>



# *Integrated Science Assessment (ISA) for Particulate Matter, and Supplement*

- ISA Completed December 2019
- Available at:  
<https://www.epa.gov/isa/integrated-science-assessment-isa-particulate-matter>
- Supplement Completed September 2021
- Available at:  
<https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=354490>





# Cardiovascular Health Effects

Recent epidemiologic studies support and extend the evidence that contributed to the conclusion of a *causal relationship*

## Short-term PM<sub>2.5</sub> Exposure

- Positive associations between PM<sub>2.5</sub> exposure and ED visits and hospital admissions for:  
ischemic heart disease, myocardial infarction, heart failure, and arrhythmia
- Less consistent evidence of association with stroke

## Long-term PM<sub>2.5</sub> Exposure

- Strong evidence for cardiovascular mortality, and additional evidence for cardiovascular morbidity, specifically coronary heart disease (CHD), stroke, and atherosclerosis progression
- Continued evidence of a linear, no-threshold concentration-response relationship with initial evidence of non-linearity at lower concentrations for some outcomes



# Air Pollution Worsens Vascular Risk Factors

## Risk Factors for Atherosclerosis and Air Quality

The screenshot shows the ASCVD Risk Estimator Plus interface. The top navigation bar includes 'Estimate Risk', 'Therapy Impact', and 'Advice'. Below this, there are two boxes for 'Current 10-Year ASCVD Risk' and 'Previous 10-Year ASCVD Risk', both showing '~%'. The main form is divided into three sections: 'Patient Demographics', 'Current Labs/Exam', and 'Personal History'. In the 'Patient Demographics' section, 'Current Age' is circled in red. In the 'Current Labs/Exam' section, 'Total Cholesterol (mg/dL)', 'HDL Cholesterol (mg/dL)', 'LDL Cholesterol (mg/dL)', and 'Systolic Blood Pressure (mm of Hg)' are all circled in red. In the 'Personal History' section, 'History of Diabetes?' and 'Smoker?' are circled in red.

<http://tools.acc.org/ASCVD-Risk-Estimator-Plus/#!/calculate/estimate/>

### Poor Air Quality:

**Age** – might shorten telomeres

**Total Cholesterol** – increases cholesterol

**HDL** – decreases HDL particle number

**LDL** – oxidizes LDL and ox-LDL receptor

**Systolic BP** – increases blood pressure

**Diabetes** – associated with type II diabetes

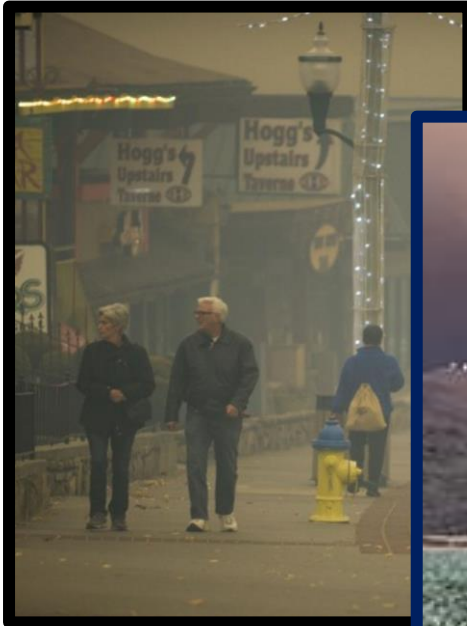
**Statin Therapy** – might be protective





# Wildland Fires & Their Emissions

Rural & Urban Community Public Health Concern



*Brianna Paciorka, Knoxville  
News Sentinel*

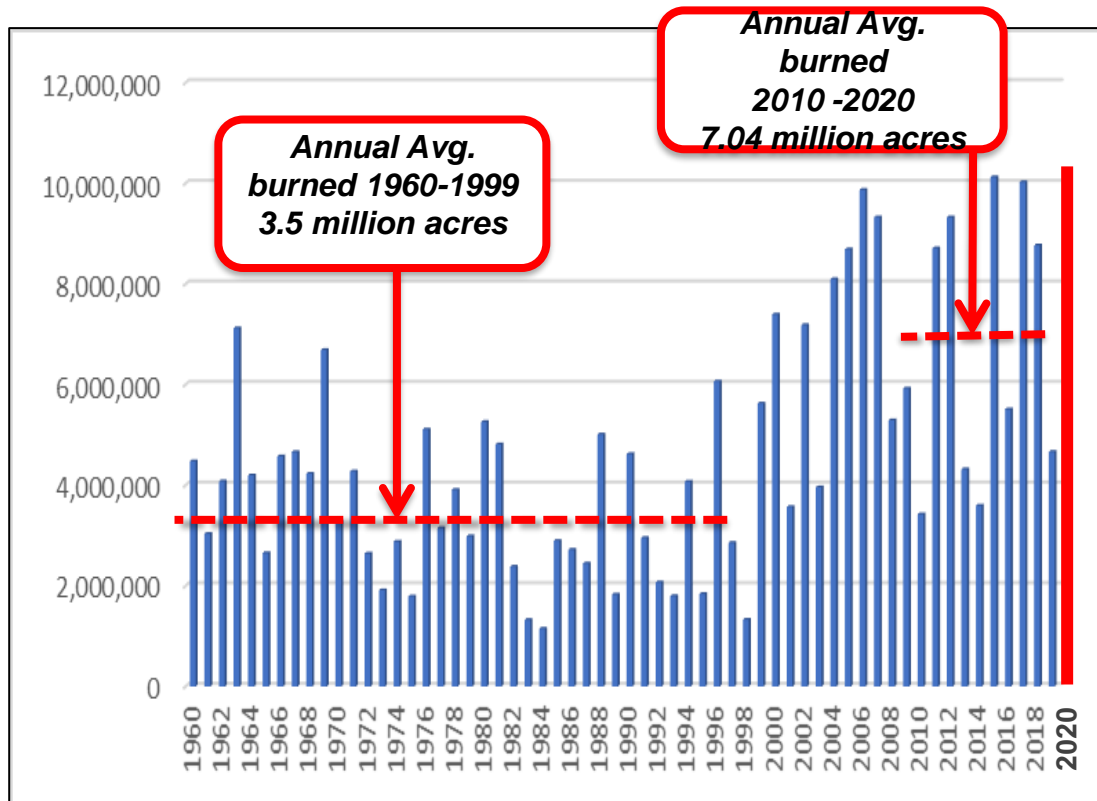


*Stephanie Rodriguez, Courtesy of CAUSE*





# Wildfire in the U.S. Acreage Burned in the U.S. Annually



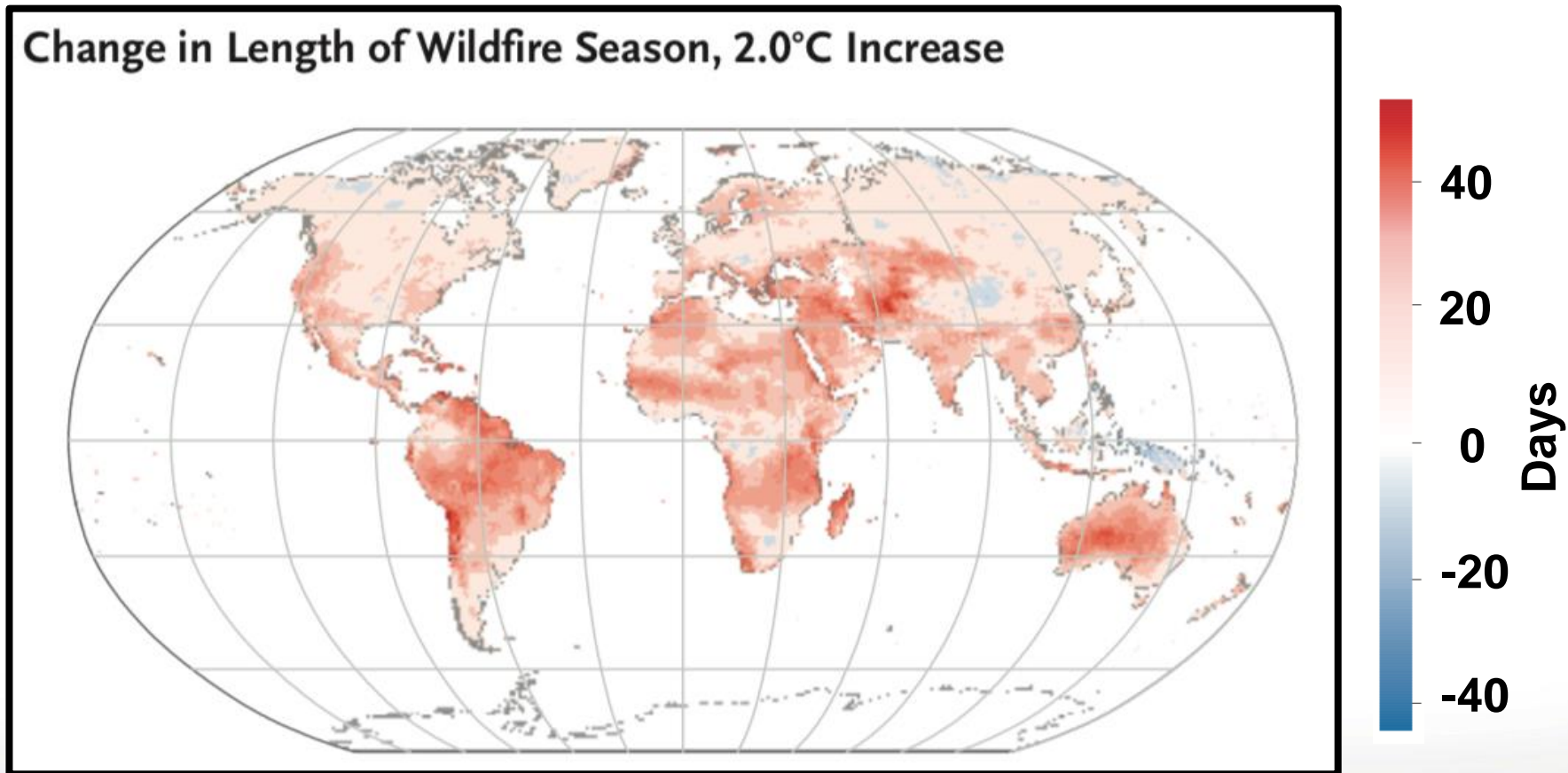
Adapted from  
<https://www.nifc.gov/fireInfo/nfn.htm>

## Present Concerns

- Increasing acreage burned
- Increasing impact on urban areas
  - 10% of all land area with housing are situated in the wildland-urban interface
  - Between 1990 and 2010 housing in the Wildland Urban Interface (WUI) grew 41% and land area by 33% (Radeloff et al. PNAS 2018)
- Impacts on at-risk populations

## Projected Change in Wildfire from 1981-2000 to 2080-2099

Climate change is predicted to increase the frequency of wildfires and lengthen the wildfire season.

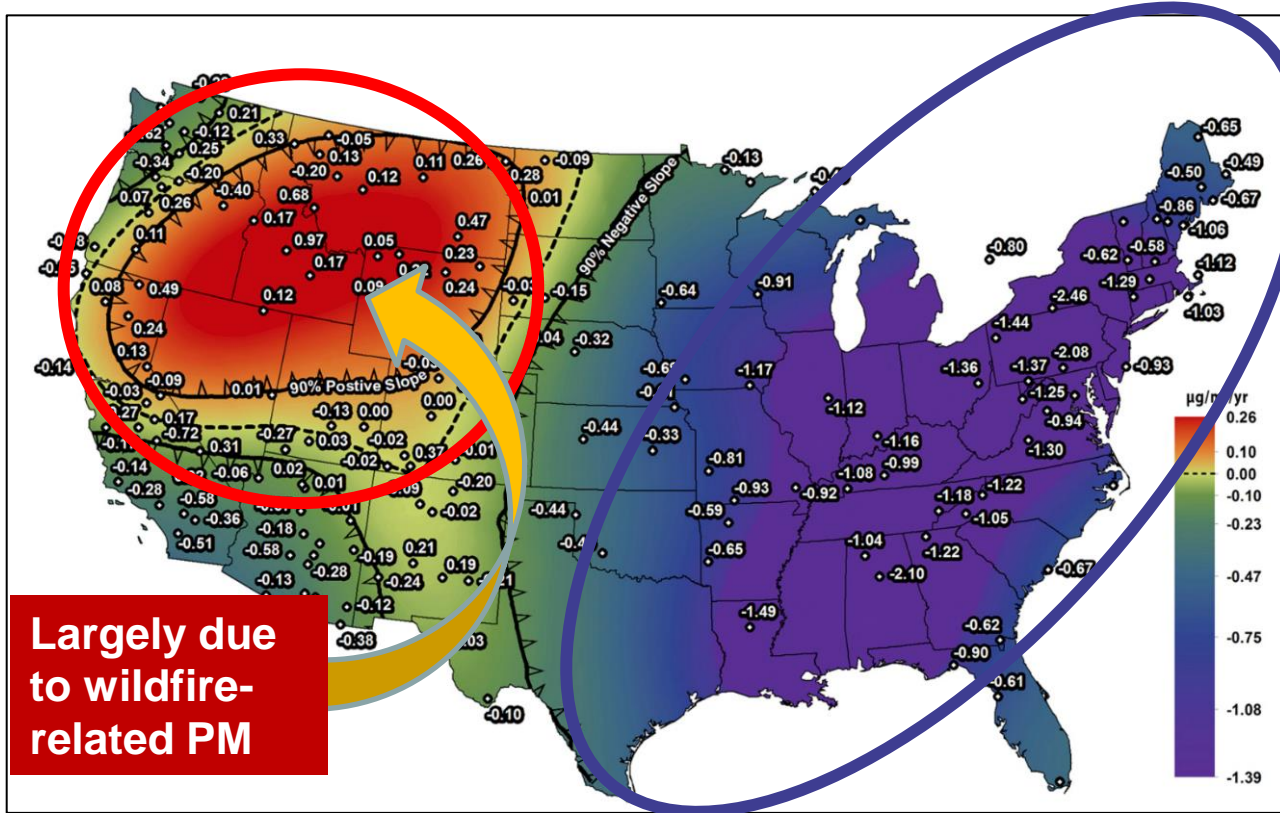




# Air Quality Improves in U.S. from 1988-2016 Except in Wildfire-Prone Areas

*Worsening  
Air Quality*

**Increasing  
annual  
ambient air  
particle  
pollution**



**Largely due  
to wildfire-  
related PM**

*Improving  
Air Quality*

**Decreasing  
annual  
ambient air  
particle  
pollution**

McClure CD and Jaffe DA. PNAS 115 (31): 7901-7906, 2018

# Thank you

**Wayne E. Cascio, MD, FACC, FAHA**  
**Director**  
**Center for Public Health and Environmental Assessment**  
**Office of Research and Development**  
**U.S. Environmental Protection Agency**

**Email: [cascio.wayne@epa.gov](mailto:cascio.wayne@epa.gov)**



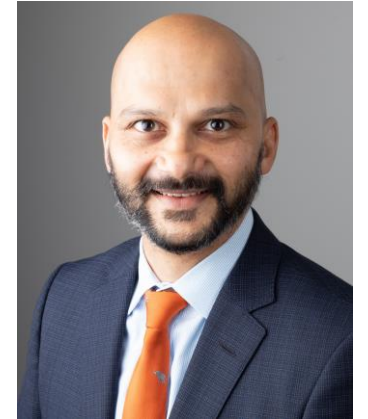
# Climate change & air pollution: integral to our diverse roles in healthcare

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Dr. Ash Sehgal is a nephrologist and clinical researcher at The MetroHealth System, Case Western Reserve University, Cleveland, Ohio

Dr. Dhruv Kazi is an Associate Professor at Harvard Medical School and a cardiologist and researcher at Beth Israel Deaconess Medical Center in Boston, Massachusetts



Becca Philipsborn is a general pediatrician and medical educator at Emory and Children's Healthcare of Atlanta.

# Climate Change and Cardiovascular Health:

## Implications for Clinicians

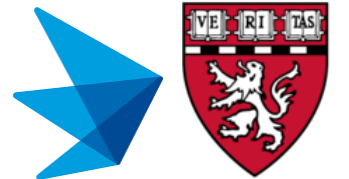
**Dhruv S. Kazi, MD, MSc, MS, FAHA**

Associate Professor, Harvard Medical School

Associate Director, Smith Center for Outcomes Research in Cardiology

Director, Cardiac Critical Care, Beth Israel Deaconess Medical Center

@kardiologykazi



**Greenhouse Gas Emissions**  
Rising global surface and air temperature



**Increased Frequency and/or Intensity of Environmental Stressors**

(Extreme Heat; Ground-level ozone; Wildfires; Droughts; Dust Storms; Hurricanes; Floods)



### Effect on Physical Health

- Increased sympathetic tone, altered fluid and electrolyte balance, increased blood viscosity, increased plasma cholesterol, increased platelet counts, decreased cerebral perfusion
- Oxidative stress and inflammation

### Effect on Mental Health

- Anxiety, stress, depression, and post-traumatic stress disorder

### Disruption of Healthcare Delivery

- Damage to healthcare infrastructure
- Power outages
- Damage to transportation systems
- Disrupted supply chains
- Increased demand for emergency services (deferred elective or preventative care)

### Impact on Social Determinants of Health

- Malnutrition, increased stress, worsening economic well-being
- Declining societal wealth
- Conflict



**Worse Cardiovascular Health**

## Implications for Clinicians

- Risk assessment
- Exposure prevention: Extreme heat, air pollution, smoke
- Adaptation: Medication dose
- Contingency planning: Access to medications, devices, emergency care
- Health systems: Resilience, Crisis planning, reduction in GHG
- Advocacy: Local, regional, national, global

## Conclusions

- Climate change is already affecting cardiovascular health and care delivery
- Clinicians should adapt their practice to include a location-specific climate change risk assessment of their patients and contingency planning
- Health systems need to invest in resilience and crisis planning
- Clinicians are trusted voices in their communities and should lead advocacy and research efforts.

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EMORY  
UNIVERSITY



Children's<sup>SM</sup>  
Healthcare of Atlanta

# Climate Change in Medical Education

Rebecca Philipsborn, MD, MPA

November 3, 2022



Resilience and  
Sustainability  
Collaboratory

*Take home messages for climate & health education and clinical practice*

Acknowledge the value of time

Start where you are

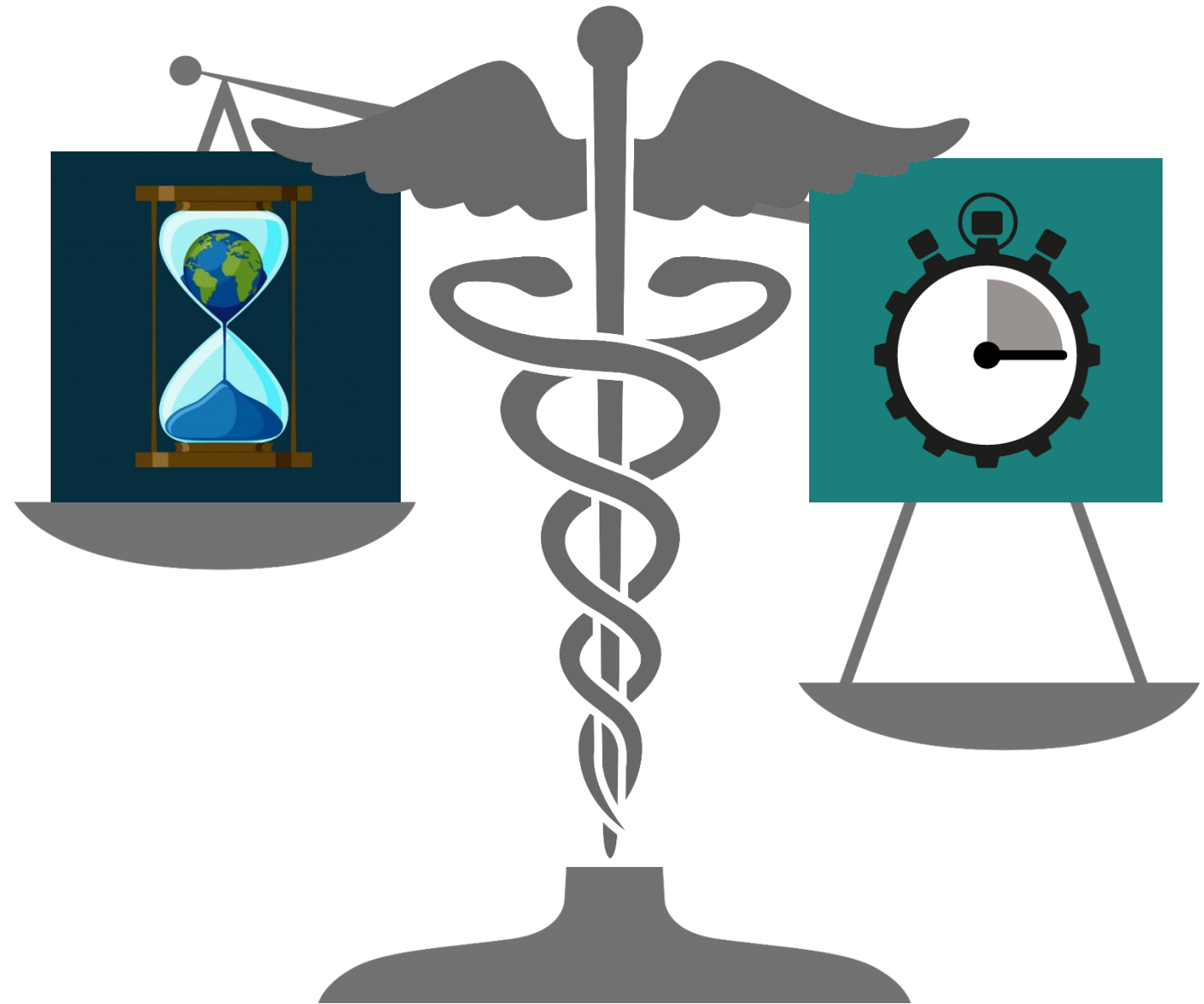
Link to existing structures and topics

Partner (co-create!) with your students and residents

## *Urgency and the balance of time*

*To limit to 1.5°C -  
Reduce global  
emissions by 45%  
below 2010 levels by  
2030 and be “net zero”  
by 2050.*

*-IPCC Special Report on Global  
Warming of 1.5°C*



CLIMATE RESOURCES FOR HEALTH EDUCATION  
IS PROUD TO LAUNCH OUR

# CLIMATE & HEALTH CURRICULUM

FOR HEALTH PROFESSIONAL CURRICULA

WITH EXPERT REVIEWED



Learning Objectives

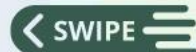


Slide Decks



Problem Based Learning Cases

Visit [climatehealthed.org](https://climatehealthed.org) to explore our free resources!



# Climate Change & Environmental Health Thread

content disseminated in the pre-clinical curriculum

2020-21 (21-22)

- 35+ faculty engaged at Emory
- Across 13 courses
- Contextualized learning points
- 4 small group activities
- Starting to incorporate assessment questions for class of 2025



## Prologue I

- Intro to Climate Change & the Practice of Medicine\*

## Integrated Healthy Physiology

- Exercise and the Healthy Human
- CV Adaptation in Athletes

## Infectious Disease

- Pneumonia

## Pulmonology

- Asthma
- Pediatric Respiratory Disease
- COPD

## Cardiology

- Atherosclerosis and Ischemic Heart Disease
- Introduction to Congenital Heart Disease
- End Stage Heart Failure

## Gastroenterology

- Nutritional Deficiencies

## Renal

- Climate Change and its Impact on Renal Disease\*
- Heat and its effects on migrant workers\*

## Women's Health

- Maternal Adaptations of Pregnancy

## Neurology

- Cerebrovascular Disease

## Summation

- Summation symposium topic

+ 21-22

## Healthy Human

- Climate Change Across the Lifespan\*

## Infectious diseases

- Malaria

## Pulmonology

- Pulmonary pathology

## Cardiology

- Atherosclerosis pathology

## Gastroenterology

- Endoscopy and healthcare waste

## Endocrinology

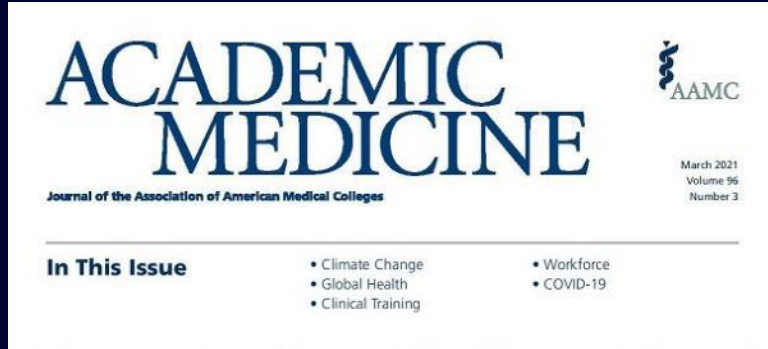
- Global Syndemic: Climate Change, Obesity, Malnutrition\*

## Skin, Bone, Muscles and Joints

- Environment and Gout
- Environment and Lupus
- Traditional medicines and medicinal plants



# Linked to Accreditation Council for Graduate Medical Education (ACGME) core competencies



ARTICLE: PDF ONLY

## Climate Change and the Practice of Medicine Essentials for Resident Education

Philipsborn, Rebecca Pass MD, MPA; Sheffield, Perry MD, MPH; White, Andrew MD; Osta, Amanda MD; Anderson, Marsha S. MD; Bernstein, Aaron MD, MPH [Author Information](#)

Academic Medicine: September 8, 2020 - Volume Publish Ahead of Print - Issue -  
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### Article Level Metrics

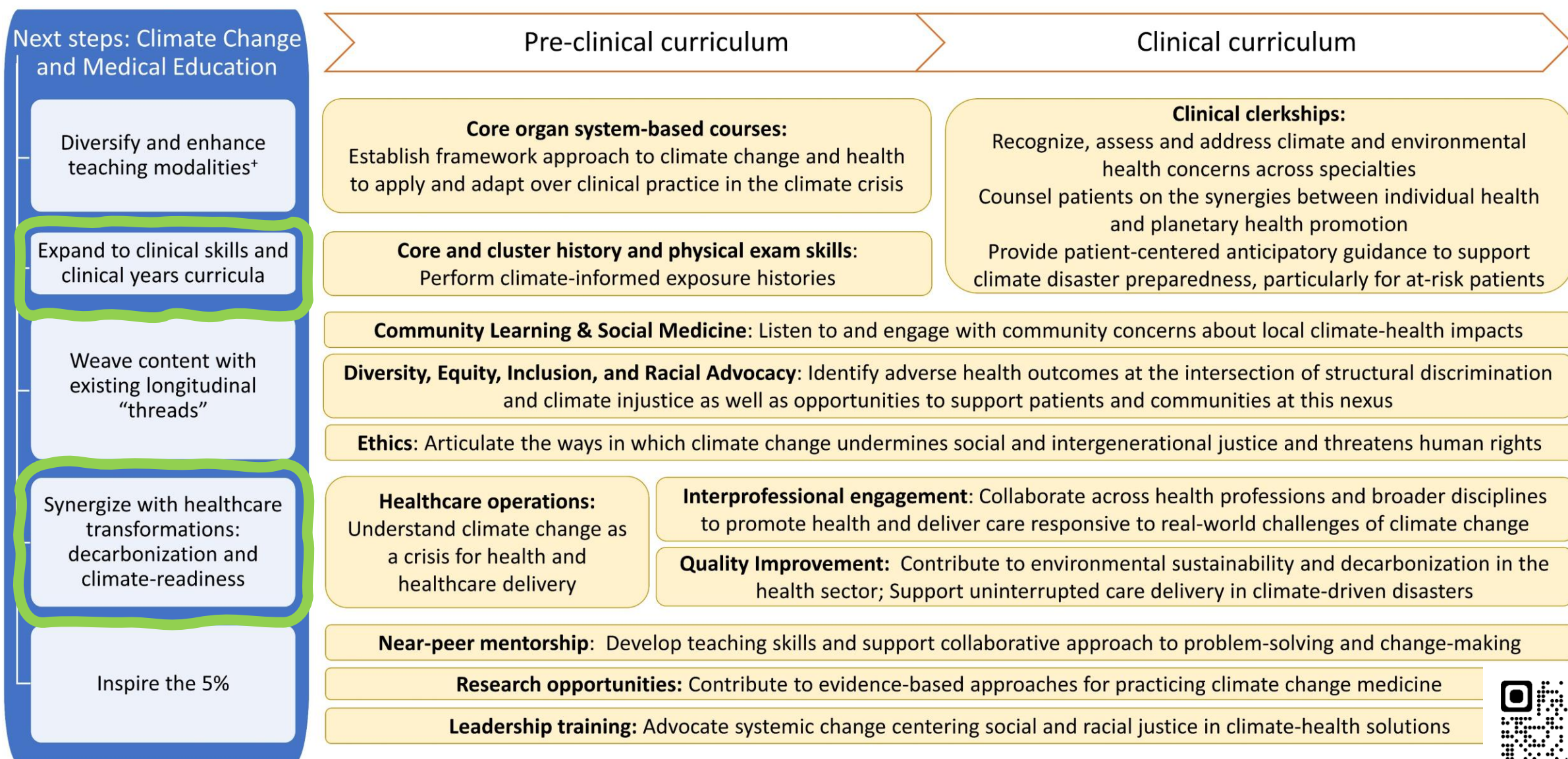


- Tweeted by 24
- Blogged by 3
- Picked up by 50 news outlets
- 7 readers on Mendeley

September 2020

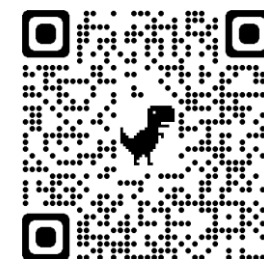


Figure 1: Climate change and environmental health across the undergraduate medical education curriculum: Curricular opportunities and learner outcomes informed by student focus group perspectives



<sup>+</sup>Including case-based learning, small group discussions, experiential and community learning, hands-on clinical skills, and learner-directed electronic modules

From: Liu I, B Rabin, M Manivannan, E Laney and R Philipsborn. Evaluating strengths and opportunities for a co-created climate change curriculum: Medical student perspectives. *Frontiers Public Health*. Oct 24, 2022.





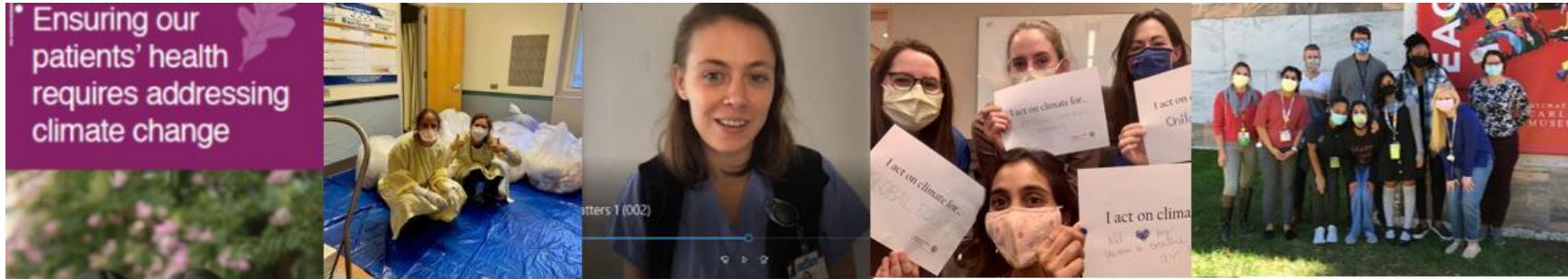


EMORY UNIVERSITY

Thank you!



Children's Healthcare of Atlanta



Madhu Manivannan  
Gilda Rastegar  
Co-Presidents  
Medical Students for Climate Action  
what will you do?  
sustainability initiatives  
sustainability.emory.edu



Raisa Uddin

# Eco-ethical Leadership

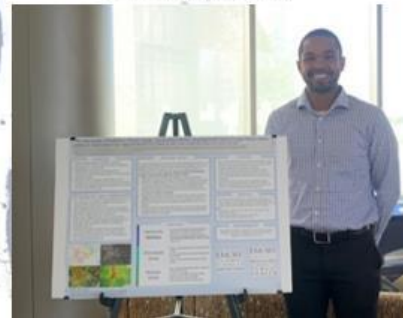
Emaline Laney



Emaline Laney



Benjamin Rabin



Brendan Gray



Irene Liu



@EmoryMSCA



Resilience and Sustainability Collaboratory

# Research and Quality Improvement

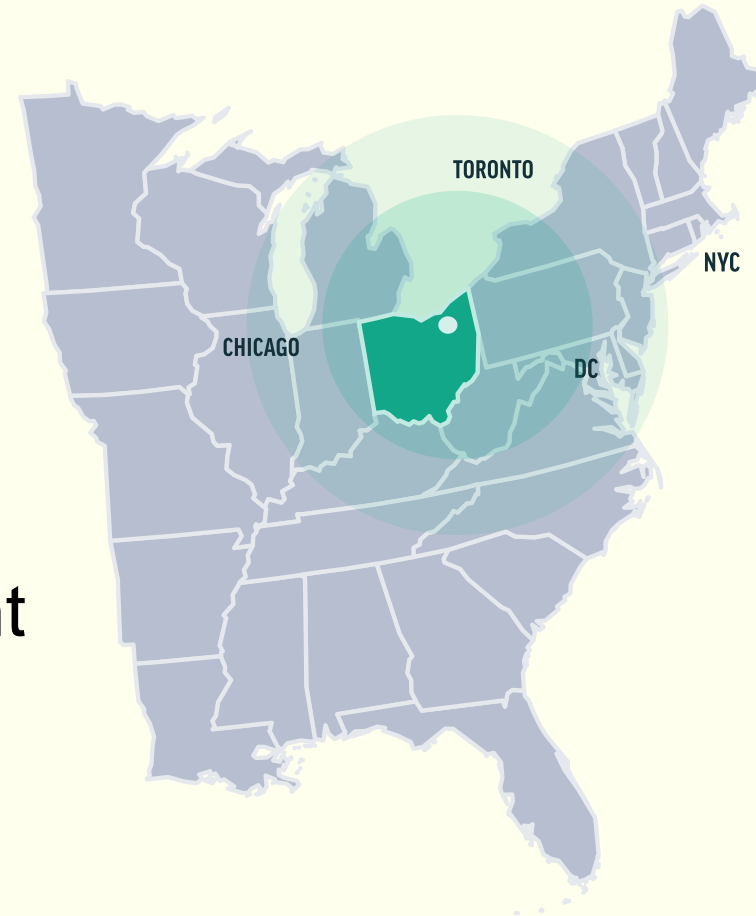
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Ashwini Sehgal, MD

The MetroHealth System  
Case Western Reserve University  
Cleveland, Ohio

# 1. Health system collaboration

- 5 health systems in Northeast Ohio
- Energy manager, physician
- Data use agreement: share energy use data
- Use quality improvement methods to understand and reduce greenhouse gas emissions





# Change from 2019 to 2020, (emissions per 1000 sq ft)

- A: not available
- B: 1.7% decrease
- C: 0.6% increase
- D: 0.2% decrease
- E: 1.4% decrease



- To cut emissions 50% by 2030: need 8% decrease year over year

## 2. Carbon footprint hemodialysis

- Energy, water use
  - Patient, employee transportation
  - Supplies
  - Waste
- 
- Collect detailed data; apply emission factors



# Hemodialysis emissions

---

- Facility: 769,000 Kg CO<sub>2</sub>-eq per year
  - Same as annual energy use of 93 homes
- Treatment: 58.9 Kg CO<sub>2</sub>-eq per treatment
  - Same as driving automobile for 149 miles
- Variation emission contributors per treatment
  - 3-fold variation in electricity use
  - 8-fold variation in natural gas use
  - 5-fold variation in water use
- Variation: potential opportunities to reduce

### 3. Health system financial investments

- Cash, stocks, bonds
- Some portion support fossil fuel development and carbon-intensive industries
- Recent analysis: \$1 million financial investments generates on average 126,030 kg CO<sub>2</sub>-eq emissions
- Boston: requires all large buildings to report energy use



# Financial investment emissions

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- 6 Boston health systems: \$8.8 billion
- Investment emissions 3.5 times larger than energy use emissions
- Analysis based on average values
- Ask banks, brokerage firms for accurate data on individual investments
- Divesting from carbon-intensive investments may quickly reduce carbon footprint

## Review of federal toolkits and resources

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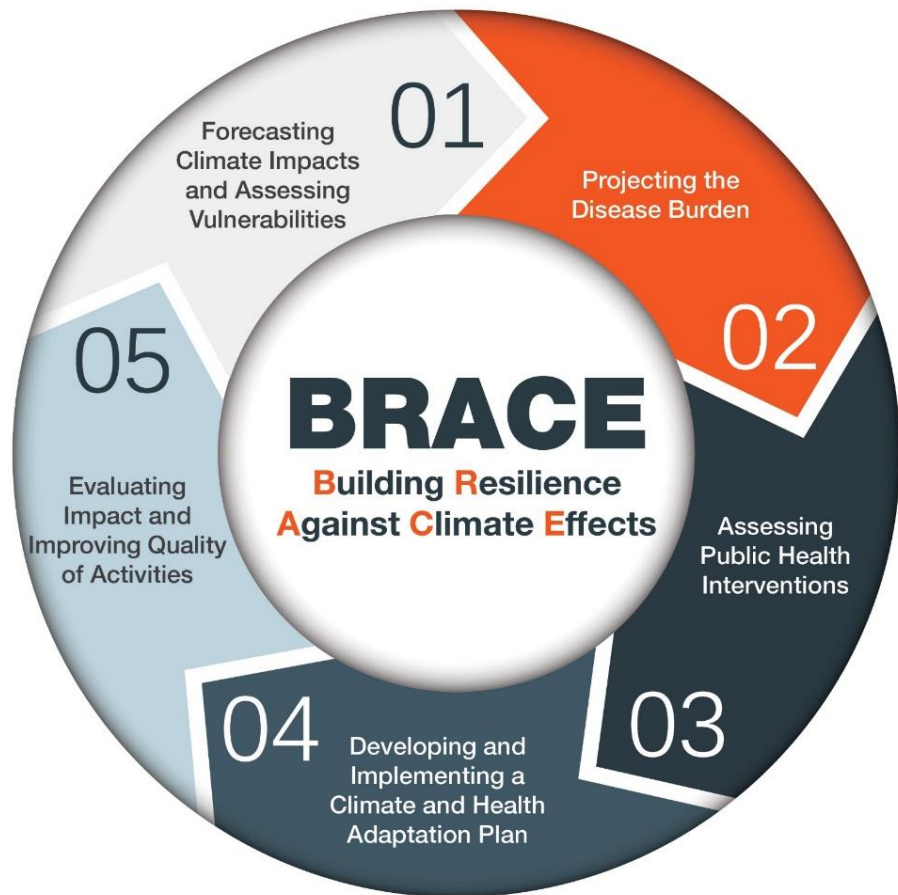
Kat Sisler is a Health Scientist in the National Center for Environmental Health's Climate and Health Program. Her work focuses on developing and implementing evaluations, with a particular focus on health outcomes of climate adaptation interventions and providing technical assistance to the climate program's recipients to build evaluation capacity.



# CDC's Climate and Health Program

- **Serve as a resource** for federal, state, local, and tribal health agencies
- **Prepare public health practitioners** to address the health effects of climate change
- **Provide tools, guides, and processes** to help assess vulnerability to possible health effects
- **Serve as a leader** in planning for public health effects of climate change

# CDC's Framework for Climate & Health Adaptation



# CDC and American Public Health Association's Justice, Equity, Diversity, and Inclusion Playbook



# CDC's Heat & Health Tracker

## What is it?

A publicly-available, online tool that provides heat and health data and information at the local level to help communities better prepare for and respond to extreme heat events.



**CDC**  
CENTERS FOR DISEASE CONTROL AND PREVENTION

**Climate & Health Program**

Home  
About The Data  
Resources  
Search

**Heat & Health Tracker**

Extreme heat events have long threatened public health in the United States. The CDC Heat & Health Tracker provides local heat and health information so communities can better prepare for and respond to extreme heat events. Use the search on the right to explore how extreme heat affects your county, populations who are at risk, and response resources.

[Search for location here](#)  
Enter zip or county here

Historical | Current | **Heat-Related Illness** | Monthly Forecast | Projected

Year: 2021  
Week: 09/26/2021 - 10/02/2021

**LEGEND**

- ≤ 50°F
- > 50°F - 60°F
- > 60°F - 70°F
- > 70°F - 80°F
- > 80°F - 90°F
- > 90°F - 100°F
- > 100°F

**About the Data**  
The Heat-Related Illness and Temperature map shows the rate of emergency department (ED) visits associated with heat-related illness (HRI) per 100,000 ED visits by region (as defined by Health and Human Services) for the selected week using data available through the National Syndromic Surveillance Program. The colors on the map show average maximum temperature by county for the same week, using data from the National Center for Environmental Information.  
[\(more info\)](#)

**POWERED BY TRACKING**

<https://ephtracking.cdc.gov/Applications/heatTracker/>



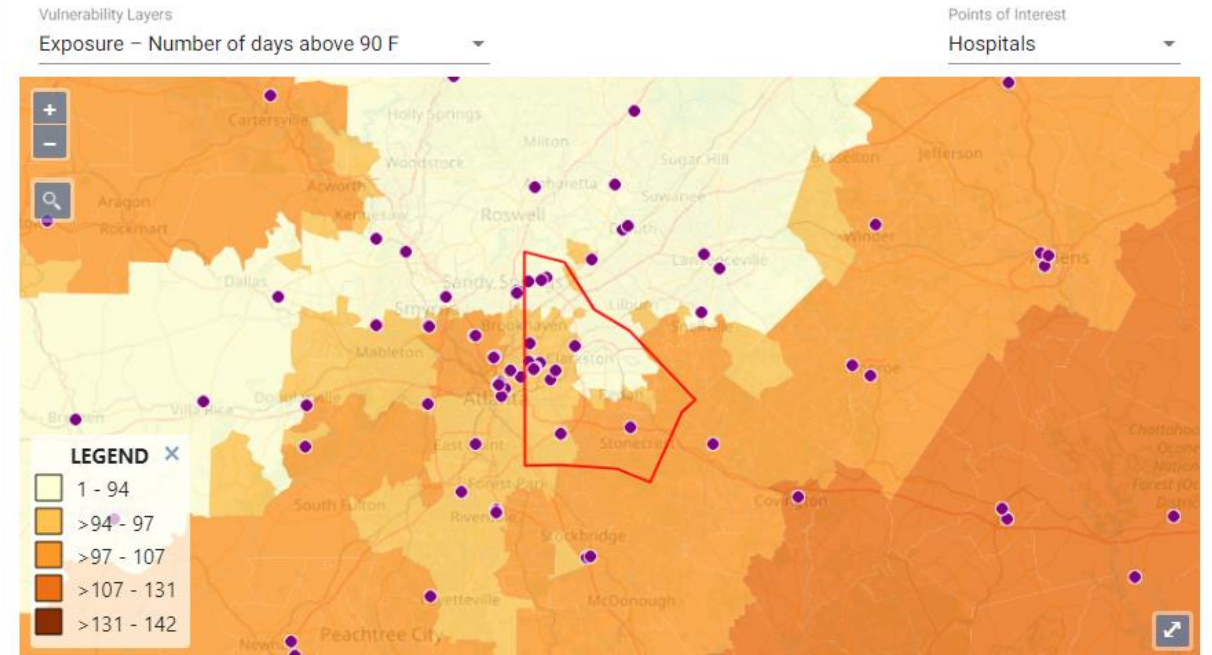
# CDC's Heat & Health Tracker

## Informs the following public health actions:

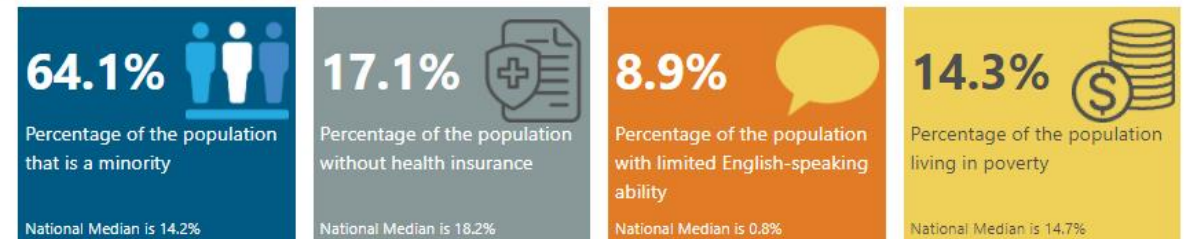
- Identify extreme heat trends (e.g., frequency and timing)
- Describe and locate vulnerable populations
- Determine resources available and potential resource needs
- Provide information and resources for responding to heat events
- Identify when and where to activate or close cooling centers

## Heat Vulnerability Data Explorer

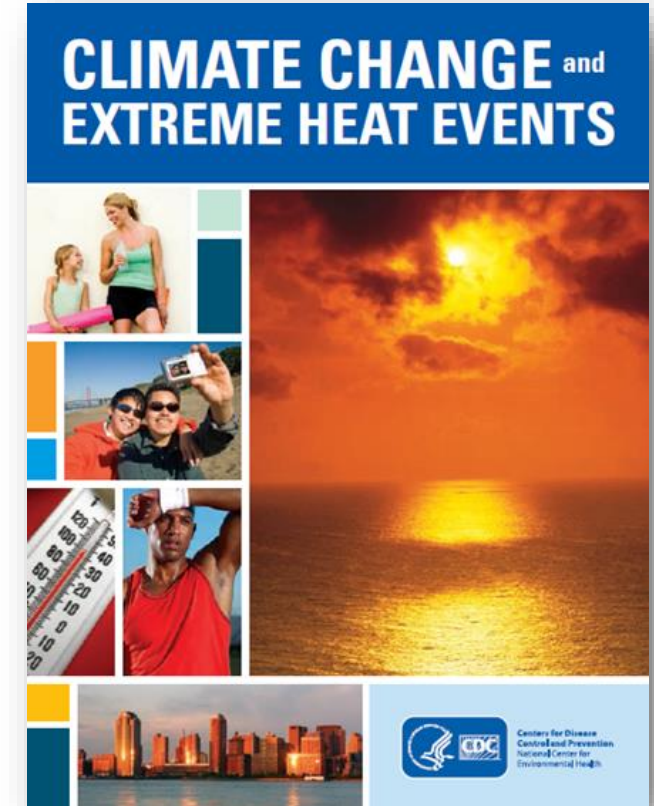
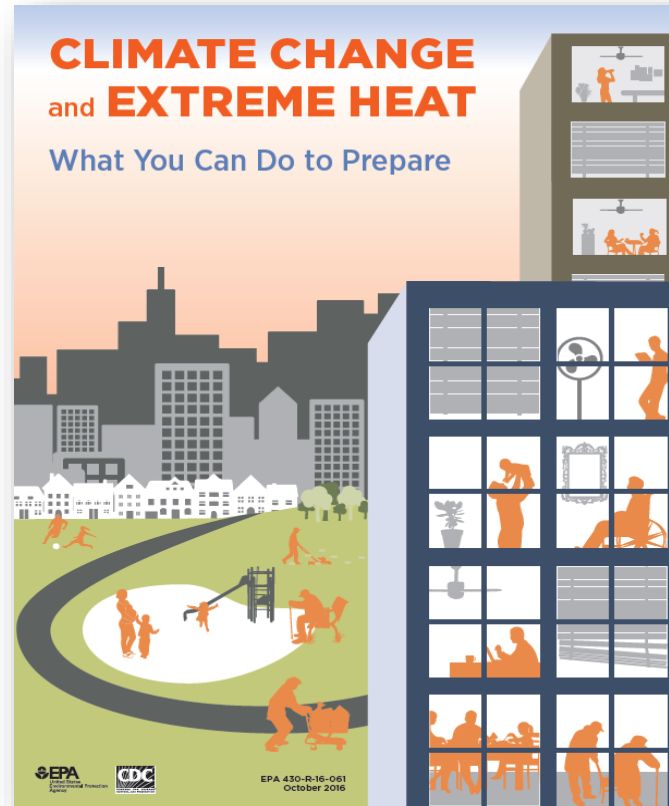
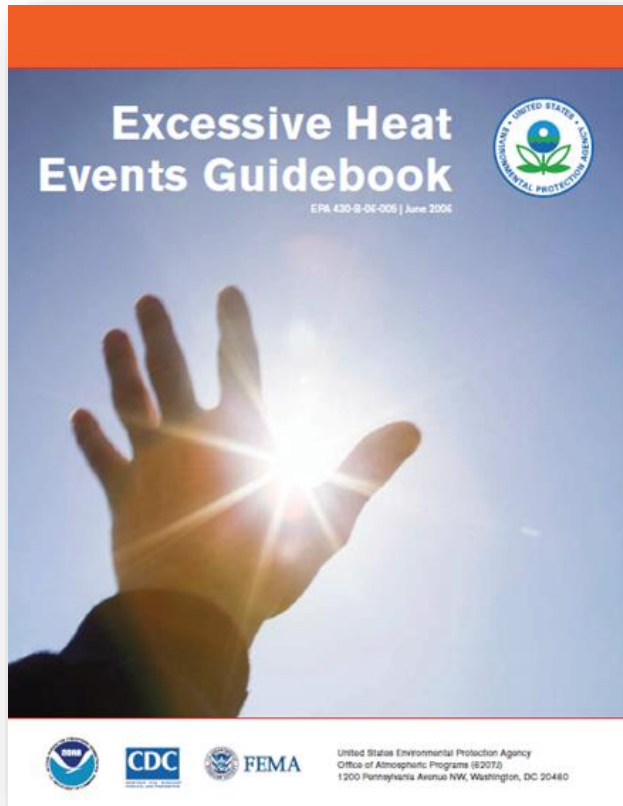
Use this interactive map to explore information on heat exposure, vulnerability, and points of interest during the hot season in your area. For more information on these measures, see [About the Data](#)



## Population Characteristics



# Tools and Resources for Communities and Health Departments



[www.cdc.gov/climateandhealth/site\\_resources.htm](http://www.cdc.gov/climateandhealth/site_resources.htm)

Don't Forget to Bookmark!

- [SMaRT Search / Science Inventory](#)
- [Smoke Ready Toolbox](#)
  - [AirNow Fire and Smoke Map](#)
    - [Learn about air quality and smoke near you \(before/during/after wildfires\)](#)
  - [Wildfire Smoke: A Guide for Public Health Officials](#)
  - [Smoke Sense](#)
  - [Particle Pollution and Your Patient' Health Online Training](#)
  - [Online Training for Health Professionals](#)
  - [Wildfire and Your Patients' Health \(continuing education credits\)](#)
- [Healthy Heart Toolkit](#)
- [EnviroAtlas](#)
- [Wildfires and Indoor Air Quality](#)





## Federal Resources Webinar and Compendium

### Federal Resources to Support Emissions Reduction and Climate Resilience for Healthcare Stakeholders

On Earth Day 2022, the White House and HHS launched the Healthcare Sector Climate Pledge initiative, creating an opportunity for healthcare stakeholders across the United States to make bold commitments to emissions reduction and resilience in response to the growing threats presented by climate change.

In conjunction with a June 2022 White House event to celebrate the organizations that made these commitments, the Office of Climate Change and Health Equity (OCCHE) produced this compendium of federal resources that may assist healthcare stakeholders in emissions reduction and climate change adaptation.

### Financial Resources, Funding Opportunities, and In-Kind Supports

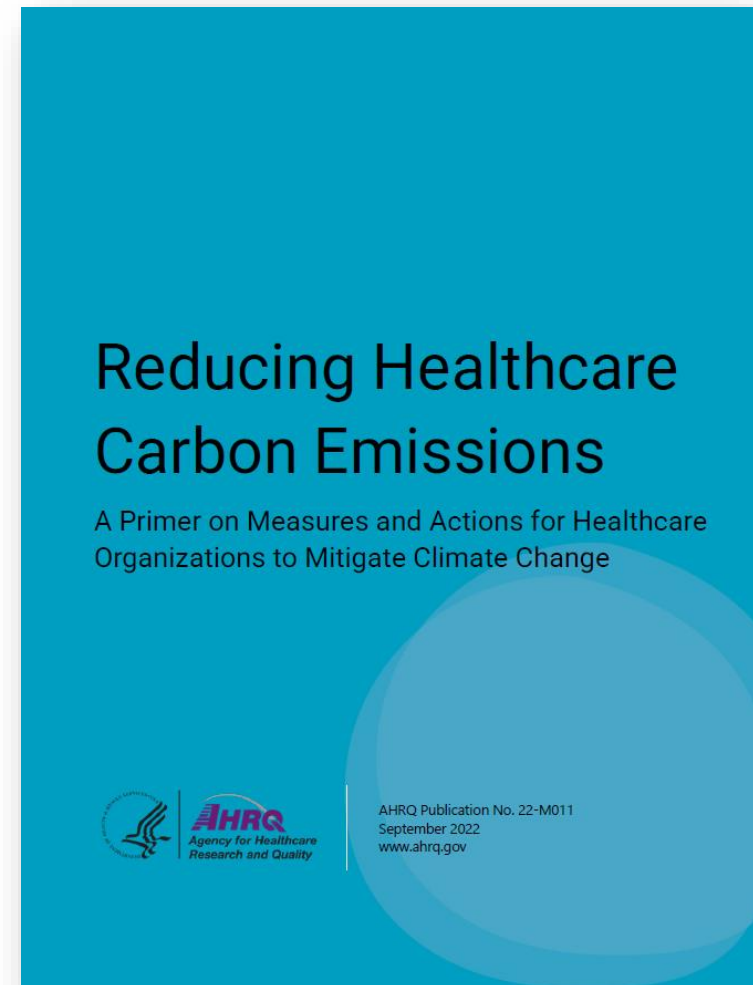
#### Broad Applicability

##### **Better Buildings Financing Navigator, Healthcare Energy Financing Primer**

*Department of Energy*

An online tool that helps public and private sector organizations find financing solutions for energy efficiency and renewable energy projects. Learn more at

<https://betterbuildingsolutioncenter.energy.gov/financing-navigator/primer/healthcare-energy-financing-primer>.



# Sustainable and Climate-resilient Healthcare Facilities Toolkit

- <https://toolkit.climate.gov/topics/human-health/building-climate-resilience-health-sector>



## Components:

- 5 element framework for Healthcare Facility Resilience**
  - Diagrams, descriptions, tools
- Case studies
- Compendium of resources

Framework for Climate Resilient Healthcare Settings	
<b>1</b>	<b>Climate Risks and Community Vulnerabilities Assessment</b> Maintain up-to-date data on climate hazards and community climate and health vulnerabilities, and use hazard vulnerability analyses to inform health services and infrastructure planning today and for the future. Understand the role of the hospital, long term care and ambulatory settings within the community during and after identified extreme weather events, and use this knowledge to inform resilience strategies.
<b>2</b>	<b>Land Use, Building Design and Regulatory Context</b> Understand the land use, building design and regulatory context within which the healthcare facilities are situated. What were the design assumptions for roof drainage systems, stormwater, stormwater, wind loads? Are they adequate to meet the changing climate risks identified in Element 1? Catalog the larger local and community land use vulnerabilities in the face of extreme weather – aging or inadequately sized infrastructure or removal of natural buffers.
<b>3</b>	<b>Infrastructure Protection and Resilience Planning</b> Critical infrastructure resilience measures can avoid disruption, incapacitation or loss of use of healthcare facilities. For hospitals and related critical facilities meant to operate through an event and shelter in place, retrofit, design and construct sustainable communications, transport, building, energy, water and waste infrastructure in appropriate locations and to a standard of climate resilience to withstand future events. For less critical facilities, design for safe closure prior to an event with the resilience to resume services within 48 to 96 hours following a major event.
<b>4</b>	<b>Essential Clinical Care Service Delivery Planning</b> Hospitals provide essential functions during and immediately following an extreme weather event, as they continue to shelter patients in place as well as accommodate and treat survivors. Critical services must remain operational during events. In addition, healthcare settings may serve important non-traditional disaster response roles in their communities: sources for clean water, food, and shelter for a larger affected population. Ensure that essential services, critical supply inventories and personnel (and families) can be accommodated on-site.
<b>5</b>	<b>Environmental Protection and Ecosystem Adaptations</b> Protect and support ecosystems and natural buffers to mitigate extreme weather hazards to which your building or campus may be vulnerable. Green infrastructure practices and enhanced stormwater management are two key contributory strategies. Understand that ecosystems, wildlife corridors, and natural hydrology patterns extend beyond individual property boundaries; engage the broader community in applying best design practices for adapting to extreme weather risks in order to mitigate future damages to property and people.

HHS Sustainable and Climate Resilient Health Care Facilities Toolkit: Element 1 Resources: Climate Risks and Community Vulnerabilities Assessment

Element 1: Unidentified Climate Risks	Yes	No	Unknown	Not Applicable	Other
1.0. Please indicate if your facility uses facility vulnerability analysis of weather hazards with reference to all applicable local, state, and federal climate hazard data.					
1.1. Are there any climate hazards that are not included in the current climate hazard data used for your facility's vulnerability analysis?					
1.2. If yes, what are the climate hazards that are not included in the current climate hazard data used for your facility's vulnerability analysis?					
1.3. Are there any climate hazards that are not included in the current climate hazard data used for your facility's vulnerability analysis that you are currently addressing?					
1.4. If yes, what are the climate hazards that are not included in the current climate hazard data used for your facility's vulnerability analysis that you are currently addressing?					
1.5. How does your facility's vulnerability analysis account for the changing climate risks identified in Element 1? Catalog the larger local and community land use vulnerabilities in the face of extreme weather – aging or inadequately sized infrastructure or removal of natural buffers.					
1.6. How does your facility's vulnerability analysis account for the changing climate risks identified in Element 1? Catalog the larger local and community land use vulnerabilities in the face of extreme weather – aging or inadequately sized infrastructure or removal of natural buffers.					
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# Million Hearts<sup>®</sup> 2027 Priorities

## Building Healthy Communities

Decrease **Tobacco Use**

Decrease **Physical Inactivity**

Decrease **Particle Pollution Exposure**

## Optimizing Care

Improve Appropriate **A**spirin or **A**nticoagulant Use

Improve **B**lood Pressure Control

Improve **C**holesterol Management

Improve **S**moking Cessation

Increase Use of **Cardiac Rehabilitation**

## Focusing On Health Equity

Pregnant and Postpartum Women with Hypertension

People from Racial/Ethnic Minority Groups

People with Behavioral Health Issues Who Use Tobacco

People with Lower Incomes

People Who Live in Rural Areas or Other 'Access Deserts'

# Building Healthy Communities

Goals	Evidence-based Strategies
<b>Decrease Tobacco Use</b>	<ul style="list-style-type: none"><li>• Enact smoke-free space policies that include e-cigarettes</li><li>• Use point-of-sale and pricing approaches</li><li>• Conduct mass media campaigns</li></ul>
<b>Decrease Physical Inactivity</b>	<ul style="list-style-type: none"><li>• Create or enhance access to places for physical activity</li><li>• Design communities and streets that support physical activity</li><li>• Develop and promote peer support programs</li></ul>
<b>Decrease Particle Pollution Exposure</b>	<ul style="list-style-type: none"><li>• Raise awareness of the Air Quality Index</li><li>• Reduce wildfire smoke exposure</li><li>• Reduce traffic-related exposures like supporting idling policies</li><li>• Support power plant-, factory-related policies</li></ul>



# The Million Hearts Climate Change & Cardiovascular Disease Collaborative (CCC)

Topic	Date
Clinical interventions to address particle pollution and heart disease (part A)	1/12/23 <a href="#">Register here</a>
Interventions to address particle pollution and heart disease (part B)	2/9/23 <a href="#">Register here</a>
Interventions to prepare for extreme heat	3/9/23 <a href="#">Register here</a>
Leading on climate resilience and mitigation in your organization	4/13/23 <a href="#">Register here</a>



[Climate Change and Cardiovascular Disease Collaborative \(CCC\) | Million Hearts® \(hhs.gov\)](#)



## Upcoming Opportunities

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- The fiscal year 2022 application period for the Notice of Funding Opportunities for **the Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA)** grant programs will close at 3 p.m. Eastern Time on **January 27**
  - Business operators and nonprofit organizations cannot apply directly to FEMA; however, they can be included in a subapplication submitted by an eligible subapplicant

## Environmental Justice Index Webinars

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- The EJI is the first national, place-based tool designed to measure the cumulative impacts of environmental burden through the lens of human health and health equity.
- Opportunities to attend:
  - **November 9, 2022 1pm EST**
  - **December 7, 2022 12pm EST**

## Register Now for Upcoming Sessions!

Date	Name	Speakers
July 14 at 12:00 PM	Resilience, Emissions Reduction and Health Equity	Department of Energy, OCCHE
July 21 at 12:00 PM	Financial Supports for Climate Action (and Insights on Applying)	Department of Agriculture, Department of Housing and Urban Development, Department of Treasury
July 28 at 12:00 PM	Emergency Preparedness and Response Supports	Administration for Strategic Preparedness and Response, Federal Emergency Management Agency
<i>August Break</i>		
Sept. 8 at 12:00 PM	EPA Tools and Incentives	Environmental Protection Agency
Sept. 22 at 12:30 PM	Introduction to AHRQ's Decarbonization Toolkit	Agency for Healthcare Research Quality
Oct. 6 at 12:00 PM	International Perspectives on Resiliency and Decarbonization	United Nations Framework Convention on Climate Change, Race to Zero
Oct. 20 at 12:00 PM	Action Collaborative Tools and Supports	National Academy of Medicine Action Collaborative on Decarbonizing the U.S. Health Sector Leadership
Nov. 3 at 12:00 PM	Introduction to the Million Hearts Climate Change & Cardiovascular Disease Collaborative (CCC)	Centers for Disease Control and Prevention, Environmental Protection Agency, OCCHE
<b>Nov. 17 at 12:00 PM</b>	<b>Federal Health Systems Learning Network Findings and Best Practices</b>	<b>Federal Health Systems Learning Network Findings and Best Practices</b>

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THANK YOU!!!