

# Climate Change and Health

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Associate Professor of Pathology

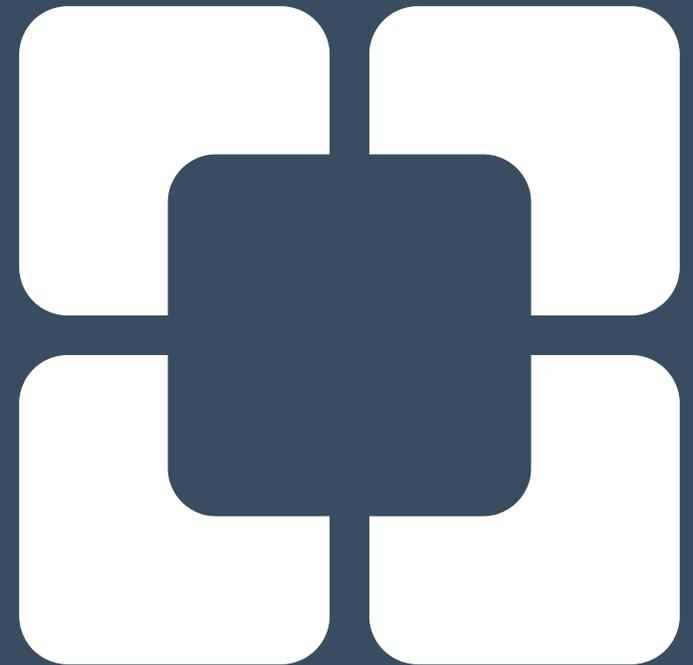
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Senior Director Sustainability, Cleveland Clinic

12/1/22





**25%** Global Deaths Caused by  
Environmental Factors

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**10%** US Deaths Caused by  
Environmental Factors

# TACKLING CLIMATE CHANGE COULD BE THE GREATEST GLOBAL HEALTH OPPORTUNITY OF THE 21ST CENTURY

The Lancet, June 2015

SUSTAINABILITY

## Cleveland Clinic makes carbon-neutrality its newest sustainability goal

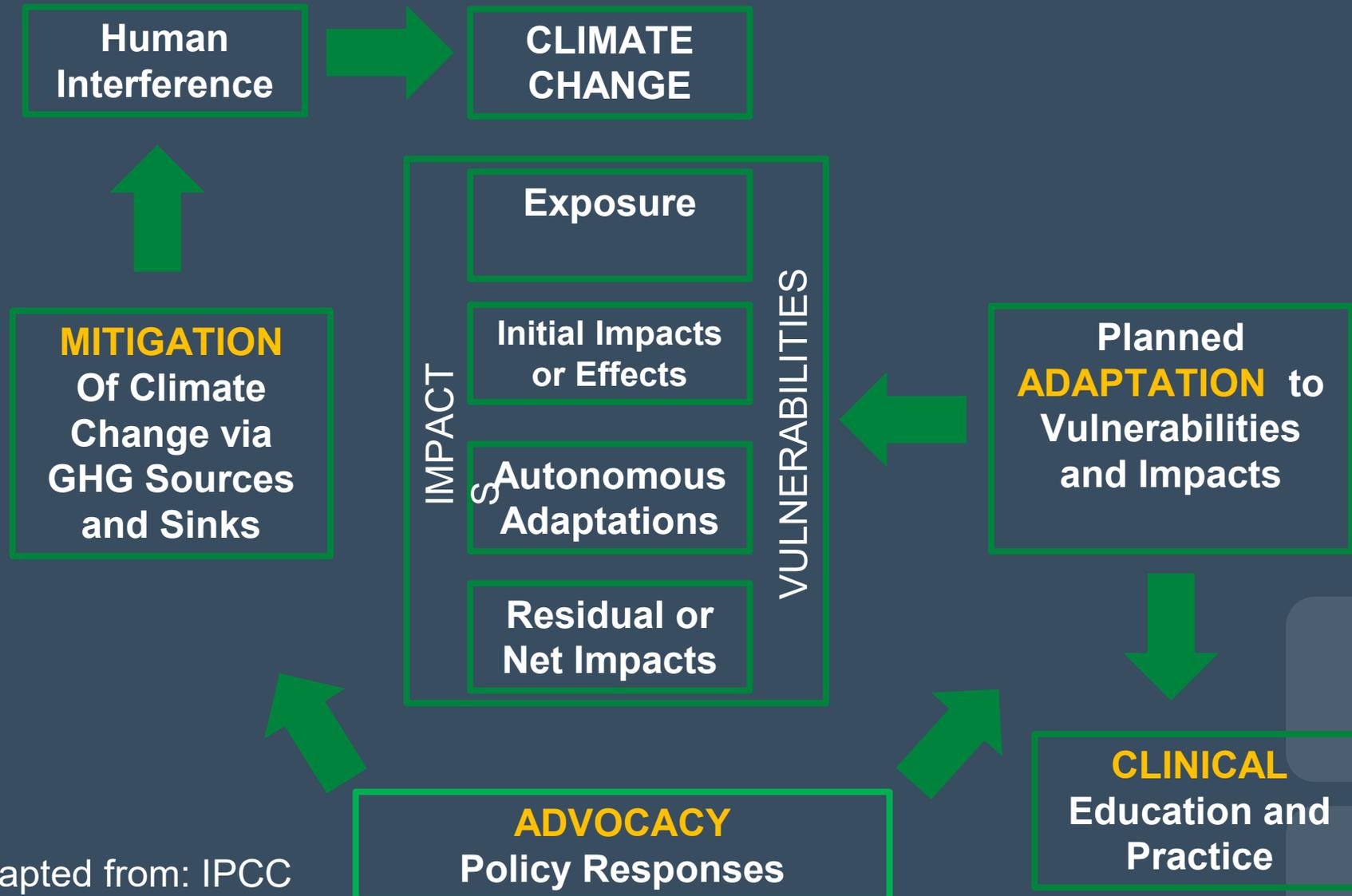
Health system plans to reach goal through renewable energy purchases,  
continued energy efficiency

November 30, 2017 | Jeff Ferenc



Cleveland Clinic is expanding successful energy-saving strategies it has implemented and purchasing renewable energy to reach its goal of being carbon-neutral in 10 years.

# Climate Change Strategies



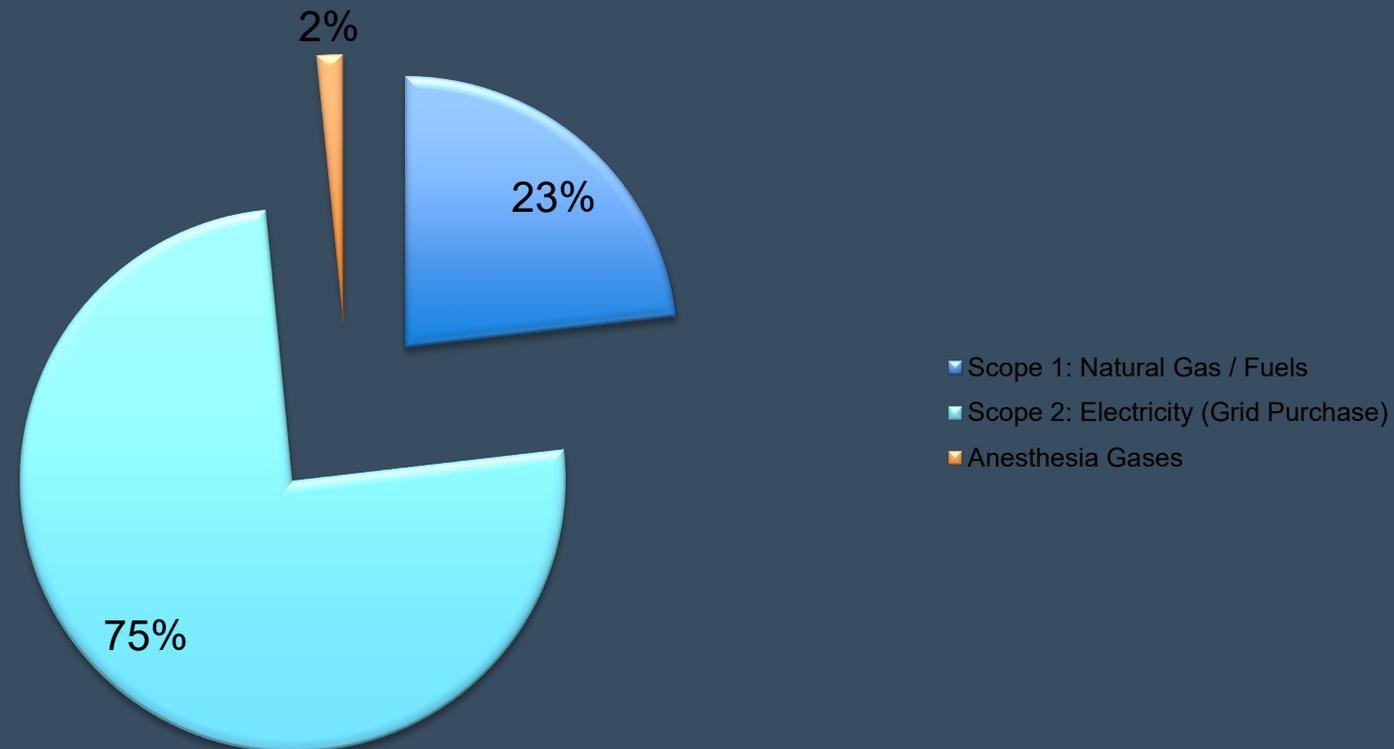
Adapted from: IPCC

# Activating the Sector

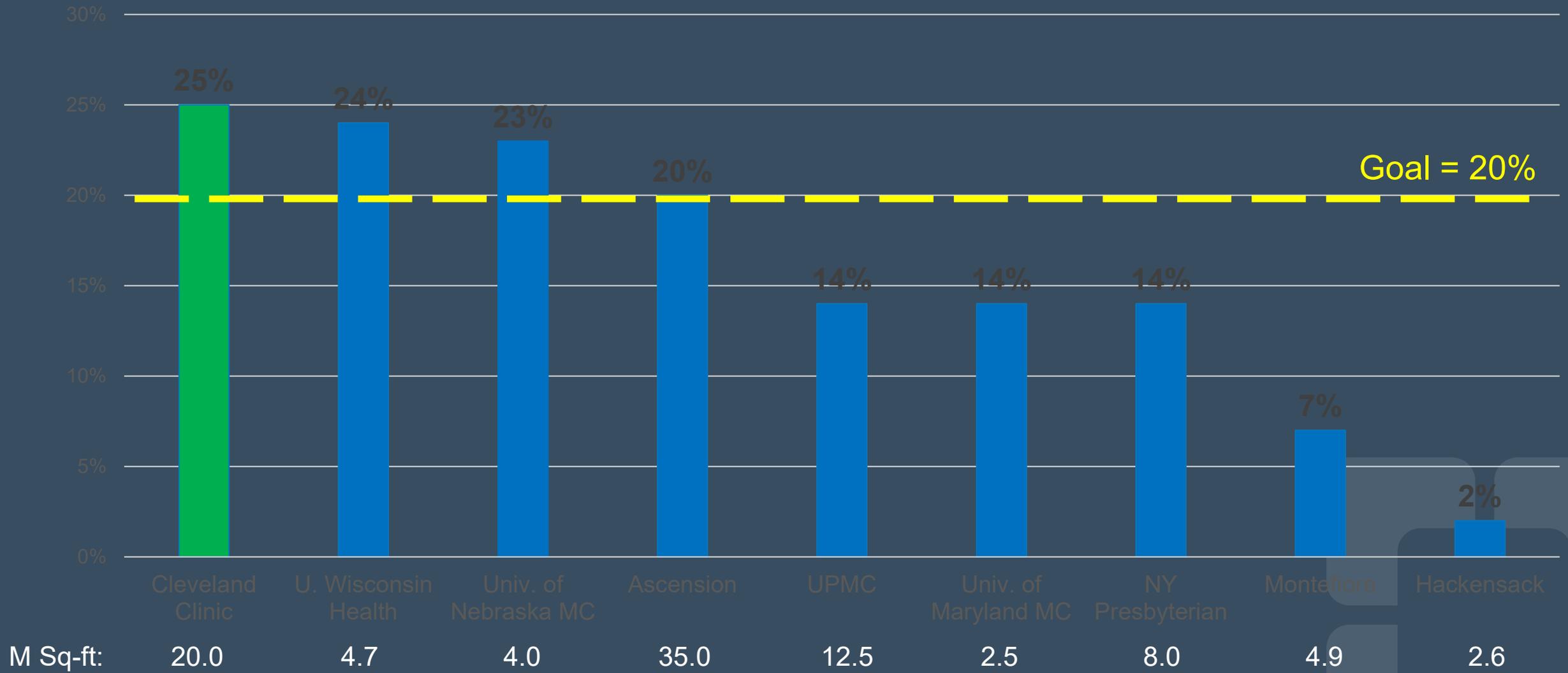
- **Mitigation Imperative: Reduce Carbon Footprint**
- **Adaptation Necessity: Hospital/Community Resilience**
- **Advocacy Opportunity: Climate Change and Health**
- **Clinical Education: Train Healthcare Professionals**

# At Cleveland Clinic, scope 2 is three times larger than Scope 1

## Cleveland Clinic Carbon Footprint

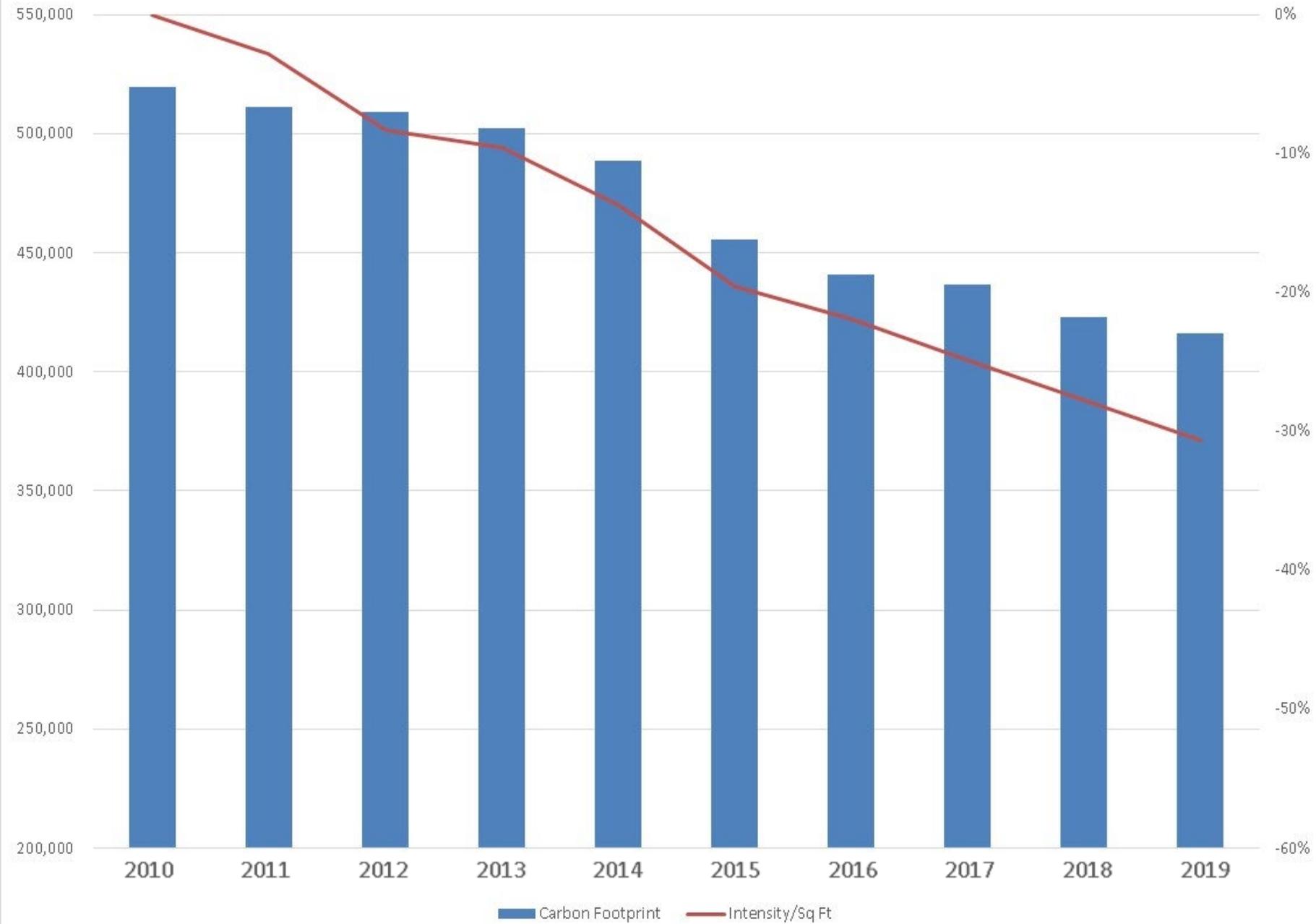


# Percent EUI Reduction from Baseline 2010-2020



Note: other participants include Mayo Clinic, Kaiser Permanente, Legacy Health, North Shore-Long Island Jewish, Univ. S. Alabama Medical Center, University of Utah Healthcare

# Cleveland Clinic is Reducing Its Carbon Footprint



## Carbon Reduction Drivers

### 2010-2020 (Sq Ft)

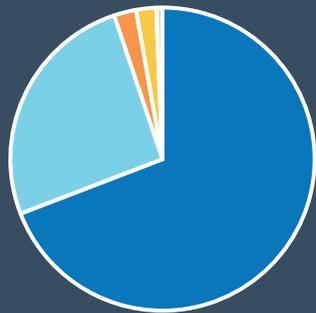
- Energy Efficiency (26%)
- Fleet Efficiency (2%)
- Anesthesia (2%)
- Renewables/Grid (3%)

### 2020-2027

- More Efficiency
- Better Buildings
- Renewable Energy
- Offsets

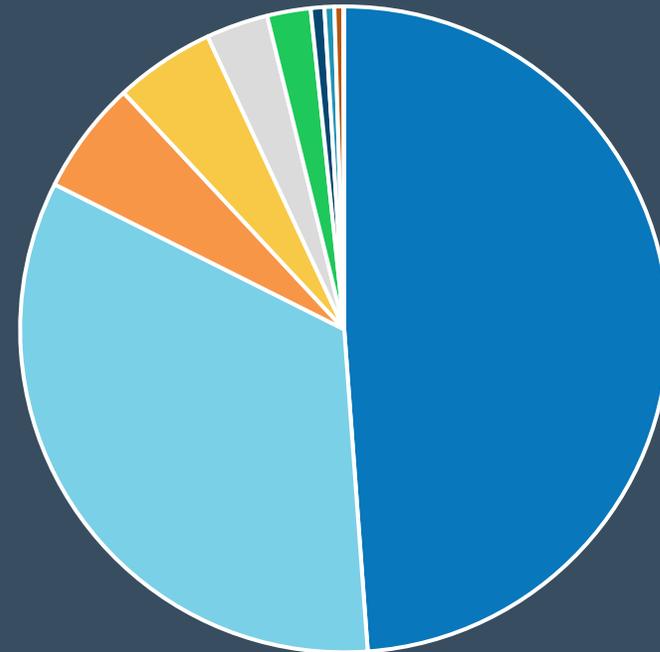
# Scope 3 is 4 times bigger than Scope 1+2... and driven by Purchases and Investments

Scope 1 + 2 = **412,194** tons



Electricity Natural Gas Anesthesia  
Steam Fuel

Scope 3 = **2,083,551** tons



Purchased Goods & Services  
Investments  
Capital Goods  
Employee Commuting  
Fuel and Energy Related Emissions  
Downstream T&D  
Waste Generated  
Business Travel  
Upstream T&D

# Greening the OR and Greening the Labs

- LED Lighting
  - (\$3 Million Saved)
- OR HVAC Setbacks (\$2M)
- Equipment Power Management
- Shut the Sash
- Plastics Recycling



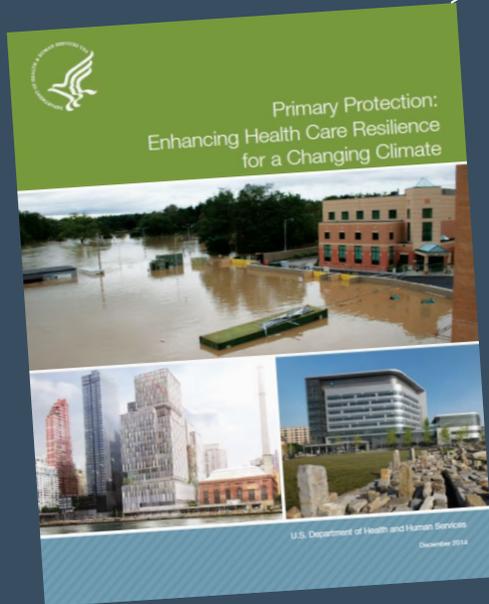
Sofya Asfaw, MD,  
Ken Lee Memorial Fellow  
General Surgery

# Activating the Sector

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# Adaptation



## Climate Risk Assessment - Cleveland Clinic



	Today	2030	2050
<b>Gradual</b>			
Sea Level Rise	Minor Risk	Minor Risk	Minor Risk
Increased Precipitation	Minor Risk	Moderate Risk	Moderate Risk
Increased Drought	Minor Risk	Minor Risk	Minor Risk
Higher Average Temperature	Minor Risk	Moderate Risk	Moderate Risk
<b>Extreme Events</b>			
Coastal Flooding and Storm Surge	Minor Risk	Minor Risk	Minor Risk
Heavy Downpours	Minor Risk	Moderate Risk	Moderate Risk
Riverine Flooding	Minor Risk	Minor Risk	Minor Risk
Heat Waves	Moderate Risk	Moderate Risk	Major Risk
Cold Waves	Moderate Risk	Moderate Risk	Moderate Risk
High Winds	Minor Risk	Moderate Risk	Moderate Risk
Forest Fires	Minor Risk	Minor Risk	Minor Risk

# Community Resilience

## OHIO RESILIENCE SUMMIT - 2017



## FLORIDA RESILIENCE SUMMIT - 2021



### Building Health Care and Community Resilience in Southeast Florida

Dear Jon,

You are cordially invited to attend a two-day virtual event: *Building Health Care and Community Resilience in Southeast Florida*. The summit will bring together critical stakeholders to participate in panel presentations, interactive sessions, and facilitated discussions.

You have been identified as an important participant in this critical dialogue. Please [confirm your attendance](#) by April 2.

#### About the event

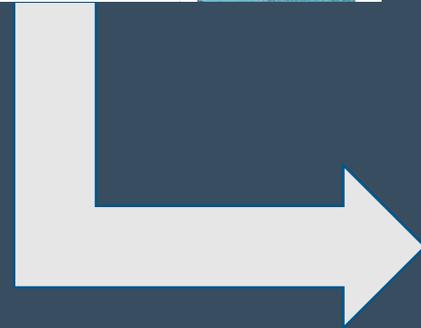
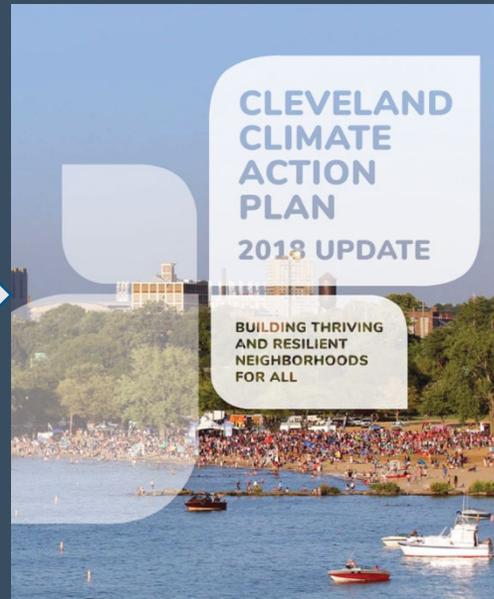
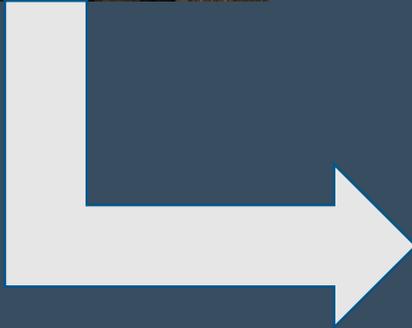
Southeast Florida hospitals are on the front line of climate change, bearing the costs of increased diseases and more extreme weather events. In 2020, the dual crises of more frequent and intense heat waves, hurricanes, and flooding and the COVID-19 pandemic have exposed the urgent need for more resilience in both health care and communities.

#### Building Health Care and Community Resilience in Southeast Florida

Thursday, April 8  
1 p.m. - 4:30 p.m. ET

Thursday, April 15  
1 p.m. - 4:30 p.m. ET

[REGISTER NOW](#)



### News

#### Southeast Florida Health Care Resilience Collaborative Launches

In the Spring of 2021, the nonprofit organization Health Care Without Harm, the Cleveland Clinic, and Perkins & Will convened a healthcare summit on climate resilience to catalyze collaborative climate action planning among institutions, hospitals, and partners. This event served as the catalyst for the creation of the Southeast Florida Health Care Resilience Collaborative, focused on supporting health care institutions in their efforts to prepare their facilities and communities for the impacts of climate change. The collaborative provides a forum for members to learn and share best practices for mitigation and resilience that support the health of patients and the communities served. Health Care Without Harm will bring its outside experts when



**5,500 Trees**  
Planted in our Region

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# US Healthcare Carbon Goals Timeline

- 2000-2017: 3 systems set goals

- Gundersen
- Kaiser Permanente
- Cleveland Clinic
- (Less than 2% of healthcare)

- 2018-2021: 15 systems set goals

- Kaiser Permanente, Gundersen, Cleveland Clinic, Boston Medical Center, Providence, Mass General, Rochester Regional, Hackensack, Common Spirit, Advocate Aurora...
- (Almost 10% of healthcare)

- 2022: 102+ Systems

- More than hospitals and systems representing 1,050 hospitals have signed the HHS Climate Pledge
- (almost 20% of healthcare)



# Leadership Body: HCWH Climate Council Cleveland Clinic a Founding Member



# Healthcare Sector Engagement Driver

## Grand Challenge on Climate Change, Human Health, and Equity Advisory Council

- **Peter Agre, MD** | Johns Hopkins Bloomberg School of Public Health
- **Martin Chalfie, PhD** | Columbia University
- **Nicholas Christakis, MD, PhD, MPH** | Yale University
- **Steve Chu, PhD** | Stanford University
- **Elaine Fuchs, PhD** | Howard Hughes Medical Institute, The Rockefeller University
- **Atul Gawande, MD, MPH** | Ariadne Labs, Brigham and Women's Hospital, Harvard Medical School
- **Helene Gayle, MD, MPH** | Chicago Community Trust
- **Laurie Glimcher, MD** | Harvard Medical School
- **Sir Andy Haines, MD, MBBS** | London School of Hygiene and Tropical Medicine
- **John Holdren, PhD** | Harvard University
- **Mariana Mazzucato, PhD** | University College London
- **Randy Schekman, PhD** | Howard Hughes Medical Institute, University of California, Berkeley



NATIONAL ACADEMY of MEDICINE  
**GRAND CHALLENGE ON  
CLIMATE CHANGE,  
HUMAN HEALTH & EQUITY**

Climate change represents one of the most significant threats to human health in the 21st century. The Grand Challenge on Climate Change, Human Health, and Equity (Climate Grand Challenge) is a multi-year global initiative to improve and protect human health, well-being, and equity by working to transform systems that both contribute to and are impacted by climate change.

The Climate Grand Challenge has four strategic objectives:

Communicate the climate crisis as a public health and equity crisis

Develop a roadmap for systems transformation

Catalyze the health sector to reduce its climate footprint and ensure its resilience

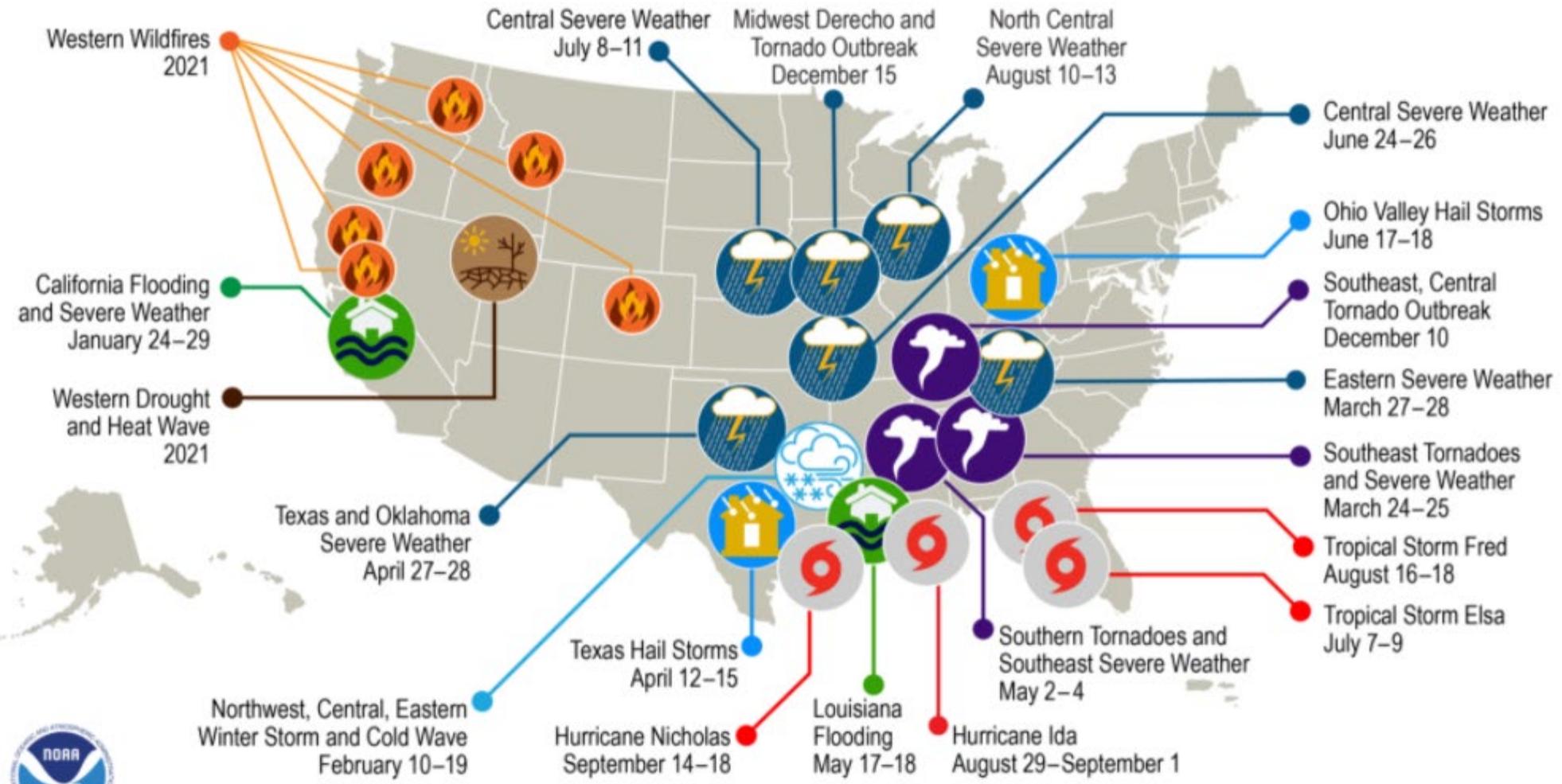
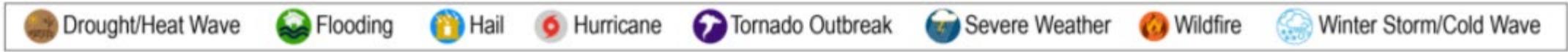
Accelerate research and innovation at the intersection of climate, health, and equity

# Activating the Sector

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- **Clinical Education and Practice**



# U.S. 2021 Billion-Dollar Weather and Climate Disasters



This map denotes the approximate location for each of the 20 separate billion-dollar weather and climate disasters that impacted the United States in 2021

# Climate change impacts healthcare delivery *and* health

## PROBLEM

- Climate change is harming our health now.
- Everyone is affected, but some people are more vulnerable.
- If we do nothing, these health threats will increase.

## IMPACTS

### Eight Impacts Four Categories:

- **Direct Impact**
  - Extreme Heat
  - Air Pollution
  - Extreme Weather
- **Spread Disease**
  - Insects & Vectors
  - Contaminated Water
  - Contaminated Food
- **Disrupt Food Supply**
  - Hunger & Malnutrition
- **Disrupt Well Being**
  - Emotional stress



# H E A T W A V E

Heat illness

Exacerbate heart and lung conditions

Asthma

Traumatic injury

Water and foodborne illnesses

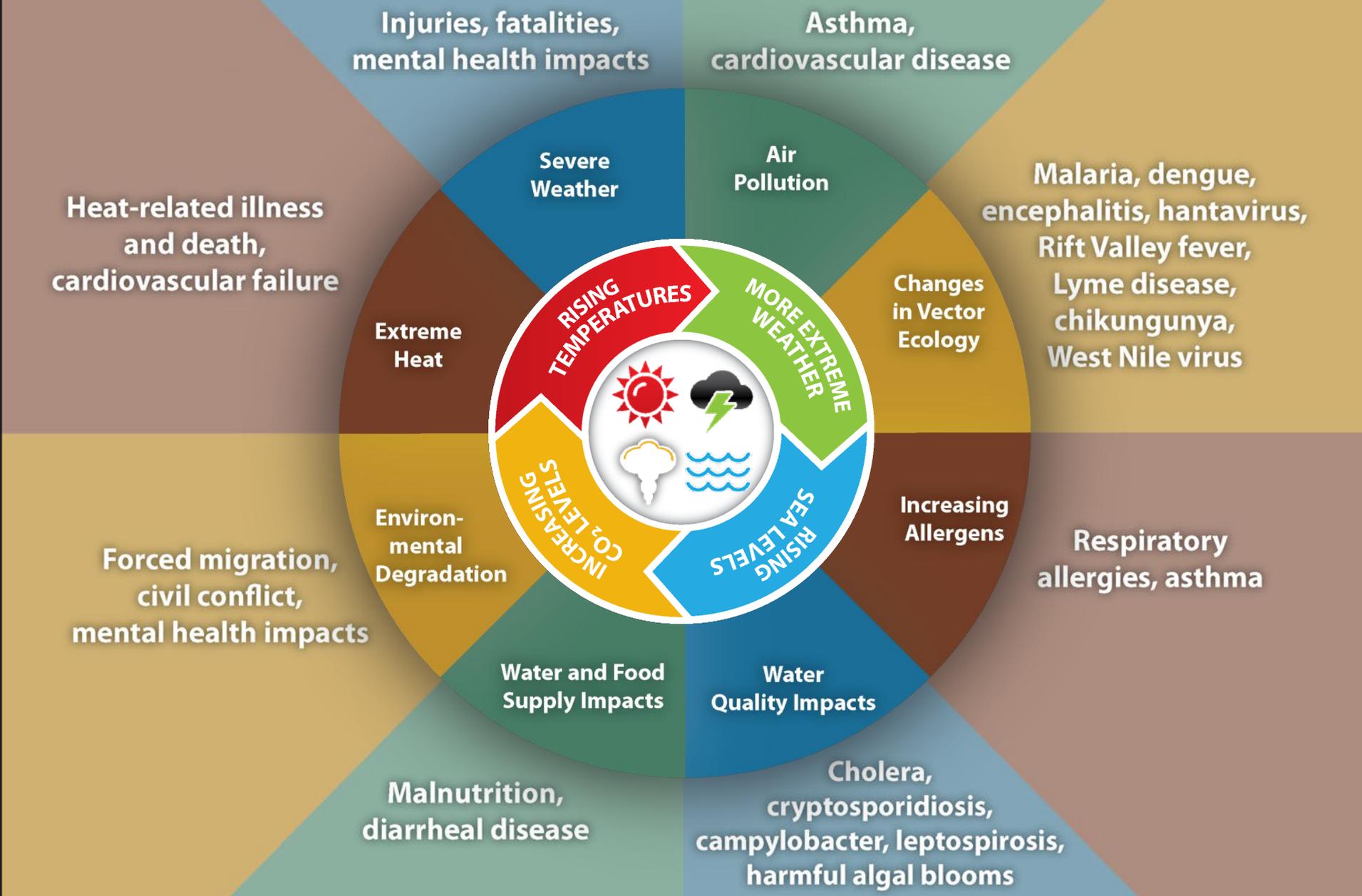
Allergies

Vector-borne disease

Emotional stress

# Impact of Climate Change on Human Health

<https://www.cdc.gov/climateandhealth/effects/default.htm>





J. Harry (Bud) Isaacson, MD

## We Must Address this Public Health Emergency

As physicians, we are committed to helping our patients live healthy, productive lives. In this age of a rapidly changing climate, that commitment extends to helping them understand how climate change can affect their health — more intense allergy seasons and deadly heat waves are just two examples — and what we all can do to both combat climate change and minimize its health effects.

In this issue of *InSight*, we highlight the work of Renee N. Salas, MD, MPH, MS ('09), the lead author of the "2018 Lancet Countdown on Health and Climate Change Brief for the United States of America" (see "An urgent call

Adverse effects from climate change result from just a half-degree of warming. In the book "The Uninhabitable Earth: Life After Warming," David Wallace-Wells writes that today we have "fully a third more carbon in the atmosphere than at any point in the last 800,000 years—perhaps in as long as 15 million years." He warns of collapsing ice sheets, water scarcity and an equatorial band too hot to be livable that could come with 2 degrees Celsius of warming.

As physicians, we must educate ourselves about the impacts of climate change on health and educate our patients without wading into



## Element 7.5 - Societal Problems

*The faculty of a medical school ensure that the medical curriculum includes instruction in the diagnosis, prevention, appropriate reporting, and treatment of the medical consequences of common societal problems.*

**The AMA has called for the inclusion of climate change and health in medical education at the undergraduate, graduate, and continuing medical education levels.**

SCHOLARLY PERSPECTIVE: PDF ONLY

# Climate Change and Medical Education

## An Integrative Model

Sullivan, James K.<sup>1</sup>; Lowe, Katherine E. MSc<sup>2</sup>; Gordon, Ilyssa O. MD, PhD<sup>3</sup>; Colbert, Colleen Y. PhD<sup>4</sup>; Salas, Renee N. MD, MPH, MS<sup>5</sup>; Bernstein, Aaron MD, MPH<sup>6</sup>; Utech, Jon MBA<sup>7</sup>; Natowicz, Marvin R. MD, PhD<sup>8</sup>; Mehta, Neil MBBS<sup>9</sup>; Isaacson, J. Harry MD<sup>10</sup>

[Author Information](#) 

Academic Medicine: August 24, 2021 - Volume - Issue -  
doi: 10.1097/ACM.0000000000004376



# An Examination of the Intersection of Climate Change, the Physician Specialty Workforce, and Graduate Medical Education in the U.S.

Colleen Y. Colbert  , Judith C. French , Andrei Brateanu, Susan E. Pacheco, Sumita B. Khatri , Suneeti Sapatnekar , Voranaddha Vacharathit, Lily C. Pien, Allison Prelosky-Leeson, Regina LaRocque , Bryan Mark  & Renee N. Salas 

Received 17 Dec 2020, Accepted 25 Apr 2021, Published online: 19 May 2021



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

Academic Medicine: March 2021

Philipsborn, Rebecca Pass MD, MPA; Sheffield, Perry MD, MPH; White, Andrew MD; Osta, Amanda MD; Anderson, Marsha S. MD; Bernstein, Aaron MD, MPH

# Nursing's pivotal role in global climate action

Box 1

Past as prologue

- **1859: All roads lead to Florence**—Nursing's leadership originated with Florence Nightingale's 1859 treatise on ventilation and light. Her progressive and subversive work made it clear that all health is environmental health; all life depends on the earth's primal assets
- **1986: "The vastness and urgency"**—The International Council of Nurses called on nurses to tackle "the vastness and urgency" of environmental issues. In a bold and forward thinking declaration, the council told nurses that they shared the responsibility of protecting the world. Subsequent position statements were released in 2008 and 2018
- **1995: Nursing and environment on the national stage**—The US based Institute of Medicine released *Nursing, Health, and the Environment*
- **1996: Right before their eyes**—Nurses began to understand that healthcare itself perpetuated climate change. Discarded tubing and vials were a daily reminder of what was wrong. Cofounded in 1996 by a nurse and an environmental health activist, Health Care Without Harm, and other groups worked to rebrand climate change from a narrowly defined ecological concern to one with consequences for public health
- **2008: Building organizational infrastructure**—Both nursing and interdisciplinary organizations were founded—for example, the Alliance of Nurses for Healthy Environments (2008), the Canadian Association of Nurses for the Environment (2009), and United Kingdom Health Alliance on Climate Change (2016)
- **2010-present: Transforming the curriculum**—Educators began to include climate change in curricular blueprints, in which it had been noticeably absent. Materials, initially descriptive, soon became focused on action and situation; challenges included overcrowded curricula and lack of faculty capacity and expertise. Student outcomes showed that students were receptive to climate change education
- **2014-present: At the table**—Nurses collaborated with other health professionals to create national and international policy. Early successes in this area included substantive recommendations from the White House (2016). Nursing leadership has been instrumental in advancing the work of the Global Consortium on Climate and Health Education and the Climate and Health Alliance. Both the International Council of Nurses and the American Academy of Nursing have led throughout the years

# Medical, nursing, and physician assistant student knowledge and attitudes toward climate change, pollution, and resource conservation in health care

Emma C. Ryan , Robert Dubrow & Jodi D. Sherman

*BMC Medical Education* 20, Article number: 200 (2020) | [Cite this article](#)

4217 Accesses | 15 Citations | 8 Altmetric | [Metrics](#) [doi.org/10.1186/s12909-020-02099-0](https://doi.org/10.1186/s12909-020-02099-0)

## Results

The response rate was 28% (280 respondents). 90% felt that physicians, nurses, and physician assistants have a responsibility to conserve resources and prevent pollution within their professional practice. 63% agreed or strongly agreed that the relationship between pollution, climate change, and health should be covered in the classroom and should be reinforced in the clinical setting. 57% preferred or strongly preferred reusable devices. 91% felt lack of time and production pressure, and 85% believed that lack of education on disease burden stemming from health care pollution, were barriers to taking responsibility for resource conservation and pollution prevention. Women and physician assistant students exhibited a greater commitment than men and medical students, respectively, to address pollution, climate change, and resource conservation in patient care and professional practice.

## Conclusion

We found that health professional students are engaged with the concept of environmental stewardship in clinical practice and would like to see pollution, climate change, and health covered in their curriculum. In order for this education to be most impactful, more research and industry transparency regarding the environmental footprint of health care materials and specific clinician resource consumption patterns will be required.

## The National Association of Social Workers

750 First Street NE  
Suite 800  
Washington, DC 20002-4241  
SocialWorkers.org



Carrie Dorn, MPA, LMSW  
Senior Practice Associate  
cdorn.nasw@socialworkers.org

## Climate Change and Health: A Call to Social Workers

The accelerating rate of climate change is a threat to human health. On a global scale, climate change is affecting the way people live; its effects are seen in rising temperatures, extreme weather events, transmission of illness and disease, access to food and water, and changing agricultural patterns. Although climate change is a global issue, it touches each person individually.

It can be challenging to establish a direct connection between climate events and our daily lives when these concepts feel distant and people may feel that they are unable to contribute to solutions (<https://ecoamerica.org/wp-content/uploads/2017/03/ea-apa-psych-report-web.pdf>). However, becoming prepared and learning to mitigate the negative consequences of climate change can make people feel empowered. Social workers can help clients recognize and address emotional, health, and environmental factors to improve their well-being.

### Climate Science: Where Are We?

Over the past two decades the temperature on earth has warmed more than the past thousands of years, due to human activity and industries that use fossil fuel (oil, coal, natural gas), releasing greenhouse gases into the air. These

gases become trapped in the atmosphere and lead to a rise in temperatures. Since the late 1950s scientists have raised awareness about concerning trends in warming temperatures; today there is international consensus on climate change and its causes. The Intergovernmental Panel on Climate Change, convened by the United Nations, confirms the scientific consensus that human-induced climate change is accelerating the warming of the Earth ([www.ipcc.ch/sr15/](http://www.ipcc.ch/sr15/)). Drastic action must be taken to stop further warming (beyond 1.5 °C above preindustrial levels) and the resulting catastrophic consequences of climate change.

### Social Work Connection

The professional commitment to underserved and vulnerable populations necessitates that social workers are knowledgeable about climate change and its effects on people. The environmental perspective of social workers should be inclusive of the natural environment, not only social and familial systems ([www.ifsw.org/globalisation-and-the-environment/](http://www.ifsw.org/globalisation-and-the-environment/)). Gradually, climate change threatens our environment and patterns of living. Communities with less resources and capital are likely to be disproportionately affected by the negative effects of climate change in the United States and worldwide. The framework of environmental justice ([www.epa.gov/environmentaljustice](http://www.epa.gov/environmentaljustice)) is essential to guide practice and policy responses to climate change.

[https://www.socialworkers.org/LinkClick.aspx?fileticket=H0t76Ho\\_6Ts%3D&portalid=0](https://www.socialworkers.org/LinkClick.aspx?fileticket=H0t76Ho_6Ts%3D&portalid=0)



Cleveland Clinic



Cleveland Clinic  
Lerner College of Medicine  
of Case Western Reserve University



University Hospitals  
Rainbow Babies & Children's



MetroHealth



SCHOOL OF MEDICINE  
CASE WESTERN RESERVE  
UNIVERSITY

## The Climate Crisis:

Addressing Impacts on Clinical Practice  
in the Great Lakes Region

Wednesday, March 10th, 2021 | Virtual by ZOOM

## THEMES FROM HEALTH PROFESSIONAL EDUCATION BREAK OUT SESSIONS

### Themes:

- Inter-professional education is needed
- Continue to work on faculty development
- Having framework for curriculum is important, sharing the wealth and making sure the curriculum doesn't fade away when one faculty leaves

### Taking Action:

#### *Tools we have*

- Multi-disciplinary approach
  - Occupational medicine can be a good partnership
  - Involve nursing in patient education
- Med ed portal; my learning modules at CCF, simulation lab
- Using requirements we already have (ie QI project) and relate to climate change

#### *Barriers & Resource Gaps*

- Access to reliable quality patient education materials
- Lack of data on how much waste we produce (ie volatile anesthetics) costs and savings
- Time, need leadership support/buy-in
- Faculty development
- Cultural resistance
- Students do not always pay attention to topics not on exams
- COVID – PPE, took step backwards to many single use items
- Building trust with local community and educating them – having health care professionals interact locally can be helpful

### Priorities:

#### *Short term*

- Collaborate with teams that already have curriculum in place
- Determine how health professionals can work with the community sustainability organizations to better provide for local patients
- Development (create or adapt) of patient education materials regarding climate change issues/topics
- Faculty development on climate change, open forums
- Electives on sustainability, establish if there aren't any that exist
- Making students aware of the climate impacts on the health system where they work
- Begin discussion with leadership within own discussion
- Integrate anti-racisms and climate change topics
- Using google classroom for climate content
- Reach out to the Sketchy videos about including climate change

#### *Long term/visionary*

- Climate change becomes a normal part of medical education
- Involving patients (children & adults) in different community activities (such as gardening) that would benefit climate change
- Going to patient neighborhoods and partnering with non-profit organizations in the city to educate people at a local level
- Renewed focus on public health
- Capstone, review of local community, climate change objectives
- EMR integration to prevent duplicative work
- Advocacy within professional groups
- Making supply chains more sustainable
- Having an educational officer for climate change amongst system administration

# CWRU Climate and Health Education Collaborative

## Statement of Purpose

The CWRU Climate and Health Education Collaborative of northeast Ohio will create and disseminate educational programs and curricula about the health effects of climate change in order to improve health, empower communities and train future health leaders.

## Goals

### Education

- Create a climate change and health competency
- Create a framework for understanding the health impacts of climate change
  - Health professions, social work, and other students whose professions and disciplines impact the health and well-being of individuals, communities and populations
  - Existing health, social work, education and other professionals whose work impacts the health and well-being of individuals, communities and populations
- Develop health leaders with expertise in the health impacts of climate change in clinical, public health, administrative, education and other relevant professions and disciplines
- Foster relationships and gather knowledge and perspective from other sources, particularly non-traditional sources
  - Communities, including minority and indigenous

# Questions/Prompts

1. Why should healthcare providers become educated about climate change and health?
2. What can health professionals do to reduce the carbon footprint of healthcare?
3. How might you incorporate the health effects of climate change into a patient/client encounter?

