

What physicians can do about climate change

It's already making our patients sick

BY VISHNU LAALITHA SURAPANENI, MD, MPH, AND NYASHA SPEARS, MD

Climate change is the greatest health threat of the 21st century. Surveys consistently show that more physicians than the general public agree with the scientific consensus on anthropogenic climate change. For physicians, the question isn't whether climate change is occurring, but "How do I address this complex topic in an already short patient visit?"

Even as we struggle to answer that question, we are beginning to see and treat the health impacts of climate change. Whether it's an elderly woman on diuretics with heart failure who comes

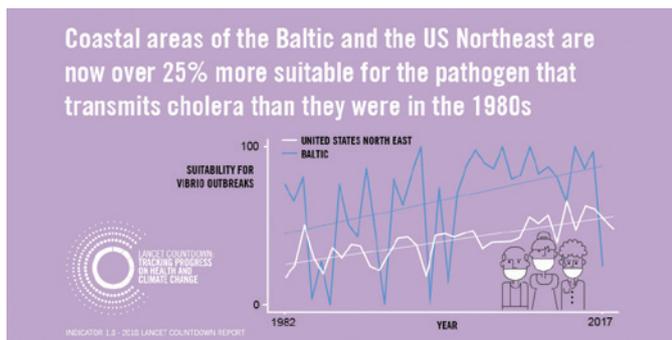
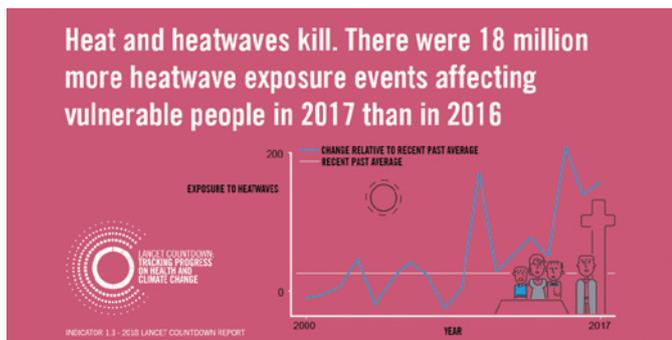
in with syncope and acute kidney injury while gardening on an unusually warm day in June, or an asthmatic child with a severe exacerbation after playing in his schoolyard next to a highway, we are seeing a rise in diseases directly attributed to climate change. Physicians all over America encounter families under stress due to displacement by floods, fire and famine. The physical and mental health implications of a warming planet are being felt in every corner of the earth, including Minnesota.

The Lancet Countdown, a global monitoring system dedicated to tracking the health impacts of climate change, reported in 2018 that 24 million more Americans were exposed to extreme heat in 2011 and 12.3 million more in 2016 when compared to the 1986–2005 baseline. Climate-sensitive vector-borne illnesses transmitted by mosquitoes, ticks and fleas, including Lyme disease and West Nile virus, tripled between 2004 and 2016. The U.S. Northeast has had a 27 percent increase from the 1980s to the 2010s in the area of coastline that's suitable for the pathogenic waterborne *Vibrio* bacteria. According to the Fourth National Climate Assessment, extreme heat and wildfire smoke, augmented by climate change, are projected to worsen air quality, even as more than 100 million Americans live in communities where air pollution already exceeds air quality standards. More people are likely to be impacted by climate change—and health care infrastructure itself is directly at risk during extreme weather events, as we've seen during hurricanes Katrina and Maria.

Climate change is an existential crisis; thinking of the magnitude of the action we need to take can be paralyzing. This is precisely why physicians can and should take the lead in addressing it. As health care professionals, we routinely work to help patients tackle enormous challenges by encouraging action in small steps.

Individuals *Changing behavior*

To limit global temperature rise to no more than 2 degrees Centigrade above pre-industrial levels, as outlined in the Paris Agreement, individuals must collectively make lifestyle modifications to promptly reduce carbon emissions. Three of the top four most high-impact actions to reduce individuals' greenhouse gas emissions have clear links to improved health outcomes and so fall under the purview of physician recommendations. In short, these behaviors have climate and health co-benefits.



Graphic used with permission of Lancet Countdown www.lancetcountdown.org.

Nutrition. One of the most rapid and effective ways for an individual to reduce his or her carbon footprint is to eat less meat. A 2015 study by Hudenus demonstrated we can't stay below the 2-degree Centigrade limit expressed in the Paris Agreement without a significant change in diet: eating less meat and generally shifting away from reliance on animal sources of protein.

According to the United States Department of Agriculture (USDA), Americans consume the equivalent of 223 pounds of meat per person each year. Compared to the average American diet, vegetarian and vegan diets reduce foodborne greenhouse gas emissions by 32 percent and 67 percent respectively, reduce water use by 70–75 percent and land occupation by 70–79 percent. According to the Centers for Disease Control (CDC), only one in 10 American adults gets enough fruit and vegetables. By helping patients eat less meat and more vegetables, we can simultaneously change the rising trajectory for chronic diseases such as vascular disease, obesity and many cancers; reduce health care costs; and reduce greenhouse gas emissions. This is a win-win-win.

There are several realistic strategies to move patients toward more plant sources and fewer animal sources of protein. Incremental changes such as Meatless Mondays, avoiding meat on weeknights or weekends and even eating generally lower on the food chain are good first steps. One excellent resource for patients is the Meatless Monday Campaign (<http://www.meatlessmonday.com>), which has recipes for patients and institutions and practical suggestions to move people toward a more climate-friendly diet. In our practices, we have found that meat-eating patients find this resource informative and non-judgmental.

Exercise. The transportation sector now contributes up to a third of greenhouse gas emissions, according to the U.S. Environmental Protection Agency. Recommendations to use public transport and purchase an electric car don't generally fall within the purview of clinical practice, but increasing physical activity is a lifestyle modification we can recommend in many clinically relevant scenarios. Most Americans do not get the requisite physical activity recommended by current guidelines. Exercise provides mental and physical health benefits. Physical activity is vital for healthy aging, prevention and control of chronic diseases and preventing premature death.

Car-free living is one of the top four most effective ways to reduce an individual carbon footprint while reducing obesity, hyperglycemia and airborne pollutants. In addition to mitigating the impacts of climate change, walking or biking as a mode of active transportation coincides perfectly with the exercise needed to help our patients live longer, healthier lives. Forty percent of all car trips in America are less than 2 miles. Physicians can advise patients to begin choosing active transportation for any trip that's less than 2 miles. Those in rural areas may reduce car mileage by walking the last part of a trip or seeking ways to ride-share.

Reproductive choices. When women are given the ability to avoid unplanned pregnancies, their health benefits. Having fewer

What's good for health is good for the planet too.

+ active transportation
(walking, biking)

exercise benefits and reduced emissions

+ plant-based diet

nutritional benefits and reduced emissions

+ using renewable energy

cleaner air and water and reduced emissions

+ energy efficiency

improved air quality and reduced emissions

+ green spaces

psychological, civic and health benefits and trapped emissions

children is also the largest impact one can make on an individual level in cutting emissions. According to one research paper, a family choosing to have one less child provides the same level of emission reduction as 684 teenagers who adopt comprehensive recycling habits for the rest of their lives. Physicians should routinely provide a full range of reproductive health counseling and services to both male and female patients.

Adapting to a changed environment

In addition to encouraging behavior changes that help mitigate the damage to our climate, physicians need to counsel patients on how they can protect themselves from climate change that is already impacting health.

Extreme heat. Minnesota is one of the fastest warming states in America. Unfortunately, Minnesotans tend to underestimate their susceptibility to extreme heat, putting themselves at a higher risk for heat-related illnesses. We need to identify and educate vulnerable groups such as the elderly, outdoor workers, the homeless and athletes—those more likely to suffer heat-related illness. This includes education on tracking extreme-heat alerts and recognizing the signs of heat illness. Physicians can help develop extreme-heat plans to check on elderly people living alone and identify access to air-conditioning or community cooling centers. Documenting heat as a risk factor for hospitalization when appropriate will also help accurately track the burden of heat illness.

Air quality, allergies and asthma. Patients with heart and lung disease are particularly vulnerable when air quality worsens. Warmer temperatures worsen air quality, and studies show increased ER visits with asthma on hot days. Our allergy season in Minnesota has increased by 18-21 days, which compounds the

problem of allergic asthma attacks. Physicians should counsel patients to check air quality before outside activities and help them prepare asthma contingency plans for hot and poor air quality days.

Mental health. Extreme weather events, including extreme heat, have been linked to increased rates of suicide. People impacted by extreme weather events, such as flooding or tornadoes or extended frigid temperatures, may face the loss of their homes, jobs and communities. Health care professionals can help patients prepare a mental health plan and assist with the burden of displacement, whether temporary or permanent.

Realistically, patients will rarely bring up climate change in a time-limited office visit. They do, however talk about their concerns regarding obesity, mental health, cancer risk, diabetes, heart disease and stroke risks. Physicians are in a unique and powerful position to help patients make lifestyle changes to improve their own health outcomes, keep our climate cooler and manage the negative impacts of a warming planet.

Health care institutions Changing behavior

In the United States, health care institutions contribute 10 percent of greenhouse gas emissions. As a profession that practices “First, do no harm,” we have a moral obligation to reduce our contribu-

tion to climate damage that adversely impacts the health of our most vulnerable patients.

The health care system can become more environmentally sustainable in many areas, including energy use and efficiency; managing food, water and transportation needs of patients and staff; and the unique challenges of the use and disposal of chemicals and waste. Many resources now exist to help guide hospitals and offices through this transition including Practice Greenhealth, Healthcare Without Harm and My Green Doctor. Hospitals all over the country are already making major changes to deliver health care sustainably.

For example, Gundersen Health System (Wisconsin, Minnesota, Iowa) was the first U.S. health system to target (2008) and reach energy independence (2014), saving millions of dollars a year. Minnesota hospitals have made sustainability leadership a priority and rank in the top 25 hospitals nationwide (Practice Greenhealth 2018 Environmental Excellence Awards). HCMC’s Whittier Clinic received a LEED Silver Certification for sustainable building, Stillwater’s Lakeview Hospital energy usage was 57 percent carbon-free in 2017 and Mayo Clinic retrofitted its parking ramps with LED lights and is saving \$300,000 dollars annually as a result.

In 2017, the St. Cloud VA hospital reduced its water use by 30 percent, Park Nicollet Hospital in St. Louis Park decreased its food waste by 40 percent and the Minneapolis VA reduced its meat consumption by 33 percent. Regions Hospital in St. Paul achieved a 20 percent reduction in its paper usage in 2017, compared to the 2014 baseline, and is planning on adding electric vehicles to its fleet.

According to Practice Green Health, the operating room produces 20–30 percent of hospital waste, is the largest consumer of hospital supplies and uses anesthetic gases, like halogenated ethers, that are powerful greenhouses gases. Interdisciplinary “greening” of operating room teams including surgeons, nurses and anesthesiologists, are diverting waste from landfills, reducing emissions and saving hospitals tens of thousands of dollars, adding to the triple bottom-line of “people, profits and planet.” Fairview was the first health system locally to recycle blue wrap from the surgical ORs, and received a Greening the Operating Room Recognition Award in 2018. As a first step, physicians can create or join a green team in their hospitals.

Organizations can amplify individual employee behaviors by implementing systems that make planet-friendly behaviors easier. For example, hospital cafeterias can endorse Meatless Mondays. Hospitals can provide bike racks and showers for employees who choose active transport (walking, running or biking) to work.

Adapting to a changed environment

Health care systems also need to develop resiliency in their infrastructure and staff operations as part of climate adaptation. This is evident when we recall extreme weather events like hur-

Resources for health care professionals

+ American College of Physicians Climate Change Toolkit

<https://www.acponline.org/advocacy/advocacy-in-action/climate-change-toolkit>

+ Practice Greenhealth. Greening the OR Toolkit

<https://practicegreenhealth.org/initiatives/greening-operating-room>

+ U.S. Climate Resilience Toolkit

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

+ Medical Society Consortium

<https://medsocietiesforclimatehealth.org/take-action/>

+ Health Professionals for a Healthy Climate, including a Minnesota-specific Action Toolkit

<https://www.hpforhc.org/>

+ Climate and Health Resources for Patients

<http://climatehealthconnect.org/resources/posters/>

ricanes Katrina and Maria, which disrupted delivery of health care services. In response, based on specific regional threats, hospitals across the country have built first-floor elevations above predicted flood levels, created underground hospital floors where tornado risk is high and installed air scrubbers to protect air quality during wildfires.

Hospitals need to develop emergency plans for an influx of patients who will present in large numbers during critical weather events, including heat waves, or disasters.

Hospitals need health care and ancillary staff in order to function effectively. During superstorm Sandy, disruptions to care resulted in staff not able to reach the hospital. Increases in precipitation and tornadoes are predicted for Minnesota, meaning road closures and electricity outages that can disrupt delivery of care. Health care professionals need to be involved in developing an extreme weather event emergency response plan specific to their institutional needs and the populations they serve.

Communities

It is our ethical duty as physicians to help prevent what we cannot treat. From the days of John Snow, who discovered that a cholera outbreak was caused by an infected water pump, to the recent efforts of Mona Hanna-Attisha, MD, who exposed the Flint water crisis in Michigan, physicians have been advocating for patients outside of their clinics and hospital rooms. Today, our role as physicians is expanding, with some advocating for policies around affordable health care, gun violence, drug use, smoking and more. Some are even running for public office themselves. More medical schools and residencies are including advocacy tracks.

Health care professionals are in the frontlines, caring for victims of extreme weather events, treating children with asthma readmissions from air pollution and serving immigrant populations displaced by climate change. We need tell our patients' stories and advocate for environmental policies that protect human health. In the Climate Change Toolkit, the American College of Physicians outlines steps we can all take.

Physicians can write letters to the editor in local newspapers, author opinion editorials, use social media and meet with legislators to report our observations from caring for patients in a warming climate. Expert testimonies by physicians to city, county and state legislators help communicate the impacts of pollution and climate change on patient health.

For collective action to be effective, joining a group that is already working on climate issues is a good place to start. In Minnesota, Health Professionals for a Healthy Climate is a multi-disciplinary group of health professionals, including doctors, nurses and public health professionals who work on advocacy issues at institutional and policy levels.

To tackle an issue as complex and multi-faceted as climate change, we need to break down our traditional practice silos and work in an inter-professional team-based manner. At the Uni-

versity of Minnesota Academic Health Center, we are tackling climate change in a team that spans medicine, nursing, dentistry, physical therapy, pharmacy and veterinary medicine.

Climate action is primary prevention. Physicians are well suited to act on climate. We are agents of change; this is what we do. As trusted voices, we can lead individuals and communities by using evidence-based data to foster behavior changes and public policy changes that will positively affect human health and the health of the planet. MM

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