Climate Change and Health: An Urgent Call to Academic Emergency Medicine

There is consensus among 97% of scientists that anthropogenic climate change is occurring and international agreement of the grave threat it poses.[1,2] A *Lancet* Commission declared climate change "the biggest global health threat of the 21st century" with "potentially catastrophic risk to human health."[3,4] Emergency medicine (EM) is already on the frontlines as climate change directly affects our patients, clinical practice, and emergency departments (EDs). This presents EM with a profound leadership opportunity to join our colleagues in the house of medicine to improve health and save lives.

Climate change, driven by increased greenhouse gas (e.g., carbon dioxide) emissions from activities like fossil fuel combustion for electricity generation, has led to rising temperatures, more extreme weather, and rising sea levels. The United States has warmed 0.15°F per decade since 1895, with 2016 the warmest year on record, and the first year scientists definitively identified extreme weather events that would not have occurred without climate change.[5–7] Almost as hot, 2017 had a record-setting number of large-scale disasters with these 16 events alone causing over $313 billion in damages and an official death toll of 3,278.[8,9] Sea level rise is also well documented with significant implications for coastal regions.[10] While these are the most tangible exposure pathways of climate change, others include exacerbation of air pollution, increased allergen production, alterations in vector ecology, and decreased water and food quality.[11]

While new impacts on health are continually being discovered, climate change is already causing a broad range of human disease in the United States like injuries from severe weather and interpersonal violence, heat stroke and heat-related cardiac disease, reactive airway disease exacerbations from smog and allergens, gastrointestinal illnesses from water supply contamination, vector-borne diseases, and mental health crises.[11] These harms disproportionately affect children and elders, the poor, and those with chronic diseases—the patients we see in our EDs.[3] Globally, those most affected are the least responsible.[12] Thus, there are practical and ethical imperatives for academic emergency physicians to become climate and health champions.

The health risks of climate change are complex and challenging to communicate.[13] Yet, as with many other complex health issues, emergency physicians are in a unique position to help as we practice at the front door of the health care system. We are natural educators and caregivers, routinely communicating abstract scientific concepts and presenting digestible treatment plans to our patients, all in an incredibly high-stakes environment. The public, even those who are dismissive of climate change, trusts physicians' assessments regarding climate and health.[14]

Literature on physician views shows a clear consensus: climate change is happening and affecting our patients.[15–17] Most physicians also feel that it is important for them to inform patients of the threat and that medical associations should play an advocacy role. Other specialties have responded.[18] Twenty-one medical societies, including the American Medical Association, have joined the Medical Society Consortium on Climate and Health. Until California's chapter of the American College of Emergency Physicians joined, EM had been absent despite early consideration of the issue as a priority.[19]

Our specialty was born of a societal need, not a unique scientific scope, and we continue to respond to the needs of those we serve. EDs are the safety net of our health care system, and climate change will

The authors have no relevant financial information or potential conflicts of interest to disclose.
Author contributions: study concept and design/acquisition of data—RNS, JES, CS, JL, and JH; drafting of the manuscript—RNS, JES, CS, JL, and JH; and critical revisions of the manuscript—RNS, JES, CS, JL, and JH.

doi: 10.1111/acem.13657
ISSN 1553-2712

challenge our already-stretched EDs.[20] In addition to increased utilization of emergency services, we will treat more patients displaced by extreme weather events.[21,22] In fact, it could be predicted that all of the 20 leading diagnoses for both ED visits and hospital admissions will increase as the climate crisis swells.[23]

The most affected patients are those for whom we already provide care. In 2014, 18% of ED patients were over 65 and 19% were under 18.[24] The impoverished visit the ED at twice the rate of those with incomes over 400% of the poverty line.[25] We already see a steady increase in ED patients with chronic diseases.[26] This is particularly true in disasters, when EDs are often the only source of care for acute or chronic conditions.[27] No profession exceeds our dedication to, and proficiency for, disaster response and indefatigable care for the most vulnerable.[28]

The house of medicine is fatigued and strained, and our practitioners are burning out from a host of stressors, but that does not have to be.[29] While there are contributing factors physicians cannot change, taking leadership on climate and health could help us reconnect with our altruistic calling. Academic EM can add to our legacy by leading the charge, embracing the Society for Academic Emergency Medicine's vision of "creating and disseminating content with the greatest impact on emergency care." In the face of this challenge, academic EM's unique contribution should focus on education, research, and advocacy, so we are better prepared, informed, and aligned with those we serve.

Education is perhaps the most central for our colleagues, students, and patients. While most physicians have minimal understanding of climate change and health linkages, approximately three-fourths want relevant continuing medical education.[15–17] Columbia University's Global Consortium on Climate and Health Education has pledges from over 115 health profession schools to include climate and health in their curricula. These educational efforts need a clinical focus for acute care practitioners, which will translate to education of our patients and the public.

There are also a host of EM climate and health research needs, from epidemiologic analyses to consideration of how climate-related migrations are likely to impact health system operations and service delivery. Analyses of health system failures in disasters and infrastructure vulnerabilities to flooding and sea level rise are sorely needed, as are strategies for improving resilience to issues such as medication shortages from disasters.[30] With health care contributing at least 10% of U. S. greenhouse gas emissions,[31] we need research to help us reduce our footprint. Finally, research evaluating educational interventions for medical and patient communities is required.

Advocacy is needed, at a minimum, to bridge the gap between research and policy. One of the most critical steps is unifying physicians and the larger health community to advocate for our current and future patients against the negative health impacts of climate change. We have the ability and expertise to put a human face on climate change in a way no other group can.

Climate change has moved beyond a fight over fossil fuels and causality. As impacts mount, level-headed engagement and risk assessment are needed, and physicians are in a unique position to reframe climate change as a public health issue to mobilize action.[32] The battle is not already lost, and the fact that significant further warming and sea level rise are now inevitable only reinforces the need to aggressively attack preventable dangers to and minimize the harms.[33]

Emergency medicine joined the house of medicine in 1979, and its practitioners now span three generations. While young, EM is mature enough to consider its legacy. If current trends continue, when we celebrate our first centennial the world will be several degrees warmer and seas almost a meter higher. The impacts on EM will be incontrovertible. How will trainees then view the choices we make now? Hopefully, they will say we acted with foresight, courage, and haste.

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