



Environmental, Social, and Governance (ESG)

The public health community has dubbed climate change the 21st century's greatest threat to public health.¹ No country or continent is immune from the health impacts of worsening global climate change. Our warming planet increases the risk for wildfires, rising sea levels, extreme heat, severe weather, and droughts. These factors can have a direct effect on population health and further stress health care infrastructures.² Smoke from wildfires and higher pollen counts can lead to respiratory disease or exacerbate asthma. Extreme heat and droughts can increase the risk of cardiovascular disease and heat stroke.

Climate change has been labeled "as serious a threat to humanity as nuclear war."³ The risks of climate change to the planet's biodiversity also pose risks to the human microbiome, threatening detrimental changes to our immune system and mental well-being.

Pollution, too, is coming under increasing scrutiny for its detrimental health impacts. According to the World Health Organization (WHO), ambient pollution contributes to 4.2 million premature deaths worldwide each year, with the Western Pacific region among the worst affected. The effort to combat pollution has taken on a particularly high profile in China, where officials say that birth defects rose by 70 percent between 1996 and 2010.⁴

Climate change is impacting the conditions in which people are born, grow, work, live, and age, as well as the wider set of forces and systems shaping the conditions of daily life—the drivers of health (DoH), or also known as the social determinants of health. For example, climate change not only has the potential to reduce nutritional value in food, it also can have a negative impact on food production, which can impact food security. In addition, it can lead to economic instability for businesses, resulting in potential job losses. Across the board, social and economic factors are at risk from climate change.⁵

Health costs related to climate change and pollution are estimated at USD \$820 billion a year, according to a recent report.⁶ Leading organizations around the world—including the American Medical Association, the British Medical Association, and the Australian Medical Association—officially recognize climate change as a health emergency.⁷

How is climate change acting as a health care catalyst? We see three horizons: Efforts to decarbonize health care and achieve net-zero; climate change's impact on health systems' infrastructure and workforce; and its impact on people's health and well-being.

1. Getting to net-zero: Decarbonizing health care

It's ironic that the health care sector, which guides medical practitioners' actions with the ethic "first, do no harm" ("primum non nocere"),⁸ is not leaving this world unharmed. Due to health systems' round-the-clock operations, extensive use of air conditioning and refrigerated storage, and specialist medical equipment—and because many hospitals and care facilities are aging and poorly designed for energy efficiency⁹—health care can be seen as a major contributor to the climate crisis.

More than one-third of global heat-related deaths can be attributed to climate change, according to a recent study.¹⁰

The world's health care systems account for 4% of global carbon dioxide emissions, more than aviation or shipping.¹¹ If the health sector was a country, it would be the fifth-largest emitter of greenhouse gas (GHG) emissions on the planet.¹² According to conclusions from the study Health Care's Global Climate Footprint:¹³

- Health care emissions make up a varying percentage of each country's climate footprint. They range from highs in the United States (7.6%), Switzerland (6.7%) and Japan (6.4%), to lows in India (1.5%) and Indonesia (1.9%). While China is the number one absolute greenhouse gas emitter in the world today, this study finds that the United States far surpasses it in terms of absolute health care emissions.
- Emissions emanating directly from health care facilities make up 17% of the sector's worldwide footprint. Indirect emissions from purchased electricity, steam, cooling, and heating comprise another 12%. And the greatest share of emissions—71%—are primarily derived from the health care supply chain; the production, transport, use, and disposal of goods and services that the sector consumes.

A recent study determined that the US health care industry is responsible for roughly 10 percent of the country's greenhouse gas emissions.¹⁴ It is time for health care leaders and their organizations to extend the "do no harm" ethic to the environment—to measure, manage, and set targets to reduce the sector's carbon footprint to fight climate change. The United Kingdom, Australia, and Brazil offer examples of health systems positioning themselves for a "greener" future:

- **United Kingdom:** Freeman Hospital introduced an online ordering system that allows patients' meals to be ordered 12 hours in advance, offering smaller portion sizes, to support correct food preparation and reduce food waste. The hospital also replaced macerators with bio-digesters for plate waste, reducing water use by the equivalent of three Olympic-sized swimming pools annually, and saving the hospital approximately £14,000 on energy, water, and landfill costs.¹⁵
- **Western Australia:** Pingelly & Cunderdin Health Centre's two facilities were designed to reduce their environmental impact. Examples of design features include the use of airlocks (to improve climate control and avoid wind tunnels); natural light, laminated safety glass windows and treatments to reduce heat transfer; grey water systems, water wise gardens and landscaping to reduce water consumption; and installation of solar panels to produce electricity. Both new health centers received a 4 Star Green Star rating.¹⁶
- **Brazil:** The non-profit association Projeto Hospitais Saudáveis (PHS) is dedicated to transforming the country's health sector into an example for society at large in the areas of environmental protection and the health and well-being of workers, patients, and the general population.

Equipping the health care workforce—hospital administrators, clinicians, and support staff—with greater awareness and training to offset climate change’s impact on the health ecosystem is another important undertaking. So are facility-level initiatives to, for example, reduce and dispose of clinical waste and personal protective equipment (PPE) correctly. However, individual health organizations also need to partner with regulators, suppliers, and others to address larger environmental issues. Governments at all levels will play an instrumental role, setting clean energy standards, emissions targets, carbon prices, and other regulatory and policy mechanisms—and also acting as a catalyst through procurement. The technology sector has a critical role to play, as well, in providing the digital infrastructure and solutions to enable a decarbonized health care ecosystem.

2. Climate change’s impact on health systems’ infrastructure and workforce

The increased frequency, intensity, and variability of natural disasters and their downstream effects challenge health care systems’ infrastructure, supply chain, and workforce. Many health care facilities and their support systems are not designed to withstand the impacts of extreme weather events: Infrastructure disruptions (utilities, transportation, communication systems) can impact patient access to emergency and routine services. Supply chain disruptions can lead to shortages (medical equipment, medicine supplies) for patients, providers, and manufacturers.

Already, we are seeing examples where natural disasters have caused challenges for health care systems. In 2012, for example, Hurricane Sandy forced the evacuation of more than 6,400 patients from six hospitals and 21 residential care facilities. NYU Langone Medical Center experienced nearly \$1 billion in damages – operating without an emergency room for 18 months.¹⁷

As climate change’s influence continues to increase, health care leaders will need to build resilience into their facilities, systems, and workforce to withstand natural disasters such as floods, drought, fires, and storms. Doing so is largely about long-term risk reduction: It may not be possible to diminish the risk to zero, but steps can be taken to be prepared in the face of future threats.¹⁸ For example, during the 2010 heat wave in Ahmedabad, India, temperatures reached as high as 46.8°C (116.2°F); a review of one hospital’s records found that its neonatal intensive care unit (NICU) admissions increased dramatically. At the time, the maternity ward was located on the non-air-conditioned hospital’s top floor and under a dark tar roof, making it the hottest area in the building. In response to 2010’s high rate of admissions and neonatal mortality, the maternity ward was moved to the ground floor in 2012, where it was found that, at a cooler 42°C, there was a 64% reduction in heat-related NICU admissions.¹⁹

Workforce skills, capacity, and commitment is a major determinant of health care delivery efficiency and effectiveness.²⁰ This critical resource also constitutes between 70% and 75%²¹ of a hospital or health system’s ongoing operating costs. Understanding the likely impact of climate-related disasters on health care workers is a vital part of any planning/risk mitigation going forward. For examples, organizations should establish contingency working arrangements, such as allowing virtual consults from home or another safe place in the event of extreme weather.

3. Climate change’s impact on people’s health and well-being

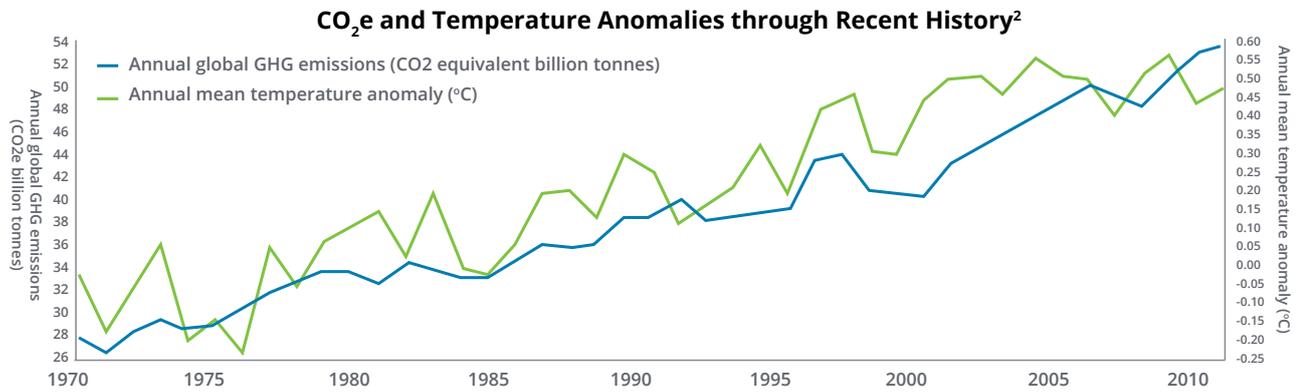
According to the 2020 report of The Lancet Countdown,²² an international collaboration tracking the impact of climate change on health, worsening global climate change is responsible for:

- A 53.7% increase in heat-related deaths in people over 65 years old
- 3.01 million premature deaths from heart and lung disease linked to ambient particulate air pollution
- Undernutrition in some countries due to warmer temperatures, flooding, and drought
- Rising climate suitability for the spread of infectious diseases, which can increase the risk of new pandemics
- Disproportionate impact on vulnerable communities

Climate change is a universal comorbidity (figure 1). Exposure to climate extremes has both direct and indirect effects on physical and mental health. It exacerbates existing conditions, increases vector-borne diseases, and threatens efforts to eradicate/control already eradicated diseases.

Figure 1. Climate change is a universal comorbidity

The science of climate change is as settled as any in the moder canon: human acivity is changing the Earth’s climate in ways that endager the natural environment and all aspects of human civilization. It is a existetial threat to life on earth and the greatest challenge of the 21st century



EXPOSURE PATHWAY

Direct

- Storms
- Drought
- Flooding
- Heatwaves
- Temp.changes
- Wildfires

Indirect

- Water quality
- Air quality
- Land use changes
- Ecological Changes

Mediating factors

Environmental

- Geography
- Baseline weather, air and water quality
- Soil/dust
- Vegetation

Social

- Socioeconomic status
- Baseline health/nutrition
- Displacemet
- Conflict
- Age and Gender

HEALTH IMPACTS

- Mental Illness
- Undernutrition
- Injuries
- Respiratory Disease
- Allergies
- Cardivasular Disease
- Infectious Disease
- Waterborne Disease
- Heat Stroke

Sources: (1) Peter Ward (2) Data from World Bank, NASA, WEF, IPCC, Deloitte analysis

Absent aggressive and rapid steps to cut emissions, chronic illnesses tied to the environment will likely get worse.²³ To minimize the future risk on human health, efforts should be directed at ensuring the health care system has the capacity and expertise to manage the influx of patients with respiratory, cardiovascular, and other climate change-induced health issues.

Furthermore, climate change threatens the achievement of equitable population-wide health and wellness, as it disproportionately affects disadvantaged populations.²⁴ Children, the elderly, and people with existing health conditions are most threatened by the health impacts of climate disruptions such as flooding, dangerous heat, drought, and poor air quality; threats to these groups are compounded for those belonging to indigenous populations and other historically excluded communities that live with unfavorable, geographically-driven climate factors resulting from historic discrimination.

A longitudinal study modeling the life expectancy for 136 nations found a strong correlation between shortened life spans and low air quality areas, with income inequality identified as an amplifying factor between this negative association.²⁵ And another study, published in the journal *Nature Communications*, “found that in all but six of the largest 175 US cities it examined, people of color had higher exposures to heat than White residents.”²⁶ While climate change threatens health across demographics and communities, the most historically excluded and vulnerable members of society are the most vulnerable to its health effects.

“Climate change is the greatest global health threat facing the world in the 21st century, but it is also the greatest opportunity to redefine the social and environmental determinants of health.”

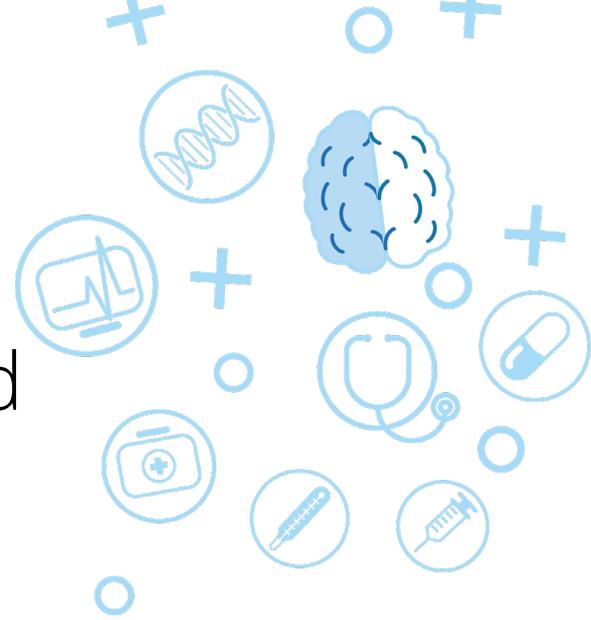
The 2020 report of The Lancet Countdown on health and climate change

To counter the negative effects of climate change, health care organizations need to concurrently employ a mix of mitigation and adaptation/resilience tactics. Some tactics may position the organization to achieve both goals, so identifying opportunities to unlock co-benefits is crucial to developing a portfolio of climate actions. For example, encouraging employees to use active transport (walking, biking) rather than driving reduces an organization's carbon footprint and benefits an individual's health.

Hospitals and health systems are uniquely positioned to advance practices and solutions to protect the health of people and the planet. Through their status as huge employers, major producers and purchasers of goods and services, they can lead and influence supply chains. In addition, they can collaborate with and support the efforts of other sector stakeholders to act on climate change. Consider these examples:

- **National Health Service (NHS):** The UK's publicly-funded health system has been working to reduce its carbon footprint for more than a decade. Between 2009 and 2019, the NHS says it reduced carbon-dioxide emissions by 26%. A decarbonized UK electricity grid significantly reduced energy-related emissions, and the phase-out of chlorofluorocarbon propellants in inhalers also helped to decrease greenhouse gas emissions. More recently, increased use of telehealth monitoring, remote diagnostics, and virtual appointments is helping cut air pollution related to car emissions. The next step, according to NHS, is to convert gas boilers to electric heat pumps and switch to a low-carbon energy source.²⁷
- **Kaiser Permanente:** Last fall, California-based Kaiser Permanente announced that it had become carbon-neutral. Onsite, Kaiser Permanente installed solar panels, made long-term purchases of renewable energy, and took other steps to make its buildings more energy efficient. The organization is also sourcing local and sustainable healthy food for its patients and employees. It also has taken steps to substantially reduce food waste in its supply chain. Off-site, the health system invested in ways to offset emissions generated by its hospitals.²⁸
- **Health Care Without Harm²⁹** is a non-profit organization that works to transform the health care sector worldwide so that it reduces its environmental footprint, becomes a community anchor for sustainability and a leader in the global movement for environmental health and justice. In July 2021, the organization launched Climate Impact Checkup, a unique tool developed for any health care facility in the world to measure, manage and track GHG emissions to support climate change mitigation goals.

Questions/actions health care leaders should consider for 2022



The sheer magnitude and complexity of environmental, social, and governance challenges can be overwhelming. Where should health care organizations start, and what might the journey look like?

Mitigating and adapting to climate change presents a global opportunity to remake the foundations of health care and introduce new operational models for resilience and sustainability. An organization's response to climate change should not be an "add-on" initiative; it should be integrated into a transparent, comprehensive planning and decision-making process. To begin the journey, sector leaders should set aside existing frameworks and preconceptions about what the health care sector—and their organization's place in it—should look like and assess, instead, their role in a sector that is likely to be reconfigured as it moves toward a low-carbon footing.

Among actions to consider:

Develop a business case to show the economic benefits of reducing health care's waste and carbon footprint. Health care leaders typically focus on access, quality, and cost when identifying and assessing enterprise-level improvement opportunities. It's time to add a fourth dimension to deliberations: environmental sustainability. While this doesn't mean an organization will always choose the (sometimes pricier) sustainable option, there are ways to address the needs of multiple priority areas to achieve clinical, financial, and environmental objectives. For example:

- The health care ecosystem encourages **healthy behaviors**, such as reducing meat consumption and biking over driving, which have a **positive downstream climate impact**.
- Micro-interventions build over time to **prevent disease** from developing in the first place, which **reduces demand** for carbon-intensive health care infrastructure.
- Health recommendations that are **personalized and extend beyond** traditional care delivery improve health systems' ability to **target "hot spots"** and effect greater change.
- Right-sized care is **less service- and carbon-intense** due to improved baseline health across a population.

Understand where value is likely to be created in a low-carbon future. Value drivers in a low-carbon health care economy include using less; emitting less; regenerating, restoring, and repairing; and measuring, verifying, disclosing, valuing, and tracking. Specific action items could include implementing energy efficiency and renewable energy to get to net-zero energy usage; reducing water consumption and reuse; investigating sustainability ratings for hospitals and other facilities; designing energy efficiency into new buildings; procuring sustainable and ethical materials and equipment; and employing models of care delivery that avoid unnecessary or duplicative testing and treatment. Creative thinking can uncover virtually limitless opportunities for value-creation in a low-carbon future.

Adopt systems thinking to address climate change. Every public and commercial health care entity has both an individual and a collective role to play in accelerating the transition to a low-carbon economy. Start with the basics of understanding your carbon footprint and identifying the major levers you can pull to introduce change. Adopting a systems-thinking approach can help leaders look beyond their organization's carbon-reducing initiatives and answer questions that can unlock critical, interconnected opportunities:³⁰ How can health systems invest in their communities to improve planetary and human health at the same time? What about leveraging purchasing power and general operations budgets to create demand for products that have an environmental and health benefit? How might emerging technologies such as virtual health and increased computing power from cloud, artificial intelligence and machine learning be combined with new business models to create more resilience in health care systems?³¹

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