Climate Change and Healthcare: A Complicated Relationship

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SUMMARY

Climate change is a crisis with a devastating impact on health. The warming atmosphere is increasing the tolls of deaths and illnesses from heat waves, extreme weather, poor air quality, insect-borne diseases, and other conditions. Healthcare is connected to climate change in a way that is not fully appreciated by many healthcare leaders—in fact, the sector generates a significant share of greenhouse gas emissions that cause climate change. As additional costs, healthcare providers’ margins are put at risk from treating more climate-related diseases and illnesses, supply chain disruptions, and damage from severe storms and wildfires. These connections provide a compelling rationale for healthcare executives to create more resilience in operations, lead efforts toward decarbonization, and catalyze climate action.

A wildfire in northern California jumps from a forest into a city, forcing a hospital to close. A superstorm hits the East Coast, causing evacuations of 6,300 patients in New York City. A heat wave blasts...
the Pacific Northwest with temperatures of 110 degrees, costing the lives of hundreds of mostly poor and elderly people.

These recent devastating events have something in common: their association with the climate crisis. In response, meaningful actions to reduce greenhouse gas emissions must be accelerated to avoid the worst human health consequences of global warming because the human toll from inaction is real and worsening.

The United Nations warns that global emissions must be cut in half by 2030 and get to zero by 2050 to keep warming to 1.5 degrees Celsius (2.7 degrees Fahrenheit) and avoid the most catastrophic effects of climate change (Intergovernmental Panel on Climate Change 2022). Healthcare has an outsized role to play in achieving this imperative. The sector both contributes to and is burdened by the implications of this health crisis, and it is in a unique position to speed up solutions.

CLIMATE CHANGE AND HEALTH

Health concerns are front and center in the climate crisis, and the harms are widely recognized. Two overarching effects make climate change a health crisis:

1. The warming trend supercharges the frequency and severity of weather disasters across the planet, which leads to injury, death, displacement, and damage to property and ecosystems.
2. Health consequences are especially devastating for people with higher existing health risks, especially older adults, children, those with chronic conditions or disabilities, and those living in low-income communities or communities of color.

Climate change affects health in many ways. Some examples follow.
• **Heat.** As the deadliest result, heat waves occur more frequently and last longer without sufficient cooling at night.
• **Air quality.** Worsened by warmer weather and wildfire smoke, poor air quality causes respiratory illnesses such as asthma.
• **Severe weather.** Superstorms, floods, long-term droughts, and destructive winds wreak widespread injury, death, and destruction.
• **Vector-borne illnesses.** As mosquitoes and other insects thrive at expanded latitudes and elevations, more people are exposed to Lyme disease, malaria, and dengue fever.
• **Food and water contamination.** Pathogens such as salmonella occur more frequently with persistently high temperatures and rainfall—prime conditions for diarrhea and other diseases.
• **Food scarcity.** Droughts and severe weather strike at crop production, resulting in hunger, malnutrition, and population displacement.
• **Mental health trauma.** Severe weather events and heat waves are associated with immediate trauma as well as with longer-term despair resulting from a suddenly uncertain future (U.S. Global Change Research Program 2016).

**CLIMATE CHANGE AND HEALTHCARE DELIVERY**

**We’re Part of the Problem**

Many leaders in care delivery are surprised to learn that their operations contribute significantly to a warming climate. If the global health sector were a country, it would be the fifth largest emitter of greenhouse gases in the world (Arup and Health Care Without Harm 2019); in the United States, 8.5 percent of emissions are from healthcare (Dzau et al. 2021).
Some important sources of emissions can be controlled through operations. These include the consumption of natural gas to heat and cool buildings, anesthetic and medical gases, fleet vehicles fuel, refrigerants, and purchased electricity. Such uses typically account for about 20 percent of all emissions for a healthcare organization. The rest results from decisions each organization makes that are indirectly tied to emissions through its supply chain and investments. For example, if a computer you purchase was made with coal-fired energy, it has a larger carbon footprint than one made with renewable energy. Investments you make in fossil-fuel holdings exert a larger footprint, as well. Other indirect emission sources to consider include staff commutes, business travel, patient transportation, contracted deliveries, waste disposal, and leased assets.

Where Healthcare Feels Burdens of Climate Change

Infrastructure
Hard lessons were learned in 2005 from Hurricane Katrina when hospitals were flooded and their basement mechanical plants stopped functioning, which led to patient deaths. Now, power systems are more commonly located at elevated levels. In 2017, the wildfire that shut down a northern California hospital forced an emergency evacuation, and it remained closed for more than two weeks while all supplies could be replaced and the facility cleared of smoke. Today, huge wildfires are regular occurrences in the United States, prompting hospitals to enhance their emergency plans and infrastructure to better anticipate and respond to the growing risk.

Among specific infrastructure risks of severe storms, sea-level rise and coastal erosion, and wildfires are:

- suspension or closure of key facilities (clinical, research, information technology),
- compromised ventilation as a result of harm to energy and mechanical systems,
damaged property,
release of hazardous material,
derundermined availability and quality of water,
interrupted supply chains, and
inaccessible roadways.

Hospitals in regions that are most at risk are investing in resilience by hardening their buildings’ facades and equipment against wind and flood damage, relocating critical infrastructure and clinical services above flood and storm surge levels, building barriers to mitigate storm surge intensity, and expanding on-site generator capacity.

Financial Cost
In addition to the infrastructure costs from climate-exacerbated severe weather and wildfires, the health costs of fossil fuel–related air pollution total $820 billion per year in the United States (De Alwis and Limaye 2021). Medical treatment for health problems worsened by climate change is expensive and a financial burden to patients, employers, public and private insurers, and health system operators.

Supply Chain Disruption
Hurricane Maria devastated Puerto Rico in 2017, shutting a major production facility for saline intravenous bags. The subsequent shortage of these ubiquitous medical products throughout the US healthcare system lasted for months. The COVID-19 pandemic also has exposed vulnerabilities in the healthcare supply chain that will worsen the impact of climate change on the production and delivery of supplies, medicine, and equipment.

Investor Concerns
In April 2022, the Securities and Exchange Commission proposed a rule (87 FR 21334) that would require publicly traded companies to disclose their climate-related risks and greenhouse gas emissions to investors. Investors have been stepping up their demands to understand the financial risks related to climate change, and this pressure
is causing companies to create more robust plans to reduce their greenhouse gas emissions.

**Impact on Personnel**
Healthcare leaders are very concerned about burnout and staffing shortages. Climate change adds to those vulnerabilities. The California wildfire mentioned earlier had a catastrophic impact on the hospital staff, as hundreds of employees and physicians lost their homes. These individuals were both caregivers and victims of the disaster. The trauma they experienced is repeated in every community that suffers from extreme storms, deadly heat waves, and wildfires. Experiencing these types of events can cause significant distress and contribute to more serious mental health issues such as anxiety disorders and depression.

**THE BENEFITS OF CLIMATE-SMART ACTIONS**

Healthcare executives should consider the financial benefits that can be derived from their leadership in reducing greenhouse gas emissions. Some examples follow.

- **Lower costs.** Optimizing energy systems, reducing water consumption, and adopting other green building features can lower energy and operating costs.
- **Energy price stability.** Drawing from renewable energy sources, on-site and off-site, can help stabilize prices.
- **Ongoing value.** Reducing waste reduces the expenses of disposal and emissions.
- **Less damage.** Designing resilient facilities can result in lower damage costs from extreme weather and wildfires.
- **Staff recruitment and retention.** Attracting and keeping talent is easier, as many health professionals today prefer to work where climate change action is a priority.
• **Risk avoidance.** Avoiding loss of value associated with risks that are not adequately addressed is especially important to investor-owned organizations.

• **Cleaner air.** Reducing air pollution from fossil fuel use mitigates health risks and saves lives.

**HOW TO LEAD THE BATTLE**

There are several strategic commitments that healthcare executives can make now to ensure a healthier future for their organizations and their communities.

**Set a Target of Zero Emissions**

• Set targets to cut emissions in half by 2030 and achieve zero emissions by 2050 (as suggested by Science Based Targets at https://sciencebasedtargets.org/). While the work presents challenges, the crucial importance of this goal is commensurate with the health crisis associated with climate change.

**Understand Your Emissions**

• Conduct an inventory of emissions from facility operations and purchased energy using the Greenhouse Gas Protocol (see https://ghgprotocol.org/corporate-standard).

• Conduct a spend-based inventory for those emissions you influence through your supply chain and investment portfolios, and calculate other activities such as commuting, business travel, and so forth (as outlined by the EPA Center for Corporate Climate Leadership at https://www.epa.gov/climateleadership/scope-3-inventory-guidance).
Prepare and Execute a Reduction Plan

**Reduce Emissions You Control**

- Cut facility energy use through efficiency and design initiatives. The US Green Building Council’s LEED certifications (posted at https://www.usgbc.org/leed) specify actions for new and existing buildings.
- Invest in renewable energy through on-site and off-site solar and wind installations.
- Reduce natural gas used for heating and cooling buildings by transitioning to renewable energy modes such as geothermal, hydrogen, and biomass.
- Purchase zero-emissions fleet vehicles.
- Switch to lower-emission anesthetic gases (e.g., eliminate the use of desflurane), consider waste anesthetic gas-capturing systems, and reduce nitrous oxide waste—especially from centrally piped systems.

**Reduce Emissions You Influence**

- Encourage suppliers to reduce their operational emissions over which they have direct control (i.e., emissions related to buildings, fleets, purchased energy).
- Limit waste by minimizing the use of single-use devices and plastics and implementing circular systems in which materials have lasting value when maintained through repair and recapture.
- Decrease business travel by continuing the pandemic-induced practice of virtual meetings.
- Incentivize staff commuting by public transit, walking, and bicycling; optimize remote work.
- Reduce patient and visitor trips through transit shuttles and by consolidating patient appointments with multiple providers.
• Promote local and seasonal meal menus while reducing reliance on resource-intensive meat and dairy products.

**Link Climate and Quality Initiatives**

• Prioritize high-quality, high-value healthcare and promote preventive care to avoid illnesses while reducing healthcare costs and emissions associated with treating (and re-treating) diseases.
• Cut inefficient and unnecessary practices.
• Reduce unnecessary pharmaceutical use.
• Include greenhouse gas emissions data on leadership and quality performance dashboards.

**CONCLUSION**

Greenhouse gas emissions must be eliminated to avoid the most catastrophic effects of climate change that are already underway. Healthcare leaders must address the sector’s greenhouse gas footprint, which is a sizable portion of the entire US footprint. Decarbonization strategies can yield benefits such as reduced financial and operational risks and infrastructure resilience. Healthcare executives can leverage their roles as community leaders by acting with urgency. The way out of this health crisis is for healthcare organizations and their global value chains to be catalysts for a carbon-free future.

**ADDITIONAL RESOURCES**


Health Care Without Harm. 2018. “Safe Haven in the Storm: Protecting Lives and Margins with Climate-Smart Health


REFERENCES


PRACTICE GREENHEALTH: A SUPPORT SYSTEM FOR SUSTAINABILITY

Practice Greenhealth is a networking organization of more than 1,500 US and Canadian hospitals and healthcare systems. Together, they embrace sustainability to practice the Hippocratic oath’s ethical precepts—to heal and to do no harm—through emissions reduction, elimination of toxic chemicals and products, creation of safer working environments, waste reduction, healthier food offerings, and more efficient use of energy and water.

Representing 20 percent of the US economy with a workforce of 22 million, healthcare has the power to transform lives, communities, and markets. To help its members do that, Practice Greenhealth provides information, tools, data, resources, and expert technical support for local sustainability initiatives. When tied to business and mission-driven goals, sustainability programs yield benefits not only for the planet but also for a hospital’s financial bottom line, patient satisfaction and well-being, employee engagement, and the communities healthcare organizations serve.

Reducing Wastes, Reducing Costs

Over the past seven years, Practice Greenhealth member hospitals have achieved remarkable results: 1.5 million kilowatt...
hours of energy saved through energy efficiency, 1.8 million metric tons of carbon avoided through mitigation and resilience, 424,000 metric tons of carbon avoided through the use of renewable energy, 1.5 billion gallons of water saved, and 1.9 billion pounds of waste diverted from landfills. In addition, these projects have reduced operational costs. Savings have ranged from approximately $200,000 annually at a small critical access hospital to more than $5.5 million in 2019 at a large academic medical center. Annual savings across the membership have averaged around $350,000 on waste-related costs, $214,000 through advancements in energy efficiency, and $300,000 by implementing Practice Greenhealth’s operating room strategies.

In sum, these results help organizations understand the cost, impact, and performance of their past and present sustainability initiatives and anticipate future conditions and requirements, allowing them to unlock hidden value and build more resilient enterprises.

Practice Greenhealth’s tools help hospitals and health systems measure sustainability metrics, identify gaps, refine goals, and focus their sustainability efforts. Individualized sustainability report cards provide an annual snapshot of a facility’s performance on 30 metrics along with percentile comparisons to peer hospitals. Also, the annual Sustainability Benchmark Report covers industry statistics, trends, and emerging issues.

**Celebrating Achievements**

Practice Greenhealth goes beyond benchmarking and annually celebrates sustainability achievements through its Environmental Excellence Awards program. Stony Brook University Hospital, a long-standing member, has consistently...
been recognized for its environmental sustainability leadership, most recently receiving Practice Greenhealth’s Top 25 Environmental Excellence Award. A culture of sustainability is embedded into its public-facing environmental commitments, sustainability grand round series for staff and leadership, and meticulous practices in data collection and review. Gap analyses help SBUH recognize needs and strategize new ways to reduce insulin, pharmaceutical waste, and other chemicals.

Another leader in environmental sustainability, Ascension has aligned its sustainability efforts in areas that have the greatest impact, including sustainable procurement, green building, and waste reduction. The health system applies Practice Greenhealth’s data collection framework to its annual reporting and goal-setting for its environmental stewardship program. Ascension’s commitment to net-zero carbon emissions and zero waste by 2040 serves as an inspiration for other health systems to set ambitious sustainability goals.

As a network of like-minded organizations, Practice Greenhealth hospitals and health systems participate in work groups through virtual cohort calls. Cohorts are groups of sustainability and healthcare professionals of similar regions, interests, and hospital types from children’s hospitals to academic medical centers. They meet to learn from peers and experts, develop strategies to overcome barriers to sustainability progress, and expand their network with new connections to leaders and innovators.

Participants say that they benefit from the successes and experiences of colleagues across the country, implementation guidance from experts, and the resources and tools that are appropriate to where they are in their sustainability journey.

*Practice Greenhealth*
FOR DISCUSSION

1. Considering the many ways climate change affects health, what is the most significant environmental concern in your community?
2. Which are some of the standard operations at your institution that contribute to greenhouse gas emissions?
3. What climate-smart actions could you recommend to your institution? How would you make a business case for their adoption?
4. How can climate initiatives support quality initiatives over both the short and long term?