

ASPR TRACIE Technical Assistance Request

Request Receipt Date (by ASPR TRACIE): 7 March 2022

Response Date: 9 March 2022

Type of TA Request: Standard

Request:

The requestor asked ASPR TRACIE for resources related to how the healthcare and public health sector may contribute to/affect/exacerbate climate change issues.

Response:

The ASPR TRACIE Team conducted a search of existing ASPR TRACIE resources, namely the [Climate Change Resilience and Healthcare System Considerations](#) document, and the [Climate Change and Healthcare System Considerations](#) and [Natural Disasters](#) Topic Collections. We also conducted a search online for additional related resources. Section I of this document provides a summary of key points for consideration that were compiled from the literature reviewed, and Sections II include links to those resources.

I. Key Points for Consideration

- The U.S. healthcare sector contributes extensively to greenhouse gas emissions, carbon dioxide, air pollution, and environmental degradation. This is primarily caused by:
 - Energy intensive 24-hour operation of services in hospitals.
 - 24/7 operations of computers, machinery, and lighting.
 - Ventilation systems that exchange air up to 20 times an hour or more even when patient or operating rooms are empty.
 - High demand of healthcare services and operations that rely on natural resources such as energy, water, and food procurement.
 - High production of medical waste and unsustainable materials.
- Hospitals and pharmaceutical companies are large drivers of emissions.
 - Healthcare facilities consume more energy than any industry except for food service.
 - Hospitals consume [2.5 times as much](#) energy per square foot as typical office buildings, contribute to tons of medical waste, and emit atmosphere-damaging gases used in surgery and other procedures.
- Research has indicated that healthcare emissions, through the relationship between air pollution and human health, results in [23,000 years of life lost](#) due to disability or early death.
- Most healthcare sustainability initiatives focus on large-scale facility operations, such as improving hospital energy performance and sourcing renewable electricity.

- Healthcare organizations lag behind every other economic sector in sustainability reporting.
- The following examples can reduce emissions from healthcare services:
 - Clinicians can monitor and treat patients virtually at home.
 - Switching from fluorescent lights to lower-energy LEDs and installing software on computers that would automatically put them to sleep when not in use can reduce energy use.
 - Healthcare facilities can install systems that adjust the air exchanges based on patient/ operating room occupancy and exchange only as much air as is necessary.
- Incorporating appropriate mitigation efforts to reduce greenhouse gas emissions can also contribute to enhanced patient care and cost savings.
 - Reducing emissions can help reduce the health impacts of climate change, while also improving wellbeing through health co-benefits, such as cleaner air.
 - Importantly, these co-benefits can help to offset part of the costs of mitigation interventions.

II. Select Relevant Resources

American College of Physicians. (n.d.). [Climate Change Toolkit](#). (Accessed 3/8/2022.)

This toolkit includes information on how to reduce energy use and greenhouse gas emissions in a healthcare facility or practice. Resources includes power point slides, patient education facts, and talking points broken down by region.

Backman, I. and Abbott, F. (2021). [Stanford Explainer: Social Cost of Carbon](#). Stanford News.

This webpage explains the work done by Marshall Burke and Lawrence Goulder, two economists at Stanford University, who describe the social cost of carbon, how it is calculated and used in policymaking, and how it relates to environmental justice.

Blumenthal, D. and Seervai, S. (2018). [To Be High Performing, the U.S. Health System Will Need to Adapt to Climate Change](#). The Commonwealth Fund.

The authors of this article state that the U.S. healthcare system is the world's seventh-largest producer of carbon dioxide, which makes the U.S. a major contributor to air pollution. The U.S. must take action to reduce greenhouse gas emissions and take proactive steps to mitigate climate change impacts.

Budd, K. (2019). [Hospitals Race to Save Patients- and the Planet](#). Association of American Medical Colleges.

This article highlights hospital contributions to greenhouse gas emissions and waste amid the climate crisis. It details specific actions that can be taken to reduce the carbon footprint of a healthcare facility with specific examples and case studies.

Chen, A. and Murthy, V. (2019). [How Health Systems are Meeting the Challenge of Climate Change](#). Harvard Business Review.

This article summarizes discussions with four major health systems taking action against the climate crisis by moving to make their facilities carbon neutral and building climate resiliency. It summarizes specific efforts being taken at the Cleveland Clinic, Kaiser Permanente, Boston Medical Center, and Partners Healthcare.

Choi-Schagrin, W. (2021). [How Hospitals Fuel Climate Change](#). (Subscription and log in required.) The New York Times.

The author of this article states that the healthcare industry is a large source of greenhouse gases, which account for approximately 5% of global carbon dioxide emissions. The article identifies several ways in which health systems contribute to these emissions such as 24/7 operations of computers, machinery, and lighting; and ventilation systems that exchange air up to 20 times an hour or more even when rooms are empty.

Cooper, R. (2019). [States Take the Lead to Address Climate Change](#). National Academy for State Health Policy.

This article summarizes recent state actions to mitigate the climate crisis and includes specific information on state policy goals, partnerships, and collaborations. It addresses protection of public health, environmental justice, and equity as well as how health systems can reduce emissions.

Cummings, M. (2019). [Health Care Industry is a Major Source of Harmful Emissions](#). Yale News.

The author states that the U.S. healthcare system contributes 10% of the nation's carbon emissions and 9% of harmful non-greenhouse air pollutants. He also notes that the rate of greenhouse emissions from the healthcare sector increased by 30% between 2006 and 2016.

DeAlwis, D. and Limaye, V.S. (n.d.). [The Costs of Inaction: The Economic Burden of Fossil Fuels and Climate Change on Health in the United States](#). (Accessed 3/8/2022.) The Medical Society Consortium on Climate and Health, Natural Resources Defense Council, and Wisconsin Health Professionals for Climate Action.

This report estimates the financial impact of climate change on healthcare costs specifically highlighting the harm of fossil fuels, vector-borne disease, and extreme weather events. It tallies the economic toll of each environmental issue and provides recommendations for individuals, communities, and health professionals to mitigate further consequences.

Frentzel, E., Roberson, B., Madan, I., et al. (2019). [The State of Climate Resilience and Climate Mitigation Efforts at Essential Hospitals](#). Essential Hospitals Institute.

This report presents findings and recommendations related to building climate resilience at essential health practices and outlines how they can help mitigate climate change, engage communities, and educate partners.

Gan, C.C.R., Banwell, N., Pascual, R.S., et al. (2019). [Hospital Climate Actions and Assessment Tools: A Scoping Review Protocol](#). *BMJ Open*. 9:e032561.

This review, a part of the climate-smart healthcare initiative, assesses current hospital climate actions and the existing tools available to measure progress.

Global Green and Healthy Hospitals. (n.d.). [Climate Change](#). (Accessed 2/8/2022.)

This webpage provides information on the Global Green and Healthy Hospitals initiative to move hospitals and healthcare facilities towards more sustainable green practices. It outlines how hospitals can contribute to reducing the impact of the climate crisis, opportunities for action, and resources for reducing climate-related impacts on health.

Health Care Without Harm. (2019). [Health Care's Climate Footprint: How the Health Sector Contributes to the Climate Crisis and Opportunities for Action](#). Associated Regional and University Pathologists.

This research paper includes information on the healthcare sector's impact on climate change. It includes a roadmap and policy recommendations for decarbonizing the healthcare industry and how to support climate-smart healthcare practices.

Kaiser Health News. (2021). [Hospitals Confront Climate Change as Patients Sick from Floods, Fires Crowd ERs](#).

This article explains how the healthcare industry is having a negative impact on climate change. It states that U.S. healthcare facilities consume more energy than any industry except for food service. Hospitals consume 2.5 times as much energy per square foot as typical office buildings, contribute to tons of medical waste, and emit atmosphere-damaging gases used in surgery and other procedures.

Mercer, C. (2019). [How Health Care Contributes to Climate Change](#). *Canadian Medical Association Journal*. 191(14): E403–E404.

This article addresses the impacts that the healthcare industry in Canada has had on climate change. It states that from 2009-2015, healthcare in Canada was accountable for 4.6% of national greenhouse gas emissions. The author claims that research has indicated that healthcare emissions (through the relationship between air pollution and human health) results in 23,000 years of life lost due to disability or early death.

Meyer, M. (2021). [Doctors Pledge to Do No Harm. The Entire Health Care Sector Should Do the Same by Battling Climate Change.](#) Stat News.

This article outlines key aspects of climate change on human health, including recent statistics on impacts and initiatives taken in healthcare. It provides specific recommendations to reduce waste, pollution, and carbon footprint.

Paterson, P.B., Berry, P., Ebi, K., et al. (2014). [Health Care Facilities Resilient to Climate Change Impacts.](#) International Journal of Environmental Research and Public Health. 11(12): 13097–13116.

This article focuses on how to make healthcare facilities more resilient to climate change and how to identify gaps in preparedness. It also addresses how “healthcare facilities contribute significantly to greenhouse gas emissions through the energy intensive 24-hour operation of services and to environmental degradation through the high demand of healthcare services and operations on natural resources (energy, water, and food procurement).”

Shankar, D. and Ahsanuddin, S. (2019). [It’s Time for the Health Care System to Reckon with the Human Costs of Climate Change.](#) Health Affairs.

The authors of this article state that the U.S. healthcare sector produces about 10% of the nation’s total annual carbon emissions. In 2011, the healthcare sector produced 655 million metric tons of carbon dioxide and other greenhouse gases. The authors also highlight how healthcare organizations lag behind every other economic sector in sustainability reporting.

Sherman, J.D., McGain, F., Lem, M., et. al. (2021). [Net Zero Healthcare: A Call for Clinical Action.](#) British Medical Journal. 374:n1323.

This article identifies several ways in which the healthcare sector can support sustainability initiatives, such as clinicians having the ability to determine whether monitoring and treatment of patients can be administered at home, clinic, or the hospital, which has the highest resource and emissions intensity. The authors also explain how providing care virtually as appropriate can reduce fuel and clinic emissions.

Tennison, I., Roschnik, S., Ashby, B., et al. (2021). [Health Care’s Response to Climate Change: A Carbon Footprint Assessment of the NHS in England.](#) The Lancet Planetary Health. 5(2). E84-E92.

The authors of this article note that the healthcare sector is responsible for approximately 4-5% of global greenhouse gas emissions. They also state that mitigation efforts will result in substantial reductions of emissions, which can also lead to enhanced patient care, staff satisfaction, and cost savings.