

# Addressing the environmental impact of healthcare is a vital step to combat the climate crisis

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## **Daniel G. Rainham and Sean D. Christie from Dalhousie University and Nova Scotia Health discuss the key areas where efforts should be directed to reduce the environmental impact of healthcare**

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The climate crisis presents a monumental challenge for global health systems, which paradoxically are significant contributors to environmental degradation. The transition to low-carbon healthcare, often called green or sustainable care, is imperative for mitigating the sector's environmental impact while preserving planetary health and human wellbeing.

### **Environmental Impact of healthcare and the need for measurement**

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The provision healthcare consumes enormous amounts of energy and other resources. In Canada and the United States, healthcare accounts for between 5% and 8.5% of national greenhouse gas emissions, respectively, including direct emissions from healthcare facilities and indirect emissions from transportation, supply chain and waste disposal. (1,2) Furthermore, hospitals are the third most energy-intensive type of commercial building, after food service and sales, using an average of 566kWh of electricity per 1 m<sup>2</sup>•yr. (3) Canadian hospitals produce an estimated 3.4 tonnes of solid waste per bed. (4)

Efforts to reduce the healthcare sector's carbon footprint hinge on accurate measurement and comprehensive analysis. Life cycle assessment (LCA) is a key methodology to quantify environmental impact of healthcare products and services, from raw material extraction to disposal. (5)

LCAs enable healthcare professionals to make evidence-based decisions regarding sustainable practices, highlighting emission hotspots and guiding mitigation strategies.

Healthcare LCA (6) supports healthcare professionals, policymakers, and sustainability researchers by offering data on the environmental impacts associated with a broad array of activities pertaining to the delivery of healthcare services. (5) Importantly, this repository reflects exponential growth in sustainability research over the past two decades, emphasizing the mounting awareness of healthcare's environmental impact. (6)

### **Moving away from single-use items**

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Single-use medical items represent hotspots of healthcare-related emissions. Surgical suites generate from 3.2 to 5.2 million kgCO<sub>2</sub>e annually, with anesthetic gases and disposables being primary contributors. <sup>(7)</sup> Although single-use items are often chosen due to concerns over infection control and convenience, the environmental cost of manufacturing, transporting, and disposing of these items is substantial. <sup>(7)</sup> Moving towards reusable alternatives, particularly in high-use areas like operating rooms, can markedly reduce emissions. Research shows that for many applications, reusable options are both environmentally superior and economically advantageous in the long run, without negatively impacting patient outcomes.

## **Mitigation strategies: Beyond measurement**

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While measurement is crucial, healthcare systems must adopt practical mitigation strategies to reduce emissions. Key approaches include:

1. Energy efficiency and renewable energy adoption:  
Transitioning to renewable energy sources, such as solar and wind power, can significantly reduce emissions from hospital operations. Retrofitting healthcare infrastructure to enhance energy efficiency – by improving insulation, using energy-efficient lighting, and optimizing heating, ventilation, and air conditioning systems – further contributes to emission reductions. <sup>(7)</sup>
2. Sustainable procurement:  
Integrating carbon emissions data into procurement decisions can incentivize suppliers to develop low-carbon medical products. This strategy aligns with global efforts, as seen in the UK's National Health Service (NHS) commitment to net-zero emissions by 2045 through green procurement practices. <sup>(8)</sup>
3. Waste reduction:  
Reducing waste by minimizing single-use items, enhancing recycling protocols, and properly disposing of medical waste can decrease environmental impact. Hospitals should consider adopting circular economy principles, where materials are reused and recycled to the greatest extent possible.
4. Sustainable healthcare practices:  
Employing LCAs to identify high-impact areas within surgical and anesthetic practices allows for targeted interventions. For instance, choosing inhalational anesthetics with lower global warming potential and reducing unnecessary surgical procedures can improve environmental performance and significantly reduce greenhouse gas emissions. <sup>(7)</sup>
5. Plant-forward food services:  
Research on the environmental impact of patient meals in healthcare institutions is limited. Our own research estimates an average of 8.8kg CO per patient-bed-day. Simply replacing beef as a protein source with chicken would reduce emissions by 29% (Murray et al., in preparation).

## **Policy challenges and opportunities**

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Achieving sustainable practices has significant challenges, particularly in countries with decentralized healthcare like Canada. Provincial autonomy can hinder the implementation of national strategies, leading to inconsistent adoption of green practices. <sup>(1)</sup> Effective policy frameworks may consider:

- National standards and incentives:  
Establishing federal guidelines and financial incentives for low-carbon healthcare operations will standardize efforts and promote prioritizing sustainability initiatives.
  - Leadership and accountability:  
Healthcare leaders must champion sustainable practices and integrate environmental stewardship into institutional cultures. Creating designated sustainability roles within healthcare facilities can help maintain momentum and accountability.
  - Education and training:  
Incorporating environmental sustainability into medical education empowers future professionals to adopt green practices from the outset. Surveys indicate that while healthcare professionals acknowledge the importance of sustainability, it remains a low priority in medical and public health curricula.
- (1)

The path forward: A multi-faceted approach

Sustainable transformation requires a coordinated effort across multiple stakeholders: healthcare practitioners, policymakers, industry, and the public. As the climate crisis escalates, it is essential to integrate sustainability into all aspects of healthcare.

Healthcare professionals must lead by advocating for sustainable practices within their institutions and fostering partnerships to develop innovative solutions. Simultaneously, governments must provide the regulatory framework and financial support necessary to facilitate transformation. Furthermore, enhanced public awareness of healthcare's environmental impact can drive societal demand for cleaner, more sustainable healthcare systems.

A robust commitment to sustainable practices is crucial to mitigate the environmental impact of healthcare. Leveraging data-driven tools like LCAs, reducing reliance on single-use items, and enacting supportive policies will minimize the sector's carbon footprint and enhance public health resilience in the face of climate change. As stewards of health, the medical community must take proactive steps to reduce its environmental footprint, thereby safeguarding both human health and the planet.

1. Barber B, Rainham DG, Tyedmers P, Vandertuin T, Ritcey G, Christie SD. Taking action towards climate-resilient, low-carbon, health systems: Perspectives from Canadian health leaders and healthcare professionals. *Healthc Manage Forum*. 2024 Sep;37(5):395-400. doi: 10.1177/08404704241252032. Epub 2024 May 13. PMID: 38739689; PMCID: PMC11348628.

2. Eckelman MJ, Sherman J. Environmental Impacts of the U.S. Health Care System and Effects on Public Health. PLoS One. 2016 Jun 9;11(6):e0157014. doi: 10.1371/journal.pone.0157014. PMID: 27280706; PMCID: PMC4900601.
3. <https://www.eia.gov/consumption/commercial/>
4. <https://greenhealthcare.ca/wp-content/uploads/2019/09/GHS-2017-Report.pdf>
5. Drew J, Christie SD, Rainham D, Rizan C. HealthcareLCA: an open-access living database of health-care environmental impact assessments. Lancet Planet Health. 2022 Dec;6(12):e1000-e1012. doi: 10.1016/S2542-5196(22)00257-1. PMID: 36495883.
6. <https://healthcarelca.com/>
7. Drew J, Christie SD, Tyedmers P, Smith-Forrester J, Rainham D. Operating in a Climate Crisis: A State-of-the-Science Review of Life Cycle Assessment within Surgical and Anesthetic Care. Environ Health Perspect. 2021 Jul;129(7):76001. doi: 10.1289/EHP8666. Epub 2021 Jul 12. PMID: 34251875; PMCID: PMC8274692.
8. <https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2020/10/delivering-a-net-zero-national-healthservice.pdf>

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