# Title: **Natural Disasters’ Impact on Supply Chain Spurs Reckoning with Health Care’s Role in Climate Change**

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In late September 2024, Hurricane Helene made landfall in the Southeastern United States. Record-breaking precipitation from this hurricane caused catastrophic flooding in the region. Hurricane Helene has been called the deadliest hurricane to strike the US mainland since Hurricane Katrina in 2005. As 2024 came to an end, more than [200 fatalities](https://www.climate.gov/news-features/event-tracker/hurricane-helenes-extreme-rainfall-and-catastrophic-inland-flooding) had been ascribed to Helene, with many individuals still reported missing. Economic costs were also staggering, with projected losses exceeding $50 billion.

One of the hardest hit areas was well inland, in western North Carolina. North Cove, NC, about 40 miles northeast of Asheville, is home to Baxter International’s largest manufacturing plant. This facility produces 1.5 million bags of intravenous (IV) fluids per day, or [60 percent](https://www.aha.org/news/headline/2024-09-30-north-carolina-under-phe-following-hurricane-helene-iv-solutions-plant-closed) of the US’s supply. In addition to the significant damage suffered by the North Cove community, the Baxter plant was forced to halt all operations, leading to a nationwide IV fluid shortage. With [guidance](https://www.fda.gov/drugs/updates-2024-hurricane-season/hurricane-helene-baxters-manufacturing-recovery-north-carolina) from the Food and Drug Administration (FDA), health care organizations implemented temporizing measures, including extending use dates for drug products, and compounding IV medications. The FDA also worked to temporarily import products from other countries to mitigate fluid shortages. [Multiple health care facilities](https://www.ama-assn.org/delivering-care/public-health/iv-shortage-update-baxter-facility-damage-after-hurricane-north) around the US reported that they were forced to postpone elective surgeries and procedures as a result of the IV fluid shortage, which is still ongoing.

The IV fluid shortage from Baxter recalled another major supply chain interruption in 2024 that caused significant impacts to clinical care. Just two months before Helene hit, in July 2024, [BD announced a critical shortage of its BACTEC blood culture vials](https://news.bd.com/2024-07-10-BD-Statement-on-Supplier-Issue-Impacting-BD-BACTEC-TM-Blood-Culture-Vials)from its supplier. Fortunately, this supply disruption has been [largely resolved](https://bdbactec-update.com/), and hospitals have been advised to return to their typical clinical practices. However, during the height of the blood culture vial shortage, health care organizations were required to implement mitigating measures, including strict restrictions on blood culture ordering, and reducing the number of blood culture sets obtainable per patient.

On closer inspection, these two major disruptions reveal two distinct but intertwined issues in health care: waste and environmental sustainability. Throughout the blood vial shortage, many infectious disease physicians (including me) thought about the vast number of unnecessary blood cultures we see collected, and how better blood culture stewardship may have mitigated some of the panic resulting from this shortage. Or, as Dr. Jonathan Ryder and his coauthors stated in [this article](https://pmc.ncbi.nlm.nih.gov/articles/PMC11376067/), perhaps this shortage represented an opportunity to bolster appropriate utilization of blood culture bottles.

Unnecessary blood cultures are just one example among countless others of “low-value care” — defined by [Shrank et al](https://jamanetwork.com/journals/jama/fullarticle/2752664) as “services that provide no or minimal benefit to a patient in a specific clinical situation.” Such care is estimated to cost between $75-$101 billion of unnecessary spending each year in the US. Low-value care can also lead to unnecessary care cascades. For example, an unnecessary CT scan can cause a needless biopsy for an incidental finding. Such cascades are not only wasteful but can expose patients to invasive procedures that may cause harmful complications. Unnecessary cultures with false positive results can also lead to unneeded antibiotic use — in many instances causing antibiotic-related toxicities and furthering our drug-resistant bacteria problem.

Reducing low-value care has another benefit: decreasing the environmental impact of health care. The US health care sector causes approximately [8.5 percent of all US greenhouse gas emissions](https://www.healthaffairs.org/doi/10.1377/hlthaff.2020.01247). With scientific consensus that climate change is making storms like Hurricane Helene more intense, it’s clear that health care must play a vital role in addressing the crisis at its roots. Unnecessary blood cultures likely confer a substantial environmental impact. Blood culture bottles and other microbiologic waste frequently require autoclaving or incineration for disposal, both of which are high environmental impact processes.

Fortunately, many measures that are known to reduce environmental impact also build resilience, manifesting in the ability to maintain clinical processes despite supply chain and other operational disruptions. For example, reusable isolation gowns, which are known to cause [less environmental harm](https://www.sciencedirect.com/science/article/pii/S0196655318300750) compared to single-use disposable gowns, can also provide a reliable supply of personal protective equipment (PPE) during supply chain shortages. Reusable medical devices average [38-56 percent lower carbon emissions](https://www.gov.uk/government/publications/design-for-life-roadmap/design-for-life-roadmap--4) compared to single-use devices. Implementing a circular economy of medical supplies and devices in our health care infrastructure can thus reduce environmental impact and our reliance on volatile and vulnerable supply chains of single-use products.

Making health care more sustainable has clear benefits for the environment and for health care: it can improve organizational resilience, reduce costs, and most importantly, benefit patients. Prioritizing interventions such as reducing low-value care and developing health care processes that support a circular economy can dramatically reduce health care’s carbon footprint, while also improving patient care. Initiatives such as the Institute for Healthcare Improvement’s Decarbonizing Health Care Collaborative for Safety Net Hospitals can help organizations increase sustainability in health care, and ultimately, improve the health of our communities.