

Prescription for a Healthy Planet

THE INEXTRICABLE LINK BETWEEN HUMAN and environmental health is impossible to ignore. This year's searing heatwaves, wildfires and floods have fueled air pollution, disrupted food supply, enhanced the spread of pathogens, and exacerbated myriad diseases from asthma to malaria.

Sadly, things look set to get worse. Climate change is now ranked by the World Health Organization as the single biggest health threat facing humanity, projected to cause 250,000 additional deaths every year between 2030 and 2050.

However, a warming world is not only impacting health. The multitrillion-dollar healthcare industry

is also affecting the climate. Although healthcare as a sector may not get the attention of traditional smokestack industries, the world's vast array of hospitals, clinics, support services and pharmaceutical factories have a mighty carbon footprint.

If the healthcare industry was a country, it would be the world's fifth-largest emitter. Globally, healthcare is responsible for nearly 5% of emissions—and this increases as systems become more sophisticated, with the US health sector estimated to be responsible for a hefty 8.5% of national carbon emissions.

The implications are profound for a business whose mission is to protect and promote health. Perhaps more than any other sector, healthcare has a unique responsibility to put environmental sustainability at the heart of its operations—not just by curtailing emissions, but by acting to tackle the adverse health impacts caused by an over-heating planet.

The critical intersection of climate and health is now moving up the agenda, as policymakers and individual citizens experience its impact in day-to-day life, and businesses across the healthcare value chain face mounting environmental pressure from

As the climate crisis deepens, Stanford Medicine is leveraging science and smart working practices to counter the threat to health. By **BEN HIRSCHLER** and **JENNIFER SUKAWATY**.

employees, investors and governments.

The issue is also gaining traction on the international stage—exemplified by a landmark decision to hold the first-ever Health Day at this year’s COP28 climate meeting in Dubai. The discussions on December 3 will aim to build a consensus on priority actions for the health system’s response to climate change.

So, what exactly can be done? Few places have a better insight into the challenges and opportunities than Stanford Medicine, the medical school and hospital complex headquartered in Silicon Valley with a long and storied history of biomedical innovation.

Lloyd Minor, MD, the scientist-surgeon who leads the Stanford School of Medicine, is today putting climate center stage in the belief that while the scale of the problem may be daunting, the situation is not hopeless. Instead of despairing, Stanford’s faculty, doctors, hospital administrators and medical students are working on a growing range of projects to tackle the issue piece by piece.

“Climate change is already adversely impacting human health and it will probably continue to do so at an increasing pace in the future. It is, for sure, a danger to everyone. But when we really put our minds to a problem and come together, we can do incredible things,” Minor said.

He draws inspiration from the COVID-19 pandemic and humanity’s ability to develop a vaccine in less than a year—in defiance of all expectations—thanks to the application of groundbreaking science and new models of collaboration across businesses, academia and governments.

In the case of climate change and health, he acknowledges the problem is a lot more complex and the adverse health manifestations far more diffuse. “That means finding the place where we can have maximal impact is harder, but it doesn’t mean we should back away. We need to find actionable targets and then commit to intervening where we can have the greatest impact.”

As a first step, healthcare professionals, policymakers, businesses and society at large need to understand the precise nature of the problem—including the fact that each fraction of a degree of global warming makes a real difference to millions of lives. At 1.5°C warming, for example, the Intergovernmental Panel on Climate Change (IPCC) estimates that 14% of Earth’s population will be exposed to severe heatwaves at least once every five years. At 2°C, that number jumps to 37%.

The message is stark. Turning up the planetary thermostat will translate into more direct deaths



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from heat-related cardiovascular, respiratory and kidney failure—but this is just the tip of the iceberg. More heatwaves also mean more wildfires, stoking air pollution and increasing rates of asthma, pneumonia and lung cancer. A warmer world also fuels the spread of infectious diseases as increases in temperature and humidity encourage the spread of mosquito-borne diseases like malaria, dengue fever and Zika, while storm damage aids water-borne infections such as cholera and leptospirosis.

Crucially, the health burdens of the climate crisis are not equally distributed, with the most vulnerable in society disproportionately affected, whether they are living economically precarious lives in the scorching US Southwest or on the flood plains of Bangladesh. This makes climate a challenge not only for public health but also for equity.

Taking effective action to address all these problems requires breaking down the challenge into manageable segments. Given the breadth of expertise within the university, Minor believes Stanford is in a unique position to play a leadership role—from pioneering interdisciplinary research to implementing conservation regimens in its state-of-the-art hospitals.

Last year’s opening of the Stanford Doerr School of Sustainability, after a \$1.1 billion donation from John and Ann Doerr, is particularly important in seeding new initiatives that move beyond traditional silos. The gift was the largest ever to a university for the establishment of a new school.

“It puts Stanford in a special position. There are lots of synergies between Stanford Medicine and the Doerr School, and we now have initiatives in climate and health that are sponsored jointly by our two schools,” Minor said.

One example is the university’s work in synthetic biology, where researchers from both schools are working on processes with huge potential to decarbonize swathes of the economy, including the plastic-heavy healthcare sector. Future applications range from the production of biologically based plastic-like materials to lab-engineered meat.

At the same time, Stanford Medicine is incorporating climate change in the curriculum to ensure that the next generation of practitioners have the issue front of mind. The move follows the creation of the Stanford Climate and Health group in 2019 by students and faculty members, which is now integrating materials on climate and health into every preclinical course.

The task of applying rigorous environmental standards across the university’s hospitals falls to

Helen Wilmot, a former critical care nurse who is now Chief Facilities and Sustainability Officer for Stanford Health Care.

Energy efficiency is a major focus in her drive to decrease the carbon footprint, including not only greater use of solar and other green electricity sources but also innovative building design, like energy-efficient cooling systems that use natural convection currents to move the air inside patient rooms. “I want our buildings to be much, much smarter—and this isn’t some rinky-dink statement, because these hospitals are built like rocket ships. I need to find a way to turn the dials, both figuratively and literally, to optimize operational efficiency, while ensuring the same safety levels and giving physicians the operational flexibility that they need,” Wilmot said.

This needs to be supplemented by other less obvious changes in the way hospitals operate, from re-sterilizing unused surgical equipment—rather than throwing it away—to rethinking which anesthetics to use.

One of the more startling facts of modern medicine is that some inhaled anesthetics produce greenhouse gases that are thousands of times more potent than carbon dioxide. By one estimate, global emissions of such anesthetics have the same climate impact as CO₂ emissions from 1 million cars. Stanford has taken a lead in changing clinical practice by drastically reducing use of the common anesthesia gas desflurane in favor of less damaging alternatives,



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eliminating 1,200 tons of greenhouse gas emission in the process.

And the hunt is on for other ways to reduce the carbon footprint. This has been spurred on by a 2022 seed grant program that awarded \$135,000 to nine Stanford clinicians to advance healthcare sustainability research projects. Initiatives to date include reducing unused supply waste in the operating room, increasing the use of telehealth in delivering tobacco cessation services and improving sustainability within the hospital food system.

There is, however, only so much that Stanford can do on its own. As with most other industries, the lion’s share of emissions are derived from the healthcare supply chain. These so-called Scope 3 emissions include the production, transport and disposal of goods such as pharmaceuticals, medical devices and other hospital equipment.

“This can’t be accomplished without suppliers as partners. We have to address the incentive system so that the suppliers manufacture products that last longer and can be reused, rather than the current situation where the supplier’s incentive is simply to sell more disposable items,” Wilmot said.

Key to the whole process is understanding that upfront investment in greener ways of working can deliver not only environmental benefits but also a more sustainable commercial bottom line. In this respect, Wilmot is encouraged by the US Inflation Reduction Act, which has significant funding available to help organizations cut greenhouse gas emissions.

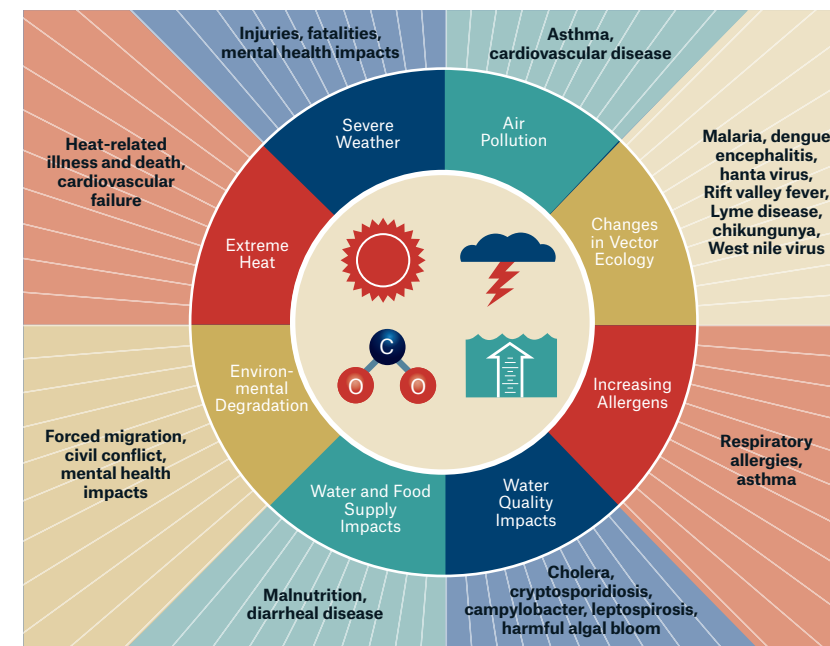
“There are hospitals in the middle of America that are running on very tight margins. So, we must figure out what are the scalable initiatives that can be done in any hospital,” she said. “If you can deliver a return on investment, for example in terms of energy consumption, then you can demonstrate value to the organization.”

Changing the direction of the supertanker that is the global healthcare sector is clearly a formidable task. It requires engagement and commitment across one of the most complex value chains in the modern economy. But it also needs leadership from institutions with the talent and resources to act as role models.

“This is part of our job as a brand of Stanford,” said Wilmot. “We are not here to be mediocre. We are here to make a difference.” ♦

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IMPACT OF CLIMATE CHANGE ON HUMAN HEALTH



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