Beyond net-zero: Toward a "One Planet" health system

Trevor Hancock

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Beyond net-zero: Toward a "One Planet" health system

Trevor Hancock, MD[1]

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Abstract

Climate change has captured much attention, but it is just one part of a much larger set of massive and rapid global ecological changes. While the United Nations has taken to referring to the "triple planetary crisis" of climate change, biodiversity loss, and pollution, even this does not capture the full extent of human impact upon the Earth—and thus upon human well-being. Canada's ecological footprint is equivalent to five planets worth of biocapacity, and healthcare's footprint is probably greater. So while health systems need to become low-carbon or net-zero, they need to go further. If healthcare is to stand by its ethical duty to do no harm, it must become a "One Planet" system. In addition to becoming a net-zero system, healthcare must reduce the consumption of material resources, the use of toxic substances, and production of all forms of waste, and protect and restore nature.

Introduction

Climate change has captured global attention—finally, some would say, although actions to reduce Greenhouse Gas (GHG) emissions remain insufficient. But climate change is just one of a number of global ecological crises we face, often referred to as the Anthropocene.[1-3] As United Nations (UN) Secretary General Antonio Guterres put it in an important but somewhat overlooked speech on the state of the planet in December 2020: "Humanity is waging war on nature. This is suicidal," adding that we have to "make peace with nature."[4]

The health implications of the Anthropocene were explored in 2015 by both a Canadian Public Health Association workgroup[5] and a global Commission.[6] In June 2022, Guterres described a "triple planetary crisis" of climate change—"that is killing and displacing ever more people each year"; biodiversity loss—which threatens "more than three billion people," and pollution and waste, "that is costing some nine million lives a year."[7]

Clearly, this is of great relevance to the health sector, for two important reasons. First, of course, because these changes threaten the health of the population and are likely to increase the burden on the health system and second, because the health sector has a large ecological footprint and contributes—usually inadvertently—to the problem, thus contravening its ethical duty to do no harm. That ethical duty requires the health system not only to reduce its carbon footprint but also its overall ecological footprint.

While the overall reduction in the ecological impact of healthcare was seen as the focus from the outset of the work of the Canadian Coalition for Green Health Care (CCGHC),[8] there is a danger that the focus of action can become too narrowly focused on just climate change. This article seeks to maintain the wider focus on healthcare's overall ecological footprint, and its ethical duty to reduce that footprint.

Beyond climate change: The Anthropocene and planetary health

So powerful is the human impact on the Earth that geologists and Earth scientists have proposed we have entered a new geological epoch, the Anthropocene.[1-3,1] It has three aspects. First, it is a geological phenomenon. As a result of human activity, geologists far in the future will see a distinctive layer characterized by new, human-made (anthropogenic) materials such as pure aluminium, cement and plastic, new chemicals such as Persistent Organic Pollutants (POPs) or elevated levels of carbon dioxide, and radioactive isotopes such as plutonium.[11,12]

But perhaps most dramatically, they will see a shift in fossil assemblages, a sign of the sixth "Great Extinction" (the last one was 65 million years ago, when the dinosaurs became extinct), which humans are creating. Today, humans make up roughly one-third of the mass of all land vertebrates, while our domesticated species make up almost all the rest; wild animals are less than 5%.[11,12] The Living Planet Index[13] based on population counts for 31,821 monitored populations of 5,230 species of wild vertebrates (mammals, birds, reptiles, amphibians, and fish) around the world declined 69% between 1970 and 2018.

Second, the Anthropocene is an ecological phenomenon. The geological changes are symptoms of global ecological changes such as climate change, pollution, and loss of biodiversity. We have crossed or are approaching a number of planetary boundaries,[14] and globally, our Ecological Footprint[2] (EF) has been exceeding the Earth's biocapacity for at least 50 years.[15] In 2018, the last year for which data are

[1] University of Victoria, Victoria, British Columbia, Canada.

Corresponding author:
Trevor Hancock, University of Victoria, Victoria, British Columbia, Canada.
E-mail: Thancock@uvic.ca

available, the global EF was the equivalent of 1.8 Earths. In other words, the world's population used 1.8 times as much bio-productive capacity as is actually available globally. Clearly, this is unsustainable. Moreover, it is inequitable; Canada's EF, which is among the highest in the world, was equivalent to using 5.1 Earth's worth of biocapacity.[15,3] If the whole world lived the way we do, we would need 4 more planets!

Third, it is a human phenomenon; we are the *anthropos* (Ancient Greek for human) in the Anthropocene. The ecological changes result from unparalleled population and economic growth and a "Great Acceleration"[16] of a variety of socio-economic and technological forces since the mid-20th century—easily within one lifetime.[4] This is the main reason why it has been proposed that the start date for the Anthropocene is the mid-20th century.

Clearly, we are in trouble. We are living in an unsustainable manner, and we have been doing so especially since the mid-20th century, especially in high-income countries, and as a result, we are crossing planetary boundaries, decimating vertebrates, polluting entire ecosystems, depleting natural resources, creating a sixth mass extinction, and heating the planet. We are, in short, creating a new and potentially unsustainable situation for ourselves and the rest of creation, one that will have profound adverse health impacts; indeed, climate change alone may pose an existential threat to modern societies and perhaps even to the human species as a whole.[17] Welcome to the Anthropocene!

Healthcare's contribution to the Anthropocene

It should not be surprising to anyone that healthcare has a large ecological footprint. It is, after all, a large economic sector; the WHO estimated global healthcare expenditure in 2019 was 9.8% of global GDP,[18] while it is expected to reach 12.2% (or one eighth) of GDP in Canada in 2022.[19] It operates 24/7 and maintains a constant temperature in its institutions; uses a lot of water and other materials, many of them disposable; uses a variety of toxic substances, from medications and radioactive materials to cleaning agents and pesticides; and produces large amounts of solid, liquid, and gaseous wastes, some of it toxic or a bio-hazard.

The breadth of healthcare's environmental impact has long been known. A 2001 report prepared for the early work of the CCGHC included sections on impacts related to pollution and ecotoxicity, resource use, climate and atmospheric change (including air pollution), and reduced ecosystem health, such as loss of biodiversity.[8]

To the best of my knowledge, only one attempt to estimate the ecological footprint of a hospital has been published, and that was more than 20 years ago, when Dr. Susan Germain looked at the Lion's Gate Hospital in North Vancouver.[20] She found the EF of Lion's Gate was at least 4.9 ha/patient-year, meaning the hospital had a footprint (per patient-year) equivalent to more than 2 Earths, at that time. However, she noted, this was a considerable under-estimate.

A recent estimate of healthcare's overall environmental impact, "the first assessment of the global environmental footprint of health care," looked at seven areas of impact, based on a global supply-chain database: greenhouse gas emissions, particulate matter, air pollutants (nitrogen oxides and sulphur dioxide), malaria risk, reactive nitrogen in water, and scarce water use.[21] The study found: "Healthcare causes global environmental impacts that, depending on which indicator is considered, range between 1% and 5% of total global impacts, and are more than 5% for some national impacts."

Specifically, they found that in 2015, healthcare contributed 4.4% of global annual greenhouse gas emissions, comparable to the 4.9% estimate in the 2021 report of the *Lancet* Countdown on health and climate change.[22] In addition, they found healthcare contributed significantly to air pollution (3.6% of sulphur dioxide emissions, 3.4% of nitrogen oxide emissions, and 2.8% of particulate matter emissions), as well as 1.7% of nitrogen to water and 1.5% of scarce water use. Moreover, they noted "all environmental impacts studied increased over the period 2000 to 2015," which is concerning.

While the share of impact seems to be less than would be expected, given the economic size of the sector, it is important to note that while the study included transportation of goods, power generation, manufacture of equipment, and extraction of raw ores, coal, oil, and gas, there is still much that is missing here, including in particular food, but also deforestation for paper and lumber, the impacts of toxic chemicals and impacts on biodiversity.

Finally, and of particular concern, healthcare's environmental impact has a related health cost: "The impact that healthcare pollution has on human health was assessed by three studies, with an estimated annual loss of 244,000 – 614,000 disability-adjusted life-years in the USA."[23] A similar study for Canada[24] gave "…a median estimate of 23,000 disability-adjusted life years (DALYs) lost annually from direct exposures to hazardous pollutants and from environmental changes caused by pollution, with an uncertainty range of 4,500 ± 610,000 DALYs lost annually."

Importantly, the authors noted, "Non-GHG emissions are responsible for the majority of health damages, predominantly related to Particulate Matter (PM)."

Beyond net-zero: Toward a "One Planet" health system

WHO launched its COP26 Health Program at COP26 in Glasgow in 2021, asking countries to commit to building climate resilient health systems and to create sustainable low-carbon health systems. Beyond that, countries were challenged to make a "high-ambition" commitment to "set a target date by

which to achieve health system net zero emissions (ideally by 2050)."[25]

While Canada eventually ended up joining 61 other countries in signing on to what is now called the Alliance for Transformative Action on Climate and Health (ATACH),[26] regrettably, Canada did not join 21 countries in signing on to the high-ambition net-zero commitment. This may be because the federal government is sensitive to the fact that Canada's healthcare systems come under provincial jurisdiction. But that means that Canada's provincial governments must be challenged to sign on to these challenges, including the "high ambition" net-zero by 2050 target.

However, useful though that would be, we know that healthcare has a large environmental footprint that extends well beyond greenhouse gas emissions, that its environmental impact also results in population health impacts, and that those health impacts arise from many factors, not just climate change. So while reducing greenhouse gas emissions and becoming a net-zero system is a necessary step toward reducing healthcare's environmental and health impact, it is not sufficient.

In the end, there is only one planet, and healthcare—and indeed society as a whole—has to learn to live within the Earth's boundaries. Moreover, as a high-footprint country, Canada—and its health system—has an ethical duty to reduce its footprint significantly and rapidly.

To do so, the health system needs to embrace the concept of the Anthropocene and the ecological footprint and seek to become a "One Planet" healthcare system. In addition, it must fulfill its obligation to protect the health of the population by calling on all sectors of society to play their part in creating "One Planet" communities and a "One Planet" society.

In recent years, the concept of "One Planet Living" has been championed by a UK NGO—Bioregional[27,28]—and the World Wide Fund for Nature (WWF).[29] Canada, with a footprint equivalent to 5.1 Earths, needs to reduce its footprint by 80% to achieve a "One Planet" status, and quite rapidly. It is reasonable to assume that the health system will need to do at least as much.

The good news is that since 65% of Canada's footprint is attributed to carbon emissions,[15] becoming a net-zero system will take healthcare a long way toward being a "One Planet" system, underlining the importance of provincial governments and health ministries committing to WHO's "high-ambition" net-zero by 2050 target. But there is much more to do.

Becoming a "One Planet" health system

The broader approach to "greening" healthcare is not—or should not—be news to healthcare professionals and managers. Just over 20 years ago, as part of the launch of the Canadian Coalition for Green Health Care, a background paper, "Doing Less Harm," outlined a comprehensive agenda for reducing healthcare's overall environmental impact.[8]

Practical tips for becoming a "One Planet" health system

In addition to its focus on climate change, energy use, and transportation, the CCGHC has initiatives on water conservation, waste management, safer chemicals, and healthy and sustainable food,[30] while Healthcare Energy Leaders Canada profiles Energy Success Stories; CASCADES also has case studies of people making real change in their healthcare settings.

HCWH's program areas include medical waste, toxic materials, safer chemicals, healthy food, pharmaceuticals, sustainable procurement, and water in addition to climate and health, green building, and energy and transportation.[31]

GGHH has over 250 case studies documenting the successful sustainability projects and programs being implemented by healthcare institutions around the world.

Many elements of such a comprehensive approach are taken AQ3 up both by the CCGHC and its global counterpart, Health Care Without Harm (HCWH), as well as the Global Green and Healthy Hospitals (GGHH) network, which has over 1,700 members in more than 80 countries "dedicated to reducing their environmental footprint." All three organizations also highlight examples of leading-edge work (see Text Box).

A new Canadian initiative, CASCADES, which "supports Canada's healthcare community in transitioning toward high-quality, low-carbon, climate resilient care," is—among other things—partnering with the Canadian College of Health Leaders to offer a Health Leadership Specialty in Sustainable Health Systems.

Sustainable procurement is an important aspect of a sustainable and ethical health system. Both the CCGHC and HCWH have extensive resources available,[32,33] and it is an important focus in Canada for HealthPRO, which manages procurement contracts for supplies and medicines for than 1,300 member hospital and healthcare organizations across Canada.[34] But an emerging issue is the application of ethical purchasing to the services the health system uses.

As an ethical system, healthcare has a particular duty to ensure that not only the products but also the services it purchases are consistent with a just, sustainable, and healthy future. The fossil fuel industry has been likened to the tobacco industry,[35] and just as the health system cannot support the tobacco industry, so too it is no longer appropriate to support the fossil fuel industry, or for that matter companies in other sectors that deplete resources, reduce biodiversity, or pollute the environment or otherwise undermine planetary health.

This means that healthcare organizations, agencies, and the health system as a whole need to join the movement to divest from fossil fuels,[36,37] including not using banks, pension funds, insurance companies, or other services that fund, insure, or

otherwise support fossil fuel expansion. And as with tobacco, the health system should not accept donations from such industries and should advocate for fossil fuel industry of cultural and sporting events to be prohibited.

Working for the creation of "One Planet" communities and a "Well-being Society"

Ultimately, addressing the health and environmental challenges of the Anthropocene and becoming a "One Planet" society will require a very different society to that of today—and a very different economy. A useful approach can be found in the 2021 WHO Geneva Charter for Well-being,[38] which calls for the creation of Well-being Societies that are committed to "achieving equitable health now and for future generations without breaching ecological limits." The first three action areas are to respect and protect nature, to create a Well-being Economy that puts people and planet first, and to create healthy public policies in all sectors.

So while it is important that Canada's health system becomes a "One Planet" system, the system also needs to be working with local governments, communities, businesses, and other partners to help their local communities become "One Planet" communities.[39]

In addition, the health system needs to push for Canada to become a "One Planet" nation, which means becoming a Well-being Society. The WHO has shown the way in its *Manifesto for a Healthy Recovery from Covid-19*,[40] its *COP26 special report on climate change and health*,[41] and its 2022 World Health Day recommendations.[42] Together, they cover issues as diverse as transportation, housing, urban development, food and agriculture policy and, of course, energy policy, and the protection of biodiversity.

Here in Canada, a coalition of 38 national and regional organizations (including both the Canadian Medical Association and the Canadian Nurses Association) supported an open letter on World Health Day 2022 to Canada's First Ministers that called upon them to create Well-being Societies.[43] Specifically, they asked for the creation of "a Well-being Society Office in the Privy Council Office federally and in the Cabinet Offices in the provinces and territories," as well as Well-being budgets and a Commissioner for the Well-being of Future Generations.

Provincial health system organizations, health authorities, and hospitals should join their national counterparts in calling for action to transform Canada and its health systems to becoming net-zero, "One Planet" systems within Well-being Communities and a Well-being Society. It is what is required for a healthy, just, and sustainable future.

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ORCID iD

Trevor Hancock https://orcid.org/0000-0003-4408-4616

Notes

1. For more detail see, for example, Hancock, 2019[9]; Tuitahi et al.[10]
2. The Ecological Footprint is "a measure of the biologically productive land and water area an individual, population or activity requires to produce all the resources it consumes, to accommodate its occupied urban infrastructure, and to absorb the waste it generates." Specifically, the EF expresses in hectares of land the use of cropland, grazing land, forest production, fisheries, built-up land, and carbon; the latter is measured in terms of the amount of land that would need to be re-forested to absorb the carbon dioxide that is emitted.[15]
3. It is important to note that carbon emissions constitute 65% of Canada's consumption footprint,[15] which means that at least 35% of our impact is NOT carbon emissions—more than that if we include the footprint of toxics and the impact our activities have on biodiversity, neither of which are included in the EF.
4. I was born in 1948 and am now 74 years old; this has all happened within my lifetime!

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