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Sustainable global health practice: An ethical imperative?

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Abstract

We are in the midst of a crisis of climate change and environmental degradation that will only get worse, unless significant changes are rapidly made. Globally, the healthcare sector causes a large share of our total environmental footprint: 4.4% of greenhouse gases. Sustainable healthcare has emerged as a way for healthcare sectors in high-income countries to help mitigate climate change by reducing their emissions. Whether *global health* should be sustainable and what ethical grounds might exist to support such a claim are not questions that have been investigated. The paper argues that global health practice—the delivery of health services to underserved populations in resource-poor areas of the world—should be sustainable as a matter of climate justice and solidarity. Reducing climate change-related risks and harms for the vulnerable is integral to the mission of global health and thus it is necessary to consider the climate impact of its practice. The field has a duty to provide sustainable health services that are responsive to climate change-related changes in the local burden of disease and to build sustainable health system infrastructure. Specific responsibilities for global health funders, managers, and implementers to uphold the duty are proposed. To conclude, the paper considers what limits might be placed on the duty to deliver sustainable global healthcare.

KEYWORDS

climate change, ethics, global health, justice, solidarity, sustainability

1 | INTRODUCTION

Climate change remains the greatest threat of our time and is fundamentally related to our health. More intense storms and floods, more frequent heatwaves and the spread of infectious disease from climate change threaten to undermine years of health and well-being gains, with those already experiencing marginalization and disadvantage most severely affected.[1] How to address this threat ethically and equitably is an important challenge facing societies worldwide.

The healthcare sector plays a key role in the climate change problem and solution. Globally, the healthcare sector causes a large share of our total environmental footprint: 4.4% of greenhouse gases.[2] Substantial direct emissions are caused by operations such as patient transport and space and water heating.[3] Individual countries

[1]National Health Service. (2020). *Delivering a "net zero" National Health Service*. NHS England and NHS Improvement.

[2]Lenzen, M., Malik, A., Li, M., Fry, J., Weisz, H., Pichler, P. P., Chaves, L. S. M., Capon, A., & Pencheon, D. (2020). The environmental footprint of health care: A global assessment. *Lancet Planet Health*, *4*(7), e271–e279.

[3]Ibid.

fall above and below the global average. For instance, the carbon footprint attributed to healthcare is 7% of Australia's total, with hospitals and pharmaceuticals the major contributors.[4] In the United States, the estimate is 10% of the country's total carbon footprint, with the largest contributors similarly being hospital care, physician and clinical services, and pharmaceuticals.[5] The UK National Health Service's (NHS) carbon footprint is smaller, with estimates placing its emissions at 4% of the United Kingdom's total.[6]

Sustainable healthcare has emerged as a way for the healthcare sector to help mitigate climate change by reducing its emissions. Sustainable healthcare is healthcare that minimizes the impact of healthcare delivery on the environment while providing the best quality care and promoting healthy living. It means delivering high quality healthcare without damaging the environment.[7] Core components of sustainable healthcare and examples of how to implement them are described in Box 1. At the national level, the NHS is leading the way in transitioning to such care. In October 2020, the United Kingdom became the first country in the world to commit to delivering a net zero national health system.[8] It has set two main targets to meet that objective:

- For the emissions it controls directly (Scope 1 and Scope 2[9]), it will reach net zero by 2040, with an ambition to reach an 80% reduction by 2028–2032;
- For the emissions it can influence (Scope 3[10]), it will reach net zero by 2045, with an ambition to reach an 80% reduction by 2036–2039.[11]

However, it is important to note that net zero is not the same as zero emissions, which means that no carbon or other greenhouse gases are released at all, or carbon negative, which means that more carbon is removed than is emitted. Net zero means that greenhouse gases are still being emitted, but the emissions are offset through some action taken. Such offsetting (e.g., carbon offsetting) remains contentious and has the potential to generate injustices.[12] As such, this paper will primarily use the terms "low emissions" and "low carbon" rather than "net zero."

Within countries, state health departments, local health departments, and individual healthcare organizations are also working to make the healthcare they deliver more sustainable. As an example, in Australia, environmental sustainability strategies exist at the state level (e.g., Victoria and New South Wales health departments), local level (e.g., local health district North Sydney), and facility level (e.g., Metro North hospitals).[13]

Thus far, sustainable healthcare and its ethics have primarily been discussed in the high-income country context. Philosophical and ethical grounds for delivering sustainable healthcare include both general (duty of rescue) and special (entrustment, compensation) duties for the healthcare sector, and actors operating within it, to reduce its carbon footprint.[14] Whether *global health* should be sustainable and what ethical grounds might exist to support such a claim are not questions that have been raised much less investigated. However, it is a conversation worth starting.

Global health is an area of study, research, and practice that emphasizes improving health and achieving equity in health for all people worldwide.[15] It places a priority on poorer, vulnerable, and underserved populations.[16] Yet global health is a field that was "birthed in colonialism" and is still significantly affected by coloniality.[17] It is typically funded by multilateral or high-income country organizations and undertaken in low- and middle-income countries (LMICs).

This paper focuses on global health as a *practice*—namely, the delivery of health services to underserved populations in resource-poor areas of the world, often LMICs.[18] Healthcare delivery encompasses both the effective provision of services to

[4]Malik, A., Lenzen, M., McAlister, S., & McGain, F. (2018). The carbon footprint of Australian health care. *Lancet Planet Health, 2*(1), e27–e35.

[5]Eckelman, M. J., & Sherman, J. (2016). Environmental impacts of the U.S. health care system and effects on public health. *PLoS One, 11*(6), e0157014.

[6]National Health Service, op. cit. note 1.

[7]Schroeder, K., Thomopson, T., Frith, K., & Pencheon, D. (2013). *Sustainable healthcare*. Wiley-Blackwell.

[8]National Health Service, op. cit. note 1.

[9]Scope 1: Direct emissions from owned or directly controlled sources on site. Scope 2: Indirect emissions from the generation of purchased energy, mostly electricity (NHS net zero).

[10]Scope 3: All other indirect emissions that occur in producing and transporting goods and services, including the full supply chain (NHS net zero).

[11]National Health Service, op. cit. note 1.

[12]Cho, R. (2021). *Net zero pledges: Can they get us where we need to go?* https://news.climate.columbia.edu/2021/12/16/net-zero-pledges-can-they-get-us-where-we-need-to-go/

[13]Victorian Government Department of Health and Human Services. (2018). *Environmental sustainability strategy 2018-19 to 2022-23*. DHHS. https://www2.health.vic.gov.au/about/publications/policiesandguidelines/environmental-sustainability-strategy-2018-19-to-2022-23; NSW Department of Health. (2016). *Resource efficiency strategy 2016 to 2023*. NSW Health. https://www.health.nsw.gov.au/assets/Publications/resource-efficiency-strategy.pdf; Northern Sydney Local Health District. (2021). *NSLHD planetary health framework 2021-2023*. https://www.nslhd.health.nsw.gov.au/AboutUs/Documents/NSLHD%20Planetary%20Health%20Framework%20.pdf; Metro North Health. (2021). *Green Metro North sustainability strategy 2021-2026*. https://metronorth.health.qld.gov.au/wp-content/uploads/2021/04/green-mn-sustainability-strategy-21-26.pdf

[14]MacPherson et al. (2020) contend that healthcare providers have a duty to rescue patients from harm if they can do so without significant harm to themselves. This would encompass modifying their practices in ways that reduce environmental damage such as engaging in and advocating for workplace changes that promote energy efficiency and incorporating low carbon products into their practice. MacPherson (2014) further argues that, as climate change harms human health, embracing sustainability helps health workers and organizations fulfill their professional obligation to protect health. In terms of compensation, since healthcare delivery and promotion harm the environment through energy use and waste production, the healthcare industry has a responsibility to adopt environmentally friendly policies and practices that reduce energy use and waste but do not compromise quality or access to care (Macpherson et al., 2020). It has an ethical obligation to reduce carbon emissions and mitigate climate change (Ritchie, 2022). See: Macpherson, C. C. (2014). Climate change matters. *Journal of Medical Ethics, 40*(4), 288–290; Macpherson, C. C., Smith, E., & Rieder, T. N. (2020). Does health promotion harm the environment? *The New Bioethics, 26*(2), 158–175; Richie, C. (2022). Environmental sustainability and the carbon emissions of pharmaceuticals. *Journal of Medical Ethics, 48*(5), 334–337. https://doi.org/10.1136/medethics-2020-106842

[15]Koplan, J. P., Bond, T. C., Merson, M. H., Reddy, K. S., Rodriguez, M. H., Sewankambo, N. K., Wasserheit, J. N., & Consortium of Universities for Global Health Executive Board. (2009). Towards a common definition of global health. *Lancet, 373*(9679), 1993–1995.

[16]Ibid.

[17]Bhakuni, H., & Abimbola, S. (2021). Epistemic injustice in academic global health. *Lancet Global Health, 9*(10), e1465–e1470, p. e1466; Abimbola, S., Asthana, S., Montenegro, C., Guinto, R. R., Jumbam, D. T., Louskieter, L., Kabubei, K. M., Munshi, S., Muraya, K., Okumu, F., Saha, S., Saluja, D., & Pai, M. (2021). Addressing power asymmetries in global health: Imperatives in the wake of the COVID-19 pandemic. *PLoS Medicine, 18*(4), e1003604; Rasheed, M. A. (2021). Navigating the violent process of decolonisation in global health research: A guideline. *Lancet Global Health, 9*(12), e1640–e1641.

[18]Mukherjee, J. S. (2022). *An introduction to global health delivery*. Oxford University Press; Kim, J. Y., Farmer, P., & Porter, M. E. (2013). Redefining global health-care delivery. *Lancet, 382*(9897), 1060–1069.

BOX 1: Components of sustainable healthcare and examples of how to implement them*

- *Low carbon models of care*
  - o Invest and engage with preventative care and tackling social determinants of health
  - o Eliminate low value care: eliminate redundant tests, procedures, treatments; eliminate care that lacks evidence; eliminate care where the cost of intervention is not proportionate to benefits
  - o Eliminate use of certain anesthetic gases and method dose inhalers
  - o Low carbon information, communication, and technology (ICT) pathways
  - o Green prescribing: use treatments and technologies with lower environmental impacts, for example, choose drugs with lower carbon footprints
  - o Make service delivery more efficient and effective
    - Reduce steps in clinical pathways
    - Telehealth to reduce unnecessary travel and time

- *Procurement of low carbon goods and services, including energy, pharmaceuticals, medical equipment, office equipment, and food*
  - o Procure locally
  - o Use CO_2-efficient vehicles to transport goods and services
  - o Procure goods with low carbon footprint, for example, pharmaceuticals with lower energy costs of manufacturing and R&D
  - o Avoid procuring plastic products

- *Reduce, recycle, and reuse waste*
  - o Reduce reliance on single use plastics
  - o Reduce food waste

- *Low carbon transport*
  - o Reduce patient and staff travel, reduce business travel
  - o Use fleet of CO_2-efficient vehicles
  - o Situate facility near public transport
  - o Encourage active travel and fuel-efficient vehicles, have bike infrastructure, promote staff carpooling

- *Low carbon buildings and spaces: build new buildings green and upgrade existing buildings*
  - o No fossil fuels used to power or heat buildings; use renewables
  - o Make buildings energy efficient, for example, insulation, triple glazed windows
  - o Set up recycled water (rain, grey and others) collection and use systems
  - o Use lighting and appliances with 5-star energy rating

**Note*: Examples are included because they have been proposed by various bodies, but this does not mean they are necessarily endorsed at an ethical level by this paper.

Sources: National Health Service. (2020). *Delivering a "net zero" National Health Service*. NHS England and NHS Improvement; Schroeder, K., Thompson, T., Frith, K., & Pencheon, D. (2013). *Sustainable healthcare*. Wiley-Blackwell; Hoban, E., Haddock, R., & Woolcock, K. (2021). *Deeble Issues Brief No. 41. Transforming the health system for sustainability: Environmental leadership through a value-based health care strategy*. Australian Healthcare and Hospitals Association.

people with diseases for which proven therapies exist and the infrastructure required to do so.[19] The cycle of care for a condition ideally begins with prevention and screening and ends with ongoing disease management to reduce recurrence of disease and its severity.[20]

There are three main categories of actor in global health practice: providers, managers, and spenders. Providers are those actors who raise or generate global health funds. Principally, funding comes from three main sources: national governments in high-income countries, business and corporate entities, and private foundations and individuals.[21,22] Managers are responsible for managing or pooling global health funds as well as channelling funds to recipients. They are typically multilateral organizations within the United Nations network; bilateral organizations; global health partnerships such as the Global Fund to Fight AIDS, Tuberculosis and Malaria and GAVI; nongovernmental organizations (NGOs) such as Save the Children, World Vision and PATH; private foundations; or the business/corporate sector.[23] Finally, spenders are actors who are responsible for building necessary healthcare infrastructure; delivering healthcare to patients; and/or procuring vaccines, diagnostics, medicines, and other healthcare, often from the private sector. They include multilateral organizations, global health partnerships, the private sector, international NGOs, national NGOs in LMICs, and national health ministries in LMICs.[24]

While no estimates exist at present for global health practice's environmental footprint, it, like all health service delivery, clearly has the potential to generate substantial emissions through models of care, transport, procurement, waste generation, and infrastructure energy and water use. Additionally, transport and procurement in global healthcare delivery may generate considerable emissions, perhaps even greater than those caused by healthcare delivery within high-income countries. This is because, where managers and implementers are from high-income countries, their international travel generates a sizeable environmental footprint. Procurement from multinational pharmaceutical companies[25] will also elevate the environmental footprint of goods and services because their manufacturing may not be low carbon and their transport will also likely be from overseas rather than locally-based.

This paper therefore explores the questions: do ethical and/or philosophical bases exist to ground the claim that global healthcare delivery should be sustainable and, if so, who is responsible for doing what? It demonstrates that strong grounds, derived from concepts of climate justice and solidarity, exist for global health practice to be sustainable. Specific responsibilities for global health funders, managers, and spenders to uphold the duty are proposed. To conclude, the paper considers what limits might be placed on the duty to deliver sustainable global healthcare.

2 | ETHICAL GROUNDS FOR SUSTAINABLE GLOBAL HEALTH

This section applies concepts of climate justice and solidarity to determine whether they provide an ethical basis for sustainable global healthcare delivery. These concepts were selected because they are especially relevant to the field of global health. Equity and solidarity are two of its core underlying values.[26] Their importance has only been reinforced by the COVID-19 pandemic. Uneven impacts of the pandemic between and within countries and a fractured global response highlight an urgent need to focus on health equity and for international cooperation.[27] As such, arguments for carrying out global healthcare delivery sustainably that are based on concepts of justice and solidarity should be especially compelling to those working in the field. Since climate justice provides a conception of justice and equity in relation to climate change and its effects, it is the most pertinent understanding of justice to consider here.

While the paper's focus is on applying concepts of climate justice and solidarity for the reason outlined above, this does not imply that there are no other ethical grounds for the position that global healthcare delivery should be sustainable. It is beyond the scope of the paper to consider what those other ethical bases might be, but it is recognized as a future avenue of inquiry to explore.

2.1 | Climate justice

A common conception of climate justice voiced by scholars and grassroots climate justice movements is reducing the disparate risk of climate change impact on well-being.[28] The impacts of climate change are felt unequally, with those in the Global South bearing the brunt of climate disruption in terms of ecological, economic, and health burdens.[29] The Global South is not a geographic concept, even

[19]Kim et al., op. cit. note 18.
[20]Ibid.
[21]McCoy, D., Chand, S., & Sridhar, D. (2009). Global health funding: How much, where it comes from and where it goes. *Health Policy & Planning, 24*(6), 407–417; Olusanya, J. O., Ubogu, O. I., Njokanma, F. O., & Olusanya, B. O. (2021). Transforming global health through equity-driven funding. *Nature Medicine, 27*(7), 1136–1138.
[22]Olusanya et al., op. cit. note 21.
[23]Ibid; McCoy et al., op. cit. note 21.
[24]Ibid.
[25]McCoy et al., op. cit. note 21; Medicines San Frontieres. (2011). *GAVI money welcome but could it be more wisely spent?* https://www.msf.org/gavi-money-welcome-could-it-be-more-wisely-spent; Medicines San Frontieres. (2019). *Pharma giants shouldn't receive multi-million dollar pneumonia vaccine subsidy*. https://www.msf.org/pfizer-and-gsk-should-not-get-huge-subsidy-pneumonia-vaccine

[26]Koplan et al., op. cit. note 15; Jensen, N., Kelly, A. H., & Avendano, M. (2022). Health equity and health system strengthening – Time for a WHO re-think. *Global Public Health, 17*(3), 377–390; Abimbola, S. (2018). On the meaning of global health and the role of global health journals. *International Health, 10*(2), 63–65.
[27]Tomson, G., Causevic, S., Ottersen, O. P., Swartling Peterson, S., Rashid, S., Wanyenze, R. K., & Yamin, A. E. (2021). Solidarity and universal preparedness for health after covid-19. *BMJ, 372*, n59; Bump, J. B., Friberg, P., & Harper, D. R. (2021). International collaboration and covid-19: What are we doing and where are we going? *BMJ, 372*, n180; Ba, M., Gebremedhin, L. T., Masako, P., Msigallah, F., Kone, K. E., & Baird, T. L. (2021). Diversity and solidarity in global health. *Lancet Global Health, 9*(4), e391–e392.
[28]Dunlap, R. E., & Brulle, R. J. (Eds.). (2015). *Climate justice and inequality in climate change and society: Sociological perspectives*. Oxford University Press; Moellendorff, D. (2015). Climate change justice. *Philosophy Compass, 10*(3), 173–186; Schlosberg, D., & Collins, L. B. (2014). From environmental to climate justice: Climate change and the discourse of environmental justice. *WIREs Climate Change, 5*, 359–374.

though the great majority of its populations live in LMICs. It encompasses all those worldwide who experience systemic and unjust human suffering.[30] They are exposed to persistent intersecting entrenched structural inequities, making them particularly vulnerable to harm from the hazards unleashed by climate change: increased air pollution, extreme heat, drought, food and water shortages, infectious diseases, and floods.[31] As a result, climate change-related harms are widening disparities in health and well-being between and within countries, pushing the worst-off farther below a sufficient level.

Climate justice is therefore about ensuring the vulnerability of people to climate change-related risks and harms is reduced, particularly for those in the Global South.[32] Their vulnerability consists of two main factors: exposure to risk and a deficiency of resources for protecting their well-being against the risk.[33] Mitigation can reduce exposure to climate change risk, fostering a climate system that is less risky in relation to the irregularity of weather, intense storms, extreme droughts, sea level rise, and flooding. Adaptation can provide resources for protection such as sea-walls and levees, crop diversification, infrastructure reinforcement, and healthcare adapted for climate change-related changes in burden of disease. In effect, climate justice demands both mitigation and adaptation, with the ultimate goal of mitigation being a no-carbon economy across all sectors.[34]

Concepts of justice, including climate justice, have associated duties that are owed by duty-bearers and claimable by duty-recipients.[35] Arguably, the field of global health has duties of climate justice to help reduce the Global South's vulnerability to climate change-related risks and harms. We bear general duties of justice towards other people under certain circumstances, simply in virtue of the status that all people have as being worthy of moral regard. Global health likely has general duties of climate justice, but that is not the focus here. The paper instead makes a case for why global health has *special* duties of climate justice that are specific to the field and must be upheld for it to achieve its mission.

We bear special duties "only to those particular people with whom we have had certain significant sorts of interactions or to whom we stand in certain significant sorts of relations."[36] Many kinds of relationships can give rise to special duties. Acquired duties arise in virtue of past interactions: duties of commitment (such as the duty generated by making a promise); duties of reciprocity (such as the duty to benefit someone who has benefited you in the past); and duties of culpability (such as the duty to compensate someone you harmed through deliberate or negligent behavior). Constitutive duties arise in virtue of one's societal role.[37]

The, albeit self-professed, societal role of global health is to help reduce health disparities between and within countries, with a priority focus on improving the health of the most marginalized globally. While it is true the field does not always assume this role effectively in practice for political and other structural reasons, those within the field see their mission as being about "health equity everywhere."[38] Climate change opposes that mission. It functions to widen global health disparities and to push the most marginalized farther away from a sufficient level of health. The people the field of global health is trying to help are the ones experiencing the greatest climate change-related impacts on their health and well-being. These effects are occurring now and are predicted to worsen—namely, increasing chronic undernutrition, respiratory impacts (e.g., chronic obstructive pulmonary disease, asthma), the seasonality of vector-borne disease transmission, and heat stroke and death.[39] As such, the field of global health has a *constitutive* duty to help reduce people's vulnerability to climate change-related risks and harms. To uphold its self-professed societal role, it should promote mitigation by reducing its environmental footprint, including by providing sustainable healthcare and building sustainable (i.e., low emissions) health system infrastructure. It should promote adaptation by offering models of care that are responsive to climate change-related changes in local burdens of disease in the countries where it is undertaken.

2.2 | Solidarity

Solidarity is understood as both an attitude and a practice. Several cognitive and emotional bases for solidaristic relationships amongst humans have been identified, including moral imagination, mutual recognition of one another's moral standing and interdependence, empathy, mutual understanding, and mutual respect.[40] Moral imagination refers to the capacity to project oneself imaginatively into the perspective and viewpoint of another person and the ability to understand lifeworlds other than one's own.[41] Bioethicists Bruce Jennings and Angus Dawson conceptualize solidarity as moving through a trajectory of relational dimensions: standing up for, standing up with, and standing up as.[42] Moving through these dimensions occurs as the cognitive and emotional bases for solidaristic relationships grow stronger.

[29]Dunlap & Brulle, op. cit. note 28.
[30]Santos, B. (2014). *Epistemologies of the south: Justice against epistemicide*. Paradigm.
[31]Dunlap & Brulle, op. cit. note 28.
[32]Moellendorff, op. cit. note 28.
[33]Ibid.
[34]Ibid.
[35]Powers, M., & Faden, R. (2006). *Social justice: The moral foundations of public health and health policy*. Oxford University Press; Tasioulas, J., & Vayena, E. (2016). The place of human rights and the common good in global health policy. *Theoretical Medicine and Bioethics*, *37*, 365–382.
[36]Scheffler, S. (2001). *Boundaries and allegiances: Problems of justice and responsibility in liberal thought*. Oxford University Press, p. 49.
[37]Pierson, L., & Millum, J. (2018). Health research priority setting: The duties of individual funders. *American Journal of Bioethics*, *18*(11), 6–17.
[38]Abimbola, op. cit. note 26, p. 63.
[39]Red Cross Red Crescent Climate Centre. (2021). *Climate change impacts on health: Kenya assessment*. https://www.climatecentre.org/wp-content/uploads/RCRC_IFRC-Country-assessments-KENYA.pdf
[40]Tosam, M. J., Chi, P. C., Munung, N. S., Oukem-Boyer, O. O. M., & Tangwa, G. B. (2018). Global health inequalities and the need for solidarity: A view from the Global South. *Developing World Bioethics*, *18*(3), 241–249; Jennings, B., & Dawson, A. (2015). Solidarity in the moral imagination of bioethics. *Hastings Center Report*, *45*(5), 31–38.
[41]Jennings & Dawson, op. cit. note 40; Jennings, B. (2018). Solidarity and care as relational practices. *Bioethics*, *32*(9), 553–561.
[42]Jennings & Dawson, op. cit. note 40.

Solidaristic relationships imply solidaristic action. As a practice, solidarity amongst humans has been interpreted in several different ways that are relevant here. Some scholars define solidarity as acting for the common good. This could entail action to alleviate common threats (e.g., diseases, climate change).[43] For others, solidarity means taking action to relieve suffering and to aid the poor.[44]

Philosopher Carol Gould further distinguishes between two forms of solidarity: networking and unitary.[45] Networking solidarity captures relations of support between distantly situated others. It can apply within, as well as across, borders. Unitary solidarity captures relations of support within a single group or community.[46]

Bioethicists Peter West-Oram and Alena Buyx argue that common vulnerabilities to common threats create "*global health solidarity*," a form of networking solidarity.[47] Emerging health threats and harms inflicted by climate change demonstrate a common vulnerability to serious risk of harm exists between even distant persons.[48] Awareness of these common vulnerabilities builds the cognitive and emotional bases for solidaristic relationships amongst distantly situated others. Greater awareness and the fear associated with such knowledge provides the basis of recognition of shared interests in cooperatively promoting health for all persons. This, in turn, generates motivation for the establishment of "solidaristic, cooperative global health infrastructures."[49]

The cognitive and emotional bases for solidaristic relationships are also arguably built in the context of global health practice. Global health practice brings managers, implementers, and community members together. It creates structures and mechanisms that establish regular interactions between them, often over lengthy periods. Consistent and sustained interactions as part of global health practice afford managers, implementers, and community members the opportunity to build their moral imagination in relation to one another. Over time, they can learn more and more about each other's cultures, views, daily lives, and circumstances. As Oram and Buyx note, global health solidarity can be "project-related," where it comprises enacted practices that are based on concrete recognition of similarity in a given specific context.[50]

If we accept that global health solidarity is built generally and within global health practice, what actions does it then entail for the field? Would it support providing sustainable healthcare? Oram and Buyx contend that solidaristic global health infrastructure should respond to health needs of distant others and seek to alleviate common global threats to health such as climate change and pandemic diseases.[51] Here, they interpret solidaristic action in terms of the common good. Where solidaristic action is understood to mean alleviating the suffering of the poor, this too would encompass climate change mitigation and adaption because the effects of climate change fall disproportionately on the poor and socially marginalized. Solidarity, whether understood as acting for the common good or alleviating suffering, requires global health to consider its climate impacts since it is precisely those with whom the field claims to be acting in solidarity who are most affected by climate change. As such, solidaristic global health practice should be sustainable in its provision and infrastructure and responsive to changing health needs due to climate change.

3 | THE DUTY TO DELIVER SUSTAINABLE GLOBAL HEALTHCARE

As argued above, climate justice grounds a duty for global health to provide sustainable health services that are responsive to climate change-related changes in local burdens of disease and to build sustainable health system infrastructure. The next step is then to consider what the content of this duty might comprise. In other words, who is responsible for doing what to uphold it?

Relevant to addressing that question, philosopher Simon Caney distinguishes between first-order and second-order responsibilities of justice to address climate change.[52] First-order responsibilities include responsibilities to mitigate climate change, to undertake adaption, and to compensate people for harm done. Second-order responsibilities refer to responsibilities to ensure that other actors comply with their first-order responsibilities. They encompass responsibilities of enforcement, incentivization, enablement, and influencing the behavior of others by creating norms that discourage high emissions and/or foster a commitment to adaptation. When allocating these responsibilities, Caney affirms that the "logical step is to consider who has the capacity to perform these tasks."[53] Capacity to act allocative principles are commonly employed in global health justice and climate justice theory and essentially allocate responsibilities to whomever is best placed to execute them.[54]

Bearing the different global health actors and their functions in mind, arguably spenders are best positioned to help mitigate and adapt to climate change, whereas funders and managers have the capacity to create a global health environment where spenders are able to comply with their first-order duties. As such, capacity to act principles would allocate first- and second-order responsibilities accordingly. But then what would upholding these first- and second-order responsibilities require of different global health actors?

[43]Metz, T. (2015). An African theory of social justice. In C. Boisen & C. Murray Matthew (Eds.), *Distributive justice debates in political and social thought* (pp. 173–190). Routledge; West-Oram, P. G. N., & Buyx, A. (2017). Global health solidarity. *Public Health Ethics*, *10*(20), 212–224.

[44]Tosam et al., op. cit. note 40; Prainsack, B., & Buyx, A. (2012). Solidarity in contemporary bioethics: Towards a new approach. *Bioethics*, *26*(7), 343–350.

[45]Gould, C. C. (2018). Solidarity and the problem of structural injustice in healthcare. *Bioethics*, *32*(9), 541–552.

[46]Ibid.

[47]West-Oram & Buyx, op. cit. note 43.

[48]Ibid.

[49]Ibid.

[50]Ibid.

[51]Ibid.

[52]Caney, S. (2014). Two kinds of climate justice. *Journal of Political Philosophy*, *22*, 125–149.

[53]Ibid: 139.

[54]Moellendorff, op. cit. note 28; Barry, C., & Raworth, K. (2002). Access to medicines and the rhetoric of responsibility. *International Affairs*, *16*(2), 57–70; Caney, S. (2011). Human rights, responsibilities, and climate change. In C. R. Beitz & R. E. Goodin (Eds.), *Global basic rights* (pp. 227–247). Oxford University Press.

To uphold their duty to deliver sustainable global healthcare, it is suggested that procurers and implementers should be responsible for those aspects of sustainable healthcare (Box 1) that they are best placed to effect. Accordingly, procurers should be responsible for procuring sustainable medical products, that is, low emissions in terms of their R&D and manufacture as well as their transport to where global healthcare is being provided. Implementers, on the other hand, should be responsible for providing some or all of the following components of sustainable healthcare: low carbon models of care; low carbon goods and services, including energy, medical equipment, office equipment, and food; waste reduction, recycling, and reuse; low carbon transport; and low carbon buildings and spaces. The distinction between providing some versus all of these components rests on a key consideration: whether implementers control the infrastructure within which they are operating. Often, where foreign implementers operate within a local health system, they conduct their work within existing hospitals and clinics and, thus, may have limited or no control over aspects of transport, waste, and energy systems beyond their own individual use. They will also have limited or no control over the buildings and spaces within which they provide care to patients.

In other contexts, local actors will receive global health funds and operate within local health systems or external actors will receive global health funds to provide care via new infrastructure. Here, they are more likely to have control over transport, waste, and buildings and spaces—namely, the power to use global health money to upgrade existing infrastructure to improve its energy and water efficiency or to build new green hospitals and clinics, respectively.

But does this mean that when foreign implementers are allocated global health funding, they should build the clinics and hospitals they operate out of rather than work through existing infrastructure? There are several reasons why this might not be a good rule on the balance. First, the environmental footprint of building new green infrastructure may be so large that it would not be offset for decades. For instance, the environmental footprint of knocking down old buildings and constructing new buildings can be quite large and, in certain cases, lots of materials may need to be flown in from overseas. Second, the sustainability of the infrastructure in terms of its capacity to be used once the global health funding ends must be considered. If the infrastructure is unlikely to continue being used, then the environmental footprint of building it may not be offset. Third, there is a danger that building new albeit green hospitals and clinics may create parallel health systems that weaken existing local health systems. In some circumstances, these dangers may not be an issue, for example, when the environmental footprint of building is not too high and there are no local health clinics or hospitals that people can access. But in other situations, the costs may outweigh the benefits. As such, at a minimum, the benefits and costs of building new infrastructure in terms of its environmental and health system impacts, and whether the costs can be avoided or mitigated, will need to be assessed by implementers.

Upgrading existing infrastructure seems perhaps a friendlier action from both an environmental and health system perspective. It often comes with less of an environmental footprint than constructing a new building and does not create a parallel health system. Given the energy demands of most existing healthcare buildings, facilitating their sustainability has the potential to make a significant difference in national energy use.[55] Yet global health implementers, especially those from outside a given country, may not always be best placed to effect such changes, even if they have global health funds to do so. Partnering or collaborating with those who do have that power may be a useful strategy in such cases.

To uphold their duty to deliver sustainable global healthcare, it is suggested that funders and managers should be responsible for incentivizing and enabling implementers to provide sustainable healthcare. Incentives could be created through low emissions grantmaking principles and selection criteria and through award of funds to implementers who have proposed sustainable global health programs. Enabling conditions might involve obtaining and directing funds to implementers for mitigation and adaptation purposes, thereby making budgetary allocations for elements of sustainable healthcare (Box 1), including infrastructure upgrades, possible. Here, funders and managers can access funding channels that have traditionally been outside of the scope of global health because climate mitigation and adaptation now fall within the remit of global health. Other enabling conditions might be providing guidance on how to implement sustainable healthcare in LMICs and connecting implementers with low carbon goods and services providers. Funders and managers should also be responsible for enforcement and for creating norms that encourage sustainable global health practice. Grantees must demonstrate that they are in fact implementing low emissions healthcare and be held accountable where they fail to do so for avoidable reasons. Sustainability norms could be promoted through funders and managers' global health strategies and mission statements and by creating organizational cultures that values sustainability.

It could be argued that, instead, the duty to deliver sustainable healthcare should be understood as a duty to minimize healthcare delivery so that fewer people will live, and the population will be held in check. The most sustainable healthcare is no or very little healthcare since population growth is a major contributor to climate change. Yet, if the duty were understood in that way, it would lead to gross social injustices, especially if done in the global health context. Were global health practice to stop or be strictly limited, it would penalize populations in LMICs for the benefit of high-income country populations and do so in the most severe way: by causing their death. Disproportionately taking the lives of LMIC populations would create injustice by reinforcing relations of coloniality and pushing individuals who are considered to be disadvantaged farther below a sufficient level of well-being. (Even if the duty to deliver sustainable healthcare were understood as a duty to minimize healthcare delivery globally, the poor generally have worse health and would be the most likely to

[55]Sagha Zadeh, R., Xuan, X., & Shepley, M. M. (2016). Sustainable healthcare design: Existing challenges and future directions for an environmental, economic, and social approach to sustainability. *Facilities*, *34*(5/6), 264–288.

suffer and die in the name of population control.) Allowing LMIC populations to suffer and die would also violate the primary duty of global health.

4 | LIMITS OF THE DUTY TO DELIVER SUSTAINABLE GLOBAL HEALTHCARE

Arguably global health's *primary* constitutive duty of justice is to help reduce health disparities between and within countries, with priority going to improving the health of the most marginalized globally to a basic or sufficient level. At a minimum, justice demands that people reach a basic level of health understood in terms of subsistence or survival.[56] They can access those necessities without which they cannot survive, including basic medical care. Beyond this level, sufficientarian justice holds that it is morally valuable for people to attain the level of health required for a decent life over a "sufficient" life span (such as 75 years).[57] They are entitled to appropriate healthcare goods and services for prevention, diagnosis, treatment, and rehabilitation necessary to maintain normal functioning, that is, an absence of pathology.[58] This raises the question: Would delivering sustainable healthcare interfere with upholding a duty to bring the most marginalized globally up to a basic or sufficient level of health?

It is possible that providing certain elements of sustainable healthcare could compromise individuals' ability to achieve a minimally decent or sufficient level of health in LMICs. For instance, green prescribing in a global health program could block access to more affordable medicines for a particular disease(s). Spending money on green infrastructure could affect the quality of care offered if it means less money in the short-term for other things, for example, fewer staff hired or medicines procured. Where a community's primary access to health services comes through a global health program, these types of situations could negatively affect individuals' health.

That being said, sustainable healthcare may increase the efficiency and quality of care in many cases. Models of care that prioritize disease prevention, health promotion, and public health services will also likely lead to a lower disease burden. Low emissions energy, transport and dietary pathways can deliver health benefits from decreased air pollution, increased physical activity, and increased plant-based diets.[59]

Nonetheless, given it is possible the two duties will conflict, one limit to the duty to deliver sustainable healthcare occurs when upholding it comes at the expense of the primary duty to improve the health of the most marginalized globally to a basic or sufficient level. Implementers and procurers should consider whether delivering different components of sustainable healthcare will affect achievement of a minimally decent (basic) level or even a sufficient level of health for the LMIC populations they serve. In certain cases, the need to provide healthcare may outweigh the imperative to deliver sustainable care. Identifying tradeoffs between achieving sustainable healthcare and ensuring access to basic or sufficient healthcare and services in LMICs and determining how to balance them is an important area to explore further. For example, when budgeting for components of sustainable healthcare means less money for other things (e.g., staff, medicines), under what circumstances does that mean that sustainability spending is not ethically justifiable?

Another consideration is whether the duty is limited to global health actors from high-income countries. Allocating a first-order duty to global health implementers would frequently identify parties from LMICs as duty-bearers. Development assistance for health is often channeled to LMIC governments who then distribute it to implementers within their country rather than to foreign implementers. However, it has been claimed that LMICs have less ethical responsibility to prevent or slow climate change.[60] Thus, it could be argued that, when global health implementers are LMIC government agencies, NGOs, or civil society organizations, it should not matter if they fail to use global health funding for *sustainable* healthcare. They are entitled to spend global health money on the healthcare and infrastructure they need, irrespective of its environmental footprint.

Philosopher Henry Shue asserts that

> those living in desperate poverty ought not to be required to restrain their emissions, thereby remaining in poverty, in order that those living in luxury should not have to restrain their emissions… I believe that the emissions from these poor, economically less developed countries also ought to rise insofar as this rise is necessary to provide a minimally decent standard of living for their now impoverished people.[61]

This raises the question: Would delivering sustainable healthcare mean people in LMICs remain or fall further below a minimally decent standard of living? Given that the financial costs are born by funders that are either multilateral organizations or from high-income countries, it is unlikely that the cost of providing sustainable global healthcare would push LMIC populations farther into poverty. Thus, LMIC implementers should still aim to uphold their duty. As previously stated, where upholding the duty conflicts with ensuring people's access to a basic or sufficient level of health, then LMIC implementers, like high-income country implementers, would potentially have grounds for not doing so.

[56]Pogge, T. (2008). *World poverty and human rights*. Polity Press; Shue, H. (1996). *Basic rights: Subsistence, affluence, and U.S. foreign policy*. Princeton University Press.
[57]Powers & Faden, op. cit. note 35.
[58]Daniels, N. (2008). *Just health: Meeting health needs fairly*. Cambridge University Press.
[59]Kayak, E. (2021, May 3). Roadmap to sustainable health care. *Medical Journal of Australia Insights+*. https://insightplus.mja.com.au/2021/15/roadmap-to-sustainable-health-care/
[60]Moellendorff, op. cit. note 28; Shue, H. (1993). Subsistence emissions and luxury emissions. *Law & Policy*, *15*(1), 39–60.
[61]Shue op. cit. note 60, p. 42.

5 | CONCLUSIONS

This paper raised the question as to whether ethical grounds exist for global health to be sustainable. Despite increasing recognition of the importance and ethical basis for delivering sustainable healthcare in high-income countries, there has been no consideration as to whether global health has an ethical responsibility to reduce its environmental footprint. The paper argued that global health practice should be sustainable as a matter of climate justice and solidarity. Reducing climate change-related risks and harms for the vulnerable is integral to the mission of global health and thus it is necessary to consider the climate impact of its practice. The field has a duty to provide sustainable health services that are responsive to climate change-related changes in the local burden of disease and to build sustainable health system infrastructure. To uphold the duty, it is suggested that spenders (procurers and implementers) should be responsible for those aspects of sustainable healthcare (Box 1) that they are best placed to effect and over which they have control. When doing so, they must consider whether delivering sustainable healthcare prevents the delivery of a basic or sufficient level of healthcare. Funders and managers should be responsible for incentivizing and enabling implementers to provide sustainable healthcare as well as creating and implementing enforcement mechanisms and norms to do so.

Further study is needed to explore whether other philosophical and ethical bases exist for the claim that global health should be sustainable and whether they support similar or different responsibilities for the various types of global health actors. Investigating tradeoffs between promoting climate justice versus health equity in global health practice also merits more examination than offered here. Another future topic to explore is, where global healthcare delivery or global health more broadly encompasses addressing the social determinants of health in LMICs, for example, procuring healthy food or investing in housing, should it be sustainable? It is hoped that this paper will spark more dialogue and ethics research about these and other matters related to global health and its environmental impact.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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