Navigating uncharted waters: challenge of anticipating technologies subject to environmental considerations in future health technology assessment

Wieffer H, Ammirabile G
Avalere Health, London, United Kingdom

Avalere Health™
EVERY PATIENT POSSIBLE.

HTA250

Introduction

Healthcare accounts for ~5% of global greenhouse gas (GHG) emissions, the majority from the healthcare supply chain.[1,2] Pharmaceuticals contribute 10%-30% of healthcare-related emissions.[3] While the focus of quantification has been on GHG emissions, the environmental impact of healthcare further encompasses pollution, resource depletion, and waste.[4]

There is growing international momentum to integrate sustainability into healthcare decision-making and HTA. HTA bodies are exploring how to include environmental factors, but consensus on methods and scope is still lacking.

We hence aimed to pragmatically consider where—for which products and disease areas— future consideration of environmental impacts in HTA should be on the radar of technology developers, to inform R&D and evidence planning.

Objectives

We sought to identify:

- the scope of environmental impacts considered in future HTA
- key products and disease areas where environmental considerations in future HTA should guide technology developers

Methods

Guidance and policy documents from HTA agencies were identified (May 2025) via website searches and pearl-finding from published reviews.

Published literature on environmental considerations in HTA was identified through a PubMed search (March 2025; search terms: HTA AND [environmental OR environment]).

- We noted recent studies that have identified and reviewed HTAs that have included environmental considerations[5,6]; given the limited number of such appraisals, we searched the broader published literature.

Searches of HealthcareLCA, an online database of environmental assessments in healthcare, were conducted in April and updated in August 2025.[7]

Results

Table 1 summarizes documents from seven national agencies.

Most are future-focused—strategic plans, pilots, or pending implementation—with routine consideration not yet recommended.

Most describe environmental considerations either nonspecifically or covering a broad range.

- Exceptionally, Sweden's pilot targets wastewater eco-toxicity only.
- NICE references "government and NHS commitments to future net zero carbon emissions" but does not suggest to limiting evaluation.

Table 1: **Environmental factors in HTA: overview from seven agencies**

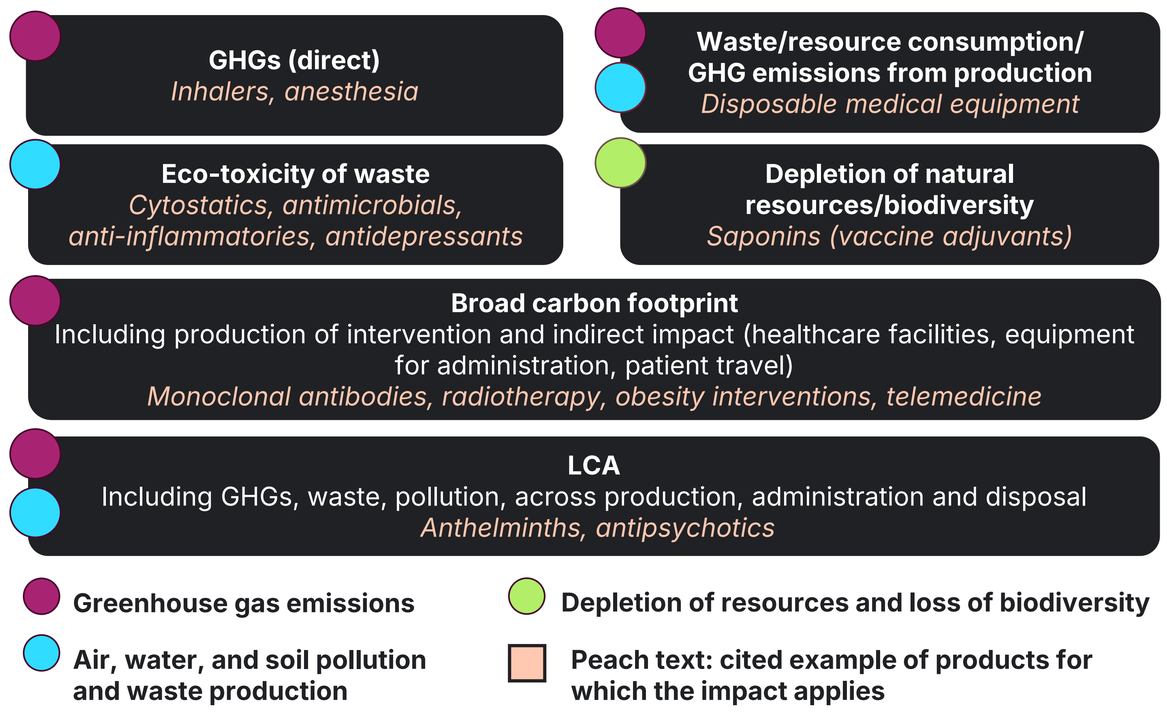
Country /agency	*Document*	*Stated scope of environmental concerns*	*Place in decision-making*
France/HAS	Environmental health roadmap	• GHGs • Depletion of resources • Solid waste • Special waste (eg, batteries, infectious clinical waste) Specific examples cited: packaging of health technologies, disposal/recycling of medical devices, carbon emissions in medico-economic-environmental analyses	Alongside other factors, with quality of care as the primary focus
Canada/CADTH	2022-2025 Strategic Plan	Nonspecific: "the environmental footprint of health systems"	Not stated
Canada/CADTH	Health technology expert review panel deliberative framework	Nonspecific: "What potential impact on the environment does this technology have?"	One of ten possible domains, tailored to the technology and decision context
UK/NICE	2021-2026 Strategy	"Reducing the carbon footprint of health and care"	Not stated
UK/NICE	Sustainability statement	• GHGs • Air and water pollution • Biodiversity protection • Solid waste	Not routinely considered; may be explored in pilot evaluations when health or cost outcomes are similar
Netherlands/ Zorginstituut	Advisory committee report	• GHGs • Solid waste • Air, water, and soil pollution • Hazardous healthcare waste (eg, medicines, microorganisms, heavy metals, organic halogens, free chlorine) • Depletion of resources GHG emissions considered the most feasible starting point for including environmental impact in decisions	Weighted alongside in a deliberative process
Australia/MSAC	MSAC assessment preparation guidelines	Nonspecific Examples cited: emissions from transportation or manufacturing	May be included as "Other relevant consideration" if there are specific concerns or key benefits
Spain/Ministry of Health	Draft bill, "Law on Medicines and Health Products"	• Climate change mitigation/adaptation • Depletion of resources • Solid waste • Air, water, and soil pollution • Biodiversity protection	Always secondary to therapeutic benefit, supply guarantee, and protection of human health
Sweden/ Läkemedelsverket (procurement not HTA)	Pilot for environmental premium in medicines benefit procurement	Eco-toxicity in wastewater, specific to antibiotics, sex hormones, and non-steroidal anti-inflammatory drugs	"Environmental premium" may be applied during pharmaceutical procurement

Based on literature (23 articles reviewed), key themes and examples of environmental considerations for HTA were identified, as illustrated in Figure 1.

Common examples cited were GHGs as components of anesthetics and propellants, and the resource use and waste of disposable medical devices.

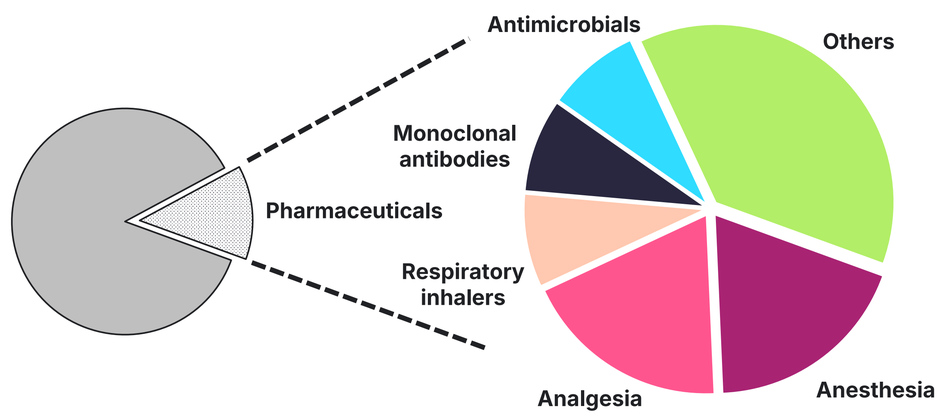
- However, wider literature has tested the application of environmental impact to disparate technologies and to healthcare delivery more broadly.
- Products and indications considered for carbon footprint and life cycle analysis (LCA) are disparate and do not seem to have been selected based on the magnitude of their impact.
- No studies were identified that suggested how HTA could be rationalized for those products and indications with the most significant impact.

Figure 1: **Key impacts/products identified in the literature**



Life cycle analysis (LCA) assesses the environmental impact of healthcare interventions beyond the carbon footprint. We found that analgesics, anesthetic gases, and inhalers were the most commonly studied (Figure 2); however, LCA has been applied across a wide range of products and disease areas.

Figure 2: **Focus areas of LCAs of healthcare products**



Conclusions

- Routine inclusion of environmental factors in HTA is unlikely. Instead, prioritization may depend on the magnitude of impact and the feasibility of assessment, but agencies have not yet implemented this approach.
- Agencies currently suggest a broad scope of impacts that may be considered. Restriction, to where more standardized assessments are possible (eg, eco-toxicity), is piloted but would miss other impacts highlighted as meaningful.
- The literature highlights GHG emissions and single-use waste as prominent product-impact associations that are likely to be considered in future HTAs.
- To guide meaningful environmental assessment, agencies will need to establish clear criteria and frameworks aligned with policy goals.
- Current evidence does not support technology developers focusing only on specific technologies or limiting the scope of environmental impact.

References

1. Health Care Without Harm, Health care's global climate footprint, 2019.
2. Peter-Paul Pichler, et al. *Environmental Research Letters*. 2019;14(6).
3. Or Z, Seppänen AV. *Health Policy*. 2024;143:105053.
4. Lenzen M, et al. *Lancet Planet Health*. 2020;4(7):e271.
5. Mansinho, JN. et al. *Value in Health*. 2023;26(12):S374.
6. Williams JTW, et al. *Value in Health*. 2024;27(6):794.
7. Drew J, Rizan C. (2022). HealthcareLCA Database [Online Database]. HealthcareLCA. healthcarelca.com/database.

Poster presented at ISPOR Europe 2025, 9–12 November, Glasgow, UK