

Incorporating Environmental Sustainability Considerations Into National HTA Assessments: A Landscape Review

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1. Research Planning

Methodologies & Results- Notes

HTA Model	Explanation	Case Studies	Feasibility of application
Enriched Cost-utility analysis (CUA)	Incorporate the environmental impact of a technology into health impact and convert this into estimations of health-related quality of life (HRQOL) or disability-adjusted life-years (DALYs). Improved health outcomes would then be rewarded by automatically improving the ICER with an increase in the denominator of the equation.	Duane et al Modelling Study on Dental Healthcare- Recyclable Toothbrushes Life Cycle Assessment followed by CUA based on DALYs. Debaveye et al. Economic evaluation based on Markov modelling- UK NHS Three modalities of treatment for schizophrenia. Marsh et al. Economic Evaluation for the UK NHS. Addition of Insulin to an oral antidiabetic regimen for patients with type 2 diabetes. The healthcare cost and HRQoL outcomes were estimated using the IMS CORE model.	This approach requires information about the health impact of environmental outcomes and does not incorporate non-health benefits of a reduced environmental impact. Environmental consequences are often far-reaching and hence utility measures centered on individual health (e.g., DALYS or HRQoL) do not adequately capture the full extent of the environmental benefits and/or harms. CUA is the usual method underpinning HTA, so this would require minimal adjustments.
Cost-Benefit Analysis (CBA)	Monetization of environmental effects using, for instance, the social cost of carbon or non-traded cost of carbon, allowing for a wide range of social costs and benefits. A reduction in product-related emissions would therefore be positively rewarded as cost-saving. Involves a variety of meta techniques for synthesizing different types of evidence for decision making.	Jacob et al. Systematic review on Intervention of promoting active travelling to school. CBA used to combine health and environmental effects by converting both into monetary terms.	Well-established evidence for incorporating environmental outcomes. Models of the economic value of environmental outcomes such as social costs of carbon (SCC) are subject to significant uncertainty due to the factors related to discount rate, valuation of damages, population growth or geographical location, non-inclusion of certain costs related to environmental effects, and how human health and mortality costs are represented. Not widely accepted due to difficulty of placing monetary value on

			nonmarket, social goods such as health.
Multicriteria Decision Analysis (MCDA)	Rather than attempting to value outcomes monetarily, MCDA elicits outcome trade-offs from decision makers to determine the most preferred treatment option. These all have various steps in common though, including defining the decision problem, identifying value criteria, weighting criteria, measuring the performance of alternatives against the criteria, aggregation into an overall estimate of value, and assessing the impact of uncertainty.	EVIDEM Model has been frequently used, considering the relevance and validity of evidence, cost-effectiveness of intervention, public health interest, impact on other spending, the improvement of patient reported outcomes, the size of the population affected by the disease and severity amongst others (Marsh et al., 2018).	Incorporating environmental impacts into the MCDA places the burden of understanding the value of changes in environmental outcomes on the stakeholders involved in the MCDA (proxy bias). There is lack of established best practice to guide application of MCDA to HTA.

2. Additional References

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