

Inclusion of environmental sustainability in the economic analysis of healthcare interventions: a review of policy approaches

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Background and Objectives

- > Over recent years greater focus has been given to the environmental impact of all aspects of life as the world is seeing more extreme weather events each year and changing climates.
- > In order to tackle these global issues many steps have been taken both on domestic and international scales to find ways to reduce the impact people have on the world.
- > Globally it is estimated that healthcare accounts for between 1% and 5% of the global greenhouse gases and air pollutants, making this an area of significant attention for policies to reduce emissions.¹
- > Additionally, due to the nature of medical procedures the healthcare sector is an area of high waste, as many resources are single use and require specialist disposal once used with patients.
- > There are also a large number of health conditions which are impacted by environmental factors, and as such climate change may also lead to additional healthcare burden.
- > First, this study investigated the current policies, action plans, and metrics being used by healthcare toward the reduction of their environmental impact.
- > Second, this study investigated the utility of these metrics within economic evaluations.

Methods

- > A landscaping review was conducted to investigate published policies, action plans, and metrics being deployed by national healthcare systems and health technology assessment bodies.
- > The landscaping review consisted of conducting a literature search, reviewing key HTA websites, government websites, free text searches and grey literature searches to ensure existing materials were identified.
- > Based on the metrics used to define environmental impact identified through the landscaping review, the feasibility of including these outcomes into health economic analyses was explored.

Results







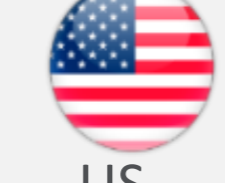
Environmental impact target setting in healthcare systems

- > Based on the identified healthcare policies, NHS England was the first healthcare system to pledge net zero carbon emissions across healthcare services, through deploying policies such as delivering care at home to reduce patient journeys to hospitals.
- > Across the G20 countries, several environmental goals focused on the reduction of emissions have been set, each nation setting their own internal goals across all aspects of their policy landscape. These include policies such as low carbon prescribing, considering supply chain impact emissions, geographical sourcing and favouring low CO2 packaging. The results are shown in Table 1.

Measures used to assess environmental impact

- > Carbon emissions were a key metric used to quantify the effect of government policies on the environment across several healthcare systems and could be considered within economic analysis.
- > Other metrics were also considered within the healthcare system when assessing environmental impact, however these are less universal in use and may provide less benefit to economic evaluations.

Table 1: Environmental targets across the globe

Country	Are environmental targets set?	Metrics used
 Globally	<ul style="list-style-type: none"> International agreements to target climate change and environmental impact have been in effect since the early 90s. This has primarily been through the implementation of the Kyoto Protocol (1992-2020), followed by the Paris Agreement (2016-current). Targets have been set through these for countries to reach net-zero carbon emissions by mid-21st century. Within this the countries involved set individual targets, and therefore may pool contributions to meet the overall targets 	<ul style="list-style-type: none"> Carbon emissions
 Australia	<ul style="list-style-type: none"> Currently the Australian healthcare system accounts for approximately 7% of all emissions in the country.² Over 200 health systems have voluntarily opted to become part of the Global Green and Healthy Hospitals (GGHH) network, in which the members aim to reduce their environmental impact across at least 2 of 10 areas: energy, waste, water, buildings, transport, food, pharmaceuticals, chemicals, procurement, leadership 	<ul style="list-style-type: none"> Carbon emissions Additional institute specific goals targeting energy, waste, water, buildings, transport, food, pharmaceuticals, chemicals, procurement, leadership
 Canada	<ul style="list-style-type: none"> The 2019 Lancet Countdown on Health and Climate Change reports that Canada has the third-highest per capita greenhouse gas emissions coming from its health care sector in the world.³ 	<ul style="list-style-type: none"> Greenhouse gas emissions
 England	<ul style="list-style-type: none"> In 2020 NHS England introduced the Greener NHS initiatives with a pledge to deliver a net zero health service by 2040 and extend this to areas where the NHS has influence over by 2045.⁴ Efforts to reduce carbon emissions have focused on: direct care, medicines and supply chain, transport and travel, innovation, hospitals, heating and lighting, adaptation efforts, values and governance. 	<ul style="list-style-type: none"> Direct carbon emissions Indirect carbon emissions Other emission types Waste produced
 France	<ul style="list-style-type: none"> A domestic target of a 40% reduction in emissions by 2030 from 1990 levels (or a 41% reduction from 2005) excluding land-use change and forestry.⁵ France has a target to be net zero emissions by 2050. 	<ul style="list-style-type: none"> Greenhouse gas emissions
 Germany	<ul style="list-style-type: none"> Currently the health care sector represents 6.7% of national green house gases, with one third being energy related and two thirds being produced up- and downstream of health care facilities.⁶ In 2019 the German federal government committed to reducing green house gases by 55% by 2030 compared to 2030 levels. Targets for reduction align with the Paris agreement and European Green Deal. 	<ul style="list-style-type: none"> Greenhouse gas emissions
 US	<ul style="list-style-type: none"> Voluntary targets supported by HHS and the White house, set a target to reduce emissions by 50% by 2030 and to net neutral by 2050.⁷ No mandatory targets 	<ul style="list-style-type: none"> Greenhouse gas emissions Supply chain emissions

How to incorporate into economic analyses

- > Being able to demonstrate the effect that new medical developments have on these targets set by governments will be a key aspect of supporting the healthcare systems in being able to achieve the environmental standards that are being set for them.
- > To allow for the exploration of these may be best achieved through an expansion of the current budget impact analysis approaches to also capture the environmental impact of an intervention. This would ensure that the impact of the intervention is explored across the entire market and the ways in which clinical practice are altered are fully captured.
- > Alongside the direct impact of the amount of waste, carbon footprint of drug interventions and carbon emissions associated with hospital resources, it would be beneficial to also consider the indirect carbon emissions that may be incurred though patients travelling for appointments and other aspects such as these associated with treatment.
- > Additionally the environmental impact captured in modelling activities may focus on alternative measures as a proxy to allow the discussion of the sustainability challenges. This may focus on exploring the amount of wastage produced through different dosing approaches, the number of units being transported and stored or the quantity of single use resources that would be required across the treatment course.

Conclusions

- > Overall, the impact of healthcare on the environment is becoming an increasingly important issue globally through various international agreements, domestic targets and increased public awareness.
- > There is a need to be able to quantify this through economic evaluations to capture the wider impact of interventions. Economic evaluations provide an existing framework to translate and extrapolate clinical trial findings to economic burden and therefore could be expanded through the inclusion of the CO2 emission impact alongside the economic impact of interventions.
- > The landscaping search found that a majority of countries focused on green house gas emissions with half considering further criteria. The timeline and level of reduction in green house gases required varied across the countries, with Germany and the US targeting a 55% and 50% reduction respectively by 2030 where as France are targeting a 40% (excluding land-use change and forestry) reduction by 2030.
- > The UK NHS sets out the most comprehensive guidelines for measuring the environmental impact, these guidelines should be the starting place before including the environmental impact in an economic model, however further research and guidelines

Abbreviations:

CO2; Carbon dioxide, G20; Group of Twenty, HHS; Department of Health and Human Services, HTA; Health Technology Assessment, NHS; National Health Service, US; United States

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