Methodology

Measuring and projecting global health sector emissions

Health Care Without Harm and Arup had the ambition to create a global health care sector GHG emissions Road Map with the goal to frame the conversation and catalyze climate action across the sector and its community of practitioners. There are few formalized or standardized approaches for establishing such an evidence-based approach, and none currently exists in the health care sector on a global scale with detail across nations.

To help bring definition to the scope, coverage, analysis, methodology, and formatting of what this Road Map might look like, Health Care Without Harm and Arup developed a structured approach across six components to provide the health care sector with a robust method and evidence base, which includes the following features:

- Reporting GHG emissions from the health sector and its supply chain to GHG Protocol Scope 1, 2, and 3 categories
- Laying the groundwork for future scenario analysis within IPCC emission pathways
- Reporting of national perspectives
- Projections based on specific health care trends
- Incorporation of climate actions that health care actors can make
- Granularity sufficient to inform supply chain actions

A full description of the methodology and its six component parts of developing the Road Map are in the Technical Report (Annex A). For summary purposes, Figure 4 provides an overview of the chronology and relationship between each step, with each referenced number linking to a summary of each component below.

The Road Map's goal is to catalyze climate action across the sector and its community of practitioners.

Step 1. We took Green Paper One as the starting point, while adding 25 additional countries bringing the total countries covered to 68, with a "rest of the world" (RoW) category to provide a baseline emissions profile in 2014 for the global health care sector. Further analysis was conducted, using a methodology called structural path analysis (SPA) to separate and break out Scope 3 emissions (i.e., those coming from indirect sources) into usable categories from which to explore health care system emissions.

Step 2. We selected a global warming scenario aligned with keeping warming at 1.5C from which national emission budgets and health care sector pathways within these could be prescribed. This is illustrated by the dashed line and its end point in Figure 4.

Step 3. We used data from the Institute for Health Metrics Evaluation[39] to model growth in health care demand from 2014 to 2050 for each of the 68 nations and RoW. This was used to generate a forecast emissions profile based on the premise of no future climate action has been termed Business as Usual (BAU). In projecting in this manner, the assumption is made that the structure of the health system and wider economy is consistent with the 2014 baseline throughout the projected period. This assumption, its limitations, and its impact on the modelling is described in more detail in the limitations section below and in the technical report (Annex A).

Steps 4 and 5 (highlighted as the blue and gray wedge's respectively in Figure 4). We overlaid the decarbonization actions that can be taken in the health care sector, its supply chain, and the wider economy at large. The interventions that make up these decarbonization pathways and actions are pulled from third party models and published evidence, alongside more focused and new research completed by Health Care Without Harm and Arup to determine the scope, scale, and pace of feasible actions.

Step 6. We applied these actions to each nation's situation, and as an aggregate at global scale for health care, thus presenting a single emissions decarbonization profile as the global health care decarbonization Road Map.
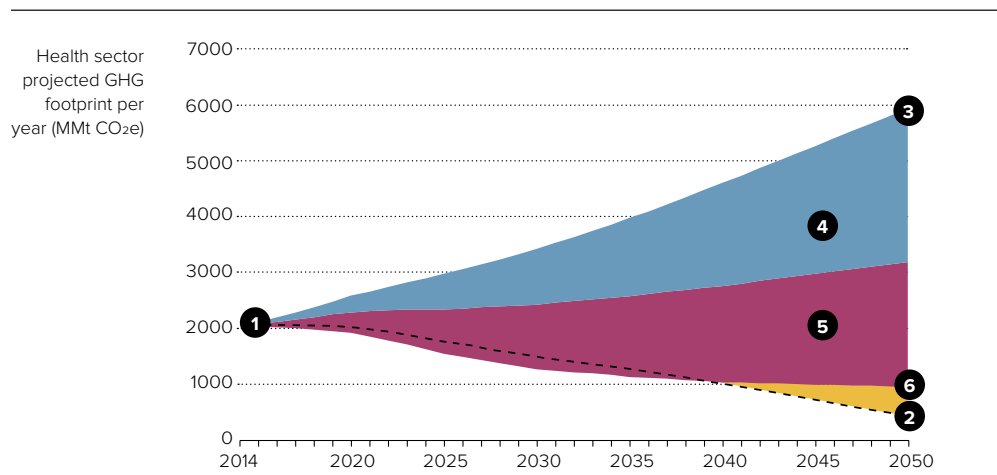
Health sector projected GHG footprint per year (MMt CO_2e)

Figure 4. Workflow representation of the Health Care Without Harm and Arup global health care sector Road Map methodology. The numbers shown relate to the work step descriptions provided below.

Limitations and assumptions

The methodology incorporates assumptions and limitations that are considered appropriate for a 36-year emissions projection of a globally heterogenous sector. Please see the technical report (Annex A) for a more complete list and discussion of limitations and assumptions. A summary is provided in Table 1.

Limitation or assumption	Description
Static structure	The projection is based on a static model of the economy from 2014; no changes in the structure of the economy are considered. It is therefore a projection, not a prediction, and is just one of an undeterminable number of possible emissions futures and as such provides only a guide to how the sector can decarbonize at pace.
Consistent growth	The projected growth of the health sector assumes all parts of the system grow at a consistent rate within each country.
Boundaries between the health sector, health retail, and health organizations	The model uses expenditure data which aligns with the WHO's definition of health care, which includes activities, for example, the direct sale of pharmaceuticals to individuals by pharmacies. The boundary of the sector as a whole differs therefore from that of a typical national health provider, for example, the NHS. This is not a limitation as such, rather it is an important consideration when comparing the results of this study with organizational footprints, particularly those covering Greenhouse Gas Protocol (GHGP) Scope 3 emissions.
Homogeneous product	The model assumes a single emissions intensity for the health sector. This assumption holds for considering the sector as a whole but must be acknowledged when considering the impact on emissions of redeploying expenditure from one part of the health care system to another.

Limitation or assumption	Description
Emissions trajectories	The emissions trajectories presented represent plausible emissions pathways. They are an illustration of the effort required by countries to reduce emissions and achieve the budget allocated to the global health care sector. It should be emphasised that these are not forecasts.
Decarbonization trends	The data used to project decarbonization is well-cited and respected in literature. These projections are predictions, and as such are have a degree of uncertainty; however, they represent the best, most comprehensive studies available.
Decarbonization actions	The mitigation actions modelled in this study are not exhaustive, for example, no mitigation of direct emissions from waste, water, and sanitation is modelled. The projected estimates of avoided emissions are therefore likely to be underestimated.
Rebound effects	Where behavioral changes and expenditure reductions are modelled, the emissions impact of the resultant avoided expenditure potentially being redirected to other activities is not considered because it is very complex to model. Policy action can be considered alongside actions in order to limit the scale of any rebound effect.
Emissions trajectories	The model does not account for changing health demands (for example, changed distribution of infectious diseases) or changing the health cost base (from climate shocks e.g., higher insurance, more frequent extreme weather).

Table 1. Summary of methodology limitations and assumptions