



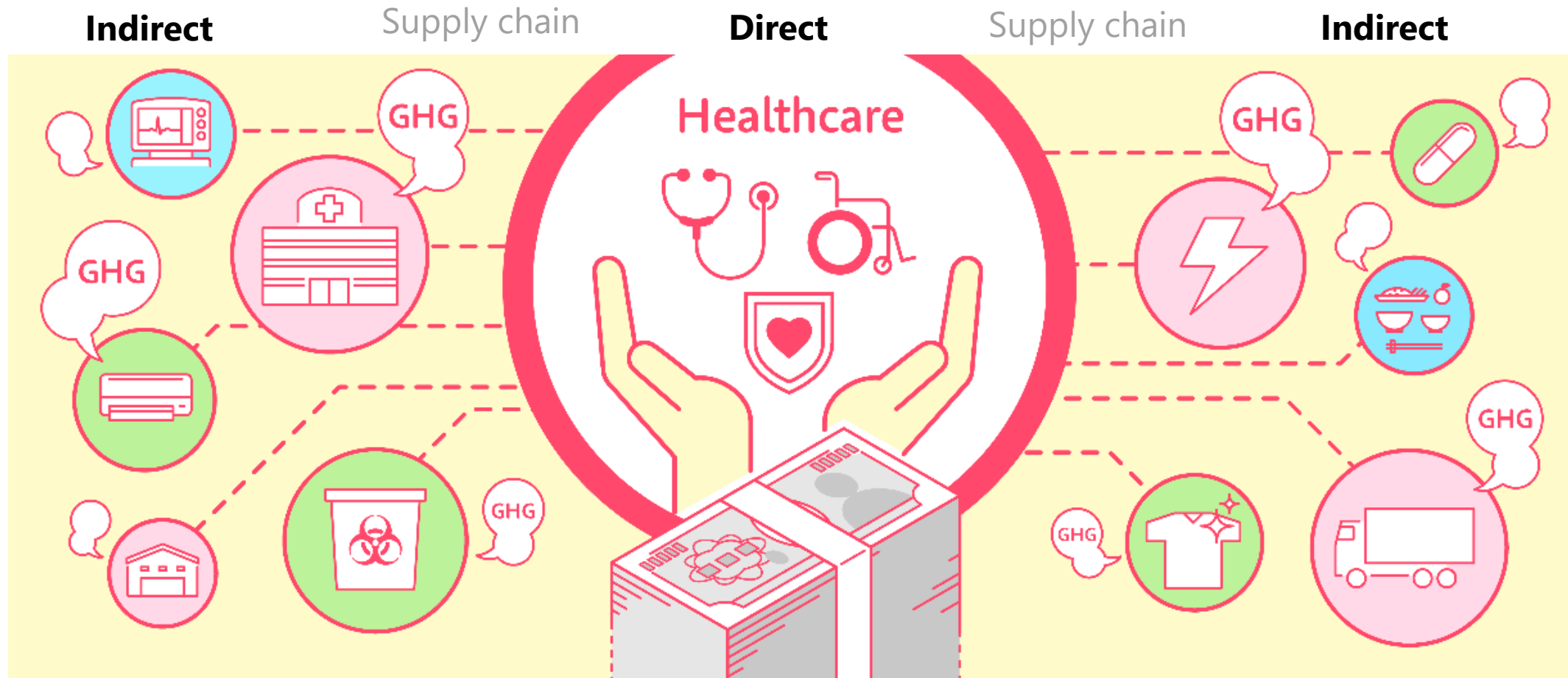
# Demands, drivers and sources of healthcare's carbon footprint: the case of Japan

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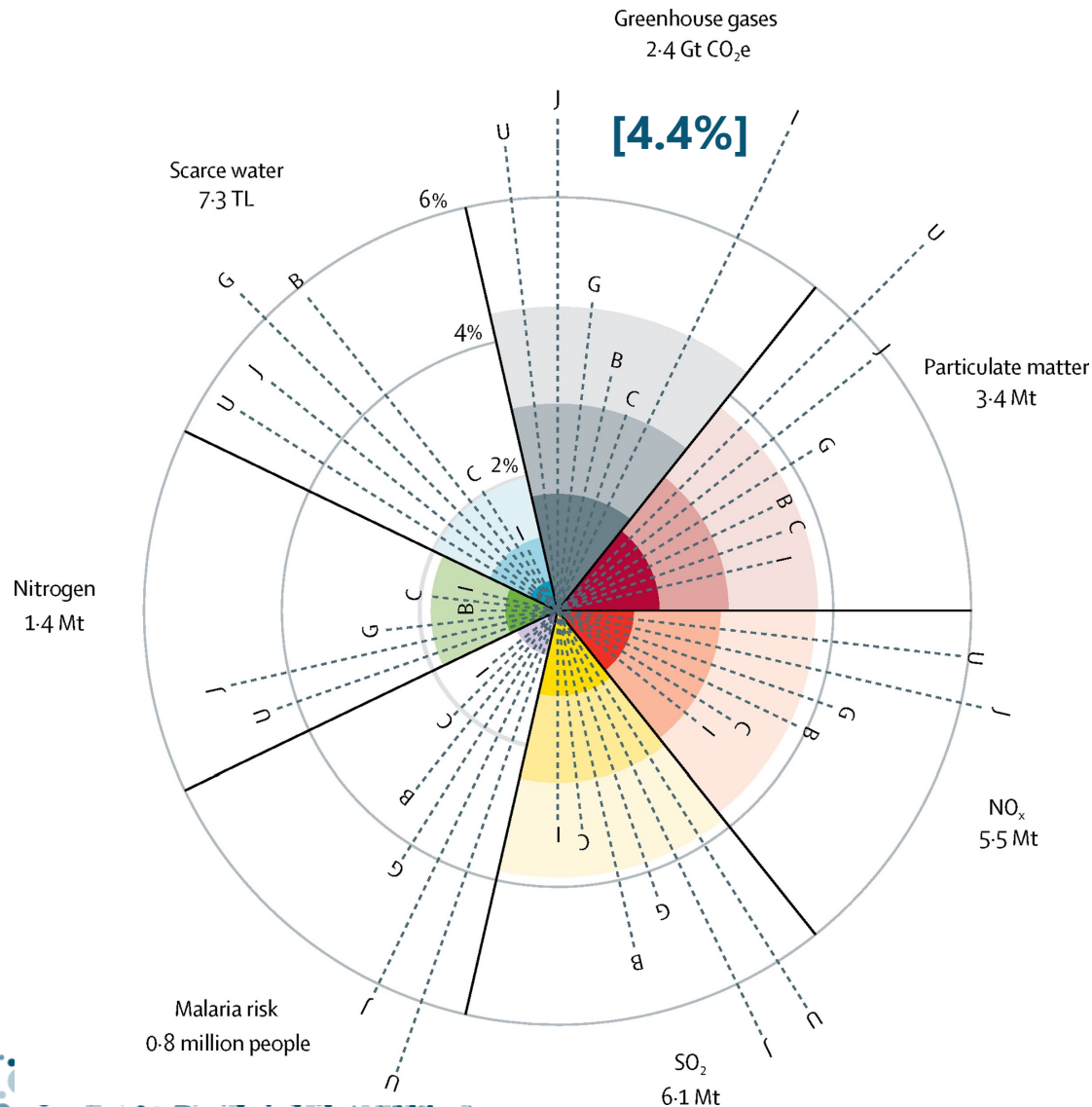
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Panel member, UNEP International Resource Panel

# Direct and indirect GHG emissions for healthcare



# 2.4Gt GHG emissions responsible for global healthcare



**Figure 1 Environmental footprints of health care for 2015**

The impact of health care is shown as a percentage of total impact, for the world (segments) and selected countries (spokes), in terms of greenhouse gas emissions (**global total=54.4 Gt CO<sub>2</sub>e**), particulate matter (122.2 Mt), NO<sub>x</sub> (161.9 Mt) and SO<sub>2</sub> (167.3 Mt) emissions, malaria risk (113.1 million people), nitrogen to water (79.0 Mt), and scarce water use (483.9 TL).

Spokes represent data for the USA (U), Japan (J), the UK (G), Brazil (B), China (C), and India (I). Direct (lightest shade), first-order (middle shade), and supply-chain (darkest shade) refer to impacts caused by health care directly, by health care's immediate suppliers, and the remainder, respectively. CO<sub>2</sub>e=carbon dioxide equivalent. Gt=gigatons. Mt=megatons. NO<sub>x</sub>=nitrogen oxides. SO<sub>2</sub>=sulphur dioxide. TL=teralitres.

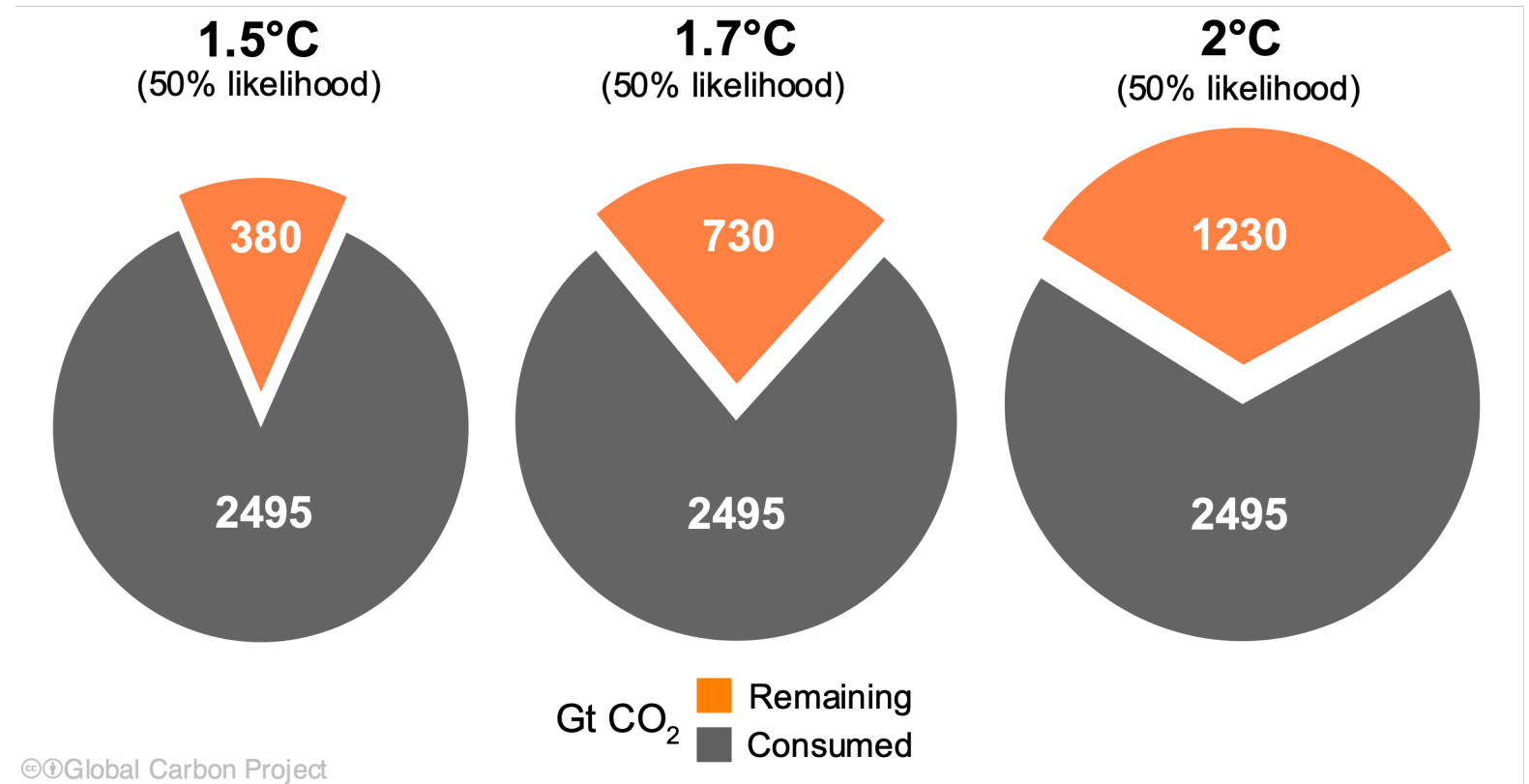
Source) Lenzen, et al. *The Lancet Planetary Health*, 2020  
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# Remaining carbon budget at 2022

The remaining carbon budget to limit global warming to 1.5°C , 1.7°C and 2°C is 380 GtCO<sub>2</sub>, 730 GtCO<sub>2</sub>, and 1230 GtCO<sub>2</sub> respectively.  
2495 GtCO<sub>2</sub> have been emitted since 1750

Given an equal contribution,  
 $380 \times 4.4/100 = 16.72 \text{ GtCO}_2$   
 can be used for HC.  
 This is equivalent to  $16.72 / 2.4 = 6.97 \text{ years}$

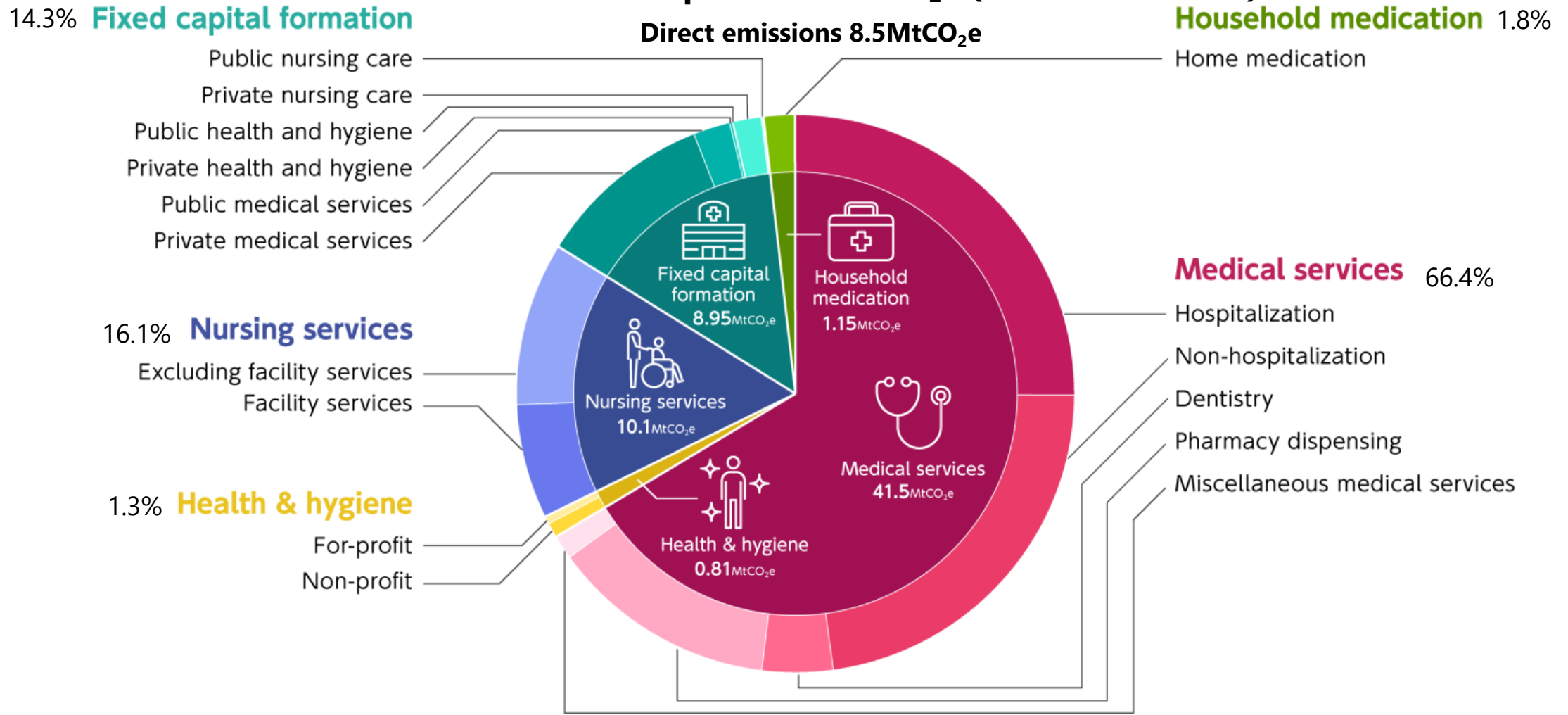
As there are 27 years to go until 2050 carbon-neutrality, the carbon footprint of healthcare needs to be 26% (6.97/27) of the current level.



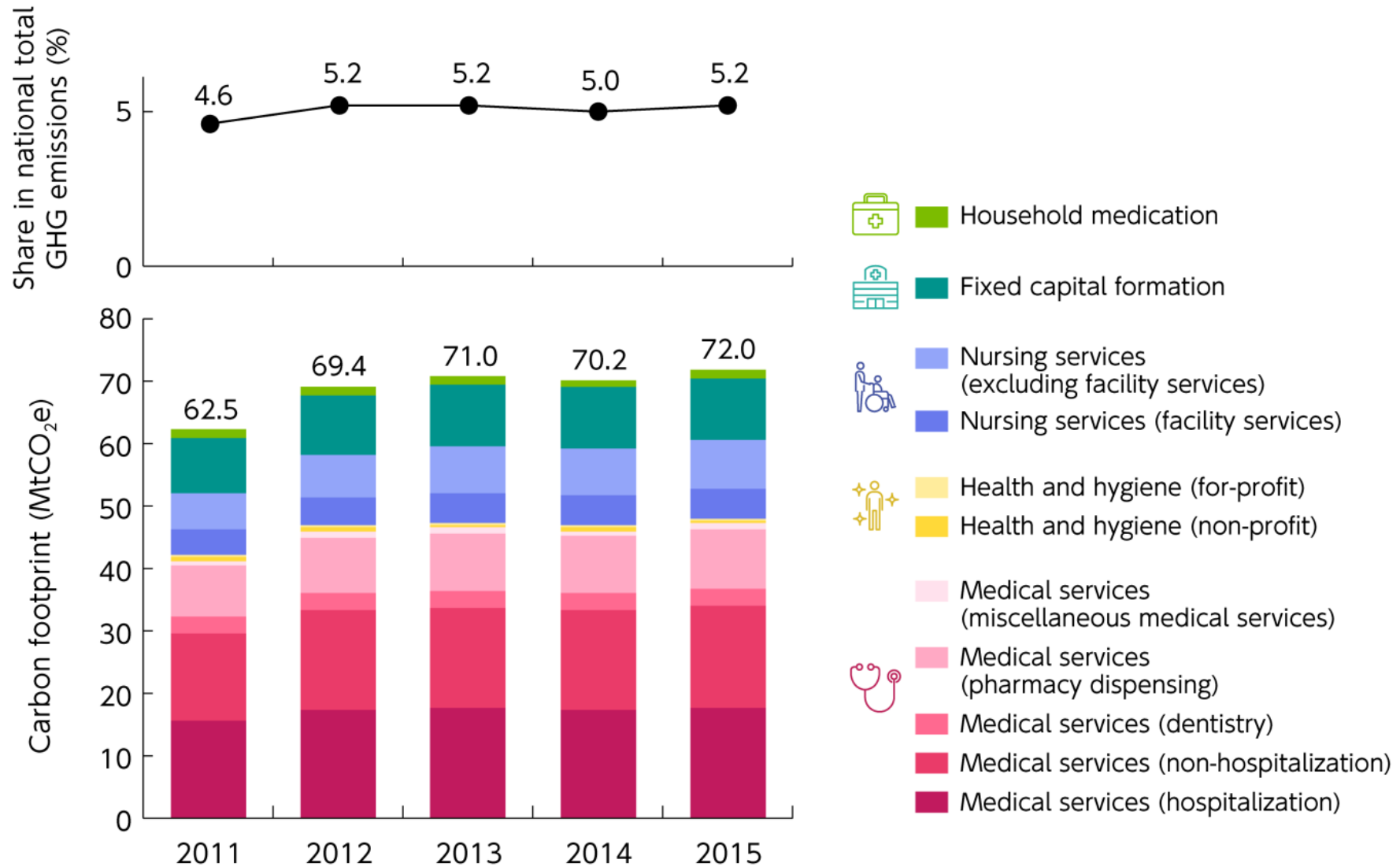
The remaining carbon budgets are updated from IPCC AR6 WG1 Chapter 5 by removing additional historical emissions since 1 January 2020. Quantities are subject to additional uncertainties e.g., future mitigation choices of non-CO<sub>2</sub> emissions  
 Source: IPCC AR6 WG1; Friedlingstein et al 2022; Global Carbon Budget 2022

# Carbon footprint of healthcare services in Japan in 2011

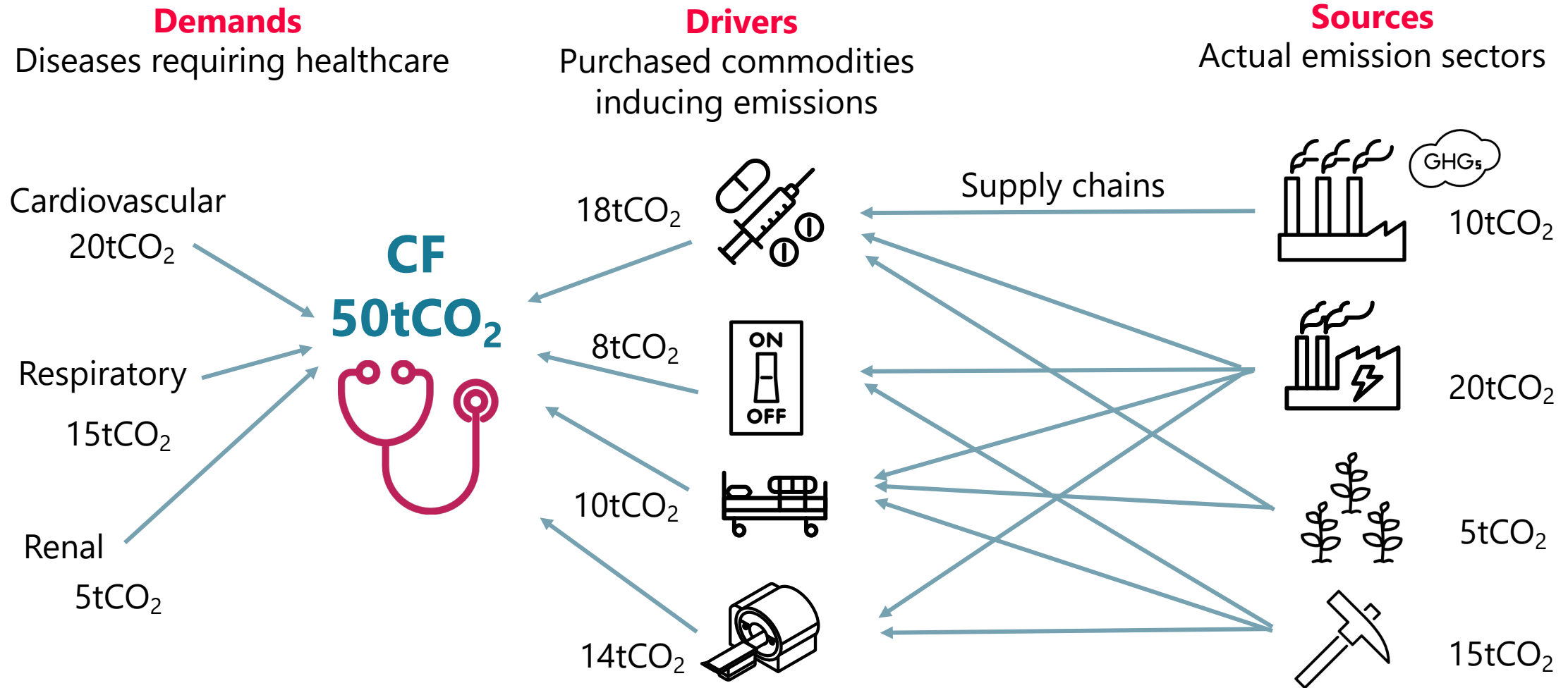
## Carbon footprint 62.5MtCO<sub>2</sub>e (4.6% of the total)



# Trend of carbon footprint of healthcare services in Japan



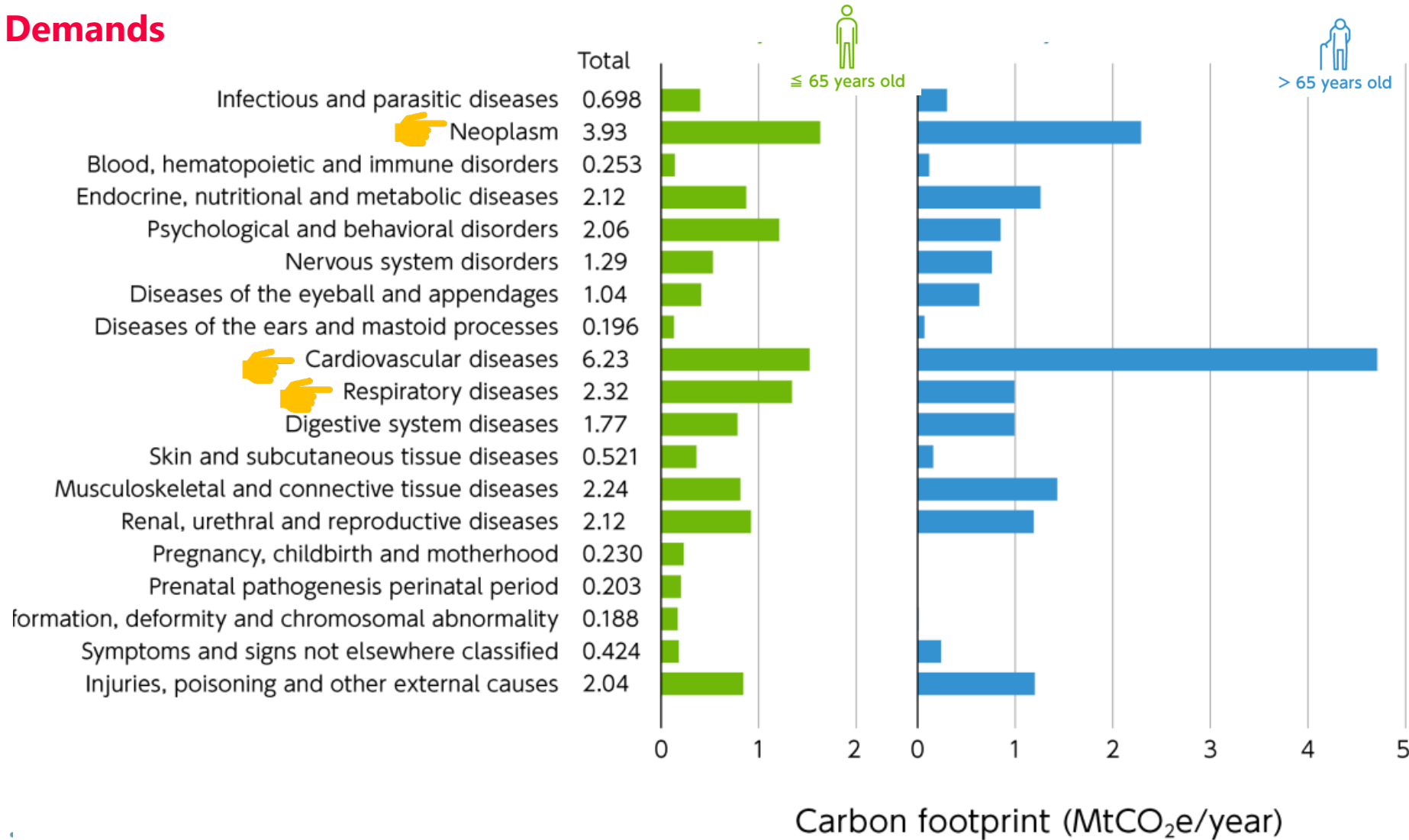
# Decomposition of healthcare's carbon footprint





# Carbon footprint of Japanese medical services by injury/disease type

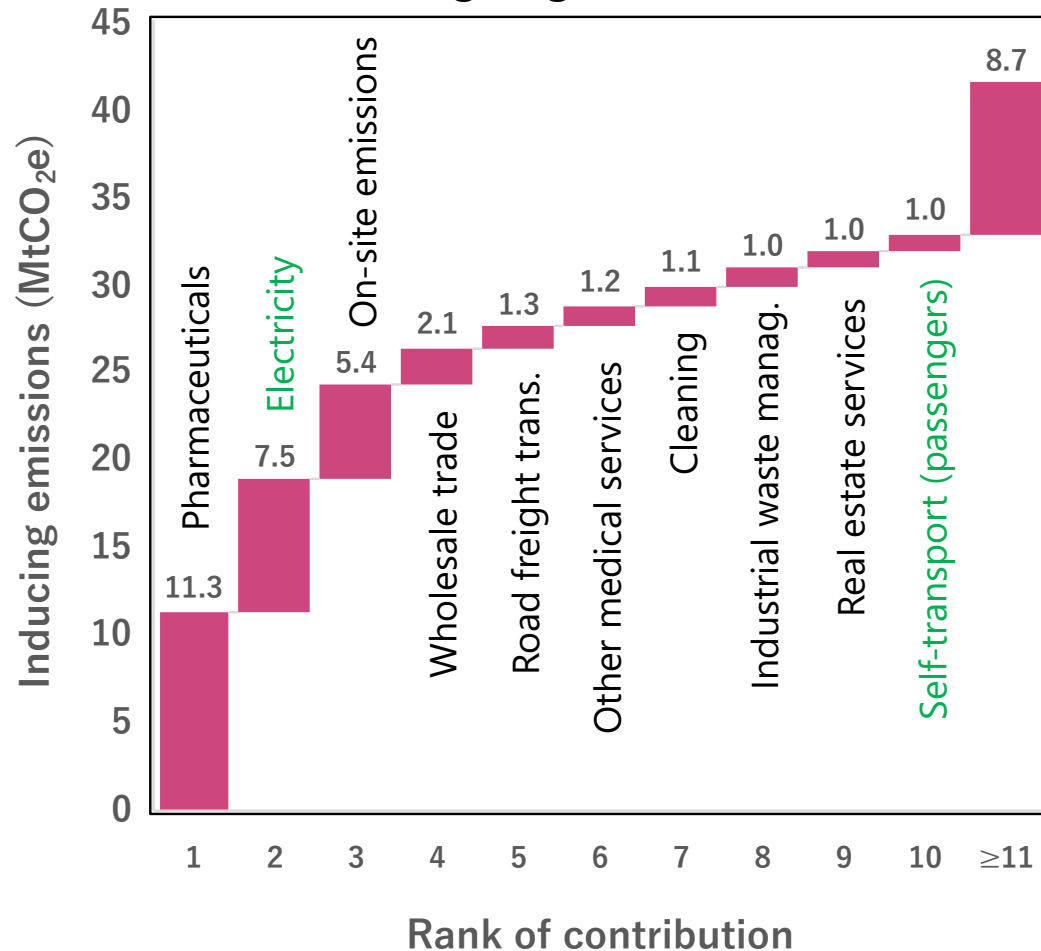
## Demands



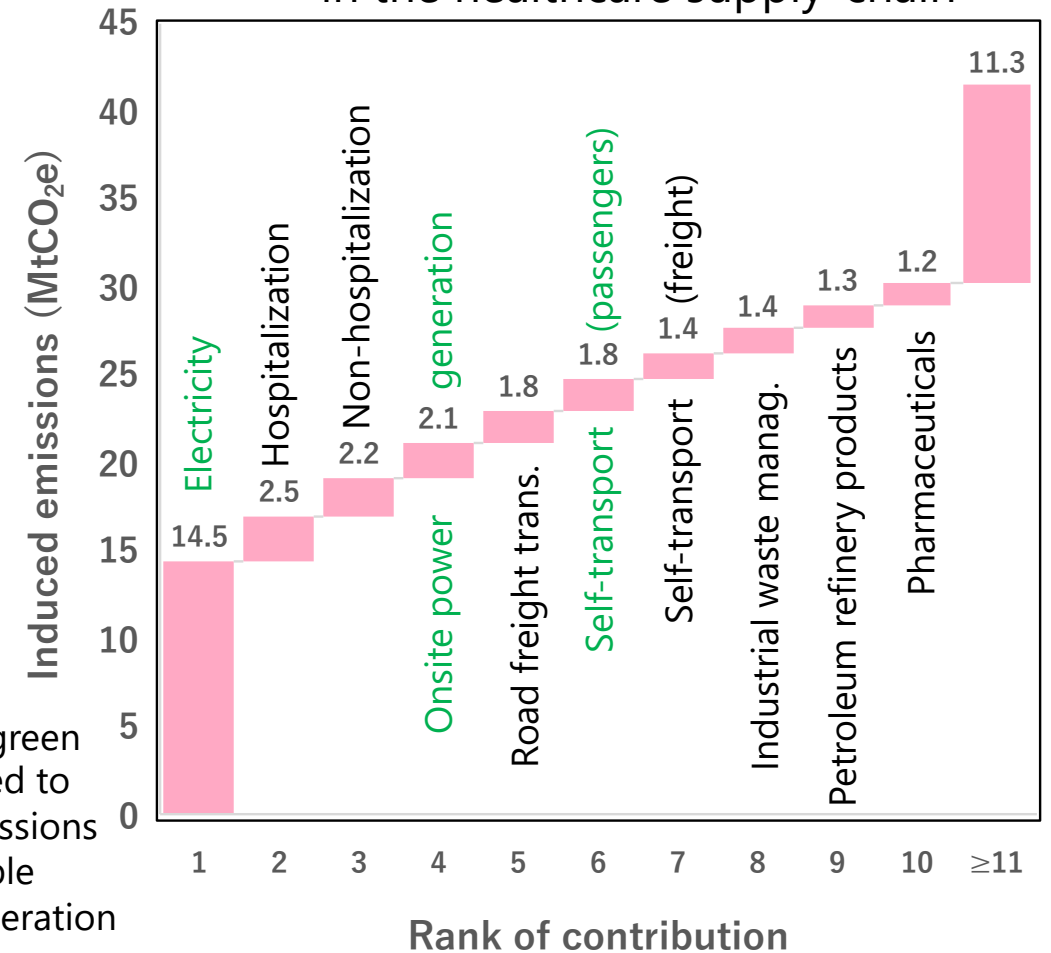


# GHG emission structure of medical services supply-chain

**Drivers** Healthcare's purchased commodities inducing large GHG emissions



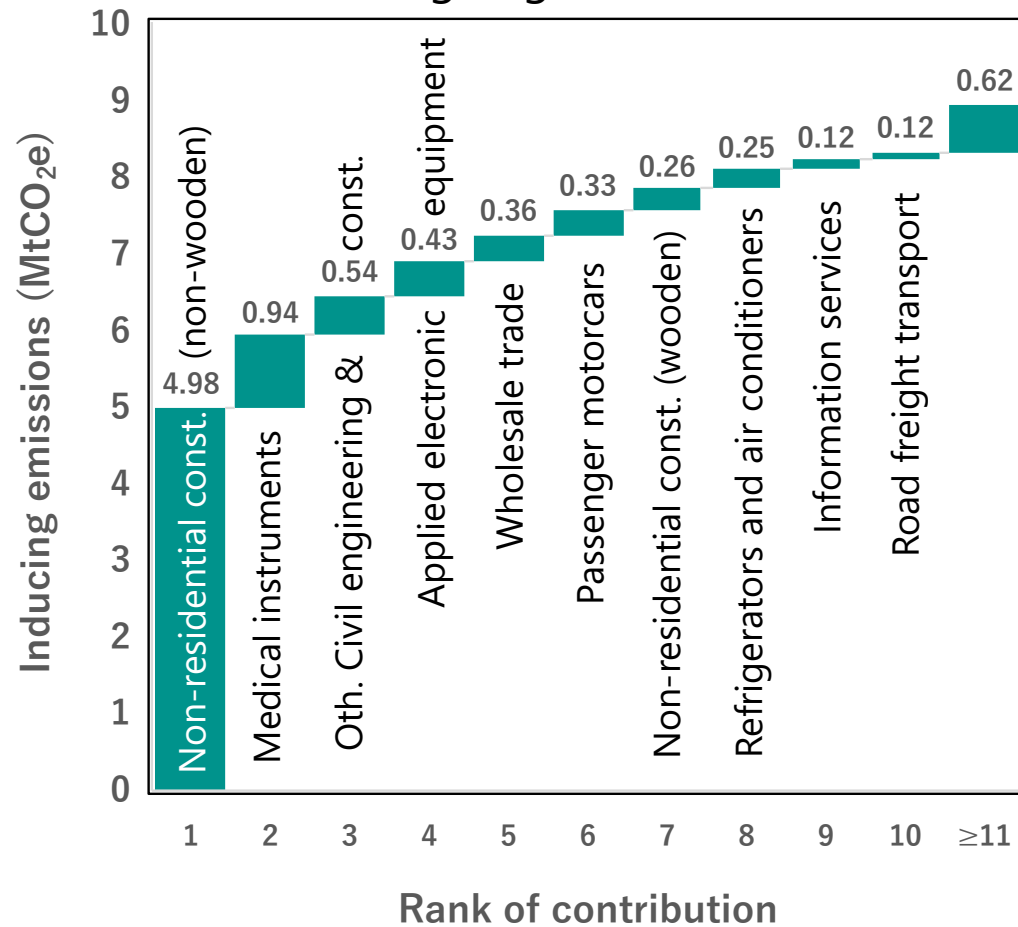
**Sources** Sectors that emit large GHG emissions in the healthcare supply-chain



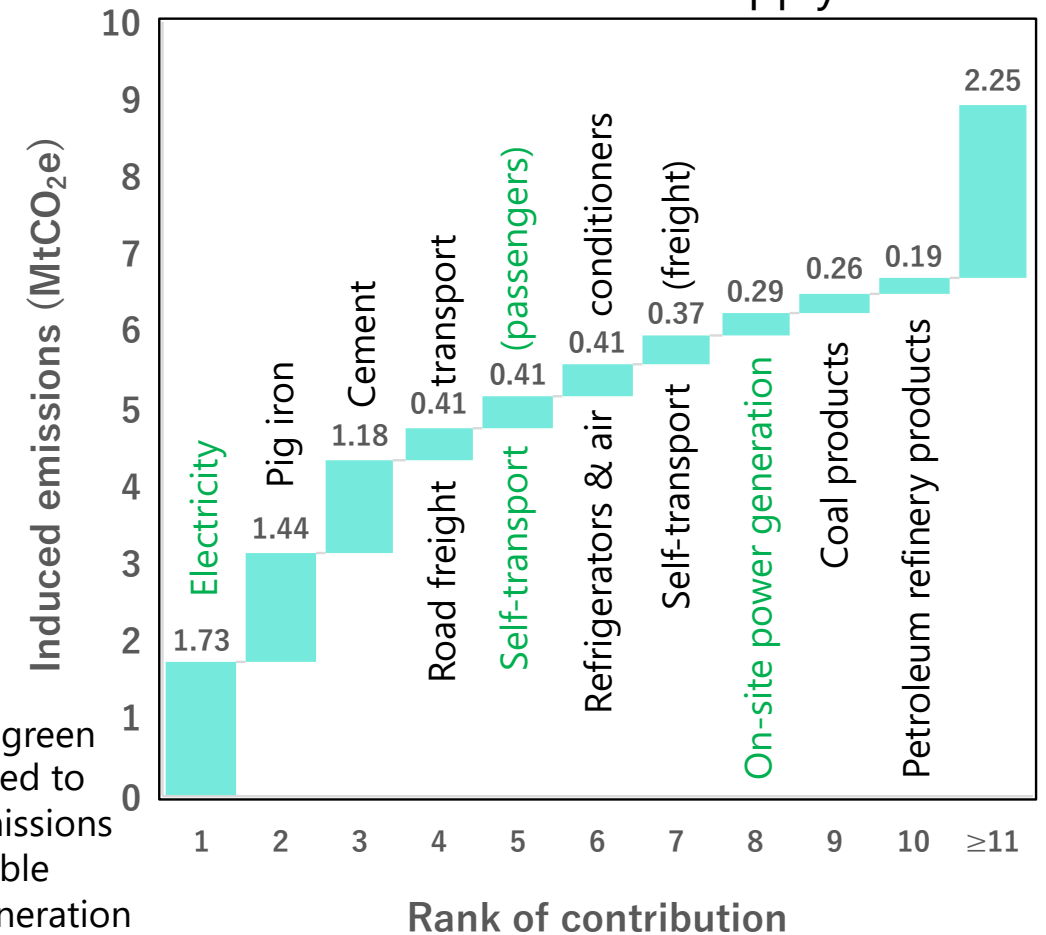
Sectors in green are expected to reduce emissions by renewable energy generation and electric vehicles.

# GHG emission structure of fixed-capital investment for healthcare

**Drivers** Healthcare's purchased commodities inducing large GHG emissions



**Sources** Sectors that emit large GHG emissions in the healthcare supply-chain



Sectors in green are expected to reduce emissions by renewable energy generation and electric vehicles.

# Interventions, stakeholders, targets, and policy measures to reduce healthcare's carbon footprint

Supply chains	Interventions	Stakeholders	Key targets	Policy measures
<b>Demands</b> Diseases requiring healthcare	Disease preventions Preventing serious illness	Citizens, patients Public health group	Cardiovascular Cancer Respiratory	Share the knowledge of health and carbon neutrality nexus with patients
<b>Drivers</b> Purchased commodities inducing emissions	Change of treatment Commodity selection Lifetime extension of equipment	Hospital management Pharmaceutical and medical equipment manufacturers Healthcare professionals Ministry of Health and Finance	Pharmaceuticals Electricity Cleaning Transport  Construction Medical instrument	Declaration and target setting for decarbonising hospitals  Financial incentives for decarbonising hospitals
<b>Sources</b> Actual emission sectors	Request for installation of decarbonisation technologies	Government Industry groups	Road freight transport Industrial waste management Pig iron Cement	<b>Forming a net zero alliance with material industry</b>

## Key messages

- An equal contribution to the carbon budget savings of the Climate 1.5° target requires a reduction in the carbon footprint of healthcare to 26% of the current level by 2050 on average .
- Reducing the carbon footprint of healthcare requires strategic interventions in healthcare demand, treatment methods and actual emissions sectors.
- It should be noted that emissions from the construction of healthcare facilities, production of medical equipment and freight transport would not be reduced by the widespread use of renewable energy generation.
- It is important to have policy mechanisms to quantify and manage materials as well as energy consumed by healthcare via its supply chain.

**Thank you for your kind attention!**

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