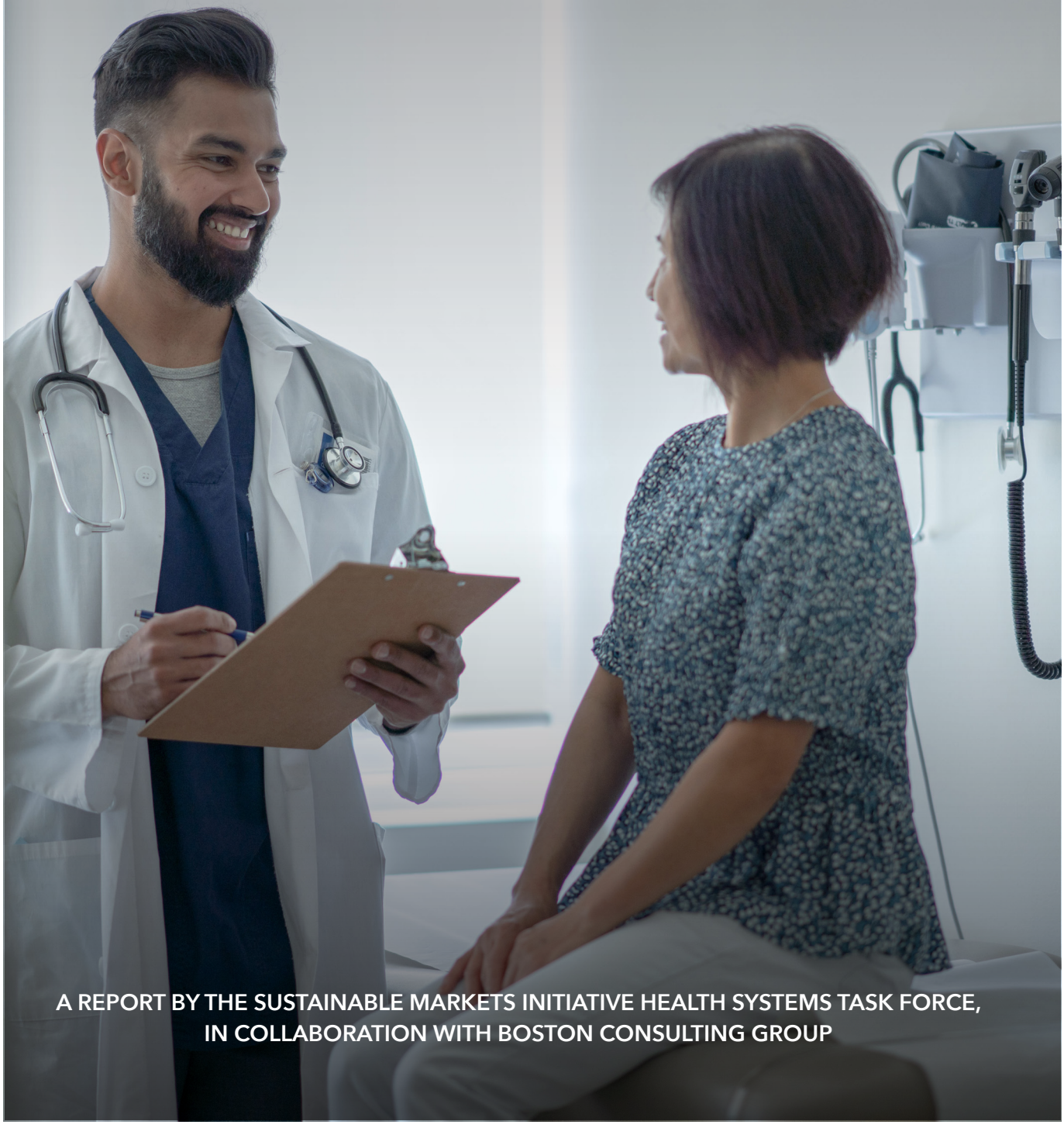
Sustainable Markets Initiative

DECARBONISING PATIENT CARE PATHWAYS

HOW CHOICES IN PATIENT CARE CAN DRIVE REDUCTIONS IN CARBON EMISSIONS



A REPORT BY THE SUSTAINABLE MARKETS INITIATIVE HEALTH SYSTEMS TASK FORCE, IN COLLABORATION WITH BOSTON CONSULTING GROUP

PREFACE: THE SUSTAINABLE MARKETS INITIATIVE HEALTH SYSTEMS TASK FORCE

Sustainable Markets Initiative.
In his former role as His Royal Highness The Prince of Wales, His Majesty King Charles III launched the Sustainable Markets Initiative (SMI) at Davos in January 2020. The SMI is a network of global CEOs across industries working together to build prosperous and sustainable economies that generate long-term value through the balanced integration of natural, social, human, and financial capital. These global CEOs see themselves as the 'Coalition of the Willing' helping to lead their industries onto a more ambitious, accelerated, and sustainable trajectory. Read more here.

Terra Carta.
In his former role as His Royal Highness The Prince of Wales, His Majesty King Charles III launched the Terra Carta at the One Planet Summit in January 2021. The Terra Carta serves as the mandate for the SMI and provides a practical roadmap for acceleration towards an ambitious and sustainable future; one that will harness the power of Nature combined with the transformative power, innovation, and resources of the private sector. Currently there are over 500 CEO-level supporters, including the first C40 city of Athens, Greece. The Terra Carta has served as the inspiration for the Terra Carta Design Lab. The Terra Carta is a roadmap for public, private, and philanthropic collaboration and open to all countries, cities, companies, organizations, and schools who wish to support it. Read more here.

SMI Health Systems Task Force.
The SMI Health Systems Task Force was launched at the 26th United Nations Climate Change Conference (COP26) with the central aim of accelerating the delivery of net zero, patient-centric health systems that improve individual, societal, and planetary health. The public-private partnership brings together CEOs and leaders from AstraZeneca, GSK, Merck, Novo Nordisk, Roche, Samsung Biologics, Sanofi, the Karolinska Institutet, National Health Service (NHS) England, the Sustainable Healthcare Coalition, UNICEF, the University of Pavia, and the World Health Organization (WHO).

The SMI Health Systems Task Force is also a partner of the WHO's Alliance on Transformative Action on Climate and Health (ATACH), a platform that over 60 countries have committed to at the Minister of Health level to strengthen climate resilience and lower the emissions of health systems.

Additional information on the SMI Health Systems Task Force can be found here.

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ABOUT THIS PAPER

The climate crisis is one of the most pressing risks to global health:[1] rising temperatures are resulting in an increase in hospital admissions and heat-related deaths; extreme weather events such as flooding and droughts are disrupting food systems, displacing people, and undermining access to healthcare; and changing patterns of water-borne and vector-borne diseases are threatening decades of progress in infectious disease control.[2] Climate change is also exacerbating the incidence of many non-communicable diseases (NCDs), including cardiovascular and respiratory illnesses, through increased air pollution, extreme heat, and other factors.[1] [3]

Climate change affects us all, but populations living in low- and middle-income countries are the most severely impacted.[4] The health risks associated with climate change also disproportionately affect the most vulnerable and disadvantaged in our societies, such as children, displaced populations, and people with underlying health conditions.[1] [4] [5]

Climate change causes millions of deaths every year – findings from 2019 indicate that over 9 million global deaths are attributable to air pollution[6] and over 5 million deaths are associated with non-optimal temperatures.[7] Limiting global warming to well below 2 degrees Celsius can avoid further impact on global health.[8] Healthcare stakeholders must play their part by accelerating the delivery of patient-centric, equitable, net zero health systems.

The SMI Health Systems Task Force is committed to collaborating across and beyond the healthcare sector to drive concrete action to reduce emissions and propose targeted recommendations to health leaders worldwide. Its work is driven by the conviction that a whole system approach is needed to decarbonise healthcare, with targeted actions focused on product manufacturing and distribution, innovative clinical research and development, all the way to delivery of patient care.

This paper outlines tangible actions to reduce emissions across patient care pathways and identifies seven levers to drive change; the impact of acting on these levers is illustrated in a case study looking at type 2 diabetes. It concludes with recommendations to ensure choices in patient care deliver quality, resource-efficient, and patient-centred care while having a minimal environmental impact.

Additional perspectives on how to reduce emissions across health systems can be found in the associated white papers:

- **"Accelerating the Delivery of Net Zero Health Systems"** is an overview of practical recommendations and actions from the Task Force in support of net zero health systems
- **Decarbonising Healthcare Supply Chains"** highlights how to reduce emissions across the supply chain, which is responsible for >50% of healthcare emissions
- **"The Digital Solution for Sustainability in Clinical Research"** showcases how digital solutions can help abate emissions from clinical trials

EXECUTIVE SUMMARY

The Opportunity

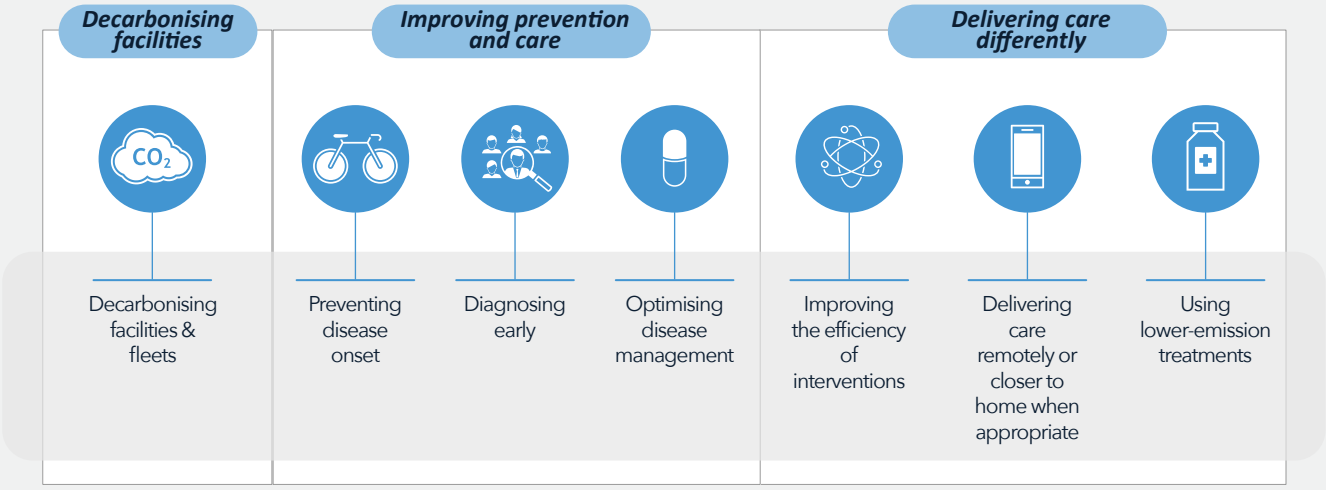
The healthcare sector generates approximately 5% of total global emissions,[5] and care pathways are responsible for over 40% of these.[a] Choices in patient care – in terms of the design of healthcare facilities, the way care is delivered, or the choice of intervention – can play a critical role in reducing emissions. It follows that all stakeholders must work together to drive action along the entire pathway of care to improve patient outcomes and reduce the environmental impact.

Seven Levers for Change

Drawing from international frameworks, this paper highlights seven levers of change that can achieve substantive reductions in emissions in care pathways. Applying these levers to type 2 diabetes, it is estimated that diet and exercise programmes aimed at lowering the incidence of type 2 diabetes can reduce emissions by more than 30% and the use of mobile apps for lifestyle modification can reduce emissions by up to 5%.[b]

Replicating these figures to other conditions would be a worthwhile exercise to understand the potential for reducing emissions while improving patient outcomes. Such extrapolations are, however, currently challenged by limited data availability on disease-pathway-specific emissions. The evidence base and assessment methods for these levers of change need to be further developed and refined. Therefore, an agenda and funding plan for research, learning, and education should be formed.

Seven levers to reduce emissions in care pathways



Source: Health Care Without Harm, WHO, academic literature, BCG analysis

a. BCG analysis. **b.** BCG analysis.

The Need for a Whole-System, Collaborative Approach

Decarbonisation needs to become an integral part of how stakeholders assess options to deliver patient-centric, high-quality care. Health systems are complex, and all stakeholders need to be involved in designing and adopting solutions – with each having a specific role to play.

Decarbonisation: a role for all stakeholders

Clinicians and healthcare professionals:
- Implement guidelines focused on prevention & early intervention
- Optimise investigation, prescribing & treatment
- Use lower-emission treatments when available & safe
- Implement recommendations to decarbonise their own care settings
- Support increased sustainability education for healthcare professionals

Government and policymakers:
- Pass policy that enables a green transition in health systems
- Fund emissions reduction initiatives in healthcare settings
- Enable the use of digital solutions to improve health and reduce emissions
- Support healthy, low-carbon lifestyles

Health authorities & payers:
- Align coverage to reduce emissions
- Promote healthy lifestyles

Patients and patient groups:
- Share information on how patient care options impact the climate
- Empower patients to explore and align on green care options with healthcare professionals

Providers & facility managers:
- Identify emissions hotspots & set targets
- Increase energy efficiency & switch to greener forms of energy
- Decarbonise transport by electrifying fleets
- Reduce emissions from hospital waste
- Educate staff on emissions reductions
- Design carbon neutral facilities

Regulatory bodies:
- Adopt green criteria in new treatment approval (e.g. green labelling), including CO_2e as a key metric

Pharma, biopharma, med-tech:
- Publish product-level emissions data
- Decarbonise own operations & supply chain
- Redesign products to reduce their carbon footprint
- Invest in prevention & early detection

Source: Health Care Without Harm, WHO, academic literature, BCG analysis

The SMI Health Systems Task Force Commitment

Meaningful change will require all stakeholders to work together. As a collaborative alliance of public and private sector leaders, the SMI Health Systems Task Force is uniquely positioned to accelerate decarbonisation efforts across the entire health ecosystem. With relevance to patient care pathways, it is committed to:

Engage and collaborate with health policy makers, regulators, payers and providers, and hospitals from across the globe to raise awareness of the need and the opportunity to decarbonise care pathways

Build an end-to-end care pathway emissions calculation standard and tool for specific diseases that allows stakeholders to **measure and track emissions** across the care pathway and assess decarbonisation strategies

Align on a common framework to perform lifecycle assessments (LCA) – with private sector members also committed to publishing product-level LCA data across their product portfolio to increase transparency on treatment emissions

Reduce emissions across their own operations – with private sector members committed to achieving net zero emissions by 2045[c] across all scopes and working with suppliers to decarbonise healthcare product supply chains

c. At present, Samsung Biologics is committing to achieve net zero by 2050 at the latest given local market constraints, and is actively working to reach this target as early as possible.

CLIMATE CHANGE: THE CHALLENGE FOR HEALTHCARE

A Reciprocal Relationship

Climate change is a considerable threat to the resilience of health systems. The WHO considers it to be the biggest health threat facing humanity.[1] Like the populations they serve, health systems are also vulnerable to climate change: extreme weather events such as flooding, fires, and extreme heat can impact infrastructure, lead to power outages and impact workforce productivity.[9] [10] These events can also displace populations, undermining access to care.[4]

Health systems are under mounting pressure to deliver care more effectively and sustainably – and climate change adds to that pressure. The ageing of the population,[11] the rise of chronic NCDs,[12] and rapid urbanisation all contribute to an increased demand for healthcare.[13] At the same time, health systems are still reeling from the impact of the COVID-19 pandemic, facing a backlog of patients who require care due to interruptions in health services and a mounting human resource crisis. This situation has shed light on the need to improve health systems' resilience to future crises – with climate change among them.

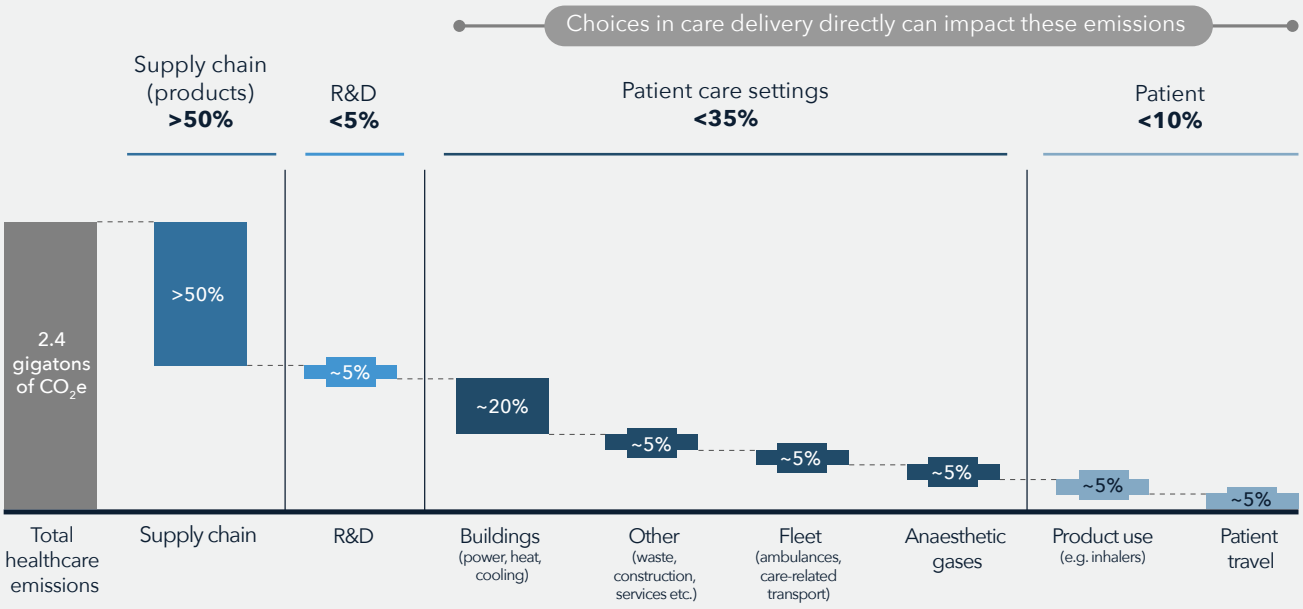
Health systems are, however, also significant contributors to climate change. In 2018, the global healthcare sector was responsible for almost 5% of total global emissions.[5] Recognising this, over 60 governments have pledged to strengthen the climate resilience and lower the emissions of health systems, with almost 20 also committed to delivering net zero health systems by 2050 (see Appendix). To support turning these commitments into action, the WHO has launched the Alliance for Transformative Action on Climate Change and Health (ATACH) as a platform to foster coordination and collaboration across countries.[14]

A Focus on Patient Care Pathways

Health systems are complex, and their decarbonisation will require a system-wide approach to reduce emissions at each step leading to the delivery of care. Governments need to find appropriate approaches to tackle the combined goals of improving population health, decarbonising healthcare and improving the resilience of health systems – and it is arguably at the level of patient care pathways that these goals intersect the most. Patient care pathways account for approximately 45% of total emissions.[d] This includes approximately 35% for emissions linked to healthcare settings and approximately 10% directly linked to the choice of intervention and patient travel (see Exhibit 1).

d. BCG analysis.

EXHIBIT 1 | Choices in patient care have a direct impact on ~45% of healthcare emissions



Source: Health Care Without Harm/Arup (2019); Health Care Without Harm/World Bank (2017); UK National Health Service/Lancet (2020); UK NHS: Delivering a 'Net Zero' National Health Service (2020); The Lancet Countdown on Health and Climate Change (2020, 2018); Environmental Research Letters: International Comparison of Health Care Carbon (2019); Health Affairs: Health Care Pollution And Public Health Damage In The United States: An Update (2020); BCG analysis based on literature review and case experience

SEVEN LEVERS OF CHANGE TO REDUCE EMISSIONS ALONG THE CARE PATHWAY

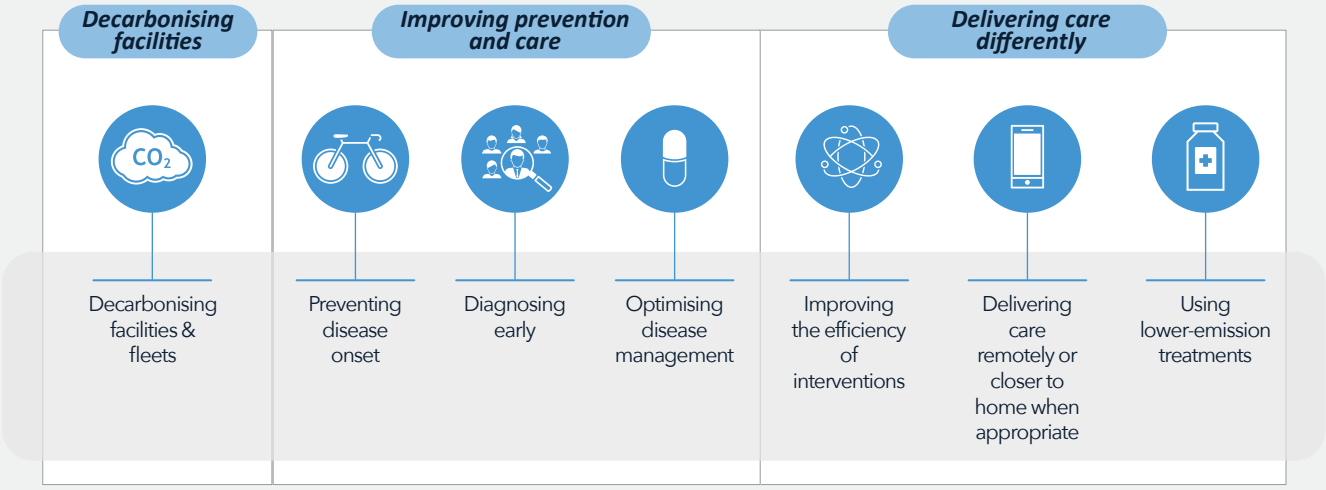
Decarbonisation opportunities occur at all stages of care pathways. Drawing from international frameworks to decarbonise healthcare,[15][16] this paper highlights seven levers that can reduce emissions and contribute to high-quality care at the same time (see Exhibit 2). These can be grouped into three overarching themes:

- Decarbonising healthcare facilities and fleets through technological innovations (renewable energy, electric ambulances) and improved efficiency through conservation of resources and promoting circularity principles within healthcare (such as use of reusable and recyclable materials)[15]

- Improving prevention and disease management to reduce the frequency and severity of disease and improve the effectiveness of treatment

- Delivering care differently, by improving the overall efficiency of care delivery and choosing interventions that have a lower carbon footprint and offer similar or improved healthcare outcomes

EXHIBIT 2 | Seven levers to reduce emissions in care pathways



Source: BCG analysis, based on Health Care Without Harm, WHO, academic literature

1 Decarbonising Facilities and Fleets

Emissions from heat and power drive approximately 20% of healthcare emissions.[e] Designing more energy-efficient buildings, deploying circular construction practices, and using environmentally sustainable materials and energy sources can help abate overall emissions from facilities.[15] Health Care Without Harm's Green and Healthy Hospitals provides helpful guidance on concrete actions that can be taken to reduce emissions within hospital settings, and this guidance has been implemented in many institutions around the world.[17] Some health systems, such as NHS England, now require all hospital trusts to develop a 'green plan' to decarbonise facilities[18] – a target met by all 212 NHS trusts (covering over 1,000 facilities) in 2022.[19]

Using fleets more efficiently and transitioning to low-emission, green ambulances and light vehicles can address around 4% of healthcare emissions. As part of NHS England's decarbonisation strategy, for example, many hospitals are moving towards electric fleets.[20] [21]

2 Preventing the Onset of Disease

Minimising risk factors for illness and preventing diseases from occurring in the first place are the most cost-effective ways to reduce the burden of disease on our societies – particularly NCDs[22] – and decrease the carbon footprint of healthcare.

Acting on air pollution – which causes up to 9 million deaths a year[6] – can have obvious co-benefits for health and the environment. Reducing air pollution levels in cities can have a particularly powerful effect as cities are associated with 75% of energy-related greenhouse gas emissions.[2] Several city-driven initiatives have been launched to create healthy, sustainable urban environments, including the WHO Healthy Cities programme,[23] C40 Cities,[24] and Eurocities.[25] The city of Paris is planning on implementing a fossil-free zone by 2030, which is forecast to add ~2.5 weeks to the average Parisian's life expectancy.[26]

Vaccination programmes are also an effective prevention measure. The measles vaccination has prevented over 25 million deaths since 2000, and the polio vaccination has helped to reduce cases globally by over 99% since 1988.[27] [28] COVID-19 vaccinations have substantially altered the course of the pandemic, with an estimated ~20 million deaths averted in 2021 across 185 countries.[29]

Vaccination programmes also have the potential to reduce emissions and further studies are needed to measure the impact. One study by GSK found that a two-dose herpes zoster vaccination in a sample of US adults over 50 years old reduced lifetime risk of shingles by 67.8% and resulted in carbon savings of 18% (4.5k tons of CO_2e for every 1 million individuals vaccinated)[f] due to avoided hospitalisation and care visits.[g]

e. BCG analysis. **f.** Weighing the CO_2e from the vaccine programme (manufacturing, distribution, and administration) against avoided hospitalisation emissions **g.** Based on internal company data.

3 Diagnosing Disease Early

Identifying and treating disease early and effectively improves patient outcomes and has the potential to reduce emissions, especially for NCDs, which account for almost three quarters of all deaths globally.[30] In 2019, 17 million people died of an NCD before the age of 70 – and 86% of these premature deaths occurred in low- and middle-income countries.[30]

Early detection is a recognised pillar of cancer control and is central to reducing mortality from many cancers. Detecting cancer at an early stage allows clinicians to offer people treatments that are generally more effective, less complex, and less expensive.[31] Strategies for early detection have shown benefits in both high-income and lower-income settings. For example, low-cost early cancer surveillance reduced the presentation of late-stage breast cancer by almost half over 4 years in a pilot study in Malaysia.[32]

4 Optimising Disease Management

Avoiding disease progression has the potential to improve outcomes, lower costs, and reduce emissions. Once a disease is diagnosed, timely treatment and active management, with full engagement of patients, are essential to halt progression to more advanced stages of the disease and development of associated complications.

For example, oral therapies in patients with chronic kidney disease (CKD) (with or without type 2 diabetes) have been shown to reduce further disease complications. A study of over 4,300 patients across 21 countries assessed the impact of treating CKD with oral therapy; it found that over a median of 2.4 years, there was a 29% reduction in risk of death from cardiovascular causes and heart failure hospitalisation compared with the placebo group.[33]

Optimisation of clinical care pathways can improve outcomes and also provide an opportunity to reduce emissions. An example is the OPERA platform set up by AstraZeneca, Roche Diagnostics, Bering, Storm ID, NHS Greater Glasgow and Clyde, Us2.AI, and the Singapore Heart Foundation. This platform aims to improve the heart failure diagnosis pathway and allows non-specialist practitioners to diagnose heart failure in the community. It reduces waiting times, enabling faster treatment and reducing hospitalisations—and cuts ~8 kg of CO_2e per patient per year.[34] [h]

h. Assumes average annual specialty care visits for heart patients are reduced from 2–6 to 1.4–4.2 and an emission factor of 6.9 kg CO_2e per visit based the Sustainable Healthcare Coalition Care Pathway Carbon Calculator.

5 Improving the Efficiency of Interventions

Improving the overall efficiency of care is a recognised priority for the future sustainability of our health systems. The Organisation for Economic Co-operation and Development (OECD) estimates that one-fifth (20%) of healthcare expenditure either does not improve people's health or could worsen their outcomes.[35] Choosing Wisely, an initiative started in the US in 2012 and expanded to over 20 countries,[36] was created to reduce inefficiency by promoting conversations between doctors and patients, enabling clinical teams and patients to choose care together that is evidence-based, necessary and does not duplicate other interventions previously received.[36] Implementation of the Choosing Wisely guidelines has had marked effects; in a US hospital for example, over 8 weeks the number of blood tests was reduced by 50%, and length of hospital stays by around 20%.[37]

Reducing unnecessary or inappropriate prescriptions is a key focus area for improving efficiency: in the US, 25% of antibiotic prescribing in ambulatory care is estimated to be inappropriate.[38] Actions can help increase patient safety, reduce pharmaceutical waste, and reduce emissions. Opportunities may also exist to optimise follow-up outpatient appointments. Pilots conducted by an NHS England trust found that 20% of the 175,000 outpatient follow-up appointments studied could be reduced through solutions such as patient-initiated follow-up.[39]

6 Delivering Care Remotely when Appropriate

Using solutions such as telemedicine and wearable devices can reduce the need for patient travel and increase access to specialist care, thus reducing emissions without compromising care quality.[40] Digital health solutions can also remove physical and financial barriers to accessing care.[41]

Remote monitoring for NCDs has been shown to improve health outcomes. For example, prospective telemonitoring for heart failure has been shown to reduce all-cause hospitalisations and mortality compared with usual care.[42]

However, barriers to implementation exist in terms of complexity and ease of use,[43] impacting accessibility for different populations. Therefore, it is imperative that non-digital options for care remain to ensure inclusivity and optimal health outcomes for all.

7 Using Lower-Emission Treatments Where Appropriate

Certain treatments and procedures carry a greater carbon footprint, for example anaesthesiology and use of inhalers for respiratory care. NHS England estimates that 3% and 2% of its emissions are from inhalers and anaesthetic gases, respectively.[16]

Pressured-metered dose inhalers (pMDIs) used in respiratory care contain polluting fluorinated gases as a propellant, and dry-power inhalers (DPIs) are less polluting.[44] Some health systems, such as NHS England, are encouraging the use of DPIs where clinically appropriate.[16] However, there is recognition that patients must be consulted with any medication changes to preserve patient choice.

Anaesthetic gases, such as desflurane, are estimated to account for 50% of surgery-related emissions in high-income countries.[45] Desflurane is estimated to have a 40 to 50 times greater global warming potential (over 100 years) than alternatives such as sevoflurane and isoflurane.[45] NHS England has committed to lowering the carbon footprint of anaesthetics by using lower-carbon alternatives (such as sevoflurane), along with capture and destruction of gases, and reducing the amount of residual gas in cylinders leaking into the atmosphere.[16]

Many of the above levers can be applied today.
For example, implementing guidelines focused on prevention, early diagnosis and treatment using existing approaches and technologies – including telemedicine – can reduce the burden of disease on health systems and reduce healthcare emissions. Switching to renewable power and optimising emergency fleet use can also help reduce the carbon footprint of care settings and can be done at low incremental cost today.[46] Other actions, such as developing and using low-emission treatments or designing new low-carbon models of care will require further innovation and close collaboration across healthcare stakeholders to yield emissions savings in coming years.

The application of the above levers will vary by healthcare setting.
Countries can learn from each other's experience in designing new models of care guided by quality and sustainability criteria – and solutions that are found to be effective in one country can be emulated elsewhere. For example, cataract surgery centres in India have developed new models of care that deliver the better outcomes and lower complication rates than the UK average, with a carbon footprint 20x lower.

CASE STUDY: APPLYING THE SEVEN LEVERS OF CHANGE TO DIABETES

The choice of interventions that can reduce emissions while improving health outcomes will vary by care pathway. This case study looks at what actions can be taken in care pathways for type 2 diabetes across the seven levers to reduce emissions. Replicating this analysis to other disease care pathways is not always possible given the limited available data on care pathway environmental footprint, including for product-level treatment emissions – however, the methodology could in theory be applied to other conditions if emissions data is available.

About Type 2 Diabetes

Type 2 diabetes is a chronic condition that occurs when the body cannot effectively use insulin, a hormone that regulates blood sugar. In 2021, over 500 million adults (approximately 10% of the global population) had type 2 diabetes, with 80% living in low and middle-income countries.[47]

The care pathway for diabetes has been well defined in clinical guidelines. Early detection is important to start treatment as soon as possible and can be done using a simple glucose blood test. There are multiple modalities for treatment, but these centre around control of blood sugar, lipids, and blood pressure though a combination of medication and risk factor management.[48] Control of the disease is essential to reduce the risk of further complications (such as CKD).[48]

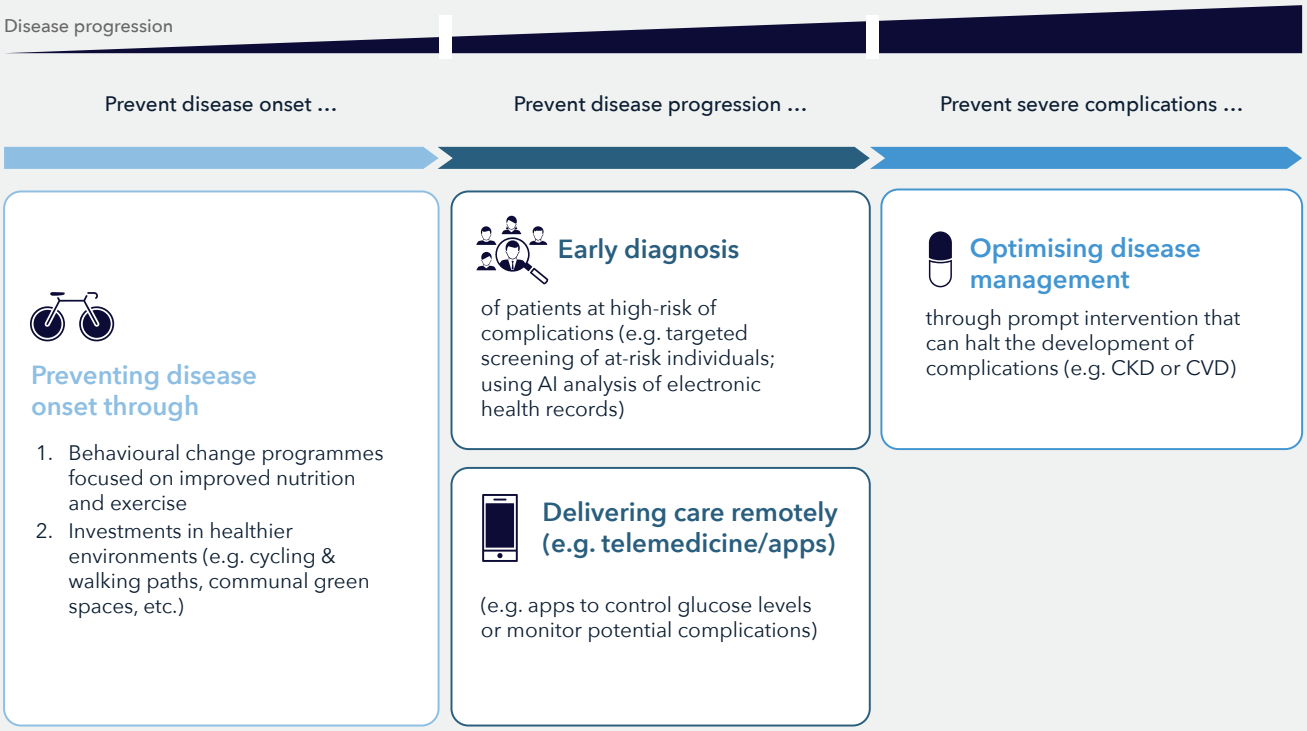
Like many NCDs, type 2 diabetes is largely preventable by taking actions, such as promoting healthy diets and physical activity, to address common risk factors. It is also the focus of many innovations – telehealth solutions have seen a lot of applications in type 2 diabetes, allowing clinicians to remotely monitor a patient's blood sugar, clinical effectiveness of interventions and overall outcomes through apps.[49]

Seven Levers of Change Applied to Diabetes

The seven levers for change are highly relevant to diabetes – with actions having significant impact on patient outcomes and carbon emissions (see Exhibits 3 & 4). Preventing the occurrence of complications holds the greatest promise for reducing emissions, while also significantly reducing the risk of adverse outcomes. The associated emissions for treating a patient who develops late-stage kidney disease and needs dialysis several times a week are about 70 times greater than those for

treating a patient controlled via insulin, and up to 200 times greater than treating a patient with oral antidiabetic drugs alone.[50] [i] Applying these figures to a cohort of 10,000 people in the UK with pre-diabetes, it was found that approximately 15% of people will develop complications such as chronic kidney disease or cardiovascular disease, yet their care accounts for about 50% of the total lifetime emissions across the entire cohort.[j]

EXHIBIT 3 | Reducing emissions in type 2 diabetes care

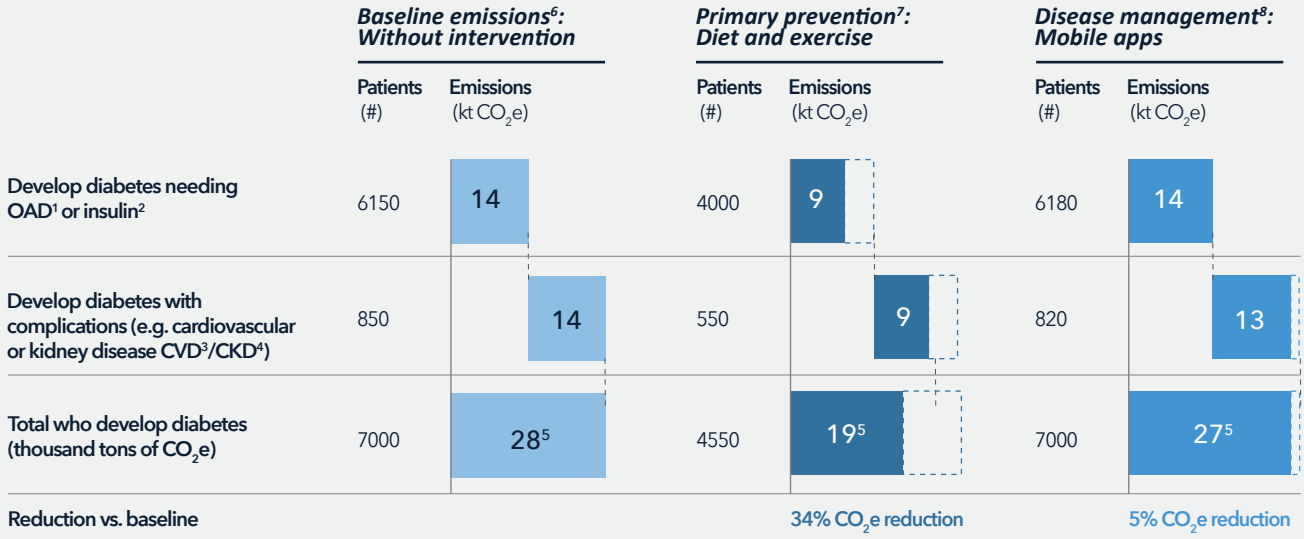


Source: BCG analysis

i. BCG analysis. **j.** BCG analysis.

To illustrate the effect of these interventions on patient outcomes and care pathway emissions, the impact of two low-cost levers – primary prevention and disease management using mobile apps – was modelled for the hypothetical cohort of 10,000 people with prediabetes mentioned above. Based on this analysis, an effective primary prevention programme could support a 34% reduction in CO_2 emissions. The use of mobile apps to manage insulin-dependent diabetics can reduce the risk of complications, and support a 5% emissions reduction. This is based on a 2019 meta-analysis finding significant improvements in blood sugar levels when using digital apps for lifestyle management of type 2 diabetes.[51] It is estimated that such apps could reduce cardiovascular complications by 3% and emissions related to renal complications by 14%.[50] [51] [52] k

EXHIBIT 4 | Interventions can reduce cohort emissions by 5% to 34%



1. Over 28 years 2. Over 18 years 3. Over 13 years 4. Over 13 years 5. Totals show remaining emissions 6. Among 10,000 with prediabetes, 7,000 get diabetes, creating ~29,000 tons of CO_2e in ~28 years 7. Study showed programmes can reduce rate of T2DM by 34% 8. Study with insulin-dependent patients reduced complications by 3% to 14%.
Source: BCG analysis

k. BCG analysis combining two studies. The first study (2019 meta-analysis) found a 0.25% to 0.5% reduction in HbA1c (glycated haemoglobin, a measure of how well controlled blood glucose has been) over the preceding 3 months. A 0.5% reduction in HbA1c is estimated to reduce cardiovascular complications by 3% and emissions related to renal complications by about 14% based on a second study. This study also found that 1% reduction in HbA1c leads to 40% reduction in CO_2e from CKD and 3% in CVD complications among patients on first-line therapy for type 2 diabetes.

HOW HEALTH SYSTEMS CAN COME TOGETHER TO IMPROVE THE SUSTAINABILITY OF CARE PATHWAYS

The future sustainability of healthcare requires decarbonisation to be an integral part of health agendas – with commitment from all stakeholders. Environmental considerations need to become part of how stakeholders assess options to deliver patient-centric, high-quality care, guiding relevant actions at the level of health facilities and delivery of patient care. Given the complexity of health systems, all stakeholders need to be involved in designing and adopting solutions, including patient communities (see Exhibit 5).

EXHIBIT 5 | Decarbonisation: a role for all stakeholders

Clinicians and healthcare professionals:
- Implement guidelines focused on prevention & early intervention
- Optimise investigation, prescribing & treatment
- Use lower-emission treatments when available & safe
- Implement recommendations to decarbonise their own care settings
- Support increased sustainability education for healthcare professionals

Government and policymakers:
- Pass policy that enables a green transition in health systems
- Fund emissions reduction initiatives in healthcare settings
- Enable the use of digital solutions to improve health and reduce emissions
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Health authorities & payers:
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Patients and patient groups:
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Regulatory bodies:
- Adopt green criteria in new treatment approval (e.g. green labelling), including CO_2e as a key metric

Pharma, biopharma, med-tech:
- Publish product-level emissions data
- Decarbonise own operations & supply chain
- Redesign products to reduce their carbon footprint
- Invest in prevention & early detection

Source: Health Care Without Harm, WHO, academic literature, BCG analysis

Partnership and collaboration will be essential to have lasting impact – all stakeholders could look to work to a set of guiding principles to drive change collaboratively and commit to:

- **Sharing results transparently**, by establishing and supporting an open-source database to report care pathway data publicly, including patient outcomes. Pharma, biopharma, and med-tech companies should also publish product-level emissions data to increase transparency on treatment related emissions

- **Ensuring consistency in measurement**, to ensure stakeholders use the same reporting standards and can use and understand each other's data

- **Making decisions transparently** to ensure that criteria for regulatory and policy assessments are known in advance, and outcomes of the review process and underlying evaluations are made public

- **Adopting an integrated system mindset**, preventing improvements in one intervention or care pathway at the expense of another – thereby avoiding setbacks in patient outcomes or safety

- **Incentivising continuous improvement through periodic reviews**, using data to identify successful approaches to accelerate and scale up

SMI HEALTH SYSTEMS TASK FORCE ACTIONS TO SUPPORT THE DECARBONISATION OF CARE PATHWAYS

The SMI Health Systems Task Force recognises the scale of the challenge associated with addressing healthcare emissions – as well as the need to act now.

The Task Force is taking concrete actions to support its ambition of accelerating the decarbonisation of health systems and is committed to:

Engage and collaborate with health policy makers, regulators, payers and providers, and hospitals from across the globe to **raise awareness of the need and the opportunity** to decarbonise care pathways

Build an end-to-end care pathway emissions calculation standard and tool for specific diseases that allows stakeholders to **measure and track emissions** across the care pathway and assess decarbonisation strategies. The tool will leverage the expertise of public and private sector partners to complement and scale up existing tools and approaches, such as the Sustainable Healthcare Coalition's Care Pathway Guidance and Calculator[53]

Align on a common framework to perform lifecycle assessments (LCA) – with private sector members also committed to publishing product-level LCA data across their product portfolio to increase transparency on treatment emissions

Reduce emissions across their own operations. Private sector members are committed to achieving net zero emissions by 2045[I] across all scopes, and to working with suppliers to decarbonise healthcare product supply chains (*see Decarbonising Healthcare Supply Chains for additional details*)

I. At present, Samsung Biologics is committing to achieve net zero by 2050 at the latest given local market constraints, and is actively working to reach this target as early as possible.

SMI HEALTH SYSTEMS TASK FORCE CONTRIBUTORS

The SMI Health Systems Task Force thanks the members of the Task Force's Patient Care Pathway working group for their contribution to this whitepaper, and for their role in coordinating contributions from their organisations:

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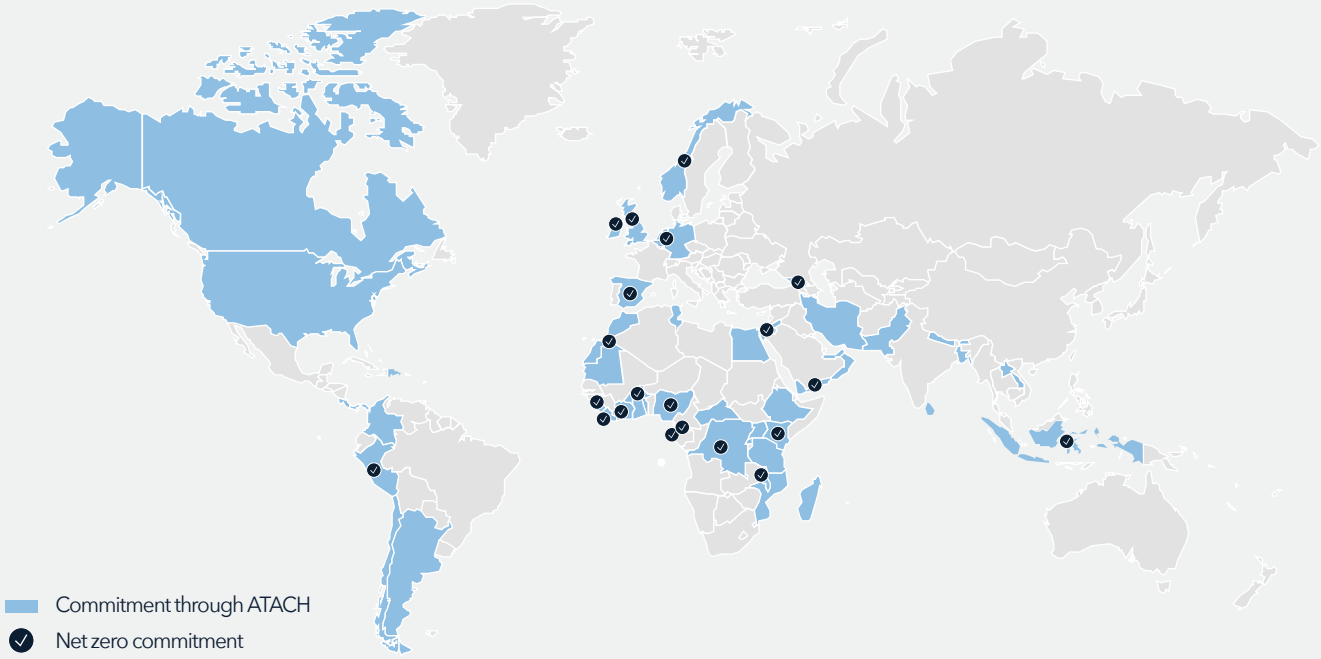
APPENDIX: WHO ALLIANCE FOR TRANSFORMATIVE ACTION ON CLIMATE CHANGE AND HEALTH (ATACH)

Over 60 governments have made commitments at the Minister of Health level to strengthen climate resilience and lower emissions of health systems. The SMI Health Systems Task Force is a partner of the WHO ATACH.

EXHIBIT 6 | 60+ governments across the world have made commitments to address healthcare's climate footprint through ATACH



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