

South East

Clinical
senate

**Embedding healthcare
sustainability in major service
change**

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Foreword

I am delighted to recommend this report prepared by Rachel Bracegirdle, Senate Clinical Fellow, on behalf of the South East Clinical Senate. For too long environmental sustainability has been something of a footnote in cases describing service change despite its ever-increasing importance in all aspects of our lives. As a clinical senate we have been actively promoting environmental sustainability in all of our work, but we can and must, do more. Rachel's report highlights key facts, describes the approach that the NHS is taking and provides some focus for systems and clinical senate council and panel review members on the areas that we must be considering when cases for change are presented to us for review in the future. She combines a data-led view of what contributes to the NHS carbon footprint with real insight into what we can do to achieve our goals, illustrated by real life case studies. I firmly believe that, with the right support from us all, it can lead to the redesign of services with environmental sustainability firmly embedded from the outset as a guiding principle.



Dr Paul Stevens,

Chair South East Clinical Senate

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1. Introduction

The aim of this report is to provide guidance to help both systems and review panels to ensure sustainability is embedded into service change proposals from the outset and to demonstrate 'what good looks like' for us as a Clinical Senate. The setting the scene section explains the need for action, to embed healthcare sustainability into major service change. The areas to consider section gives practical guidance to support systems to incorporate sustainability into major service change by providing key questions for systems to ask themselves when considering major service changes and examples of good practice. Further information, resources and tools are signposted to in the final section of the report. Both service providers and commissioners have a responsibility to deliver sustainable healthcare systems, ensuring the provision of high-quality care now and in the future.

2. Setting the scene

The current problem

Climate change is the single biggest health threat facing humanity in the 21st century.¹ Global temperatures are increasing and continue to rise at an unprecedented rate, driven by the accumulation of carbon dioxide (CO₂) and other greenhouse gases (GHG) in the atmosphere. The average global temperature on Earth has increased by at least 1.1⁰C since 1880.² A global increase of 1.5⁰C, above the pre-industrial average, risks catastrophic harm to health, which would be impossible to reverse.³ Climate change threatens human health and wellbeing through its impact on weather, ecosystems, and human systems.³ Table 1 summarises the human health and operational / infrastructure impact of climate change, for example an increase in patients needing to access services and damage to hospital buildings.⁴ In addition, climate change disproportionately effects the most vulnerable and disadvantaged, widening the health inequalities which already

¹ Costello, A et al. (2009) 'Managing the health effects of climate change'. *The Lancet*. 16;373 (9676), pp.1693-733.

² National Aeronautics and Space Administration Goddard Institute for Space Studies. GISS Surface Temperature Analysis. Available online from <https://data.giss.nasa.gov/gistemp/>

³ Romanello, M et al. (2021) 'The 2021 report of the Lancet Countdown on health and climate change: code red for healthy future'. *The Lancet*. 398 (10311), pp. 1619-1662.

⁴ Romanello, M et al. (2022) 'The 2022 report of the Lancet Countdown on health and climate change: health at the mercy of fossil fuels.' *The Lancet*. 400 (10363), pp 1619-1654.

exist in society.^{3,5} Climate change is 1 of the 9 planetary boundaries, which have been identified by the Stockholm Institute for Climate Research, as the boundaries within which humanity can continue to develop and thrive in future generations. Others include biosphere integrity, land-system change and biogeochemical flows, along with climate change all these boundaries have already been transgressed.⁶

Table 1: The impact of climate change

Impact of climate change	Human health impact	Operational / infrastructure impact
Extreme weather conditions e.g., heatwaves, wildfires, floods, drought, and storms	<ul style="list-style-type: none"> • Immediate risk of injury / death. • Food and water insecurity, increasing risk of malnutrition, conflict, and displacement. • Increase in infectious diseases, as heat increases the geographical range and months suitable for vectors to spread disease, such as Malaria and pathogens in water, such as Cholera. • Increase in/exacerbation of medical conditions e.g., heat stroke, dehydration, kidney disease and mental health conditions. 	<ul style="list-style-type: none"> • Increase in staff sickness. • Transport links impacted, increasing difficulty for users to access services. • Increase in patients needing to access healthcare services. • Damage to basic infrastructure e.g., hospital buildings, food, and water supplies. • Disruption of supply chains.
Air pollution	<ul style="list-style-type: none"> • Air pollution is responsible for approximately 7 million deaths globally per year.⁷ • Air pollution increases risk of several respiratory diseases, cardiovascular disease, stroke, and negative foetal health outcomes. It is also associated with mental health conditions including depression and anxiety. 	<ul style="list-style-type: none"> • Staff sickness. • Increase in patients needing to access healthcare services. • Damage to basic infrastructure e.g., buildings.

⁵ Munro, A et al. (2020) Advisory Group Reports for the UK committee on Climate Change: Sustainable Health equity: Achieving a Net Zero UK. Available online from <https://www.theccc.org.uk/publication/ucl-sustainable-health-equity-achieving-a-net-zero-uk/>

⁶ Stockholm Resilience Centre. Planetary boundaries. Available online from <https://www.stockholmresilience.org/research/planetary-boundaries.html>

⁷ WHO. Air pollution data portal. Available online from <https://www.who.int/data/gho/data/themes/air-pollution>

Figure 1 further illustrates the impact of climate change on human health.

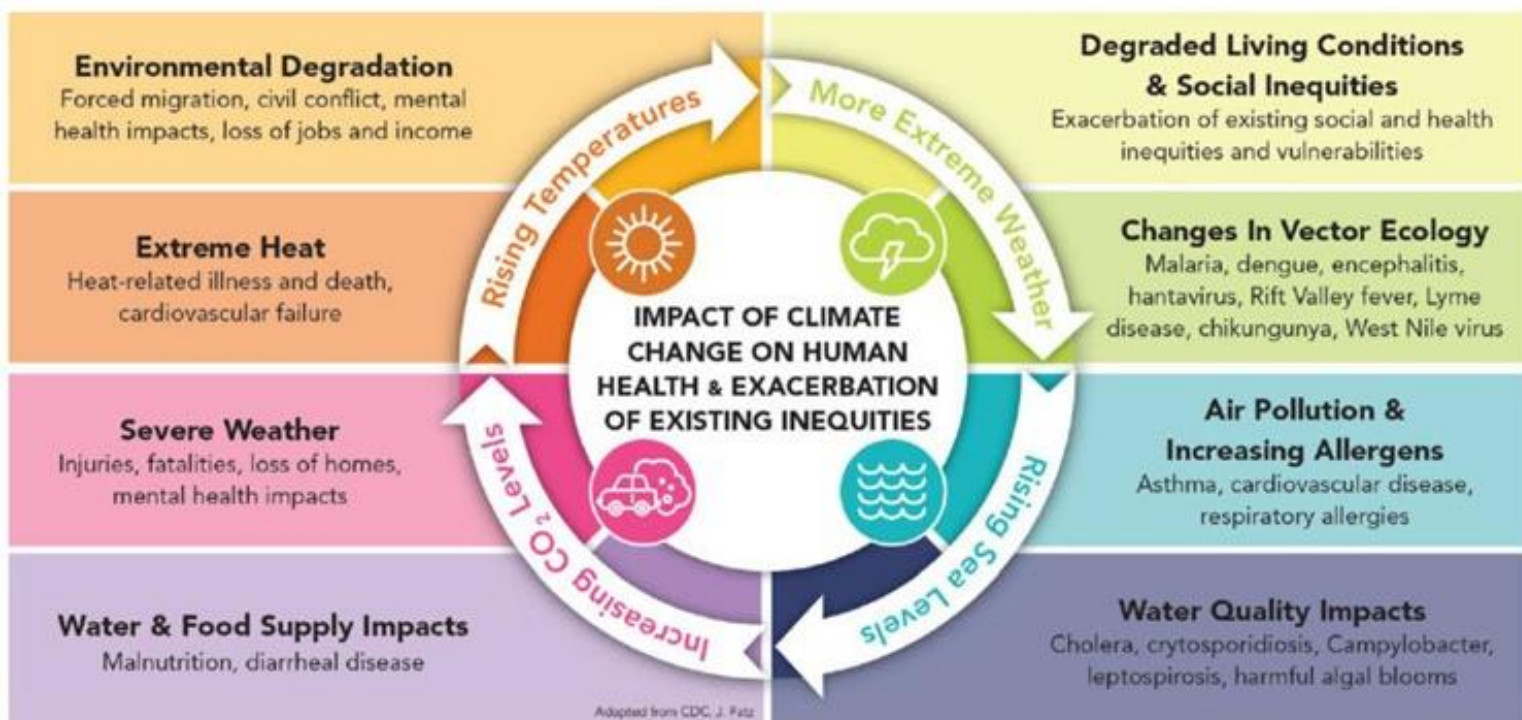


Figure 1: The impact of climate change on human health⁸

Targets for climate change

The UK has a legal duty to act to tackle climate change. The UK signed is aligned to the Paris Agreement (2015), a commitment to limit the global increase in temperatures to well below 2°C and preferably below 1.5°C, compared to pre-industrial levels.⁹ The Intergovernmental Panel on Climate Change (IPCC) in 2018, warned it was vital to limit global temperature rises to 1.5°C, to avoid catastrophic harm to health.¹⁰ The latest evidence highlighted in the recent IPCC reports strengthen this verdict and places emphasis on the need for urgent action, otherwise it warns these targets will not be

⁸ Geelong Sustainability. Available online from <https://www.geelongsustainability.org.au/the-health-benefits-of-tackling-climate-change-wed-5-august-2020/>

⁹ United Nations. (2015) The Paris Agreement. Available online from https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf

¹⁰ IPCC. (2018) Global Warming of 1.5 °C. Available online from <https://www.ipcc.ch/sr15/>

achievable.^{11,12} The UK recently signed the Glasgow Climate Pact, agreed by almost 200 countries at COP26 in 2021, which recognised the need for accelerated action to limit global warming to 1.5°C and for countries to strengthen their Nationally Determined Contributions.¹³

The Climate Change Act, as amended in 2019, commits the UK to achieving a target of net zero emissions by 2050.^{14,15} Net zero has been defined as a state in which the quantities of GHG (commonly referred to as carbon emissions, as they mainly comprise of CO₂) going into the atmosphere, are balanced by the removal from the atmosphere.¹⁶ The original Climate Change Act, passed in 2008, committed the UK to an 80% reduction of GHG emissions by 2050, compared to 1990 levels.¹⁷ In 2019, the Climate Change Act 2008 (2050 Target Amendment) Order 2019 was passed which increased the UK's commitment to a 100% reduction in emissions by 2050.¹⁴ We have a legal duty to act to achieve these targets, which was further emphasised in The Sixth Carbon Budget,¹⁸ published in 2020. This provides limits on the volume of GHGs the UK can emit during the period between 2033-2037 and is enshrined in law. It requires emissions to be reduced by 78% by 2035, compared to 1990 levels.¹⁹

¹¹ IPCC (2022) Climate Change 2022 Mitigation of Climate Change. Available online from https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_FullReport.pdf

¹² IPCC (2023) AR6 Synthesis Report: Climate Change 2023. Available online from <https://www.ipcc.ch/report/ar6/syr/>

¹³ United Nations Climate Change. COP26 The Glasgow Climate Pact. Available from <https://ukcop26.org/wp-content/uploads/2021/11/COP26-Presidency-Outcomes-The-Climate-Pact.pdf>

¹⁴ The Climate Change Act 2008 (2050 Target Amendment) Order 2019. Available online from <https://www.legislation.gov.uk/ukdsi/2019/9780111187654>

¹⁵ Committee on Climate Change (2019) Net Zero - The UK's contribution to stopping global warming. Available online from <https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf>

¹⁶ University of Oxford. What is net zero? Available online from <https://netzeroclimate.org/what-is-net-zero>

¹⁷ The Climate Change Act 2008. Available from <https://www.legislation.gov.uk/ukpga/2008/27/contents>

¹⁸ Climate Change Committee. (2020), Sixth Carbon Budget. Available online from <https://www.theccc.org.uk/publication/sixth-carbon-budget/>

¹⁹ Department for Business, Energy & Industrial Strategy. (2021). Press release: UK enshrines new target in law to slash emissions by 78% by 2035. Available from <https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035>

Contribution of the NHS to climate change

As the largest employer in the UK, the NHS is responsible for approximately 4-5% of all UK environmental emissions.^{20,21} In 2019, the carbon footprint of the NHS equated to 25 megatonnes of carbon dioxide equivalent (CO₂e), equivalent to approximately 5 million return flights from London to Sydney.^{22,23} Additionally, the NHS is responsible for approximately 5% of road traffic in England.²⁴ Considerable progress has already been made to reduce the NHS carbon footprint, with a 30% reduction in NHS emissions, since 2010.²⁵ It is imperative the NHS leads the way in reducing its carbon footprint further. This will have significant health benefits, estimated to save thousands of lives, reduce the health inequalities gap, and ultimately ensure the delivery of high-quality care now and for future generations.

The plan for a net zero NHS

Commitments to sustainable healthcare are clearly documented in The NHS Long-term Plan,²⁶ including specific targets to lower the carbon footprint from anaesthetic gases and inhalers and new models of care which focus on prevention and digitally enabled care.

The 2022/2023 priorities and operational planning guidance²⁷ included the expectation that *“We will continue to embed the response to climate change into core NHS business. Trusts and ICBs, once established, are expected to have a board-level Net Zero lead and a Green Plan, and are asked to deliver carbon reductions against this, throughout*

²⁰ Owen, A, et al. (2019) Data release of material footprint and resource efficiency for the UK. Available online from <https://sciencesearch.defra.gov.uk/ProjectDetails?ProjectID=20306&FromSearch=Y&Publisher=1&SearchText=ev0279&SortString=ProjectCode&SortOrder=Asc&Paging=10%20-%20Description>

²¹ NHS England. (2022) Delivering a ‘Net Zero’ National Health Service. Available online from [B1728-delivering-a-net-zero-nhs-july-2022.pdf \(england.nhs.uk\)](https://www.england.nhs.uk/wp-content/uploads/2022/07/B1728-delivering-a-net-zero-nhs-july-2022.pdf)

²² Tennison, I et al. (2021) ‘Health care’s response to climate change: a carbon footprint assessment of the NHS in England.’ *The Lancet*. 5 (2) pp 84-92.

²³ Department for Business, Energy & Industrial Strategy. (2022) Greenhouse gas reporting: conversion factors 2022. Available online from <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022>

²⁴ BRE Group. Travel in the NHS – Key Facts. Available online from <https://www.bre.co.uk/page.jsp?id=2726#:~:text=The%20NHS%20accounts%20for%205%25%20of%20all%20road,five%20miles%20and%2023%25%20less%20than%20two%20miles.>

²⁵ NHS England. Greener NHS. Health and Climate Change. Available online from <https://www.england.nhs.uk/greenernhs/national-ambition/national-commitments/>

²⁶ NHS England. (2019) The NHS Long Term Plan. Available online from

<https://www.longtermplan.nhs.uk/wp-content/uploads/2019/08/nhs-long-term-plan-version-1.2.pdf>

²⁷ NHS England. (2022) 2022/23 priorities and operational planning guidance. Available online from <https://www.england.nhs.uk/wp-content/uploads/2022/02/20211223-B1160-2022-23-priorities-and-operational-planning-guidance-v3.2.pdf>

2022/23.” It asks systems to focus on several priorities which are in line with providing more sustainable healthcare, including:

- Focusing on population health management, including disease prevention, and addressing health inequalities.
- Accelerating progress already made towards a more personalised approach to follow up care and increasing uptake of patient initiated follow up.
- Achieving a core level of digitalisation in every service across systems.
- Using digital technologies consistently to their full potential in new models of care.
- Improving community care capacity, offering the right care, at the right time, in the right capacity.

A similar theme of priorities is included within the 2023/2024²⁸ priorities and operational planning guidance, including:

- Embedding measures to improve health and reduce inequalities, focusing on disease prevention.
- Delivering personalised care (specific to maternity care).
- Ensuring NHS England continue to work with systems to level up digital infrastructure and drive greater connectivity.
- Improve support for patients in the community.

Sustainability is included within the ‘Guidance on developing a joint forward plan’,²⁹ designed for integrated care boards and their partner NHS trusts and foundation trusts to develop their first 5-year joint forward plans. The importance of ensuring sustainable and efficient use of resources and recognition of the duty to improve the quality of services, from a sustainable and equitability perspective is highlighted.

There are a detailed range of obligations outlined in the NHS Standard Contract 2023/2024 on Green NHS and Sustainability, including that “*providers must take all reasonable steps to minimise its adverse impact on the environment and to deliver its commitments set out in the Delivering a Net Zero NHS.*”³⁰

In 2020, the NHS launched its campaign for a ‘For a Greener NHS’³¹ and became the first healthcare system in the world to commit to delivering net zero carbon healthcare. An

²⁸ NHS England. (2023) 2023/24 priorities and operational planning guidance. Available online from <https://www.england.nhs.uk/wp-content/uploads/2022/12/PRN00021-23-24-priorities-and-operational-planning-guidance-v1.1.pdf>

²⁹ NHS England. (2022) Guidance on developing the joint forward plan. Available online from <https://www.england.nhs.uk/wp-content/uploads/2022/12/B1940-guidance-on-developing-the-joint-forward-plan-december-2022.pdf>

³⁰ NHS England. (2022) NHS Standard Contract 2023/24. Service Conditions. Available from <https://www.england.nhs.uk/wp-content/uploads/2022/12/03-nhssc-service-conditions-full-length-2324.pdf>

³¹ NHS England. Greener NHS. Available online from <https://www.england.nhs.uk/greenernhs/>

expert panel set out an evidence-based path to achieve 'a net zero NHS' and published the 'Delivering a net zero NHS'²¹ report. The ambitious but achievable targets set out within this report are:

- Achieve net zero by 2040 for the emissions the NHS controls directly (with an ambition to reach an 80% reduction by 2028 to 2032).
- Achieve net zero by 2045 for the emissions the NHS has the ability to influence (with an ambition to reach an 80% reduction by 2036 to 2039).

Delivering a net zero NHS aligns to the Paris Agreement and to achieving net zero emissions in the UK and it has been embedded into legislation within the Health and Care Act, 2022.³² This Act requires commissioners and providers to address:

- The UK Net Zero emissions targets
- The environmental targets in the Environment Act 2021, and
- to adapt to any current or predicted impacts of climate change identified within the 2008 Climate Change Act.

Figure 2 illustrates the NHS Carbon Footprint is made up of emissions it is directly responsible for (referred to as Scope 1), including anaesthetic gases and the transport fleet, as well as indirect emissions (referred to as Scope 2), from the generation of purchased energy, mainly electricity. The NHS Carbon Footprint Plus (referred to as Scope 3), includes all other indirect emissions that occur in producing and transporting goods and services, the full supply chain as well as emissions from patient and visitor travel.

³² UK Public General Acts. (2022) Health and Care Act 2022. Available online from <https://www.legislation.gov.uk/ukpga/2022/31/contents/enacted>

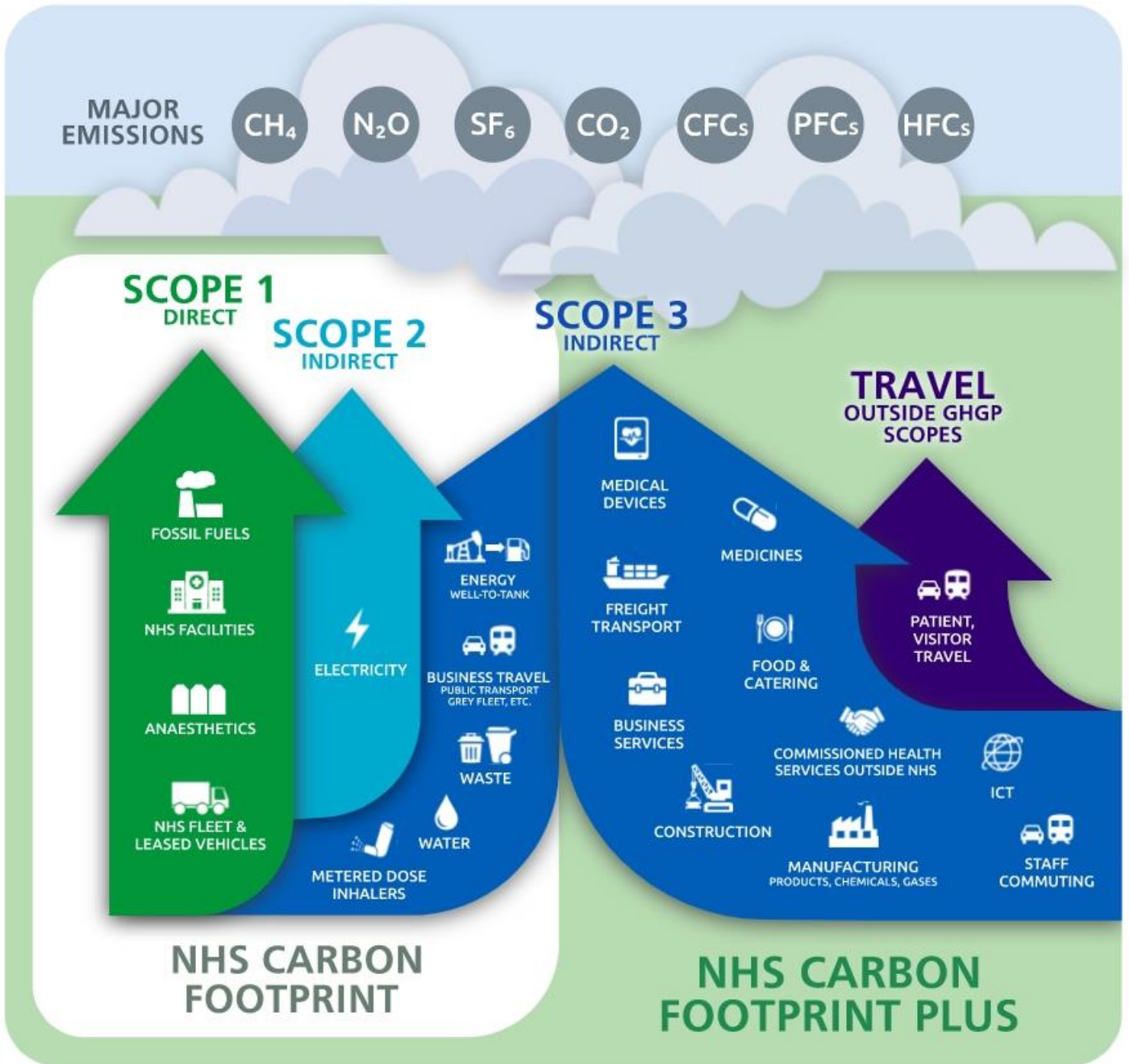


Figure 2: Direct and indirect emissions from NHS²¹

Achieving a net zero NHS

The NHS is treating an increasing number of patients affected by climate change factors. However, it is also partly responsible for the increase in these health conditions associated with climate change, as the NHS is the largest public sector contributor to climate change.³³ Tackling climate change has huge health, environmental, social, and financial benefits, and results in direct improvements for public health and health equity,³⁴ making it clear why achieving a net zero NHS needs to be a priority.

Figure 3 shows the breakdown of the areas which contribute to the NHS Carbon Footprint Plus. The largest contributor is medicines, medical and non-medical equipment, and other supply chain activity, in combination contributing 62%. As an example, metered dose inhalers (MDI); the most common inhaler used in the UK, contain potent GHGs contributing to 3-4% of the NHS carbon footprint. Switching to more environmentally friendly, dry powder inhalers through changes in prescribing practices in primary care, will result in a large reduction in the NHS carbon footprint, which could be considered as a ‘quick win.’

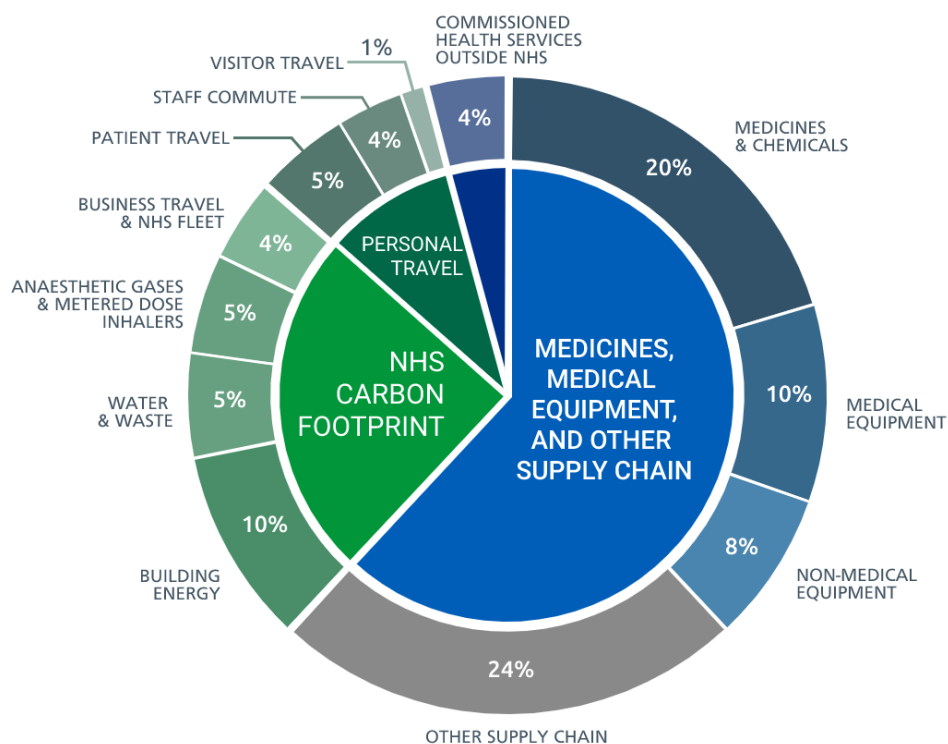


Figure 3: Sources of carbon emissions by proportion of the NHS Carbon Footprint Plus²¹

³³ The Kings Fund. Sustainable services: Future trends. Available from

<https://www.kingsfund.org.uk/projects/time-think-differently/trends-sustainable-services>

³⁴ Economist Impact. (2022) Do no harm: healthcare professionals address sustainability and climate change. Available online from <https://impact.economist.com/sustainability/resilience-and-adaptation/healthcare-professional-and-climate-change>

To achieve net zero, the NHS as an organisation needs to act at scale and speed. All NHS staff, beyond those sitting in estates and sustainability teams have a critical role to play. Awareness and clinical decision making on actions to reduce carbon emissions and waste relating to the delivery of care services is key. The steps which NHS staff may be involved in are vast and include:

- Delivering care with a focus on disease prevention and low carbon models of care for example, digital healthcare.
- Reviewing prescribing practices, to reduce the carbon emissions from large contributors to the carbon footprint including anaesthetic gases and inhalers.
- Decision making around improving the energy efficiency of buildings, utilising on-site renewable energy, and reducing carbon emissions from the transport fleet e.g., embedding zero emission ambulances.
- Encouraging an increase in green spaces and tree planting, to improve biodiversity and air quality and to provide space for green breaks and green social prescribing.
- Investing in research and innovation to guide future interventions to achieve a net zero NHS.

All staff have an important role to play if the NHS is to achieve its net zero ambition. A 2021 survey by the Health Foundation found that only 27% of NHS staff surveyed were aware of the net zero ambitions.³⁵ Therefore, building staff awareness and knowledge around sustainability is essential. It has been shown that when there is awareness of the ambitions, there is the support, with a YouGov 2021 survey finding 87% of NHS staff support the NHS net zero ambition.³⁶ This support must be translated into demonstrable action if it is to be successfully leveraged, and to meet the expectations of the workforce.

³⁵ The Health Foundation. (2021) Going green: what do the public think about the NHS and climate change? Available online from <https://www.health.org.uk/publications/long-reads/going-green-what-do-the-public-think-about-the-nhs-and-climate-change>

³⁶ NHS England. Public and staff opinions. Available from <https://www.england.nhs.uk/greenernhs/national-ambition/public-and-staff-opinions/>

Achieving a net zero NHS requires a focus on several different areas. The National Greener NHS programme is arranged into several workstreams, highlighted in figure 4.



Figure 4: National Greener NHS programme workstreams

As well as the National programme, each region also has a Regional Greener NHS team. The South East Regional Greener NHS team have been working to a set of national and regional priorities during 2022-2023, which are highlighted below:

- Reducing the environmental impact of **medicines** (especially anaesthetic gases and inhalers).
- Reducing **travel and transport** emissions.
- **Digitally enabled working** – use digitally enabled working models and practices to minimise carbon emissions.
- **Estates and Facilities** – to decarbonise all NHS buildings, purchase renewable sources of energy, and maximise energy efficiency.
- **Supply Chain and Procurement** – ensure a 10% net zero social value weighting is applied and suppliers have a carbon reduction plan in place to address indirect emissions.

These priorities are currently being updated for 2023-2024 and will also include clinical models of care and operational transformation priorities.

To move the agenda forward across multi-disciplinary teams, to achieve a net zero NHS, increasing awareness and action through effective senior clinical leadership is key. Each Trust and Integrated Care System (ICS) now has a Green Plan in place, which summarises aims, objectives and plans for reducing its carbon emissions. The areas of focus for a Green Plan are:³⁷

- Workforce and System Leadership
- Sustainable Models of Care
- Digital Transformation
- Travel and Transport
- Estates and Facilities
- Green Space
- Medicines and Medical Devices
- Supply Chain and Procurement
- Food and Nutrition
- Adaptation

Board level leadership is required to support the effective implementation of these Green Plans. Every Trust and ICS Green Plan has a board senior responsible officer (SRO). They have an essential role to lead by example, to champion the Green Plan from the ‘top down’ and to work with partners across organisations to achieve this. When considering service change proposals, it is helpful to know who the SRO is, to establish what they have done and what they plan to do, in order to ensure sustainability plans can be linked with the service change proposal. Traditionally, sustainability has sat with estates and facilities but there is a growing understanding of the wider implications for clinical care and all areas within NHS organisations, including to enhance patient care through improving sustainability. There is an opportunity for senior leaders to signal this to the system, to empower the workforce to move the agenda forward and focus on sustainability across the board and within all areas of the clinical pathway. In addition, as anchor institutions, hospitals and NHS services can also positively influence the organisations they work with and the populations they serve to have a positive influence on achieving the UK’s net zero targets.

³⁷ NHS England. (2021). How to produce a Green Plan: A three-year strategy towards net zero. Available online from <https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2021/06/B0507-how-to-produce-a-green-plan-three-year-strategy-towards-net-zero-june-2021.pdf>

Sustainability and Service Change

For the NHS to achieve its net zero targets, it is essential that sustainability is embedded into service change proposals, and it becomes business as usual. Key performance indicators and metrics on sustainability need to be included in service design and delivery, to increase awareness and focus on action across this area.

Clinical Senate teams have an extremely valuable role to play in supporting this mission. Service reconfiguration is a window of opportunity to drive forward the delivery of sustainable, low carbon healthcare with the Clinical Senate being approached at a pivotal point of the change process and therefore having the opportunity to work proactively at the points where change is happening. Clinical senates are ideally placed to consider sustainable healthcare in terms of patient need and choice encompassing the end-to-end patient pathway of any clinical model being proposed. Additionally, clinical senates can play a key role in clinical leadership, as ambassadors and advocates, working with the patient and public voice, to advocate for the public, to address their concern over the climate health emergency.

There is the potential that the carbon burden may be shifted from one area to another when reconfiguring services, for example from acute trusts to the community. As the clinical senates have an overview of the entire clinical pathway, they are ideally placed to recognise any shifts in carbon burden across the pathway. For example, a reconfiguration which creates a centre of excellence may increase the travel impact, despite providing a higher quality service with improved patient outcomes, and clinical senates are ideally placed to review the entire patient pathway and outcomes.

Within this report, the areas highlighted in figure 5 will be examined in greater detail in terms of what needs to be considered to achieve sustainable service change. This figure is split into operational resource use and the principles of sustainable healthcare, as a way to develop a sustainable model of care. These areas differ slightly to those which are required to be included within Green Plans, highlighted on page 15, however all these areas are covered throughout this report.

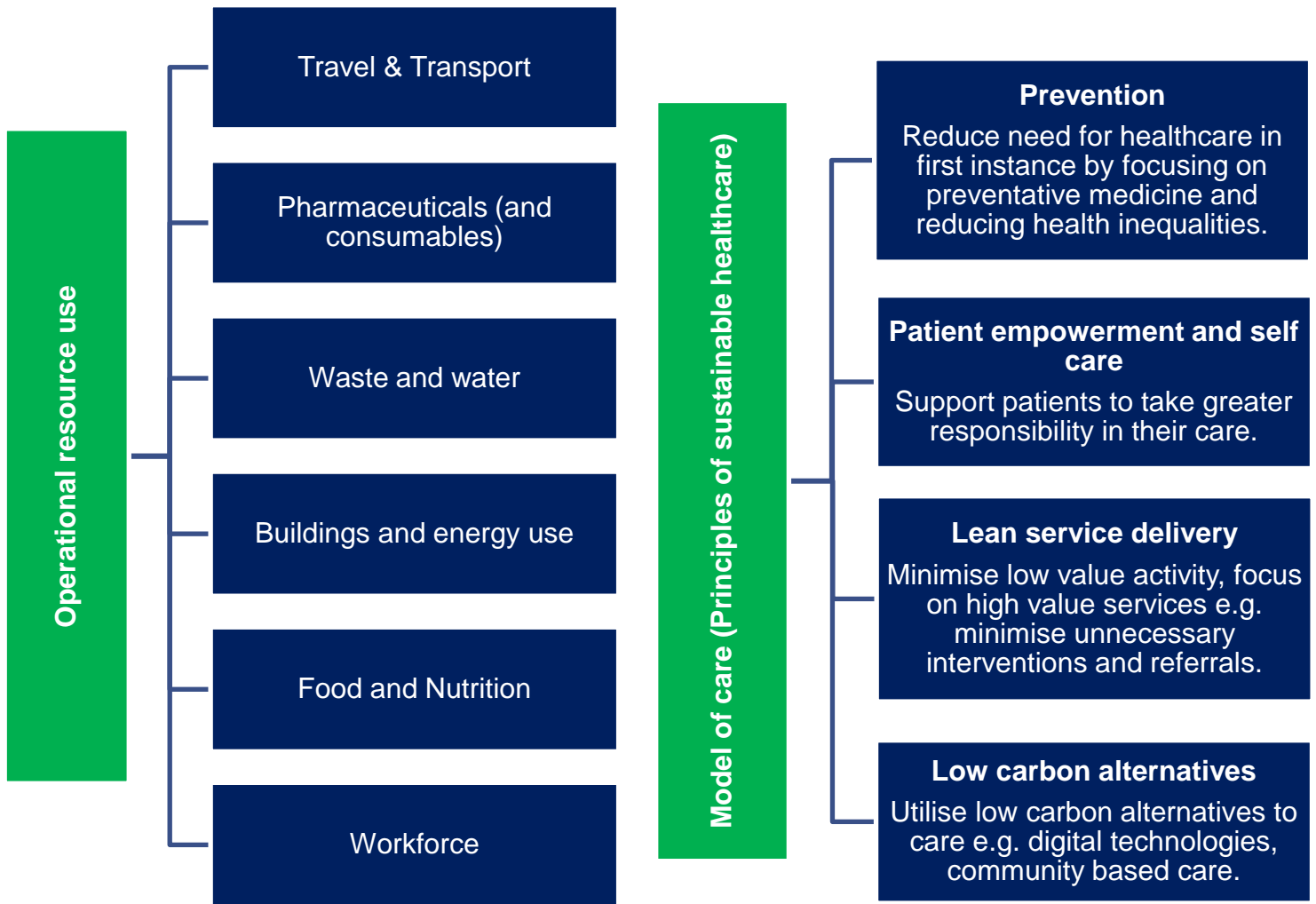


Figure 5: Areas to consider for sustainable service change^{31,38}

Sustainable healthcare

Sustainable healthcare delivers high quality care without damaging the environment, is affordable now and in the future and delivers positive social impact.³⁹ Mortimer (2010) identified four principles to define sustainable healthcare.³⁸ Figure 6 demonstrates, with examples, how these principles of sustainable healthcare can be applied to systems. The examples provided relate to the outcome of improving sustainability of inhaler prescribing.

³⁸ Mortimer, F. (2010) 'The sustainable physician'. *Clin Med.* 10 (2) pp 110 – 111.

³⁹ Centre for Sustainable Healthcare. Introduction to Sustainable Healthcare. Available online from <https://sustainablehealthcare.org.uk/courses/introduction-sustainable-healthcare#:~:text=Sustainable%20healthcare%20delivers%20high%20quality%20care%20without%20damaging,focus%20on%20health%20creation%20at%20a%20population%20level.>

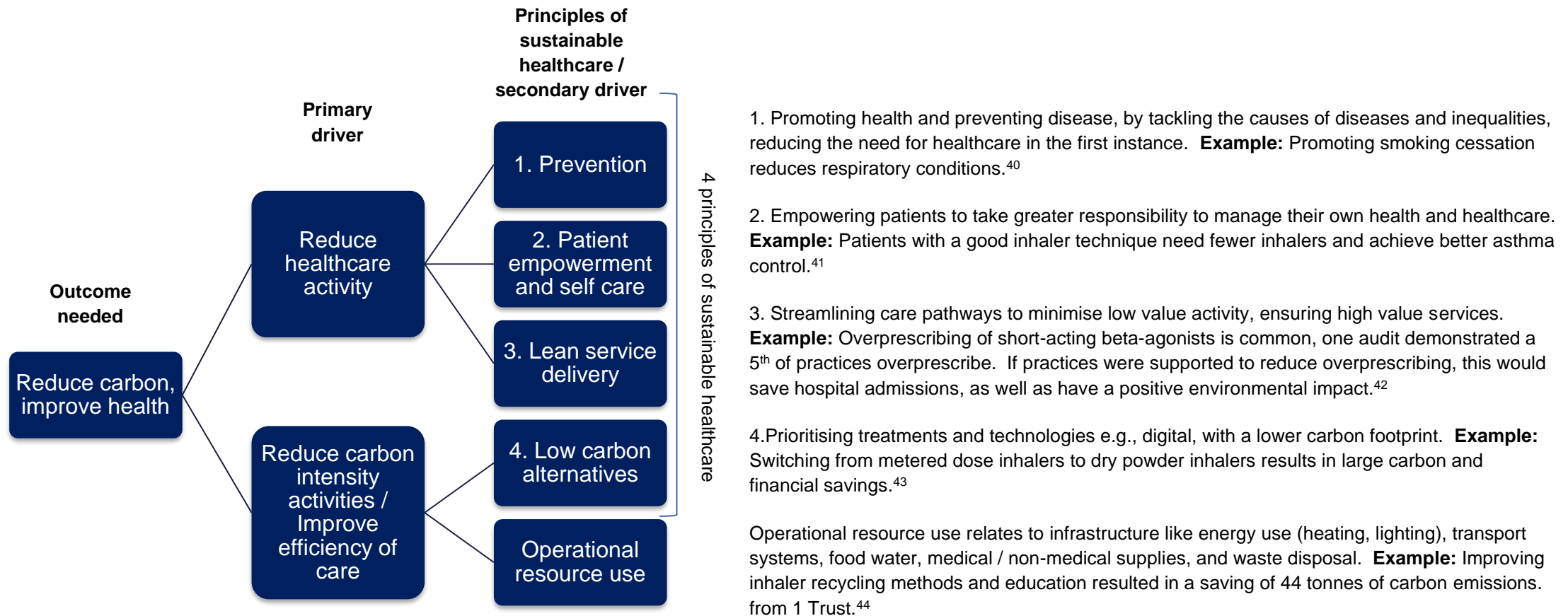


Figure 6: Applying the principles of sustainable healthcare to systems

⁴⁰ Willemsse, B.W.M. (2004) 'The impact of smoking cessation on respiratory symptoms, lung function, airway hyperresponsiveness and inflammation.' *European Respiratory Journal*. 23 (3), pp 464-476.

⁴¹ Capstick, T.G, et al. (2021) 'Ward based inhaler technique service reduces exacerbations of asthma and COPD'. *Respir Med* 187 (106583).

⁴² Wilkinson, A.J.K et al. (2019) 'Costs of switching to low global warming potential inhalers. An economic and carbon footprint analysis of NHS prescription data in England.' *BMJ*. 9 (10), pp 1-8.

⁴³ De Simoni, A et al. (2022) 'Reducing short-acting beta-agonist overprescribing in asthma: lessons from a quality-improvement prescribing project in East London.' *Br J Gen Pract*. 72(722): e619–e626.

⁴⁴ Frimley NHS Foundation Trust. Case Study: Reducing the Environmental Impact of Inhalers in Frimley. Available online from <https://future.nhs.uk/SouthEastGreenerNHS/view?objectId=143627173>.

Value in healthcare has traditionally been defined as outcomes in relation to clinical outcomes and cost.⁴⁵ The need to redefine value in healthcare has been recognised by Mortimer et al, 2018 and is summarised in figure 7.⁴⁶ It represents the importance of valuing healthcare through a sustainability lens by considering both current and future generations, through weighing up patient and population outcomes against a 'triple bottom line' of environmental, social, and financial impacts.

$$\text{Value} = \frac{\text{Outcomes for patients and populations}}{\text{Environmental + social + financial impacts (the 'triple bottom line')}}$$

Figure 7: Sustainable value in healthcare equation, reproduced under Creative Commons license <https://www.susqi.org/licensing>

It is not intended that a common measure be used for the equation to be resolved, instead the aim is to help visualise the true impact of a healthcare system in a holistic manner, informing and driving improvement in each area. Table 2 represents considerations for assessing the impact of the outcomes in the sustainable value in healthcare equation. These would be important outcomes to consider measuring as part of any service change proposal.

⁴⁵ Porter, M.E. (2010) 'What is value in health care?' *N Engl J Med.* 363: pp 2477– 81.

⁴⁶ Mortimer, F et al. (2018) 'Sustainability in quality improvement: redefining value'. *Future Healthcare J*, 5 (2), pp 88-93.

Table 2: Measuring the value of healthcare

Considerations for measuring the value of healthcare using the 'Triple Bottom Line' ⁴⁷	
Outcome for patients	<p>What is the net impact of care on the health of the patients served?</p> <p>Examples of outcome measures:</p> <ul style="list-style-type: none"> • Patient reported outcome measures (PROMs) • Patient reported experience measures (PREMs) • Infection rates • Mortality rates • Recovery time
Outcome for population	<p>What is the impact of care on the health of the population?</p> <p>Example of outcome measures:</p> <ul style="list-style-type: none"> • Life expectancy • Health related quality of life (HRQoL) • Disparities in access to services
Environmental impact	<p>What is the carbon footprint of the healthcare activity?</p> <p style="text-align: center;">Carbon footprint (kg CO₂ emissions) = activity or resource use x GHG emissions factors</p> <p>Generic GHG emissions factors are published by the UK government²³ and healthcare specific guidance to calculate the carbon footprint can be found from the Centre for Sustainable Healthcare.⁴⁸</p> <p>Being able to translate resource use into carbon emissions makes the environmental impact quantifiable. Compared to other environmental impacts, measuring carbon emissions is relatively easy and can be measured over time, allowing for progress to be tracked and comparison between options, however we may also want to consider other environmental impacts, such as impact on waste and biodiversity / green space.</p>

⁴⁷ Mortimer, F et al. (2018) 'Sustainability in quality improvement: measuring impact'. *Fut Hosp J.* 5 (2) pp 94–7.

⁴⁸ Centre for Sustainable Healthcare. Resources: Measure the Impact: Environmental outcomes: carbon footprinting for healthcare. Available online from <https://www.susqi.org/templates>

Considerations for measuring the value of healthcare using the 'Triple Bottom Line'⁴⁹

Social impact	<p>There is no standard methodology for measuring the social impact of healthcare. Factors to consider are the impact of healthcare, for patients, carers, staff, and the wider community on:</p> <ul style="list-style-type: none"> • Housing • Education • Equity of access • Employment Wellbeing (including the impact of staff health and wellbeing on sickness) <p>The following resources, from the Centre for Sustainable Healthcare support assessing the social impact:</p> <ul style="list-style-type: none"> • Scanning for social impact.⁵⁰ • Scanning for social determinants.⁵¹
Financial impact	<p>What is the financial impact of providing care as well as the financial impact of ill-health?</p> <p>Is the care affordable now and in the future?</p> <p>Examples of outcome measures:</p> <ul style="list-style-type: none"> • Cost of inpatient bed day and outpatient appointment • Medication costs

Table 2 Continued: Measuring the value of healthcare

Education and training of health care professionals in sustainable healthcare

There has been limited education around sustainable healthcare within the medical curriculum, resulting in health care professionals (HCPs) often being poorly equipped with the knowledge and skills to engage in sustainable healthcare practices.^{52,53}

More recently, the importance of incorporating education on sustainable healthcare has been recognised by several professional bodies. The General Medical Council now mandates that newly qualified UK doctors are “*able to apply the principles of sustainable*

⁴⁹ Mortimer, F et al. (2018) ‘Sustainability in quality improvement: measuring impact’. *Fut Hosp J.* 5 (2) pp 94–7.

⁵⁰ Centre for Sustainable Healthcare. Resources: Study the System: Scanning for waste. Available online from <https://www.susqi.org/templates>

⁵¹ Centre for Sustainable Healthcare. Resources: Study the System: Scanning for social determinants. Available online from <https://www.susqi.org/templates>

⁵² Omrani O,E et al. (2020) ‘Envisioning planetary health in every medical curriculum: an international medical student organization’s perspective.’ *Med Teach.* 42 (10) pp 1107–11.

⁵³ Clery, P et al. (2021) ‘Sustainability in quality improvement (SusQI): a case-study in undergraduate medical education.’ *BMC Medical Education.* 21 (425).

healthcare to medical practice”.^{54,55} Additionally, the Association for Medical Education in Europe, released a consensus statement which recommended a “sustainability in quality improvement approach in education, to develop the skills and capabilities of HCPs to effectively drive sustainable change and improvement”.⁵⁶

The International Council of Nursing (ICN) position statement recognises the importance of embedding the concept of climate change and sustainability into the nursing curriculum and practice, as well as in post-registration continuing education.⁵⁷

The Allied Health Care Professions (AHPs) Strategy for England (2022-2027)⁵⁸ states an urgent collective action from all AHPs is needed for the NHS to achieve net zero. The Greener AHP hub provides useful information, examples of good practice and suggestions for how AHPs can contribute to improving the environmental sustainability of healthcare.⁵⁹

Furthermore, the Royal Pharmaceutical Society recognises the need to include appropriate education in sustainability, to maximise the input from pharmacy to work towards achieving a net zero NHS.⁶⁰

Although several professional organisations have set these standards to highlight the need to include sustainability in education, it is recognised that at present, generally the implementation of these standards has been limited.⁶¹ The urgency to respond to the challenge to tackle climate change has been recognised by the Royal Colleges and the British Medical Association and needs to be translated into widespread awareness and action. The following documents have been published which reflect this:

⁵⁴ General Medical Council. (2018) Outcomes for Graduates. Available online from https://www.gmc-uk.org/-/media/documents/dc11326-outcomes-for-graduates-2018_pdf-75040796.pdf

⁵⁵ Thompson, T et al. (2014) ‘Learning objectives for sustainable health care’. *The Lancet*. 384 (9958) pp 1924–5.

⁵⁶ Shaw, E et al. (2021) ‘AMEE consensus statement: planetary health and education for sustainable healthcare’. *Med Teach*. 43 (3) pp 272–86.

⁵⁷ International Council of Nurses. Position Statement. (2018) Nurses, climate change and health. Available online from <https://www.icn.ch/sites/default/files/inline-files/ICN%20PS%20Nurses%252c%20climate%20change%20and%20health%20FINAL%20.pdf>

⁵⁸ NHS. (2022) The Allied Health Professions (AHPs) Strategy for England (2022-2027). Available online from <https://www.england.nhs.uk/wp-content/uploads/2022/06/allied-health-professions-strategy-for-england-ahps-deliver.pdf>

⁵⁹ NHS England. Greener Allied Health Professional Hub. Available online from <https://www.england.nhs.uk/ahp/greener-ahp-hub/>

⁶⁰ Royal Pharmaceutical Society. (2021) Sustainability Policies. Available online from <https://www.rpharms.com/recognition/all-our-campaigns/policy-a-z/sustainability-policy/policies>

⁶¹ Stanford, V et al. (2023) ‘Teaching skills for sustainable health care.’ *The Lancet Planetary Health* 7(1) e64-e67.

- **Royal College of Physicians** - Breaking the fever: Sustainability and climate change in the NHS,⁶² RCP Climate Policy.⁶³
- **Royal College of Nursing** - Responding to climate change RCN position statement.⁶⁴
- **British Medical Association** – Doctors must lead fight against climate change.⁶⁵
- **Royal College of Surgeons of England** – Sustainability in Surgery,⁶⁶ Intercollegiate climate emergency declaration.⁶⁷

Further information on sustainability training available to clinical and non-clinical staff can be found within the 'Further information and resources' section on page 51.

Sustainability and Quality Improvement

The changes required to reach the net zero NHS targets need to be integrated with existing innovation and improvement. It has been shown, from the principles of sustainable healthcare described previously, that improving sustainability and patient outcomes can be done simultaneously. Quality Improvement (QI) provides a recognised space for both clinical and non-clinical staff to develop sustainable innovations and a recognised methodology for change management.

The Royal College of Physicians describes 7 domains of quality:

- Patient experience
- Safety
- Effectiveness
- Efficiency
- Equity
- Timeliness

⁶² Royal College of Physicians. (2017) Breaking the fever: Sustainability and climate change in the NHS. Available online from <https://www.rcplondon.ac.uk/projects/outputs/breaking-fever-sustainability-and-climate-change-nhs>

⁶³ Royal College of Physicians. (2019) Climate Policy. Available online from <https://www.rcplondon.ac.uk/news/royal-college-physicians-adopts-new-climate-policy>

⁶⁴ Royal College of Nursing. (2019) Responding to climate change RCN position statement. Available online from <https://www.rcn.org.uk/professional-development/publications/pub-007878>

⁶⁵ British Medical Association. (2020) Doctors must lead fight against climate change. Available online from <https://www.bma.org.uk/news-and-opinion/doctors-must-lead-fight-against-climate-change>

⁶⁶ Royal College of Surgeons of England. (2021) Sustainability in Surgery. Available online from <https://www.rcseng.ac.uk/about-the-rcs/about-our-mission/sustainability-in-surgery/#:~:text=Our%20Sustainability%20in%20Surgery%20Strategy%2C%20launched%20in%20April,in%20line%20with%20the%20Greener%20NHS%20strategy.%20Guidance>

⁶⁷ Royal College of Surgeons of England. (2022) Intercollegiate climate emergency declaration. Available online from <https://www.rcseng.ac.uk/news-and-events/news/archive/intercollegiate-climate-emergency-declaration/>

- Sustainability.

Sustainability should be viewed as a characteristic of healthcare which must run through and moderate other domains and is required to ensure a high-quality healthcare system exists now and for future generations.⁶⁸

Everyone involved in the delivery of healthcare including both clinical and non-clinical staff are expected to do more than just deliver excellent patient care; they are also expected to contribute to QI of healthcare services, by making healthcare safer, more effective, patient centred, timely, efficient, equitable and sustainable.^{69,70}

The Sustainability in Quality Improvement (SusQI) framework developed by the Centre for Sustainable Healthcare (CSH) provides a practical approach to integrate sustainability into mainstream QI methodologies. It aims to drive sustainable improvements in healthcare by considering the principles of sustainable healthcare in QI and measuring the impact using the 'triple bottom line',⁴⁶ ultimately, aiming to improve patient and population health, whilst creating environmental, social, and financial value. Figure 8 represents the main stages within QI in which sustainability can be applied.⁴⁶

Health Education England and The Health Foundation funded the CSH to create a toolkit for the SusQI framework. Further information on this toolkit can be found at <http://www.susqi.org>. Integrating the SusQI framework into existing QI teaching, has been positively evaluated, with medical students and junior doctors reporting it created strong intentional value and led to improvements in self-reported knowledge, confidence, and attitudes to both QI and sustainable healthcare.⁷¹ Utilising the SusQI resources for QI education in clinical and non-clinical staff will influence day-to-day clinical decisions and support the embedding of sustainability in QI in existing practices and pathways and transform the healthcare system.⁵¹

⁶⁸ Royal College of Physicians. Defining the RCP's approach to quality. Available online from <https://www.rcplondon.ac.uk/defining-rcp-s-approach-quality>

⁶⁹ NHS Health Education England South East. What is Quality Improvement? Available online from <https://wessex.hee.nhs.uk/quality/quality-improvement/what-is-quality-improvement/>

⁷⁰ Atkinson, S et al.(2010) 'Defining quality and quality improvement.' 'Defining quality and quality improvement.' *Clinical Medicine*. 10 (6), pp 537-9.

⁷¹ Spooner R, et al. (2022) 'Concrete ways we can make a difference: a multi-centre, multi-professional evaluation of sustainability in quality improvement education'. *Medical Teacher*. 44 (10), pp 1116-1124.

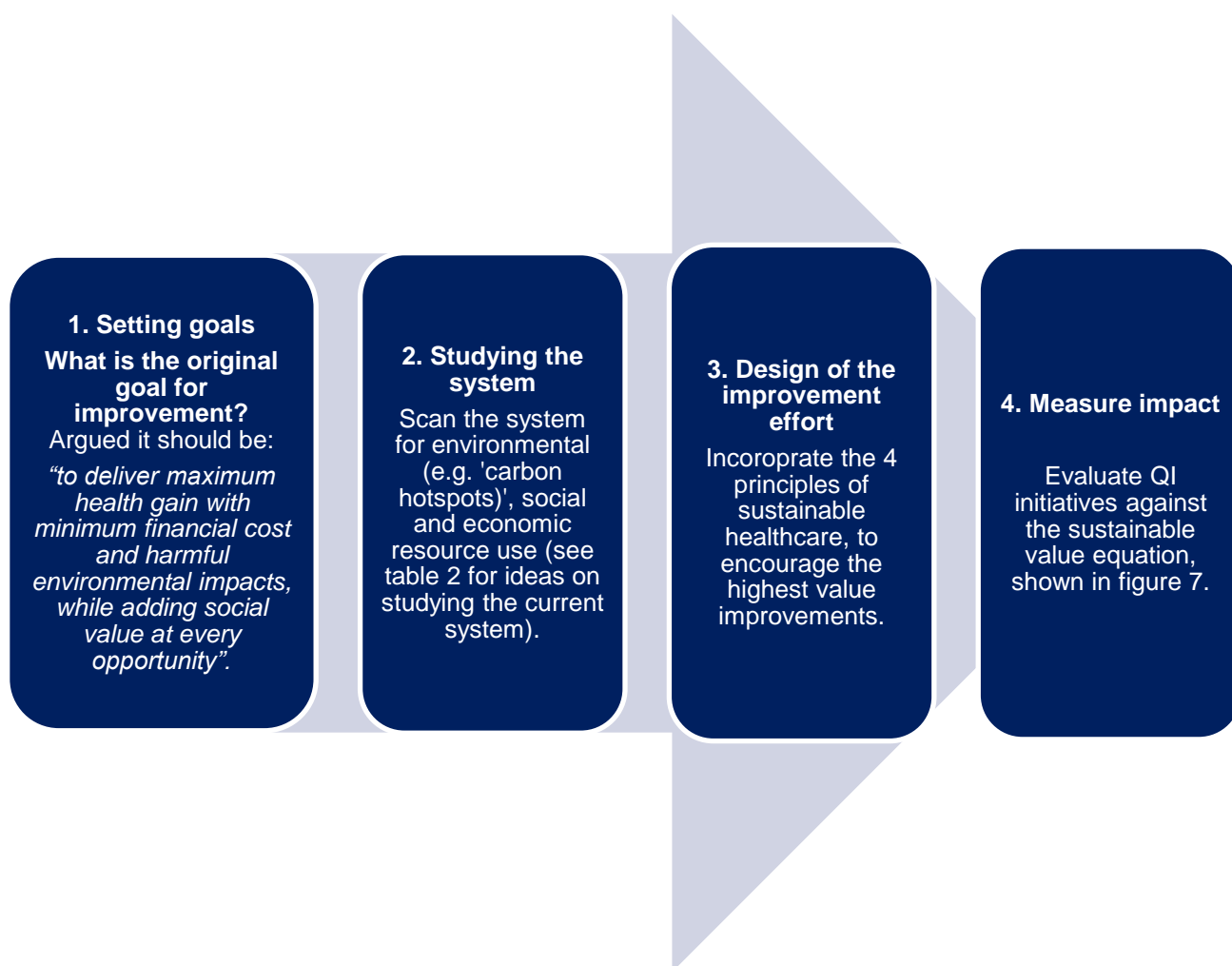


Figure 8: The SusQI framework⁴⁶

In addition to all the work from the CSH on sustainability within QI, the Greener NHS team are working with several different workstreams, highlighted in figure 4 to also empower the workforce to engage in sustainable QI projects. There are several additional resources and tools which can support the implementation of the SusQI framework, including:

- Care pathways carbon footprint calculator⁷²
- The Sustainability Impact Assessment Tool⁷³

⁷² Sustainable Healthcare Coalition. Care pathway carbon calculator. Available online from <https://shcpathways.org/>

⁷³ Lane S. Dorset Healthcare University NHS Foundation Trust. Sustainability Impact Assessment Tool.

Additional information on resources and tools can be found in the 'Further information and resources' section, on page 51.

3. Methodology

Relevant literature and current policies around sustainability within healthcare were reviewed through a service change lens. Stakeholders from the National and Regional Greener NHS Teams, the CSH charity and Trust Sustainability managers and teams were engaged. The initial draft report was presented at the South East Clinical Senate Council meeting and feedback on the report was welcomed and actioned.

4. Areas to consider

It is important to consider the entire clinical pathway, when examining the suitability of service change from a sustainability perspective, including the impact on patients, carers, and staff. Within this section, each of the areas highlighted in figure 5 and listed below, will be reviewed in relation to sustainability and service change, with examples of good practice included.

- Models of care (including considerations around digital healthcare and the workforce delivering the services model of care)
- Travel and Transport
- Pharmaceuticals and consumables
- Buildings and energy use
- Waste and water
- Food and Nutrition

As highlighted earlier in this report, when considering service change proposals, it is also helpful to know who the SRO is, to establish what they have done and what they plan to do, in order to ensure sustainability plans can be linked with the service change proposal.

Models of care

There is a much greater emphasis now in the NHS for models of care within services to focus on care closer to home, patient initiated follow up and utilising digital technologies, which will contribute to the sustainable value of the service. Generally, inpatient care is considered more carbon intensive than community care, due to various factors including increased use of equipment, energy use, travel and the risk of hospital acquired

complications.⁷⁴ Virtual wards support patients to manage their condition at home, when they would otherwise be in hospital. Virtual wards continue to be evaluated but may be an example of providing high quality care, at a lower cost and with lower carbon emissions.⁷⁵ With virtual wards, there is a risk that digital technologies disproportionately exclude certain groups, including older populations and populations with higher levels of deprivation, it is important this is considered to prevent widening the health inequalities gap.⁷⁶ Table 3 highlights some key questions which need to be answered.

Table 3: Considerations for and examples of good practice in relation to sustainability and models of care

Model of care
<p>What key questions need to be answered when considering service change and sustainability? At all points consider the Environmental, Social and Financial impact.</p>
<p>Prevention</p> <ul style="list-style-type: none"> • Is there a focus on disease prevention within the service’s model of care? For example, supporting patients to make lifestyle changes where appropriate e.g., healthy eating, physical activity, stopping smoking, reducing alcohol. • Is there a focus on social determinants of health? For example, access to suitable housing / education? <p>Patient empowerment and self-care</p> <p>Is there a focus on empowering patients to manage their conditions? Consider:</p> <ul style="list-style-type: none"> • How do patients learn about their condition and access information? • Are patients supported to participate effectively in decisions about their care? • Is there technology in place for patients to access their own health records remotely/self-monitor their condition? For example, patient portals have been shown to provide a more personalised patient experience and they have the potential to promote self-management.⁷⁷ • Is the service accessible to all users? <p>Additional information on personalised care can be found on the NHS England website.⁷⁸</p> <p>Lean service delivery (improving value and reducing waste)</p> <ul style="list-style-type: none"> • Are patients cared for at the most appropriate level of the health system (according to need/benefit)?

⁷⁴ Tsagkaris, C et al. (2021) ‘Using telemedicine for a lower carbon footprint in healthcare: A twofold tale of healing.’ *The Journal of Climate Change and Health*. 1, 100006.

⁷⁵ Health Innovation Network. (2021) Rapid Evaluation of Croydon Virtual Ward. Available online from <https://healthinnovationnetwork.com/wp-content/uploads/2022/01/Croydon-VW-Evaluation-Report-to-NHSX-v10.pdf>

⁷⁶ NHS England (2022) Supporting information for ICS leads Enablers for success: virtual wards including hospital at home. Available online from https://www.england.nhs.uk/wp-content/uploads/2022/04/B1382_supporting-information-for-integrated-care-system-leads_enablers-for-success_virtual-wards-including-hos.pdf

⁷⁷ Hazara, A. M et al. (2020) ‘The role of patient portals in enhancing self-care in patients with renal conditions.’ *Clin Kidney J*. 13 (1) pp 1-7.

⁷⁸ NHS England. Personalised care. Available online from <https://www.england.nhs.uk/personalisedcare/>

- Does the service deliver evidence-based care?
- Does the service deliver personalised patient care?
- Is there overuse of low value interventions or underuse of high value interventions?
- Has there been a consideration for delivering integrated care and/or streamlining care pathways, within the services model of care?
- Specific examples of lean service delivery include:
 - Patient initiated follow ups (PIFUs)
 - Same day emergency care provision
 - One stop clinic
 - Rapid diagnostic centres
 - Utilising digital technologies, for example, virtual wards (for admission avoidance and early discharge)
 - Hospital at home
 - Low carbon pre assessment
 - 'Call before you convey programme' - an initiative where ambulance workers call a dedicated helpline to ensure patients are getting the right care at the right time, for example they may seek support from a community care response team rather than take a patient to A&E.⁷⁹

Low carbon alternatives

- Have low carbon alternatives to care been considered, for example, green / social prescribing and switching from MDI to dry powder inhalers?

Workforce

- Does the service model account for the health and wellbeing of its workforce?
- Does the service offer equitable employment opportunities to all groups?
- Have training opportunities for the workforce been considered? For example, education around sustainable quality improvement.
- Are sustainable healthcare practices embedded into organisational, department, team and individual objectives (and considered in job descriptions and appraisals)?
- Further information on embedding environmental sustainability into organisations can be found in the following documents:
 - Embedding environmental sustainability in your organisation: A guide for HR professionals.⁸⁰
 - Top tips for embedding environmental sustainability – practical advice for HR professionals.⁸¹

⁷⁹ Fenland Citizen (2022) 'New ambulance initiative launched in Cambridgeshire.' Fenland Citizen, 16 Dec. Available online from <https://www.fenlandcitizen.co.uk/news/new-ambulance-initiative-launched-in-cambridgeshire-9289962/>

⁸⁰ CIPD (2021). Embedding environmental sustainability in your organisation: A guide for HR professionals. Available online from https://www.cipd.co.uk/Images/sustainability-guide_tcm18-98576.pdf

⁸¹ CIPD. Top tips for embedding environmental sustainability – practical advice for HR professionals. Available online from https://www.cipd.co.uk/Images/sustainability-top-tips_tcm18-98609.pdf

Example of good practice

University Hospitals, Dorset - Reducing waste of outpatient appointments in the eye unit-Ophthalmology team.⁸²

Background and aim

Minimising waste from outpatient services is a priority for the NHS, including focusing on targeting non-attendance at appointments and ensuring appointments are only booked if they are considered to add value to the patients care. The aim of this project was to reduce the number of 'wasted' eye appointments in the paediatric ophthalmology unit.

Approach

The system was studied to collect baseline data to identify reasons behind wasted appointments. Interventions were then implemented with the aim to reduce further wasted appointments.

Reason for wasted appointment	Intervention to reduce further wasted appointment
Patient bookings incorrect	Staff training and prompts for bookings
Patients cancelling on the day	Update patient communication to explain importance of advance notice for cancellation of appointments and set up text reminder service
Patients unable to cancel appointment and patient moved away or discharged	Awaiting intervention action

Over a 2-week period, 23 (7.5%) appointments were avoidably wasted and 6 (2%) unavoidably wasted. Over 1 year this equates to a predicted 597 appointments which would be avoidably wasted.

Outcomes

Environmental

If by implementing interventions, avoidable wasted appointments were reduced by 50%, it is predicted this would equate to a reduction of:

32.60 kg CO₂ emissions for travel to hospital appointments

7,208 kg CO₂ emissions per year for wasted appointments (equivalent to ~ 288 trees planted⁸³)

Financial

Based on the yearly predictions, it is estimated avoidable wasted appointments cost £36,634. Reducing the avoidable wasted appointments to 50% would be predicted to result in an annual saving of £18,317.

Social

In the long term, implementing interventions to reduce avoidable wasted appointments will save clinician time. Additionally, ensuring appointments are only booked if they add value is beneficial for patients, who may otherwise waste time or miss school/work unnecessarily.

⁸² Centre for Sustainable Healthcare. University Hospitals Dorset Green Ward Competition 2020 Case Studies. Available online from https://sustainablehealthcare.org.uk/sites/default/files/impactreport_dorsetbournemouth_green_ward_competition.pdf

⁸³ Ecotree. How much CO₂ does a tree absorb? Available online from <https://ecotree.green/en/how-much-co2-does-a-tree-absorb>

Travel and Transport

Travel and transport are important considerations within any service change proposals, given they make up approximately 14% of the NHS carbon footprint and are significant contributors to air pollution.²¹ The NHS is responsible for approximately 5% of all road traffic, of which single occupant travel makes up a significant proportion. It is estimated that 56% of all journeys made by car are less than 5 miles.²⁴ Promoting active travel is essential to reduce air pollution and its detrimental effects on health. Table 4 highlights some key questions which need to be answered.

Table 4: Considerations for and examples of good practice in relation to sustainability and travel / transport

Travel and Transport
<p>What key questions need to be answered when considering service change and sustainability? At all points consider the Environmental, Social and Financial impact.</p>
<ul style="list-style-type: none"> • If the location of a service is moving, what will the impact be on travel for all service users? (Consider patients, staff, carers/relatives, and suppliers). • Have the service users been consulted on the proposed service changes to assess the impact on travel? • Consider completing a benchmarking travel data survey, comparing current travel data to predicted travel data with proposed service changes (compare this data against the proposed environmental, social, and financial impacts). The South East Greener NHS team have electronic staff record data which details how far staff travel to their work based location, and may be used for some initial benchmarking data. • Have alternative ways of delivering the service been considered, which would prevent and/or reduce the need for travel? For example, use of remote consultations and digital technology and/or providing services locally where possible. • Are all service users and staff being encouraged to use active travel and/or low carbon alternatives? For example, walking, cycling, public/shared transport, or electric cars? Consider: <ul style="list-style-type: none"> ➤ Facilities for staff, for example electric vehicle charging spaces, secure cycle parking, changing, showering and lockers. ➤ Incentives to use low carbon alternatives, such as the cycle to work schemes. ➤ Charging points for NHS transport fleet e.g., ambulances. ➤ How commissioners and providers liaise with local authority / bus companies on location and timing of services. ➤ Have options to reduce the number of single occupancy vehicle journeys been considered, for example encouraging staff car sharing with the use of an app / communication streams, which would enable staff to co-ordinate lift sharing? ➤ Have Personal Travel Plans been offered to staff, which outlines public transport, active travel, and lift share options all in one place⁸⁴?

⁸⁴ Mobilityways. Take action, reduce emissions. Personal Travel Plan. Available online from <https://www.mobilityways.com/platform-reduce/>

- Has equitable access of the service for vulnerable or disadvantaged groups been considered?
- If your service has a transport fleet, does it meet the current requirements e.g., low / ultra-low emissions?²¹
- Has there been consideration of the future needs of service users / staff for example, access points/bays for autonomous vehicles, mobility on demand services, micro mobility devices (for example electric scooters) and drones for medication delivery?

Example of good practice

Manchester University NHS Foundation Trust – Sustainable travel programme⁸⁵

Background and aim

In 2018, two large NHS trusts merged in Manchester, which posed a challenge to travel within the area, with an increased requirement for travel between sites and overall reliance on road travel.

Approach

How were the principles for sustainable healthcare applied?

- **Low carbon alternatives** – Engaged staff to partake in more sustainable travel options and established a shuttle service between the Trusts. Provided personal travel information and motivation to use sustainable options e.g., subsidised travel and discount schemes.
- **Operational resource use** - Improvement in infrastructure e.g., additional cycle parking spaces (>200) and electric vehicle charging points.

Outcomes

More than 40% staff are now using sustainable travel to and from work. 5,000 (25%) using public transport and 3,000 (15%) staff using active travel.

Using more sustainable and active travel is anticipated to have the following positive impacts⁸⁶:

Environmental

There will be carbon savings associated with 3000 staff switching to active travel. As an estimate, if these 3000 staff completed a journey which averaged 3.5 miles (which is the average bicycle trip⁸⁷) via active travel instead of using a car, this would equate to a carbon saving of ~2820kg each time those 3000 people make the switch, equivalent to planting 112 new trees.

Financial

Active travel is considered a more economically viable long-term option.

⁸⁵ NHS England. Boosting healthy and sustainable travel in Manchester. Available online from <https://www.england.nhs.uk/greenernhs/whats-already-happening/boosting-healthy-and-sustainable-travel-in-manchester/>

⁸⁶ Department for Transport (2022) Active travel: local authority toolkit. Available online from <https://www.gov.uk/government/publications/active-travel-local-authority-toolkit/active-travel-local-authority-toolkit>

⁸⁷ Sustrans (2018) Key walking and cycling statistics for the UK. Available online from <https://www.sustrans.org.uk/our-blog/research/all-themes/all/key-walking-and-cycling-statistics-for-the-uk/>

Social

Active travel is considered to add social value in terms of improving physical health and wellbeing. It is however recognised that active travel is not an option for all service users / staff who may have a disability or shifts which mean these options are not feasible.

Data for average carbon emissions from common modes of travel can be found on the government website.²³ Carbon emissions for travel by car are highest, followed by bus and then by train. By comparison walking and cycling generate zero carbon emissions.²³ These data can be used to estimate the environmental impact of a service change, if data are available on how the service change is anticipated to influence staff and patient travel, using the following equation:

$$\text{Average journey emissions (kgCO}_2\text{ emissions)} = \text{Average journey travel (km)} \times \text{carbon emissions per km}$$

Using this equation and the available data on emission factors, as an example it can be calculated that if by a service change, 100 staff switched from using a car to cycling for a 5km (3.1 miles) return daily journey, and worked 5 days a week, this would equate to an annual carbon saving equivalent to planting approximately 1615 trees.⁸²

Additional information on travel and transport

Centre for Sustainable Healthcare: Remote Consultations: Do they reduce Greenhouse Gas Emissions?⁸⁸ – Provides guidance on how to estimate savings of GHG emissions from avoided patient travel, from switching from face to face to remote consultations.

Context of Vehicle Emissions Tool⁸⁹ - A tool for calculating carbon emissions associated from organisational mileage claim data, developed through a collaboration between Kent Community Health NHS Foundation Trust and Loughborough University.

The ICS Clean Air Framework⁹⁰ – A tool which can be used to develop a stand-alone Clean Air Action Plan, or to integrate and prioritise clean air actions in a Green Plan.

⁸⁸ Centre for Sustainable Healthcare (2022) Remote Consultation: Do they reduce Greenhouse Gas Emissions? Your Guide to Calculating the answer. Available online from <https://networks.sustainablehealthcare.org.uk/networks/carbon-footprinting-healthcare/remote-consultations-do-they-reduce-greenhouse-gas-emissions>

⁸⁹ Context of Vehicle Emissions Tool. Available online from https://github.com/danwrisar/COVE_ContextOfVehicleEmissionsTool

⁹⁰ Global action plan. ICS Clean Air Framework. Available online from <https://www.actionforcleanair.org.uk/health/ics-framework#form>

Energy Saving Trust – Fleet Support⁹¹ – An overview of reviews which are available to help organisations ensure their fleets are more efficient, cost effective and lower in emissions.

Sustrans⁹² – A charity promoting active travel, whose mission is to make it easier for everyone to walk, wheel and cycle.

Pharmaceuticals and consumables

Pharmaceuticals and consumables are important considerations within any service change proposals, given that medicines (including inhalers and anaesthetic gases) account for 25% of the NHS carbon footprint and equipment (medical and non-medical), makes up a further 18%.²¹ It has been estimated between 30-50% of medicines prescribed for long-term conditions are not taken as intended.⁹³ Table 5 highlights some key questions which need to be answered.

Table 5: Considerations for and examples of good practice in relation to sustainability and pharmaceuticals / consumables

Pharmaceuticals and consumables
<p>What key questions need to be answered when considering service change and sustainability?</p> <p>At all points consider the Environmental, Social and Financial impact.</p>
<p>Pharmaceuticals</p> <ul style="list-style-type: none"> • Has the sustainability of the prescribing practices embedded within the service been considered? For example, do pathways align with evidence-based practice and consider reviewing for overprescribing, deprescribing, patient compliance with medications or lower carbon alternatives to medicine such as green / social prescribing? • Do prescribing practices include a person-centred approach to prescribing which considers patient wishes and includes non-pharmaceutical interventions, such as green / social prescribing? Further information on social prescribing is detailed in the following documents: <ul style="list-style-type: none"> ➤ Social prescribing and community-based support: summary guide⁹⁴ ➤ Social prescribing Network⁹⁵ ➤ The National Academy for Social Prescribing⁹⁶

⁹¹ Department for Transport. Fleet Support. Available online from https://energysavingtrust.org.uk/sites/default/files/23580-EST%2BDFT-Fleet%20support%20A5-WEB_Full.pdf

⁹² Sustrans. Available online from <https://www.sustrans.org.uk/about-us/>

⁹³ NICE. (2015) Medicines optimisation: the safe and effective use of medicines to enable the best possible outcomes. Available online from <https://www.nice.org.uk/guidance/NG5/chapter/introduction>

⁹⁴ NHS England. (2020) Personalised Care Social prescribing and community-based support: Summary guide Updated: June 2020. Available online from <https://www.england.nhs.uk/wp-content/uploads/2020/06/social-prescribing-summary-guide-updated-june-20.pdf>

⁹⁵ Social Prescribing Network. Available online from <https://www.socialprescribingnetwork.com/>

⁹⁶ National Academy for Social Prescribing. Available online from <https://socialprescribingacademy.org.uk/>

- Has consideration been given to an appropriate system for supply of medicine to avoid unnecessary prescribing (e.g., use of the patient's own medicines on admission to hospital) and avoid waste (e.g., appropriate systems for prescribing and repeat prescribing to avoid unnecessary prescribing)?
- Has consideration been given to appropriate disposal of expired or unused medicines to avoid pharmaceutical pollution (e.g., leakage of GHGs from inappropriately disposed of inhalers or waterway pollution from disposing of medicines down sink or toilet)?
- Do pharmacy staff have appropriate education and training on the environmental impact of the pharmaceuticals commonly used within the service (or at least the hotspots)?
- Are the medicines used within the service known to contribute to a large proportion of the NHS carbon footprint e.g., inhalers / anaesthetics / Entonox (gas and air)? If so, ensure that the service is aligned to the relevant requirements outlined in key documents such as the NHS Long Term plan,²⁶ NHS Standard Contract Service Conditions⁹⁷ and Delivering a Net Zero NHS²¹ around reducing anaesthetic and inhaler use. Refer to the following documents for additional information on sustainable practice:

Inhaler prescribing

- High quality and low carbon asthma care⁹⁸
- How to reduce the carbon footprint of inhaler prescribing⁹⁹
- RightCare Asthma Toolkit¹⁰⁰ (Refer to priority 2 = environmental considerations)
- Inhaler carbon footprint¹⁰¹
- Inhaler Choices (Asthma and Lung UK and NHS England partnership)¹⁰²
- NICE: Asthma inhalers and climate change¹⁰³

Anaesthetics

- Intercollegiate Green Theatre Checklist¹⁰⁴
- Royal College of Anaesthetists: Environment and Sustainability¹⁰⁵

⁹⁷ NHS England. (2021) NHS Standard Contract 2021/22 Service Conditions (Full Length). Available online from <https://www.england.nhs.uk/wp-content/uploads/2021/03/3-FL-SCs-2122-republished-may.pdf>

⁹⁸ Greener Practice. High Quality and Low Carbon Asthma Care: Quality Toolkit. Available online from <https://www.greenerpractice.co.uk/high-quality-and-low-carbon-asthma-care/>

⁹⁹ Greener Practice. How to Reduce the Carbon Footprint of Inhaler Prescribing: A Guide for Healthcare Professionals in the UK. Available online from <https://s40639.pcdn.co/wp-content/uploads/Reducing-Carbon-Footprint-of-Inhaler-Prescribing-v3.3.2.pdf>

¹⁰⁰ NHS England. RightCare Asthma Toolkit. Available online from <https://www.england.nhs.uk/rightcare/wp-content/uploads/sites/40/2022/09/RightCare-Asthma-Toolkit.pdf>

¹⁰¹ PrescQIPP (2021). Inhaler Carbon Footprint. Available online from <https://www.prescqipp.info/umbraco/surface/authorisedmediasurface/index?url=%2fmedia%2f5719%2f295-inhaler-carbon-footprint-22.pdf>

¹⁰² Asthma Lung UK. Inhaler Choices. Available online from <https://www.asthmaandlung.org.uk/inhaler-choices>

¹⁰³ NICE. Asthma inhalers and climate change. Available online from <https://www.nice.org.uk/guidance/ng80/resources/patient-decision-aid-pdf-6727144573>

¹⁰⁴ The Royal College of Surgeons of Edinburgh et al. Intercollegiate Green Theatre Checklist. Available online from <https://www.rcsed.ac.uk/media/1331733/green-theatre-compendium-of-evidence-rcsed-161022.pdf>

¹⁰⁵ Royal College of Anaesthetics. Environment and sustainability. Available online from <https://www.rcoa.ac.uk/about-us/strategy-vision/environment-sustainability>

- The Nitrous Oxide project¹⁰⁶
- Action guidance for addressing pollution from inhalational anaesthetics¹⁰⁷

Procurement of pharmaceuticals and consumables

- Has efficient ordering of pharmaceuticals been considered, to minimise deliveries and waste?
- Has the sustainability of procurement for consumables related to the service been considered? For example:
 - Reducing the need for procurement e.g., reviewing equipment for procedures to use the minimum, planning procedures to reduce waste, including packaging waste and using reusable rather than single use items (including reducing single use plastics).
 - Supporting local business
 - Procuring items with a low carbon footprint
 - Considering ethical procurement and labour standards

Examples of good practice

Frimley NHS Foundation Trust - Reducing the carbon footprint of paediatric respiratory care¹⁰⁸

Background and aim

To reduce the environmental impact of metered-dose inhaler (MDI) use in the paediatric department. MDI is a significant contributor to the NHS carbon footprint and is frequently prescribed in the emergency paediatric department.

Approach

Studying the system

- Created a process map of inhaler use across the paediatric department (within the hospital and community).
- Staff survey undertaken to benchmark current practice around inhaler prescribing in hospital respiratory teams.
- Patient survey to assess number of inhalers at home, how they are routinely disposed, and the inhaler technique used.

How were the principles for sustainable healthcare applied?

Lean service delivery and low carbon alternatives

- 44% of clinical staff were unaware that inhalers have a high global warming impact and 88% were unaware that inhalers should be disposed of at a pharmacy or inhaler recycling point. Therefore, a key action was educating hospital staff on the environmental impact of inhalers and the influence they could have in minimising this impact.

¹⁰⁶ Centre for Sustainable Healthcare. The Nitrous Oxide Project. Available online from <https://sustainablehealthcare.org.uk/what-we-do/sustainable-specialties/anaesthetics/nitrous-oxide-project>

¹⁰⁷ J. A. Devlin-Hegedus et al. (2022) 'Action guidance for addressing pollution from inhalational anaesthetics.' *Anaesthesia* 2022. 77, pp 1023–1029.

¹⁰⁸ Centre for Sustainable Healthcare. Frimley NHS Foundation Trust Green Ward Competition 2020 Case Studies. Available online from https://sustainablehealthcare.org.uk/sites/default/files/impactreport_frimley_health_green_ward_competition_2020.pdf

- Clinical Commissioning Group (CCG) staff were involved by ensuring low carbon alternative inhalers were prescribed by recommending Salamol over Ventolin in communications, guidelines and via an automatic alert on the prescribing system.

Patient self-care and empowerment

- No patients/parents knew how to identify if an inhaler is empty and 80% disposed of them in domestic waste. Education was provided on identifying if an inhaler still has some of the drug in and the correct inhaler disposal method.

Outcomes

Environmental

100% of those surveyed reported willingness to dispose of inhalers at a local pharmacy, to reduce the negative environmental impacts. It is proposed if 30% patients/parents change behaviour after education, this would equate to a carbon saving of 11 tonnes CO₂ over the year, equivalent to planting ~440 trees.

If GPs changed prescribing practices, by reducing the number of Ventolin inhalers prescribed by 30% and prescribing Salamol instead, this would save 363 tonnes CO₂ over 1 year, equivalent to planting ~14,520 trees.

Financial

The interventions on inhaler prescribing and disposal were cost neutral.

Social

By changing practices around inhaler prescribing and disposal, this is proposed to have a positive impact on society, as it ensures alignment to staff and patient values, as evidenced by comments below:

“I had no idea inhalers damage the environment if just thrown away, of course I don’t want that for the next generation. Now I know I’ll take them back to a pharmacy”
“We all have a responsibility for the environment, and I’d like to do my bit”

Hampshire Hospitals Sustainability Department– Reducing the environmental impact of Nitrous Oxide at Hampshire Hospitals¹⁰⁹

Background and aim

To reduce the environmental impact of nitrous oxide at Hampshire Hospitals. Nitrous oxide (NO₂) is a potent greenhouse gas and ozone depleting substance. It makes up 75% of the total anaesthetic gas footprint in the UK. Most of this comes from wastage in piped supplies in acute settings in areas such as theatres, wards, and maternity.

Approach

The AAGBI (Association of Anaesthetists of GB and Ireland) audit project guidance was used to complete the project.

Studying the system

- Spring 2022 – audited monthly purchase of nitrous oxide cylinders versus clinical usage
- Survey of anaesthetist’s nitrous oxide usage habits

¹⁰⁹ Brown et al. Reducing the environmental impact of nitrous oxide at Hampshire Hospitals case study.

- Intercollegiate Green Theatre Checklist used

How were the principles for sustainable healthcare applied?

Lean service delivery and low carbon alternatives

- 45% of staff used NO₂ less than once per month and 15% never used NO₂. 74% of those that used NO₂ used this for less than 30 minutes during surgery and 26% between 30 – 60 minutes. Actual use in theatres was low at 160 litres per week / 58,400 litres per annum, however the Trust was purchasing 396,000 litres per year, showing 98% wastage in the pipework.
- Estates, Clinical Governance and Medical Gas committee were included in stakeholder engagement to understand if decommissioning the manifolds and moving to cylinder use was a suitable next step to reduce waste. Most staff were unaware of the GHG potential of NO₂ and harmful effects of long-term exposure, presentations were given to provide greater awareness and stakeholders regularly informed of progress. Nitrous Oxide manifolds to be decommissioned on both Basingstoke and Winchester Hospital sites in main theatres.
- New anaesthetics machines have been purchased that include cylinder capability.
- The Trust will retain empty cylinders until national policy has agreed that all unused Nitrous and Entonox returned to suppliers will undergo safe destruction.

Outcomes

Environmental

Nitrous oxide also interacts with water, oxygen and other chemicals in the atmosphere to form acid rain, which harms ecosystems such as lakes and forests. Reducing nitrous oxide levels at Hampshire Hospitals, specifically through the decommissioning of theatre manifolds will save ~337,600 litres of nitrous oxide, equivalent to ~188 tonnes CO₂e over one year.

Financial

Decommissioning the manifolds and moving to a gas bottle approach is expected to save £12,000 per annum (this is for the gas alone, not including maintenance, servicing costs etc). Savings do not include the purchase of new anaesthetic gas machines, which was a planned project. Discussions were held to ensure the machines had the capacity to attach cylinders.

Social

There is also an association between NO₂ concentrations in the air and increases in mortality and hospital admissions for respiratory disease. NO₂ can decrease the lungs' defences against bacteria making them more susceptible to infections. It can also aggravate asthma. Reducing levels of NO₂ locally, reduces the harmful effects on our local population.

Wincanton Community Hospital, Somerset - BGS Green Issues: Show me your meds, please¹¹⁰

Background and aim

The complex care GP team recognised a significant number of patients in the community do not comply with medications, resulting in a large amount of wastage. The aim was to monitor the impact of implementing a simple screening question, which resulted in a subsequent medication review, where appropriate.

Approach

At routine visits, community staff asked patients **“Show me your meds, please?”** The staff then reported back to the complex care GP team if there were concerns regarding medication compliance. A multidisciplinary team decision was made as to what HCP would be most appropriate to review the patient. Patients’ medication was reviewed as part of a holistic assessment.

How were the principles for sustainable healthcare applied?

Lean service delivery – As part of the medication review, alternatives to medications were considered, for example green / social prescribing. Medication regimens were simplified in more than 50% of cases. The reasons for poor compliance were reviewed including identification of a cognitive impairment in 35% of cases.

Outcomes

40 patients were identified as not complying with medications as prescribed in the 1st pilot which took place over a 3-month period. In total, 1049 individual months of unused prescription items were identified.

Environmental

Wasted medication was estimated to equate to 1693 Kg CO₂ emissions, equivalent to planting 67 new trees.

Financial

Wasted medication was valued at £10,866, highlighting the potential for huge financial savings.

Social

Social prescribing was initiated in 30% of cases.

The adapted medication regimens were designed to fit in better with carers, having a positive influence on the care packages.

¹¹⁰ British Geriatrics Society. BGS Green Issues: Show me your meds, please. Available online from <https://www.bgs.org.uk/bgs-green-issues-show-me-your-meds-please>

Additional information on pharmaceuticals and consumables

Royal Pharmaceutical Society: Sustainability Policies⁶⁰ – Includes information on tackling prescribing and medicines use, tackling medicines waste, preventing ill health, improving infrastructure and ways of working from a pharmaceutical perspective.

Integrated Care Systems (ICSs) Pharmacy and Medicines Optimisation Sustainability Checklist¹¹¹ - Provides options for delivery of sustainability within pharmacy green plans, to be used alongside NHS England Medicines Net Zero guidance and medicines optimisation strategies.

Applying net zero and social value in the procurement of NHS goods and services¹¹² – Sets out how the procurement of NHS Goods and Services can play its part in achieving the NHS Net Zero carbon targets while achieving its wider Social Value priorities.

Procurement Policy Note – Taking account of the social value in the award of central government contracts¹¹³ – Details evaluating social value in central government procurement.

Procurement Policy Note – Taking Account of Carbon Reduction Plans in the procurement of major government contracts¹¹⁴ - Outlines how to take account of suppliers' Net Zero Carbon Reduction Plans in the procurement of major Government contracts.

NHS England: Net zero supplier roadmap¹¹⁵- Outlines the plan for the NHS to achieve net zero by 2045 for the emissions it influences, through the goods and services it buys from partners and suppliers.

¹¹¹ Pharmacy declares. Integrated Care Systems (ICSs) Pharmacy and Medicines Optimisation Sustainability Checklist. Available online from <https://www.pharmacydeclares.co.uk/resources>

¹¹² NHS. Applying net zero and social value in the procurement of NHS goods and services. Available online from <https://www.england.nhs.uk/greenernhs/wp-content/uploads/sites/51/2022/03/B1030-applying-net-zero-and-social-value-in-the-procurement-of-NHS-goods-and-services-march-2022.pdf>

¹¹³ UK Government (2020). Procurement Policy Note – Taking account of the social value in the award of central government contracts. Action Note PPN 06/20. Available online from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/921437/PPN-06_20-Taking-Account-of-Social-Value-in-the-Award-of-Central-Government-Contracts.pdf

¹¹⁴ UK Government (2021). Procurement Policy Note – Taking Account of Carbon Reduction Plans in the procurement of major government contracts. Available online from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1054374/PPN-0621-Taking-account-of-Carbon-Reduction-Plans-Jan22_1_.pdf

¹¹⁵ NHS England. Suppliers: Net zero supplier roadmap. Available online from <https://www.england.nhs.uk/greenernhs/get-involved/suppliers/>

Buildings and Energy use

Buildings and energy use contributes to 10% of the NHS carbon footprint.²¹ Table 6 highlights some key questions which need to be answered.

Table 6: Considerations for and examples of good practice in relation to sustainability and buildings and energy use

Buildings and Energy use
<p>What key questions need to be answered when considering service change and sustainability? At all points consider the Environmental, Social and Financial impact.</p> <ul style="list-style-type: none">• Does the service change proposal require a change in the amount of building space required? For example, consider if it requires an increase, no change or decrease, in the building space required, and the impact this will have on energy use e.g., electricity required. Models of care which support virtual care and working from home will reduce requirement for building space, travel and may reduce energy use. If the service change requires a new building, or major construction / refurbishment projects, do these meet the requirements set in the NHS Net Zero Building Standard?¹¹⁶• Do new and existing buildings comply with the operational running requirements outlined in the NHS Estates Net Zero Carbon Delivery Plan?¹¹⁷• If the service requires any change in buildings, have adaptation measures been considered, to mitigate for climate change? For example, more efficient cooling systems. Buildings in densely populated city areas can be exposed to significantly warmer temperatures than those in the countryside, known as the 'urban heat island effect,' as vegetation cools the air around it. The need for efficient cooling systems in all areas and particularly those exposed to this additional risk is an important consideration.• Does the service make efficient use of energy? (E.g., increasing energy efficiency and reducing unnecessary consumption). For example, consider use of efficient/renewable energy systems (e.g., replace fossil fuels with low / zero carbon energy sources such as solar) for heating/lighting and motion sensors for taps and lights, as an example.• Are there any on-site green spaces for staff, patients, and visitors?

¹¹⁶ NHS. (2023) NHS Net Zero Building Standard. Available online from <https://www.england.nhs.uk/wp-content/uploads/2023/02/B1697-NHS-Net-Zero-Building-Standards-Feb-2023.pdf>

¹¹⁷ NHS. Estates 'Net Zero' Carbon Delivery Plan Summary Report. Available online from <https://www.jpaget.nhs.uk/media/588250/Estates-Net-Zero-Carbon-Delivery-Plan.pdf>

Example of good practice

St Bartholomew's and the Royal London Hospital NHS Trust-Operation TLC - Improving patient experience & energy efficiency.^{118,119}

Background and aim

St Bartholomew's and the Royal London Hospital in London is England's largest NHS Trust, with a workforce of 15,000 and an annual energy bill equating to £12 million. The aim of Operation TLC was to reduce the annual energy bill of the Trust and to respond to staff and public's desire for a more sustainable NHS.

Approach

Interviews and focus groups initially took place which revealed energy saving messages don't always motivate staff. It was found the best way to encourage staff to engage in more sustainable actions was to focus on the benefits in terms of improving patient outcomes.

Following this research, operation TLC was set up, this involved asking staff to:

1. **Turn Off Equipment** when not in use, reducing excessive heat and noise.
2. **Switch off lights** to help promote sleep and reduce light pollution.
3. **Close Doors** to improve patient safety, privacy and help regulate room temperatures.

How were the principles for sustainable healthcare applied?

Operational resource use – several interventions were aiming to reduce energy use (but encouraged from a patient care perspective). Interventions to achieve this included:

- The sustainability team attending ward round to share success stories, deal with signs of resistance and reward energy-saving activities until they became routine.
- Establishing a group of "grassroots influencers," who became advocates for action for their own teams.
- Senior leaders within the Trust reinforced the message through computer screensavers and films.

Outcomes

Environmental

After 4 months, 40% more lights were being switched off and 18% more doors were being closed. 800 tonnes of CO₂ were saved within the 1st year.

¹¹⁸ Barts Health NHS Trust et al. Operation TLC: Improving patient experience and energy efficiency. Available online from

http://2013.cleanmedeurope.org/images/pdf/Case_Fiona%20Daly_Operation%20TLC%20-%20Barts%20Health%20NHS%20Trust%20Global%20Action%20Plan.pdf

¹¹⁹ The Guardian (2014) 'Barts links energy saving to patient care and saves £105,000 in first year.' The Guardian, 15 May. Available online from <https://www.theguardian.com/sustainable-business/sustainability-case-studies-barts-hospital-tlc>

Financial

The annual energy savings equated to a financial saving of more than £100,000 in its 1st year.

Social

The campaign was shown to positively benefit patients, with 1 in 3 patients reporting fewer incidences of sleep disruption and 1 in 4 patients reporting they experienced fewer privacy infringements.

Frimley NHS Foundation Trust - New Heatherwood Hospital¹²⁰

Background and aim

Heatherwood Hospital, a new centre for excellence for non-emergency care was opened in March 2022. Sustainability was a key part of the design.

Approach

During the design process, sustainability was a key focus, with the following being implemented:

1. Solar panels – 188 panels were built into the roof, producing ~ 60,000 kWh/year.
2. Sustainable urban drainage system installed under the car park.
3. Achieved Building Establishments Environmental Assessment Method (BREEAM) very good status.

How were the principles for sustainable healthcare applied?

The above approaches apply to the use of **low carbon alternatives** i.e., utilising efficient and renewable energy sources.

Outcomes

Environmental

Solar panels resulted in 50-55% less mains gas and 15-20% less grid electricity use. Overall, it is estimated this will result in >60% less energy (CO₂ emissions) per patient contact by 2025.

Financial

In the long term, the utilisation of renewable energy sources will be cost effective.

Social

The draining system prevents floods and encourages the promotion of biodiversity.

Additional information for Buildings and Energy Use

Net Zero Estate Playbook¹²¹ - Provides guidance to support UK Government departments and public sector bodies to transition their estate towards net zero.

¹²⁰ Taylor et al. (2022) *Focus on Medicines Bottoms up and top down*. [powerpoint presentation] Available online from South East Greener NHS Workspace

<https://future.nhs.uk/SouthEastGreenerNHS/view?objectId=37426032>

¹²¹ Government Property Function. (2021) Net zero Estate Playbook. A guide to decarbonising government property. Available online from

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1035417/Net_Zero_Estate_Playbook_1.pdf

NHS Net Zero Building Standard¹¹⁶ – Provides technical guidance to support the development of sustainable, resilient, and energy efficient buildings that meet the needs of patients now and in the future.

Estates ‘Net Zero’ Carbon Delivery Plan¹¹⁷ - Addresses the aspects of the net zero strategy pertinent to estates and facilities activities.

A Healthcare Engineering Roadmap for Delivering Net Zero Carbon¹²² – A best practice guide for Healthcare Estates, developed and reviewed by experts from across industry and the NHS to set out a clear three-staged approach to decarbonising NHS Estates.

Energy management self-assessment tool¹²³ – Workbook which provides two tools which can be used to assess organisations current position in respect of energy management.

Further resources around Buildings and Energy use can be found within the South East Greener NHS team hub on NHS Futures, within the Estates and Facilities section.¹²⁴

¹²² IHEEN. A healthcare engineering roadmap for delivering net zero carbon. Available online from <https://www.iheem.org.uk/a-healthcare-engineering-roadmap-for-delivering-net-zero-carbon/>

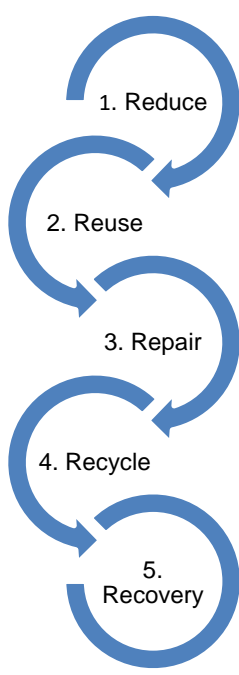
¹²³ The Carbon Trust. Energy management self-assessment tool. Available online from <https://www.carbontrust.com/our-work-and-impact/guides-reports-and-tools/energy-management-self-assessment-tool>

¹²⁴ Futures NHS. South East Greener NHS workspace. Estates and Facilities. Available online from <https://future.nhs.uk/SouthEastGreenerNHS/view?objectId=37559184>

Waste and water

Waste and water contribute to 5% of the NHS carbon footprint.²¹ Table 7 highlights some key questions which need to be answered.

Table 7: Considerations for and examples of good practice in relation to sustainability and waste and water

Waste and Water
<p>What key questions need to be answered when considering service change and sustainability? At all points consider the Environmental, Social and Financial impact.</p> <ul style="list-style-type: none">Has the service change been scanned / reviewed for any potential changes in waste production? The diagram below can be used as a hierarchal preference for managing waste within a system.  <p>Consider whether:</p> <ol style="list-style-type: none">Resources / products use can be reduced in the first instance? For example, reduce prescriptions, reduce paper use by electronic prescribing, reduce water use.Resources / products can be reused or reprocessed? For example, can single use items be switched to reusable products? Reprocessing refers to a process carried out on a used device which is safe to reuse, this involves cleaning, disinfection, sterilisation, testing and restoring the technical and functional safety of the used device.¹²⁵

¹²⁵ European Commission. Public Health. Reprocessing of medical devices. Available online from https://health.ec.europa.eu/medical-devices-topics-interest/reprocessing-medical-devices_en#:~:text=%22Reprocessing%22%20refers%20to%20a%20process,safety%20of%20the%20used%20device

3. Resources / products can be repaired rather than replaced?
4. Resources / products can be recycled?
5. Resources / products can be used to recover any energy (e.g., for products which cannot be recycled, can they be burnt for energy?) It is important to note this is the least favourable option as whilst it recovers energy, it will also have an impact on GHG emissions.

Example of good practice

Barking, Havering and Redbridge (BHRUT) University Hospital Trust - Reducing waste to improve health¹²⁶

Background and aim

Single use sharp smart bins have a negative environmental impact, through the manufacturing process itself and their disposal, contributing to air and land pollution.

Reusable sharps bins have successfully been implemented at another hospital within the Trust (Queens Hospital). Therefore, an opportunity was seen to review the process and implement at the King George Hospital, within the same Trust.

Approach

Single use sharps bins were switched to Sharpsmart bins / MR64 sharp smart container.

The Sharpsmart bin is reusable, and it is only the contents which get incinerated. The MR64 sharp smart container, has a separate section for metal, which means the metal can be treated and its contents reclaimed.

How were the principles for sustainable healthcare applied?

The above approaches are linked to using **lower carbon alternatives**, which is one of the principles for sustainable healthcare.

Outcomes

Environmental

Reduction in 50,000 single use containers. Carbon emissions savings from waste estimated to be ~ 30 tonnes of CO₂, equivalent to planting 1200 trees.

Financial

Predicted to be financially neutral and the suggestion of a potential financial saving, but this was not measured.

Social

60% reduction in sharps injuries and reduced waste treatment plant downtime.

¹²⁶ Jackson A. (2022) Reducing waste to improve health. [powerpoint presentation] Available online from <https://fabnhsstuff.net/fab-stuff/reducing-waste-to-improve-health-reusable-sharps-containers>

Great Ormond Street Hospital-Gloves off campaign^{127,128}

Background and aim

The Infection Prevention and Control team wanted to address the overuse of non-sterile gloves within the Trust, with the aim to improve patient and staff safety and improve the environmental impact.

Approach

Baseline data was collected for hand hygiene audits, infection rates, soap and hand sanitiser usage, glove usage, dermatitis levels in staff, qualitative data from patients and families surrounding glove usage, financial and environmental measurements.

How were the principles for sustainable healthcare applied?

Lean service delivery + operational resource use (aiming to reduce waste) – an educational programme for staff was developed to include information on appropriate glove wearing, aiming to prevent unnecessary glove wearing. The educational programme involved developing resources, webpages, screensavers, and a hand hygiene event.

Outcomes

Environmental

It is estimated that 21 tonnes of plastic were saved over the course of a year.

Financial

There has been a significant reduction in the number of gloves the hospital orders, equating to 36,608 less gloves ordered over a 3-month period between April 2018-July 2018, which will be associated with financial cost savings.

Social

A reduction was seen in staff attending occupational health for hand or skin related problems. Qualitative feedback was received from case reports highlighting an improvement in patient experience who was glove phobic.

Additional information on waste / water

Pharmaceutical waste reduction¹²⁹ - Outlines pharmaceutical waste reduction best practice.

¹²⁷ Leonard A. (2018) The Atlas of Shared Learning: 'The gloves are off' campaign. Available online from https://www.england.nhs.uk/atlas_case_study/the-gloves-are-off-campaign/

¹²⁸ Leonard A et al. (2019) The gloves are off! Available online from <https://www.gosh.nhs.uk/news/gloves-are-off/>

¹²⁹ NHS England. (2015) Pharmaceutical waste reduction in the NHS. Available online from <https://www.england.nhs.uk/wp-content/uploads/2015/06/pharmaceutical-waste-reduction.pdf>

Environment and sustainability Health Technical Memorandum 07-01: Safe management of healthcare waste¹³⁰ - Outlines guidance on the management of healthcare waste, and the benefits of compliance in terms of cost savings, safer working practices, direct environmental benefits, and a reduction of carbon emissions.

Less waste, more health: A health professionals guide to reducing waste¹³¹ - Outlines how health professionals can positively influence societal health and wellbeing by making simple changes to the procurement and disposal of medical supplies.

Greener Practice – Reducing waste in health care¹³² - Provides useful considerations and information about reducing waste in the NHS.

¹³⁰ NHS England. (2022) Health Technical Memorandum 07-01: Safe and sustainable management of healthcare waste. Available online from <https://www.england.nhs.uk/wp-content/uploads/2021/05/B2159iii-health-technical-memorandum-07-01.pdf>

¹³¹ Royal College of Physicians. (2018). Less waste, more health: A health professional's guide to reducing waste. Available online from <https://www.rcplondon.ac.uk/projects/outputs/less-waste-more-health-health-professionals-guide-reducing-waste>

¹³² Greener Practice. Reducing waste in healthcare. Available online from <https://www.greenerpractice.co.uk/information-and-resources/organisational-considerations/reducing-waste-in-health-care/>

Food and Nutrition

It is estimated that approximately 18% of food in hospitals is wasted.¹³³ It is estimated that food and catering services in the NHS contributes to approximately 6% of its total emissions²¹. There are 8 National Standards of Hospital Food, with 1 of these standards being that ‘Organisations must monitor food waste, manage any waste produced and take action to reduce the food waste produce in their plate waste, production waste and unserved food’.¹³⁴ Table 8 highlights some key questions which need to be answered.

Table 8: Considerations for and examples of good practice in relation to sustainability and food and nutrition

Food and Nutrition
<p>What key questions need to be answered when considering service change and sustainability? At all points consider the Environmental, Social and Financial impact.</p>
<ul style="list-style-type: none"> • Does the service change impact food/nutrition provision (consider staff, patients, and visitors), if so, are the following being supported? <ul style="list-style-type: none"> ➢ Locally produced food ➢ Organically grown food ➢ Seasonal food ➢ Sustainability sourced fish and meat ➢ Sustainable suppliers ➢ Reduction in meat and increase in use of plant based meals • Have measures been put in place to reduce waste in food packaging? Single use plastic plates, bowls, cutlery, trays and certain types of polystyrene cups and food containers will be banned from October 2023. • Have measures been put in place to reduce food waste? For example, not over-ordering and use of electronic ordering systems.
<p>Example of good practice</p>
<p>Kent Community NHS Foundation Trust – Hawkhurst Kitchen Garden¹³⁵</p>
<p>Background and aim</p> <p>The Hawkhurst Community Hospital, which is part of Kent Community NHS Foundation Trust was selected for the ‘kitchen garden.’</p>

¹³³ Wrap. (2017) Preventing food waste in the UK Health Sector. [powerpoint presentation] Available online from https://noharm-europe.org/sites/default/files/documents-files/4896/FW_workshop_Hugh_Jones_WRAP.pdf

¹³⁴ NHS England. (2022) National standards for healthcare food and drink. Available online from <https://www.england.nhs.uk/wp-content/uploads/2022/11/B0508-i-National-standards-for-healthcare-food-and-drink-Nove-2022.pdf>

¹³⁵ Kent Community Health NHS Foundation Trust. Case Study: Hawkhurst Kitchen Garden. Available online from <https://future.nhs.uk/connect.ti/SouthEastGreenerNHS/view?objectId=143624581>

The Trust were looking to reduce mileage associated with patient meals and the 'last mile' delivery emissions. Therefore, having a 'kitchen garden' and growing on site fruit and vegetables is considered an ideal way to achieve this aim.

Approach

This project is a pilot scheme, with an aim to eventually roll out to other sites across the Trust. Setting up a 'kitchen garden' at the Hawkhurst Community Hospital was led by the Head Chef and supported by the dietetics team. The feasibility of the idea was assessed within this pilot scheme, including assessing if the yields will be adequate to supplement meals and reviewing additional potential benefits to growing food on site.

How were the principles of sustainable healthcare applied?

The implementation of the 'kitchen garden' itself applies the **lean service delivery** and **low carbon alternative** principles. It is anticipated it will result in reduced need for accessing suppliers from the supply chain i.e., less steps in the supply chain process and therefore reduced delivery miles.

Outcomes

Environmental

The 'kitchen garden' will result in reduced delivery miles, which will in turn have a positive impact on CO₂ emissions, however, the exact impact of this pilot project was not reported.

Financial

It is anticipated to have a beneficial financial impact in the future, as it is aimed at reducing the need for suppliers and being more self-sufficient.

Social

The project involves volunteers from the local community, bringing together a community and sense of well-being.

Additional information on food / nutrition

Eating patterns for health and environmental sustainability. One blue dot. British Dietetic Association¹³⁶ - Details the link between food behaviours and the environment.

Sustainable Food and the NHS: Summary. The Kings Fund¹³⁷ - Details and discusses a framework for a sustainable food system in the NHS and provides recommendations.

Report of the Independent Review of NHS Hospital Food¹³⁸ - Chapter 7 provides specific recommendations on sustainability and 'going green' in relation to hospital food.

¹³⁶British Dietetic Association. (2020) One blue dot: eating patterns for health and environmental sustainability. A Reference Guide for Dietitians. Available online from <https://www.bda.uk.com/uploads/assets/539e2268-7991-4d24-b9ee867c1b2808fc/a1283104-a0dd-476b-bda723452ae93870/one%20blue%20dot%20reference%20guide.pdf>

¹³⁷ Kings Fund. (2005) Sustainable food and the NHS. Available online from https://www.kingsfund.org.uk/sites/default/files/field/field_publication_file/sustainable-food-nhs-summary-karen-jochelson-sally-norwood-sabina-hussain-baljinder-heer-kings-fund-10-november-2005_0.pdf

¹³⁸ Shelley, P. (2020) Report of the Independent Review of NHS Hospital Food. Available online from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/929234/independent-review-of-nhs-hospital-food-report.pdf

The Hospital Food Standards Panel’s report on standards for food and drink in NHS hospital¹³⁹ - Recommends a set of food standards that should become routine practice across NHS Hospitals. Includes a chapter on sustainable food and catering services and examples of good practice.

Food for Life Served Here – Our impact (2020-2021)¹⁴⁰ – Outlines the work of The Food for Life Served Here and Green Kitchen Standard, which supports catering businesses to provide sustainable meals and show a traceable supply chain. Further information on Food for Life Served Here and the Green Kitchen Standard, can be accessed online.^{141,142} The Green Kitchen Standard states that “*Caterers must prove their environmental credentials and provide a clear point of difference to set their service apart from the rest, which can mean cost savings as well as aligning with energy, water and waste requirements of the Defra Plan for Public Procurement and the UN’s Sustainable Development Goals*”.

Summary Report of the EAT-Lancet Commission on Food, Planet, Health – Healthy diets from sustainable food systems: Food Planet Health¹⁴³ – Recognises that a radical transformation of the global food system is urgently needed and provides quantitative scientific targets for healthy diets and sustainable food production.

National Food Strategy for England - Independent review of England’s food chain from field to fork¹⁴⁴ - Includes several recommendations, including on ensuring sustainability along the food chain.

Food Climate Research Network (FCRN)¹⁴⁵ - Interdisciplinary, intersectoral and international research-based network focused on food systems, climate, and sustainability.

¹³⁹ Department of Health. (2014) The Hospital Food Standards Panel's report on standards for food and drink in NHS hospitals. Available online from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/523049/Hospital_Food_Panel_May_2016.pdf

¹⁴⁰ Soil Association, Food for Life (2020) Food for life serves here: Our impact. Available online from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/523049/Hospital_Food_Panel_May_2016.pdf

¹⁴¹ Food for life served here. Available online from <https://www.foodforlife.org.uk/catering/food-for-life-served-here>

¹⁴² Green Kitchen Standard. Available online from <https://www.foodforlife.org.uk/catering/green-kitchen-standard>

¹⁴³EAT-Lancet Commission. (2019) Healthy diets from sustainable food systems: Food Planet Health. Available online from https://eatforum.org/content/uploads/2019/07/EAT-Lancet_Commission_Summary_Report.pdf

¹⁴⁴ Department for Environment, Food & rural Affairs. (2021) Policy paper National food strategy for England. Available online from <https://www.gov.uk/government/publications/national-food-strategy-for-england>

¹⁴⁵ Food Climate Research Network. Available online from <https://eatforum.org/partner/food-climate-research-network/>

5. Further information and resources

Some additional useful sources of information for further reading and resources are listed below. A copy of this report, along with all the links to access further information, is available to view on the South East Clinical Senate website.¹⁴⁶

Centre for Sustainable Healthcare¹⁴⁷ – In addition to the SusQI information, CSH hosts several profession / speciality specific networks, including:

- Anaesthetics
- Dentistry
- Kidney care
- Mental health
- Occupational therapy
- Respiratory care
- Surgery

These networks can be accessed at online on the Centre for Sustainable Healthcare website.

Greener NHS Knowledge Hub (Future NHS)¹⁴⁸ – An online space for sharing of information, tools, resources and knowledge, ideas, and best practice with others. There is a 'Training hub' space, which includes links to a variety of training and educational modules and courses.

South East Greener NHS Hub (Future NHS)¹⁴⁹ - Useful links to tools and resources, more specific to the South East region and a forum to connect with colleagues in the South East.

The NHS Emission Quantification Recipe Book¹⁵⁰ - A collaborative, evidence-based approach to establishing a standardised means of calculating emissions associated with NHS Carbon Footprint and Carbon Footprint Plus.

¹⁴⁶ South East Clinical Senate. Available online from <https://secsenate.nhs.uk/published-advice-recommendations/south-east-advice-recommendations/>

¹⁴⁷ Centre for Sustainable Healthcare. Available online from <https://sustainablehealthcare.org.uk/>

¹⁴⁸ Greener NHS Knowledge Hub. Available online from <https://future.nhs.uk/connect.ti/sustainabilitynetwork>

¹⁴⁹ South East Greener NHS. Available online from <https://future.nhs.uk/SouthEastGreenerNHS>

¹⁵⁰ Wright et al. The NHS Emission Quantification Recipe Book. Available online from https://github.com/danwrisar/KMSIMG_NHS_EmissionsRecipeBook

The Sustainability Impact Dashboard¹⁵¹ - Provides projected information on the sustainability benefits and/or increased emissions for outpatient appointments, virtual GP appointments and virtual wards.

Sustainable Care Pathways Guidance¹⁵² - Guidance to understand the environmental impacts of different aspects of healthcare treatment pathways.

Climate adaptation has not been covered in detail within this report, however, further information on this can be accessed from the following sources:

Third Health and Care adaptation report (2021)¹⁵³ - Builds on report co-developed by NHS and PHE in 2015. It summarises the impact of climate change on the sector and outlines practical next steps to build resilience and adapt.

The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting¹⁵⁴ - Sets out the strategy for adapting current and future climate change.

6. Sustainability tools

The South East Clinical Senate are aware of a number of sustainability tools which are currently in development. At the time of publication of this report, one of the systems which the senate works with have tested a sustainability impact assessment tool,⁷³ developed by Stuart Lane, Sustainability and Carbon manager at University Hospitals Dorset NHS Foundation Trust. Positive feedback was received from the system on the excellent potential of the tool, to guide systems in reviewing services from a sustainability perspective. Additional feedback was provided on how the tool could be improved further, which mainly related to ensuring the tool is more user friendly. To achieve this, suggestions were made such as including instructions, potentially in the form of a video to guide users on how to use the tool effectively and improving ease of navigation through the tool by adding prompts in certain areas to give users additional points to consider.

¹⁵¹ Sustainability Impact Dashboard. Available online from

<https://future.nhs.uk/SouthEastGreenerNHS/view?objectId=40341456>

¹⁵² Sustainable Healthcare Coalition. Sustainable Care Pathways Guidance. Available online from

<https://shcoalition.org/sustainable-care-pathways-guidance/>

¹⁵³ NHS and UK Health Security Agency. (2021) Third Health and Care Adaptation Report. Available online from <https://www.england.nhs.uk/wp-content/uploads/2021/12/NHS-third-health-and-care-adaptation-report-2021.pdf>

¹⁵⁴ Department for Environment Food & Rural Affairs. (2018) The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting. Available online from

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/727252/national-adaptation-programme-2018.pdf

The South East Clinical Senate team are also aware that the Care without Carbon team, as part of Sussex Community NHS Foundation Trust are in the process of developing a Sustainability Impact Assessment for project work. Additionally, the National Greener NHS team are in the process of developing a low carbon care impact assessment tool, to appraise a services model of care.

7. Next steps

An area of work which is recommended to take forward is to further research and test sustainability tools which are being developed, with systems. It is recommended to test these in collaboration with South East Greener NHS Team and the Centre for Sustainable Healthcare.

8. Conclusion

Climate change is a global health emergency. It is essential that sustainability is embedded within all areas of healthcare to provide the highest quality care now and for future generations. Given the extent of the emergency and the speed in which we need to act, it is imperative that careful thought and consideration are given, and actions taken around embedding sustainability within any service change at the earliest stage and at all stages of the pathway. The evidence is clearer than ever, and we are at a critical point. As shown in this report, many of the tools and solutions exist and people are often committed to the concepts around the importance of embedding sustainability into practice, but effective clinical leadership and decisive demonstrable actions need to be put into place as a matter of urgency. Difficult decisions are likely to be the norm, especially where short term costs are weighed against long term benefits, it is therefore essential that all parties involved within major service change fully understand and place the same importance on sustainability.

9. Acknowledgments

The South East Clinical Senate would like to thank Frances Mortimer, Catherine Richards, and the Centre for Sustainable Healthcare for their input into this report.

Appendix A –

Further acknowledgements:

- The South East Clinical Senate Council
- The South East Regional Greener NHS Team – Simon Rollason, Regional Greener NHS Lead, James Bate, Senior Project Manager and Kate Townsend, Programme Manager
- Stuart Lane, Sustainability and Carbon Manager, University Hospitals Dorset NHS Foundation Trust
- Gillian Brown, Head of Sustainability, Hampshire Hospitals NHS Foundation Trust
- Miranda Chubb, Energy and Sustainability Officer, Hampshire Hospitals NHS Foundation Trust
- Manraj Phull, Senior Net Zero Delivery Manager, National Greener NHS
- Cristina Calleja, Sustainability Manager, South Warwickshire NHS Foundation Trust