

## Policy and practice

# TRANSITIONING TO ENVIRONMENTALLY SUSTAINABLE HEALTH SYSTEMS: THE EXAMPLE OF THE NHS IN ENGLAND

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## ABSTRACT

**Background:** Health systems frequently consume considerable amounts of energy and resources, and generate large and multifaceted waste and pollution streams. Improving their own environmental sustainability may provide benefits and opportunities. Sustainability initiatives and activities in health systems tend to be bottom-up, local and driven by providers, which results in challenges for transferability and scaling-up.

**Local context:** The National Health Service (NHS) is the publicly funded health-care system for the United Kingdom. It employs more than 1.7 million people and caters to a population of 65.1 million. Within its

decentralized structure, several providers and trusts had been engaging in a variety of small-scale, independent and locally-coordinated sustainability initiatives.

**Approach:** The Sustainable Development Unit (SDU) was established in 2008 to work with and support the NHS to be more environmentally and socially sustainable, thus contributing to its overall financial sustainability. Thereafter, strategies were developed; governance structures and mechanisms for sustainability were put in place; stakeholder engagement mechanisms were implemented; and supporting mechanisms were devised.

**Relevant changes:** Information and indicators relevant for sustainability have been routinely collected since the SDU's establishment, and net comparative gains have been observed in reduced use of resources, reduced carbon footprint, reduced waste generation and stakeholder engagement.

**Lessons learnt:** some aspects of the NHS experience may be transferable to other national health systems. These include the importance of manageable entry points and stakeholder engagement, how to promote change, the complementarity of top-down and bottom-up action, and the inextricability of the environmental, social and economic dimensions of sustainability in health systems.

**Keywords:** HEALTH SYSTEMS, SUSTAINABILITY, CHANGE MANAGEMENT, CLIMATE CHANGE, ENVIRONMENT

## BACKGROUND

Health systems frequently constitute large and organizationally complex sectors requiring considerable amounts of energy and resources for their activities, and generating sizeable and multifaceted emissions of waste, air pollutants, greenhouse gases, toxic chemicals and other emissions (1–6). Albeit relatively limited, the existing evidence (5, 7) suggests that an improvement of environmental sustainability in health systems provides benefits and opportunities for health protection and promotion, financial savings and improved efficiency, as well as reduced environmental risks. A similar

realization in other sectors has led large private and public organizations to incorporate sustainability as a core component of their corporate strategy, usually through a so-called triple bottom line approach (8) that integrates all dimensions of sustainability. However, this shift is still at an early stage in most health systems. The potential benefits and opportunities attainable through better environmental sustainability are particularly relevant in national health systems, where ongoing trends of rising urbanization, population ageing and advances in medical technologies pose challenges to their financial viability and ultimately their continued capacity to deliver results (9).



Processes towards improved environmental performance are typically bottom-up, local and driven by providers, which results in few lessons being transferable to multiple and diverse settings. However, there are also examples of governance-driven, top-down change towards environmental sustainability in health systems, which are crucial to amplify effects and ensure consistency in larger settings. Within the WHO European Region, the National Health Service (NHS) in England constitutes one such example. This paper aims to explain the rationale and circumstances of the establishment of the NHS Sustainable Development Unit (SDU), to describe its history and achievements up to the present day, and to offer some generalizable principles which could be used by similar organizations elsewhere.

## LOCAL CONTEXT

The NHS, launched in 1948, is the publicly funded health-care system for the United Kingdom. It employs more than 1.7 million people, putting it in the top five of the world's largest workforces. The NHS in England is the biggest part of the system, catering to a population of 54.3 million and employing around 1.4 million people (10). NHS providers of services are mostly set up as independent legal entities called trusts. These operate under a blueprint NHS contract determined and monitored locally by commissioning organizations in a purchaser-provider approach. A number of national organizations provide support functions such as data and information, regulation and monitoring, and training and education. Public health is provided nationally through an arms' length body of the Department of Health and locally through Local Authorities. For context, it is important to note that the NHS has been operating under significant financial constraints for several years. This has brought about intense financial scrutiny, particularly on any measures or considerations beyond "business as usual".

Regarding environmental performance, a variety of context-specific climate change and sustainability activities have been underway in some parts of the NHS for several years. However, most of these efforts were locally determined, concentrated either in Estates and Facilities or Public Health Directorates and focused primarily on energy efficiency, waste recycling, travel plans and improved lifestyle approaches.

## APPROACH

### CONCEPTUALIZING CHANGE

The SDU was established in 2008 to help the NHS to be more environmentally and socially sustainable, thus contributing to its overall financial sustainability. The establishment of the SDU coincided with the adoption of the Climate Change Act, passed the same year. The Act had direct implications for most sectors, including health (11). This regulatory framework thus influenced the SDU from its inception. The unit was explicitly positioned within the NHS so that it could operate from within the sector and work closely with the Department of Health, regulators and NHS organizations to align objectives and drive wide-scale engagement.

Tackling the environmental impact of the NHS posed a significant challenge from inception, and the SDU was forced to look for suitable entry points and to prioritize efforts. The unit decided to initiate a carbon footprint assessment and in parallel, to carry out an NHS-wide consultation to ascertain the willingness for change in the system. The carbon footprint and consultation served to develop a Carbon Reduction Strategy, which proposed carbon interventions and evaluated their potential in terms of their net financial savings (12). As stakeholder involvement grew, the publication *Fit for the future: scenarios for low carbon health care 2030* (13) was designed to help stakeholders move beyond a short-term focus, proposing a societal approach dealing with climate change from a health care perspective over a 20-year horizon.

By 2010, it was clear that a broader framework was needed. The *Route map for sustainable health* (14) was developed by bringing together a wide range of stakeholders within and outside the NHS. This process helped identify the necessary general transformative processes to be initiated (see Table 1).

Since the publication of the *Route map*, much progress has been made towards environmental sustainability in the NHS. The collaborative efforts across the sector have largely focused on five main areas: 1) Governance; 2) Stakeholder engagement; 3) Carbon measurement and reduction; 4) Building resilience and adaptation to climate change; and 5) System support. These are summarized in greater detail in the next sections.

**TABLE 1. ROUTE MAP TRANSFORMATION PATHWAYS**

From	health care as an institution-led service	To	health and social care as part of the community
From	curative and fixing medical cure	To	early intervention and preventive care
From	sickness	To	health and well-being
From	professional	To	personal/community
From	isolated and segregated	To	integrated and in partnership
From	buildings and institutions	To	healing environments and community-focused models of care
From	decision-making based on today's finances	To	an integrated value of the future which accounts for the impacts on and assets of society and nature
From	single indicators and out-of-date measurements	To	multiple score card information in real time
From	sustainability as an add-on	To	integration in culture, values, practice and training
From	waste and overuse of all resources	To	a balanced use of resources where waste becomes a resource
From	nobody's business	To	everyone's business

Source: Authors' own elaboration based on (14).

## GOVERNANCE STRUCTURE AND MECHANISMS

A number of structural mechanisms were put in place to support change across the whole sector including a national advisory group, regional leads and local networks. The advisory group is a national cross-system group with membership from every national organization. The group's purpose is to consider, reflect on and support progress across all levels of the health and social care sector. Within those attributions, the national advisory group suggested that sustainable development management plans (SDMPs) based on key principles defined by the government (15), should be developed and approved at board level (see Box 1).

In many organizations, the first iteration of SDMPs focused primarily on carbon reduction in buildings, and expanded in scope over time. The regional leaders provide support in each region and are instrumental in developing local networks to support the implementation of the relevant strategies, and the local networks are in charge of the actual implementation.

## STAKEHOLDER ENGAGEMENT

Participatory approaches and engagement were considered crucial by the SDU for the long-term success of this transformational intervention. A number of engagement mechanisms were used with

**BOX 1. BASIC COMPONENTS AND TYPICAL SPECIFIC ELEMENTS OF AN SDMP**

Basic components	Specific elements
<ul style="list-style-type: none"> <li>Board-level approval</li> <li>Organizational vision and alignment</li> <li>Action plan</li> <li>Metrics and measurement of progress</li> <li>Governance/ accountability mechanisms that are included in annual report</li> </ul>	<ul style="list-style-type: none"> <li>Carbon reduction hotspots</li> <li>Commissioning and procurement processes</li> <li>Leadership, engagement and development with staff and public</li> <li>Considering communities (including adaptation and resilience)</li> <li>Developing sustainable clinical and care models</li> <li>Fostering innovation</li> <li>Capturing social value</li> </ul>

Source: Authors' own elaboration based on (16).

various groups of stakeholders. The SDU aimed to engage with all major groupings both at leadership and operational level, in order to achieve wide coverage and to reach a varied representation of every part of the sector. These included:

- **Health workforce:** The SDU conducted an NHS-wide consultation in order to ascertain the level

of support for carbon reduction among staff and to harness input to the development of the carbon reduction strategy (17). The SDU co-developed guidelines for those groupings of the health workforce that have a key role to play, including general practitioners, nurses and finance managers (18).

- **Top management:** The SDU engaged with national leaders and Trust management teams through regular liaison with influential or key players in the system to ensure sustainable development remained a priority and to ensure integration into organizational cultures. A survey of chief executives was conducted in 2011 to ascertain the level of support from CEOs (19).
- **Local leaders:** The SDU worked with regional leaders who helped to take the strategy implementation forward in their own geographical areas. In addition, support was provided for local leaders and sustainability managers through regular open forums, consultations and regional debates and events.
- **General public:** Public opinion surveys have been conducted by a leading independent survey company every two years since 2011.
- **Industry:** Given the large contribution of pharmaceuticals and medical devices to the NHS footprint (see next section), a group of representatives from industry, national agencies in the United Kingdom and the SDU developed guidance for foot-printing products based on a greenhouse gas (GHG) protocol (20). This group became the coalition for sustainable pharmaceuticals and medical devices and continues to publish guidance to support the foot-printing of care pathways (21).

## CARBON MEASUREMENT AND REDUCTION

The framework for the SDU estimation of the NHS carbon footprint was set by the United Kingdom's Climate Change Act in 2008 (11). It included the three GHG emission scopes (1: All direct GHG emissions; 2: Indirect GHG emissions from consumption of electricity, heat, etc. and 3: Other indirect emissions such as the extraction and production of purchased

materials and fuels, waste disposal, etc.). The SDU's first estimation of the NHS carbon footprint (22) revealed not only its scale (25% of the public sector footprint) but also that most of the emissions came from the products that the NHS bought, from their manufacture to their use and disposal. Pharmaceuticals and medical devices formed 22% of the total footprint. In response to requirements set by the Climate Change Act, the NHS set a level of ambition to reduce the footprint by 10% by 2015 based on a 2007 baseline (see below, "Relevant changes"). The health sector overall in England is now working towards a 34% carbon reduction by 2020.

## BUILDING RESILIENCE AND ADAPTATION TO CLIMATE CHANGE

The United Kingdom's Climate Change Act required national organizations, including the NHS, to adapt to climate change, to undertake risk assessments and to prepare for a changing climate. The health sector in England was asked by the government to submit a report on climate change preparedness and undertook a joint exercise to evaluate the sector's level of progress. The main recommendations were that the sector should consider actions to improve resilience, monitor the impact of climate change and assess the level of preparedness while developing a sound platform of information from nationally collated information and intelligence (23). The SDU also became responsible for national reporting on climate change adaptation of the health system for the Department for Environment, Food and Rural Affairs.

## SYSTEM STRENGTHENING

The SDU and its stakeholders identified a number of areas where further system-wide support was needed in order to ensure the required levels of transformational change.

- **The development of metrics:** Progress was regularly reviewed and the results published, including carbon footprint changes, the uptake of relevant processes, and consultations (24). However, it was recognized that further indicators would be needed over time. A cross-health sector metric steering group was therefore set up to take stock of the available data and to build on existing reporting tools, methods and mechanisms.

- **Research and development:** The SDU took stock of existing research and knowledge gaps to encourage health research funders and researchers to focus on these areas.
- **Sector and industry guidelines:** In addition to the abovementioned guidance for foot-printing products, sustainable health research guidelines were developed. Ongoing developments include additional methodologies for carbon foot-printing key care pathway components.
- **Workforce support:** In addition to the engagement strategies already mentioned, SDU supports the workforce in their sustainability efforts by: 1) developing factsheets and tailored guides for different staff groups such as nurses, doctors and finance professionals; 2) engaging with royal colleges to establish college guidelines; 3) presenting national awards for sustainability; 4) organizing a yearly NHS sustainability day; and 5) creating bespoke communication messages and campaigns within organizations.

## RELEVANT CHANGES

Several positive changes were observed, both in terms of processes and outcomes. They are summarized below. The information was collected from national datasets, national reporting tools, SDU processes and commissioned work. All data are available in the public domain (24–26).

### USE OF RESOURCES

- By 2015 the NHS had reduced its overall footprint by 11% (25.7 MtCO<sub>2</sub>e in 2007 to 22.8 MtCO<sub>2</sub>e in 2015), while activity levels rose by 18%. Intensity reductions correspond to 22% per head of population and the carbon intensity per pound spent is now one fifth of the 1990 figure after adjusting for inflation.
- There was a 4.3% decrease in the building energy carbon footprint between 2007/2008 (3.3 MtCO<sub>2</sub>e) and 2014/2015 (3.2 MtCO<sub>2</sub>e) with a 1.4% reduction in the last year<sup>1</sup>. Some 90 organizations (38% of the NHS) have reduced their building energy carbon

<sup>1</sup> Data presented to two significant figures.

footprint by more than 10% since 2007/2008. The reduction in energy use has helped to save £23 million in 2014/2015.

- There was a 4.2% reduction in water consumption between 2007/2008 (36 m<sup>3</sup>) and 2014/2015 (35 m<sup>3</sup>)<sup>2</sup>.
- Waste not recycled decreased by one third between 2007/2008 (0.3 million tonnes) and 2014/2015 (0.2 million tonnes) with 40% of waste recycled or in preparation for reuse.

### SOCIETY – ENGAGEMENT

- Three public opinion surveys, conducted by an independent survey company in 2011, 2013 and 2015, revealed high and growing public support for a more sustainable NHS (89% in 2013, 92% in 2011 and 2015), a growing opinion that this should be a top priority (19% in 2011 and 2013 and 25% in 2015) and that the health system should act in a more sustainable way even if there is a cost involved (33% in 2011, 36% in 2013 and 43% in 2015) (27).
- Health sector staff consultations were held in 2008 and 2013 in order to develop the five-year strategies. Stakeholder workshops were held in 2010 to develop the *Route map* and thereafter twice yearly events were held to optimize implementation.
- A survey of all NHS CEOs conducted by another polling company in 2011 highlighted that 90% of those that responded felt this was an important part of their business.
- A global consultation across health sectors and industry in 2011 was held as part of the publication of carbon foot-printing guidance for pharmaceutical products and medical devices.
- NHS Sustainability Day has been held for six years, with growing participation (600 organizations in 2016) and more recently a wider emphasis across the sector, going beyond the NHS.

<sup>2</sup> Data presented to two significant figures.

## GOVERNANCE AND ACCOUNTABILITY

- The SDU was established, along with a national cross-system group and regional lead structure to support sustainability managers working within organizations.
- Five NHS-wide carbon footprints were published across the sector (based on data in 2004, 2007, 2010, 2012 and 2015).
- Two carbon footprints for the health and social care sector were published (based on data from 2012 and 2015).
- Maps of progress across regions were published every year from 2010 onwards (24), focused on SDMPs developed in organizations, annual reporting on sustainability/carbon and regional carbon reduction maps for energy, waste and water.
- As of May 2015, 70% of NHS providers in England and 30% of clinical commissioning groups (CCG) (52% overall), had a current SDMP approved by their governing body or board.
- As of May 2015, 42% of NHS providers had a board-approved adaptation plan.
- Some 43% of NHS providers are on track for a 34% carbon reduction by 2020 (or equivalent 28% reduction on a 2013 baseline).
- One third of the 2014/2015 Annual Reports for CCGs and NHS providers included sustainability reporting while 68 organizations (15%) excelled in clearly communicating the meaning of sustainability, policy, information and performance analyses, according to a set of predefined criteria.

## TRANSFERABLE LESSONS

The sustainability journey across the health sector in England may, with the warranted caution, provide useful lessons to other health systems in their efforts towards greater environmental sustainability. A few are succinctly summarized below.

## TOP-DOWN CHANGE THAT NURTURES BOTTOM-UP ACTIVITIES

The NHS experience suggests that the rate of change needed to achieve the environmental sustainability of large health systems can only be reached through governance-driven policy issued at the highest level of management. The top-down approach in the NHS made the process faster and arguably more effective. However, there is great value in provider-driven activities in terms of local relevance, learning potential and engagement. Moreover, local autonomy of the NHS organizations meant that they could engage in environmental sustainability and take advantage of the opportunities it brings about in ways that fitted their own needs.

## A DEDICATED UNIT AS A SEED OF CHANGE

The establishment of the SDU within and for the NHS was important to make sure that this agenda had a voice and was tackled systematically across the sector. It helped keep the issue on the agenda through transitional periods or changing government priorities. It also provided coherence to the overall cross-sector approach, ensured a sound basis for data measurement and was able to foster engagement across the sector. In addition, the cost of such a unit can easily be recouped through savings across the sector.

## A MANAGEABLE TOPIC AS ENTRY POINT TO BROADER CHANGES

The SDU was criticized for initially focusing on carbon emissions at the expense of other aspects. However, this choice proved useful due to the measurability of carbon, which made it a manageable entry point to sustainability. Using carbon as a starting point meant that discussions about environmental sustainability could get started with concrete data. It also enabled a focused approach in areas where the footprint was largest such as procurement and pharmaceuticals. The availability of data and evidence about ways of reducing carbon also helped to catalyse discussions about a broader sustainability perspective, thus facilitating a transition to a wider framing within sustainable development.

## FOSTERING ENGAGEMENT

Engagement was and still is crucial, providing both a view of the support for change across the sector and a mandate to respond by developing strategies and

tools to support progress. Listening intently to those operating within the system helps determine the context, barriers, successes and ideas for innovation and change. This feedback is critical in helping to address key perceived challenges and also in ensuring these opportunities can be realized. For instance, the surveys and workshops greatly strengthened the SDU's mandate, and helped to target its work and communication.

## THINKING SMALL AND BIG

With the sustainability of the NHS and the sector itself in question, it is worthwhile exploring a broad diversity of options to find the models that will enable the NHS to continue to deliver results. While environmental sustainability can provide relatively easy gains in terms of efficiency and cost savings, it is just a fraction of a greater debate. Ultimately, the NHS (and any health-care system) may need to consider a fundamental shift in the way it delivers care and reconsider the ultimate purpose of health care, including the role of well-tested and cost-effective health promotion and prevention interventions.

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