

DELIVERING A SUSTAINABLE DERMATOLOGY SERVICE

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ABSTRACT

Healthcare accounts for approximately 4.4% of global net carbon dioxide emissions in the world. In this paper, we discussed the NHS carbon footprint and the practical strategies to deliver a greener dermatology service at the individual, practitioner, service and corporate levels.

Keywords: low-carbon, lean service, recycle, sustainable, net-zero

INTRODUCTION

Healthcare accounts for approximately 4.4% of global net carbon dioxide emissions in the world. In brief, 61% of the National Health Service (NHS) carbon footprint originates from procurement of resources, 17% from energy, 13% from business travel and 9% from commissioning of services (National Audit Office, 2015). Medical instruments and pharmaceuticals are responsible for approximately a quarter of carbon emissions in health and social care in 2017 (Sustainable Development Unit, 2018).

The NHS introduced a statutory target to reach net zero for carbon emissions following the publication of the Health and Care Act 2022. In ‘Delivering a net zero National Health Service’, the first statutory target is for commissioners and providers of NHS service to reach net zero by 2040 for the emissions the NHS controls directly (i.e., Greenhouse Gas Protocol (GHGP) Scope 1 – direct emissions and GHGP Scope 2 – indirect emissions from the generation of purchased energy) and by 2045 for the emissions the NHS has the ability to influence (i.e., GHGP Scope 1, GHGP Scope 2 and GHGP Scope 3 – all other indirect emissions such as supply chain) (NHS England, 2022).

In this commentary, we will explore the history of the NHS carbon footprint, the NHS carbon reduction plan and strategies to deliver a sustainable dermatology service.

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HISTORICAL PERSPECTIVE OF NHS CARBON FOOTPRINT

NHS carbon emissions began to be systemically evaluated in the 1990s. The NHS carbon footprint (i.e., GHGP Scopes 1 and 2) was estimated to be 16.2 MtCO₂e in 1990, 8.7 MtCO₂e in 2010 and 6.1 MtCO₂e in 2020. The NHS carbon footprint plus (i.e., GHGP Scopes 1, 2 and 3) was estimated to be 33.8 MtCO₂e in 1990, 28.1 MtCO₂e in 2010 and 24.9 MtCO₂e in 2020; this represented a 26% reduction in carbon emissions between 1990 and 2020 (NHS England, 2022).

A major source of carbon emissions in the NHS is electricity use. Thus, it is important to consider the fuel mix for electricity generation in the UK which has transitioned from majority fossil fuel source to majority clean energy over the past few decades. The UK's fuel mix for electricity generation was estimated to be 78% fossil fuel, 21% nuclear and 1% renewables in 1985 and 45% fossil fuel, 15% nuclear and 40% renewables in 2022 (Our World in Data, 2022). The shift away from using fossil fuels to generate electricity has implications for reducing emissions from GHGP Scope 2.

NHS CARBON REDUCTION PLAN

The NHS carbon reduction plan was broadly summarised as decarbonising the electricity and the NHS fleet (vehicles), digital care pathway redesign, low-carbon models of care, preventative medicine, reducing health inequalities, reducing anaesthetic gas, shifting to low-carbon inhalers, nitrous oxide capture and reuse, improving the energy efficiency of estates, on-site renewable energy, reducing foot waste, moving towards plant-forward diet, more efficiency use of supplies, supplier alignment to net zero commitments, low-carbon substitutions and product innovation, research innovation and offsetting (NHS England, 2022). In 2023, suppliers to the NHS of new services over the value of £5 million per year would be required to publish a carbon reduction plan for their emissions (NHS England, 2023).

Carbon offsetting may include nature-based solutions (e.g., planting new forests or restoring agricultural land back into forests), enhanced natural processes that recapture carbon (e.g., use of charcoal produced from biomass, called biochar, and plough them into the soil to increase soil carbon contents) and technology to capture and store carbon (e.g., bioenergy with carbon capture and storage deep underground).

PRACTICAL STRATEGIES TO DELIVER A GREENER DERMATOLOGY SERVICE

Practical strategies to deliver a greener dermatology service could be broadly divided into four levels, namely, individual, practitioner, service and corporate.

INDIVIDUAL LEVEL

As individuals, we are in control of our own lifestyle and homes. We should give consideration to adopting a plant-forward diet as plant-based food sources have less environmental impact compared with animal-based food sources. We could consider improving the energy efficiency of our own homes such as draught-proofing doors and windows, loft and cavity wall insulation, upgrading to energy-efficient lights and heating systems and considering solar panel and heat pump technologies. We should be more conscientious about our choice of method to travel for work and leisure as walking, cycling, public transport, car sharing, private car and air travel have different environmental impacts. We could consider taking up nature-based hobbies. Gardening and beekeeping (BeeKeeping, 2022) could promote biodiversity, and litter picking protects the environment and enhances the community. If we have items or food that we no longer need but are safe to use, we could consider offering the items for other people to enjoy (e.g., via food bank and online apps) in a circular economy or recycle the items instead of disposal as waste.

PRACTITIONER LEVEL

Dermatology health professionals could consider promoting and integrating the four principles of sustainable practice (prevention, patient self-care, lean service delivery and low carbon alternatives; Mortimer, 2010) into their day-to-day clinical practices.

PREVENTION

As healthcare practitioners, we are in a position to ask patients about their sun exposure, vaccination, smoking and alcohol history. We can provide patients with advice on sun protection, vaccination (e.g., human papillomavirus, varicella zoster virus and flu vaccination for at-risk groups), smoking cessation and alcohol reduction advice to prevent disease and their complications.

PATIENT SELF-CARE

Examples of patient empowerment to self-care may include provision of sun protection advice, organising mole mapping photographs and educating patients on how to perform self-skin monitoring so that patients can protect and monitor their skin and know when to seek medical advice about changing skin lesions. Provision of high-quality information to patients about the expectant effects of therapies and how to self-care following treatment (e.g., following fluorouracil, imiquimod and cryotherapy treatments) is important as this will not only address patient expectations, encourage compliance with treatment and empower them

to self-care but also minimize the need for additional clinical consultations to deal with expected side effects from treatments.

LEAN SERVICE DELIVERY

Health professionals are best placed to understand the strengths and limitations of care pathways and the opportunities to make the care pathways leaner and more efficient. The literature reported recent clinician-led initiatives in delivering leaner skin surgery (Tso, 2023a; Tso et al., 2024) and identified opportunities to reduce resource consumption in skin surgery training (Johnson-Ogbunike et al., 2023). The British Society of Dermatological Surgery (BSDS) sustainability guidance 2022 further provided helpful recommendations on lean service delivery such as one-stop clinics and teledermatology services (Ali et al., 2022).

LOW-CARBON ALTERNATIVES

We should be more conscientious about our choice of consumables used in our clinical practice as they can have different carbon footprints. However, the selection of low-carbon alternatives in care pathways will need to be balanced against individual case's infection risks and there is a need to comply with relevant local and national regulations (e.g., infection control, manual handling and health and safety). In addition, there is a paucity of professional guidelines and life cycle data on medical devices, medicines and cosmeceutical products to facilitate health professionals in making decisions on suitable low-carbon alternative products. The BSDS sustainability guidance 2022 (Ali et al., 2022) made helpful evidence-based recommendations on low-carbon alternatives that could be considered when carrying out skin surgery, for example:

- Reusable surgical instruments are favoured over single-use surgical instruments.
- Absorbable sutures are favoured over non-absorbable sutures.
- Home-laundered reusable surgical cloth caps are favoured over single-use caps.
- Use surgical aprons or clean scrubs instead of surgical gowns.

There is a lack of research examining the carbon footprint of dermatology topical products. In respiratory medicine, the literature suggested the carbon footprint of combination inhaler therapy (e.g., long-acting beta-agonist and inhaled corticosteroid combination inhaler; carbon footprint per actuation 130–197 gCO₂e) could be lower than using two separate inhalers (e.g., long-acting beta agonist inhaler 130 gCO₂e per actuation and inhaled corticosteroid inhaler 73.5–130 gCO₂e per actuation; total 203.5–260 gCO₂e) (Wilkinson et al., 2019). However, the findings of

this study have limitations as it did not consider patients' clinical needs, how patients actually used and how clinicians recommended the use of these inhalers. Nevertheless, it is possible that the use of a single topical product containing two active ingredients could have a lower carbon footprint than two separate topical products each containing one active ingredient. More research into the carbon footprint of topical therapies could have implications on how health professionals select, prescribe and recommend the use of these pharmaceutical and cosmeceutical products.

REDUCE, REUSE AND RECYCLE

It is good practice for clinicians prescribing pharmaceuticals or recommending cosmeceuticals to have an awareness of packaging sizes and the volume of products a patient may require. Products should be dispensed according to how much is needed. Over-prescribing could potentially lead to waste. Under-prescribing may lead to additional consultations. It is good practice to ask patients what treatment they have access at home (especially in relation to topical emollients and soap substitutes) and encourage them to use their own stocks before prescribing new ones. Medication reuse schemes are available in countries such as the United States and Greece, but not available in the UK. Some but not all healthcare facilities provide collection points for recycling of medicine blister packs. Patients could be signposted to these recycling services to promote recycling. Efforts should be made to improve access to recycling bins as a recent study reported 42% (5/12) of dermatology departments in the UK did not have access to a recycling bin in their skin surgery room (Shearman et al., 2023).

SERVICE LEVEL

The Dermatology GIRFT (Get It Right First Time) Programme National Specialty Report made a range of recommendations on how to optimise the delivery of dermatology services (Levell, 2021). Examples of GIRFT recommendations that are relevant to environmental sustainability by reducing appointments and patient or staff travel include:

- Increasing the use of telephone outpatient consultations and exploring further the new video consultation systems.
- Inform patients of their diagnosis by letter after excision of low risk skin cancers unless there are particular reasons for seeing them again in secondary care.
- Promote the development of AI and digitization of slides to support the work of clinicians in dermatology histopathology reporting.
- Establish networks to encourage shared care and expertise across specialties for complex medical dermatology.

The literature reported switching from face-to-face to telemedicine appointments in dermatology or general medicine settings reduced carbon footprint due to patient and/or clinician travel. Bonsall (2021) reported an estimated average potential saving of 11.1 kgCO₂e (55.8 km of travel distance) per patient in a cohort of 61 dermatology patients from Aberdeen, Scotland. However, it is important to note that the amount of patient travel-related carbon footprint savings in telemedicine is highly variable and dependent on the geographic distance and mode of transport (e.g., savings of 0.70 kgCO₂e/consultation if patients travelled by underground train in London; 3.55 kgCO₂e/consultation if travelled by car in London; 8.05 kgCO₂e/consultation in Warwickshire; 372 kgCO₂e/consultation in California, the United States; Purohit et al., 2021). Furthermore, clinicians should be mindful about the strengths and limitations of different modalities of consultations, with careful case selection for teledermatology clinics as recent literature reported an incidental skin cancer detection rate of 5.1% in face-to-face skin cancer clinics (Omara et al., 2020). Gerhardt et al. (2021) explored the diagnostic accuracy of teledermatology clinics in the United States. Of the 809 patients who had an initial teledermatology consultation followed by a face-to-face consultation, 60.2% (487/809; 95% confidence interval [CI] 56.7–63.6) were found to have at least one additional diagnosis during the face-to-face consultation with 1.1% (9/809; 95 CI 0.6–1.8) cases being a malignant melanoma additionally identified during a face-to-face consultation. The complete concordance between teledermatology and face-to-face consultation diagnosis was 75.3% (609/809; 95% CI 72.2–78.2) (Gerhardt et al., 2021).

CORPORATE LEVEL

Organisations could consider developing a green plan to outline their aims, objectives, scope and deliverables to improve the environmental sustainability of their organization and services delivered. They could review their internal operations to identify the opportunities to introduce or strengthen environmental considerations in their internal processes. Environmental management systems (e.g., ISO 14001 and EU Eco-management and audit scheme) may be helpful to organisations in improving their environmental performance through more efficient use of resources (Tso, 2023b).

Developing green leadership within the organization should be encouraged. A green estate strategy such as improving energy efficiency of the estate, electrifying the vehicle fleet, sustainable procurement, introducing green and blue (water) space at the workplace and provision of environmental sustainability training to staff should be promoted. Organisations could further impact climate change through how they choose to invest or divest their pension and endowment funds from fossil fuels as well as its advocacy on environmental sustainability, diversity and inclusion (Cooke et al., 2022).

CONCLUSION

This paper discussed the NHS carbon footprint and the practical strategies to deliver a sustainable dermatology service. There are ample opportunities for individuals to engage with sustainable healthcare at individual, practitioner, service and corporate levels.

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CONFLICTS OF INTERESTS

No relevant competing interests.

ETHICAL APPROVAL

Not applicable.

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