

The First Quantification of the Carbon Footprint of the Portuguese National Health Service: A Positive but Insufficient Step Forward

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The threat of climate change and global warming demands an urgent transition toward carbon neutrality. This implies a major transformation across all economic sectors. Healthcare is no exception.

The contribution of health systems to overall economic activity has grown considerably in many countries. Portugal spends 11% of its GDP in the health sector, with public expenditure representing 64% of the overall health spending. Health spending in Portugal, similar to many other developed economies, has been increasing in recent years and is expected to keep increasing. Health systems are major contributors to carbon and greenhouse gas (GHG) emissions. In fact, research suggests that the healthcare sector is responsible worldwide for 4.6 percent of total GHG emissions [1]. Moreover, in many countries, such as the USA, health system-related emissions have been increasing [2].

Different countries worldwide have implemented carbon emissions monitoring mechanisms in their health systems and designed carbon neutrality roadmaps, with the UK considered an example of best practice [3]. However, over the last few years, and despite the growing importance of the health sector in Portugal, its carbon footprint remained largely unknown. Past attempts, such as the low carbon strategic

plan launched in 2010, lacked the ambition to deliver the structural change needed to reduce the environmental impact of the health system.

Nonetheless, this might be changing. In late 2022, as part of the Operation Zero project, the Portuguese National Health System (NHS) funding agency (ACSS) launched a report with estimates on the carbon footprint of the NHS [4].

Based on an internationally validated methodology [5] and 2014 data, the report estimates the carbon footprint of the Portuguese Health Sector to be around 3.92 Mt CO₂eq, which corresponds to 5.8% of national GHG emissions. The National Health Service is estimated to have a carbon footprint of 2.51 Mt CO₂eq (3.7% of national GHG emissions) [4].

We argue that while this first quantification of the carbon footprint of the Portuguese NHS is an important progress, the scope of the report, as well as its policy recommendations, is insufficient. Further efforts are required to produce a more comprehensive report, overcoming some of the following key limitations. The report does not stratify emissions according to the type of health services provided (not only the private vs. public sector duality, but also distinguishing between inpatient and outpatient care, for instance). It would also be key to pin

down the evolution of the carbon footprint over time for each category to estimate the potential impact of measures implemented in the health system (higher rate of ambulatory care, home hospital programs, telemedicine).

Moreover, the initiatives and forecasts provided in the report lack detail on their implementation and their expected effectiveness. Further detail is required to justify whether these initiatives should be prioritized and implemented in the Portuguese health system.

A report assessing the Portuguese Health System Carbon Footprint should be seen as part of an overarching strategy to lead the health system toward net zero. In our opinion, this implies changes along three main dimensions:

1. **Governance:** the urgency of climate change and the need to quickly and effectively implement measures to reduce emissions in the health sector require a clear governance mechanism with a focus on sustainability. The Portuguese health system should have a chief sustainability officer responsible for designing and implementing a strategy toward net zero. The governance model must also define how to deal with the carbon footprint of the private health sector, which is out of the scope of the NHS. This should include coordinated actions between the public and private sectors.
2. **Monitoring:** achieving net zero requires the availability of proper monitoring mechanisms which track the evolution of key performance indicators. A comprehensive annual report on the carbon footprint of the health system is an essential part of such a monitoring

mechanism. Access to data, namely, for the scientific community, should be promoted to foster additional studies and external validation mechanisms.

3. **Implementation:** a governance model supported by a proper monitoring mechanism should lay down clear targets and implement actionable evidence-based policies. Domestic and international best practices should be rolled out and scaled up. Targets must be clear, reasonable, and measurable, allowing tracking progress on the implementation and on the results of such policies.

An integrated approach is required to achieve the net zero goal in health systems. The report produced by ACSS is a first step forward. However, more concerted action is needed to ensure the Portuguese health system achieves net zero.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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Author Contributions

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References

- 1 Pichler PP, Jaccard IS, Weisz U, Weisz H. International comparison of health care carbon footprints. *Environ Res Lett*. 2019;14(6):e064004.
- 2 Eckelman MJ, Huang K, Lagasse R, Senay E, Dubrow R, Sherman JD. Health care pollution and public health damage in the United States: an update. *Health Aff*. 2020;39(12):2071–9.
- 3 Tennison I, Roschnik S, Ashby B, Boyd R, Hamilton I, Oreszczyn T, et al. Health care's response to climate change: a carbon footprint assessment of the NHS in England. *Lancet Planet Health*. 2021;5(2):e84–92.
- 4 Portugal. Ministério da Saúde, ACSS. *Pegada de carbono do sector da saúde português e caminhos para a mitigação: projeto relatório* [Carbon footprint of the Portuguese Health Sector and ways for mitigation: project “Operation Zero”: report]. Lisboa: Administração Central do Sistema de Saúde (ACSS); 2022.
- 5 Parker Z, Ashby B, Tuddenham A, Brady S, Steele K, Boyd R. *Designing a Net Zero road map for healthcare: technical methodology and guidance*. Brussels: Health Care Without Harm Europe (HCWH Europe); 2022.