POLICY AND REGULATIONS FOR SUSTAINABLE HEALTHCARE

Abstract

Healthcare is one of the most crucial sectors of society. In recent years, the sustainability of healthcare has become a significant source of concern. The healthcare sector generates a large amount of trash, necessitating the deployment of sustainable waste management solutions. This emphasis on waste management efficiency is critical to reducing healthcare services' total environmental effect. The introduction of telehealth and e-health technology enables virtual consultations and remote monitoring, significantly lowering the need for patient travel. This chapter examines the current state of knowledge in the field of sustainable healthcare and implementation of ecological practices into the academic programs while the government policies ensuring the healthcare policies are in line with principles of equality and Non-discrimination. Followed by World health organization (WHO) that promotes countries to establish consistent health policies that promotes resource efficiency and achieve long-term health improvements and the Joint commission launching the voluntary programs that helps the hospital to advance their sustainability efforts and reduce green- house gas emission.

Keywords: Sustainability; Ecologically; Stakeholders; Policymakers; Green Technology; Telehealth; Digital Health; Greenhouse gas emission; Federal policies; Equality and Non-Discrimination; Ecological academic programs;

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I. INTRODUCTION

Policy and Regulations for Sustainable Healthcare are a set of frameworks and suggestions for implementing sustainability into healthcare practices while considering the environmental, economic, and social elements of health systems. The importance of sustainable healthcare has grown as the healthcare industry is recognised as a significant contributor to global greenhouse gas emissions, ranking fifth as a separate country.(1) As public knowledge of climate change and its impact on health grows, politicians are challenged with developing legislation that encourage ecologically responsible practices, reduce emissions, and provide fair access to healthcare services.

The push towards sustainable healthcare is being led by a variety of stakeholders, including governments, healthcare organisations, and advocacy groups, who work together to develop effective policies. These regulations frequently involve sustainability certification programs, such as the Joint Commission's Sustainable Healthcare Certification, which seeks to help healthcare institutions improve their environmental performance while providing high-quality patient care.(2) Furthermore, global health organisations such as the World Health Organisation (WHO) emphasise the significance of overall health policies that promote long-term improvements and address social aspects of health in order to achieve universal health coverage.(3)

Although these developments, political, organisational, and financial challenges continue to prevent broad acceptance of sustainable practices. For example, the differences in healthcare systems between countries, such as the lag in the United States due to its privatised method, creates barriers to properly incorporating sustainability strategies.(4)Furthermore, the complexity of healthcare rules can result in dispersed methods that may increase gaps in obtaining care, demanding a coordinated effort to ensure that sustainability measures do not unnecessarily promote existing gaps(5,6) Controversies regarding sustainable healthcare policies typically centre on the balance between cost-effectiveness and the deployment of environmentally friendly methods.

Analysts claim that short-term financial reasons frequently take priority over long-term sustainability goals, resulting in opposition to adopting innovative approaches that can require larger initial investments.(7,8) As the healthcare sector evolves, on-going discussion and research are critical for developing policies that promote a sustainable and fair future for all.

II. EVOLUTION OF SUSTAINABLE HEALTHCARE

The path to sustainable healthcare has transformed significantly over the last few decades, affected by a variety of socio-economic, political, and environmental issues. Early conversations about sustainability in healthcare centred on the environmental consequences of healthcare practices, highlighting the sector's significant carbon footprint. In fact, if the health sector were a country, it would be the world's fifth highest emitter of greenhouse gases (1).

This recognition inspired attempts to create policies that reduce emissions and promote sustainable practices in healthcare systems. In recent years, the focus on sustainable

healthcare has shifted from environmental issues to social and economic factors. Transparency in healthcare policies, national registration, and audit programs has been shown to improve the sustainability of healthcare strategies that enhance performance and accountability (7).

Working together among diverse stakeholders, such as hospitals, medical institutions, and community partners, have been recognised to be essential in promoting for sustainable practices, especially in rural areas where distributing resources can be difficult (9).

Furthermore, the research has increasingly urged for a balanced strategy that promotes the long-term viability of successful innovations while tackling the end or redesigning of failed programs. This is essential to maintaining value in the healthcare system by distributing resources effectively to treatments that provide favourable results (9).

As the need for sustainable solutions has grown, authorities have begun to build more deeply connections between healthcare costs and outcomes, leading to major shifts in healthcare delivery systems (10).

For example, while some countries have made significant progress in greening their healthcare systems, others, such as the United States, have fallen behind due to a privatised healthcare model that prioritises profit over sustainability (4).

The different political environments and healthcare finance methods have influenced the implementation of sustainability plans, such as the Health Sector Climate Pledge, which was proposed in 2022 and received little participation from US hospitals (11).

III. POLICIES AND REGULATIONS

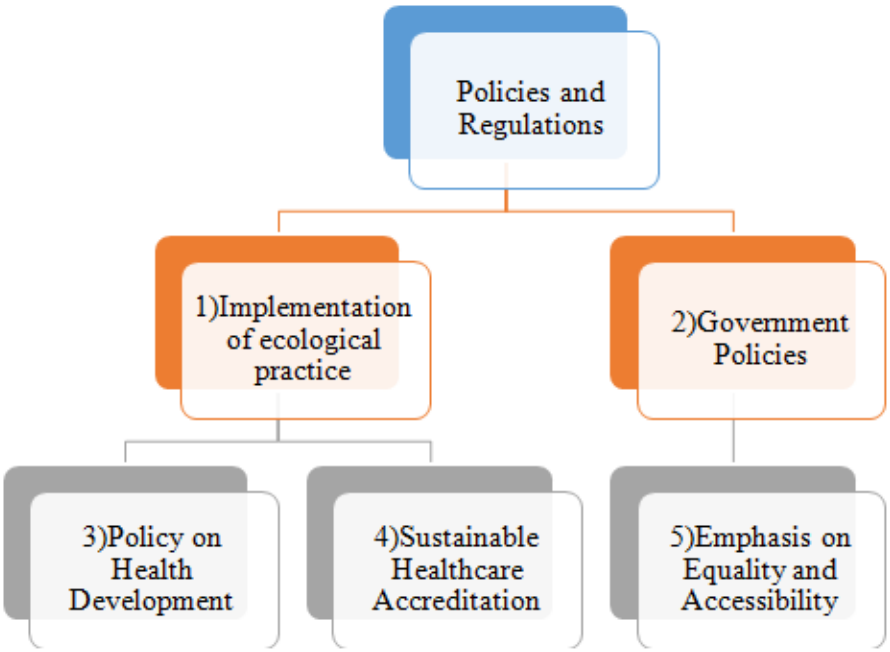

Figure 1: Policies and Regulations

1. **Implementation of Ecological Practices:** Professional representative organisations are increasingly demanding for the incorporation of ecological health practices in healthcare certification requirements. Post-graduate educational programs are including sustainable healthcare into their academic programs, highlighting the need for ecologically responsible practices in the healthcare industry (12).

2. **Government Policies:** In line with recent management instructions, the United States Federal Government has taken major steps to ensure that healthcare policies are in line with principles of equality and non-discrimination. Executive Order 13985 requires federal agencies to develop "Equity Action Plans," which detail how these institutions would address issues of diversity, equality, and inclusion (DEI) in their operations. The initiatives seek to improve government responsiveness to all residents and ensure that public resources are used efficiently(13).Furthermore, this ruling requires the end of discriminatory practices and encourages adherence to civil rights laws, ensuring equal access to healthcare services(14).

3. **Policy on Health Development:** The World Health Organisation (WHO) promotes countries to establish consistent health policies that promote resource efficiency and achieve long-term health improvements. These programs address universal health coverage, social aspects of health, and health security, providing long-term benefits to communities. Policies in this setting are crucial in establishing goals and strategies that steer healthcare at various governance levels, from national to local (3).

4. **Sustainable Healthcare Accreditation:** The Joint Commission has launched a Sustainable Healthcare Certification (SHC) scheme, which has been implemented on January 1, 2024. This voluntary program aims to help hospitals advance their sustainability efforts and reduce greenhouse gas emissions. It provides a framework for healthcare organisations to launch or expand their decarbonisation activities while earning recognition from the public for their dedication to environmental sustainability (2,4).This certification is an important step towards encouraging healthcare providers to embrace greener practices and improve their overall environmental impact.

5. **Emphasis on Equality and Accessibility:** Furthermore, national health policies continue to highlight the value of equity and access to care. According to numerous health policy assessments, gaps in healthcare access and quality continue to be a serious concern, especially in light of reforms aimed at decentralising healthcare systems. The concepts of local self-government and regional councils' right to independent decision-making have resulted in diverse implementations of national health programs, often leading to gaps in access to excellent care(5,6).These continuous advances demonstrate an increasing recognition of the interdependence of health outcomes, environmental sustainability, and social fairness, emphasising the importance of broad and diverse healthcare policies.

IV. THE FUNDAMENTALS FOR SUSTAINABLE HEALTHCARE

Sustainable healthcare depends on many fundamental concepts that work to incorporate environmental, social, and economic factors into healthcare delivery. These principles guide healthcare practitioners and organisations in developing systems that not only provide high-quality care but also help to sustain health resources.

1. **Embracing Sustainability in Care:** For successful sustainability into healthcare, eco-friendly techniques must improve, not delay, the delivery of safe and effective treatments. This method supports the Institute of Medicine's goals of safe, effective, patient-centered, timely, efficient, and fair treatment (15).For example, energy-efficient medical equipment can cut energy use while maintaining performance, demonstrating how sustainability is possible with great treatment.(15)

2. **Awareness of the Environment and Education:** Enhancing knowledge of environmental issues among healthcare workers is essential for supporting sustainable practices. Educated healthcare providers are more able to develop and engage in sustainability programs, which improves patient and community health outcomes(16). Institutions that prioritise sustainability and support eco-friendly projects create a climate that encourages the implementation of green practices(4).

3. **Economical Considerations:** Economic aspects must be considered while discussing sustainability in healthcare. While initial investments in sustainable practices may be necessary, the long-term financial benefits frequently exceed the costs. Efficient resource usage and waste reduction can result in significant cost savings, which help healthcare organisations remain a financial success(4,8).

4. **Collaboration and Engagement among Stakeholders:** Working together across disciplines is essential to the effective implementation of sustainable healthcare practices. Engaging stakeholders from many sectors, such as policymakers, providers, and patients, ensures that sustainability issues are factored into healthcare decision-making processes.(1) (17).This collaborative strategy improves the efficacy of initiatives targeted at lowering healthcare's environmental impact while enhancing individual and population health outcomes(18).By following to these principles, healthcare systems can strive for a balance between providing high-quality care and encouraging environmental sustainability, resulting in healthier societies and a planet that is healthier.

V. CHALLENGES AND BARRIERS

A number of problems and limitations, which can be classified as individual, organisational, and external, frequently affect the sustainability of healthcare initiatives.

1. **Administrative Barriers:** Organisational barriers have a substantial impact on the long-term effectiveness of healthcare programs. Many research have identified a lack of organisational support and preparation as a major barrier, with nine and seven studies noting these concerns, respectively(7).A hospital's culture and values can also create obstacles; for example, existing habits may resist change, as evidenced by six studies(7). Furthermore, failing to incorporate novel interventions into current programs could prevent long-term success, with a reported lack of infrastructure and resources weakening implementation efforts (8).

2. **Individual Barriers:** Particular staff members may experience a number of challenges that prevent the proper implementation of treatments. Several studies have revealed a lack of experience, competence, and confidence in delivering treatments (7).Furthermore, time restrictions frequently prohibit staff from fully participating in new efforts, with eight

studies finding that staff were too busy or overburdened to prioritise treatment activities (8).Ambiguity regarding roles and unclear responsibilities may worsen the situation, making it harder for employees to figure out their participation in treatments (7).

3. **External Barriers:** The external environment has a significant impact on the sustainability of healthcare initiatives. Social and political issues, such as instability and shifting goals, have been demonstrated to disrupt current initiatives (8).Political turnover, for example, can result in program end when stakeholders' goals shift. According to studies, a mismatch between program activities and the community's needs or values might be an obstacle to success (8).Furthermore, financial issues, such as the inability to secure long-term funding, were identified in four studies as a key factor affecting the sustainability of treatments (7).Economic limits, such as shortages of resources and excessive personnel turnover, can pose substantial challenges, as they can lead to lower program quality and continuity (7,8) .

VI. CASE STUDIES

1. **Importance of Case Studies in Sustainable Healthcare:** Case studies serve an important role in promoting best practices and promoting learning in the field of sustainable healthcare. They provide in-depth assessments of individual cases or treatments in real-world settings, allowing healthcare practitioners to share experiences and insights that add to the collective knowledge base (19).Case studies, which detail projects, outcomes, and the different hurdles and facilitators encountered, can be excellent tools for people looking for sustainable practices in their own healthcare settings (20).

2. **Examples of Case Studies:** Several important case studies have been published, demonstrating the impact of sustainable measures in healthcare. One such example is the "Hand Therapy Pre-operative Appointment for Plastic Hand Trauma Patients," which shows how a small procedure change can drastically save time for multidisciplinary team (MDT) personnel (19). Another example is the "Kapsule Kids" project at Great Ormond Street Hospital (GOSH), which produced significant financial savings with only ten patients, demonstrating how sustainability efforts can provide both therapeutic and economic benefits (19).

3. **Developing and Publishing Case Studies:** Creating a case study requires collecting detailed information about the project, such as who was involved, the problems faced, and the results attained. Healthcare practitioners are advised to use models from resources such as the CSH Resource Library to successfully format their case studies(19).Furthermore, existing case studies published elsewhere can be connected and shared within the library, creating a collaborative environment in which information and experiences are easily available(19).

VII. CURRENT TRENDS IN SUSTAINABLE HEALTHCARE

The next phase of sustainable healthcare is increasingly centred on the combination of cross-sectoral methods to promoting health and well-being within global boundaries. A recent call to action highlighted the importance of many stakeholders engaging in transformative efforts to help achieve the Sustainable Development Goals by 2030(21).This highlights the necessity

of working together with governments, healthcare providers, and communities to build strong healthcare systems that promote equality and accessibility for all people.

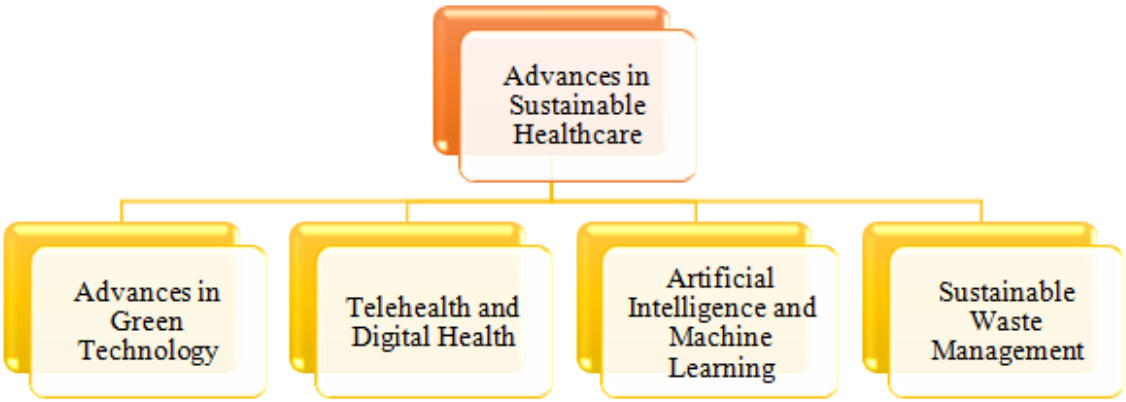

Figure 2: Advances in sustainable healthcare

1. **Advances in Green Technology:** Sustainable healthcare is progressively using green technologies to reduce its environmental impact. Healthcare facilities are incorporating innovations such as energy-efficient technologies, renewable energy sources, and environmentally friendly materials. These environmentally friendly designs highlight natural light, optimum ventilation, and waste minimisation, resulting in better settings for both patients and healthcare providers(22,23).The shift to green healthcare facilities not only improves patient care but also helps to achieve broader environmental objectives.

2. **Telehealth and Digital Health Solutions:** The growth of telemedicine and digital health platforms has transformed healthcare delivery by eliminating the need for in-person visits. This move has two benefits: it reduces the carbon footprint associated with patient and staff transportation while also improving access to care, particularly in distant areas(22–24). Additionally, the use of digital health data and e-prescriptions reduces paper waste while expediting administrative processes (23).These technologies represent a shift towards a more interconnected and resource-efficient healthcare system.

3. **Artificial Intelligence and Machine Learning:** AI and machine learning (ML) have transformed many parts of healthcare, including diagnostics and treatment planning. AI enables analytical modelling, which can identify dangers early on and help to avoid costly actions later on (24). For example, AI systems can detect early indicators of chronic illnesses, saving money while enhancing patient outcomes (24). The incorporation of artificial intelligence in healthcare systems enables better personalised care and operational efficiencies, while also contributing to sustainability goals by lowering waste and resource consumption.

4. **Sustainable Waste Management:** The healthcare sector creates an enormous quantity of trash, necessitating the implementation of sustainable waste management strategies. Innovations in biodegradable and recyclable medicinal materials are emerging as vital answers. For example, the creation of eco-friendly packaging and reusable surgical tools helps to promote a circular economy in healthcare by solving the environmental

difficulties created by single-use medical supplies (24,25). This emphasis on efficiency in waste management is crucial for lowering the overall environmental impact of healthcare services.

VIII. INNOVATION AND TECHNOLOGICAL ADVANCES

1. **Green Healthcare Facilities:** Sustainable healthcare starts with the design of environmentally friendly healthcare facilities that use energy-efficient technology, renewable energy sources, and sustainable materials. These facilities prioritise natural light, optimum ventilation, and waste reduction, lowering their environmental impact (22).

2. **Telehealth and E-Health:** The implementation of telehealth and e-health technologies allows for virtual consultations and remote monitoring, considerably lowering the requirement for patient travel. This not only reduces carbon emissions, but also improves access to healthcare services, especially in regions that are remote(22) .

3. **Renewable Energy Integration:** Incorporating renewable energy sources, such as solar panels and wind turbines, into healthcare facilities is critical for reducing dependence on fossil fuels and lowering carbon footprints (10). Investments in energy-efficient technologies, such as LED lighting and greenhouse gas emissions (10).

REFERENCES

[1] Alira Health [Internet]. [cited 2025 Jan 26]. Environmental Sustainability and Healthcare: Examples From Worldwide Markets. Available from: https://alirahealth.com/education-hub/environmental-sustainability-and-healthcare-examples-from-worldwide-markets/
[2] Cowie J, Nicoll A, Dimova ED, Campbell P, Duncan EA. The barriers and facilitators influencing the sustainability of hospital-based interventions: a systematic review. BMC Health Serv Res. 2020 Jun 28;20(1):588.
[3] How can the healthcare system deliver sustainable performance? A scoping review | BMJ Open [Internet]. [cited 2025 Jan 26]. Available from: https://bmjopen.bmj.com/content/12/5/e059207
[4] Economist Impact - Perspectives [Internet]. [cited 2025 Jan 26]. Value-based healthcare in Sweden: Reaching the next level. Available from: https://impact.economist.com/perspectives/VBHCSweden
[5] Christophel E, Martins RS, Tafuri K, Bhora FY. Incentivizing environmental sustainability for surgical healthcare at a systems level. BMC Surg. 2025 Jan 20;25(1):34.
[6] Lennox L, Linwood-Amor A, Maher L, Reed J. Making change last? Exploring the value of sustainability approaches in healthcare: a scoping review. Health Res Policy Syst. 2020 Oct 13;18(1):120.
[7] Walsh SJ, O'Leary A, Bergin C, Lee S, Varley Á, Lynch M. Primary healthcare's carbon footprint and sustainable strategies to mitigate its contribution: a scoping review. BMC Health Serv Res. 2024 Dec 20;24(1):1630.
[8] The White House [Internet]. 2025 [cited 2025 Jan 26]. Ending Radical And Wasteful Government DEI Programs And Preferencing. Available from: https://www.whitehouse.gov/presidential-actions/2025/01/ending-radical-and-wasteful-government-dei-programs-and-preferencing/
[9] The White House [Internet]. 2025 [cited 2025 Jan 26]. Ending Illegal Discrimination And Restoring Merit-Based Opportunity. Available from: https://www.whitehouse.gov/presidential-actions/2025/01/ending-illegal-discrimination-and-restoring-merit-based-opportunity/
[10] Supporting countries in developing and implementing health policies [Internet]. [cited 2025 Jan 26]. Available from: https://www.who.int/europe/activities/supporting-countries-in-developing-and-implementing-health-policies
[11] The Joint Commission announces Sustainable Healthcare Certification for U.S. hospitals [Internet]. [cited 2025 Jan 26]. Available from:

https://www.jointcommission.orghttps://www.jointcommission.org/resources/news-and-multimedia/news/2023/09/sustainable-healthcare-certification-for-us-hospitals/

[12] Jonsson F, Blåhed H, Hurtig AK. More than meets the eye: a critical discourse analysis of a Swedish health system reform. BMC Health Serv Res. 2023 Nov 9;23(1):1226.

[13] Lemery J, O'Connor T, Gillespie E, Blackburn H, Demorest S, Philipsborn R, et al. Opportunities for Strengthening Climate Education for Clinical Health Professionals. NAM Perspect [Internet]. 2024 Sep 23 [cited 2025 Jan 26]; Available from: https://nam.edu/opportunities-for-strengthening-climate-education-for-clinical-health-professionals/

[14] Global Center for Sustainable Healthcare – making healthcare sustainable for patients, clinicians, societies and the planet [Internet]. [cited 2025 Jan 26]. Available from: https://globalsustainablehealthcare.org/

[15] Advancing sustainable healthcare: a concept analysis of eco-conscious nursing practices | BMC Nursing | Full Text [Internet]. [cited 2025 Jan 26]. Available from: https://bmcnurs.biomedcentral.com/articles/10.1186/s12912-024-02197-0

[16] Zurynski Y, Ludlow K, Testa L, Augustsson H, Herkes-Deane J, Hutchinson K, et al. Built to last? Barriers and facilitators of healthcare program sustainability: a systematic integrative review. Implement Sci. 2023 Nov 13;18(1):62.

[17] Integrating Environmental Sustainability into Healthcare: Practices for 2024 - The Healthcare Executive [Internet]. [cited 2025 Jan 26]. Available from: https://www.thehealthcareexecutive.net/blog/healthcare-environmental-sustainability-2024/

[18] Braithwaite J, Smith CL, Leask E, Wijekulasuriya S, Brooke-Cowden K, Fisher G, et al. Strategies and tactics to reduce the impact of healthcare on climate change: systematic review. BMJ. 2024 Oct 8;387:e081284.

[19] Case Studies | Sustainable Healthcare Networks Hub [Internet]. [cited 2025 Jan 26]. Available from: https://networks.sustainablehealthcare.org.uk/CaseStudies

[20] Khalil H, Kynoch K. Implementation of sustainable complex interventions in health care services: the triple C model. BMC Health Serv Res. 2021 Feb 15;21(1):143.

[21] Wanyenze RK, Alfvén T, Ndejjo R, Viberg N, Båge K, Batte C, et al. Sustainable health—a call to action. BMC Glob Public Health. 2023 Aug 3;1(1):3.

[22] Hospitals M. Best Hospitals in India | Medicover Hospitals. [cited 2025 Jan 26]. Innovations and Initiatives in Sustainable Healthcare. Available from: https://www.medicoverhospitals.in/articles/innovations-and-initiatives-in-sustainable-healthcare

[23] Macias G. Sustainable Healthcare: Green Tech, Efficiency, & Challenges [Internet]. 2024 [cited 2025 Jan 26]. Available from: https://pressmaverick.com/sustainable-healthcare-green-tech-efficiency-and-challenges/

[24] Kepler Team [Internet]. [cited 2025 Jan 26]. 2023's Top 8 HealthTech Breakthroughs: AI, Cloud Innovation, Digital Health Advances. Available from: https://www.kepler.team/articles/a-year-in-healthcare-the-big-8-of-healthtech-developments-in-2023

[25] Philips [Internet]. [cited 2025 Jan 26]. 10 healthcare technology trends for 2024. Available from: https://www.philips.com/a-w/about/news/archive/features/2023/20231114-10-healthcare-technology-trends-for-2024.html

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