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Reconciling Sustainability and Cost Efficiency in Green Procurement & Supply Chain within Singapore's Healthcare Landscape: Strategies for a Greener Future

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Climate change is widely recognised as the greatest public health threat of the 21st century [1], with its impact ranging from rising temperatures to changing patterns of infectious diseases [2, 3]. In Singapore, this climate shift adds further strain on healthcare systems, with climate-induced conditions like dengue and heat-related illness on the rise [4, 5]. Paradoxically, healthcare itself is a major contributor to global warming, accounting for 4.4% of global greenhouse gas emissions [6]. Singapore currently ranks second globally in per capita healthcare emissions with 8.6 million metric tons of carbon dioxide equivalent [7], and the lion's share of the emissions – 71% – stems from the healthcare supply chain [6]. Henceforth, the need to address sustainability in healthcare, particularly within the healthcare supply chain, is more critical than ever.

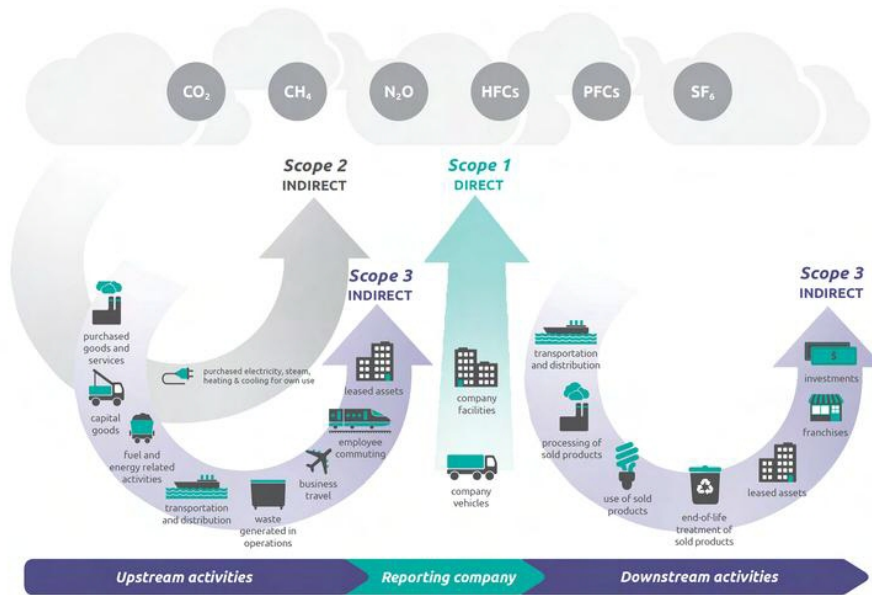
One key consideration (or dilemma) in adopting sustainability in healthcare is costs – in particular, the cost of goods to deliver healthcare sustainably. Hospitals are compelled to adopt more sustainable procurement methods to achieve their carbon reduction targets. This often means sourcing from suppliers committed to environmentally friendly practices, which can come with higher costs. Concurrently, rising inflation places additional financial pressure on healthcare services that must remain affordable, urging them to seek cost-saving measures within their supply chains.



Hospitals of Singapore (HOS) Network Roundtable at Singapore Healthcare Management Congress (SHMC), August 2024.

These two forces – the push for sustainability and the need for cost reduction – raise an important question: Can cost savings and sustainable procurement be achieved together, or are they inherently conflicting?

The Hospital of Singapore (HOS) Network Leadership Roundtable 2024, hosted by the Centre for Healthcare Innovation (CHI), brought together key stakeholders from the Agency for Logistics and Procurement Services (ALPS), National University Health Systems (NUHS), Singapore Health Services (SingHealth), National Healthcare Group (NHG), ST Logistics and PARKROYAL COLLECTION Pickering, to explore the convergence of sustainability and cost efficiency within healthcare procurement and supply chain management.



Pictorial breakdown of Scope 3 emissions
 Source: US EPA (2024).

Sustainable Sourcing and Cost Containment

ALPS, the national integrated supply chain management agency for public healthcare in Singapore, has committed to a 30% reduction in Scope 3 emissions by 2030, with an ambitious goal of achieving net zero emissions by 2045. Scope 3 emissions, which include indirect greenhouse gas emissions throughout the value chain—from suppliers, product transportation, to the disposal of products—represent a significant challenge in the journey towards achieving a greener healthcare system.

Embarking the first steps in greening Singapore’s healthcare supply chain, Ms Nina Zhang, Chief Procurement Officer from ALPS, shared that ALPS has incorporated an environmental score to its existing vendor evaluation framework, which assesses suppliers against a set of financial, quality (and now sustainability) criteria. This amendment in assessment framework serves to nudge and motivate suppliers to embrace more eco-friendly practices, while allowing procurement teams from hospitals to select vendors that best fulfil their requirements of cost, quality and environmental sustainability.

With more countries embarking on sustainability goals, ALPS is also casting a wider net globally to source for suppliers meeting these requirements. Ideally, this framework prioritises and rewards suppliers with sustainable practices and products, encouraging the shift to ‘greener’ healthcare supplies of acceptable costs and quality.

However, as environmental sustainability is just one of the many criteria in supplier selection, the healthcare supply chain may not necessarily achieve an increase in overall supplier sustainability should other procurement criteria be heavily prioritised over sustainability considerations. As Prof Eugene Fidelis Soh, Executive Director of CHI, NHG, mentioned “How can healthcare factor in our own sustainability goals into such standards for national procurement?”. Ultimately, hospitals must balance priorities and make deliberate efforts to opt for sustainable supplies where possible.

Volume Consolidation

Another opportunity to reconcile sustainability with cost efficiency lies in volume consolidation. Leveraging on ALPS as the national supply chain management agency across 3 public healthcare clusters, hospitals can consolidate purchases, reduce number of deliveries, and engage in inter-hospitals procurement, achieving volume discounts while minimising their carbon footprint. For example, Dr Tang Chien Her, Head of Healthcare Vertical in ST Healthcare, a subsidiary of ST logistics, reported a monthly reduction of 1.455 tonnes of carbon dioxide emissions after switching to volume-consolidated deliveries, exemplifying the environmental and financial benefits in volume consolidation.

Waste Reduction

A/Prof Eugene Liu, Head of Sustainability Office in NUHS, aptly shared: “The greenest items are the ones that we don’t buy in the first place”. Reducing waste is one of the most effective strategies to decrease carbon footprint [8], which hospitals should first focus on before looking to sustainable procurement and delivery.

Reducing waste involves critically accessing hospitals’ medical procedures and procurement practices to identify areas where items or processes can be minimised. For instance, reducing the number of routine tests like blood draws or x-rays lowers not only carbon load but also operational costs. By redesigning care pathways to eliminate unnecessary procedures, hospitals can reduce their carbon impact while saving on manpower and resources.

Total Cost of Ownership (TCO) and Life Cycle Assessment (LCA)

A critical barrier to adopting green procurement practices in healthcare is the perception that sustainable resources incur prohibitive upfront costs and delayed returns. However, through tools like Total Cost of Ownership (TCO) and Life Cycle Assessment (LCA) [9], healthcare institutions can better understand the long-term costs and benefits of their procurement decisions.

TCO and LCA evaluate all costs associated with a product from production to disposal, including environmental impact, maintenance, and potential savings from lower operational costs. For instance, products with lower upfront cost may incur higher long-term operational or staffing expenses. Conversely, products that are more expensive but environmentally efficient may reduce these long-term costs, offering financial and environmental benefits over time. By leveraging TCO and LCA, hospitals can make more informed decisions that balance both sustainability and cost-effectiveness.

Iceberg Principle



Iceberg Principle of Total Cost of Ownership

Source: Strategic Dynamics (2015)

Data-Driven Approaches to Sustainability

To complement systemic changes in procurement and waste management, hospitals can reduce their carbon footprint in high-impact areas with minimal upfront investments. Data-driven approaches help identify these areas where cost-effective, sustainable changes can be made rapidly.


For example, replacing metered-dose inhalers (which contain high global warming potential hydrofluorocarbons) with low-impact alternatives such as dry powder inhalers can reduce greenhouse gas emissions by over 90% while saving costs [10, 11]. Likewise, switching from high-impact anaesthetic gases like desflurane to alternatives like sevoflurane, allows for up to 75 times less warming effect with minimal cost changes [12]. By incorporating data-driven changes that yield high returns, hospitals can simultaneously improve sustainability and reduce costs in the short term.

Stakeholder engagement

Successful 'greening' of healthcare procurement requires collaboration among stakeholders. ALPS play a crucial role in facilitating communication between healthcare providers and suppliers to ensure mutual understanding and alignment on sustainability goals. A/Prof Benita Tan, Co-Chair of Office of Sustainability in SingHealth, shared that such conversations with suppliers allow exploration of solutions like green packaging and product recycling to circularise the economy.

Upskilling of employees, as the company's key resource, is equally important. In collaboration with Republic Polytechnic, ALPS has initiated sustainability training programmes for its employees. Hospitals should similarly invest in training for key teams in procurement and finance to ensure that staff are well-equipped to make decisions in alignment with sustainability objectives.

Delivery of safe and quality patient care remains at the crux of hospitals. While advancing sustainability goals, engaging departments like infection control ensures that any changes made are both safe and effective for patients.



“A ruined planet cannot sustain human lives in good health. A healthy planet and healthy people are two sides of the same coin.”

Dr Margaret Chan
Founding Dean, Vanke School of Public Health
Tsinghua University
Chair of International Advisory Panel, Saw Swee Hock School of Public Health
National University of Singapore
Former Director-General
World Health Organisation



Group photo of the HOS Network members at HOS Network Roundtable 2024.

From left to right: Ms Michelle Lee (Deputy Director, Partnerships Office, HOS Network Secretariat Team, CHI), Dr Jeannie Tey (Co-Lead, CHI Sustainability Academy), Ms Lim Hui Chee (CFO, SCH), Ms Neo Paey Paey (Director, Group Finance, KKH), Ms Charity Wai (COO, SKGH), Ms Wong Soo Min (Group CFO, NUHS), Mr Ang Kwok Ann (CFO, SGH), Mr Peter Tay (CEO, ALPS), Prof Eugene Fidelis Soh (Host, HOS Network, ED, CHI), Dr Tang Chien Her (Head of Healthcare Vertical, ST Logistics), A/Prof Benita Tan (Co-Chair, Office of Sustainability, SingHealth), Ms Lynette Ong (COO, TTSH), Mr Dennis M Johnny (Director of Operations, PARKROYAL COLLECTION Pickering, Singapore), Ms Nina Zhang (CPO, ALPS), Prof Eugene Liu (Head, Office of Sustainability, NUHS), Ms Audrey Khng (Director, Corporate Finance, NUHS), Mr Jeremy Lee (Asst COO, NUH), Ms Irene Lai (Deputy Director, Corporate Finance, NUHS), Mr Lionel Lim (Asst Director, Transformation, ALPS), Mr Shane Lee (CFO, NUH), Mr Siow Seow Wei (General Manager, ST Healthcare), and Mr Joseph Chua (Sustainability Lead, ST Logistics).

Leadership Commitment

Leadership plays a pivotal role in embedding sustainability within the healthcare sector, as it sets the vision and mobilises resources for meaningful change. Drawing lessons from the hospitality industry, PARKROYAL COLLECTION Pickering demonstrates how committed leadership can weave sustainability into its core value, earning the hotel global recognition for its eco-friendly principles.

Similarly, healthcare leaders must champion green initiatives by setting clear objectives, allocating resources, and fostering a culture of environmental responsibility. By aligning organisational culture with sustainability goals, healthcare leaders can lay the foundation for a sustainable healthcare ecosystem that balances environmental stewardship with excellence in care delivery.

Conclusion

Transitioning to a sustainable healthcare supply chain is complex yet essential. The strategies explored from this HOS Network Leadership Roundtable highlights the intricate polarities and opportunities between the urgency of environmental responsibility, cost efficiency and the uncompromising need for patient safety.

Ultimately, patients are at the heart of this ‘green’ transition. As recipients of care and contributors to healthcare costs, their acceptance of sustainable yet potentially costlier solutions introduce an ethical dimension to the conversation: should patients bear the financial burden of sustainability? Reconciling these polarities requires collective commitment and innovation from all stakeholders – leaders, suppliers and patients alike– to create a healthcare system that is as resilient as it is environmentally responsible.



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