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Accelerating the future
Climate resilience and sustainable healthcare systems

Life sciences and healthcare predictions 2030

Deloitte Centre *for* Health Solutions

Climate resilience and sustainable healthcare systems

Collaborating to deliver and measure environmental excellence

Prediction 2030

Life sciences and healthcare (LSHC) organisations are major contributors to the climate crisis and climate change is increasingly detrimental to people's health. LSHC organisations accept they have a crucial role to play in reducing their own emissions and waste, and those of their suppliers. Governing bodies have introduced a wide raft of legislation to deliver environmental, social and governance (ESG) standards to reduce climate change. Stakeholders are also using their leadership role within communities to tackle biodiversity. While most providers have had ESG strategies in place for a decade or more, these have become more mature, focused on science-based targets, a net-zero mind-set and the development of climate-resilient healthcare. A critical aim is to reduce greenhouse gas (GHG) emissions under their direct control (Scope 1 and 2 emissions) and take action to reduce Scope 3 emissions of their complex, global, supply chains. Providers use 'climate smart' thinking and unprecedented levels of collaboration and innovation, to improve their impact on climate change, pollution, biodiversity, resource use, and the circular economy. Data sharing from interconnected data systems, powered by AI algorithms, has helped improve awareness of risks and opportunities, and maintain regulatory compliance with the latest sustainability reporting legislation and standards, thereby gaining the trust of stakeholders, and attracting and retaining staff.

The world in 2030

- New models of care delivery, including specialist acute hospitals and 'hospitals without walls', telehealth, virtual consultations and health coaching, have improved patient triaging, reducing the demand on higher carbon intensive hospitals, and reducing staff and patient travel.
- Healthcare systems are committed to ensuring a consistent supply of medicines to patients. AI-enabled logistics help maintain the balance between necessary levels of surplus stocks to ensure patient access and minimising waste.
- Mindful purchasing of renewable 'green' energy, such as solar, wind, hydro and geothermal and bio-based fuels, is helping healthcare providers achieve their net-zero targets.
- Pharma and medtech companies have embraced the concept of circularity by creating sustainable, closed-loop product life cycles – ensuring that products and materials are reused or recycled, thereby reducing the use of raw materials and emissions.
- LSHC companies have built end-to end visibility of the entire supply network helping to identify hotspots, support real time decision making, and improve demand forecasting.
- Healthcare procurement teams require evidence of sustainability credentials when purchasing products and services; companies that cannot demonstrate they are taking actions to reduce their emissions are removed from their approved supplier lists.
- LSHC organisations have developed and agreed standardised metrics across the industry for reporting on sustainability issues.
- Healthcare stakeholders draw on multiple datasets and use integrated, AI-enabled insight platforms to inform, forewarn and measure environmental impact across the healthcare ecosystem.
- Improving resilience and sustainability is everyone's business, with staff taking responsibility for their own emissions and identifying ways of reducing their company's emissions.
- Healthcare providers have embraced collaborative ways of working to help deliver their net-zero ambitions.

Conquered constraints

Skills and talent

Leaders with expertise in climate change, prevention and preparedness have a seat on their company's board and are accountable for delivering the system and organisation's GHG emission reduction ambitions. Motivated, educated and committed employees are incentivised to change habits and patterns of consumption, and adopt a net-zero mind-set, with rewards for identifying new approaches. Educational programmes on climate change, resource use and biodiversity impacts, are designed for staff to engage them in contributing to reducing climate impacts and build a climate-resilient workforce.

Funding and business models

Capital investment in the green energy transition and other sustainability projects is an opportunity to drive growth, revenue and lasting change due to evidence of long-term, environmental and financial efficiency gains; consequently, ESG reporting is now the responsibility of the finance team. Public and private investors provide finance through green bonds and sustainability-linked bonds. Transparency in reporting progress towards ESG goals has driven trust and attracted greater investment.

Regulation

The regulatory landscape for sustainability measurement and reporting is continually evolving, and by 2030 exemptions that LSHC companies enjoyed have been removed. This has played a crucial role in promoting cross-industry collaboration and proof of progress. Global standards for sustainability reporting have increased transparency and accountability and provided insights, using analytics, benchmarking, and auditing. There is also a transition towards site and product-based reporting where each product carries an environmental sustainability rating.

Digitalisation and data

Healthcare systems have developed robust strategies, processes and technology-enabled controls around data collection and reporting. Additionally, the industry has adopted a consistent methodology and common framework to enable global consistency and comparability using validated, science-based information across the ecosystem. Healthcare systems use data to better predict and prepare for potential climate impacts and the identification of at-risk populations, including changes in real-time weather and pollution, climate trends and supply chain demand forecasting.

Imagine the world in 2030*

Procurement teams are supported by end-to-end supply chain visibility

Stefan manages his hospital group's procurement team across Europe from his base in Vienna. He uses end-to-end supply chain technology to obtain full visibility of each suppliers' performance, including compliance with sustainable practices and progress towards their science-based targets for reduction in GHG emissions. Over the past five years, through working with suppliers and a relentless focus on carbon reduction, the hospitals in the group have met most of their 2030 sustainability goals, including those relating to the European Renewable Energy Directive. Procurement has been centralised, ensuring optimal buying practices, with larger shipments enabling load optimisation. Stefan has prioritised sourcing sustainable products and is confident that the hospitals will be net-zero in ten years' time. Stefan is in the group's finance directorate and works closely with the team responsible for compliance with the EU Corporate Sustainability Reporting Directive. He educates his suppliers on tracking their energy use, resource efficiency and waste, and on logging required metrics on to an AI-enabled data platform, which provides Stefan with real-time visibility into energy use, waste and material hotspots, enabling him to address problems proactively. Demand forecasting informs all procurement decisions, enabling 'just-in-time' ordering and efficient inventory management, reducing overproduction and minimising storage needs. The platform also facilitates tracking of shipments, enabling his colleagues in the logistics function to plan more efficient routes, utilise distribution hubs, ensure load optimisation and identify potential risks in cold-chain transportation. This has helped reduce costs by minimising loss of products, optimising packing procedures and reducing shipping duration. Stefan champions circularity throughout the supply chain and has established multiple arrangements for product returns and remanufacturing processes for single-use products, reducing the need for new raw materials.

Improving the patient experience of day surgery

Eloise has been reflecting on her recent laparoscopic day-surgery experience at her local hospital. Prior to admission she had a virtual pre-operation (pre-op) check-up with her surgeon, Dr Singh, aimed at providing convenient access and reducing unnecessary travel. On the day of her admission, she checked in at a virtual reception desk and followed her personalised geo-locater to her room where the charge nurse welcomed her and gave her a decomposable hospital gown, a reusable 'keep' cup, biodegradable antiseptic wipes, and a tablet that contained all her medical information, pre-op timing and instructions. While waiting for her theatre slot, she watched a video on the tablet which explained how the state-of-the-art theatre design was helping reduce the hospital's carbon footprint. The hospital is particularly proud of its advanced waste management, temperature and humidity control systems, and its use of advanced motion sensor, LED surgical lighting and low-flow anaesthesia technology. While the carbon reduction data on these 'green' initiatives seemed very impressive, Eloise was more concerned about having a successful surgical outcome but felt that such attention to detail was reassuring and she went into the operating theatre feeling relaxed and optimistic. Following her successful operation, Eloise was encouraged to get out of bed and explore the hospital's green spaces, which has been designed to improve biodiversity and provide a rejuvenating environment for patients. Following her discharge, she was reassured that the remote monitoring equipment she had been given would enable her healthcare team to track her post-surgery progress and that the remote Gen-AI physiotherapy sessions would help optimise her recovery while minimising the environmental impact associated with outpatient care.

Cross-sector collaboration gives pharma companies competitive advantage

Anders is the chief operating officer (COO) for a mid-sized pharma company, TreCura, headquartered in Europe. After witnessing the progress pharma companies made in the early 2020s by joining together to build economies of scale for renewable energy purchasing, tackle the growing waste issue and embrace circularity principles, Anders has spearheaded a programme of joining and building cross-industry collaborations. Anders has been particularly grateful and proud of the work around the alignment and adoption of standardised life cycle assessment (LCA) information requirements through the Pharmaceutical Environment Group (PEG). In 2030, healthcare and pharmacy procurement principles have sustainability criteria ingrained, significantly influencing purchasing decisions. By joining resources with pharma companies across the globe, TreCura has gained a competitive advantage over those who have waited for the legislation to be enforced. Anders is proud to be on the front-foot and has detailed, measured analysis on the environmental impact of all of TreCura's products and is taking clear, recorded steps to reduce the impact for each of the products in development, but also those on the market. By being proactive and continuing to actively monitor regulation changes, and designing future products to comply, Anders has placed TreCura in a position where they already comply with the regulation wavers before they are lifted, and the products in development are being developed with future regulations in mind.

* Note: All elements on this page are from a perspective of 2030 and are fictional

Evidence in 2024

The global health sector is responsible for 5% of global GHG emissions

If it were a country, it would be the fifth largest emitter on the planet, according to a study carried out by **Health Care Without Harm**. Seventy-one per cent of these emissions come from the supply chain, with the remaining 17% coming from the health facilities themselves and 12% from their energy consumption.[1] A 2023 report by the independent think tank **Observer Research Foundation** found that some of the main contributors to global GHG emissions in healthcare are the US (27%), China (17%), the EU (12%), Japan (5%), and Russia (4%). Brazil, India, South Korea, Canada, and Australia contribute about 2% each.[2]

How Providence, one of the largest health care systems in the US, is reducing emissions and waste

Providence operates across 51 hospitals and 1,000 clinics. It established its first 'green team' in 1993. Its 'WE ACT' scorecard, which is used to track waste, energy and water, agriculture, chemicals and transportation across its 51 hospitals, is being rolled out across the entire organisation during 2024. Metrics dating back to 2019 show how many gallons of water are used and how many tonnes of waste are generated. Its reusable gowns can be used up to 75 times, and some devices are being reprocessed, repackaged and resold, saving several million dollars per year. Since 2019, Providence has cut business travel by 70%. It has switched more than 30 facilities to renewable energy and aims to use renewable electricity throughout the system by 2030. It has cut waste to landfill by 25% and plans to divert 50% less waste to landfill by the end of the decade. This is currently saving more than US$11mn annually and has a target to save US$100mn a year in the future.[3]

How a Spanish hospital group became carbon neutral in electricity and gas consumption

Vithas has become the first private hospital group in Spain that is carbon neutral in electricity and natural gas consumption. Since 2020, 100% of its electricity has come from certified renewable sources, and in 2023 its centres were the first in the sector to be CO_2 neutral in terms of natural gas consumption. In line with its commitment to environmental sustainability it has commissioned a photovoltaic solar power installation in five of its hospitals. In one year, these solar power plants produced 662,513 kWh of power (The Vithas Aguas Vivas hospital in Valencia generated 231,071 kWh, representing 36.8% of its electricity consumption). New photovoltaic plants are due to be installed this year at three more hospitals. These sustainability and efficiency measures have reduced energy consumption by 14.8% and annual CO_2 emissions by 27.6%, this is equivalent to planting 22,467 trees or saving the energy required for 164,979 hospital stays.[4]

Commitments to reducing the impact of asthma inhalers

Asthma inhalers, which typically use chemical propellants to administer the dose, account for about 3% of the NHS carbon footprint.[5] **Chiesi Group** has initiated a new phase III long-term safety trial to replace the current hydrofluorocarbon propellant with a new low global warming potential option. The aim is to preserve the choice of devices for patients suffering with asthma and chronic obstructive pulmonary disease (COPD) while reducing emissions by up to 90%, when compared to existing metered dose inhalers.[6] **GSK** has started phase III trials of a low-carbon version of its metered dose inhaler Ventolin, utilising a next-generation propellant with the potential to reduce GHG emissions by 90%.[7]

NHS Scotland estimates that emissions due to inhaler propellant were 81,072 tonnes CO_2e in 2022-23 – equivalent to flying 81,000 people from London to New York. It has launched a quality prescribing strategy to improve treatment for people with respiratory conditions, with a detailed list of environmental considerations.[8]

South East London ICS has launched an inhaler recycling scheme. NHS England has committed to assessing the feasibility of a national scheme following the pilot trials.[9]

Green Operating Day trial

Southmead Hospital's neurosurgery team liaised with suppliers to transport equipment in a carbon neutral way. It reduced single-use equipment and energy use in surgery, by measures such as turning off lights when unoccupied and not leaving taps running. It has also used technology to support remote follow-up and programming of devices to minimise patient travel, resulting in emissions connected with operations on the day being reduced by at least 44%.[10]

Global impact of climate change

By 2050, climate change could lead to an additional 14.5mn deaths and US$12.5tn in economic losses worldwide. Left unaddressed, these losses may exceed US$175tn by 2070.[11]

Pharma companies are coming together for coordinated global efforts

Recognising the importance of a harmonised method to measure and report the environmental impact of medicines and healthcare products, the **Sustainable Markets Initiative** (SMI) Health Systems Task Force has worked with the **PEG** through a LCA consortium and **NHS England** to support the development of a sector-wide standard for medicines LCA. This will enable pharmaceutical companies and their stakeholders, including payers, to make informed choices about product development and patient care. The Consortium's outputs will be freely accessible to all pharmaceutical companies and their stakeholders.[12]

Artificial intelligence and the transformative power of GenAI

The impact on sustainability

By increasing efficiencies, forecasting demand and enabling remote monitoring, AI has the potential to drastically reduce the environmental impacts of the healthcare ecosystem. More specifically:

- Digitally enabled end-to-end visibility empowers the proactive identification and targeting of energy and waste hotspots in a continually evolving and improving sustainable environment. AI algorithms play a pivotal role in monitoring and regulating energy consumption within healthcare facilities, uncovering opportunities for energy conservation and cost reduction. AI also enhances supply chain management by accurately forecasting demand, and facilitating agile production and procurement processes.

- The adoption of AI technologies invigorates trial design, yielding environmental sustainability benefits through optimising data collection; improving patient and trial site selection (reducing delays and abandonment); remotely monitoring and managing patients; reducing the need for travel while improving adherence and reducing attrition; and consolidating data on to a shared cloud-based analytics platform.

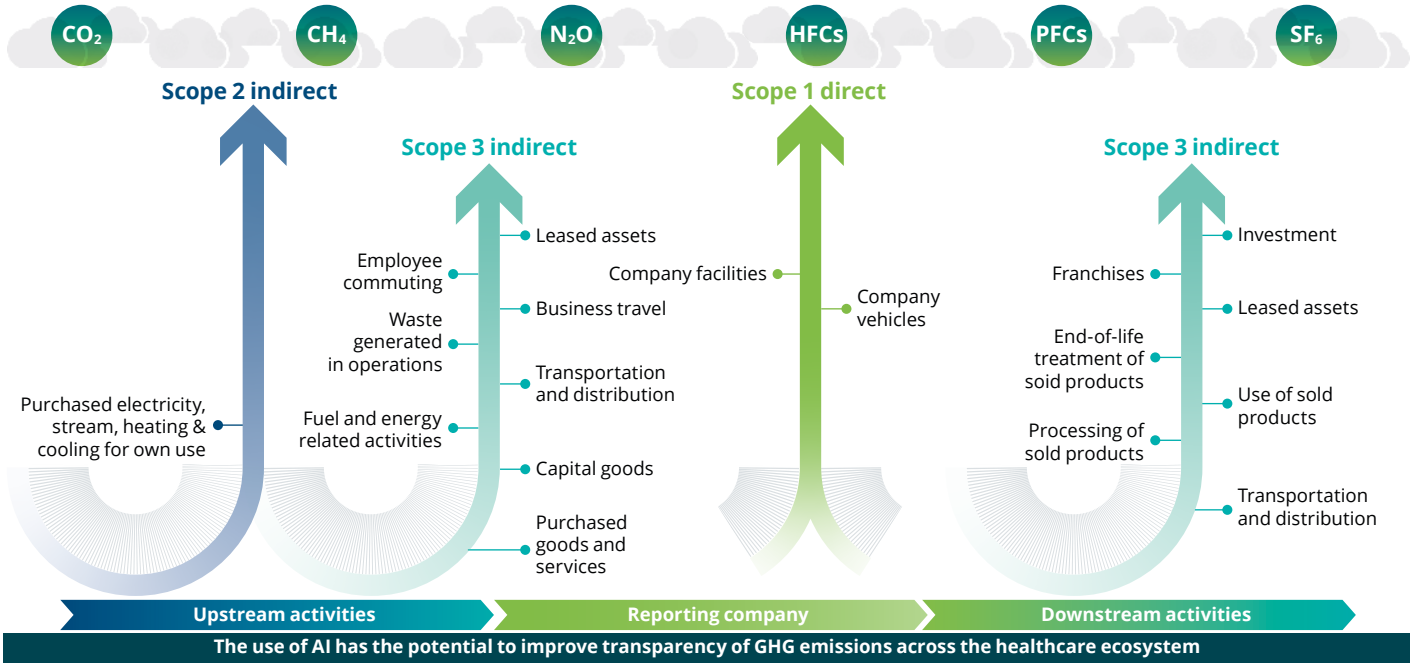
- AI analyses extensive datasets to predict patient admission rates, resource utilisation and supply chain requirements, enabling hospitals to optimise inventory levels and reduce waste.

- AI algorithms contribute to the development of personalised treatment plans, reducing the reliance on trial-and-error approaches, and so mitigating resource over-use.

- AI-powered telemedicine platforms reduce the need for patient travel, thereby cutting emissions.

It is imperative to acknowledge that data collection, storage and analytics have significant energy demands and so contribute to GHG emissions. Measures to mitigate these environmental impacts are essential in fostering a sustainable and responsible approach to leveraging AI in healthcare and life sciences. Quantum computing can enable AI systems, such as the transformer networks that underlie GenAI models, to perform certain complex calculations more quickly. Quantum systems may also use just a fraction of the energy required by 'traditional' computers.[13]

The importance of understanding the full extent and complexity of GHG emissions across the healthcare supply chain



Source: Adapted from Deloitte's 'Embedding environmental sustainability into pharma's DNA' report.

Examples in 2024

- People with diabetes requires regular diabetic eye exams to prevent blindness and vision loss which generally requires a separate clinic appointment. The use of a specific autonomous AI eye exam can lead to an 80% reduction of GHG emissions, compared to in-person diabetic eye exams.[14]

- A study modelled the environmental sustainability of deep learning (DL) for histopathology image analysis within the pathology workflow, modifying variables such as the size and complexity of DL models, and the type of digital image input data. It found that different strategies, such as choosing simpler models (i.e. ones with fewer parameters) or only tissue-containing sections of histopathology slides, could reduce the CO_2e emissions drastically, without compromising performance.[15]

- **Google** has recently started to build a US$735mn clean energy data centre in Quebec and plans to shift to 24/7 carbon-free energy by 2030. It also offers a 'Carbon Sense Suite' to help companies reduce energy consumption in their cloud workloads. Users of cloud providers can monitor announcements by companies about when and how they have deployed carbon-neutral or zero-carbon energy sources.[16]

- **Reckitt** working with **CO_2 AI** and **Quantis** has improved the granularity of their understanding and measuring of Scope 3 emissions. Reckitt collected over 300,000 data points to gain detailed insights into emissions per product. CO_2 AI features GenAI capabilities to transform these data points into a faster and more accurate carbon footprint, identifying priority areas to reduce carbon emissions. In four months, Reckitt obtained precise emissions data for each of its 25,000 products, improving the accuracy of its emissions footprint by 75 times, revealing new ways to reduce emissions and helping teams visualise the impact of their initiatives, contributing significantly towards their net-zero target.[17]

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