



Cover Story

# New Care Delivery

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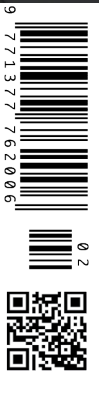
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# Hospitals Going Green & Healthy Sustainability for healthcare and patients

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Following their unique healing mission to ‘first, do no harm,’ hospitals and health professionals should lead the transition to carbon neutrality, reduce their environmental footprint, and adopt effective strategies to respond to the impacts of climate change and pollution without compromising the quality of care.

## Key Points

- The healthcare sector consumes large amounts of single-use plastic and produces significant carbon and other toxic emissions through energy consumption and waste, undermining the health of the very population it seeks to heal.
- Plastics used in the healthcare sector regularly contain harmful chemicals that can put already vulnerable patients at risk and present a continued exposure for healthcare workers.
- Continued environmental damage, including pollution, reduced air quality and climate change are testing the healthcare sector’s resilience and ability to provide care and prevent harm.
- Increased plastic consumption and waste during the COVID-19 pandemic is unsustainable and is contributing to continued environmental degradation and climate change – which are public health issues, not just environmental concerns.
- The sector must reduce its environmental footprint and collaborate with suppliers to innovate and overcome barriers to a low-carbon, low-impact, circular economy.

*“Places of healing should be leading the way, not contributing to the burden of disease.”*

Tedros Adhanom Ghebreyesus,  
Director General of the World Health Organization

### Healthcare Today – Carbon-Intense, Linear Economy

Discussions of sustainability in the healthcare sector often focus on drug shortages, demographic changes and shrinking public health budgets. Much less attention is paid to reducing the significant environmental footprint

of the sector, while sustaining high-quality care.

The global healthcare sector accounts for 4.4% of total global carbon emissions, and the healthcare sector within the European Union is one of the highest polluting healthcare sectors after the U.S. and China; evidence also shows that the supply chain drives 75% of emissions within EU healthcare (HCWH 2019a). [Anaesthetic gases](#), though they make up a small percentage of the overall carbon emissions from healthcare facilities, are extremely potent greenhouse gases and persist in the atmosphere for a long time driving a warmer climate.

Climate change is increasingly being acknowledged as a public health issue, not just an environmental one – our health and our environment are intrinsically connected. A warming climate increases extreme-weather events, not only risking and endangering human life but also testing the healthcare sector’s resilience and ability to deliver care under pressure. As temperatures rise, we are also seeing an increased incidence of vector-borne diseases (Githeko et al. 2000), which is even linked to COVID-19. The World Health Organization (WHO) states that most emerging infectious diseases and recent pandemics [originate](#)

[in wildlife](#) and evidence suggests that increasing human activity on the natural environment is driving the emergence of new diseases as wildlife and ecosystems are disturbed and displaced (WHO 2020).

How we currently produce, use and dispose of healthcare-related products is emblematic of our linear economy and also presents a significant source of environmental pollution. Hospitals worldwide generate millions of tons of waste

of today's problem. More recently, the COVID-19 pandemic has made us more aware about the level of waste being produced by personal protective equipment (PPE), now both within healthcare sector and outside.

With such a significant environmental footprint, the healthcare sector has not only an opportunity to lead us towards a low-impact, low-carbon, circular economy, but also the moral responsi-

The most widely used plastic material in medical applications is PVC followed by polyethylene (PE), polypropylene (PP), polystyrene (PS) and polyethylene terephthalate (PET). The industry points out that modern healthcare would be impossible without many plastic-based medical products.

Over the last 30 years, there has been a gradual transition from reusable non-plastic to disposable plastic

## The COVID-19 pandemic has made us more aware about the level of waste being produced by personal protective equipment

each year, most of which is incinerated – non-medical products such as paper and plastic are not always segregated and recycled, or are wrongly handled as medical waste.

As harmful chemicals (Napierska n.d.) can be found in a wide range of healthcare-specific products, such as disinfectants, medical devices and textiles (HCWH 2019b), when they are used and disposed of, they pollute the environment and negatively affect human health. Toxic emissions from plastic incineration not only contribute to global warming but reduce air-quality and can trigger a number of health-related problems (Azoulay et al. 2019), particularly respiratory issues in vulnerable populations, which is also increasing [vulnerability to COVID-19](#). Plastics disposed of via landfill have the potential to leach toxic chemicals into the soil, groundwater and other surrounding water sources (UN Environment Programme 2018).

The volume of healthcare-related products and consequently the volume of medical waste is rising steadily – not only due to a growing population and increase in patients, but crucially because the healthcare sector has become more and more reliant on single-use items (Terzon 2019) and products with a lot of packaging, representing a substantial part

of today's problem. More recently, the COVID-19 pandemic has made us more aware about the level of waste being produced by personal protective equipment (PPE), now both within healthcare sector and outside.

### Plastics in Healthcare – Closer Look

For over 20 years, Health Care Without Harm's ([HCWH](#)) work has focussed on toxic chemicals generated throughout the lifecycle of plastics used in healthcare that can harm patients and workers' health, and pollute the environment. Some examples of such chemicals include phthalates and Bisphenol A, which are used to make many medical devices (HCWH 2019c), and dioxins generated during the production and disposal of plastics (polyvinyl chloride, PVC in particular [Schettler 2020]), which can damage human health.

Previously, metals, glass and ceramics were used for medical implants, devices and supports. In recent decades, plastic polymers have replaced those materials as they offer transparency, reduced weight, better biocompatibility and lower cost. With excellent barrier properties, plastic packaging also offers lightweight, low cost, durability and transparency, and is particularly suitable for medical applications.

products in healthcare. The most common arguments for this transition were an increased focus on infection prevention and control, and cost-effectiveness. Today, medical plastics are everywhere, from examination gloves to sterile syringes and IV tubes or heart valves. This increase in plastic consumption, however, represents not only more waste but also more supply chain emissions. Plastic packaging and single-use products made of different (often mixed) plastics and materials frequently contain hazardous chemicals (HCWH 2019c). Plastics used in healthcare can therefore pose a direct localised risk to patients and staff.

There is, unfortunately, a lack of precise data showing the extent of medical and non-medical plastics uses and volumes of waste. Where evidence has been gathered, the need for transformative action is clear. The UK's National Health Service, for example, recovers only 5% of plastic waste (Percival 2019) and pays to dispose of 133,000 tonnes of plastic each year, significantly contributing to its €766m (£700m) annual waste disposal bill (GPT Waste 2014). More and more initiatives are being [undertaken](#) to address plastic waste streams in European healthcare providers.



## Plastic Pandemic

Whilst COVID-19 has spurred an unprecedented increase in the use of PPE everywhere, naturally the healthcare sector has particularly seen a huge spike in demand and use.

Much of the PPE being produced to fight the COVID-19 pandemic is made from plastics and therefore very likely to contain hazardous chemicals (Hervey 2020). Medical textiles, such as masks and gowns, are often treated with per- and polyfluoroalkyl substances (a chemical group known as PFAS) due to their excellent repellent properties. Unfortunately, these chemicals are also [toxic and very persistent](#): they do not break down in the human body or the environment and can enter our water systems. Another concern is PVC, the cheapest option for manufacturing disposable gloves, which often contains harmful phthalates. Whilst financial considerations remain prominent in purchasing decisions, healthcare purchasers should consider these risks and exposures to not only their healthcare workers but importantly their patients, who are often already vulnerable.

The COVID-19 pandemic has also seen an increased offering of antimicrobial impregnated products (containing biocides, which are per definition harmful substances). Whilst the specific advantages of treating PPE with biocides is frequently questionable, another concern is that the indiscriminate use of biocides can contribute to the increasing development of antimicrobial resistance (AMR) (Stenuick 2019).

PPE is, of course, essential for the protection of health workers and patients, but there is growing concern about the increase in waste from healthcare's response to this outbreak. Since 25 February, 3.1 billion items of PPE have been distributed for use by health and social care services in England alone – compared to 2.43 billion items used by all NHS trusts and social care organisations in 2019 (Department of Health and Social Care 2020). In Italy's northern Lombardy region, the amount of infectious medical waste in April this year has

doubled or maybe even tripled since the start of the pandemic (TheLocal.it 2020).

Hospitals and waste processors often label all hospital waste as infectious, meaning that many products are being sent for incineration when they can in fact be safely recycled. No qualitative data is yet available on the environmental impacts of the increased plastic incineration during COVID-19; however, there is already sufficient evidence that incineration is harmful for the environment and therefore our health. Health Care Without Harm's experts have prepared a comprehensive document with the latest information and recommendations on how to address waste management during a pandemic (HCWH 2020). We need to ensure that sound medical waste management – proper segregation, collection and disposal of all COVID-19-related waste – is duly practiced.

The pandemic has also highlighted the sector's single-use problem. Challenges around decontamination and reuse of PPE still remain after many faced shortages early on in the pandemic, affecting the care of patients and safety of healthcare workers. There are growing calls to safely reuse equipment and recycle some non-infectious hospital waste, such as plastic packaging. It is vital that we rethink our dependency on single-use items and work towards more sustainable solutions to reduce environmental impacts from manufacturing and waste, as well as improved resilience to supply shortages.

COVID-19 is reshaping the world and has reoriented healthcare's priorities. This crisis is helping all of us realise that 'business as usual' is not an option anymore: we all need to work towards more sustainable and resilient health systems that effectively care for the planet, as well as for its people.

## Healthcare of Tomorrow – Hospitals Go Green & Healthy

Established a decade ago, Global Green and Healthy Hospitals [GGHH](#) is a growing community of over 1,350 members who are using innovation, ingenuity

and investment to transform the health sector. GGHH brings together hospitals, health systems and health organisations from around the world under the shared goal of reducing the environmental footprint of the health sector and contributing to improved public and environmental health.

In Europe, the European Green Deal initiative has a potential to impact the healthcare sector in many ways, and offers unprecedented opportunities for hospitals and health systems to achieve their sustainability goals (HCWH Europe 2020). The principle of 'do no harm,' which underpins the deal, is closely aligned with HCWH Europe's vision that the sector should protect not only the communities it serves but also the environment – itself a critical component of human health. With over 15,000 hospitals in the EU, the healthcare sector accounts for approximately half of public spending in the EU and 14% of annual EU GDP in total (HCWH 2019a). European healthcare can therefore play a significant role in influencing market supply and demand to lead the transition towards safer, innovative, and more sustainable and circular products.

The new EU Circular Economy Action Plan lists textiles as the fourth highest-pressure category for the use of primary raw materials including water, and fifth for greenhouse gas (GHG) emissions. Boosting the EU market for sustainable textiles and tackling the presence of hazardous chemicals should not only address fast fashion, but also include an important category of technical textiles, such as medical textiles. The global medical textiles market is growing (Grand View Research 2019), but unfortunately medical textiles can contain harmful substances such as endocrine disrupting chemicals (EDCs), and single-use items are significantly contributing to plastic pollution: polyester and other plastic polymers make up the majority of textiles today.

Increasing the use of reusable textiles represents a more sustainable [alternative](#) to single-use items in healthcare and provides benefits such as

waste reduction and cost savings. The healthcare sector needs to innovate and collaborate with suppliers to overcome barriers to this transition, like the limited sterile service and laundry capacity of hospitals. More effort is needed to accelerate the transition to a circular economy where materials are reused and recycled and waste is prevented (European Environmental Bureau 2019); there is an urgent need to expand the circularity of products and materials used in the medical sector. Withdrawing or minimising legislative exemptions for harmful substances in medical products will also help promote the use of non-toxic, reusable and recyclable materials, and ensure higher safety and sustainability of those products.

In Europe, incinerating healthcare waste is still common practice, yet in the U.S., where more than 5,000 medical waste incinerators were in operation nearly 30 years ago, today fewer than 60 active medical waste incinerators

remain (Wernick 2015). Given that alternatives to incineration are available, a phase-down of medical waste incineration in Europe is possible and appropriate. HCWH is collaborating globally with healthcare systems, NGOs, governments and international agencies such as WHO to research and promote environmentally sound and healthy [alternatives](#) to medical waste incineration.

By taking action to reduce its own environmental impact and its contribution to practices that damage health, the healthcare sector can truly embrace its healing mission, as well as reduce costs in pursuit of its sustainability goals. Healthcare spending represents a large part of total public procurement spending in Europe. By uniting purchasing power and aligning procurement criteria to demand for ethically produced, healthy and sustainable products and services, healthcare organisations could simultaneously gain more leverage and demand lower prices. With harmonised

[sustainable healthcare procurement](#) across Europe, manufacturers will be more inclined to meet the demand for sustainable products.

Of course, the responsibility for creating a healthier environment does not solely lie with the healthcare sector. However, through its mission and its purchasing power, it has the opportunity to drive innovation and find new ways of delivering high-quality patient care and reduce environmental and human harm. Inspiring other sectors to follow and collaborating with private industry to reduce the environmental footprint of its activities, the healthcare sector has both the potential and the opportunity to make a huge impact in slowing and even reversing environmental degradation for the benefit of all.

### Conflict of Interest

None. ■

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