



From Regulations to Strategy for Sustainable Healthcare by 2030

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Dear Editor,

At the 28th United Nations Climate Change Conference, during Health Day on December 3, 2023, it emerged that “the climate change crisis is a health crisis [1]”. With global warming, more infectious diseases are emerging, facilitated by heat waves, and abnormal weather events are jeopardizing access to clean water and quality food [2, 3]. However, the healthcare sector also has a high environmental impact: it is estimated that globally it contributes 4-5% of total greenhouse gas emissions into the atmosphere [3]. This is why attention to sustainability has also grown in the healthcare field, especially in recent years, in view of the 2030 Agenda goals.

According to a study conducted in 2023 by ALTIS, BCG, and CERISMAS, nearly 80% of the companies surveyed reported having defined a sustainability strategy or were in the process of developing one [4]. Institutions are also increasingly recognizing the need to adopt more responsible and environmentally friendly practices. There are several areas where intervention is possible: foremost among them is waste disposal, where it is crucial to promote reuse and recycling, limiting the use of single-use devices, provided that patient safety is not compromised. Since the onset of the Russia-Ukraine conflict and the resulting increase in energy costs, energy efficiency has become a priority for healthcare facilities. Energy bills have come to represent 2.3% of a healthcare company's expenses. Nationally, the amount has reached 1.6 billion euros, necessitating government intervention to cover this amount. Energy resource optimization interventions could lead to saving up to 30%, as outlined in the National Recovery and Resilience Plan (PNRR). To reduce energy impact, healthcare companies must promote sustainable mobility for staff and patients. At the same time, they should prioritize suppliers who adopt ethical and environmentally friendly practices in the purchasing of medicines and other medical devices. Reducing waste also involves avoiding unnecessary exams, screenings, or inappropriate antibiotic prescriptions. Sustainable healthcare means efficient healthcare, and this also involves digitization, which enables the use of telemedicine, thereby reducing

the need for travel. However, digital technology also optimizes resources, data storage, and online training, significantly reducing the use of paper.

Legislation to reduce energy consumption is already in place, starting with Legislative Decree 152 of April 3, 2006, which regulates environmental assessments, interventions, tools, and possible sanctions, however still needs to be implemented across many healthcare companies. The first to adopt sustainable practices must be healthcare personnel: it is estimated that employees' behaviors can reduce consumption by a few percentage points. To accelerate energy efficiency interventions, it is desirable to establish partnerships with the private sector where possible, due to significantly higher investment capacity and faster project execution. The provincial healthcare company of Caltanissetta, Sicily Italy [5], exemplified this by implementing a trigeneration plant, photovoltaic panels, and boiler replacement. The company's energy manager created synergies with private entities to complete all efficiency works by the end of 2024. It started with an energy assessment, considering both thermal and electrical energy profiles, annual and daily consumption, and potential consumption peaks. To estimate the effectiveness of the interventions, one must compare to the national average consumption cost per square meter. Based on all collected data and studies, the savings were calculated: in one year, Caltanissetta will save 450 tons of oil equivalent (toe), equivalent to removing 500 cars from the road daily. Additionally, a decalogue of good practices has been provided employees, enabling them to immediately adopt measures. A new hospital is also being designed, constructed with zero-impact materials and incorporating water recovery systems.

The green revolution has also involved the Western Friuli, Italy [6] healthcare company: the project began in 2022 and aims to achieve complete digitization of forms and administrative practices by 2025. The contract for integrated digital medical records in the two hospitals has already been awarded, electronic signatures have been adopted in departments for nurses and technicians, and desk printers have been abolished. Only one printer remains per floor within the facilities.

The project includes the creation of a telemedicine room where doctors can be supported by technical and IT staff. This is also because digital training is lacking among today's doctors: there is a significant generational gap, but at the same time, future doctors and nurses will also need continuous updates on technological opportunities. The hospital of the future must consider experiences like the Mercy Virtual Hospital in Chesterfield, USA, which assists patients remotely through various telemedicine services. This model could be adopted to reduce numerous hospitalizations of elderly patients who could be managed through teleassistance and telemonitoring in other facilities or at home. To optimize resources, it would also be wise to consider reducing investments in favor of developing new solutions. However, this requires revisiting the standards that mandate the presence of at least one community hospital with 20 beds per 100,000 inhabitants.

Meanwhile, in Friuli, specialist outpatient clinics have been distributed throughout the territory: patients no longer need to travel for medical visits, but professionals move between various health districts, thus reducing travel distance and related emissions. Six years ago, the region initiated a tender that will result in the delivery of electric cars to the healthcare company. In line with the goal of reducing unnecessary travel, an agreement has been made with pharmacies for the delivery of vaccines to family doctors. Patients can book through the CUP (Single Booking Center) and find single-use items and dietary supplements. An agreement with the postal service is also being studied to handle administrative procedures there, so people do not have to physically visit healthcare company offices. Regarding public-private partnerships, this approach is being adopted for waste disposal.

The transition to sustainable healthcare requires a collective and timely commitment. As in all fields, it starts with the daily behaviors of everyone working within a healthcare company and extends to involving private partners, as well as adopting new strategies shared with local institutions and the government. It is an ambitious challenge to design healthcare that is

more digital, equitable, and environmentally conscious, as well as an imminent challenge in light of the 2030 Agenda goals.

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Conflict of interest statement

None.

Authors' contribution

All authors equally contributed to the conception, design, execution, and manuscript preparation.

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