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The “Green Bubble” revolution: rethinking the carbon cost of chemotherapy

La révolution « Bulle verte » : repenser le coût carbone de la chimiothérapie

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The silent environmental footprint in life-saving acts

Numbers don't lie: the French healthcare sector accounts for almost 10% of the nation's total greenhouse gas (GHG) emissions, with pharmaceuticals and medical devices accounting for nearly half of these emissions [1].

Hospital pharmacies are currently at a critical crossroads between the relentless rise of cancer [2] and the escalating climate crisis. With cancer treatment success steadily improving, the demand for injectable chemotherapy preparations has surged. Though essential, this life-saving act carries a hidden cost: a significant environmental footprint. Its demand in energy (equipment, air treatment systems) and materials (drugs, single-use medical devices) is substantial [3-7], yet its environmental impact remains largely unassessed.

The “Green Bubble” Project brings together various stakeholders across the value chain to ask a bold question: How

can we continue to efficiently treat cancer while dramatically reducing its environmental toll?

Disrupting the Status Quo

The “Green Bubble” Project brings together an unprecedented collaboration —three leading pharmaceutical companies (MSD, Roche, Johnson & Johnson Innovative Medicine) and seven major French healthcare institutions—to comprehensively measure and address the carbon impact of chemotherapy preparation all across the value chain. Each step—from drug manufacture to final patient administration—is under the microscope. But this isn't merely a diagnostic exercise. The goal is to translate data into action in three steps:

- **Measure** the carbon footprint of chemotherapy preparation using the Life Cycle Assessment (LCA) method, in compliance with ISO 14040 and 14044 standards;

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- **Mitigate** this impact through a roadmap involving the entire value chain without compromising best practices in preparation and safety;
- **Mobilize** the entire hospital pharmacy community with an open-access, user-friendly tool that allows every institution to chart its own path toward sustainability.

This collaboration was made possible thanks to a grant from the National Academy of Pharmacy (AnP) and the French Society for Oncology Pharmacy (SFPO), as well as financial contributions from the three participating pharmaceutical companies (MSD, Johnson & Johnson Innovative Medecine and Roche).

Members of the “Green Bubble” Project Group

- Hospitals: Hôpital Paris Saint-Joseph, CHU Avicenne, CHU Nice, CHU Nîmes, CHU Reims, Gustave Roussy, Hôpital Européen Georges Pompidou;
- Agence générale des équipements et produits de santé (AGEPS) ;
- A society specialized in carbon impact assessment: Ecovamed;
- 3 pharmaceutical companies: MSD, Roche, Johnson & Johnson Innovative Medecine.

Collaboration for sector-wide change

What sets the Green Bubble Project apart is its holistic approach. Climate solutions in healthcare cannot be siloed which is why the essence of the project is bridging the divide between manufacturers, environmental experts and hospital pharmacists for a systemic approach to climate accountability and a roadmap engaging all stakeholders.

By creating a tool that is both technically robust and pragmatically designed, the project ensures scalability and

inclusivity. Any chemotherapy preparation unit in France will soon be able to assess its own carbon emissions and benchmark its performance. Crucially, this will empower institutions not only to reduce waste and energy use, but to do so in a way that’s clinically viable and economically sound.

In a world of rising temperatures and rising cancer rates, the “Green Bubble” might just be the breath of fresh air the healthcare sector needs.

Links of interests : The authors declare no conflict of interest.

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