

Gastrointestinal health and the environment: a bidirectional relationship



The health-care sector produces significant amounts of waste and greenhouse gas emissions. In turn, environmental damage can have a negative effect on health, including gastrointestinal health. Two articles in this month's issue prompt us to reflect upon the connections between gastrointestinal health, the health-care sector and the environment.

Protecting and preserving the environment is one of the most pressing global challenges of our age. Several of the United Nations [Sustainable Development Goals](#) (SDGs) relate to the environment, climate change, pollution and sustainability. For example, SDGs 6 and 14 focus on clean water and SDG 13 urges action to combat climate change. There is increasing recognition that the biomedical and health-care sectors have a large environmental footprint, for example in the form of greenhouse gas emissions and pollution. The gastroenterology community must be mindful – not only does environmental damage have implications for digestive health but gastrointestinal health care and surgery have a substantial environmental burden. Two articles in this month's issue, taken together, explore this bidirectional relationship between environmental damage and gastrointestinal health.

A Comment article by Luc van der Laan and colleagues¹ discusses a 2022 report from the World Health Organization² on the potential implications of dietary nanoplastic and microplastic particles (NMPs) – tiny plastic particles found in marine and freshwater ecosystems and as food and drink contaminants – for human health. Drawing on experimental animal studies investigating the role of NMPs in, for example, pathological changes in the gut and liver, the authors highlight the major knowledge gaps in the field. They conclude that improving the reliability of estimates of NMP dietary exposure will demand advances in analytical methods and note that the report calls for improved quality assurance and quality control protocols to better enable comparisons between studies. Further research into the effects of microplastics and other environmental pollutants on gastrointestinal health is warranted.

Another article in this issue discusses sustainable health care. In a Perspective article, Miguel Cunha and Gianluca Pellino collate the research on the environmental footprint of health-care systems and surgical procedures – with a focus on gastrointestinal conditions – and propose a framework for sustainable surgical practices³. They lay out in detail the carbon footprint of surgical procedures,

including factors such as patient and staff transport, diagnostic scans, anaesthetic gas, waste, single-use devices and more. In addition, the authors posit a framework for sustainability that includes encouraging use of sustainable modes of transport, use of renewable energy sources, avoiding anaesthetic gases where possible, reducing use of disposables and harnessing the possibilities of telemedicine. In terms of gastroenterology-specific suggestions, they discuss potential interventions to reduce environmental effects associated with digestive endoscopy, an energy-intensive practice with a substantial carbon footprint⁴.

Sustainability in health care is an increasing concern for health-care workers and policymakers. Health-care systems as a whole are setting net-zero targets. For example, NHS England [has committed](#) to become net zero by 2045 (including both direct and indirect emissions). Gastroenterology stakeholders are also pursuing more-specific initiatives. A consensus document on “green endoscopy” by the British Society of Gastroenterology as well as the Joint Advisory Group for GI Endoscopy and the Centre for Sustainable Healthcare was published in 2023 (ref. 5). The paper suggests measures to minimize the environmental footprint of digestive endoscopy while improving patient outcomes.

As these articles illustrate, environmental damage has direct relevance to gastrointestinal health and health care and vice versa. The gastrointestinal health-care and research communities can help to address these problems, for example by studying and raising awareness of the gastrointestinal health effects of pollutants, or by working towards sustainable medical and surgical practices. A determined focus on how health-care systems and biomedical science can contribute to achieving the United Nations SDGs remains paramount.

Published online: 3 May 2023

References

- van der Laan, L. J. W., Bosker, T. & Peijnenburg, W. J. G. M. Deciphering potential implications of dietary microplastics for human health. *Nat. Rev. Gastroenterol. Hepatol.* <https://doi.org/10.1038/s41575-022-00734-3> (2022).
- World Health Organization. Dietary and inhalation exposure to nano- and microplastic particles and potential implications for human health. *WHO* <https://www.who.int/publications/i/item/9789240054608> (2022).
- Cunha, M. F. & Pellino, G. Environmental effects of surgical procedures and strategies for sustainable surgery. *Nat. Rev. Gastroenterol. Hepatol.* <https://doi.org/10.1038/s41575-022-00716-5> (2022).
- Maurice, J. B. et al. Green endoscopy: a call for sustainability in the midst of COVID-19. *Lancet Gastroenterol. Hepatol.* **5**, 636–638 (2020).
- Sebastian, S. et al. Green endoscopy: British Society of Gastroenterology (BSG), Joint Accreditation Group (JAG) and Centre for Sustainable Health (CSH) joint consensus on practical measures for environmental sustainability in endoscopy. *Gut* **72**, 12–26 (2023).

“Sustainability in health care is an increasing concern for health-care workers and policymakers”