

Is the climate emergency editorial relevant to surgeons?

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Introduction

The sequence of anthropogenic greenhouse gas (GHG) emissions causing climate change is now universally accepted[1]. To highlight the urgent need to reverse climate change, editors of 231 leading international medical journals[2] published a common climate emergency editorial[3] in their September 2021 issues. The signatory journals include those with a widespread reach as well as surgical journals.

The eminent editors set the tone of the editorial at the outset, when they state that “health is already being harmed by global temperature increases and the destruction of the natural world, a state of affairs health professionals have been bringing attention to for decades. The science is unequivocal; a global increase of 1.5°C above the pre-industrial average and the continued loss of biodiversity risk catastrophic harm to health that will be impossible to reverse”[3]. This article attempts to draw the relevance of this unprecedented editorial and the climate change discussion to surgical practice.

Global climate change discussion

The first assessment report (FAR) of the IPCC[4] in 1990 warned that “major health impacts are possible” which three decades on seem to have been proven correct. Later publications by the IPCC including AR5[1] are widely accepted and form the basis for many international actions. Climate change featured strongly in the September 2021 General Assembly of the United Nations. Climate discussion will continue when global leaders meet at the UN Biodiversity Conference (COP15), virtually in October 2021, and physically in April 2022 in Kunming, China. Leaders will convene at UN Climate Change Conference (COP26) in October 2021 in Glasgow, UK.

Impact of health care services on climate change

The interaction between healthcare and climate change is well summarized by Lenzen et al in the Lancet Planet Health[5] who state that, “although the health impacts of pollution and environmental change are well recognized, the environmental impacts of health care have received less attention”. The paper concludes that 1-5 % of the global environmental impact is caused by health care provision. This is made up by 4.4% of greenhouse gases, 2.8% of particulate matter, 3.4% of NO_x, and 3.6% of SO₂. Other published data indicate 10% of greenhouse gases in the US [6] are produced by the health care sector.

Impact of surgery on climate change

Initially the connection between surgery and climate change was not apparent or ignored by the surgical community. In a groundbreaking event, a consensus conference held in 2011 between the Association of Surgeons of Great Britain and Ireland (ASGBI) and Royal College of Surgeons in Ireland (RCSI), concluded in a Consensus Statement On Cost-Effective And Sustainable Surgery[7] in May 2012. In its introduction, John MacFie, President, ASGBI says “as far as we are aware this is the first attempt by surgeons to collectively address the issue of environmental change”. The role of the surgeon is summarized by Eilis McGovern, President, RCSI who said “at first glance, the relationship between surgical practice and climate change might not be obvious. However, there is now ample data to show that health service delivery is a major source of carbon pollution. It is timely, therefore, for surgeons to consider how we might adapt our practice in a way which reduces the surgical carbon footprint and, at the same time, maximizes cost-effectiveness [7]”.

Operating theaters are 3-6 more energy intensive than the rest of the hospital. Modern surgery is dependent on increased use of energy devices, supporting machinery including imaging devices and robotics, single use consumable instruments, advanced implants, and large operating theater suites, and patient transport systems including fixed wing and rotary wing aircraft. The evidence supporting the hypothesis that these changes have a higher climate cost must be examined.

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Woods et al showed that robotically assisted laparoscopy had a larger carbon footprint compared to laparoscopy and laparotomy in a series of 150 procedures[9]. Siu et al who completed a systematic review of reusable versus disposable laparoscopic instruments: costs and safety, noted a paucity of comparative studies and inconclusive evidence[10]. Authors concluded that further research is needed to address the issue taking into consideration wider environment and financial cost benefits. Guetter et al who reviewed green operating theaters too found an absence of comparative studies[11]. Authors found many opportunities for research and application of green technology in the field. Research has shown that the Carbon footprint, and by implication the climate cost of each surgery is dependent on the type of surgery, duration of surgery, consumables, equipment used, type of theater, type of power supply, and modes of transport involved[12].

A paucity of research papers prevents establishment of a clear verdict on the climate cost of surgery. Of the available evidence, some studies indicate increased climate cost with surgical procedures involving more equipment as in minimal invasive methods and robotics. Other studies are inconclusive as they were not properly structured. Much of the climate cost surgery is through the supply chain as well as running the operating theaters[8]. Both areas can be adapted to more ecofriendly systems. Although it was trendy and convenient to use disposable consumables it may be time to return to reusable consumables which are showing evidence of a lower climate cost[8]. The research and resolution of the climate question is, and should be, of prime relevance to surgeons. When assessing the efficacy of any surgical method, its climate cost too should be factored in.

Mitigation and reversal of climate change

A country like Sri Lanka, which yearns to move its surgical practice and services to global excellence, will embrace new technology modern science has to offer. This may lead to a higher climate cost in the short term. The global need to mitigate climate change should not stifle advancement of surgery in Sri Lanka. Modes of climate change mitigation must be found to compensate for the higher costs of expansion of surgery. Scientists have identified a rational approach to mitigation of climate change through the AR5 - section on mitigation[13]. This document is due for an update when the full AR6 report is released by the IPCC in 2022.

Conclusion

Evidence shows that global health care services contribute to the greenhouse gas emissions and other forms of pollution leading to climate change. A significant part of this may be through provision of surgical services. It is relevant that

surgeons quantify this contribution and identify modes of mitigation. Many global industries have changed in a bid to reduce the climate cost. Field of surgery is not exempt from this need for change[7]. For change to be universally successful, adaptations need to be at multiple levels including personal and domestic, individual practice, institution and community, national and international. Surgeons by training are expected to be pragmatic and adaptable. This quality could be a key in climate change mitigation in future surgery.

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