

## Environmental Stewardship Resource Desk

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### New Research

[Environmental Stewardship publications by Providence caregivers – see Digital Commons](#)

#### COVID-19

- 1. Technology: the nexus of climate change and COVID-19?** Lancet Digit Health. 2021 Feb;3(2):e67. doi: 10.1016/S2589-7500(21)00007-8.  
[https://www.thelancet.com/journals/landig/article/PIIS2589-7500\(21\)00007-8/fulltext](https://www.thelancet.com/journals/landig/article/PIIS2589-7500(21)00007-8/fulltext)  
We are in the midst of dual crises: COVID-19 and climate change. Both have led to a substantial loss of life, disproportionately affected vulnerable and disadvantaged individuals, and pushed some health-care systems to the maximum. The 2020 report of The Lancet Countdown on health and climate change emphasises the need for responses to these crises to be aligned, in order to tackle them successfully. What role can technology play in helping us win these battles?
- 2. COVID-Clarity demands unification of health and environmental policy.** Gillespie TR, Jones KE, Dobson AP, Clennon JA, Pascual M. Glob Chang Biol. 2021 Jan 28. doi: 10.1111/gcb.15508. Online ahead of print.  
<https://onlinelibrary.wiley.com/doi/10.1111/gcb.15508>  
Spillover of novel pathogens from wildlife to people, such as the virus responsible for the COVID-19 pandemic, is increasing and this trend is most strongly associated with tropical deforestation driven by agricultural expansion. This same process is eroding natural capital, reducing forest-associated health co-benefits, and accelerating climate change. Protecting and promoting tropical forests is one of the most immediate steps we can take to simultaneously mitigate climate change while reducing the risk of future pandemics; however, success in this undertaking will require greater connectivity of policy initiatives from local to global, as well as unification of health and environmental policy.
- 3. The COVID-19 pandemic face mask waste: A blooming threat to the marine environment.** Dharmaraj S, Ashokkumar V, Hariharan S, Manibharathi A, Show PL, Chong CT,

Ngamcharussrivichai C. *Chemosphere*. 2021 Jan 9;272:129601. doi: 10.1016/j.chemosphere.2021.129601. Online ahead of print.

<https://www.sciencedirect.com/science/article/pii/S0045653521000710>

Recently, the COVID-19 disease spread has emerged as a worldwide pandemic and cause severe threats to humanity. The World Health Organisation (WHO) releases guidelines to help the countries to reduce the spread of this virus to the public, like wearing masks, hand hygiene, social distancing, shutting down all types of public transports, etc. These conditions led to a worldwide economic fall drastically, and on the other hand, indirect environmental benefits like global air quality improvement and decreased water pollution are also pictured. Currently, use of face masks is part of a comprehensive package of the prevention and control measures that can limit the spread of COVID-19 since there is no clinically proven drugs or vaccine available for COVID-19. Mostly, face masks are made of petroleum-based non-renewable polymers that are non-biodegradable, hazardous to the environment and create health issues. This study demonstrates the extensive use of the face mask and how it affects human health and the marine ecosystem. It has become a great challenge for the government sectors to impose strict regulations for the proper disposal of the masks as medical waste by the public. Neglecting the seriousness of this issue may lead to the release of large tonnes of micro-plastics to the landfill as well as to the marine environment where mostly end-up and thereby affecting their fauna and flora population vastly. Besides, this study highlights the COVID-19 spread, its evolutionary importance, taxonomy, genomic structure, transmission to humans, prevention, and treatment.

### Health Impacts of Climate Change

4. **The impact of climate change on neglected tropical diseases: a systematic review.** Tidman R, Abela-Ridder B, de Castañeda RR. *Trans R Soc Trop Med Hyg*. 2021 Jan 28;115(2):147-168. doi: 10.1093/trstmh/traa192.

<https://academic.oup.com/trstmh/article/115/2/147/6121885>

Neglected tropical diseases (NTDs) are a diverse group of diseases that continue to affect >1 billion people, with these diseases disproportionately impacting vulnerable populations and territories. Climate change is having an increasing impact on public health in tropical and subtropical areas and across the world and can affect disease distribution and transmission in potentially diverse ways. Improving our understanding of how climate change influences NTDs can help identify populations at risk to include in future public health interventions. Articles were identified by searching electronic databases for reports of climate change and NTDs between 1 January 2010 and 1 March 2020. Climate change may influence the emergence and re-emergence of multiple NTDs, particularly those that involve a vector or intermediate host for transmission. Although specific predictions are conflicting depending on the geographic area, the type of NTD and associated vectors and hosts, it is anticipated that multiple NTDs will have changes in their transmission period and geographic range and will likely encroach on regions and populations that have been previously unaffected. There is a need for improved surveillance and monitoring to identify areas of NTD incursion and emergence and include these in future public health interventions.

### WE ACT

5. **Intraoperative waste segregation initiative among anesthesia personnel to contain disposal costs.** Fraifeld A, Rice AN, Stamper MJ, Muckler VC. *Waste Manag.* 2021 Jan 26;122:124-131. doi: 10.1016/j.wasman.2021.01.006. Online ahead of print.

Approximately 90% of medical waste generated in the operating room (OR) is considered to be non-infectious and non-regulated (Wyssusek, Keys & van Zundert, 2019). Frequently, this waste is inappropriately disposed of into infectious regulated medical waste containers. Due to differences in waste treatment, improper segregation can lead to the misuse or inappropriate allocation of resources, environmental pollution, and increased cost for institutions. A waste segregation initiative was instituted in a tertiary care medical center in the anesthesia work-space of 35 ORs. This initiative included education of medical waste management to increase anesthesia staff knowledge and compliance with waste segregation and optimization of existing waste disposal containers to decrease waste disposal costs. After implementation, there was an increase in overall provider knowledge ( $p < 0.001$ ) particularly in the categories of medication vial disposal, medication disposal and identification of items for disposal in the sharps containers ( $p \leq 0.05$ ). Data suggests a 34.7% increase in providers reporting to always practice waste segregation ( $p \leq 0.05$ ). Additionally, there was a statistically significant decrease in overall weight of regulated medical waste items from 0.33 kg/case to 0.09 kg/case ( $p < 0.001$ ). This decrease in regulated waste supports an improvement in waste segregation and inappropriate items being disposed of in the general trash container. The omission of inappropriate waste was further confirmed by a segregation audit that showed an overall increase in correctly segregated regulated waste of 65%. Collectively, this led to a cost savings of \$15.60 per OR per week, or \$28,392 annually.

6. **Transforming Food Systems: The Missing Pieces Needed to Make Them Work.** Kennedy E, Webb P, Block S, Griffin T, Mozaffarian D, Kyte R. *Curr Dev Nutr.* 2020 Dec 10;5(1):nzaa177. doi: 10.1093/cdn/nzaa177. eCollection 2021 Jan.

<https://academic.oup.com/cdn/article/5/1/nzaa177/6030026>

Food systems lie squarely at the intersection of several overarching goals of the UN and member states, as embodied in the Sustainable Development Goals, including eliminating poverty, hunger, and malnutrition in all its forms, achieving good health and well-being, while promoting environmental sustainability. The need for radical transformation of current food systems is inescapable if the world is to achieve one, let alone all, of these goals. Meeting this challenge will inevitably be disruptive to current food systems, carry costs, and be politically onerous. But the projected benefits far outweigh these difficulties. This commentary spells out the complexity of issues that need to be tackled to design and implement food systems that improve diets, nutrition, and health in an equitable fashion, while simultaneously respecting planetary boundaries. Six critical domains are identified that must be addressed for the successful transformation of food systems: 1) reinvent agriculture, 2) transform food environments for healthy diets, 3) mitigate climate change, 4) productively engage the private sector, 5) influence public policy priorities, and 6) establish true cost accounting of food. Because science is crucial for each of these domains, a research-driven strategy, emphasizing a collaborative process, is outlined. Bold, new, but technically and politically feasible actions are needed to effectively transform current food systems.

7. **Climate Change, Food Supply, and Dietary Guidelines.** Binns CW, Lee MK, Maycock B, Torheim LE, Nanishi K, Duong DTT. *Annu Rev Public Health.* 2021 Jan 26. doi: 10.1146/annurev-publhealth-012420-105044. Online ahead of print.

Food production is affected by climate change, and, in turn, food production is responsible for 20-30% of greenhouse gases. The food system must increase output as the population increases and must meet nutrition and health needs while simultaneously assisting in achieving the Sustainable Development Goals. Good nutrition is important for combatting infection, reducing child mortality, and controlling obesity and chronic disease throughout the life course. Dietary guidelines provide advice for a healthy diet, and the main principles are now well established and compatible with sustainable development. Climate change will have a significant effect on food supply; however, with political commitment and substantial investment, projected improvements will be sufficient to provide food for the healthy diets needed to achieve the Sustainable Development Goals. Some changes will need to be made to food production, nutrient content will need monitoring, and more equitable distribution is required to meet the dietary guidelines. Increased breastfeeding rates will improve infant and adult health while helping to greenhouse gases.

8. **Environmental sustainability in anaesthesia and critical care.** Response to Br J Anaesth. Sherman JD, Sulbaek Andersen MP, Renwick J, McGain F. *Br J Anaesth.* 2021 Jan 21:S0007-0912(20)31023-0. doi: 10.1016/j.bja.2020.12.025. Online ahead of print.

[https://bjanaesthesia.org/article/S0007-0912\(20\)31023-0/fulltext](https://bjanaesthesia.org/article/S0007-0912(20)31023-0/fulltext)

Editor—In their comment to the recent review article, ‘Environmental sustainability in anaesthesia and critical care’, 1 Slingo and Slingo 2 attempt to downplay calls to reduce inhaled anaesthetic pollution in clinical practice, citing low atmospheric concentrations and short lifetimes of volatile drugs, and suggest that climate change mitigation efforts should instead focus on aggressive reductions of CO<sub>2</sub> emissions (though they offer no recommended actions). Although we do not disagree that the impact of CO<sub>2</sub> on climate vastly overshadows that of the inhaled anaesthetics, we believe Slingo and Slingo represent a misleading over-simplification of the issue.

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