

Environmental Stewardship Resource Desk

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COVID-19

- 1. Assessment of Health Infrastructure in Tackling COVID-19: A Case Study of European and American Scenario.** Kumar Agrawal A, Arora PK, Nafees M, Akhtar Khan S, Kumar H. Mater Today Proc. 2021 Feb 12. doi: 10.1016/j.matpr.2021.01.916. Online ahead of print.
<https://www.sciencedirect.com/science/article/pii/S2214785321010130>

The COVID-19 coronavirus pandemic is an unparalleled threat intoday's quickly developing climate, and we face it as a global community. Like climate change, it is challenging our resilience from environmental health, social security, and government, to knowledge exchange and economic policy in all sectors of the economy and all fields of growth. So much as climate change, everybody's coming together would require the initiative. Throughout Europe and America, several organizations have mobilized to ensure that the neediest are not left behind, encouraging emergencies and disruptions avoidance and preparedness. The coronavirus outbreak has highlighted the growing community's strengths and vulnerabilities that it has influenced, and has provided us with the ability to benefit from each other's accomplishments and shortcomings. The comparison graph has also been shown in this paper displaying European and American scenarios. The globe might feel smaller amid disaster states and global travel bans, but it is a period when teamwork and looking outward were never more relevant.
- 2. Food production, human health and planet health amid Covid-19.** Stark JC. Explore (NY). 2021 Mar-Apr;17(2):179-180. doi: 10.1016/j.explore.2020.12.009. Epub 2020 Dec 26.
<https://www.sciencedirect.com/science/article/pii/S1550830720304213>

Even before COVID-19 took hold, the deep connections between the health of the planet and human health were demanding attention as never before. A definition of health - encompassing all living beings and not exclusive to us humans - is certainly more than the absence of disease, although that is a good start. It may also include the notion of flourishing, that is, functioning at the highest levels possible given our history, family, culture, and immediate surroundings.1

Abraham Maslow's hierarchy of needs provides an effective measure of what we humans need to thrive and flourish.²

Health Impacts of Climate Change

- 3. The Neuroscience Community has a Role in Environmental Conservation.** Keifer J, Summers CH. eNeuro. 2021 Feb 25;ENEURO.0454-20.2021. doi: 10.1523/ENEURO.0454-20.2021. Online ahead of print.
<https://www.eneuro.org/content/eneuro/early/2021/02/23/ENEURO.0454-20.2021.full.pdf>

We previously argued that the neuroscience community has a role in environmental conservation because protection of biodiversity and the specialized behavioral adaptations of animals is essential to understanding brain structure and function. Preserving biodiversity and the natural world is also linked to human mental health and broadens our insight on the origins of psychiatric disorders like stress, anxiety and depression. The study of neuroscience has become a global scientific pursuit that involves thousands of researchers and has an economic impact in the billions of dollars. As a group of biomedical research scientists, neuroscientists have the knowledge base and public credibility to convincingly promote sustainable environmental actions and policies. Here, we outline several key areas in which we as a neuroscience academic community can participate to preserve a rich global biodiversity and confront the environmental crises that lie before us. Significance Statement Biodiversity and the global environment are currently undergoing unprecedented threats stemming from climate change and other sources of environmental stress that are rapidly leading toward widespread habitat loss and species extinction. These events endanger not only plant and animal species, but human health and well-being. Environmental conservation limits habitat degradation that leads to disease from pollution, brain injury through neurotoxicity, and mental illness. Therefore, the neuroscience community has a direct stake in working for the protection and preservation of a rich global environmental biodiversity. By promoting sustainable actions, policies and approaches to biomedical research, neuroscientists can and should have a leadership role in developing strategies that will benefit the environment and human health.
- 4. Hotter and sicker: External energy expenditure and the tangled evolutionary roots of anthropogenic climate change and chronic disease.** Pontzer H. Am J Hum Biol. 2021 Feb 25:e23579. doi: 10.1002/ajhb.23579. Online ahead of print.

BACKGROUND: The dual crises of climate change and chronic, or non-communicable, disease (NCD) have emerged worldwide as the global economy has industrialized over the past two centuries.

AIMS: In this synthesis I examine humans' dependence on external (non-metabolic) energy expenditure (e.g., fire, fossil fuels) as a common, root cause in these modern crises.

MATERIALS AND METHODS: Using fossil, archeological, and historical evidence I show that the human lineage has been dependent on external energy sources since the control of fire in the Paleolithic. This reliance has grown with the development of agriculture, the use of wind- and water-power, and the most recently with industrialization and the transition to fossil fuels. To place industrialization in context I develop a Rule of 50, whereby individuals in industrialized

economies consume roughly 50-times more external energy and manufacture roughly 50-times more material than do hunter-gatherers.

RESULTS: Industrialization and mechanization, powered by fossil fuels, have promoted centralization and processing in food production, reduced physical activity, and increased air pollution (including greenhouse gas emissions). These developments have led in turn to NCD and climate change.

DISCUSSION AND CONCLUSION: Climate change and NCD are connected both to one another and to our species' deep evolutionary dependence on external energy. Transitioning to carbon-free energy is essential to reduce the existential risks of climate change, but will likely have only modest effects on NCD. With the impending exhaustion of oil, coal, and natural gas reserves, developing replacements for fossil fuels is also critical to maintaining our species' external energy portfolio.

5. **Critical psychologies and climate change.** Adams M. *Curr Opin Psychol.* 2021 Feb 2;42:13-18. doi: 10.1016/j.copsyc.2021.01.007. Online ahead of print.

This article is a review of recent contributions in critical psychology and its close cousins, critical social psychology, critical community psychology and liberation psychology, to understand human response to climate change. It contrasts critical psychology with mainstream psychology in general terms, before introducing a critical psychological perspective on climate change. Central to this perspective is a critique of the framing of individual behaviour change as the problem and solution to climate change in mainstream psychology and a related emphasis on identifying 'barriers' to proenvironmental behaviour. This framework is argued to be reductive, obscuring or downplaying the influence of a range of factors in shaping predominant responses to climate change to date, including social context, discourse, power and affect. Currently, critical psychologies set out to study the relative contribution of these factors to (in)action on climate change. A related concern is how the psychological and emotional impacts of climate change impact unevenly on communities and individuals, depending on place-based, economic, geographic and cultural differences, and give rise to experiences of injustice, inequality and disempowerment. Critical psychology does not assume these to be overriding or inevitable psychological and social responses, however. Critical psychologies also undertake research and inform interventions that highlight the role of collective understanding, activism, empowerment and resistance as the necessary foundations of a genuine shift towards sustainable societies.

6. **Climate Change and Health Equity.** Ngo NT. *AMA J Ethics.* 2021 Feb 1;23(2):E201-203. doi: 10.1001/amajethics.2021.201.

<https://journalofethics.ama-assn.org/article/climate-change-and-health-equity/2021-02>

Physical environment, income, and access to education and food are all health determinants that situate whether, when, and to what extent patients or their communities have equitable access to wellness and health care services. Because climate change will likely exacerbate national and international health inequity, this comic considers our future.

7. **What does climate change mean for people with pollen allergy?** Shamji MH, Boyle RJ. *Clin Exp Allergy.* 2021 Feb;51(2):202-205. doi: 10.1111/cea.13826.

<https://onlinelibrary.wiley.com/doi/full/10.1111/cea.13826>

Climate change is dramatically changing our environment, and the effects are now noticeable for those with respiratory allergic diseases such as asthma.¹ The elevation in atmospheric carbon dioxide concentrations can impact plant and fungal biology, with potentially more potent pollen.² Climate change is likely to drive wet winters, warmer spring and hot summers in temperate regions. Climate change means that thunderstorms can happen at most times of the year, and this potentially puts a wider range of pollen-allergic patients at risk of so-called 'thunderstorm asthma'. Thunderstorm asthma is the occurrence of acute, often severe, asthma during thunderstorms, which can be fatal. Thunderstorm asthma affects individuals who are sensitized to relevant pollens or moulds which are airborne at the time of the thunderstorm. When osmotic shock caused by increased atmospheric humidity triggers the release of subpollen particles (SPP), sensitized individuals can inhale these SPP and develop acute, often severe, asthma.

8. **Physical activity promotion in the age of climate change.** Abu-Omar K, Gelius P, Messing S. *F1000Res*. 2020 May 11;9:349. doi: 10.12688/f1000research.23764.2. eCollection 2020. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7883311/>

The importance of the global climate crisis requires linking physical activity promotion and climate action. This article provides a first overview of interconnections between physical activity promotion and climate action, potential synergies and discrepancies, aiming to stimulate further discussion about this topic. The analysis is based on the World Health Organization's Global Action Plan on Physical Activity 2018-2030 (GAPPA). The GAPPA covers five perspectives that are of particular relevance with respect to potential links with climate policy: (1) Infrastructures supporting active transport, (2) green spaces and recreational/exercise facilities, (3) exercise programs, (4) mass communication campaigns and mass participation events and (5) training of professionals. Our analysis demonstrates a considerable alignment between strategies for physical activity promotion and efforts for the reduction of greenhouse gas emissions. However, in some of the areas, this alignment could still be improved. Additionally, more climate-conscious policies, research and surveillance need to be developed in the field of physical activity promotion.

WE ACT

9. **Impact of an Educational Training on Behavioral Intention for Healthcare Waste Management: Application of Health Action Model.** Robat DS, Sany SBT, Siuki HA, Peyman N, Ferns G. *Int Q Community Health Educ*. 2021 Feb 25:272684X20982595. doi: 10.1177/0272684X20982595. Online ahead of print.

<https://journals.sagepub.com/doi/full/10.1177/0272684X20982595>

Inappropriate healthcare waste management (HCWM) may lead to health hazards through the release of toxic and infectious agents into the environment. This study aimed to assess the appropriateness of a Health Action Model (HAM) operationalized in a training intervention to promote behavioral intent towards HCWM practice among hospital staff. This was a quasi-experimental intervention study of 128 hospital staff attending a training intervention in Sabzevar Hospital, Iran. Four training intervention was carried out using potential constructs of

the HAM model to compare the quality of HCWM process and behavioral intent of hospital staff before and after a training session. A questionnaire based on HAM and multiple statistical analyses were used to assess the effectiveness of the training intervention. The average age of the eligible participants was 35.05 ± 9.4 years. A majority of the participant was married (88%), nursing staff (54%) and possessed a bachelor's degree (66%) or diploma (18%). After the intervention, a significant change ($p < 0.05$) was observed in the intervention group compared to the control group in staff knowledge, attitude, self-efficacy, belief, and motivation. Further, our result showed a significant improvement from 53.6 ± 24.3 to 83.6 ± 11.5 in the behavioral intention toward HCWM practice. This work provides evidence of the effectiveness of the HAM as a guide in which the potential determinates that influence an individual's behavioral intention toward medical waste practice were identified and described. This model help promote behavioral intention at a variety of target audiences and setting in waste management practice.

10. The developmental roots of environmental stewardship: Childhood and the climate change crisis. Hahn ER. *Curr Opin Psychol.* 2021 Jan 30;42:19-24. doi: 10.1016/j.copsyc.2021.01.006.

Online ahead of print.

Childhood presents heightened vulnerabilities and unique opportunities in the context of climate change. Even very young children view the environment as a moral concern. Furthermore, early life experiences can lay the groundwork for a lifetime of environmental stewardship. Exposure to nature and parental eco-friendly behaviors are each predictive of children's commitment to environmental engagement later in life. However, these early inclinations give way to decreasing environmental concern in adolescence. Research is beginning to shift from a framework that emphasizes children's status as victims of the climate change crisis to one that instead underscores their role as agents of change.

11. Empowering Surgeons, Anesthesiologists, and Obstetricians to Incorporate Environmental Sustainability in the Operating Room. Yates EF, Bowder AN, Roa L, Velin L, Goodman AS,

Nguyen LL, McClain CD, Meara JG, Cooper Z. *Ann Surg.* 2021 Jan 15. doi:

10.1097/SLA.0000000000004755. Online ahead of print.

<https://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=ovft&AN=00000658-900000000-93761&PDF=y>

OBJECTIVE: We review the existing research on environmentally sustainable surgical practices to enable SAO to advocate for improved environmental sustainability in operating rooms across the country.

SUMMARY OF BACKGROUND DATA: Climate change refers to the impact of greenhouse gases emitted as a byproduct of human activities, trapped within our atmosphere and resulting in hotter and more variable climate patterns. As of 2013, the US healthcare industry was responsible for 9.8% of the country's emissions; if it were itself a nation, US healthcare would rank 13th globally in emissions. As one of the most energy-intensive and wasteful areas of the hospital, ORs drive this trend. ORs are 3 to 6 times more energy intensive than clinical wards. Further, ORs and labor/delivery suites produce 50%-70% of waste across the hospital. Due to the adverse health impacts of climate change, the Lancet Climate Change Commission (2009) declared climate change "the biggest global health threat of the 21 century" and predicted it

would exacerbate existing health disparities for minority groups, children and low socioeconomic patients.

METHODS/RESULTS: We provide a comprehensive narrative review of published efforts to improve environmental sustainability in the OR while simultaneously achieving cost-savings and highlight resources for clinicians interested in pursuing this work.

CONCLUSION: Climate change adversely impacts patient health, and disproportionately impacts the most vulnerable patients. SAOs contribute to the problem through their resource-intensive work in the OR and are uniquely positioned to lead efforts to improve the environmental sustainability of the OR.

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