

Environmental Stewardship Resource Desk

#58 | 3.15.2022 to 3.22.2022

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COVID-19

1. **Principal of environmental life cycle assessment for medical waste during COVID-19 outbreak to support sustainable development goals.** Nabavi-Pelesaraei A, Mohammadkashi N, Naderloo L, Abbasi M, Chau KW. Sci Total Environ. 2022 Mar 8;827:154416. doi: 10.1016/j.scitotenv.2022.154416. Online ahead of print.

<https://www.sciencedirect.com/science/article/pii/S0048969722015091>

Disposal of medical waste (MW) must be considered as a vital need to prevent the spread of pandemics during Coronavirus disease of the pandemic in 2019 (COVID-19) outbreak in the globe. In addition, many concerns have been raised due to the significant increase in the generation of MW in recent years. A structured evaluation is required as a framework for the quantifying of potential environmental impacts of the disposal of MW which ultimately leads to the realization of sustainable development goals (SDG). Life cycle assessment (LCA) is considered as a practical approach to examine environmental impacts of any potential processes during all stages of a product's life, including material mining, manufacturing, and delivery. As a result, LCA is known as a suitable method for evaluating environmental impacts for the disposal of MW. In this research, existing scenarios for MW with a unique approach to emergency scenarios for the management of COVID-19 medical waste (CMW) are investigated. In the next step, LCA and its stages are defined comprehensively with the CMW management approach. Moreover, ReCiPe2016 is the most up-to-date method for computing environmental damages in LCA. Then the application of this method for defined scenarios of CMW is examined, and interpretation of results is explained regarding some examples. In the last step, the process of selecting the best environmental-friendly scenario is illustrated by applying weighting analysis. Finally, it can be concluded that LCA can be considered as an effective method to evaluate the environmental burden of CMW management scenarios in present critical conditions of the world to support SDG.

2. **Estimating & Comparing Greenhouse Gas Emissions for Existing Intramuscular COVID-19 Vaccines and a Novel Thermostable Oral Vaccine.** Patenaude B, Ballreich J. *J Clim Chang Health*. 2022 Mar 4:100127. doi: 10.1016/j.jocl.2022.100127. Online ahead of print. <https://www.sciencedirect.com/science/article/pii/S2667278222000165>

INTERPRETATION: Our results demonstrate large potential GHG emissions reductions from the use of oral vs. intramuscular vaccines for mass COVID-19 vaccination programs. Up to 82.25 million kgCO₂e could be averted from utilization of an oral vaccine in the United States alone, which is equivalent to eliminating 17,700 automobiles from the road for one year.

FUNDING: Funding was provided by Vaxart, Inc. Vaxart, Inc. is currently developing an oral COVID-19 vaccine, the characteristics of which were utilized to define the thermostable oral vaccine discussed in this study. Apart from providing data on the characteristics of the oral vaccine under development, the funders had no influence over the study design, methods, statistical analyses, results, framing of results, decision to submit the manuscript for publication, or choice of journal.

3. **COVID-19 Pandemic and Microplastic Pollution.** Lee M, Kim H. *Nanomaterials (Basel)*. 2022 Mar 3;12(5):851. doi: 10.3390/nano12050851. <https://www.mdpi.com/2079-4991/12/5/851>

The world is suffering from aggravating, waste-generated consequences, and the contribution of microplastics to this problem is only increasing. A contributing factor to increased microplastic usage is the change in the use of personal protective equipment (PPE) from specific use in limited locations (e.g., hospitals) to general use in widespread locations to protect against the current COVID-19 pandemic. This has resulted in an overflow of microfiber waste from homes, schools, streets, and elsewhere, in every country. While various institutes have issued warnings regarding increasing PPE waste, there is no positive indication of an end to the pandemic in the near future. In this review, we examine the impact of the pandemic on microplastic production, consumption, and disposal, and suggest strategies for lessening environmental pollution. In preparation for the worst-case scenario in which PPE becomes a new normal (in the COVID-19 era), it is recommended that governments and other responsible organisations set up a structured monitoring system for the distribution and disposal of PPE to ensure the most effective waste management possible for continuous sustainable development.

Health Impacts of Climate Change

4. **Secular trends in global burden of diabetes attributable to particulate matter pollution from 1990 to 2019.** Wang K, Zhang Y, Wang Y, Liu J, Zhou P, Yuan Y, Yin Z, Mo S, Yu Y, Peng M. *Environ Sci Pollut Res Int*. 2022 Mar 11. doi: 10.1007/s11356-022-19510-6. Online ahead of print. <https://link.springer.com/article/10.1007/s11356-022-19510-6>

Increasing evidence suggests an association between fine particulate matter (PM_{2.5}) exposure and type 2 diabetes mellitus. However, there is still a lack of comparative evaluation regarding diabetes burden due to ambient and indoor PM_{2.5} pollution at a global scale. This study attempts to provide a systematic and comprehensive profile for PM_{2.5}-attributable burden of

diabetes and its spatiotemporal trends, globally and regionally. Comparative estimates of diabetes attributable to ambient PM_{2.5} and household air pollution (HAP) from solid fuels for 204 countries and territories were derived from the Global Burden of Disease Study 2019. Globally, 292.5 (95% uncertainty interval: 207.1, 373.4) thousand deaths and 13.0 (9.1, 17.2) million disability-adjusted life years (DALYs) from diabetes were attributed to PM_{2.5} pollution in 2019, wherein more than two-thirds (67.3% deaths and 69.7% DALYs) were contributed by ambient PM_{2.5}. Compared to 1990, age-standardized DALY rate (ASDR) in 2019 attributable to ambient PM_{2.5} increased by 85.9% (APC: 2.21% [2.15, 2.27]), while HAP-associated ASDR decreased by 37.9% (APC: - 1.66% [- 1.82, - 1.50]). We observed a negative correlation between SDI and APC in ASMR ($r_s = - 0.5$, $p < 0.001$) and ASDR ($r_s = -0.4$, $p < 0.001$) among 204 countries and territories. HAP-related diabetes experienced a sharp decline during 1990-2019, while global burden of diabetes attributable to ambient PM_{2.5} was rising rapidly. The elderly and people in low-SDI countries suffered from the greatest burden of diabetes due to PM_{2.5} pollution. More targeted interventions should be taken by governments to reduce PM_{2.5} exposure and related diabetes burden.

5. **Mental Health Impacts of Climate Change on Women: a Scoping Review.** Stone K, Blinn N, Spencer R. *Curr Environ Health Rep.* 2022 Mar 10. doi: 10.1007/s40572-022-00346-8. Online ahead of print.

Climate change is the largest threat to human health of the twenty-first century. Women are disproportionately affected by climate change. While the physical health impacts of climate change are an active area of research, works related to the mental health impacts are less developed. Furthermore, the mental health impacts of climate change on women are a particular area of interest due to women's disproportionately negative experiences with climate change and climate change-related events. Therefore, the purpose of this scoping review is to understand what is known from the existing literature regarding the mental health impacts of climate change on women. The methods for this review follow the Arksey and O'Malley framework for a scoping review. By searching databases for publications that discuss women, mental health, and climate change, and screening for relevant work, 20 studies that met inclusion criteria were included in the review. Themes derived from the reviewed studies include negative mental health outcomes, gender-based violence, burdens of care and responsibility, attachment to land and traditions, and the importance of intersectionality. From these findings, there is a clear need for climate policies on adaptation and mitigation to reflect women's unique needs to ensure their health and safety.

6. **Is ambient air pollution a risk factor for Parkinson's disease? A meta-analysis of epidemiological evidence.** Dhiman V, Trushna T, Raj D, Tiwari RR. *Int J Environ Health Res.* 2022 Mar 9:1-18. doi: 10.1080/09603123.2022.2047903. Online ahead of print.

Current evidence shows inconsistencies about ambient air pollution (AAP) exposure as a risk factor for Parkinson's disease (PD). We performed meta-analyses to estimate the pooled risk of PD due to AAP exposure. We performed a systematic search in PubMed, Google Scholar, The Cochrane Library, and J-GATEPLUS databases for peer-reviewed epidemiological studies reporting the risk of PD due to exposure to PM_{2.5}, PM₁₀, O₃, CO, NO₂, NO_x and SO₂; from the beginning until October 2021. The pooled odds ratio (OR) for the effect of NO₂ (per 1 µg/m³)

and O₃ (per 1 ppb) on PD was 1.01 [95% CI: 1.00,1.02; I² = 69% (p = .01)] and 1.01 [95% CI: 1.00,1.02; I² = 66% (p = .03)], respectively. The ORs for the effects of PM_{2.5} (per 1 µg/m³) and CO (per 1 ppm) on PD were 1.01 [95% CI: .99,1.03; I² = 40%] and 1.64 [95% CI: .96,2.78; I² = 75% (p = .01)], respectively. The study showed the adverse roles of NO₂, O₃, PM_{2.5}, and CO in increasing the risk for PD.

- 7. Air pollution associated with cognitive decline by the mediating effects of sleep cycle disruption and changes in brain structure in adults.** Lo CC et al. *Environ Sci Pollut Res Int.* 2022 Mar 8. doi: 10.1007/s11356-022-19482-7. Online ahead of print.

The effects of air pollution on sleep and dementia remain unclear. The objective of this study was to investigate the effects of air pollution on cognitive function as mediated by the sleep cycle. A cross-sectional study design was conducted to recruit 4866 subjects on which PSG had been performed. Fifty of them were further given a cognitive function evaluation by the MMSE and CASI as well as brain images by CT and MRI. Associations of 1-year air pollution parameters with sleep parameters, cognitive function, and brain structure were examined. We observed that O₃ was associated with a decrease in arousal, an increase in the N1 stage, and a decrease in the N2 stage of sleep. NO₂ was associated with an increase in the N1 stage, a decrease in the N2 stage, and an increase in REM. PM_{2.5} was associated with a decrease in the N1 stage, increases in the N2 and N3 stages, and a decrease in REM. The N1 and N2 stages were associated with cognitive decline, but REM was associated with an increase in cognitive function. The N1 stage was a mediator of the effects of PM_{2.5} on the concentration domain of the MMSE. O₃ was associated with an increase in the pars orbitalis volume of the left brain. NO₂ was associated with increases in the rostral middle frontal volume, supramarginal gyrus volume, and transverse temporal volume of the left brain, and the pars opercularis volume of the right brain. PM_{2.5} was associated with increases in the pars triangularis volume of the left brain and the fusiform thickness of the right brain. In conclusion, we observed that air pollution was associated with cognitive decline by mediating effects on the sleep cycle with changes in the brain structure in controlling executive, learning, and language functions in adults.

- 8. Long-term Air Pollution Exposure and Pneumonia Related Mortality in a Large Pooled European Cohort.** Liu S et al. *Am J Respir Crit Care Med.* 2022 Mar 8. doi:

10.1164/rccm.202106-1484OC. Online ahead of print.

MEASUREMENTS AND MAIN RESULTS: Of 325,367 participants, 712 died from pneumonia and influenza combined, 682 from pneumonia, and 695 from ALRI during a mean follow-up of 19.5 years. NO₂ and BC were associated with 10-12% increases in pneumonia and influenza combined mortality, but 95% confidence intervals included unity [hazard ratios: 1.12 (0.99-1.26) per 10 µg/m³ for NO₂; 1.10 (0.97-1.24) per 0.5 10⁻⁵m⁻¹ for BC]. Associations with pneumonia and ALRI mortality were almost identical. We detected effect modification suggesting stronger associations with NO₂ or BC in overweight, employed, or currently smoking participants compared to normal weight, unemployed, or non-smoking participants.

CONCLUSIONS: Long-term exposure to combustion-related air pollutants NO₂ and BC may be associated with mortality from lower respiratory infections, but larger studies are needed to estimate these associations more precisely.

9. **Effects of respirators to reduce fine particulate matter exposures on blood pressure and heart rate variability: A systematic review and meta-analysis.** Faridi S, Brook RD, Yousefian F, Hassanvand MS, Nodehi RN, Shamsipour M, Rajagopalan S, Naddafi K. *Environ Pollut.* 2022 Mar 7;119:109. doi: 10.1016/j.envpol.2022.119109. Online ahead of print.

Particulate-filtering respirators (PFRs) have been recommended as a practical personal-level intervention to protect individuals from the health effects of particulate matter exposure. However, the cardiovascular benefits of PFRs including improvements in key surrogate endpoints remain unclear. We performed a systematic review and meta-analysis of randomized studies (wearing versus not wearing PFRs) reporting the effects on blood pressure (BP) and heart rate variability (HRV). The search was performed on January 3, 2022 to identify published papers until this date. We queried three English databases, including PubMed, Web of Science Core Collection and Scopus. Of 527 articles identified, eight trials enrolling 312 participants (mean age \pm standard deviation: 36 ± 19.8 ; 132 female) met our inclusion criteria for analyses. Study participants wore PFRs from 2 to 48 h during intervention periods. Wearing PFRs was associated with a non-significant pooled mean difference of -0.78 mmHg (95% confidence interval [CI]: -2.06, 0.50) and -0.49 mmHg (95%CI: -1.37, 0.38) in systolic and diastolic BP (SBP and DBP). There was a marginally significant reduction of mean arterial pressure (MAP) by nearly 1.1 mmHg (95%CI: -2.13, 0.01). The use of PFRs was associated with a significant increase of 38.92 ms² (95%CI: 1.07, 76.77) in pooled mean high frequency (power in the high frequency band (0.15-0.4 Hz)) and a reduction in the low (power in the low frequency band (0.04-0.15Hz))-to-high frequency ratio [-0.14 (95%CI: -0.27, 0.00)]. Other HRV indices were not significantly changed. Our meta-analysis demonstrates modest or non-significant improvements in BP and many HRV parameters from wearing PFRs over brief periods. However, these findings are limited by the small number of trials as well as variations in experimental designs and durations. Given the mounting global public health threat posed by air pollution, larger-scale trials are warranted to elucidate more conclusively the potential health benefits of PFRs.

10. **Outdoor air pollution exposure and cognitive performance: findings from the enrolment phase of the CONSTANCES cohort.** Zare Sakhvidi MJ et al. *Lancet Planet Health.* 2022 Mar;6(3):e219-e229. doi:

10.1016/S2542-5196(22)00001-8

<https://www.sciencedirect.com/science/article/pii/S2542519622000018>

INTERPRETATION: Significantly poorer cognitive performance was associated with exposure to outdoor air pollution even at low levels of exposure. This highlights the importance of further efforts to reduce exposure to air pollution.

10. **Associations between Air Pollution and Psychiatric Symptoms in The Normative Aging Study.** Qiu X, Danesh-Yazdi M, Weisskopf M, Kosheleva A, Spiro AS, Wang C, Coull BA, Koutrakis P, Schwartz JD. *Environ Res Lett.* 2022 Mar;17(3):034004. doi: 10.1088/1748-9326/ac47c5. Epub 2022 Feb 21.

<https://iopscience.iop.org/article/10.1088/1748-9326/ac47c5>

CONCLUSIONS: Exposure to gaseous air pollutants was associated with higher intensity of psychiatric symptoms among a cohort of older men, particularly in communities with lower socio-economic or housing conditions.

11. **Pollen Allergy in a Changing Planetary Environment.** Oh JW. Allergy Asthma Immunol Res. 2022 Mar;14(2):168-181. doi: 10.4168/aair.2022.14.2.168.

<https://e-aair.org/DOIx.php?id=10.4168/aair.2022.14.2.168>

Airborne pollens are one of the common causative and triggering agents of respiratory allergy in a changing planetary environment. A growing number of people worldwide are contracting allergic diseases caused by pollens. The seasonal variations in pollens have occurred everywhere and the sensitization rate to pollens has increased in children as well as in adults. Moreover, allergenic plants, such as ragweed and Japanese hop, grow in soil damaged by human's activities and deforestation with air pollution. It is impossible to avoid plants that cause allergies, because pollens can travel many kilometers in the breeze or wind. Hence, it is essential to survey and forecast pollens for the management of pollen allergy. Weather conditions may alter pollen concentrations. A number of studies have shown that increases in CO₂ concentration and atmospheric temperature raise pollen concentration. Hence most of the studies on the impact of climate change on aeroallergens must include the amount and allergenicity of pollens. It is yet unknown whether complex interactions with pollens, meteorological variables, and air pollutants in the changing environment. Considering the effect of climate change on the long-term trends in pollen levels and emerging viral infection, it is crucial to forecast and eliminate the associated risk for human health in future and take appropriate measures to reduce it.

12. **Climate change anxiety and mental health: Environmental activism as buffer.** Schwartz SEO, Benoit L, Clayton S, Parnes MF, Swenson L, Lowe SR. Curr Psychol. 2022 Feb 28:1-14. doi: 10.1007/s12144-022-02735-6. Online ahead of print.

<https://link.springer.com/article/10.1007/s12144-022-02735-6>

A growing body of research has documented the phenomenon of climate change anxiety (CCA), defined broadly as negative cognitive, emotional, and behavioral responses associated with concerns about climate change. A recently validated scale of CCA indicated two subscales: cognitive emotional impairment and functional impairment (Clayton & Karazsia, 2020). However, there are few empirical studies on CCA to date and little evidence regarding whether CCA is associated with psychiatric symptoms, including symptoms of Major Depressive Disorder (MDD) and Generalized Anxiety Disorder (GAD), and whether engaging in individual and collective action to address climate change could buffer such relationships. This mixed methods study draws on data collected from a sample of emerging adult students (ages 18-35) in the United States (N = 284) to address these gaps. Results indicated that both CCA subscales were significantly associated with GAD symptoms, while only the Functional Impairment subscale was associated with higher MDD symptoms. Moreover, engaging in collective action, but not individual action, significantly attenuated the association between CCA cognitive emotional impairment and MDD symptoms. Responses to open-ended questions asking about participants' worries and actions related to climate change indicated the severity of their worries and, for some, a perception of the insignificance of their actions relative to the enormity of climate change. These results further the field's understanding of CCA, both in general and specifically among emerging adults, and suggest the importance of creating opportunities for collective action to build sense of agency in addressing climate change.

13. **Concurrent Heat Waves and Extreme Ozone (O₃) Episodes: Combined Atmospheric Patterns and Impact on Human Health.** Khomsi K, Chelhaoui Y, Alilou S, Souri R, Najmi H, Souhaili Z. *Int J Environ Res Public Health*. 2022 Feb 27;19(5):2770. doi: 10.3390/ijerph19052770.

<https://www.mdpi.com/1660-4601/19/5/2770>

More recurrent heat waves and extreme ozone (O₃) episodes are likely to occur during the next decades and a key question is about the concurrence of those hazards, the atmospheric patterns behind their appearance, and their joint effect on human health. In this work, we use surface maximum temperature and O₃ observations during extended summers in two cities from Morocco: Casablanca and Marrakech, between 2010 and 2019. We assess the connection between these data and climate indices (North Atlantic Oscillation (NAO), Mediterranean Oscillation (MO), and Saharan Oscillation (SaO)). We then identify concurrent heat waves and O₃ episodes, the weather type behind this concurrence, and the combined health risks. Our findings show that the concurrence of heat waves and O₃ episodes depends both on the specific city and the large-scale atmospheric circulation. The likely identified synoptic pattern is when the country is under the combined influence of an anticyclonic area in the north and the Saharan trough extending the depression centered in the south. This pattern generates a warm flow and may foster photochemical pollution. Our study is the first step toward the establishment of an alert system. It will help to provide recommendations for coping with concurrent heat waves and air pollution episodes.

14. **Extreme Heat and Pregnancy Outcomes: A Scoping Review of the Epidemiological Evidence.** Syed S, O'Sullivan TL, Phillips KP. *Int J Environ Res Public Health*. 2022 Feb 19;19(4):2412. doi: 10.3390/ijerph19042412.

<https://www.mdpi.com/1660-4601/19/4/2412>

CONCLUSION: Use of precise temperature data by most studies avoided pitfalls of imprecise, regional definitions of heat waves, however inconsistent study design, and exposure windows are a significant challenge to systematic evaluation of this literature. Despite the high risk of extreme heat events and limited mitigation strategies in the global south, there is a significant gap in the epidemiological literature from these regions. Greater consistency in study design and exposure windows would enhance the rigor of this field.

15. **Air Pollution and Breast Cancer: An Examination of Modification By Underlying Familial Breast Cancer Risk.** Niehoff NM, Terry MB, Bookwalter DB, Kaufman JD, O'Brien KM, Sandler DP, White AJ. *Cancer Epidemiol Biomarkers Prev*. 2022 Feb;31(2):422-429. doi: 10.1158/1055-9965.EPI-21-1140. Epub 2021 Dec 14.

<https://aacrjournals.org/cebp/article/31/2/422/678470/Air-Pollution-and-Breast-Cancer-An-Examination-of>

CONCLUSIONS: Our results provide additional evidence that air pollution may be implicated in breast cancer, particularly among women with a higher familial risk.

IMPACT: Women at higher underlying breast cancer risk may benefit more from interventions to reduce exposure to NO₂.

16. **Association of Exposure to Particulate Matters and Multiple Sclerosis: A Systematic Review and Meta-Analysis.** Lotfi F, Mansourian M, Mirmoayyeb O, Najdaghi S, Shaygannejad V, Esmail N. *Neuroimmunomodulation*. 2022;29(1):21-27. doi: 10.1159/000516559. Epub 2021 Jun 16. <https://www.karger.com/Article/Abstract/516559>

The association between air pollution and multiple sclerosis (MS) is not entirely clear. This meta-analysis was aimed at determining the correlation between particulate matter (PM)_{2.5}, PM₁₀, and MS incidence/relapse. The literature search was performed in EMBASE, Web of Science, PubMed, and the gray literature. Sixteen articles were retrieved, and ten articles were included and evaluated. Three measures of association were used for the meta-analysis: odds ratio (cross-sectional and case-control studies), incidence rate ratio, or hazard ratio (cohort studies). Meta-analysis of those 3 studies on PM_{2.5} indicated that exposure to PM_{2.5} was associated with MS relapse and incidence ([95% confidence interval; CI] 1.178 [1.102, 1.279]), $p > 0.05$. Also, assessment of risk ratio for all studies showed a correlation between PMs (PM₁₀ and PM_{2.5}) and MS incidence and relapse ([95% CI] 1.28, [1.13-1.43]) $p < 0.05$. Collectively, we found that PM exposure (PM₁₀ and PM_{2.5}) in MS patients associates with the occurrence and relapse of disease.

WE ACT

17. **Universal Climate Thermal Index as a prognostic tool in medical science in the context of climate change: A systematic review.** Romaszko J, Dragańska E, Jalali R, Cymes I, Glińska-Lewczuk K. *Sci Total Environ*. 2022 Mar 9:154492. doi: 10.1016/j.scitotenv.2022.154492. Online ahead of print.

The assessment of the impact of meteorological factors on the epidemiology of various diseases and on human pathophysiology and physiology requires a comprehensive approach and new tools independent of currently occurring climate change. The thermal comfort index, i.e., Universal Climate Thermal Index (UTCI), is gaining more and more recognition from researchers interested in such assessments. This index facilitates the evaluation of the impact of cold stress and heat stress on the human organism and the assessment of the incidence of weather-related diseases. This work aims at identifying those areas of medical science for which the UTCI was applied for scientific research as well as its popularization among clinicians, epidemiologists, and specialists in public health management. This is a systematic review of literature found in Pubmed, Scencedirect and Web of Science databases from which, consistent with PRISMA guidelines, original papers employing the UTCI in studies related to health, physiological parameters, and epidemiologic applications were extracted. Out of the total number of 367 papers identified in the databases, 33 original works were included in the analysis. The selected publications were analyzed in terms of determining the areas of medical science in which the UTCI was applied. The majority of studies were devoted to the broadly understood mortality, cardiac events, and emergency medicine. A significant disproportion between publications discussing heat stress and those utilizing the UTCI for its assessment was revealed.

18. **Addressing Code Red for humans and the planet: We are in this together.** McLean M, Gibbs T. *Med Teach*. 2022 Mar 8:1-4. doi: 10.1080/0142159X.2022.2040733. Online ahead of print.

Climate change is one of the greatest threats to human health. It is not surprising that following one of the hottest years on record (2019) and wildfires on almost all continents that the 2021 Intergovernmental Panel on Climate Change and the 2021 Lancet Countdown on Climate Change identified a Code Red for humanity and for a healthy future. In addition, just prior to the November 2021 Conference of the Parties (COP26), the World Health Organization released its Special Report, *The Health Argument for Climate Action*, in which the global health community provided 10 recommendations for policymakers and governments for greener, cleaner and more sustainable action to ensure a healthy and just future. There is thus an urgent need for socially and environmentally accountable health professions education to pick up the pace in terms of climate change, planetary health and/or sustainable health care integration in curricula. Considerable work has already been undertaken by faculty and students. As we are in this together, students and faculty can collaborate and build upon the work already undertaken to ensure universities are social and environmentally accountable.

19. Designing Environmental Messages to Discourage Red Meat Consumption: An Online Experiment. Wistar A, Hall MG, Bercholz M, Taillie LS. *Int J Environ Res Public Health*. 2022 Mar 2;19(5):2919. doi:

10.3390/ijerph19052919.

<https://www.mdpi.com/1660-4601/19/5/2919>

Reducing red meat consumption in high-consuming countries is critical for mitigating climate change and preventing chronic disease. This study tested the effectiveness of messages conveying the worsening or reduction of environmental harms at discouraging red meat consumption. 1078 U.S. adults viewed seven messages in an online survey highlighting the reduction or worsening of environmental harms associated with eating red meat (between-subjects factor) and rated the messages on how much they discouraged them from wanting to buy beef. Each message highlighted a different environmental harm: deforestation, climate change, water shortages, biodiversity loss, carbon footprint, greenhouse gas emissions, or environment (within-subjects factor). No statistically significant difference was found between the reduction and worsening of environmental harms conditions for most topics, though the worsening of harms frame slightly outperformed the reduction of harms frame for the 'environment' topic. 'Environment' was also the message topic that elicited the strongest response from participants overall. Latino participants, those with more than a high school degree, and those who consume beef once a week or less rated messages as more effective than non-Latino participants, those who completed high school or less, and those who consumed beef more than once a week. Future research should explore the effect of messages on behavioral outcomes.

19. Integrating planetary health into clinical guidelines to sustainably transform health care.

Herrmann A, Lenzer B, Müller BS, Danquah I, Nadeau KC, Muche-Borowski C, Traidl-Hoffmann C. *Lancet Planet Health*. 2022 Mar;6(3):e184-e185. doi: 10.1016/S2542-5196(22)00041-9.

<https://www.sciencedirect.com/science/article/pii/S2542519622000419>

Climate change and other ecological crises threaten the health of humans and the natural systems on which humans depend.¹ However, such planetary health issues have not yet entered the core of evidence-based medicine—clinical guidelines. Globally, medical

associations, research institutions, and universities have placed planetary health on their agenda and are starting to integrate it into medical education.^{2, 3} The UK National Health Service (NHS) aims to be climate neutral by 2040,⁴ and more than 50 countries committed to climate-smart health care by 2030 at the 26th UN Climate Conference of the Parties in Glasgow, Scotland.⁵ Despite all this progress, planetary health principles have yet to be fully incorporated into clinical routines. To achieve this, we believe that clinical guidelines are crucial.

21. Climate crisis and ecological emergency: Why they concern (neuro)scientists, and what we can do. Rae CL, Farley M, Jeffery KJ, Urai AE. *Brain Neurosci Adv.* 2022 Feb

28;6:23982128221075430. doi:

10.1177/23982128221075430. eCollection 2022 Jan-Dec.

<https://journals.sagepub.com/doi/epub/10.1177/23982128221075430>

Our planet is experiencing severe and accelerating climate and ecological breakdown caused by human activity. As professional scientists, we are better placed than most to understand the data that evidence this fact. However, like most other people, we ignore this inconvenient truth and lead our daily lives, at home and at work, as if these facts weren't true. In particular, we overlook that our own neuroscientific research practices, from our laboratory experiments to our often global travel, help drive climate change and ecosystem damage. We also hold privileged positions of authority in our societies but rarely speak out. Here, we argue that to help society create a survivable future, we neuroscientists can and must play our part. In April 2021, we delivered a symposium at the British Neuroscience Association meeting outlining what we think neuroscientists can and should do to help stop climate breakdown. Building on our talks (Box 1), we here outline what the climate and ecological emergencies mean for us as neuroscientists. We highlight the psychological mechanisms that block us from taking action, and then outline what practical steps we can take to overcome these blocks and work towards sustainability. In particular, we review environmental issues in neuroscience research, scientific computing, and conferences. We also highlight the key advocacy roles we can all play in our institutions and in society more broadly. The need for sustainable change has never been more urgent, and we call on all (neuro)scientists to act with the utmost urgency.

22. Sustainable Diets as Tools to Harmonize the Health of Individuals, Communities and the Planet: A Systematic Review. Kowalsky TO, Morilla Romero de la Osa R, Cerrillo I. *Nutrients.*

2022 Feb 22;14(5):928. doi: 10.3390/nu14050928.

<https://www.mdpi.com/2072-6643/14/5/928>

RESULTS: A total of 201 articles was retrieved, but only 21 were included. A calorie-balanced diet mainly based on food of plant origin that would allow the attainment of 60% of daily caloric requirements and a low protein intake from animal foods (focusing in fish and poultry) could significantly reduce global morbi-mortality and the dietary environmental impact maintaining a framework of sustainability conditioned by the consumption of fresh, seasonal, locally produced and minimally packaged products.

DISCUSSION: The implementation of sustainable diets requires working on the triangulation of concepts of food-health-environment from schools and that is permanently reinforced during

all stages of the life by healthcare workers, who should establish the appropriate modifications according to the age, gender and health situation.

[Lancet Planetary Health](#) – *open-access, interdisciplinary journal focused on sustainability*

News & Commentary

[Climate change and healthcare organizations: a call to arms.](#) Iyer Y, Moorthy S, Al-Kindi S, Rajagopalan S. Eur Heart J. 2022 Mar 8;ehac110. doi: 10.1093/eurheartj/ehac110. Online ahead of print.

[Landmark treaty on plastic pollution must put scientific evidence front and centre.](#) Nature. 2022 Mar;603(7900):202. doi: 10.1038/d41586-022-00648-9.

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