

Environmental Stewardship Resource Desk

#57 | 3.9.2022 to 3.15.2022

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COVID-19

- 1. Degradation of plastics associated with the COVID-19 pandemic.** Pizarro-Ortega CI, Dioses-Salinas DC, Fernández Severini MD, Forero López AD, Rimondino GN, Benson NU, Dobaradaran S, De-la-Torre GE. *Mar Pollut Bull.* 2022 Feb 24;176:113474. doi: 10.1016/j.marpolbul.2022.113474. Online ahead of print.
<https://www.sciencedirect.com/science/article/pii/S0025326X22001564>
The ongoing COVID-19 pandemic has resulted in an unprecedented form of plastic pollution: personal protective equipment (PPE). Numerous studies have reported the occurrence of PPE in the marine environment. However, their degradation in the environment and consequences are poorly understood. Studies have reported that face masks, the most abundant type of PPE, are significant sources of microplastics due to their fibrous microstructure. The fibrous material (mostly consisting of polypropylene) exhibits physical changes in the environment, leading to its fracture and detachment of microfibers. Most studies have evaluated PPE degradation under controlled laboratory conditions. However, in situ degradation experiments, including the colonization of PPE, are largely lacking. Although ecotoxicological studies are largely lacking, the first attempts to understand the impact of MPs released from face masks showed various types of impacts, such as fertility and reproduction deficiencies in both aquatic and terrestrial organisms.
- 2. Impact of COVID-19 Pandemic on Air Quality: A Systematic Review.** Silva ACT, Branco PTBS, Sousa SIV. *Int J Environ Res Public Health.* 2022 Feb 10;19(4):1950. doi: 10.3390/ijerph19041950.
<https://www.mdpi.com/1660-4601/19/4/1950>
With the emergence of the COVID-19 pandemic, several governments imposed severe restrictions on socio-economic activities, putting most of the world population into a general lockdown in March 2020. Although scattered, studies on this topic worldwide have rapidly emerged in the literature. Hence, this systematic review aimed to identify and discuss the

scientifically validated literature that evaluated the impact of the COVID-19 pandemic and associated restrictions on air quality. Thus, a total of 114 studies that quantified the impact of the COVID-19 pandemic on air quality through monitoring were selected from three databases. The most evaluated countries were India and China; all the studies intended to evaluate the impact of the pandemic on air quality, mainly concerning PM10, PM2.5, NO2, O3, CO, and SO2. Most of them focused on the 1st lockdown, comparing with the pre- and post-lockdown periods and usually in urban areas. Many studies conducted a descriptive analysis, while others complemented it with more advanced statistical analysis. Although using different methodologies, some studies reported a temporary air quality improvement during the lockdown. More studies are still needed, comparing different lockdown and lifting periods and, in other areas, for a definition of better-targeted policies to reduce air pollution.

- 3. The relative importance of COVID-19 pandemic impacts on biodiversity conservation globally.** Gibbons DW et al. *Conserv Biol.* 2022 Feb;36(1):e13781. doi: 10.1111/cobi.13781. Epub 2021 Oct 26.

<https://conbio.onlinelibrary.wiley.com/doi/full/10.1111/cobi.13781>

The COVID-19 pandemic has had an enormous impact on almost all aspects of human society and endeavor; the natural world and its conservation have not been spared. Through a process of expert consultation, we identified and categorized, into 19 themes and 70 subthemes, the ways in which biodiversity and its conservation have been or could be affected by the pandemic globally. Nearly 60% of the effects have been broadly negative. Subsequently, we created a compendium of all themes and subthemes, each with explanatory text, and in August 2020 a diverse group of experienced conservationists with expertise from across sectors and geographies assessed each subtheme for its likely impact on biodiversity conservation globally. The 9 subthemes ranked highest all have a negative impact. These were, in rank order, governments sidelining the environment during their economic recovery, reduced wildlife-based tourism income, increased habitat destruction, reduced government funding, increased plastic and other solid waste pollution, weakening of nature-friendly regulations and their enforcement, increased illegal harvest of wild animals, reduced philanthropy, and threats to survival of conservation organizations. In combination, these impacts present a worrying future of increased threats to biodiversity conservation but reduced capacity to counter them. The highest ranking positive impact, at 10, was the beneficial impact of wildlife-trade restrictions. More optimistically, among impacts ranked 11-20, 6 were positive and 4 were negative. We hope our assessment will draw attention to the impacts of the pandemic and, thus, improve the conservation community's ability to respond to such threats in the future.

- 4. COVID-19 and the Environment: Pandemics, Climate, and Ecosystems, and the Environmental Challenge in Dialysis.** Brioni E, Magnaghi C, Apuzzo L, Pole C, Pennaccho N, Manunta P, Vezzoli G, Zotti GD, Villa G, Manara DF. *Nephrol Nurs J.* 2022 Jan-Feb;49(1):59-65.

The recent COVID-19 pandemic has had a significant impact on the population worldwide. Patients with chronic kidney disease treated with kidney replacement therapy were no exception because they were considered highly vulnerable due to multiple comorbidities. The consequences of the physical, biological, and ecological system on the environment as a result of human activity represent a huge global health care danger. The purpose of this article is to

identify strategies that improve environmental sustainability, improve prevention of COVID-19 infection in dialysis centers, and improve the environmental impact of hemodialysis centers.

Health Impacts of Climate Change

5. **2021 Climate and Health Review - Uncharted Territory: Extreme Weather Events and Morbidity.** Sheehan MC. *Int J Health Serv.* 2022 Apr;52(2):189-200. doi: 10.1177/00207314221082452. Epub 2022 Mar 1.
<https://journals.sagepub.com/doi/full/10.1177/00207314221082452>
Extreme weather events (EWEs) affected health in every world region during 2021, placing the planet in "uncharted territory." Portraying the human impacts of EWEs is part of a health frame that suggests public knowledge of these risks will spur support for needed policy change. The health frame has gained traction since the Paris COP21 (United Nations Climate Change Conference) and arguably helped to achieve modest progress at the Glasgow COP26. However, reporting rarely covers the full picture of health impacts from EWEs, instead focusing on cost of damages, mortality, and displacement. This review summarizes data for 30 major EWEs of 2021 and, based on the epidemiological literature, discusses morbidity-related exposures for four hazards that marked the year: wildfire smoke; extreme cold and power outages; extreme, precipitation-related flooding; and drought. A very large likely burden of morbidity was found, with particularly widespread exposure to risk of respiratory outcomes (including interactions with COVID-19) and mental illnesses. There is need for a well-disseminated global annual report on EWE morbidity, including affected population estimates and evolving science. In this way, the public health frame may be harnessed to bolster evidence for the broader and promising frame of "urgency and agency" for climate change action.
6. **Public health awareness of climate change's impact on health.** Zust B, Jost R. *Public Health Nurs.* 2022 Mar 3. doi: 10.1111/phn.13050. Online ahead of print.
<https://onlinelibrary.wiley.com/doi/full/10.1111/phn.13050>
RESULTS: Thirty-three agency personnel completed the surveys. All agencies identified emerging, new health problems. Seven agencies had climate change doubters and/or opposition from the community regarding climate change reality. All eight agencies were underfunded.
CONCLUSION: Public Health agencies need financial resources to prepare for climate change threats and events. Climate change is a global reality. The world needs to collectively work together on this issue.
7. **Long-term exposure to ambient air pollution and asthma symptom score in the CONSTANCES cohort.** Keirsbulck M, Savouré M, Lequy E, Chen J, de Hoogh K, Vienneau D, Goldberg M, Zins M, Roche N, Nadif R, Jacquemin B. *Thorax.* 2022 Mar 2:thoraxjnl-2021-218344. doi: 10.1136/thoraxjnl-2021-218344. Online ahead of print.
BACKGROUND: The asthma symptom score allows to consider asthma as a continuum and to investigate its risk factors. One previous study has investigated the association between asthma score and air pollution and only for nitrogen dioxide (NO₂). We aimed to study the associations between particulate matter with an aerodynamic diameter lower than 2.5 µm (PM_{2.5}), black

carbon (BC) and NO₂ and the asthma symptom score in adults from CONSTANCES, a French population-based cohort.

METHODS: Asthma symptom score (range: 0-5) was based on the number of five self-reported symptoms of asthma in the last 12 months. Annual individual exposure to PM_{2.5}, BC and NO₂ was estimated at participants' residential address using hybrid land-use regression models. Cross-sectional associations of each pollutant with asthma symptom score were estimated using negative binomial regressions adjusted for age, sex, smoking status and socioeconomic position. Associations with each symptom were estimated using logistic regression. The effect of BC independent of total PM_{2.5} was investigated with a residual model.

RESULTS: Analyses were conducted on 135 165 participants (mean age: 47.2 years, 53.3% women, 19.0% smokers, 13.5% ever asthma). The ratio of mean score was 1.12 (95% CI 1.10 to 1.14), 1.14 (95% CI 1.12 to 1.16) and 1.12 (95% CI 1.10 to 1.14) per one IQR increase of PM_{2.5} (4.86 µg/m³), BC (0.88 10⁻⁵ m⁻¹) and NO₂ (17.3 µg/m³). Positive and significant associations were also found for each asthma symptom separately. BC effect persisted independently of total PM_{2.5}.

CONCLUSION: Exposure to each pollutant was associated with increased asthma symptom score in adults. This study highlights that BC could be one of the most harmful particulate matter components.

8. **Exposure to Outdoor Particulate Matter Air Pollution and Risk of Gastrointestinal Cancers in Adults: A Systematic Review and Meta-Analysis of Epidemiologic Evidence.** Pritchett N, Spangler EC, Gray GM, Livinski AA, Sampson JN, Dawsey SM, Jones RR. *Environ Health Perspect.* 2022 Mar;130(3):36001. doi: 10.1289/EHP9620. Epub 2022 Mar 2.

<https://ehp.niehs.nih.gov/doi/full/10.1289/EHP9620>

CONCLUSION: We concluded there is some evidence of associations between PM_{2.5} and GI cancers, with the strongest evidence for liver and colorectal cancers. Although there is biologic plausibility for these relationships, studies of any one cancer site were few and there remain only a small number overall. Studies in geographic areas with high GI cancer burden, evaluation of the impact of different PM exposure assessment approaches on observed associations, and investigation of cancer subtypes and specific chemical components of PM are important areas of interest for future research.

9. **Health Benefits of Strategies for Carbon Mitigation in US Transportation, 2017–2050.** Maizlish N, Rudolph L, Jiang C. *Am J Public Health.* 2022 Mar;112(3):426-433. doi: 10.2105/AJPH.2021.306600.

Objectives. To quantify health benefits and carbon emissions of 2 transportation scenarios that contrast optimum levels of physical activity from active travel and minimal air pollution from electric cars. **Methods.** We used data on burden of disease, travel, and vehicle emissions in the US population and a health impact model to assess health benefits and harms of physical activity from transportation-related walking and cycling, fine particulate pollution from car emissions, and road traffic injuries. We compared baseline travel with walking and cycling a median of 150 weekly minutes for physical activity, and with electric cars that minimized carbon pollution and fine particulates. **Results.** In 2050, the target year for carbon neutrality, the active travel scenario avoided 167 000 deaths and gained 2.5 million disability-adjusted life

years, monetized at \$1.6 trillion using the value of a statistical life. Carbon emissions were reduced by 24% from baseline. Electric cars avoided 1400 deaths and gained 16 400 disability-adjusted life years, monetized at \$13 billion. Conclusions. To achieve carbon neutrality in transportation and maximize health benefits, active travel should have a prominent role along with electric vehicles in national blueprints.

10. **A hot topic at the environment-health nexus: investigating the impact of climate change on infectious diseases.** Grobusch LC, Grobusch MP. *Int J Infect Dis.* 2022 Mar;116:7-9. doi: 10.1016/j.ijid.2021.12.350. Epub 2021 Dec 29.

<https://www.sciencedirect.com/science/article/pii/S1201971221012509>

CLIMATE CHANGE AND INFECTIOUS DISEASES: Infectious diseases represent only one facet of the threats arising from climate change. Direct impacts from climate change include the more frequent occurrence and increased magnitude of extreme weather events, as well as changing temperatures and precipitation patterns. For climate-sensitive infectious diseases, these changes implicate a shift in geographical and temporal distribution, seasonality, and transmission intensity.

SIZING UP THE PROBLEM: Susceptibility to the deleterious effects of climate change is a net result of the interplay of not only environmental factors, but also human, societal, and economic factors, with social inequalities being a major determinant of vulnerability. The global South is already disproportionately affected by the climate crisis. The financial capacity to pursue adaptation options is also limited and unevenly distributed.

CONCLUSIONS: Climate change-induced mortality and morbidity from both infectious and non-infectious diseases, among other adverse scenarios, are expected to rise globally in the future. The coming decade will be crucial for using all remaining opportunities to develop and implement adequate mitigation and adaptation strategies.

11. **The Need for Collective Awareness of Attempted Suicide Rates in a Warming Climate.**

Giacomini G et al. *Crisis.* 2022 Mar;43(2):157-160. doi: 10.1027/0227-5910/a000763. Epub 2021 Feb 10.

Background: Climate factors may offer a stronger explanation of the variations in suicide rates compared with economic variables, even in the case of patients admitted involuntarily. **Aims:** We assessed the role of temperature as a determinant of the increased prevalence of suicide attempts (SA). **Method:** The sample comprised all cases of hospitalization for SA at the Psychiatric Clinic of the IRCCS Ospedale Policlinico San Martino between August 2013 and July 2018. For ambient temperature, data were provided by the Meteorological Observatory of the University of Genoa. **Results:** We noted a peak in suicides that was typically found in late spring and early summer due to global warming. **Limitations:** Other environmental/psychological factors contributing to the onset of an acute clinical event were not considered. The cross-sectional design of the study is another limitation. **Conclusion:** Further studies are needed to clarify the impact of climatic factors on suicide behavior and implement early intervention and preventive strategies for mental health.

12. **Short-term exposure to traffic-related air pollution and STEMI events: Insights into STEMI onset and related cardiac impairment.** Zhu Y et al. *Sci Total Environ.* 2022 Feb 28:154210. doi: 10.1016/j.scitotenv.2022.154210. Online ahead of print.

CONCLUSIONS: Our findings extend current understanding that short-term exposure to higher levels of traffic pollution was associated with increased STEMI risks and exacerbated cardiac impairments, and provide evidence on traffic pollution control priority for protecting vulnerable populations who are at greater risks of cardiovascular events.

13. **Emerging microplastics in the environment: Properties, distributions, and impacts.** Hu K, Yang Y, Zuo J, Tian W, Wang Y, Duan X, Wang S. *Chemosphere*. 2022 Feb 25;297:134118. doi: 10.1016/j.chemosphere.2022.134118. Online ahead of print.

Microplastics (MPs) are emerging and recalcitrant micropollutants in the environment, which have attracted soaring interests from a wide range of research disciplines. To this end, numerous technologies have been devised to understand the properties, environmental behaviors, and potential impacts/hazards of MPs. Herein, we present a review on the properties, environmental distribution and possible impacts. In this review, a comprehensive introduction of the most universal types of MPs, their shapes and characters will be first presented. Then the distributions of MPs in the environment and the impacts on microbe, plants, and human will be reported. Finally, major challenges and directions will be discussed to provide some clues to the better understanding, control and migration of MPs pollution in future studies.

14. **Attributable risk and economic cost of hospital admissions for depression due to short-exposure to ambient air pollution: A multi-city time-stratified case-crossover study.** Gao X, Jiang W, Liao J, Li J, Yang L. *J Affect Disord*. 2022 Feb 25;304:150-158. doi: 10.1016/j.jad.2022.02.064. Online ahead of print.

<https://www.clinicalkey.com/#!/content/journal/1-s2.0-S0165032722002130>

RESULTS: The short-term exposure to air pollutants was positively associated with hospitalization for depression. The increase of air particulate matter (PM) had the strongest effect on lag 0 day (PM_{2.5}:1.037 (95% CI:1.022,1.052), PM₁₀:1.024 (95% CI:1.013,1.036)). The effects of SO₂ reached the peak on lag 2 day (1.317 (95% CI:1.151,1.507)). Women and older people were more likely to be affected by air pollutants and prone to depression (P = 0.013, P = 0.006). During the study period, the economic cost of hospitalization for depression caused by PM pollution was US\$ 8.36 million.

LIMITATIONS: The air pollutant concentration level of the monitoring stations in the study area was regarded as personal pollutant exposure, which may not accurately reflect the patient's exposure level, resulting in a certain measurement error.

CONCLUSIONS: Short-term changes to ambient air pollution exposure may increase the risk of hospital admissions for depression and cause economic costs due to hospitalization.

15. **Effect of Elevated Ambient Temperature on Maternal, Foetal, and Neonatal Outcomes: A Scoping Review.** Dalugoda Y, Kuppa J, Phung H, Rutherford S, Phung D. *Int J Environ Res Public Health*. 2022 Feb 4;19(3):1771. doi: 10.3390/ijerph19031771.

<https://www.mdpi.com/1660-4601/19/3/1771>

This scoping review provides an overview of the published literature, identifies research gaps, and summarises the current evidence of the association between elevated ambient temperature exposure during pregnancy and adverse maternal, foetal, and neonatal outcomes.

Following the PRISMA extension for scoping reviews reporting guidelines, a systematic search was conducted on CINAHL, PubMed, and Embase and included original articles published in the English language from 2015 to 2020 with no geographical limitations. A total of seventy-five studies were included, conducted across twenty-four countries, with a majority in the USA (n = 23) and China (n = 13). Study designs, temperature metrics, and exposure windows varied considerably across studies. Of the eighteen heat-associated adverse maternal, foetal, and neonatal outcomes identified, pre-term birth was the most common outcome (n = 30), followed by low birth weight (n = 11), stillbirth (n = 9), and gestational diabetes mellitus (n = 8). Overall, papers reported an increased risk with elevated temperature exposures. Less attention has been paid to relationships between heat and the diverse range of other adverse outcomes such as congenital anomalies and neonatal mortality. Further research on these less-reported outcomes is needed to improve understanding and the effect size of these relationships with elevated temperatures, which we know will be exacerbated by climate change.

16. **The Adverse Effects of Air Pollution on the Eye: A Review.** Lin CC, Chiu CC, Lee PY, Chen KJ, He CX, Hsu SK, Cheng KC. *Int J Environ Res Public Health*. 2022 Jan 21;19(3):1186. doi: 10.3390/ijerph19031186.

<https://www.mdpi.com/1660-4601/19/3/1186>

Air pollution is inevitably the result of human civilization, industrialization, and globalization. It is composed of a mixture of gases and particles at harmful levels. Particulate matter (PM), nitrogen oxides (NO_x), and carbon dioxides (CO₂) are mainly generated from vehicle emissions and fuel consumption and are the main materials causing outdoor air pollution. Exposure to polluted outdoor air has been proven to be harmful to human eyes. On the other hand, indoor air pollution from environmental tobacco smoking, heating, cooking, or poor indoor ventilation is also related to several eye diseases, including conjunctivitis, glaucoma, cataracts, and age-related macular degeneration (AMD). In the past 30 years, no updated review has provided an overview of the impact of air pollution on the eye. We reviewed reports on air pollution and eye diseases in the last three decades in the PubMed database, Medline databases, and Google Scholar and discussed the effect of various outdoor and indoor pollutants on human eyes.

17. **Climate Change and State of the Science for Children's Health and Environmental Health Equity.** Fuller MG, Cavanaugh N, Green S, Duderstadt K. *J Pediatr Health Care*. 2022 Jan-Feb;36(1):20-26. doi: 10.1016/j.pedhc.2021.08.003. Epub 2021 Sep 5.

<https://www.clinicalkey.com#!/content/playContent/1-s2.0-S0891524521001905>

RESULTS: The poor and communities of color are disproportionately impacted by climate change. Physical health impacts include increased vector and water-borne infectious diseases, increases in asthma and respiratory infections, and undernutrition. Social disruptions lead to human trafficking. Climate change is associated with mental health concerns, including anxiety and posttraumatic stress after natural disasters.

DISCUSSION: As clinicians, pediatric-focused providers, and advanced practice registered nurses should use multipronged and interdisciplinary approaches to address or prevent the adverse impacts of climate change. Advocacy at all government levels is necessary to safeguard children and vulnerable populations.

18. Environmental Risk Factors for Childhood Cancer in an Era of Global Climate Change: A Scoping Review. Buser JM, Lake K, Ginier E. *J Pediatr Health Care*. 2022 Jan-Feb;36(1):46-56.

doi:

10.1016/j.pedhc.2021.05.005. Epub 2021 Jun 13.

<https://www.sciencedirect.com/science/article/pii/S0891524521001024>

RESULTS: The scoping review identified 47 studies about environmental risk factors for childhood cancer with mixed results and limited consensus in four main categories, including air pollution, chemical exposures, radiation, and residential location.

DISCUSSION: Research by collaborative international groups of planetary health researchers about environmental risk factors is needed to inform global health policy for childhood cancer prevention efforts.

19. Air Pollution Is Associated with Cognitive Deterioration of Alzheimer's Disease. Lin FC, Chen CY, Lin CW, Wu MT, Chen HY, Huang P. *Gerontology*. 2022;68(1):53-61. doi:

10.1159/000515162. Epub 2021 Apr 21.

CONCLUSIONS: Air pollution is an environment-related risk factor that can be controlled and is associated with cognitive deterioration of AD. This finding could contribute to the implementation of public intervention strategies of AD.

WE ACT

20. Building sustainable and resilient surgical systems: A narrative review of opportunities to integrate climate change into national surgical planning in the Western Pacific region. Qin RX, Velin L, Yates EF, El Omrani O, McLeod E, Tudravu J, Samad L, Woodward A, McClain CD. *Lancet Reg Health West Pac*. 2022 Feb 23;22:100407. doi: 10.1016/j.lanwpc.2022.100407. eCollection 2022 May.

<https://www.sciencedirect.com/science/article/pii/S2666606522000220>

Five billion people lack access to surgical care worldwide; climate change is the biggest threat to human health in the 21st century. This review studies how climate change could be integrated into national surgical planning in the Western Pacific region. We searched databases (PubMed, Web of Science, and Global Health) for articles on climate change and surgical care. Findings were categorised using the modified World Health Organisation Health System Building Blocks Framework. 220 out of 2577 records were included. Infrastructure: Operating theatres are highly resource-intensive. Their carbon footprint could be reduced by maximising equipment longevity, improving energy efficiency, and renewable energy use. Service delivery Tele-medicine, outreaches, and avoiding desflurane could reduce emissions. Robust surgical systems are required to adapt to the increasing burden of surgically treated diseases, such as injuries from natural disasters. Finance: Climate change adaptation funds could be mobilised for surgical system strengthening. Information systems: Sustainability should be a key performance indicator for surgical systems. Workforce: Surgical providers could change clinical, institutional, and societal practices. Governance: Planning in surgical care and climate change should be aligned. Climate change mitigation is essential in the regional surgical care scale-up; surgical system strengthening is also necessary for adaptation to climate change.

21. **Climate Change, Health, and Healthcare Systems: A Global Perspective.** Setoguchi S, Leddin D, Metz G, Omary MB. *Gastroenterology*. 2022 Mar 2:S0016-5085(22)00204-9. doi: 10.1053/j.gastro.2022.02.037. Online ahead of print.

<https://www.clinicalkey.com/#!/content/journal/1-s2.0-S0016508522002049>

Many of us who have served in healthcare long enough witnessed a transition from cloth gowns, sheets, and reusable surgical trays to disposal plastic replacements decades ago. However, we have rarely connected a pair of gloves and equipment that were discarded after each use to melting ice caps and dying polar bears. Even though climate scientists long predicted devastating effects of climate change, we have more recently come to the realization that climate change is real, and have been increasingly experiencing and poignantly witnessing climate disasters around the globe. For example, in 2021, one in three people in the United States (US) experienced a weather disaster; catastrophic flooding killed hundreds and affected tens of thousands in China, Europe, Canada, and Africa; and prolonged droughts strained South America as heatwaves became more frequent and severe around the globe. In October 2021, the World Health Organization (WHO) identified climate change as “the single biggest health threat facing humanity”.²

22. **Eco-audit of conventional heart surgery procedures.** Grinberg D, Buzzi R, Pozzi M, Schweizer R, Capsal JF, Thillot B, Quyen Le M, Obadia JF, Cottinet PJ. *Eur J Cardiothorac Surg*. 2021 Dec 1;60(6):1325-1331. doi: 10.1093/ejcts/ezab320.

Erratum in

Eur J Cardiothorac Surg. 2021 Oct 05;:

Comment in

Eur J Cardiothorac Surg. 2021 Dec 1;60(6):1332-1333.

CONCLUSIONS: Conventional isolated cardiac procedures yield the global warming equivalent of a 1080 km plane ride for a single passenger. The environmental impact of such life-saving interventions, therefore, must be put in perspective alongside pollution induced by 'non-indispensable' human activities. However, numerous initiatives at the local and individual level as well as at a larger systemic and countrywide scale appear to provide accessible pathways to meaningfully reduce greenhouse gas emissions during cardiac surgery.

23. **Trash Talk in the ED: Takeaways from Waste Audits at New England Hospitals.** Martin KD, McCormick W, Capacci J, Moretti K. *R I Med J* (2013). 2021 Nov 1;104(9):43-44.

<http://rimed.org/rimedicaljournal/2021/11/2021-11-43-climate-commentary-martin.pdf>

Recent investigations at Kent Hospital, a suburban community hospital in Rhode Island, and Massachusetts General Hospital (MGH), a Level 1 trauma center, highlight the importance of health care waste.^{1,2} These investigations involve a simple concept: sorting through trash can help identify ways to cut costs and reduce environmental impact.

[U.N. panel warns of warming's toll and an 'adaptation gap'](#). Voosen P. Science. 2022 Mar 4;375(6584):948. doi: 10.1126/science.adb1761. Epub 2022 Mar 3.

[This US Supreme Court decision could derail Biden's climate plan](#). Tollefson J. Nature. 2022 Mar 3. doi: 10.1038/d41586-022-00618-1. Online ahead of print.

[G20's US\\$14-trillion economic stimulus reneges on emissions pledges](#). Nahm JM, Miller SM, Urpelainen J. Nature. 2022 Mar;603(7899):28-31. doi: 10.1038/d41586-022-00540-6.

[Climate change is outpacing efforts to adapt, warns intergovernmental panel](#). Dyer O. BMJ. 2022 Mar 1;376:o541. doi: 10.1136/bmj.o541.

[Climate change won't wait for future innovation - we need action now](#). Brisbois MC. Nature. 2022 Mar;603(7899):9. doi: 10.1038/d41586-022-00560-2.

[Harmony between Man and His Environment: Reviewing the Trump Administration's Changes to the National Environmental Policy Act in the Context of Environmental Racism](#). Kolencik GM. J Law Med Ethics. 2022;50(1):76-84. doi: 10.1017/jme.2022.11.

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