

Environmental Stewardship Resource Desk

#55 | 2.23.2022 to 3.1.2022

Prepared by [System Library Services](#)

Visit the [Environmental Stewardship site](#)

New Research

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

COVID-19

1. **Assessing face masks in the environment by means of the DPSIR framework.** Tesfaldet YT, Ndeh NT. *Sci Total Environ.* 2022 Mar 25;814:152859. doi: 10.1016/j.scitotenv.2021.152859. Epub 2022 Jan 4.

<https://www.sciencedirect.com/science/article/pii/S0048969721079389>

This review paper delves into face masks in the environment using the DPSIR (driving forces, pressures, states, impacts, and responses) framework to simplify and communicate the environmental indicators. Firstly, the historical, and briefly the economic trajectory of face masks are discussed. Secondly, the main driving forces of face masks use with an emphasis on public health are explored. Then, the pressures exerted by efforts to fulfill the human needs (driving forces) are investigated. In turn, the state of the environment due to the influx of masks along with the impacts are examined. Furthermore, the upstream, and downstream societal responses to mitigate the environmental damages of the driving forces, pressures, states, and impacts are reviewed. In summary, it has been shown from this review that the COVID-19 pandemic has been causing a surge in face mask usage, which translates to face masks pollution in both terrestrial and aquatic environments. This implies proper usage and disposal of face masks is paramount to the quality of human health and the environment, respectively. Moreover, further research on eco-friendly face masks is indispensable to mitigating the environmental damages occurring due to the mass use of surgical masks worldwide.

2. **Pharmaceutical compounds used in the COVID-19 pandemic: A review of their presence in water and treatment techniques for their elimination.** Morales-Paredes CA, Rodríguez-Díaz JM, Boluda-Botella N. *Sci Total Environ.* 2022 Mar 25;814:152691. doi: 10.1016/j.scitotenv.2021.152691. Epub 2021 Dec 30.

<https://www.sciencedirect.com/science/article/pii/S004896972107769X>

During the COVID-19 pandemic, high consumption of antivirals, antibiotics, antiparasitics, antiprotozoals, and glucocorticoids used in the treatment of this virus has been reported. Conventional treatment systems fail to efficiently remove these contaminants from water, becoming an emerging concern from the environmental field. Therefore, the objective of the present work is to address the current state of the literature on the presence and removal processes of these drugs from water bodies. It was found that the concentration of most of the drugs used in the treatment of COVID-19 increased during the pandemic in water bodies. Before the pandemic, Azithromycin concentrations in surface waters were reported to be in the order of 4.3 ng L⁻¹, and during the pandemic, they increased up to 935 ng L⁻¹. Laboratory scale studies conclude that adsorption and advanced oxidation processes (AOPs) can be effective in the removal of these drugs. Up to more than 80% removal of Azithromycin, Chloroquine, Ivermectin, and Dexamethasone in aqueous solutions have been reported using these processes. Pilot-scale tests achieved 100% removal of Azithromycin from hospital wastewater by adsorption with powdered activated carbon. At full scale, treatment plants supplemented with ozonation and artificial wetlands removed all Favipiravir and Azithromycin, respectively. It should be noted that hybrid technologies can improve removal rates, process kinetics, and treatment cost. Consequently, the development of new materials that can act synergistically in technically and economically sustainable treatments is required.

3. Waste management beyond the COVID-19 pandemic: Bibliometric and text mining analyses.

Ranjbari M, Shams Esfandabadi Z, Gautam S, Ferraris A, Scagnelli SD. *Gondwana Res.* 2022 Feb 5. doi: 10.1016/j.gr.2021.12.015. Online ahead of print.

<https://www.sciencedirect.com/science/article/pii/S1342937X22000272>

The outbreak of the COVID-19 pandemic has significantly increased the demand for personal protective equipment, in particular face masks, thus leading to a huge amount of healthcare waste generated worldwide. Consequently, such an unprecedented amount of newly emerged waste has posed significant challenges to practitioners, policy-makers, and municipal authorities involved in waste management (WM) systems. This research aims at mapping the COVID-19-related scientific production to date in the field of WM. In this vein, the performance indicators of the target literature were analyzed and discussed through conducting a bibliometric analysis. The conceptual structure of COVID-19-related WM research, including seven main research themes, were uncovered and visualized through a text mining analysis as follows: (1) household and food waste, (2) personnel safety and training for waste handling, (3) sustainability and circular economy, (4) personal protective equipment and plastic waste, (5) healthcare waste management practices, (6) wastewater management, and (7) COVID-19 transmission through infectious waste. Finally, a research agenda for WM practices and activities in the post-COVID-19 era was proposed, focusing on the following three identified research gaps: (i) developing a systemic framework to properly manage the pandemic crisis implications for WM practices as a whole, following a systems thinking approach, (ii) building a circular economy model encompassing all activities from the design stage to the implementation stage, and (iii) proposing incentives to effectively involve informal sectors and local capacity in decentralizing municipal waste management, with a specific focus on developing and less-developed countries.

4. **Ecological studies of COVID-19 and air pollution: How useful are they?** Villeneuve PJ, Goldberg MS. *Environ Epidemiol.* 2022 Feb 4;6(1):e195. doi: 10.1097/EE9.000000000000195. eCollection 2022 Feb.

https://journals.lww.com/environepidem/Fulltext/2022/02000/Ecological_studies_of_COVID_19_and_air_pollution_.13.aspx

RESULTS: Our analyses revealed that the shape of the exposure-response curve between PM_{2.5} and COVID-19 changed substantially over time. Analyses of COVID-19 mortality through June 30, 2021, suggested a positive linear relationship. In contrast, an inverse pattern was observed using county-level concentrations of PM_{2.5} and the prevalence of HIV.

CONCLUSIONS: Our analyses indicated that ecological analyses are prone to showing spurious relationships between ambient air pollution and mortality from COVID-19 as well as the prevalence of HIV. We discuss the many potential biases inherent in any ecological-based analysis of air pollution and COVID-19.

Health Impacts of Climate Change

5. **Pharmaceutical pollution of the world's rivers.** Wilkinson JL et al. *Proc Natl Acad Sci U S A.* 2022 Feb 22;119(8):e2113947119. doi: 10.1073/pnas.2113947119.

<https://www.pnas.org/content/119/8/e2113947119>

Environmental exposure to active pharmaceutical ingredients (APIs) can have negative effects on the health of ecosystems and humans. While numerous studies have monitored APIs in rivers, these employ different analytical methods, measure different APIs, and have ignored many of the countries of the world. This makes it difficult to quantify the scale of the problem from a global perspective. Furthermore, comparison of the existing data, generated for different studies/regions/continents, is challenging due to the vast differences between the analytical methodologies employed. Here, we present a global-scale study of API pollution in 258 of the world's rivers, representing the environmental influence of 471.4 million people across 137 geographic regions. Samples were obtained from 1,052 locations in 104 countries (representing all continents and 36 countries not previously studied for API contamination) and analyzed for 61 APIs. Highest cumulative API concentrations were observed in sub-Saharan Africa, south Asia, and South America. The most contaminated sites were in low- to middle-income countries and were associated with areas with poor wastewater and waste management infrastructure and pharmaceutical manufacturing. The most frequently detected APIs were carbamazepine, metformin, and caffeine (a compound also arising from lifestyle use), which were detected at over half of the sites monitored. Concentrations of at least one API at 25.7% of the sampling sites were greater than concentrations considered safe for aquatic organisms, or which are of concern in terms of selection for antimicrobial resistance. Therefore, pharmaceutical pollution poses a global threat to environmental and human health, as well as to delivery of the United Nations Sustainable Development Goals.

6. **Ambient air pollution, healthy diet and vegetable intakes, and mortality: a prospective UK Biobank study.** Wang M, Zhou T, Song Q, Ma H, Hu Y, Heianza Y, Qi L. *Int J Epidemiol.* 2022 Feb 18:dyac022. doi: 10.1093/ije/dyac022. Online ahead of print.

CONCLUSION: This study provides evidence linking long-term exposure to various air pollutants to the risk of all-cause, CVD and CHD mortality, and the potential attenuation of a healthy diet, especially high vegetable intakes, on such relations. Our findings highlight the importance of adherence to a healthy diet in lowering ambient air-pollution-related mortality risk.

7. **Long-term exposure to ambient air pollution and bladder cancer incidence in a pooled European cohort: the ELAPSE project.** Chen J et al. Br J Cancer. 2022 Feb 16. doi: 10.1038/s41416-022-01735-4. Online ahead of print.
CONCLUSIONS: We found suggestive evidence of an association between long-term PM2.5 mass exposure and bladder cancer, strengthening the evidence from the few previous studies. The association with zinc in PM2.5 suggests the importance of industrial emissions.
8. **Association Between Short-term Exposure to Environmental Air Pollution and Psoriasis Flare.** Bellinato F, Adami G, Vaienti S, Benini C, Gatti D, Idolazzi L, Fassio A, Rossini M, Girolomoni G, Gisondi P. JAMA Dermatol. 2022 Feb 16:e216019. doi: 10.1001/jamadermatol.2021.6019. Online ahead of print.
<https://jamanetwork.com/journals/jamadermatology/article-abstract/2788833>
CONCLUSIONS AND RELEVANCE: The findings of this case-crossover and cross-sectional study suggest that air pollution may be a trigger factor for psoriasis flare.
9. **Does air pollution modify temperature-related mortality? A systematic review and meta-analysis.** Hu X, Han W, Wang Y, Aunan K, Pan X, Huang J, Li G. Environ Res. 2022 Feb 15:112898. doi: 10.1016/j.envres.2022.112898. Online ahead of print.
CONCLUSIONS: PM10 and O3 modify the heat-related all-cause and non-accidental mortality, indicating that policymakers should consider air pollutants when establishing heat-health warning systems. Future studies with comparable designs and settings are needed.
10. **Air pollution and surrounding greenness in relation to ischemic stroke: A population-based cohort study.** Avellaneda-Gómez C, Vivanco-Hidalgo RM, Olmos S, Lazcano U, Valentin A, Milà C, Ambrós A, Roquer J, Tonne C. Environ Int. 2022 Feb 15;161:107147. doi: 10.1016/j.envint.2022.107147. Online ahead of print.
<https://www.sciencedirect.com/science/article/pii/S0160412022000733>
CONCLUSIONS: Higher incidence of IS was observed in relation to long-term exposures to air pollution, particularly NO2, in a region that meets European health-based air quality standards. Residential surrounding greenness was associated with lower incidence of IS.
11. **Mortality risk associated with greenness, air pollution, and physical activity in a representative U.S. cohort.** Coleman CJ, Yeager RA, Pond ZA, Riggs DW, Bhatnagar A, Arden Pope C 3rd. Sci Total Environ. 2022 Feb 14;824:153848. doi: 10.1016/j.scitotenv.2022.153848. Online ahead of print.
Several cohort studies suggest greenness is associated with decreased mortality risk. Potential confounding by or interactions between physical activity and air pollution remains unclear. This study evaluates associations of greenness, air pollution, and physical activity with mortality risk and investigates confounding and effect modification across these key risk factors. National

Health Interview Survey (NHIS) data covering 1997-2014 were linked to the National Death Index to generate a cohort of 403,748 individuals with 39,528 deaths. Greenness, represented by census-tract Normalized Difference Vegetation Index (NDVI) for the seasonal period of May-October, was averaged over the years 2003-2016. Air pollution was estimated by census-tract level PM_{2.5} concentrations from 1999 to 2015. Cox Proportional Hazard Models were used to estimate hazard ratios (HR) for differences in greenness, air pollution, and physical activity. Alternative models that evaluated potential confounding and stratified models that evaluated effect modification were examined. Mortality risks were associated with PM_{2.5} (HR = 1.14, 95% CI: 1.09-1.19 per 10 µg/m³) and physical inactivity (1.49, 1.44-1.54 relative to sufficiently active), but not with greenness (1.01, 0.99-1.03 per IQR). The PM_{2.5}-mortality association was mitigated at high levels of greenness (1.05, 0.91-1.22). There was no strong evidence of confounding between air pollution, physical activity, and greenness. However, stratified analysis suggested effect modification for PM_{2.5} and NDVI by physical activity. A significant protective greenness-mortality association was observed for only highly active individuals (0.91, 0.86-0.96). Also, relatively high PM_{2.5}-mortality HRs were observed for more physically active individuals (1.25, 1.12-1.40). PM_{2.5} air pollution and physical inactivity are robustly associated with mortality risk. Greenness may be most beneficial and air pollution relatively harmful to highly active individuals. This analysis provides evidence that, in addition to not smoking, being physically active and living in a clean, green environment contributes to improved health and reduced risk of mortality.

- 12. Prenatal exposure to air pollution is associated with altered brain structure, function, and metabolism in childhood.** Peterson BS, Bansal R, Sawardekar S, Nati C, Elgablawy ER, Hoepner LA, Garcia W, Hao X, Margolis A, Perera F, Rauh V. *J Child Psychol Psychiatry*. 2022 Feb 14. doi: 10.1111/jcpp.13578. Online ahead of print.

<https://acamh.onlinelibrary.wiley.com/doi/10.1111/jcpp.13578>

CONCLUSIONS: The commonality of effects across exposures suggests PM_{2.5} and PAH disrupt brain development through one or more common molecular pathways, such as inflammation or oxidative stress. Progressively higher exposures were associated with greater disruptions in local volumes, tissue organization, metabolite concentrations, and blood flow throughout cortical and subcortical brain regions and the white matter pathways interconnecting them. Together these affected regions comprise cortico-striato-thalamo-cortical circuits, which support the regulation of thought, emotion, and behavior.

- 13. Polycyclic aromatic hydrocarbon and its effects on human health: An updated review.** Mallah MA et al. *Chemosphere*. 2022 Feb 10:133948. doi: 10.1016/j.chemosphere.2022.133948. Online ahead of print.

Polycyclic aromatic hydrocarbons (PAHs) are a class of chemicals of considerable environmental significance. PAHs are chemical contaminants of fused carbon and hydrogen aromatic rings, basically white, light-yellow, or solid compounds without color. Natural sources of pollution are marginal or less significant, such as volcanic eruptions, natural forest fires, and moorland fires that trigger lightning bursts. The significant determinants of PAH pollution are anthropogenic pollution sources, classified into four groups, i.e., industrial, mobile, domestic, and agricultural pollution sources. Humans can consume PAHs via different routes, such as inhalation, dermal

touch, and ingestion. The Effect of PAHs on human health is primarily based on the duration and route of exposure, the volume or concentration of PAHs to which one is exposed, and the relative toxicity of PAHs. Many PAHs are widely referred to as carcinogens, mutagens, and teratogens and thus pose a significant danger to human health and the well-being of humans. Skin, lung, pancreas, esophagus, bladder, colon, and female breast are numerous organs prone to tumor development due to long-term PAH exposure. PAH exposure may increase the risk of lung cancer as well as cardiovascular disease (CVD), including atherosclerosis, thrombosis, hypertension, and myocardial infarction (MI). Preclinical studies have found a relationship between PAH exposure, oxidative stress, and atherosclerosis. In addition, investigations have discovered a relationship between PAH exposure at work and CVD illness and mortality development. This review aims to explain PAH briefly, its transportation, its effects on human health, and a relationship between environmental exposures to PAHs and CVD risk in humans.

- 14. 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.

- 15. Association of Exposure to Particulate Matter Air Pollution With Semen Quality Among Men in China.** Zhao Y, Zhu Q, Lin J, Cai J. *JAMA Netw Open*. 2022 Feb 1;5(2):e2148684. doi: 10.1001/jamanetworkopen.2021.48684.

<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2789132>

CONCLUSIONS AND RELEVANCE: These findings suggest that PM exposure may adversely affect sperm motility and highlight the need to reduce ambient particulate air pollution exposure for reproductive-aged men.

- 16. Ambient Air Pollution Exposure among Individuals Experiencing Unsheltered Homelessness.** MacMurdo MG, Mulloy KB, Felix CW, Curtis AJ, Ajayakumar J, Curtis J. *Environ Health Perspect.* 2022 Feb;130(2):27701. doi: 10.1289/EHP10414. Epub 2022 Feb 17.
<https://ehp.niehs.nih.gov/doi/10.1289/EHP10414>
We hypothesize that in addition to global air pollution, individuals experiencing unsheltered homelessness are exposed to excess air pollution as a result of proximity to stationary and mobile sources. By considering this potential exposure at the local level, our aim was to provide a broad estimate of exposure, and develop a framework of local-level geospatial analysis that can be used to guide further targeted research and intervention.
- 17. Climate change and zoonoses: A review of the current status, knowledge gaps, and future trends.** Rupasinghe R, Chomel BB, Martínez-López B. *Acta Trop.* 2022 Feb;226:106225. doi: 10.1016/j.actatropica.2021.106225. Epub 2021 Nov 7.
<https://www.sciencedirect.com/science/article/pii/S0001706X21004034>
Emerging infectious diseases (EIDs), especially those with zoonotic potential, are a growing threat to global health, economy, and safety. The influence of global warming and geoclimatic variations on zoonotic disease epidemiology is evident by alterations in the host, vector, and pathogen dynamics and their interactions. The objective of this article is to review the current literature on the observed impacts of climate change on zoonoses and discuss future trends. We evaluated several climate models to assess the projections of various zoonoses driven by the predicted climate variations. Many climate projections revealed potential geographical expansion and the severity of vector-borne, waterborne, foodborne, rodent-borne, and airborne zoonoses. However, there are still some knowledge gaps, and further research needs to be conducted to fully understand the magnitude and consequences of some of these changes. Certainly, by understanding the impact of climate change on zoonosis emergence and distribution, we could better plan for climate mitigation and climate adaptation strategies.
- 18. Drinking water, fracking, and infant health.** Hill EL, Ma L. *J Health Econ.* 2022 Jan 30;82:102595. doi: 10.1016/j.jhealeco.2022.102595. Online ahead of print.
This study assesses the health risks associated with drinking water contamination using variation in the timing and location of shale gas development (SGD). Our novel dataset, linking health and drinking water outcomes to shale gas activity through water sources, enables us to provide new estimates of the causal effects of water pollution on health and to isolate drinking water as a specific mechanism of exposure for SGD. We find consistent and robust evidence that drilling shale gas wells negatively impacts both drinking water quality and infant health. These results indicate large social costs of water pollution and provide impetus for re-visiting the regulation of public drinking water.
- 19. Air Pollution and Cognitive Impairment across the Life Course in Humans: A Systematic Review with Specific Focus on Income Level of Study Area.** Chandra M, Rai CB, Kumari N, Sandhu VK, Chandra K, Krishna M, Kota SH, Anand KS, Oudin A. *Int J Environ Res Public Health.* 2022 Jan 27;19(3):1405. doi: 10.3390/ijerph19031405.
https://www.mdpi.com/1660-4601/19/3/1405/review_report

Cognitive function is a crucial determinant of human capital. The Lancet Commission (2020) has recognized air pollution as a risk factor for dementia. However, the scientific evidence on the impact of air pollution on cognitive outcomes across the life course and across different income settings, with varying levels of air pollution, needs further exploration. A systematic review was conducted, using Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) Guidelines to assess the association between air pollution and cognitive outcomes across the life course with a plan to analyze findings as per the income status of the study population. The PubMed search included keywords related to cognition and to pollution (in their titles) to identify studies on human participants published in English until 10 July 2020. The search yielded 84 relevant studies that described associations between exposure to air pollutants and an increased risk of lower cognitive function among children and adolescents, cognitive impairment and decline among adults, and dementia among older adults with supportive evidence of neuroimaging and inflammatory biomarkers. No study from low- and middle-income countries (LMICs) was identified despite high levels of air pollutants and high rates of dementia. To conclude, air pollution may impair cognitive function across the life-course, but a paucity of studies from reLMICs is a major lacuna in research.

- 19. Uncovering Evidence: Associations between Environmental Contaminants and Disparities in Women's Health.** Rumph JT, Stephens VR, Martin JL, Brown LK, Thomas PL, Cooley A, Osteen KG, Bruner-Tran KL. *Int J Environ Res Public Health*. 2022 Jan 23;19(3):1257. doi: 10.3390/ijerph19031257.

<https://www.mdpi.com/1660-4601/19/3/1257>

Over the years, industrial accidents and military actions have led to unintentional, large-scale, high-dose human exposure to environmental contaminants with endocrine-disrupting action. These historical events, in addition to laboratory studies, suggest that exposure to toxicants such as dioxins and polychlorinated biphenyls negatively impact the reproductive system and likely influence the development of gynecologic diseases. Although high-level exposure to a single toxicant is rare, humans living in industrialized countries are continuously exposed to a complex mixture of manmade and naturally produced endocrine disruptors, including persistent organic pollutants and heavy metals. Since minorities are more likely to live in areas with known environmental contamination; herein, we conducted a literature review to identify potential associations between toxicant exposure and racial disparities in women's health. Evidence within the literature suggests that the body burden of environmental contaminants, especially in combination with inherent genetic variations, likely contributes to previously observed racial disparities in women's health conditions such as breast cancer, endometriosis, polycystic ovarian syndrome, uterine fibroids, and premature birth.

- 20. 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.

- 21. The Impact of Short-Term Outdoor Air Pollution on Clinical Status and Prognosis of Hospitalized Patients with Coronary Artery Disease Treated with Percutaneous Coronary Intervention.** Desperak P, Desperak A, Szyguła-Jurkiewicz B, Rozentryt P, Lekston A, Gaşior M. *J Clin Med*. 2022 Jan 18;11(3):484. doi: 10.3390/jcm11030484.

<https://www.mdpi.com/2077-0383/11/3/484>

RESULTS: No significant association between pollutants' concentration with baseline characteristic and in-hospital outcomes was observed. In the ACS group at 30 days, exceeding the 3rd quartile of PM10 was associated with almost 2-fold increased risk of adverse events and more than 3-fold increased risk of death. Exceeding the 3rd quartile of SO₂ was connected with more than 8-fold increased risk of death at 30 days. In the CCS group, exceeding the 3rd quartile of SO₂ was linked to almost 2,5-fold increased risk of 12-month death.

CONCLUSIONS: The acute increase in air pollutants' concentrations affect short- and mid-term prognosis in patients with CAD.

- 22. The influence of PM(2.5) exposure on kidney diseases.** Xu W, Wang S, Jiang L, Sun X, Wang N, Liu X, Yao X, Qiu T, Zhang C, Li J, Deng H, Yang G. *Hum Exp Toxicol*. 2022 Jan-Dec;41:9603271211069982. doi: 10.1177/09603271211069982.

<https://journals.sagepub.com/doi/full/10.1177/09603271211069982>

The harm of air pollution to public health has become a research hotspot, especially atmospheric fine-particulate matter (PM_{2.5}). In recent years, epidemiological investigations have confirmed that PM_{2.5} is closely related to chronic kidney disease and membranous nephropathy. Basic research has demonstrated that PM_{2.5} has an impact on the normal function of the kidneys through accumulation in the kidney, endothelial dysfunction, abnormal renin-angiotensin system, and immune complex deposition. Moreover, the mechanism of PM_{2.5} damage to the kidney involves inflammation, oxidative stress, apoptosis, DNA damage, and autophagy. In this review, we summarized the latest developments in the effects of PM_{2.5} on kidney disease in human and animal studies, so as to provide new ideas for the prevention and treatment of kidney disease.

- 23. Politics v. science: How President Trump's war on science impacted public health and environmental regulation.** Webb RM, Kurtz L. *Prog Mol Biol Transl Sci*. 2022;188(1):65-80. doi: 10.1016/bs.pmbts.2021.11.006. Epub 2022 Jan 27.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8793038/>

During his campaign for president, Joe Biden vowed to "end the politics and follow the science" when dealing with the COVID-19 pandemic and other public health and environmental crises.

He was immediately criticized by then President Trump, who cast "listen[ing] to the scientists" as something only a fool would do, and warned that it would result in a "massive [economic] depression." It is hardly surprising that Trump would take that position. After all, the Trump administration routinely prioritized economic interests, and worked tirelessly to remove what it viewed as unnecessary regulatory burdens on economic activity. The Trump administration regularly suppressed, downplayed, or simply ignored scientific research demonstrating the need for regulation to protect public health and the environment. The Biden administration has vowed to reverse course, but faces challenges in doing so due to the widespread assault on science led by former President Trump. The Trump administration's efforts to undermine science are documented in the Silencing Science Tracker, an online database, which records anti-science actions taken by the federal, state, and local governments. Drawing on more than four years of tracker data-from Trump's election to Biden's inauguration-we show that the Trump presidency fundamentally changed how federal government agencies perform, use, and communicate scientific research. While the Biden administration has taken initial steps to undo some of those changes, it still has significant work to do to restore the role of science in federal government decision-making. Its task is made more difficult by the public distrust of science engendered by the Trump presidency.

24. **Ambient particulate matter air pollution is associated with increased risk of papillary thyroid cancer.** Karzai S, Zhang Z, Sutton W, Prescott J, Segev DL, McAdams-DeMarco M, Biswal SS, Ramanathan M Jr, Mathur A. *Surgery*. 2022 Jan;171(1):212-219. doi: 10.1016/j.surg.2021.05.002. Epub 2021 Jun 29.
<https://www.clinicalkey.com/#!/content/playContent/1-s2.0-S0039606021004153>
CONCLUSION: Increasing concentration of fine (diameter $\leq 2.5 \mu\text{m}$) particulate matter in air pollution is significantly associated with the incidence of papillary thyroid carcinoma with 2 and 3 years of exposure. Our novel findings provide additional insight into the potential associations between risk factors and papillary thyroid carcinoma and warrant further investigation, specifically in areas with high levels of air pollution both nationally and internationally.

WE ACT

25. **The Triple Bottom Line and Stabilization Wedges: A Framework for Perioperative Sustainability.** Choi BJJ, Chen CL. *Anesth Analg*. 2022 Mar 1;134(3):475-485. doi: 10.1213/ANE.0000000000005890.
https://journals.lww.com/anesthesia-analgesia/Fulltext/2022/03000/The_Triple_Bottom_Line_and_Stabilization_Wedges_A.8.aspx
We present a narrative review of environmental sustainability aimed at perioperative clinicians. The review will familiarize readers with the triple bottom line framework, which aims to align the goals of delivering high-quality patient care, promoting environmental sustainability, and improving the financial position of health care organizations. We introduce the stabilization wedges model for climate change action adopted for the perioperative setting and discuss areas in which perioperative leaders can make sustainable choices. The goal of this review is to increase awareness among perioperative physicians of the environmental impacts of surgical and anesthetic care, promote engagement with sustainability efforts as a topic of professional

concern for our specialty, and inspire new research in perioperative environmental sustainability.

26. **Climate-smart Actions in the Operating Theatre for Improving Sustainability Practices: A Systematic Review.** Pradere B et al. Eur Urol. 2022 Feb 9:S0302-2838(22)00063-X. doi: 10.1016/j.eururo.2022.01.027. Online ahead of print.

[https://www.europeanurology.com/article/S0302-2838\(22\)00063-X/fulltext](https://www.europeanurology.com/article/S0302-2838(22)00063-X/fulltext)

CONCLUSIONS: This review provides arguments for many climate-smart actions that could be implemented in our daily practice. Improving awareness and education are important to act collectively in a sustainable way. Further studies are mandatory to assess the impact of these climate-smart actions in the OR.

PATIENT SUMMARY: We performed a systematic review of the available scientific literature to reference all the climate-smart actions proposed to improve the sustainability of surgical activities. Waste segregation, waste reduction and recycling, reuse and reprocessing, sterilisation, anaesthesia gas changes, and improvement of energy use in the operating room were found to be the main areas of research. There is still a long way to go to homogenise and improve the quality of our climate-smart actions.

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

News & Commentary

[The night brakes on fires are failing.](#) Nature. 2022 Feb 16. doi: 10.1038/d41586-022-00352-8. Online ahead of print.

[We Must all Join the Effort to Dismantle Environmental Racism.](#) Al-Aly Z. J Am Soc Nephrol. 2022 Jan;33(1):12-14. doi: 10.1681/ASN.2021081118. Epub 2021 Nov 17.

If you would like to receive a **customized Environmental Stewardship Topic Alert** related to your specialty or area of interest, would like a **literature search** conducted, or have difficulty **accessing** any of the above articles please contact us at librarian@providence.org

Find previous weeks [here](#).