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COVID-19

1. **Air pollution and COVID-19: clearing the air and charting a post-pandemic course: a joint workshop report of ERS, ISEE, HEI and WHO.** Andersen ZJ, Hoffmann B, Morawska L, Adams M, Furman E, Yorgancioglu A, Greenbaum D, Neira M, Brunekreef B, Forastiere F, Rice MB, Wakenhut F, Coleen E, Boogaard H, Gehring U, Melén E, Ward B, De Matteis S. Eur Respir J. 2021 Aug 12:2101063. doi: 10.1183/13993003.01063-2021. Online ahead of print.

<https://erj.ersjournals.com/content/erj/early/2021/07/08/13993003.01063-2021.full.pdf>

The COVID-19 pandemic, an emerging infectious disease probably caused by a spill over from animals, and its possible interactions with air pollution, is an existential reminder that we are a part of a larger ecosystem, and that human health is closely connected with the health of our environment and planet. Here we provide a short summary on the potential role of air pollution in the spread and worsening of health impacts of COVID-19, and on the influence of the pandemic on air pollution levels in Europe. Moreover, we outline the major lessons learned to chart a healthy post-pandemic course. This work summarizes the key messages from a workshop that took place on December 2nd, 2020, organized by the European Respiratory Society (ERS), the International Society for Environmental Epidemiology (ISEE), the Health Effects Institute (HEI), endorsed by the World Health Organization (WHO), and hosted by the European Parliament Lung Health Group, and the European Commission.

Health Impacts of Climate Change

2. **Air pollution and poverty: a deadly mix in idiopathic pulmonary fibrosis?** Sesé L, Annesi-Maesano I, Cavalin C, Nunes H. Eur Respir J. 2021 Aug 12:2101714. doi: 10.1183/13993003.01714-2021. Online ahead of print.

<https://erj.ersjournals.com/content/early/2021/07/29/13993003.01714-2021>

Disparities in respiratory health can be partly explained by environmental exposure (in particular to air pollution), and socioeconomic inequalities [1]. Although idiopathic pulmonary

fibrosis (IPF) is a rare disease, there has been growing interest over the last years in the role of air pollution in its incidence and natural history.

3. **Racial/Ethnic Disparities in Alzheimer's Disease Risk: Role of Exposure to Ambient Fine Particles.** Younan D, Wang X, Gruenewald T, Gatz M, Serre ML, Vizuete W, Braskie MN, Woods NF, Kahe K, Garcia L, Lurmann F, Manson JE, Chui HC, Wallace RB, Espeland MA, Chen JC. *J Gerontol A Biol Sci Med Sci*. 2021 Aug 12:glab231. doi: 10.1093/gerona/glab231. Online ahead of print.

BACKGROUND: Whether racial/ethnic disparities in Alzheimer's disease (AD) risk may be explained by ambient fine particles (PM_{2.5}) has not been studied.

METHODS: We conducted a prospective, population-based study on a cohort of Black (n=481) and White (n=6004) older women (aged 65-79) without dementia at enrollment (1995-98). Cox models accounting for competing risk were used to estimate the hazard ratio (HR) for racial/ethnic disparities in AD (1996-2010) defined by DSM-IV and the association with time-varying annual average PM_{2.5} (1999-2010) estimated by spatiotemporal model.

RESULTS: Over an average follow-up of 8.3 (± 3.5) years with 158 incident cases (21 in Black women), the racial disparities in AD risk (range of adjusted HR_{Black} women = 1.85-2.41) observed in various models could not be explained by geographic region, age, socioeconomic characteristics, lifestyle factors, cardiovascular risk factors, and hormone therapy assignment. Estimated PM_{2.5} exposure was higher in Black ($14.38 \pm 2.21 \mu\text{g}/\text{m}^3$) than in White ($12.55 \pm 2.76 \mu\text{g}/\text{m}^3$) women, and further adjustment for the association between PM_{2.5} and AD (adjusted HR_{PM2.5} = 1.18-1.28) slightly reduced the racial disparities by 2-6% (HR_{Black} women = 1.81-2.26). The observed association between PM_{2.5} and AD risk was ~2 times greater in Black (HR_{PM2.5} = 2.10-2.60) than in White (HR_{PM2.5} = 1.07-1.15) women (range of interaction Ps: <.01 to .01). We found similar results after further adjusting for social engagement (social strain; social support; social activity; living alone), stressful life events, WHI clinic sites, and neighborhood socioeconomic characteristics.

CONCLUSIONS: PM_{2.5} may contribute to racial/ethnic disparities in AD risk and its associated increase in AD risk was stronger amongst Black women.

4. **Systematic Review of Ozone Effects on Human Lung Function, 2013-2020.** Holm SM, Balmes JR. *Chest*. 2021 Aug 10:S0012-3692(21)03626-6. doi: 10.1016/j.chest.2021.07.2170. Online ahead of print.

[https://journal.chestnet.org/article/S0012-3692\(21\)03626-6/fulltext](https://journal.chestnet.org/article/S0012-3692(21)03626-6/fulltext)

BACKGROUND: Ozone effects on lung function are particularly important to understand in the context of the air pollution-health outcomes epidemiological literature given the complex relationships between ozone and other air pollutants with known lung function effects.

RESEARCH QUESTION: What has been learned about the association between ozone exposures and lung function, from epidemiology studies published 2013-2020?

STUDY DESIGN AND METHODS: On March 18, 2018 and Sept 8, 2020 PubMed was searched using the terms "health AND ozone", filtering to articles in English, about humans, from 2013 or later. An additional focused review searching for "ozone AND (lung function OR FEV1 OR FVC)" was performed June 26, 2021. Articles were selected for this review if they reported a specific relationship between a lung function outcome and ozone exposure.

RESULTS: Of 3271 articles screened, 53 ultimately met criteria for inclusion. A systematic review with assessment of potential for bias was conducted, but a meta-analysis was not done because of differences in exposure duration and outcome quantification. There is consistent evidence of small decreases in children's lung function, even associated with very low levels of short-term ozone exposure. The effects on adult lung function from exposure to low-level, short-term ozone are less clear, though there may be ozone-associated decrements in the elderly. Finally, long-term ozone exposure decreases both lung function and lung function growth in children, though there are few new studies of long-term ozone and lung function in adults.

INTERPRETATION: Much of this literature involves concentrations below the current US Environmental Protection Agency's National Ambient Air Quality Standard of 70 ppb over an 8-hour averaging time, suggesting that this current standard may not adequately protect children from ozone-related decrements in lung function.

5. **Long-term ozone exposure and mortality from neurological diseases in Canada.** Zhao N, Pinault L, Toyib O, Vanos J, Tjepkema M, Cakmak S. Environ Int. 2021 Aug 9;157:106817. doi: 10.1016/j.envint.2021.106817. Online ahead of print.

<https://www.sciencedirect.com/science/article/pii/S0160412021004426>

BACKGROUND: There is increasing interest in the health effects of air pollution. However, the relationships between ozone exposure and mortality attributable to neurological diseases remain unclear.

OBJECTIVES: To assess associations of long-term exposure to ozone with death from Parkinson's disease, dementia, stroke, and multiple sclerosis.

METHODS: Our analyses were based on the 2001 Canadian Census Health and Environment Cohort. Census participants were linked with vital statistics records through 2016, resulting in a cohort of 3.5 million adults/51,045,700 person-years, with 8,500/51,300/43,300/1,300 deaths from Parkinson's/dementia/stroke/multiple sclerosis, respectively. Ten-year average ozone concentrations estimated by chemical transport models and adjusted by ground measurements were assigned to subjects based on postal codes. Cox proportional hazards models were used to calculate hazard ratios (HRs) for deaths from the four neurological diseases, adjusting for eight common demographic and socioeconomic factors, seven environmental indexes, and six contextual covariates.

RESULTS: The fully adjusted HRs for Parkinson's, dementia, stroke, and multiple sclerosis mortalities related to one interquartile range increase in ozone (10.1 ppb), were 1.09 (95% confidence interval 1.04-1.14), 1.08 (1.06-1.10), 1.06 (1.04-1.09), and 1.35 (1.20-1.51), respectively. The covariates did not influence significance of the ozone-mortality associations, except airshed (i.e., broad region of Canada). During the period of 2001-2016, 5.66%/5.01%/3.77%/19.11% of deaths from Parkinson's/dementia/stroke/multiple sclerosis, respectively, were attributable to ozone exposure.

CONCLUSIONS: We found positive associations between ozone exposure and mortality due to Parkinson's, dementia, stroke, and multiple sclerosis.

6. **Climate change and environmental pollution induced risks on children's health: are pediatricians prepared to meet the challenge?** Bernasconi S, Levy C, Cohen R, Giardino I,

Pettoello-Mantovani M, Somekh E. J Pediatr. 2021 Aug 9:S0022-3476(21)00756-3. doi: 10.1016/j.jpeds.2021.08.001. Online ahead of print.

Increasing research and scientific evidence have highlighted strong links between climate change, environmental pollution, and adverse health effects in humans. In 2009, the report by The Lancet and University College London Institute for Global Health Commission emphasized climate change as the biggest threat to the survival of humanity and warned that its effects on health will affect most populations during the following decades, putting the lives and wellbeing of billions at increased risk 1). More recently, a policy statement by the American Academy of Pediatrics (AAP) and the AAP technical report on global climate change and children's health stressed that children, particularly those belonging to lower socio-economic status, are at higher risk of developing diseases for which climate change may be directly or indirectly responsible 2),3). The potential health effects of climate change and their related negative events, which plagued the world's population during recent years, have been extensively studied 4). These include disasters due to extreme weather events 5) and heat waves 6), the increase in zoonosis 7), respiratory diseases due to air pollutants and aeroallergens 8),9), water scarcity and low nutritional quality of food 10),11). Moreover, a recent review suggested that a link between climate change and mental health conditions cannot be ignored, as mental disorders represent one of the major common non-communicable diseases 12),13).

7. **Ambient Air Pollution and Lung Cancer: Nature and Nurture.** Christiani DC. Am J Respir Crit Care Med. 2021 Aug 9. doi: 10.1164/rccm.202107-1576ED. Online ahead of print.

<https://www.atsjournals.org/doi/abs/10.1164/rccm.202107-1576ED>

During a typical day, the average adult inhales about 10,000 L of air. Consequently, even the carcinogens present in the air at low concentrations are of concern as a risk factor for lung cancer in large populations. Outdoor (ambient) air can contain a number of hazardous agents, and many of these are generated by the combustion of fossil fuels, including carcinogens such as PAHs and metals such as arsenic, nickel, and chromium. Depending on the pollution sources, the constituents of "air pollution" vary by locale and over time. Particulate matter (PM),

which has multiple sources in urban air, has been studied the most as a potential lung cancer risk factor, and studies from around the world are generally consistent in finding increased cancer risk with increased PM 2.5 exposure. In 2013, the International Agency for Research on Cancer (IARC) classified ambient air pollution as Group 1 carcinogenic to humans.[1]

Particulate matter, a major component of air pollution, was evaluated separately and also classified as Group 1 carcinogen; a strong signal to the international community to take immediate action to reduce exposures.

8. **Climate Change and Mental Health: Implications for the Psychiatric Workforce.** Hwong AR, Kuhl EA, Compton WM, Benton T, Grzenda A, Doty B, Thompson L, Gogtay N, Clarke D, Alpert J. Psychiatr Serv. 2021 Aug 9:appips202100227. doi: 10.1176/appi.ps.202100227. Online ahead of print.

Climate change is a major global public mental health crisis that is expected to increase the need for mental health services. Psychiatrists and other mental health care providers must

address workforce needs through recruitment, training and education, prevention and intervention, public policy and advocacy, and direct efforts to reduce climate change. This column discusses concrete steps for the psychiatric workforce to take to prepare for growing mental health needs associated with climate change.

9. The mortality burden of nervous system diseases attributed to ambient temperature: A multi-city study in China. Su X, Song H, Cheng Y, Yao X, Li Y. *Sci Total Environ.* 2021 Aug 8;800:149548. doi: 10.1016/j.scitotenv.2021.149548. Online ahead of print.

BACKGROUNDS: Studies on the association between ambient temperature and human mortality have been widely reported, focusing on common diseases such as cardiopulmonary diseases. However, multi-city studies on the association between both high and low temperatures and mortality of nervous system diseases were scarce, especially on the evidence of vulnerable populations.

METHODS: Weekly meteorological data, air pollution data and mortality data of nervous system were collected in 5 cities in China. A quasi-Poisson regression with distributed lag non-linear model (DLNM) was applied to quantify the association between extreme temperatures and mortality of nervous system diseases. Multivariate meta-analysis was applied to estimate the pooled effects at the overall levels. The attributable fractions (AFs) were calculated to assess the mortality burden attributable to both high and low temperatures. Stratified analyses were also performed by gender and age-groups through the above steps.

RESULTS: A total of 12,132 deaths of nervous system diseases were collected in our study. The overall minimum mortality temperature was 23.9 °C (61.9th), the cumulative relative risks of extreme heat and cold for nervous system diseases were 1.33(95%CI: 1.10, 1.61) and 1.47(95%CI: 1.27, 1.71). The mortality burden attributed to non-optimal temperatures accounted for 29.54% (95%eCI: 13.45%, 40.52%), of which the mortality burden caused by low temperature and high temperature accounted for 25.89% (95%eCI: 13.03%, 34.36%) and 3.65% (95%eCI: 0.42%, 6.17%), respectively. The mortality burden attributable to ambient temperature was higher in both males and the elderly (>74 years old), with the AF of 31.85% (95%eCI: 20.68%, 39.88%) and 31.14% (95%eCI: -6.83%, 49.51%), respectively.

CONCLUSIONS: The non-optimal temperature can increase the mortality of nervous system diseases and the males and the elderly over 74 years have the highest attributable burden. The findings add the evidence of vulnerable populations of nervous system diseases against ambient temperatures.

10. The Impact of Extreme Heat Events on Emergency Departments in Canadian Hospitals. Kegel F, Luo OD, Richer S. *Wilderness Environ Med.* 2021 Aug 4:S1080-6032(21)00086-7. doi: 10.1016/j.wem.2021.05.004. Online ahead of print.

INTRODUCTION: Mean daily temperatures in Canada rose 1.7°C between 1948 and 2016, and the frequency, severity, and duration of extreme heat events has increased. These events can exacerbate underlying health conditions, bringing patients to emergency departments (EDs). This retrospective analysis assessed the impact of temperature and humidex on ED volume and length of stay (LOS).

METHODS: LOS is an indicator of ED overcrowding and system performance. Using daily maximum temperatures and humidex values, this study investigated the impact of mean 3-d

temperatures and humidex preceding ED presentation on the median and maximum ED LOS and patient volume in 2 community hospitals in Montreal, Quebec, during the summer months of 2016 to 2018. Data were analyzed with 1-way analysis of variance with post hoc Fisher least significant difference tests and Spearman correlation tests.

RESULTS: The mean maximum temperature and humidex were 26.1°C and 30.4°C, respectively (n=276 d). Mean 3-d temperatures ≥30°C were associated with higher daily ED volumes in both hospitals (138 vs 121, P=0.002 and 132 vs 125, P=0.03) and with increased median LOS at 1 hospital (8.9 vs 7.6 h, P=0.03). Mean 3-d humidex ≥35 was associated with higher daily ED volumes at both hospitals as well (136 vs 123, P=0.01 and 133 vs 125, P=0.009) with an increased median LOS at 1 hospital (8.6 vs 6.9 h, P=0.0001) with humidex values of 25 to 29.9°C.

CONCLUSIONS: Heat events were associated with increased ED presentations and LOS. This study suggests that a warming climate can impede emergency service provision by increasing the demand for and delaying timely care.

- 11. Ambient air pollution and the risk of ischaemic and haemorrhagic stroke.** Verhoeven JI, Allach Y, Vaartjes ICH, Klijn CJM, de Leeuw FE. Lancet Planet Health. 2021 Aug;5(8):e542-e552. doi: 10.1016/S2542-5196(21)00145-5.

[https://www.thelancet.com/pdfs/journals/lanplh/PIIS2542-5196\(21\)00145-5.pdf](https://www.thelancet.com/pdfs/journals/lanplh/PIIS2542-5196(21)00145-5.pdf)

Stroke is a leading cause of disability and the second most common cause of death worldwide. Increasing evidence suggests that air pollution is an emerging risk factor for stroke. Over the past decades, air pollution levels have continuously increased and are now estimated to be responsible for 14% of all stroke-associated deaths. Interpretation of previous literature is difficult because stroke was usually not distinguished as ischaemic or haemorrhagic, nor by cause. This Review summarises the evidence on the association between air pollution and the different causes of ischaemic stroke and haemorrhagic stroke, to clarify which people are most at risk. The risk for ischaemic stroke is increased after short-term or long-term exposure to air pollution. This effect is most pronounced in people with cardiovascular burden and stroke due to large artery disease or small vessel disease. Short-term exposure to air pollution increases the risk of intracerebral haemorrhage, a subtype of haemorrhagic stroke, whereas the effects of long-term exposure are less clear. Limitations of the current evidence are that studies are prone to misclassification of exposure, often rely on administrative data, and have insufficient clinical detail. In this Review, we provide an outlook on new research opportunities, such as those provided by the decreased levels of air pollution due to the current COVID-19 pandemic.

- 12. Short-term exposure to ambient air pollution and type 2 diabetes mortality: A population-based time series study.** Wu C, Yan Y, Chen X, Gong J, Guo Y, Zhao Y, Yang N, Dai J, Zhang F, Xiang H. Environ Pollut. 2021 Jul 31;289:117886. doi: 10.1016/j.envpol.2021.117886. Online ahead of print.

Acute health effects of air pollution on diabetes risk have not been fully studied in developing countries and the results remain inconsistent. This study aimed to investigate the association between short-term exposure to ambient air pollution and Type 2 diabetes mellitus (T2DM) mortality in China. Data on T2DM mortality from 2013 to 2019 were obtained from the Cause of Death Reporting System (CDRS) of Wuhan Center for Disease Control and Prevention. Air pollution data for the same period were collected from 10 national air quality monitoring

stations of Wuhan Ecology and Environment Institute, including daily average PM2.5, PM10, SO₂, and NO₂. Meteorological data including daily average temperature and relative humidity were collected from Wuhan Meteorological Bureau. Generalized additive models (GAM) based on quasi-Poisson distribution were applied to evaluate the association between short-term exposure to air pollution and daily T2DM deaths. A total of 9837 T2DM deaths were recorded during the study period in Wuhan. We found that short-term exposure to PM2.5, PM10, SO₂, and NO₂ were positively associated with T2DM mortality, and gaseous pollutants appeared to have greater effects than particulate matter (PM). For the largest effect, per 10 µg/m³ increment in PM2.5 (lag 02), PM10 (lag 02), SO₂ (lag 03), and NO₂ (lag 02) were significantly associated with 1.099% (95% CI: 0.451, 1.747), 1.016% (95% CI: 0.517, 1.514), 3.835% (95% CI: 1.480, 6.189), and 1.587% (95% CI: 0.646, 2.528) increase of daily T2DM deaths, respectively. Stratified analysis showed that females or elderly population aged 65 and above were more susceptible to air pollution exposure. In conclusion, short-term exposure to air pollution was significantly associated with a higher risk of T2DM mortality. Further research is required to verify our findings and elucidate the underlying mechanisms.

WE ACT

13. **Sustainability in quality improvement (SusQI): a case-study in undergraduate medical education.** Clery P, d'Arch Smith S, Marsden O, Leedham-Green K. BMC Med Educ. 2021 Aug 12;21(1):425. doi: 10.1186/s12909-021-02817-2.

<https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-021-02817-2>

BACKGROUND: There is a pressing need for more sustainable healthcare. UK medical graduates are required to apply social, economic, and environmental principles of sustainability to their practice. The Centre for Sustainable Healthcare has developed a sustainability in quality improvement (SusQI) framework and educator's toolkit to address these challenges. We aimed to develop and evaluate SusQI teaching using this toolkit at Bristol Medical School.

METHODS: We facilitated a SusQI workshop for all third-year Bristol Medical School students. We used mixed methods including questionnaires, exit interviews and follow-up focus groups to evaluate the outcomes and processes of learning.

RESULTS: Students reported: improvements in knowledge, confidence, and attitudes in both sustainable healthcare and quality improvement; increased self-rated likelihood to engage in SusQI projects; and willingness to change practices to reduce environmental impact in their healthcare roles. Factors for successful teaching included: interactivity; collaboration and participation; and real-life, relevant and tangible examples of projects delivered by credible role models.

CONCLUSIONS: Students reported that SusQI education supported by the toolkit was effective at building knowledge and skills, and reframed their thinking on sustainability in quality improvement. Combining the two topics provided enhanced motivation for and engagement in both. Further research is needed on the clinical impacts of SusQI learning.

14. **Preparing the Next Generation of Health Professionals to Tackle Climate Change.** Duckworth M, Hsu S, Boehler-Tatman M. Acad Med. 2021 Aug 10. doi: 10.1097/ACM.0000000000004341. Online ahead of print.

<https://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=ovft&AN=00001888-90000000-96581&PDF=y>

Climate change is the greatest health crisis of the 21st century.¹ The World Health Organization estimates that between 2030 and 2050 climate change will cause 250,000 additional deaths worldwide per year.² Moreover, the impacts of climate change are not equitable, exacerbating many racial health disparities that already exist.³ However, climate change is taught in less than 15% of medical schools worldwide.⁴ Fortunately, there is a growing movement among trainees to address this deficit. Medical students founded the Planetary Health Report Card (<https://phreportcard.org/>), a metric-based assessment tool designed to inspire medical schools to engage with planetary health. In 2021, 62 medical schools across 4 countries participated in the report card, catalyzing the inclusion of planetary health curricula in many of these schools.

- 15. Environmental physiotherapy and the case for multispecies justice in planetary health.** Maric F, Nicholls DA. Physiother Theory Pract. 2021 Aug 7:1-12. doi: 10.1080/09593985.2021.1964659. Online ahead of print.

<https://www.tandfonline.com/doi/full/10.1080/09593985.2021.1964659>

Background: Global environmental change is fundamentally altering the composition and functioning of our planetary ecosystem. Effectively presenting the largest threat to the health of present and future generations, these changes and their health impacts are forcing us to think and practice healthcare in much broader terms than ever before. **Objective:** In this article, we provide an early outline for a radically otherwise, yet strangely familiar, environmental physiotherapy developed through a succession of carefully developed arguments.

Discussion: We show how an underpinning belief in human exceptionalism has engendered an exploitative relationship with our natural planetary environment that has both shaped Western science and healthcare and led to our current environmental health crisis. Building on the dependence of human health on our planetary ecosystem, approaches like planetary health hold great promise for a corresponding, paradigmatic turn in healthcare. They fall short of this however, where they perpetuate anthropocentric interests and interventionist practices that have underpinned healthcare to date. Drawing on ethical and post-human philosophies we argue against human exceptionalism and for a solidarity that includes other-than-humans as the primary characteristic of planetary existence. **Conclusion:** Building on this foundation, we provide an early outline for a radically otherwise, yet strangely familiar, environmental physiotherapy, grounded in ecological awareness, multispecies justice, and a range of consonant practices of passivity and accompaniment, conceived as an alternative to the commonplace interventionism of healthcare.

- 16. Healthy sustainable food patterns and systems: a planetary urgency.** Lutz M. Medwave. 2021 Aug 6;21(7):e8436. doi: 10.5867/medwave.2021.07.8436.

<https://www.medwave.cl/link.cgi/English/Features/PubHealProb/8437.act>

Food choice impacts human health and planetary sustainability. The feeding patterns that reduce risk factors for noncommunicable diseases and various mortality causes are recognized as healthy eating habits. The average world population is far from reaching these habits due to the lack of access to healthy foods and a high prevalence of malnutrition. Understanding the

impact of healthy sustainable food systems is growing worldwide to reach food security for the global population and future generations. A systemic perspective of this concept includes the health and well-being of individuals and the environmental, economic, socio-cultural, public policies context, besides food, agriculture, and ecological sciences. We need to confront the menaces and challenges represented by the ongoing changes of our era, which strongly generate global food insecurity. This issue is relevant not only for human health but also for climate change and other threats, based on modifications in production, handling, and consumption of foods that consider health and welfare impact at individual and planetary levels. In this review, some key concepts related to healthy and sustainable food systems are presented.

- 17. Drug pollution & Sustainable Development Goals.** Domingo-Echaburu S, Dávalos LM, Orive G, Lertxundi U. *Sci Total Environ.* 2021 Aug 2;800:149412. doi: 10.1016/j.scitotenv.2021.149412. Online ahead of print.

The United Nations set "The 2030 Agenda for Sustainable Development," which includes the Sustainable Development Goals (SDGs), a collection of 17 global goals designed to be a "blueprint to achieve a better and more sustainable future for all". Although only mentioned in one of the seventeen goals (goal 3), we argue that drugs in general, and growing drug pollution in particular, affects the SDGs in deeper, not readily apparent ways. So far, the emerging problem of drug pollution has not been sufficiently addressed. Here, we outline and discuss how drug pollution can affect SDGs and even threaten their achievement.

- 18. Are green roofs the path to clean air and low carbon cities?** Rafael S, Correia LP, Ascenso A, Augusto B, Lopes D, Miranda AI. *Sci Total Environ.* 2021 Jul 30;798:149313. doi:10.1016/j.scitotenv.2021.149313. Online ahead of print.

Green roofs, as part of urban green structures, have been pointed out as the solution to pursuit the goal of healthy cities. This study aims to investigate the direct, focused on meteorological changes, and indirect, related to both meteorological and emissions changes, impacts of green roofs on air quality (PM10, NO₂ and O₃). For that, the numerical modelling system composed by the WRF-SLUCM-CHIMERE models was applied to a 1-year period (2017), having as case study the Porto urban area. The EnergyPlus model was also applied to estimate the green roofs impacts on the building's energy needs and related impacts on air quality and atmospheric emissions. The analysis of the direct impacts showed that green roofs promote a temperature increase during the autumn and winter seasons and a temperature decrease during the spring and summer seasons. Both negative - concentrations increase - and positive - concentrations decrease - impacts were obtained for the primary, PM10 and NO₂, and secondary, O₃, air pollutants, respectively, due to changes in the dynamical structure of the urban boundary layer. The indirect effects of green roofs showed their potential to enhance the buildings energy efficiency, reducing the cooling and heating needs. These changes in energy consumption promoted an overall decrease of the environmental and economic indicators. Regarding air quality, the impact was negligible. The obtained results highlight the need for a multipurpose evaluation of the impacts of green roofs, with the different effects having to be traded off against each other to better support the decision-making process.

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News & Commentary

Colorectal Surgeons and Climate Change? True, True and a Grain of Salt. Galandiuk S. Dis Colon Rectum. 2021 Aug 11. doi: 10.1097/DCR.0000000000002239. Online ahead of print.

[Framing climate change as a human health issue: enough to tip the scale in climate policy?](#) Rossa-Roccor V, Giang A, Kershaw P. Lancet Planet Health. 2021 Aug;5(8):e553-e559. doi: 10.1016/S2542-5196(21)00113-3.

[IPCC climate report: Earth is warmer than it's been in 125,000 years.](#) Tollefson J. Nature. 2021 Aug;596(7871):171-172. doi: 10.1038/d41586-021-02179-1.

[Who Wants a Seat at the Table for Dietary and Climate Change Strategies?](#) Johnson SL. J Nutr Educ Behav. 2021 Aug;53(8):642. doi: 10.1016/j.jneb.2021.06.013.

[Air pollution data in COVID-19 time: A call for improving availability and accessibility.](#) Nascimento C, Oliveira S, Carvalho H. J Glob Health. 2021 Jul 24;11:03089. doi: 10.7189/jogh.11.03089. eCollection 2021.

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