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#37 | 10.20.2021 to 10.26.2021

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COVID-19

1. **The occurrence of COVID-19 is associated with air quality and relative humidity.** Tong L, Ji L, Li D, Xu H. J Med Virol. 2021 Oct 14. doi: 10.1002/jmv.27395. Online ahead of print. https://onlinelibrary.wiley.com/doi/10.1002/jmv.27395
   In summary, meteorological factors could affect the occurrence of COVID-19. Reducing the effects of meteorological factors on COVID-19 may be an important public health action for the prevention and control of COVID-19.

2. **Association between air pollution and COVID-19 mortality and morbidity.** Semczuk-Kaczmarek K, Rys-Czaporowska A, Sierdzinski J, Kaczmarek LD, Szymanski FM, Platek AE. Intern Emerg Med. 2021 Oct 12:1-7. doi: 10.1007/s11739-021-02834-5. Online ahead of print. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8505468/
   The long-term exposure to air pollution, especially PM2.5, PM10, SO2, NO2, O3 seems to play an essential role in COVID-19 prevalence and mortality. Long-term exposure to air pollution might increase the susceptibility to the infection, exacerbates the severity of SARS-CoV-2 infections, and worsens the patients' prognosis. The study provides generalized and possible universal trends. Detailed analyzes of the phenomenon dedicated to a given region require taking into account data on comorbidities and socioeconomic variables as well as information about the long-term exposure to air pollution and COVID-19 cases and deaths at smaller administrative level of jurisdictions (community or at least district level).

3. **Weather, air pollution, and SARS-CoV-2 transmission: a global analysis.** Xu R, Rahmandad H, Gupta M, DiGennaro C, Ghaffarzadegan N, Amini H, Jalali MS. Lancet Planet Health. 2021 Oct;5(10):e671-e680. doi: 10.1016/S2542-5196(21)00202-3. https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(21)00202-3/fulltext
   INTERPRETATION: Warmer temperature and moderate outdoor ultraviolet exposure result in a slight reduction in the transmission of SARS-CoV-2; however, changes in weather or air

pollution alone are not enough to contain the spread of SARS-CoV-2 with other factors having greater effects.

4. **Infectious disease in an era of global change.** Baker RE et al. Nat Rev Microbiol. 2021 Oct 13:1-13. doi: 10.1038/s41579-021-00639-z. Online ahead of print.
   https://www.nature.com/articles/s41579-021-00639-z
   The twenty-first century has witnessed a wave of severe infectious disease outbreaks, not least the COVID-19 pandemic, which has had a devastating impact on lives and livelihoods around the globe. The 2003 severe acute respiratory syndrome coronavirus outbreak, the 2009 swine flu pandemic, the 2012 Middle East respiratory syndrome coronavirus outbreak, the 2013-2016 Ebola virus disease epidemic in West Africa and the 2015 Zika virus disease epidemic all resulted in substantial morbidity and mortality while spreading across borders to infect people in multiple countries. At the same time, the past few decades have ushered in an unprecedented era of technological, demographic and climatic change: airline flights have doubled since 2000, since 2007 more people live in urban areas than rural areas, population numbers continue to climb and climate change presents an escalating threat to society. In this Review, we consider the extent to which these recent global changes have increased the risk of infectious disease outbreaks, even as improved sanitation and access to health care have resulted in considerable progress worldwide.

5. **Getting out of crises: Environmental, social-ecological and evolutionary research is needed to avoid future risks of pandemics.** Destoumieux-Garzón D et al. Environ Int. 2021 Oct 8;158:106915. doi: 10.1016/j.envint.2021.106915. Online ahead of print.
   https://www.sciencedirect.com/science/article/pii/S0160412021005407
   The implementation of One Health/EcoHealth/Planetary Health approaches has been identified as key (i) to address the strong interconnections between risk for pandemics, climate change and biodiversity loss and (ii) to develop and implement solutions to these interlinked crises. As a response to the multiple calls from scientists on that subject, we have here proposed seven long-term research questions regarding COVID-19 and emerging infectious diseases (EIDs) that are based on effective integration of environmental, ecological, evolutionary, and social sciences to better anticipate and mitigate EIDs. Research needs cover the social ecology of infectious disease agents, their evolution, the determinants of susceptibility of humans and animals to infections, and the human and ecological factors accelerating infectious disease emergence. For comprehensive investigation, they include the development of nature-based solutions to interlinked global planetary crises, addressing ethical and philosophical questions regarding the relationship of humans to nature and regarding transformative changes to safeguard the environment and human health. In support of this research, we propose the implementation of innovative multidisciplinary facilities embedded in social ecosystems locally: ecological health observatories and living laboratories. This work was carried out in the frame of the European Community project HERA (www.HERAresearchEU.eu), which aims to set priorities for an environment, climate and health research agenda in the European Union by adopting a systemic approach in the face of global environmental change.

Health Impacts of Climate Change

6. **Association Between Particulate Matter Air Pollution and Heart Attacks in San Diego County.** Khanum S, Chowdhury Z, Sant KE. J Air Waste Manag Assoc. 2021 Oct 15. doi: 10.1080/10962247.2021.1994053. Online ahead of print.
   Particulate matter is an adverse contributor to overall health throughout the lifespan, contributing to diseases such as asthma, hypertension, stroke, and increased risk of cardiovascular events. Here, we assess the relationship between particulate matter and heart attacks in San Diego County using CalEnviroScreen3.0. Using these tools, we also examine correlations between this relationship and different sociodemographic indicators such as age, race, income, and proximity to the high-traffic US-Mexico border. Overall, we show that specific communities around San Diego are more highly exposed to particulate matter, and that these relationships may be disproportionately contributing to heart attacks in disadvantaged communities.

7. **Cardiovascular Effects of Particulate Air Pollution.** Bhatnagar A. Annu Rev Med. 2021 Oct 13. doi: 10.1146/annurev-med-042220-011549. Online ahead of print.
   Inhalation of fine particulate matter (PM2.5), produced by the combustion of fossil fuels, is an important risk factor for cardiovascular disease. Exposure to PM2.5 has been linked to increases in blood pressure, thrombosis, and insulin resistance. It also induces vascular injury and accelerates atherogenesis. Results from animal models corroborate epidemiological evidence and suggest that the cardiovascular effects of PM2.5 may be attributable, in part, to oxidative stress, inflammation, and the activation of the autonomic nervous system. Although the underlying mechanisms remain unclear, there is robust evidence that long-term exposure to PM2.5 is associated with premature mortality due to heart failure, stoke, and ischemic heart disease.

8. **Long-term exposure to air pollution and the risk of developing sudden sensorineural hearing loss.** Tsai SC, Hsu YC, Lai JN, Chou RH, Fan HC, Lin FC, Zhang R, Lin CL, Chang KH. J Transl Med. 2021 Oct 12;19(1):424. doi: 10.1186/s12967-021-03095-8.
   https://translational-medicine.biomedcentral.com/articles/10.1186/s12967-021-03095-8
   RESULTS: When considered continuous air pollutants concentration, subjects who exposed with higher concentration of CO (aHR = 2.16, 95% CI 1.50-3.11), NO (aHR = 1.02, 95% CI 1.01-1.03), and NO2 (aHR = 1.02, 95% CI 1.01-1.04) developing significant higher risk of SSNHL. When classified air pollutants concentration into low, moderate and high level by tertiles, and selected low level as reference, patients exposed with moderate (aHR = 1.56, 95% CI 1.20-2.04) or high level (aHR = 1.33, 95% CI 1.01-1.75) of PM2.5 showed significant higher risk of developing SSNHL.
   CONCLUSION: This study indicated an increased risk of SSNHL in residents with long-term exposure to air pollution. Nevertheless, further experimental, and clinical studies are needed to validate the study findings.

9. **Air pollution and pediatric respiratory hospital admissions in Bursa, Turkey: A time series study.** Ünal E, Özdemir A, Khanjani N, Dastoorpoor M, Özkaya G. Int J Environ Health Res. 2021 Oct 12:1-14. doi: 10.1080/09603123.2021.1991282. Online ahead of print.

We aimed to investigate the relation between air pollution and the number of daily hospitalizations due to pneumonia, asthma, bronchitis in children aged 0-18 in Bursa city of Turkey, between the years 2013-2018. The daily values of air pollutants (PM10, SO2, NO2, NOx, CO, and O3) from 2013 until 2018, were obtained. Adjusted Quasi-Poisson regression models including distributed lags, controlled for climate variables were used for data analysis. Increases in SO2, ozone, PMs, and nitrogen oxides were associated with pneumonia hospitalizations, increases in SO2 NOx and PMs were associated with asthma hospitalizations, and increases in SO2 and ozone were associated with bronchitis hospitalizations. Male hospitalization was related with SO2, ozone, and NOx; while female hospitalization was only related with SO2. This study showed that short-term exposure to air pollution is associated with an increased risk of pneumonia, asthma, and bronchitis hospitalization among children in Bursa.

10. **Ambient temperature and mental health hospitalizations in Bern, Switzerland: A 45-year time-series study.** Bundo M et al. PLoS One. 2021 Oct 12;16(10):e0258302. doi: 10.1371/journal.pone.0258302. eCollection 2021.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8509878/
CONCLUSIONS: Our findings suggest that increasing temperatures could negatively affect mental status in psychiatric patients. Specific public health policies are urgently needed to protect this vulnerable population from the effects of climate change.

11. **PM2.5 exposure in association with AD-related neuropathology and cognitive outcomes.** Thiankhaw K, Chattipakorn N, Chattipakorn SC. Environ Pollut. 2021 Oct 8;292(Pt A):118320. doi: 10.1016/j.envpol.2021.118320. Online ahead of print.
https://www.sciencedirect.com/science/article/pii/S0269749121019023
This review summarizes and discusses studies from in vitro, in vivo, and clinical studies on causative relationships of PM2.5 exposure to AD-related neuropathology. Conflicting data are also examined in order to determine the actual association between ambient air pollution and neurodegenerative diseases.

12. **Environment in Children's Health: A New Challenge for Risk Assessment.** Mastorci F, Linzalone N, Ait-Ali L, Pingitore A. Int J Environ Res Public Health. 2021 Oct 4;18(19):10445. doi: 10.3390/ijerph181910445.
https://www.mdpi.com/1660-4601/18/19/10445
The present paper provides an overview of physiologic and behavioral characteristics during the perinatal period and in childhood, suggesting in a more integrated way, the need of a new risk-assessment approach to managing chronic disease in pediatric patients.

13. **Long-term effect of exposure to lower concentrations of air pollution on mortality among US Medicare participants and vulnerable subgroups: a doubly-robust approach.** Yazdi MD et al. Lancet Planet Health. 2021 Oct;5(10):e689-e697. doi: 10.1016/S2542-5196(21)00204-7.
https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(21)00204-7/fulltext
FINDINGS: We found an increased risk of mortality with all three pollutants. Each 1 µg/m3 increase in annual PM2·5 concentrations increased the absolute annual risk of death by 0·073% (95% CI 0·071-0·076). Each 1 ppb increase in annual NO2 concentrations increased the annual

risk of death by 0·003% (0·003-0·004), and each 1 ppb increase in summer O3 concentrations increased the annual risk of death by 0·081% (0·080-0·083). This increase translated to approximately 11 540 attributable deaths (95% CI 11 087-11 992) for PM2·5, 1176 attributable deaths (998-1353) for NO2, and 15 115 attributable deaths (14 896-15 333) for O3 per year for each unit increase in pollution concentrations. The effects were higher in certain subgroups, including individuals living in areas of low socioeconomic status. Long-term exposure to permissible concentrations of air pollutants increases the risk of mortality.

WE ACT

14. **Non-sterile examination gloves and sterile surgical gloves: Which are more sustainable?** Jamal H, Lyne A, Ashley P, Duane B. J Hosp Infect. 2021 Oct 13:S0195-6701(21)00349-2. doi: 10.1016/j.jhin.2021.10.001. Online ahead of print.
https://www.clinicalkey.com/#!/content/journal/1-s2.0-S0195670121003492
Healthcare professionals should consider environmental sustainability when using personal protective equipment (PPE). One of the most frequently used PPE in medical settings are gloves. This study aims to quantify the environmental impact of sterile versus non-sterile gloves using the life cycle assessment (LCA) methodology. This study used three glove types: non-sterile gloves and sterile gloves (latex and latex-free). Sixteen different environmental impact categories were used to demonstrate the impact of each glove type. Non-sterile gloves had the least environmental impact in all categories. The two types of sterile gloves, nonlatex (synthetic rubber) and latex (natural rubber), performed similarly, although the nonlatex gloves had a greater impact on ozone depletion, mineral use, and ionising radiation. For climate change impact, sterile latex gloves were 11.6 times higher than non-sterile gloves. This study found that for both sterile type gloves (latex and nonlatex), the manufacture of the gloves contributes to the most considerable environmental impact, with an average of 64.37% for sterile latex gloves and 60.48% for nonlatex sterile gloves. Using the LCA methodology, this study quantitatively demonstrated the environmental impact of sterile versus non-sterile gloves.

15. **Geriatric medicine in the era of climate change.** Davies B, Bhutta MF. Age Ageing. 2021 Oct 13:afab199. doi: 10.1093/ageing/afab199. Online ahead of print.
Climate change has been termed the greatest threat to human health of the 21st century. Older people and those living with frailty are more vulnerable to the effects of climate change including heatwaves and extreme weather events, and therefore, we have a responsibility to advocate for action on the climate emergency and take steps to reduce the environmental impact of our care provision. The NHS contributes 5.7% to the carbon footprint of the UK, and by reviewing the financial costs associated with frailty, we estimate the carbon footprint of frailty to be 1.7 MtCO2e, or 7% of the total NHS carbon footprint. Resource use also increases with age with particular interventions and medical equipment such as hearing and mobility aids being predominantly associated with the care of older people. The NHS has committed to net zero carbon emissions by 2045 and in order to achieve this we all need to act-balancing the triple bottom line of environmental, social and financial impacts alongside outcomes for patients and populations when making decisions about care. The principles of sustainable healthcare are already embedded in the geriatrician's holisitic approach to the care of older

people and those living with frailty, and the imperative to reduce the carbon footprint of healthcare should add weight to the argument for extending the role of the geriatrician into other specialties. It is time to begin our journey to net-zero geriatric medicine.

16. **Ophthalmology Going Greener: A Narrative Review.** Wong YL, Noor M, James KL, Aslam TM. Ophthalmol Ther. 2021 Oct 11:1-13. doi: 10.1007/s40123-021-00404-8. Online ahead of print. https://link.springer.com/article/10.1007/s40123-021-00404-8
The combined effects of fossil fuel combustion, mass agricultural production and deforestation, industrialisation and the evolution of modern transport systems have resulted in high levels of carbon emissions and accumulation of greenhouse gases, causing profound climate change and ozone layer depletion. The consequential depletion of Earth's natural ecosystems and biodiversity is not only a devastating loss but a threat to human health. Sustainability-the ability to continue activities indefinitely-underpins the principal solutions to these problems. Globally, the healthcare sector is a major contributor to carbon emissions, with waste production and transport systems being amongst the highest contributing factors. The aim of this review is to explore modalities by which the healthcare sector, particularly ophthalmology, can reduce carbon emissions, related costs and overall environmental impact, whilst maintaining a high standard of patient care.

17. **Environmental impacts of hazardous waste, and management strategies to reconcile circular economy and eco-sustainability.** Zhang Z, Malik MZ, Khan A, Ali N, Malik S, Bilal M. Sci Total Environ. 2021 Oct 7;807(Pt 2):150856. doi: 10.1016/j.scitotenv.2021.150856. Online ahead of print.
The virtual survey of the available literature on waste management shows that it lacks specificity regarding the management of waste products parallel to ecological sustainability. The presented review covers the sources, potential environmental impacts, and highlights the importance of waste management strategies to provide the latest and updated knowledge. The review also put forward the countermeasures that need to be taken on national and International levels addressing the sensitive issue of waste management.

18. **Uniting the Global Gastroenterology Community to Meet the Challenge of Climate Change and Non-Recyclable Waste.** Leddin D et al. Gastroenterology. 2021 Sep 21:S0016-5085(21)03339-4. doi: 10.1053/j.gastro.2021.08.001. Online ahead of print.
Climate change has been described as the biggest global health threat of the 21st century1 and has significant implications for gastrointestinal (GI) health and disease,2 which is the focus of this consensus commentary provided by the World Gastroenterology Organisation (WGO) Climate Change Working Group (CCWG). The CCWG has members from 18 countries representing high-income, medium-income and low-income populations. The WGO includes gastroenterology societies from 108 countries, which represent more than 60 000 medical practitioner members. The CCWG members, who have coauthored this consensus commentary, aim to review the scientific literature on climate and GI health, to encourage education and the undertaking of actionable measures including advocacy, and to further research and collaborations within the global GI community. The CCWG's objective is to assist GI health providers worldwide to adapt to, and mitigate, the effects of climate change on health. The

CCWG has partnered with three major GI journals, which are copublishing this commentary, given the timeliness and importance of the topic.3 4

19. **Planetary Health, Climate Change, and Lifestyle Medicine: Threats and Opportunities.** Pathak N, McKinney A. Am J Lifestyle Med. 2021 Apr 21;15(5):541-552. doi: 10.1177/15598276211008127. eCollection 2021 Sep-Oct. https://journals.sagepub.com/doi/10.1177/15598276211008127
Global environmental degradation and climate change threaten the foundation of human health and well-being. In a confluence of crises, the accelerating pace of climate change and other environmental disruptions pose an additional, preventable danger to a global population that is both aging and carrying a growing burden of noncommunicable diseases (NCDs). Climate change and environmental disruption function as "threat multipliers," especially for those with NCDs, worsening the potential health impacts on those with suboptimal health. At the same time, these environmental factors threaten the basic pillars of health and prevention, increasing the risk of developing chronic disease. In the face of these threats, the core competencies of lifestyle medicine (LM) present crucial opportunities to mitigate climate change and human health impacts while also allowing individuals and communities to build resilience. LM health professionals are uniquely positioned to coach patients toward climate-healthy behavior changes that heal both people and the planet.

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News & Commentary

WHO Air Quality Guidelines 2021-Aiming for Healthier Air for all: A Joint Statement by Medical, Public Health, Scientific Societies and Patient Representative Organisations. Hoffmann B et al. Int J Public Health. 2021 Sep 23;66:1604465. doi: 10.3389/ijph.2021.1604465. eCollection 2021.

Climate Change and Health: A New Urgency. Holist Nurs Pract. 2021 Nov-Dec 01;35(6):295. doi: 10.1097/HNP.0000000000000483.

Emphasising the health benefits of climate change actions can make them more attractive to governments, says scientists. Wise J. BMJ. 2021 Oct 14;375:n2508. doi: 10.1136/bmj.n2508.

Acting on climate change for a healthier future: Critical role for primary care in Canada. Xie E, Howard C, Buchman S, Miller FA. Can Fam Physician. 2021 Oct;67(10):725-730. doi: 10.46747/cfp.6710725.

Climate change is a health issue. Fraser S. Can Fam Physician. 2021 Oct;67(10):719. doi: 10.46747/cfp.6710719.

COVID-19, climate change, and communities. Sacks E, Yangchen S, Marten R. Lancet Planet Health. 2021 Oct;5(10):e663-e664. doi: 10.1016/S2542-5196(21)00257-6.

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