

Impact of Environmental Factors on Health

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Health is often understood as the absence of disease, but the World Health Organization (WHO) (2024) defines health as “a state of complete physical, mental and social well-being.” Furthermore, the American Nurses Association (ANA) Code of Ethics tasks nurses with promoting “health and safety, preservation of character and integrity, maintenance of competence, and continued growth” for self and others (2015). Health outcomes are determined not only in healthcare settings, accounting for only 20% of outcomes (NNLM, 2024), but primarily by broader socioeconomic and environmental factors.

Environmental determinants include land use, ecosystem health, infrastructure, geography, and agricultural practices. Socioeconomic determinants, such as age, gender, race, ethnicity, poverty, housing, education, discrimination and racism, and community health infrastructure influence how populations can respond to environmental factors (HHS, 2022).

Climate Drivers, Pathways to Exposure, and Health Impacts

Climate change, manifesting as rising temperatures, extreme weather events, sea level rise, and increased CO₂ levels, has significant health implications for all populations (HHS, 2022).

- **Increased temperatures** lead to extreme heat, causing heat-related illnesses, deaths, and mental health issues, while severe weather events result in injuries, fatalities, property loss, and psychological consequences (HHS, 2022; Mandavilli, 2023).
- **Precipitation extremes and sea level rise** exacerbate water quality issues, increasing the risks of diseases like Cholera, Cryptosporidiosis, Leptospirosis, and harmful algal blooms (HHS, 2022).

- **Extreme weather events** worsen air pollution and increase airborne allergens, which exacerbate respiratory and cardiovascular conditions. Changes in vector ecology, such as those associated with deforestation, increase the spread of diseases like Malaria, Dengue, Lyme Disease, West Nile Virus, and Chikungunya (HHS, 2022; Robbins, 2016).
- **Increased CO₂ levels** threaten food and water security, leading to malnutrition and diarrheal diseases (HHS, 2022).
- **New environmental hazards**, including electronic waste, microplastics, endocrine-disrupting chemicals, and water scarcity, contribute to emerging health risks (PAHO, n.d.).
- **Environmental degradation** drives forced migration, civil conflict, and mental health challenges, while habitat destruction accelerates zoonotic spillover, where pathogens are transferred from animals to humans (Altman, 2023).

Population Impacts: Who's Most at Risk?

Some populations are more vulnerable to the health impacts of climate change and environmental degradation, including children, low-income populations, Black, Indigenous, and People of Color (BIPOC), older adults, outdoor and emergency workers, people with disabilities, and pregnant, postpartum and/or breastfeeding women. Among these groups, BIPOC communities face particularly inequitable risks.

BIPOC populations are more likely to live in polluted environments and nature-deprived areas. Research shows that tree cover in neighborhoods decreases with lower median household income, and tree-rich areas are significantly cooler

than urban or industrial environments (NNLM, 2024).

Black and Latino populations are exposed to significantly more pollution than they produce, 63% and 56% more, respectively, while non-Hispanic White Americans are exposed to 17% less pollution than they generate (NNLM, 2024). Black children are more than twice as likely to have elevated blood lead levels compared to non-Hispanic White children (NNLM, 2024).

These communities frequently reside in regions with outdated infrastructure that are unable to endure climate-related events. This encompasses deteriorating housing, utilities, transportation, and healthcare systems, all of which hinder access to care during and following extreme weather events (EPA, 2024).

In addition to the challenges posed by high rates of chronic illness, climate change is harming natural resources and ecosystems that are vital to the traditional food sources and cultural practices of Indigenous communities (EPA, 2024). Institutional barriers can hinder tribes' ability to adapt, restricting their access to and control over traditional lands and natural resources, which face growing impacts from climate change (EPA, 2024).

What Can We Do?

A recent study estimated that protected public lands provide mental health benefits for visitors valued at approximately \$6 trillion per year globally (JEC, 2023). Another study focused primarily on Indigenous communities, highlighted that environmental stewardship programs create an 'environmental stewardship-health nexus,' fostering a cycle of physical, mental, and spiritual health benefits, while also promoting resilient landscapes and communities (Nikolakis et al., 2023). The benefits of exposure to natural environments

may also be understood by considering the physical effects of noise stress associated with urban living, which include delayed cognitive development in children, PTSD triggers, hypertension, immune system changes, sleep disturbances, mood shifts, anxiety, and endocrine disruptions (NNLM, 2024).

However, addressing environmental determinants of health faces challenges such as limited resources and funding, political and economic resistance, cultural and social barriers, and knowledge gaps.

The Role of Nursing in Mitigating Health Impacts

Nurses can play a pivotal role in promoting climate equity. By integrating climate action into broader efforts to address social determinants of health, nurses can advocate for environmental justice, participate in community health initiatives, and lead policy changes that reduce health disparities. Public health approaches must prioritize environmental justice to reduce the health impacts of climate change and environmental degradation. Central to this is the promotion of health equity, community engagement, and sustainable practices, all of which are integral to nursing practice.

While exploring the intersection of environmental factors and public health, it becomes clear that legislation plays a pivotal role in shaping the future of both our environment and well-being. At the state and federal levels, a variety of bills and programs have been introduced to address climate change, improve infrastructure, and reduce environmental harm,

each of which directly impacts health outcomes. Such initiatives include:

- SB23-092- Agricultural Producers Use of Agrivoltaics
- HB23-1252- Thermal Energy
- SB23-283- Mechanisms for Federal Infrastructure Funding
- HB19-1261- Climate Action Plan to Reduce Pollution
- H.R. 5376- Inflation Reduction Act of 2022 (Federal)
- H.R. 3684- Infrastructure Investment and Jobs Act of 2021 (Federal)
- 2015 Clean Power Plan (Federal)

Legislative and regulatory efforts such as these represent opportunities for public engagement, policy advocacy, and education, allowing individuals and communities to influence the policies that directly impact environmental determinants of health. ■

References

Altman, M.J. (2023). *How biodiversity loss harms human health*. <https://unfoundation.org/blog/post/how-biodiversity-loss-harms-human-health/>

American Nurses Association (ANA). (2015). *Code of ethics for nurses*. <https://www.nursingworld.org/practice-policy/nursing-excellence/ethics/code-of-ethics-for-nurses/>

Environmental Protection Agency (EPA). (2024). *Climate change and the health of socially vulnerable people*. <https://www.epa.gov/climateimpacts/climate-change-and-health-socially-vulnerable-people>

Network of the National Library of Medicine (NNLM). (March 20, 2024). *The social and economic determinants of environmental health* [Video]. YouTube. https://www.youtube.com/watch?v=_78LfJzddio

Joint Economic Committee (JEC). (2023).

Public lands improve public health. <https://www.jec.senate.gov/public/index.cfm/democrats/2023/10/public-lands-improve-public-health#:~:text=Public%20lands%20play%20an%20important,traumatic%20brain%20injuries%20and%20PTSD>

Mandavilli, A. (2023, August 10). Heat sings the mind, not just the body. *The New York Times*. <https://www.nytimes.com/2023/08/10/health/heat-mental-health.html#>

Nikolakis, W., Gay, V., Nygaard, A. (2023). The environmental stewardship-health nexus' among Indigenous peoples: A global systematic literature review. *Wellbeing, Space and Society*, 4. <https://doi.org/10.1016/j.wss.2022.100121>

Pan American Health Organization (PAHO). (n.d.). *Environmental determinants of health*. <https://www.paho.org/en/topics/environmental-determinants-health>

Robbins, Jim. (2016). *How forest loss is leading to a rise in human disease*. https://e360.yale.edu/features/how_forest_loss_is_leading_to_a_rise_in_human_disease_malaria_zika_climate_change

United States Department of Health and Human Services (HHS). (2022). *Climate change and health equity*. <https://www.hhs.gov/climate-change-health-equity-environmental-justice/climate-change-health-equity/index.html>

World Health Organization (WHO). (2024). *Health and well-being*. <https://www.who.int/Data/Gho/Data/Major-Themes/Health-and-Well-Being>

CNF Awards Scholarships

Colorado Nurses Foundation (CNF) is pleased to report that our 2024 Scholarship Program was a huge success. Over 300 applications were received from students at eight schools of nursing across

the state. Twenty-one scholarships were awarded, valued at \$38,000.00. Scholarships were awarded to ADN, BSN, MSN, and DNP students. For more information about the CNF Scholarship recipients and

how you can donate to support nursing students in Colorado, go to coloradonursesfoundation.com. ■