

# CLIMATE AND HEALTH

**Alan S. Peterson, M.D.**

*Emeritus Director, Environmental and Community Medicine  
Walter L. Aument Family Health Center*



The World Health Organization states that climate change is “the greatest health challenge of the 21st century.” The pope has called climate change the most important moral issue of our time. I am 75 years of age this year and I feel the most important thing I can do with the rest of my life is to teach about climate change and health.

Climate change causes a broad range of adverse health effects, and it particularly amplifies existing health threats among the economically disadvantaged, urban dwellers, children, pregnant women, the elderly, and the chronically ill.

Levels of carbon dioxide are rising at the fastest rate in 66 million years, mostly due to the burning of fossil fuels, which contribute to four of the five top causes of mortality in the United States – heart disease, cancer, stroke, and COPD.

## HEALTH IMPACTS OF CLIMATE CHANGE

Climate change has adverse effects on health that are both specific and general. Specifically, increased ozone and particulate air pollution are linked to asthma attacks, cardiovascular disease, and premature death.

Generally, extreme weather destabilizes communities. Warmer oceans produce more water vapor, and warmer air holds more moisture. As more frequent and more sustained storms pass over communities, particularly poorer ones, they increase economic stress and poverty, reduce access to essential health care, and increase risk for mental health concerns such as post-traumatic stress disorder, depression, anxiety, aggressive behavior, and relational and social unrest.

While some areas are too wet, others are too dry. The wildfires in Canada and the Western United States are creating dangerous smoke that spreads for thousands of miles, even reaching Lancaster.

Vector-borne diseases are increasing because of milder winters, longer and warmer summers and growing seasons, and expanding geographic ranges for ticks, mosquitoes, and other disease-carrying insects. In our area alone, the growing season has increased by more

than 2 weeks since 1970. Obviously, this increases the intensity of allergy seasons. The number of people with seasonal allergies is predicted to more than double in our area by 2050.

The structural racism that permeates our civil society makes the impact of climate change fall disproportionately on people and communities of color, and indigenous people. The effects include:

- Greater harm from extreme weather events due to inferior health care and resources for community resilience;
- Pollution of lands, waters, neighborhoods and communities due to operations of the fossil fuel and mining industries;
- Greater exposure to air pollution from vehicles, industrial facilities, coal burning and other sources;
- Exacerbation of the cumulative impacts of structural racism that already work through all the social determinants of health to expand inequalities, increase health care costs, and reduce the overall resilience of society as a whole.

These problems create extreme disparities in health for the disadvantaged, including a shorter life span; higher infant and maternal mortality; and a higher incidence of asthma, diabetes, heart disease, cancer and other diseases.

## HEALTH CO-BENEFITS FROM MITIGATING CLIMATE CHANGE

Health care accounts for nearly one-fifth of the GDP. Despite the social, economic, and political barriers to reducing global greenhouse gas emissions, the health benefits from doing so will create offsetting savings estimated at 26% to 1050%.<sup>1</sup> Global average monetized health co-benefits from avoided mortality are projected to range from \$50 to \$380 per ton of carbon dioxide removed and exceed abatement costs in 2030 and 2050.

Health care is among the most energy-intensive commercial sectors. More than 6,700 health care facilities have shifted to environmentally sustainable practices and formed “Hospitals for a Healthy Environment.” The American Medical Association offers a guide for medical practices to reduce their carbon footprint.<sup>2</sup>

Major health co-benefits accrue from increased urban walking and cycling, so-called active travel. Physical inactivity is a risk factor for many non-communicable diseases, and may be responsible for 3.2 million deaths annually.

In the United States, a comparison of cities with the highest vs. the lowest levels of active travel found that obesity and diabetes rates were more than 20% lower in the former; an estimated 1,295 lives could be saved annually in the upper Midwest by replacing short (<4 km) car trips with bike transport.

Health co-benefits also emerge from decreased meat consumption in high-consuming populations, because meat production adversely impacts the environment, biodiversity, and the use of resources.<sup>3</sup> Excessive meat consumption has multiple deleterious health consequences. The emissions from agriculture, livestock production, and forestry constitute approximately 24% of global greenhouse gas emissions, resulting principally from animal production. Plus, studies have shown that 30%-40% of food that is produced is thrown away before it is even eaten.

Health co-benefits from mitigating climate change yield net economic benefits, increase labor productivity, and reduce health system costs.<sup>4</sup>

Dr. Howard Frumkin and Dr. Richard Jackson, both former directors of the National Center for Environmental Health at the Centers for Disease for Control and Prevention, have called for the creation of a National Institute of Climate Change and Health,<sup>5</sup> because recent climate-related disasters, including devastating wildfires and a record-breaking hurricane season, demonstrate the failure to take climate change seriously, resulting in needless suffering and death.

The state of Pennsylvania ranks No. 1 in the United States in combined sewer systems which allow municipal sewers to overflow into storm drains when there is too much rain. Most of the Pennsylvania systems were built in the early 1900s, and the infrastructure has not been updated. Locally, the overflow can enter the Conestoga and Susquehanna rivers. If they flood downstream, they contaminate growing produce.

Climate change endangers food and water supplies by fostering organisms that cause food poisoning and microbial contamination of drinking water. For example, extreme flooding can spawn an epidemic of leptospirosis from merely walking through floodwaters.

The science is clear. If we continue to emit greenhouse gases at current rates, it is estimated that 80 years from now our planet will be at least 4 degrees warmer than pre-industrial levels. By then it will be impossible to stop further warming to levels that civilization can't survive.

Normally, we respond to danger quickly: we put fires out, run away when we perceive risk, and protect our children every way we can, but we are slow to react to the existential threat of global warming because it is abstract.

Dr. Katharine Hayhoe, Ph.D., an atmospheric scientist and professor of political science at Texas Tech University, said in a TED talk<sup>6</sup> that “the best way to inspire people to care about and take action on climate change is through a grassroots movement. “Talk to people. Have conversations.” Each conversation has a multiplier effect as it stimulates other conversations.

I encourage everyone to listen to her talk. She emphasizes two key themes. First, people tend not to be concerned about climate change because they believe it does not affect them. Second, it is not on a list of priorities because it affects every priority, including general concepts like racial equality and mental and physical health, as well as decisions about where to live and what to eat. It affects us *here* and *now*.” Says Hayhoe: “Bring it to now. Bring it here.” She also emphasizes that these conversations need to be hopeful. Making people feel guilty is not a motivator. People need to feel empowered: Conversations ought to include suggestions for concrete and doable actions.

I have a handout, “Personal Solutions to Climate Change, Saving Your Money, the Economy and the Earth,” based on information from the Union of Concerned Scientists. I also offer a free talk on climate and health to any group that wants to hear me. Please email me at alan.peterson@pennmedicine.upenn.edu if you are interested.

## REFERENCES

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