



Global Warming And Our Health: Addressing the most serious health impacts of climate change

“If you look at climate change over the long term, it will profoundly affect the pillars of public health: water, sanitation, air quality and sufficient food.”¹

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Science has shown that global warming will affect human health across the world. From diminished air quality and degradation of food and water supplies to increasing levels of allergens and catastrophic weather events, we will experience a number of worsening health threats during our lifetimes. Fortunately, urgent action can help us avoid the worst of these impacts. First, Congress must address global warming through mandatory legislation that reduces global warming pollution on the order of 80 percent by 2050. In addition, the national and local public health system must protect communities by preparing for eight of the most pressing health hazards associated with climate change.

1. Extreme Storms Will Affect Health and Infrastructure: Science tells us that global warming has contributed to more hurricanes and intense storms in the North Atlantic during the last several decades. Increased storm wind speeds and more intense rainfall are projected as the climate warms.² More severe storms and floods can lead to drownings, injuries, and outbreaks of infectious disease. Storms also damage basic infrastructure, with moisture leading to mold growth that can exacerbate allergies and respiratory illnesses.

2. Heat Waves Will Lead to Increased Death and Illness: The frequency and duration of heat waves in the United States is projected to increase substantially because of global warming.³ As temperatures increase, so do the number of deaths and illnesses occurring from heat exhaustion or

heatstroke, cardiovascular disease, and kidney disease. Extreme heat waves cause the most harm among elderly and young children. City dwellers are at particular risk because of elevated temperatures in cities, known as the “urban heat island effect.”

3. Air Pollution Will Contribute to More Smog and Respiratory Illness: More than 100 million Americans currently live in counties with ozone levels above national EPA standards. Rising temperatures will increase ozone smog in many areas, especially in cities. Increasing levels of ground-level ozone are associated with increased hospital admissions for people with respiratory diseases such as asthma and will worsen the health of people suffering from cardiac or pulmonary disease.⁴

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4. Pollen Allergens Will Proliferate:

Higher temperatures and increased levels of carbon dioxide may cause allergenic pollen season to start earlier, last longer, and be more intense.⁵ For example, higher levels of carbon dioxide can

cause ragweed to produce 60 percent more pollen than normal. With increases in airborne pollen, those who suffer from seasonal allergies are likely to experience worse symptoms, including hayfever and asthma.

5. Mosquito- and Tick-Borne Infectious Diseases Will Spread More Widely:

Climate change will affect the patterns of diseases such as malaria, West Nile virus, dengue fever, and Lyme disease.⁶ Warming temperatures and increasing amounts of rainfall have been associated with increases

in the occurrence and transmission of insect-borne diseases, and higher temperatures lead to more rapid development of dangerous pathogens within insect carriers.

Warming temperatures allow these diseases to expand their range into new, once cooler, regions.

6. Drinking Water Will Become Increasingly Contaminated:

Outbreaks of water-borne diarrheal diseases caused by parasites, like *Giardia* and *Cryptosporidium*, have been associated with heavy rainfall events, which are likely to become more frequent due to global warming. For example, recent cholera outbreaks in Bangladesh have been brought on by heavy rains.⁷ The impact of global warming on the safety of water supplies will be most severe in developing countries, where water treatment is less available.

7. Water and Food Supplies Will Be Threatened:

Global warming is expected to worsen floods and droughts, threatening the availability of water for drinking and irrigation. Droughts diminish food variety, nutritional content, and availability—all of which can contribute to malnutrition, infectious diseases, and starvation. Warming ocean temperatures bring shifts in the geographic range of fish populations and can severely impact local food supplies. One analysis predicts that by the year 2060, there will be an additional 40 to 300 million people at risk of malnutrition from human-caused climate change.⁸ And global warming's higher temperatures can increase the risk of food-borne illnesses.

8. There Will Be Large Numbers of Environmental Refugees:

Sea-level rise will leave some areas uninhabitable, forcing people to flee their homes in coastal regions. The United Nations estimates that in the next 10 years there will be up to 50 million “environmental refugees”—people forced to migrate from their homes by a range of climate change-related environmental disasters like floods, droughts, and desertification.⁹ Health among these refugees will be threatened by associated increases in urban crowding, lack of water, and transmission of infectious diseases.

Protecting Ourselves from the Worst Impacts of Global Warming

The range of potential threats to health and life posed by global warming has never been clearer. NRDC encourages national, state, and local officials and other policymakers to act immediately to reduce global warming emissions at least 80 percent by 2050 in order to avoid the worst potential impacts of a changing climate. We must also prepare the public health system to respond to the range of anticipated health threats that will accompany global warming. For more information, see the fact sheet titled “Preparing for Global Warming” at www.nrdc.org/globalwarming/preparedness.pdf.

Global Warming's Effects On:	Adverse Health Impacts:
Floods, storms	Deaths, injuries, infectious disease outbreaks, mental health impacts on affected communities
Heat waves	Deaths, hospitalizations, emergency department visits, and heat-related illnesses
Air pollution	Increased concentrations of ground-level ozone smog and fine particulate matter, increasing premature mortality and hospitalizations
Airborne allergen production	Increased allergic illnesses (hay fever, asthma) due to longer pollen season and increases in the amount of pollen produced
Insect-borne infections	Infections carried by mosquitos, ticks, and other insects can spread into new areas
Water-borne infections	Risk of cholera could be increased as coastal and estuarine waters warm; extreme rainfall events are associated with increased risks of <i>Cryptosporidium</i> outbreaks
Water and food supplies	More frequent drought, reduced drinking water supplies and crop yields, increasing world food insecurity; declining fisheries can contribute to protein shortages; increased risks of food-borne illnesses
Sea-level rise	Contamination of coastal soils and drinking water supplies; increasing storm surges and floods; large numbers of displaced people

Table adapted from McMichael et al. (2006)

¹ Walsh B. 2008. Can climate change make us sicker? *TIME Magazine* (April 4, 2008).

² IPCC. 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon S, Qin D, Manning M, Chen Z, Marquis M, Averyt KB, Tignor M, Miller HL (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

^{3,4,5,6} Confalonieri U, Menne B, Akhtar R, Ebi KL, Hauengue M, Kovats RS, Revich B, Woodward A. 2007. Human health (Chapter 8). *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE, Eds. Cambridge University Press, Cambridge, UK.

⁷ McMichael AJ, Woodruff RE, Hales S. 2006. Climate change and human health: present and future risks. *The Lancet* 367:859-869.

⁸ Patz J, Engelberg D, Last J. 2000. The effects of changing weather on public health. *Annu Rev Public Health* 21:271-307.

⁹ United Nations Environment Programme (UNEP). 2007. *UNEP 2007 Annual Report*. Available at: http://www.unep.org/PDF/AnnualReport/2007/AnnualReport2007_en_web.pdf.