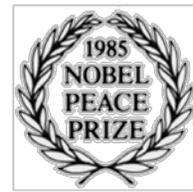




Physicians for  
Social Responsibility



United States Affiliate of International Physicians for the Prevention of Nuclear War

## Health Implications of Global Warming: Impacts on Vulnerable Populations

Global warming is acknowledged by scientists around the world to be a reality and to be caused primarily by human activity, especially the burning of fossil fuels. As the earth warms, the delicate balance of climate, weather events and life is disrupted. Consequences emerge that threaten human health and, ultimately, survival.

This is one of several fact sheets produced by Physicians for Social Responsibility that examine recent scientific evidence of global warming's impact on health.

Global warming threatens to harm our health and well-being – but it won't affect all of us equally. Some groups of people are more likely to be harmed than others. The most vulnerable tend to be the youngest and the oldest among us, the poor, and those who are already sick. The disproportionate and discriminatory impacts that climate change will have on vulnerable populations make climate change one of the most significant environmental justice issues of our time.

### Children are more vulnerable to global warming-induced dangers

- Children and infants have greater sensitivity to certain exposures. Children are especially vulnerable to air pollution. Their lungs are developing and growing; they breathe at a higher rate than adults, and they spend more time outdoors engaging in vigorous physical activity. Children who participate in outdoor sports in communities with high ozone are at increased risk of developing asthma.
- Children are at higher risk from extreme weather events such as hurricanes and floods. Associated health consequences include injury, death, increases in infectious diseases, and posttraumatic mental health and behavior problems.<sup>i</sup> Mental and emotional distress for children and adolescents after weather disasters include posttraumatic stress disorder, aggressive behavior, sadness, and substance abuse.<sup>ii</sup>
- Children must depend on caregivers for their own preparedness and response. Experiences with Hurricane Katrina demonstrated the difficulty of tracking children's whereabouts, keeping children and caregivers together, and meeting the special needs of hospitalized infants and children.<sup>iii</sup>
- These factors can also interact with poverty, race, and class to further increase risk.<sup>iv</sup>
- The probability that global warming will continue for decades (and possibly for centuries) raises issues of intergenerational equity. If we fail to sufficiently reduce greenhouse gases, we will impair the world our children and grandchildren will inherit. The more we postpone action, the more we increase the costs that future generations will have to pay to cope with the consequences of global warming.<sup>v</sup>

**Global warming threatens the elderly.** The elderly are at particularly high risk of adverse health effects from extreme heat exposure.

- Advanced age represents one of the most significant risk factors for heat-related death in the U.S.
- **Elderly people have** diminished ability to regulate body temperature and to adapt physiologically to heat. In addition, they generally experience poor health. The elderly are also more likely to live alone and have reduced social contacts, which further increases their vulnerability.<sup>vi</sup>
- This vulnerable population will grow as the elderly become an increasingly large proportion of the U.S. population.

## Global warming impacts the poor disproportionately

People in poor countries – and poor people in wealthy countries like our own – already suffer disproportionately from poor health and inadequate health infrastructure. They are likely to be heavily impacted by global warming.

- People without access to air conditioning are vulnerable to excessive heat events, or heat waves. The urban poor are particularly vulnerable, due to the “urban heat island” phenomenon. City environments increase thermal-storage capacity and routinely experience ambient air temperatures from 2° - 10°F warmer than the surrounding rural and suburban areas.<sup>vii, viii</sup> The urban heat island also absorbs heat during the daytime and radiates it out at night, raising nighttime minimum temperatures, which have been linked epidemiologically with excess mortality.<sup>ix</sup>
- Excessive heat exposure affects people with certain pre-existing medical conditions, including cardiovascular disease, respiratory illnesses, and obesity. These conditions are already more prevalent among the poor, and the poor are less likely to be able to access and afford treatment.
- Low-income populations are particularly vulnerable to floods and storm surges. They may live in high-risk areas such as flood plains and coastal zones, and they may have access to a limited public health infrastructure. Additionally, low-income populations are less likely to be covered by health insurance.<sup>x</sup>
- Poor and subsistence farmers, pastoralists and fisherfolk are vulnerable to storms and sea surges, the reduction in river flow due to melting icepacks, increased soil salinity, the impact of heat on crop yields and livestock, and drought.

## Climate change is likely to have severe effects on the poorest countries of the world.

- The Intergovernmental Panel on Climate Change projects that global warming is likely to increase malnutrition, increase death, disease, and injury from heat waves, floods, storms, fire, and drought, and expand the geographic range of malaria in the poor countries of the world.<sup>xi</sup>
- The leading health risks in the poorest countries — malnutrition, inadequate and unsafe water, poor-quality nutrients, and the burning of low-quality fuels for household use — are all significantly sensitive to climate.<sup>xii</sup>
- In low latitudes and areas with marginal rainfall, local warming of even a degree or less may reduce substantially the yield of principal grain crops.<sup>xiii</sup>
- The most severe health burdens from global warming are projected to have the greatest effect on countries that are least responsible for the emission of greenhouse gases. Those emissions originate primarily in wealthy, industrialized countries in temperate climates, whereas their negative health effects are predicted to concentrate in poor countries that typically already suffer the worst health.<sup>xiv</sup>

## Environmental refugees

- In addition to the poor, a new class of vulnerable population has emerged, spurred in part by global warming: environmental refugees. They are the people who are displaced from their homes by such phenomena as rising sea levels, expanding deserts, and catastrophic weather events, flooding, etc.
- It has been estimated that 25 million people have already been displaced for environmental reasons – more than the approximately 21 million refugees that have fled war and persecution.
- Like the poor, they too are at high risk for health: highly vulnerable to disease, at risk of spreading communicable diseases to new areas, vulnerable to shortages of often limited local resources, and subject to interruptions in supply chains and access to therapies for chronic medical condition.<sup>xv</sup>
- They are also subject to physical attack and emotional stress.

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<sup>i</sup> Greenough G, McGeehin M, Bernard SM, Trtanj J, Riad J, Engelberg D. The potential impacts of climate variability and change on health impacts of extreme weather events in the United States. *Environ Health Perspect.* 2001;109(suppl 2): 191–198

<sup>ii</sup> Ahern M, Kovats RS, Wilkinson P, Few R, Matthies F. Global health impacts of floods: epidemiologic evidence. *Epidemiol Rev.* 2005;27:36–46

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- <sup>iii</sup> Shea K, Committee on Environmental Health. "Global Climate Change and Children's Health." PEDIATRICS Volume 120, Number 5, November 2007.
- <sup>iv</sup> Ebi, K. and Paulson J. "Climate Change and Children." *Pediatr Clin N Am* 54 (2007), 213-226.
- <sup>v</sup> Ebi, K. and Paulson J. "Climate Change and Children." *Pediatr Clin N Am* 54 (2007), 213-226.
- <sup>vi</sup> Luber G et al. Climate Change and Extreme Heat Events." *Am J Prev Med* 2008;35(5). August 2008.
- <sup>vii</sup> U.S. Environmental Protection Agency. Heat island effect. U.S. Environmental Protection Agency. 2005. [www.epa.gov/heatisland/index.html](http://www.epa.gov/heatisland/index.html).
- <sup>viii</sup> Vose R, Karl T, Easterling D, Williams C, Menne M. Climate (communication arising): impact of land-use change on climate. *Nature* 2004;427:213– 4.
- <sup>ix</sup> U.S. Environmental Protection Agency. Excessive heat events guidebook. 2006. [www.epa.gov/heatisland/about/heatguidebook.html](http://www.epa.gov/heatisland/about/heatguidebook.html).
- <sup>x</sup> Haines A. et al. "Climate change and human health: impacts, vulnerability, and mitigation. *Lancet*, Vol. 367 June 24, 2006.
- <sup>xi</sup> Intergovernmental Panel on Climate Change. 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 UK: Cambridge University Press, 2007.
- <sup>xii</sup> St. Louis M. and Hess J. "Climate Change: Impacts on and Implications for Global Health." *Am J Prev Med* 2008;35(5). August 2008.
- <sup>xiii</sup> Intergovernmental Panel on Climate Change. Africa. In: Parry ML, Canziani OF, Palutikof JP, Van der Linden PJ, Hanson CE, eds. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge: Cambridge University Press, 2007:433–67.
- <sup>xiv</sup> St. Louis M. and Hess J. "Climate Change: Impacts on and Implications for Global Health." *Am J Prev Med* 2008;35(5). August 2008.
- <sup>xv</sup> St. Louis M. and Hess J. "Climate Change: Impacts on and Implications for Global Health." *Am J Prev Med* 2008;35(5). August 2008.