Global to Local: Public Health on the Front Lines of Climate Change

The classic visual representation of climate change is a dramatic video of distant melting glaciers and stranded polar bears. The public health reality is that the environment is a key determinant of human health, and climate change is now affecting the health and well-being of communities throughout the world. On the global level, the increasing concentrations of heat-entrapping greenhouse gases affect the climate drivers of increased temperatures, increased precipitation, and extreme weather events. Although the local-level impacts are widely variable, climate change contributes to the frequency and extent of extreme heat, unhealthy air quality, reduced water and food quality, and exposure to infectious agents. The World Health Organization expects that over the next 30 years, there will be an additional 250 000 deaths per year globally as climate change exacerbates the toll of malaria, malnutrition, diarrheal disease, and heat stress.[1]

In the United States, major climate-related health effects result from extreme weather events such as extreme heat and floods (e.g., heat stress, heat deaths, traffic fatalities, drowning, mental health consequences), from air pollutants (e.g., cardiovascular and respiratory diseases), and from increased habitat for disease vectors, vector-borne diseases, and water- and food-borne illnesses.[2] A state-level assessment conducted in Maryland found that climate-related health risks are diverse and affect each region differently. Inner-city Baltimore faces increased heat and air pollution, with a subsequent increase in asthma and heart attacks, and the Eastern Shore can expect increased flooding with higher risks of food- and waterborne illness.[3]

Long-term global mortality predictions and faraway environmental impacts are difficult to translate to local public health priorities. Yet, on the local level, the evidence of climate effects continues to grow. The vulnerability of coastal populations to coastal flooding, increased rainfall and storm intensity, sea-level rise, and storm surge is tragically apparent. Unhealthy air quality because of weather-related ground-level ozone and wildfires is already affecting the quality of life in vulnerable communities—likely increasing morbidity and mortality risks from cardiovascular and respiratory disease. Local impacts on water quality and availability are also evident as communities face increasing threats from flooding, drought, and climate-related pollution, such as harmful algal blooms.

Recent surveys of the National Association of City and County Health Officials confirm that most public health directors believe that climate change is already affecting their communities.[4] Unfortunately, few reported having the necessary capacity and expertise to respond.

THE TIME FOR PUBLIC HEALTH LEADERSHIP

Global climate change has been a deeply divisive political issue, pitting the short-term economic interests of fossil fuel industries against the longer-term strategies of international cooperation to reduce carbon emissions and develop sustainable public health and environmental protection policies. As the US strategy shifts away from the Paris Accord, the real-life local effects of a changing climate present an increasing challenge to our fragile public health infrastructure.

Hurricanes Harvey, Irma, and Maria have brought unprecedented devastation to Texas, Florida, Louisiana, Puerto Rico, and throughout the Caribbean. Local public health agencies are once again on the front lines, saving lives and protecting the health of the most affected communities. Like other first responders, public health officials are called to be at their best when things are at their worst. Yet, the roles of our agencies go far beyond acute emergency response. Local public health practitioners are critical to long-term recovery and community health protection—long after the television cameras and politicians have moved on. Now is the time for the public health community to emerge from the shadows of the global debate and refocus the climate change narrative on the essential public health needs of our communities.

The recent US Global Change Research Program's draft *Climate Science Special Report* provides an update on the state of climate science since the Third US National Climate Assessment. The update concludes that "stronger evidence has emerged for continuing, rapid, human-caused warming of the global atmosphere and ocean."[5(p12)] Yet, as the scientific evidence of global climate change grows, federal research and mitigation efforts are being reduced or eliminated.

Long before global climate change rose to the top of planetary concerns and polarizing politics, health officers grappled with the constant challenges of environment, weather, and health. Every public health field-worker knows to check the weather report at the start of each day. Weather has a profound effect on our work and the health of our communities. Although it is the extreme events that make headlines, local health practitioners recognize the everyday

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challenges to protecting health in this time of environmental change. Strong local public health capacity to ensure that there is clean water, safe food, housing, and sanitation and to communicate risks and respond to emergencies is the foundation of our national capacity for adaptation and resilience. This is ingrained in the essential services of public health.[6]

LEADERSHIP FOR THE FUTURE

In many ways, the US withdrawal from the Paris Accord has galvanized world support for addressing the threats of climate change and has shifted the leadership from the federal level to states, cities, and local governments.[7] As this shift continues, the public health community must have a seat at the leadership table to shape the goals, improve surveillance of public health impacts, inform the policies, improve preparedness and response capacity, and, above all, communicate the public health urgency of adaptation and resilience. Our future depends on it! AJPH

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