

HURRICANE KATRINA and SUPER STORM SANDY



The Challenge

Although a community can prepare for an extreme weather event with sound infrastructure, policies, and public education, it cannot necessarily prevent all adverse impacts. When severe, widespread storm damage is sustained, some communities may never recover. The level of resiliency after a severe weather event is one way to measure preparedness (although after-the-fact).

In August 2005, Hurricane Katrina precipitated massive flooding in New Orleans, Louisiana, damaging or destroying over 100,000 homes and causing \$108 billion in total damage.¹ In October 2012, Super Storm Sandy devastated coastal New Jersey, causing major infrastructure damage, power outages, and disruption to transportation services totaling over \$37 billion in damage.²

Stress from both storms had far-reaching environmental health impacts with acute and long-term health implications, such as post-traumatic stress disorder caused by injury or loss of life, loss of or damage to property and possessions, forced relocation, financial loss, and more.³ Additionally, transportation challenges in flooded areas delayed ambulatory care, increasing risk of permanent myocardial damage or death.² Many residents suffered lost or damaged property, financial loss, and the trauma of forced relocation.³

Severe weather events such as Hurricane Katrina and Super Storm Sandy are predicted to increase in frequency in the coming years, due to climate change.

Environmental Health Response

When a storm causes immense damage to buildings and roads, as well as psychological and emotional stress, victims may be unaware of risks associated with contaminated tap water or other environmental threats. Skilled environmental health professionals are tasked with responding to and monitoring compounded environmental threats in the immediate aftermath of an event and over time.

Clean Air

Hurricane-induced flooding can cause mold growth inside dwellings, diminishing indoor air quality. Poor air quality, in turn, may aggravate asthma and increase the incidence of lower respiratory tract infections (e.g. pneumonia) and upper respiratory tract symptoms.⁴ Unfortunately, cleaning up after

a storm often involves burning piles of accumulated debris, adding further to the air pollution burden. Ensuring that debris disposal does not worsen health is a challenge even now.⁵

Safe Water

Warm waters create a hospitable environment for harmful algae blooms and the growth of other waterborne pathogens. Flood waters often contain a variety of contaminants, and can overwhelm a region's drainage and wastewater treatment systems, increasing the risk of exposure to bacteria, parasites, and other harmful pollutants.⁶

Healthy Community Design

After a hurricane, travel through flooded, damaged or debris-strewn areas becomes challenging, even for first responders. Delays in emergency medical care can result in additional adverse health events: following the destruction caused by Super Storm Sandy, an additional 125 cases of myocardial infarctions, 35 cases of stroke, and 70 deaths were recorded—beyond the otherwise expected incidence.² The medical, disaster preparedness and first responder communities are challenged with not only responding to injuries and death caused directly by the weather event, but also indirectly caused by stress and transit limitations.

Housing

One hundred and thirty-five thousand structures sustained damage from Hurricane Katrina, including about 105,000 homes.⁷ Many of the damaged homes, built before the 1950s, underwent demolition. The destruction of lead-painted structures elevated soil lead levels; 61 percent of these homes had lead levels that exceeded EPA standards. Children residing or attending school near construction sites that dispersed lead dust were at risk of elevated blood lead levels.⁷

Tracking and Biomonitoring

The National Environmental Health Tracking Network integrates data from a variety of sources pertaining to health conditions (e.g. asthma and birth defects), environmental exposures (e.g. blood lead levels), and environmental hazards (e.g., air pollution).⁸ This data enables researchers and health authorities to pinpoint localities with environmental health problems and to track problems over time.



In August of 2005, Hurricane Katrina flooded the city of New Orleans, Louisiana, damaging or destroying over 100,000 homes and causing \$108 billion in damage.

Biomonitoring plays a critical role in accessing exposures to potentially harmful chemicals, such as lead, in adults.⁹ Biomonitoring data collected through CDC’s National Health and Nutrition Examination Survey show background levels of exposure for a typical (noninstitutionalized) US resident to more than 200 to 300 environmental chemicals.¹⁰ This baseline data complements state- and local-level biomonitoring data, which may show spikes in exposure (compared with baseline) for certain populations. Few states, however, have an adequate biomonitoring program, and not all test for every analyte tracked by CDC.

Vulnerable Populations

Severe weather events do not account for race, income, gender, or age before striking. Yet, vulnerable populations—including communities of color, the elderly, young children, low-income communities, and those with chronic illnesses—bear the greatest burden of injury, disease, and death related to climate change. Similarly, socioeconomically disadvantaged communities are not always able to recover quickly, or recover at all, in the wake of environmental disasters.

Workforce

Just as an airport ground crew works to ensure passenger safety, the well-trained, multidisciplinary environmental health workforce endeavors to maintain an environment conducive to human health. Instead of pre-flight plane inspections, environmental health professionals monitor water safety, conduct mosquito control activities, carry out syndromic surveillance and biomonitoring, and engage in other critical activities. The work that environmental health professionals perform is greatly realized at the community level, especially by those most vulnerable to harmful environmental exposures.

Opportunities for Action

- 1) Promote clean air for all through enforcement of policies like the Clean Air Act.
- 2) Improve surveillance capabilities to prevent, detect, and monitor large-scale exposures.
- 3) Create a robust environmental health system with a lead agency to shoulder the burden of responding to and monitoring compounded environmental health threats to a community.
- 4) Provide resources and training to ensure a qualified environmental health workforce.

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