Mitigating the Mental and Physical Health Consequences of Hurricane Harvey

Article *in* JAMA The Journal of the American Medical Association · September 2017

DOI: 10.1001/jama.2017.14618

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VIEWPOINT

Mitigating the Mental and Physical Health Consequences of Hurricane Harvey

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The complexity of the disaster risk landscape and the exposure of large human populations to prolonged and potentially traumatizing events were on full display during Hurricane Harvey. During the 5 days of Hurricane Harvey, more than 33 trillion gallons of rain fell on Texas and Louisiana and set a continental US record for rainfall at 51.88 in (131.78 cm). Among 13 million persons directly affected by the storm, more than 22 000 were rescued from floodwaters, an estimated 32 000 displaced survivors were temporarily housed in shelters, and at least 450 000 will apply for Federal Emergency Management Agency (FEMA) disaster assistance.[1] More than 100 000 homes were damaged and only 17% of the affected residents had flood insurance. Damage and recovery estimates are projected to exceed those incurred during Hurricane Katrina ($114.5 billion paid on an estimated $160 billion in damages). The usually circumspect National Weather Service tweeted, "This event is unprecedented & all impacts are unknown & beyond anything experienced."

During Hurricane Harvey, Texas and Louisiana residents experienced the full complement of hurricane hazards: cyclonic winds, tornadoes, storm surge along a concave coastline, deluging rains, and inland flooding.[2]

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What made Harvey an exceptional hurricane was that water, rather than wind, was the major destructive force. Harvey will be forever remembered for the unrelenting inundation that resulted from rain bands that spiraled inland from the gulf, overflowing Houston's reservoirs and overtopping dams before moving on to submerge Port Arthur, Texas, and drench western Louisiana.

The Harvey disaster response has been expansive and televised. However, this response is typical of response to such events—early initial high-visibility rescue and response activities. The storm-affected region is currently receiving a massive injection of state and federal emergency personnel and resources. Yet history teaches that this outpouring of resources will be time-limited. Responder units will be repurposed and redeployed and the media focus is already shifting elsewhere, in this case, to the subsequent catastrophic storm (Hurricane Irma).

Public health officials and others know that what happens to populations in the months and years after large-scale traumatic events can have more substantial health consequences than the immediate disaster. The mental and physical health consequences of an event like Hurricane Harvey are long-lasting. Harvey's physical health consequences included mortality, primarily drowning deaths occurring in submerged vehicles and structures (63 storm-related fatalities were tallied through September 5)[3] and injuries including lacerations, puncture wounds, abrasions, fractures, and insect bites (floating fire ant colonies have been a particular hazard) that commonly occur during clean-up activities. Residents are actively gutting their homes to stave off mold. The health effects of widespread population exposures to contaminated floodwaters—an admixture of sewage, toxins, and other hazardous substances—filling homes, streets, and neighborhoods have not been evaluated.

The psychological consequences of Hurricane Harvey are associated with traumatic exposures to storm hazards during the event, losses and hardships in the aftermath, and disruption of vital care and essential medications for those with chronic and persistent mental illness and cognitive impairment.[4] Comprehensive reviews of the mental health consequences of natural and human-generated (anthropogenic) disasters have shown that, for hurricanes, up to half of those who survive being directly in the storm's path risk developing posttraumatic stress disorder (PTSD), and that 10% of those who live in the vicinity of the storm may also develop PTSD.[5,6] Scientific evidence gleaned from work with residents from areas that were directly affected by Hurricane Katrina showed that respondents experienced nearly universal exposure to hurricane stressors and a correspondingly high 30-day prevalence of anxiety-mood disorders (31.2%).[7] Ensuring that health care system managers and clinicians recognize these risks and implement appropriate screening and treatment systems is critical.

Available evidence suggests how emergency responders, clinicians, and health care system managers can meet the key challenge of mitigating health consequences. Early psychological intervention is already under way in the immediate postdisaster phase of Hurricane Harvey. Disaster behavioral health teams are integrated into the response, providing psychological first aid and assessing for urgent psychiatric needs at Houston's 2 large consolidated shelters. However, the reach of these brief-duration approaches is limited. In contrast, research has shown that replenishing social and economic resources that will restore living conditions for those affected by the hurricane will do as much, if not

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more, for the protection of health and the promotion of resilience than do short-term, individualized medical or psychological interventions.[7,8] This population-level approach, equivalent to "community psychological first aid," illustrates the importance of optimizing social, economic, and environmental conditions to safeguard health.

A study of Katrina survivors in Mississippi showed that, while the exposure of populations to potentially traumatic disaster-phase stressors may be partially mitigated, there is much more that can be done to ameliorate postdisaster adversities that negatively affect mental health.[8] Therefore, assisting disaster-affected communities in practical ways to rapidly rebuild and regain economic viability and prosperity may concurrently diminish the burden of psychopathology. Such assistance is essential after a disaster and stands to restore health and improve lives. Attending to social determinants of health, like housing and economic well-being, is critical after a natural disaster.

Regrettably, the traditional "downstream" approach to emergency management, one that prioritizes heroic rescue operations while largely neglecting the coordination of the recovery and reconstruction phases, runs counter to this evidence about what it takes to prevent long-term, disaster-induced health consequences and to restore robust mental health to those who have experienced disaster-related psychological distress or disorder.

Texas and Louisiana are slated to receive substantial federal disaster recovery funding. These states have the opportunity to become a national showcase by creating a multifaceted recovery and reconstruction plan that undergirds community resilience, minimizes preventable storm-related psychopathology, and strengthens public mental health. What would this look like?

Effective models exist. For more than a decade, the World Health Organization (WHO) has orchestrated population-centric, evidence-based, and mental health–focused postdisaster interventions under the programmatic heading of "Building Back Better."[9] WHO is cataloging an expanding list of successful programs. WHO states, "Emergencies, in spite of their tragic nature and adverse effects on mental health, are also unparalleled opportunities to improve the lives of large numbers of people....This is important because mental health is crucial to the overall well-being, functioning, and resilience of individuals, societies, and countries recovering from natural disasters."[9]

Specific to Hurricane Harvey, elements for consideration—not all of which look like population health interventions—include reengineering the urban centers to protect their populations by zoning, landscaping, and architecting the residential environment to withstand wind and flood hazards. Residential areas near bayous and reservoirs prone to severe flooding should not be repopulated. On a regional scale, statewide planning should buffer the effects of landfalling hurricanes by replenishing coastal wetlands and preparing for ongoing sea level rise.

Post-Harvey urban redevelopment should also focus on equitable access to safe housing for poor, minority, and immigrant populations. Public health professionals should be on the frontline, intervening on social inequalities and health disparities that both predict and exacerbate disaster vulnerability for marginalized populations.

Much can be learned from Harvey. Texas and Louisiana have been the beneficiaries of timely hurricane forecasts provided by the National Hurricane Center and professional disaster leadership supplied by FEMA personnel. Congressional delegations from these storm-affected states have standing to advocate for increased funding for these agencies and to oppose the administration's proposed funding cuts that would undermine the nation's frontline disaster response capabilities.

Translational science is needed to investigate and redress societal issues that place special populations at disproportionate disaster risk. For example, at the intersection of disaster risk reduction, emergency management, and social justice, Texas can take a proactive stance by studying whether immigration policies in force during Hurricane Harvey may have jeopardized citizens from mixed-status families who did not evacuate or seek shelter because of concerns about disclosing the immigration status of family members who have not yet achieved citizenship.

Finally, disaster events such as Hurricane Harvey are occurring with accelerating frequency throughout the world, increasing complexity, and the potential for more damaging effects. Population health science and policy provide critical inputs: identifying and intervening to address disaster risks to human health; guiding the reconceptualization of urban environments to prevent and mitigate disaster consequences; and, when disaster strikes, providing the roadmap for how to build back better—and smarter—in a manner that offsets the effects of trauma exposure and restores health.

ARTICLE INFORMATION

Published Online: September 11, 2017. doi:10.1001/jama.2017.14618

Conflict of Interest Disclosures: The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

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