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Researching Storms to Prepare for the Next One

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Researching storms to prepare for the next one

By Joshua Behr and Rafael Diaz

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Severe storms such as Hurricane Sandy, which ravaged northeastern coastal and urban areas in October, are fairly low-probability, high-impact events. They are characterized as a "public risk" because the impact is broad-based, overwhelming and viewed as beyond the control of the individual.

While the hazard itself is beyond individual control, actions that can substantially lessen one's vulnerability are well known.

Two widely accepted strategies to mitigate personal vulnerability are evacuation from the region to avoid injury during the storm and the hardship in its aftermath, and flood insurance coverage to make a household's personal property whole again.

Surprisingly, citizens have adopted neither of these strategies enthusiastically, thus substantially increasing their exposure and vulnerability.

Ongoing research at Old Dominion University is beginning to untangle the factors that contribute to citizens' perceptions of risk, as well as the social, economic and cultural constraints that keep residents from preparing adequately for an impending storm.

For example, we now know that people make evacuation and sheltering decisions as a family, taking into consideration the circumstances and wishes of extended family members and friends. Assessments of impending risk, how to prepare for storms and what resources to draw upon are made within these networks. Further, the medical needs and fragility of family members are critical factors that tie entire households to shelter in place.

In addition, storms that are less severe, such as Irene in 2011, may engender complacency and a false sense of security in dealing with the storm and may feed skepticism about the severity of the next storm, while exposure to more catastrophic events, such as Katrina in 2005, may reinforce a sense of fatalism.

These factors, taken together, define the vulnerability of particular households, neighborhoods and communities, and they are not unique to Hampton Roads. While the physical geography and urban landscape may be different, many of the social dynamics and constraints remain the same, whether you live along the Gulf Coast or in Florida, mid-Atlantic or Northeast coastal zones.

To ODU researchers, these findings say that an understanding of the impact of a severe storm requires knowledge beyond its meteorological and physical characteristics. Storm-related harm in the form of death, injury, destruction, psychological trauma and disruption to regular medical care, for example, may be either exacerbated or mitigated depending on choices made by individuals and communities before the storm.

Clearly, emergency planners need to better understand the underlying rationale for a decision not to evacuate. As we have witnessed with Sandy, there is a tendency to overestimate one's ability to shelter in place and

manage the aftermath, as well as a belief that the government will respond quickly and effectively to the immediate needs of impacted communities.

A region's future ability to deflect or absorb a storm's punishing blow - and to recover from the physical, psychological and economic impact - stems in part from the capacity to recognize lessons learned, drawing upon both direct experience and analysis of other storms.

Critical assessments lay bare the inadequacies of emergency response systems, demonstrate breakdowns in communications, highlight logistical bottlenecks, spotlight political dysfunction and raise to the fore the disparate vulnerabilities of medically fragile and low-income households.

Regions that heed such insights, especially the underlying social and behavioral dynamics that define the vulnerability of our communities, will be better able to design policies and interventions that truly protect the life and property of its citizens.

Often a focusing event - such as 9/11, Katrina or, in this this case, Sandy - heightens our awareness of Hampton Roads' deep social and medical vulnerabilities and calls attention to the need for greater support of local and state emergency planning efforts.

Joshua Behr and Rafael Diaz are professors at the Virginia Modeling, Analysis and Simulation Center at Old Dominion University. They are researching the complexity of population behaviors in a severe storm and the ability of medically fragile and vulnerable populations to prepare for and recover from such an event.