Perspectives on disaster public health and disaster behavioral health integration

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At the DEEP Center, we define a disaster as, “an encounter between forces of harm and a human population in harm’s way, influenced by the ecological context, in which demands exceed the coping capacity of the disaster-affected community” (Fig. 1). Disasters affect populations, simultaneously creating public health and behavioral health challenges for the impacted communities.

When disaster strikes, physical consequences—damage, destruction, disruption, displacement, death, debility, and disability—are most often overt and observable. Disaster public health needs are starkly evident. Conversely, psychological consequences tend to be less visible and historically, overlooked.

This oversight is being redressed in the post-9/11 era. In the past decade, disaster behavioral health has been “unpacked” and showcased, separate from disaster public health, in order to assure that the need for behavioral health and psychosocial support is recognized and prioritized. This has propelled advances in disaster behavioral health science, programs, planning, and policy. However, disaster behavioral health is administratively and structurally separate from disaster public health.

The reality is that physical and psychological dimensions of disaster are not separate. Rather, they are intimately intertwined throughout all phases of the disaster cycle. The rising salience of disaster behavioral

health is a good thing, but it is now time to unite and fully integrate disaster behavioral and public health. Such integration is actively championed by SAMHSA and The Office of the Assistant Secretary for Preparedness and Response (ASPR).

Psychological Consequences of Disasters

To gain perspective on the importance of disaster public health/behavioral health integration, let’s review the attributes of psychological consequences of disaster.

In a disaster, the psychological consequences are (1) widespread, (2) extend across a spectrum of severity, (3) persist for a prolonged duration, and (4) reflect the unique and defining features of the specific disaster event. These distinguishing *psychological* features relate directly to exposure to the *physical* forces of harm in a disaster.

We will illustrate each of these four points, drawing upon two well-known disaster case studies that occurred 11 y apart, the Attack on America (September 11, 2001) and Superstorm Sandy (October 28–31, 2012). Both 9/11 and Sandy forcefully impacted New York City, Washington, DC, and rural Pennsylvania (although Sandy’s immense geographic reach extended to portions of 24 states). Each event prompted a multi-state, federal disaster declaration. Both events generated large-scale economic costs, affected transportation systems, and damaged infrastructure.

Superstorm Sandy was a conglomerate of familiar natural disaster elements (hurricane, storm surge, deluging rains, inland flooding, heavy snowfall with blizzard

conditions) packaged into one gargantuan system. In contrast, 9/11 was a “one-off” act of terrorism never previously conceived nor replicated thereafter. Superstorm Sandy was a somewhat predictable and non-intentional natural disaster, notable primarily for enormity of scale and variety of manifestations. September 11 was unpredictable, unfamiliar, human-generated, and intentionally-perpetrated.

Psychological consequences of disaster are widespread and pervasive (Fig. 2)

In a disaster, more people are affected psychologically than are harmed physically. The “psychological footprint” is larger than the “medical footprint.”

The importance of this point is that persons who may need psychological support tend to be larger in number and geographically more dispersed than persons sustaining physical injury, damage, or displacement. For the subset of persons who do sustain physical injury, many will experience powerful and enduring psychological overlays. For those disaster-exposed persons who escape physical injury, psychological casualties may be numerous but less likely to be identified or to seek mental health care.

9/11

September 11 provides the most potent and memorable example of the psychological footprint concept. While physical harm was geographically circumscribed within a square mile of downtown Manhattan, a wedge of the Pentagon, and a field in Pennsylvania, the psychological reverberations were experienced by Americans everywhere throughout the country and around the world. Three thousand persons were killed and 6,000 were

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Figure 1. Disaster ecology model diagram.

injured, but hundreds of millions were affected psychologically. Both the American psyche, in terms of belief in safety within our borders; and American freedom of movement within the United States and abroad, were indelibly altered by this event.¹

Sandy

Sandy was a record-setting storm in terms of its geographic dimensions. The system's cloud canopy ballooned to 1,000 miles in diameter, with tropical storm force winds extending 400 miles from the center of circulation. An estimated 60 million Americans experienced "weather" from Sandy, many of whom experienced considerable stress during the warning phase as the storm approached, and during the impact phase, as Sandy traversed

their respective locales. Eight million people lost electrical power, some for weeks. Millions were affected by damage to transportation infrastructure (subways, tunnels) and gasoline shortages. Several hundred thousand sustained severe damage to property and tens of thousands lost their homes. These were distressing events for all, and potentially traumatizing for many. In contrast, in terms of physical harm, the "medical footprint" was limited to 113 deaths in the US and several thousand injuries requiring medical care.

Psychological consequences of disaster range across a spectrum of severity (Fig. 3)

According to Dr. Robert Ursano, Director, Center for the Study of Traumatic Stress, Uniformed Services

University, and other thought leaders in the field, almost everyone who is exposed to a disaster experiences expectable, transient fear and distress. This is a nearly universal reaction. Most individuals who are initially affected will rebound rapidly and regain full functioning without need for psychological intervention. However, related to the intensity of disaster exposure, a subset of disaster-exposed persons will be affected to the point of exhibiting detrimental behavior changes.² As one example, unharmed-but-fearful citizens may converge en masse on area hospitals, clinics, or points of distribution. A smaller proportion of persons, especially those with the most intense exposures, are at risk of experiencing more pronounced psychological consequences,

PSYCHOSOCIAL CONSEQUENCES: WIDESPREAD

**In a disaster,
the size of the
psychological
“footprint”
greatly
exceeds the
size of the
medical
“footprint.”**

Figure 2. Psychological footprint.

that may lead to a diagnosis of post-traumatic stress disorder (PTSD), depression, generalized anxiety disorder, panic reactions, somatic complaints, and/or increased substance use. Persons who have lost one or more loved ones may experience traumatic bereavement or complicated grief. Where disaster survivors fall on this continuum from transient distress to psychopathology relates directly to their intensity of exposure to the forces of harm.

The importance of this point is that it is possible to estimate the proportions of survivors exposed to varying levels of injurious or potentially traumatizing events (PTEs) and to be able to provide active outreach to persons in geographic areas or shelter environments who are most likely to need psychological support. Working upstream, it is possible,

based on historic disaster experiences, to plan and prepare for the magnitude and extent of psychological needs for persons exposed to common disasters across a spectrum of intensities of exposure.^{3,4}

9/11

September 11 provided key research documentation for this point. In the immediate aftermath, the highest rates of distress symptoms were found for persons in lower Manhattan, close to Ground Zero. Elevated, but lower, rates were found for persons in the remainder of the New York City metro area. Nationwide telephone surveys indicated that many U.S. citizens displayed high rates of self-reported distress and even post-traumatic stress symptoms despite being distant from the scenes of impact. The areas of

physical harm were very focalized based on the “surgical strikes” against high-value targets (World Trade Center, Pentagon) but the psychological effects spread concentrically around the impact zones, diminishing in intensity with greater distance. It is important to note that six months after the disaster, all of these rates were reportedly significantly decreased.

Sandy

In contrast to 9/11, the severe direct effects of Sandy extended over a broader geography. The areas of catastrophic destruction were concentrated in coastal New Jersey and New York City. Citizens in these areas sustained losses of homes and livelihoods and they represent the subset of Sandy survivors most likely to experience serious psychological outcomes. Yet beneath this vast weather

Figure 3. Spectrum of severity.

system, the majority of the 60 million touched by Sandy experienced the stressors of emphatic warnings and hurried preparations followed by a manageable encounter with inclement but unexceptional weather. Between these poles are the several million people who experienced distress associated with moderate property damage or the rigors of power outages compounded by harsh weather, transportation disruptions, and temporary school or work closures.

Psychological consequences of disaster extend across a range of duration (Fig. 4)

While the moment of disaster impact may be brief, the stress of disaster-provoked loss and change may continue for a protracted time period.

The importance of this point is that psychological stressors can persist long

after the physical forces of harm have ceased. The realization of loss and change is likely to intensify with myriad hardships encountered in the aftermath of disaster. These ongoing experiences are psychologically stressful even when physical necessities are assured. Survivors who have lost loved ones are especially challenged as they attempt to cope with these interpersonal losses while simultaneously struggling with the transformed physical and social landscape following disaster. Prolonged grief may be part of the experience for some bereaved survivors.

9/11

September 11 will forever punctuate US history. Eleven years later, psychological effects persist, including bereavement and memorialization of the 3,000 persons

lost on that day. As painstaking construction of One World Trade Center nears completion, there are fundamental changes in the American way of life, including an altered sense of personal safety.

Sandy

Sandy is already history for most who were under the storm's wide cloud dome for a portion of the system's 2,000 mile path. However, in coastal New Jersey and portions of Staten Island and other hard-hit sections of New York City, recovery will be a long process. For these families, adversities in the aftermath will rival or exceed the stressors experienced on the day of impact. Sandy may have dissipated, but the ongoing hardships during recovery will be challenging to bear.

Figure 4. Range of duration.

Psychological consequences of disaster relate to the defining features of the event (Fig. 5)

Each disaster may be regarded as a unique event that presents a novel constellation of stressors. DEEP Center's current line of investigation examines how best to characterize the "trauma signature" of each disaster episode.

The importance of this point is that *type* of disaster matters. Psychological consequences tend to occur at higher rates for disasters that are human-generated, especially when there is intentional human causation.

9/11

As an intentional human-generated act of terrorism, we have previously described 9/11 as "psychological by design." The

intention was to strike at national icons, cause horrific physical harm and death, expose US vulnerability to domestic attack, leverage the actions of a small number to impact an entire nation state. The human, economic, and psychological costs of 9/11 are simply staggering; this single event changed America. The psychological impact of 9/11 extended to all Americans.

Sandy

Sandy started as a relatively tame late-season hurricane that interacted with a winter storm system at mid-latitudes, exploded in size, and impacted the US northeast coast in a manner that caused moderate damage across a large region and focal devastation in several densely-populated coastal areas. A defining feature

of Sandy was the myriad presentations of this single system.

Disaster Public Health/Disaster Mental Health Integration

From this exploration of the psychological dimensions of disaster, it is apparent that behavioral health consequences are public health consequences – and vice versa. These dimensions are inseparable and indivisible.

Disaster-related physical injury and death represents a disaster behavioral health issue. Conversely, stress, distress, detrimental behavior changes, psychological impairment, and psychopathology can all be potential behavioral health outcomes for disaster-exposed and disaster-impacted populations, and this represents a disaster public health issue.

Figure 5. Type of disaster.

Going forward, disaster prevention and preparedness, as well as response and recovery, is better and more economically addressed by planning and practice that blends rather than separates the disaster public health and behavioral health dimensions.

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No potential conflicts of interest were disclosed.

Note

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