

Use VR Handhelds in Mass Casualty Disasters

HOW CAN GOVERNMENTS and health organizations effectively prepare to handle mass casualty disasters? In the United States, the Centers for Disease Control and Prevention (CDC) and hospitals have plans in place to handle people's physical health needs, yet the mental health needs of survivors often get too little attention, too late. Consider the following examples of recent disasters. In most cases, the number of fatalities is small relative to the number of people whose experience may have left them traumatized.

<i>Location</i>	<i>Disaster</i>	<i>Year</i>	<i>Mortality</i>	<i>Affected</i>
Kuwait	Invasion	1990	1,000	1,500,000
Rwanda	Genocide	1994	1,000,000	8,200,000
New York	Terrorism	2001	2,985	410,557
Indonesia	Tsunami	2004	294,000	5,000,000
New Orleans	Hurricane	2005	1,800	15,000,000
California	Fires	2007	9	1,000,000
China	Earthquake	2008	69,000	10,000,000

Pioneers in treating posttraumatic stress disorder with VR-enhanced, physiologically facilitated, prolonged exposure therapy with attentional retraining can assist countries to fill this important gap in disaster planning. For example, Dr. Joanne Difede has successfully worked with 9/11 survivors to reduce their symptoms of PTSD and depression. Dr. Ioannis Tarnanas prepares Greek children with special needs to cope with a common occurrence in their village—an earthquake. Dr. Brenda Wiederhold has proposed placing Rwanda genocide survivors in, for example, a virtual field where crops have just been burned, a virtual church where a family is hiding, or in other virtual environments where a trauma has occurred, and then having them slowly experience that situation in a controlled way. In this manner, the patient may begin to habituate to his or her specific PTSD symptoms and come to reappraise the situation, allowing full emotional processing to occur.

The CDC recognizes the importance of assessing mental health following a mass casualty event and includes an instrument on its Web site to assess symptoms of anxiety, depression, acute and posttraumatic stress disorders, and problem drinking. CDC staff suggest that health departments can quickly train workers to collect survey data and use the results to guide public health responses.

However, in the face of a mass casualty disaster, it may be impossible to deploy enough mental health professionals to assess and treat people in time to prevent a surge in subsequent cases of PTSD. How can we expedite this deployment? We believe that handheld technology, along with training in its use, is the key to unlock VR's potential to prevent and treat stress disorders in these situations.

Communication systems may be unreliable in some types of disaster, so self-contained, multimedia, interactive systems designed for 3G cell phones and PDAs may provide part of the solution. Dr. Giuseppe Riva designed a handheld VR "game" designed to alleviate battlefield stress. Dr. Mark Wiederhold has proposed deploying a similar system to U.S. Army troops. The few studies conducted to date show that the small screen is no hindrance to presence and therefore immersion and effective treatment—if designers make the virtual environment to maximize small-screen advantages, such as its ability to move around. Funding more studies to determine the parameters of the most effective handheld environments would be a wise use of stimulus funds.

When is the best time to intervene in a disaster to ensure survivors' mental health? We believe that VR has a role in all three stages:

1. Predisaster/preimpact preparedness/readiness—This is the point at which VR distress handhelds can make the most impact in training therapists and first-response technicians to stay calm in the face of adversity.
2. Disaster/impact response/implementation—Although the rules of triage require that physical safety comes first, survivors may prevent PTSD by having their acute stress reaction treated at this stage.
3. Postdisaster/postimpact recovery/reconstruction/evaluation—The faster PTSD treatment can be instituted, the less time the survivor is likely to spend in therapy.

Handheld technology is only as good as the therapists who use it. As VR technology mainstreams, an increasing number of therapists are training in its use. Preliminary results show that VR-enhanced, physiologically facilitated, prolonged exposure

therapy is more effective than traditional therapy. Now, governments seeking to rein in health care costs must fund follow-on studies to show that this new technology is more cost effective as well.

As these data become available, therapists will clamor for training on VR handheld systems, which will lend therapists a competitive edge and allow their clients to destress anytime, anywhere. Governments have a stake in providing such training, which may help to reduce the share of gross domestic product going to health care. As the U.S. government struggles to find ways to increase health care access while reducing health care costs, we say the time to invest in VR handhelds is now—before the next disaster.

*Brenda K. Wiederhold
Editor-in-Chief*