



The Importance of Building a Coordinated Disaster Behavioral Health Response Protocol for a RND Event

by Ashley Pearson, B.S., MPA, CBCP, Director of Emergency Management Services State Disaster Behavioral Health Coordinator, Massachusetts Department of Mental Health

Map of the licensed nuclear reactors in the U.S. (Circa 2008)

As we review the disaster response in the aftermath of the 2011 the Great East Japan Earthquake, which was a 9.0 undersea mega thrust earthquake, the largest in the island nation's history and caused the Radiological Nuclear Disaster event at the Fukushima I Nuclear Power Plant, the full scope of the catastrophe is still



largely unknown. It is expected that the long-term psychological impacts will be felt for many years to come. Here in the U.S., we mourn the incalculable losses experienced by the people of Japan and at the same time are reminded of the risk to our own people of the danger posed by this type of incident. Across the country, we know that there are over 104 commercial reactors operating in the U.S. (2008 data¹), with all of them having at risk of becoming a nuclear hazard.

Radiological Nuclear Disasters (RND), like other major disaster incidents evoke feelings of horror, helplessness, hopelessness and sense of loss of control over an individual's life. The uniqueness of a RND incident is that the effects are far-reaching and the impact extends beyond the time of the impact. As it is not an isolated event in this sense, the after-effects can last for very long time sometimes indefinitely due to the extent of the impact. Along with the immediate physical survival needs, exposure to radiation through a nuclear disaster event often brings up fears and health concerns related to the future, as well as the impact of the RND on future generations.

For example, in a small state like Massachusetts, there are Emergency Planning Zones (EPZ)

for three power plants² that consist of: **Pilgrim Nuclear Power Station**, a General Electric Type 3 in Plymouth, MA, **Seabrook Station**, Unit 1, Westinghouse Four-Loop in Seabrook, New Hampshire and **Vermont Yankee Nuclear Power Station**, a General Electric Type 4 model in Vernon, Vermont. Two of the three plants, Seabrook and Pilgrim, are of the Mark 1 boiling water reactor type similar to the problem Fukushima reactor in Japan, which could have an impact on the state if a Radiological Nuclear Disaster (RND) were to originate at one of these facilities³. In fact, a Radiological Nuclear Disaster (*RND*) occurred in the U.S., when in 1979, the Three Mile Island reaction in Middletown, MPA malfunctioned and lead to a massive evacuation around the site. In addition to the potential impacts from nuclear plants, there are colleges and universities in the States that utilized nuclear fission as part of their research, and must be taken into consideration by emergency planners and responders. There are two locations that are known in Massachusetts, one is located at the Massachusetts Institute of Technology (MIT)⁴ and the other at the [University of Massachusetts Lowell](#)⁵, as any site using nuclear processes could pose a risk⁶.

Incidents at plants are not the only source of Radiological Nuclear Disasters. There are several types of RND that could affect us. Malfunctions at plants are not the only danger; another is for nuclear power to be used as an instrument of terror. As mentioned, local colleges and universities within States that utilize nuclear fission can be a hazard, which makes local emergency planners and responders nervous. Last, the threat of a “dirty bomb” being exploded by a terror group attempting to inflict harm on the population in a high profile area like Boston or other major cities across the U.S., is another possible source of a RND. A dirty bomb, which is a mix of explosives, such as dynamite, with radioactive powder or pellets, could be used by radicals to cause harm to large numbers of citizens. This type of nuclear-style bomb is most effective when dynamite or other explosives are set off, so that the blast carries radioactive material into the surrounding area⁷.

The possibility for RND, either within Massachusetts or the United States is probable and with the long-range psychological effects having been observed for years after events such as Chernobyl, we have a better understanding of how survivors are impacted by a RND. A local colleague in Massachusetts, Dr. Elena Cherepanov, in her recent article on the psychological impacts, describes her experience of treating victims in the aftermath as well as through the recovery phase⁸. Dr. Cherepanov has stated that there are striking similarities between issues, persistent themes and the survivors’ reactions following the Chernobyl disaster, and those observed in other RND incidents. These include:

- Multi-systemic and multi-levels impact;
- The effects of RND extend to the future;
- Conspiracy theories, mythology: making sense of the senseless catastrophe;
- Informational wars that foster distrust of the authorities and the information that they provide to the public;
- The role of media, overall to help or exacerbate recovery efforts;
- There is no perceived place of safety after exposure;
- Psychological effects of RND, most notably a sense of foreshortening future
- Physical health concerns;
- The need for organizes systems for resilience and recovery.

With this in mind, there is much we on the disaster planning, relief and response side, need to do in order to better prepare for this type of event. Although response exercises are practiced on an ongoing basis by government, emergency management agencies, at the plants and with other partners, little has been accomplished in the area of practicing full-scale evacuation or reception-center operations to test ability to meet the psycho-social needs of community members and responders. In disaster planning and preparedness we often reactive to events instead of preparing ahead of time. It is concerning that only modest steps have been taken to prepare for the disaster mental health impacts of a RND event. Best practice examples are scattered across the nation and not well communicated across federal, state and local jurisdictions.

Many have remarked at the relative calm and collectedness of the Japanese in reacting to the earthquake, although aspects of panic were observed in live footage of the early phases of the event. One reason for this may be a result of societal norms distinct to the Japanese. A second reason for the apparent lack of emotion and blunt affect we are seeing in some survivors could be an after effect of the shock that causes numbing as a way for people to cope, as a way to temporarily deal with the magnitude of loss they are experiencing. It would be wrong to attempt to diagnose or making assumptions as to the reasons for this, but these are the typical disaster reactions we know are experienced by survivors¹⁰.

Some experts in the field have stated that some manifestations of panic behavioral may be likely⁹. It can only be surmised that the reason we have did not seen images of mass panic, acute stress or psycho-social breakdown during the immediate phase after this event, was in part due to the past efforts of the Japanese to engage in disaster preparedness. Japan has a long history of earthquakes and tsunamis. They have also been described as one of the most advanced societies in their level of disaster preparedness. Yet nothing could have predicted their current triple or quadruple impact of the almost simultaneous emergencies. Survivor reports have suggested that the mental health response to the event has been limited.

The images from the news reports and documentaries that have shown us footage of the earthquake, the subsequent tsunami and the Radiological aftermath at the nuclear power plant¹¹. These are challenging to watch not only because of the massive scale of the devastation but also because those of outside of Japan have only been asked to provide outside limited help. The altered reality the Japanese are facing in the long-term recovery phase includes a myriad of dangers, foremost of which are the Radiological threat but also the onset of processing the traumatic event. If survivors' mental health needs are not addressed, we know that the potential for mental illness and other health concerns is acerbated. The research conducted as part of the Crisis Counseling Assistance and Training program over the last thirty years has shown that outreach and techniques such as Psychological First Aid assist people to cope and build resilience skills to mitigate long-term negative impacts, but must be implemented in a coordinated, professional and systematic manner by trained practitioners.

Dr. Cherepanov has observed that those of us working in the field of disaster behavioral health do not have a large toolbox of research to draw upon in order to develop an effective response to a nuclear event. Although empowered with some information on the scientific impact of nuclear and Radiological events and how they impact the human body from Hiroshima, Nagasaki, past events at power plants or Radiological releases, such as the famous case in Brazil, we have no combined store of knowledge on how to craft an effective behavioral health response for Radiological events. The incident in Goiânia, Brazil was a radioactive contamination accident that occurred on September 13, 1987 and has been considered one of the worst nuclear accidents in history, provided insight into the behavioral aspects of how individuals respond to RND. It occurred after an old Radiotherapy source was stolen from an abandoned hospital site. It was subsequently handled by many people, who were fascinated by the blue-glowing powder, resulting in four deaths and radioactive contamination of 245 other people, 20 of who showed signs of Radiation sickness and required treatment. Similar to the Sarin gas attacks in Tokyo in 1995, the greatest impact was in the fear response exhibited by those who thought they might have been exposed and how the overwhelming public reaction tapped the limits of the medical and governmental system to effectively respond.

This and other unfortunate incidents have taught us much about the effects on the body, but we are still basically in the dark when it comes to the psychological impacts on individuals and communities, and know less about the most effective ways to treat the impacts of a RND event. Beyond the pioneering work of people like Dr. Cherepanov and a few others, we have limited research, no protocols or training to prepare for RND. With the fear of nuclear attacks brought on by the bombs that were used to end combat in Japan during World War II, the subsequent shroud of fear many lived under during the Cold War period and lessons learned from event like what is being experienced at Fukushima I, it seems almost unbelievable that there are no national protocols to assist people to heal from the mental crisis the stress of either living through, or responding to, the psychological stress that a RND brings. It is understandable that the event in Japan has renewed a call by some for to close nuclear power plants but, it is unlikely that in today's geo-political climate that it is an energy producing option we can stop using in the near future. The gains anticipated from the use of nuclear power in academic or research settings also outweigh the risks or we would not employ them today. The threat of dirty bombs or other nuclear attacks is probable enough that we also prepare to respond to them as a known Radiological threat.

This being said, we should not miss the opportunity now to protect our minds and prepare for extreme emotional reactions with the same care in with which we shield our bodies from harm. Knowing that resources are always limited for this work, several structures could be put into place now to address the varied emotional, psychological, mental and behavioral well-being of citizens. Most mental health professionals have limited knowledge of addressing the unique and severe psychological trauma that would be induced by a nuclear event and the vast majority of public health or medical professionals have limited knowledge of the physical impact of RND. Neither group is well-qualified without technical assistance, guidance and training to adequately respond to this type of event. Many first responders are required to take HAZMAT or CBRNE training but this does little to address stress management,

psychological impacts or build knowledge of the psycho-social impacts of Radiological exposure. With these groups of educated and knowledgeable professionals vastly underprepared to respond, the general public located in the EPZ or impact zones, which would need to aid each other, at least during the immediate aftermath of an event, would benefit from education to promote healthy coping. First, several tools currently exist that can be integrated now into disaster planning and preparedness efforts:

1. The Lessons Learned Information Sharing document called, ***The Radiological Incident Response Post-Release Psychological Management***, which describes the event at Goiânia, Brazil, should be reviewed and implemented. Its guidance to provide specific attention to “*psychological support mechanisms [that] should be available for victims, the public, emergency response personnel, and medical personnel working with contaminated patients after a Radiological release. Teams of [trained] mental health experts should be integrated with these groups in any Radiological emergency from the onset of incident response*” should be integrated into planning efforts immediately. The document is available at www.LLIS.gov.
2. Two trainings to build resilience pre-event to RND are known and could be adopted and effectively integrated into preparedness efforts by trained professionals experienced in disaster mental health and RND. One was developed in conjunction with Institute for Disaster Mental Health at SUNY New Paltz for the New York State Department of Health and called *Disaster Mental Health: Assisting People Exposed to Radiation* and the second is a web-based training available on the CDC’s web-site entitled, “Psychological First Aid in Radiation Disasters” (http://www2a.cdc.gov/TCEOnline/registration/detailpage.asp?res_id=2490).

Second, the following next steps should be taken:

1. Behavioral Health networks already developed in States need to prepare specific Standard Operating Procedures and Protocols for how to respond to RND, using the guidance suggested by Dr. Cherepanov in her article.
2. Trainings to build resilience pre-event and specifically developed for RND should be implemented and expanded upon.
3. Psychological First Aid should be adopted as a standard for all disaster response workers, including first responders, first receivers, disaster relief workers and all disaster-related volunteers, not just the disaster mental health team members.
4. Disaster Responders and community members within EPZ should exercise evacuation, reception center and disaster recovery procedures on an on-going basis, at minimum, annually. They should also be trained to develop their

disaster resilience and coping mechanisms. This will build psychological resilience and emotional preparedness.

5. Mental/Behavioral Health teams developed specifically to respond to RND should be supported through training and integrated into ongoing exercises of all types, at the federal/national, State and local level. Disaster behavioral health is a specialty discipline within emergency management and mental health. Not all crisis counselors or mental health professionals have the capability to respond to this type of event, nor even those trained as disaster crisis interventionists, so specialized training and response teams should be developed specifically to address the acute stress, anxiety, fear and other intense emotions elicited by this disaster type. Behavioral health disaster response teams should be developed within EPZ as they would likely have to provide assistance, at least during the immediate recovery phase and possibly longer, because it would be unlikely that outside experts could be called in to assist due to the safety risks posed by Radiation exposure. Capacity-building and exercising in this area would prepare local teams and fellow responders in the impact zones for RND.
6. Experts in disaster behavioral health service provision should be given opportunities to develop RND specific response protocols for all four disaster phases: mitigation, response, recovery and planning. This should be done at the national level, in conjunction with expert practitioners at all levels, and then operationalized into disaster plans.
7. Fact sheets, media messaging and other forms of psychosocial devices that specifically address the psychological effects caused by a RND need to be developed and widely dispersed to those locations that are at risk.

The danger posed by RND is a real threat and the opportunity to conduct improvement to our emergency preparedness planning should not be missed. Our emergency management system has a well-developed and robust response system in place to address the response phase of an incident. What does not now exist are the structures to address the well-being, acute stress or to develop the coping mechanisms of community members and responders who would be impacted by a Radiological Nuclear Disaster. The Japan Great Earthquake Disaster should serve as a wake-up call to us here in America to put better systems in place now. We know from the history of disasters that it is not a matter of *if, not when*, the next RND will happen, and preparedness is our key to survival. It is timely for us to improve the overall emotional resilience response for nuclear events. By implementing the steps above and expanding upon them, we would be on the path to creating a stronger emergency management system that is better prepared to rebound from a Radiological Nuclear Disaster. Let us gain from what we have learned from Chernobyl, Fukushima and the unfolding situation in Japan, as they work to rebuild, to create a disaster behavioral health response that is well designed to aid us to recover from future RND events.

References

1. Facilities (by NRC Region or State), United States Nuclear Regulatory Commission, web page, <http://www.nrc.gov/info-finder/region-state/>, circa 2008.
2. Operating Nuclear Power Reactors (by Location or Name), United States Nuclear Regulatory Commission, web page, <http://www.nrc.gov/info-finder/reactor/>, 2011.
3. *U.S. nuclear plants similar to Japan plant in peril*, Fact box, Reuters, web page, <http://www.reuters.com/article/2011/03/12/japan-quake-nuclear-ge-idUSN1227232120110312> , Sat Mar 12, 2011 3:39pm EST
4. FES Research, Fusion Institutions, U.S. Department of Energy, web page, <http://science.energy.gov/fes/research/fusion-institutions/>, 2011.
5. Acland, Frank, Massachusetts Senator Bruce Tarr First Politician to Publicly Propose E-Cat as Energy Solution, web page, <http://www.e-catworld.com/2011/11/massachusetts-senator-bruce-tarr-first-politician-to-publicly-propose-e-cat-as-energy-solution/>, November 23, 2011
6. Lewis Larsen, Low Energy Nuclear Reactions for Green Energy, Institute of Science in Society web page, 13/11/08, <http://www.i-sis.org.uk/LENRGE.php>.
7. *Frequently Asked Questions About Dirty Bombs*, Emergency Preparedness and Response fact pages, Centers for Disease Control (CDC), web page, <http://www.bt.cdc.gov/RNDiation/dirtybombs.asp>, Page last updated March 21, 2005, page last reviewed May 10, 2006.
8. Elena Cherepanov, PhD, LMHC, *Psychological Impact of Spring Nuclear Plants Disasters, Traumatic Stress Points, ISTSS, Volume 25, issue 6, November 2011.*
9. Daniel Dodgen, PhD, Ann E. Norwood, MD, Steven M. Becker, PhD, Jon T. Perez, PhD and Cynthia K. Hansen, PhD, Social, Psychological, and Behavioral Responses to a Nuclear Detonation in a US City: Implications for Health Care Planning and Delivery, American Medical Association, Disaster Medicine and Health Preparedness, http://www.dmph.org/cgi/content/full/5/Supplement_1/S54, January 10, 2011
10. Fran H. Norris, Matthew J. Friedman, Patricia J. Watson, Christopher M. Byrne, Eolia Diaz, And Krzysztof Kaniasty, *60,000 Disaster Victims Speak: Part I. An Empirical Review Of The Empirical Literature, 1981–2001*, Psychiatry 65(3) Fall 2002. http://frames.nbi.gov/documents/hdfss/norris_friedman_watson_bryne_etal_2002.pdf
11. *Witness: Disaster in Japan – National Geographic* March 11th Japan Earthquake Documentary, National Geographic Channel, aired first on April 13, 2011

About Ashley A. Pearson, B.S., MPA, CBCP, CTR

In 2003-2004, Ms. Pearson managed the Red Cross' September 11 Recovery Program-Mental Health and Substance Abuse Services Intake Unit in New York City. She is a Certified Business Continuity Planner and Disaster Behavioral Health Specialist. Ashley serves as the Director of Emergency Management Services at the Massachusetts Department of Mental Health, where she is the Business Continuity Coordinator and implemented the first agency-wide COOP in 2005-2006. She has successfully coordinated the development, implementation and coordination of disaster plans, including an Emergency Response Plan for H1N1, All-Hazards and disaster-specific response planning. She was the Principal Investigator for the development of a curricula and a training series on All-Hazards Disaster Planning for private organizations. Ashley regularly provides technical assistance and guidance to internal, external and national partners on planning and preparedness elements. She has also implemented training modules for psychological resilience, a behavioral health overview for emergency room departments, crisis response, Psychological First Aid, basic and advanced courses. Ashley is an adjunct Senior Instructor with Cambridge College, teaching a Disaster and Terrorism for Healthcare Leaders course. She is also a Certified Trauma Responder through Association of Trauma Stress Specialists.