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Assessing Community Reactions to Ebola Virus Disease and Other Disasters: Using Social Psychological Research to Enhance Public Health and Disaster Communications

Joseph A. Boscarino, PhD, MPH^{1,2,3} and Richard E. Adams, PhD⁴

¹Center for Health Research, Geisinger Clinic, Danville, PA

²Department of Psychiatry, Temple University School of Medicine, Philadelphia, PA

³Departments of Medicine & Pediatrics, Mount Sinai School of Medicine, New York, NY

⁴Department of Sociology, Kent State University, Kent, OH

Abstract

Drawing on the lessons learned from previous disaster and disease outbreak studies over the past two decades, in the following article we review research related to social psychological assessment of community attitudes, knowledge, and beliefs associated with the recent Ebola outbreak and other public health threats, and discuss the use of this information to assist in future disaster planning and crisis communications. Psychologists, physicians, and others in the healthcare field need to be aware of these developments and involved with preparations related to mitigating the psychological impact of Ebola disease outbreaks among different populations, as well as other potential public health threats in the future.

Keywords

Preparedness; risk communications; public health; disease outbreaks; disasters; bioterrorism; social psychology

INTRODUCTION

Given the scope of the recent Ebola outbreak in West Africa, exportation of Ebola virus disease (EVD) to other parts of the world is likely to continue (Farrar & Piot, 2014; Toner, Adalja, & Inglesby, 2014). At this time, much is to be learned about EVD virology and epidemiology (Toner et al., 2014). Several metropolitan areas in the US serve as ports of entry for travelers from West Africa and have communities of immigrants who regularly travel to West Africa, as well as healthcare workers who travel to this region (Benowitz et al., 2014). In New York City (NYC) during November, 2014, several hundred persons believed to be exposed to the virus were being monitored by health department officials (Hartocollis, 2014). Many public health agencies have experience with controlling previous disease outbreaks, such as Severe Acute Respiratory Syndrome (SARS), measles, novel

*Correspondence regarding this article should be directed to: jaboscarino@geisinger.edu.

influenza strains with pandemic potential, Lyme disease, and more recently, Middle East Respiratory Syndrome (MERS) (Benowitz et al., 2014). Nevertheless, it is unclear how prepared the US and other countries are for a major outbreak of EVD (Farrar & Piot, 2014; Gostin, Hodge, & Burris, 2014). It has been noted that caring for patients with Ebola will be a challenge for most healthcare facilities (Kortepeter, Smith, Hewlett, & Cieslak, 2014). A recent survey of infectious disease prevention specialists in the US indicated that only 6% reported their facilities were prepared to receive EVD patients (Association for Professionals in Infection Control and Epidemiology, 2014). As in most large-scale disasters, the preparedness of healthcare systems and first-line healthcare professionals is typically an ongoing public health challenge (Loke, Fung, & Liu, 2013; Redlener & Reilly, 2012). Building on previous disaster experiences (Institute of Medicine and US Department of Health and Human Services, 2014), we review existing social psychological research related to assessing community attitudes, knowledge, and beliefs related to EVD and other potential public health threats, and discuss the use of this information to assist in future disaster planning and crisis communications.

OBJECTIVE

This review is based on previous research related to bioterrorism, the environmental health impact of major disasters, and disease outbreaks over the past two decades (Boscarino, 1988; Boscarino & DiClemente, 1996; Boscarino et al., 2003; Boscarino et al., 2004; Boscarino et al., 2006; Boscarino, Adams, & Figley, 2011; Boscarino et al., 2012; Boscarino et al., 2013; Galea et al., 2002). These events not only increase the public's concern about environmental health threats, but also have affected the psychological well-being of local populations. For example, research suggested that 11% of New York adults, approximately 700,000 persons, suffered a panic attack during the World Trade Center (WTC) attacks (Boscarino, Adams, & Figley, 2004). Other studies, conducted nationally and within the New York area following the WTC attacks, also reported widespread psychological distress (Schlenger et al., 2002; Silver et al., 2002). Findings related to the sudden occurrence of environmental health threats among other populations provide further evidence of the adverse psychological impact of such events, including the Tokyo Sarin gas attack (DiGiovanni, 1999; Ohbu et al., 1997), the Scud missile attacks in Israel during the Gulf War (Karsenty et al., 1991), and the West Nile virus outbreaks in the US (Covello, Peters, Wojtecki, & Hyde, 2001). The onset of psychogenic illnesses have often been reported following such events (Boscarino et al., 2013; Hallman et al., 2003; Wessely et al., 2001), and even a limited EVD outbreak would likely have a significant psychological impact, making public health management difficult (Boscarino et al., 2006; Foa et al., 2005). Consequently, to assist with community preparedness, we suggest that future research needs to be focused on the following objectives:

- Assessment of level of knowledge, attitudes, and beliefs in the community related to the perceived environmental health threat.
- Evaluation of community preparedness and evacuation planning, including perceptions of public safety and beliefs about quarantining.

- Identification of higher risk subgroups, including key demographic, socioeconomic, and psychosocial groups, which have less knowledge, are misinformed, and are poorly prepared for a major environmental health threat.
- Appraisal of urban versus rural locality, gender, income, education, race, ethnicity, and healthcare facility access, as these relate to beliefs, knowledge, misinformation, and disaster preparedness.
- Discovery of the most effective means to disseminate disaster information through local/regional communications, social networks, and public/professional release of results.

From a public health perspective, managing psychological reactions among the public after a major environmental threat, and even before it occurs, is important (Boscarino et al., 2012; DiGiovanni, 1999; Glass & Schoch-Spana, 2002). Despite this realization, most of the public health preparedness activities to date have focused on the technological and biomedical aspects of these events, not the psychological impact (Bravata et al., 2002; Committee on R&D Needs for Improving Civilian Medical Response to Chemical and Biological Terrorism Incidents, 1999; Keim & Kaufmann, 1999; US Department of Homeland Security, 2014). To examine the social psychological aspects of bioterrorism threats in New York following the WTC attacks a decade ago, we studied a random sample of nearly 1,700 adult residents (Boscarino, Adams, Figley et al., 2006). We found that 45% of these residents were concerned about future attacks and that nearly 20% reported a fear level of “10” on a 10-point analog fear scale. In addition, while 43% indicated that they would wait for evacuation instructions following a chemical, biological, or nuclear event, 34.4% (95% C.I. = 31.5–37.3) reported that they would evacuate immediately without instructions from health or police department officials, actions that might result in greater civilian casualties. In this WTC study, predictors of higher fear levels included Hispanic ethnicity (odds ratio [OR]=2.0, $p=0.006$), lower levels of education (OR=4.4, $p<0.001$, and OR=3.7, $p<0.001$, respectively, for non-high school and high school graduates, compared to college graduates), being exposed to recent stressful life events (OR=1.6, $p=0.048$), having posttraumatic stress disorder (OR=3.1, $p<0.001$), having a high fear of death (OR=2.5, $p=0.002$), and reporting a high likelihood of fleeing an event against official advice (OR=1.5, $p=0.034$) (Boscarino, Adams, Figley et al., 2006). In 2013, we reported that 6 months following Hurricane Sandy at the New Jersey Shore, 48% of area local residents reported major environment health concerns and those who had these concerns were more likely to have psychological problems, including posttraumatic stress disorder and depression, and/or to have sought mental health treatment (Boscarino et al., 2013). Thus, previous research suggests that better understanding of the public’s perception of health threats is important for efficient preparedness planning, risk communications, and disaster management (Boscarino et al., 2003; Boscarino et al., 2006; Boscarino et al., 2013; Covello et al., 2001; Foa et al., 2005).

We note that past disaster research findings are consistent with terror management theory, a social psychological concept, which suggests that a key to understanding reactions to environmental threats is understanding of the fear of death (Pyszczynski, Greenberg, & Solomon, 1999; Strachan et al., 2007). Similar to stress-process theory (Adams &

Boscarino, 2005; Adams & Boscarino, 2011; Boscarino et al., 2014), this fear is affected by social factors, level of education, self-esteem, and social support -- factors responsible for buffering individuals against traumatic episodes and the subsequent adverse cognitive processes associated with these events (Boscarino & Figley, 2012; Pyszczynski et al., 1999; Strachan et al., 2007). It is noted that our New York terrorism study found that residents had the greatest level of trust in disaster evacuation information provided by local police and fire department officials (69%) (Boscarino et al., 2003). This was followed by trust in information from their private doctors (59%), state health department officials (53%), US government officials (49%), and friends and neighbors (41%) (Boscarino et al., 2003). Interestingly, residents had the least trust (17%) in evacuation information provided by health insurance companies or managed care plans, an important public health revelation at the time, suggesting that different risk communication strategies should be deployed (Boscarino et al., 2003).

Given the threat to public health and the possible adverse impact on healthcare delivery systems, community interventions should be planned and implemented, including community surveys, workplace and family-based education and public service announcements (Engel & Katon, 1999; Foa et al., 2005), as well as provider-focused interventions (Adams et al., 2013; Gershon et al., 2004; Hu et al., 2006). Post-event health surveillance also should be planned in the aftermath of a major event or disease outbreak (Boscarino et al., 2012; Boscarino et al., 2014; Engel & Katon, 1999; Foa et al., 2005). Drawing on past experiences, it has been suggested that public education and communication can reduce or limit adverse population reactions (Covello et al., 2001; Foa et al., 2005). It has been previously suggested that "risk communication" can have the effect of not only reducing fear, but also promoting self-protecting behaviors (e.g., stockpiling emergency supplies, planning escape routes), building trust, and preventing the spread of misinformation (Covello et al., 2001; Foa et al., 2005). Without these efforts, vulnerable persons and groups may increase the level of social disruption in the community (Boscarino et al., 2003; Boscarino, Adams, Figley et al., 2006). The nature of these threats makes both media coverage and risk communications critical, warranting disaster planning considerations (Foa et al., 2005; North & Pfefferbaum, 2002). It has been noted that a particular challenge with new disease outbreaks, such as EVD, is that much of the medical science is still unknown at the time the disease emerges (Rosenbaum, 2014). Consequently, risk communications would need to incorporate this uncertainty, not ignore it, much like meteorologists do in forecasting extreme weather events using various "warning systems," such as with hurricanes or tornados (Rosenbaum, 2014). Of course, this was the same challenge with the outbreak of HIV disease in the 1980s (Boscarino, 1988; Boscarino & DiClemente, 1996). Interestingly, our WTC disaster study indicated that simple, worksite crisis interventions offered by NYC employers immediately after the WTC attacks were effective in reducing a number of mental health problems post-disaster, including binge drinking, depression, PTSD severity, and anxiety symptoms (Boscarino, Adams, & Figley, 2005; Boscarino, Adams, Foa et al., 2006), clearly a positive public health finding.

RESEARCH METHODS

Much of our past disaster research was based on random community surveys of household adults in the affected disaster areas (Adams & Boscarino, 2006; Adams, Boscarino, & Galea, 2006; Boscarino et al., 2003; Boscarino et al., 2004; Boscarino, Adams, Figley et al., 2006; Boscarino et al., 2013; Galea et al., 2002). These household population surveys were typically stratified geographically with the population sampled proportionately. At least one follow-up survey is also recommended, if research funds are available. For the follow-up surveys, typically, the investigator attempts to re-interview the participants 6–12 months after the baseline survey. For both baseline and follow-up surveys, trained interviewers using a computer-assisted telephone interviewing (CATI) system are preferred. In-person and mailed surveys are also sometimes feasible (Freeddy, Kilpatrick, & Resnick, 1993), but telephone surveys have several key advantages (Groves et al., 2009). Generally, the duration of these surveys would be about 30–40 minutes for a baseline survey and about 20–30 minutes for a follow-up survey. For both surveys, sampling weights would normally be developed to correct for potential selection bias (Boscarino et al., 2004; Boscarino, Adams, Figley et al., 2006; Boscarino & Adams, 2009; Boscarino et al., 2011). The goal should be to complete at least 600–800 interviews, in order to have sufficient statistical power to test specific hypotheses and to allow for analyses of important subgroups (Boscarino et al., 2004; Hulley et al., 2013). One of the limitations of the telephone survey, however, is the cost (Groves et al., 2009). These studies can be expensive to conduct, depending on the sample size, length of the interview, and the use incentives to increase participation (Groves et al., 2009). As a result, other methods for data collection are sometimes used, generally considered more qualitative, such as focus groups and on-line internet surveys (Groves et al., 2009). The other chief method used in public health disaster research is the post-disaster research registry (Institute of Medicine and US Department of Health and Human Services, 2014; Jordan et al., 2011; North et al., 1999). Registries are disease surveillance systems chiefly developed by epidemiologists to track disease outcomes over time (Rothman, Greenland, & Lash, 2012). One of the more well known of these post-disaster registries is the World Trade Center Disaster Registry (Institute of Medicine and US Department of Health and Human Services, 2014; Jordan et al., 2011). Another one is the World Trade Center Responder Registry (Pietrzak et al., 2014). However, regardless of the methodology used, it is extremely important for investigators to use reliable and validated research instruments in data collection (Boscarino et al., 2003; Boscarino et al., 2004; Boscarino, Adams, Figley et al., 2006; Boscarino et al., 2013; Boscarino et al., 2014; Galea et al., 2002). If not, data issues may confound the study results for years afterwards (Dohrenwend et al., 2006; Kilpatrick, 2007). Finally, studies of healthcare professional and first responders are also important for disaster planning and may warrant special research considerations (Adams, Figley, & Boscarino, 2008; Boscarino, Figley, & Adams, 2004).

CONCLUSION

Given current threats and emerging knowledge related to both environmental and human-made disasters, we think that interventions should be considered, including community, workplace and family-based programs and public service announcements, based on new and existing research (Boscarino, Adams, Figley et al., 2006; Boscarino et al., 2012; Boscarino

et al., 2014; Engel & Katon, 1999; Foa et al., 2005). Post-event health surveillance also should be planned in the aftermath of major incidents. The World Trade Center Disaster Registry is one of the more well known of these approaches (Institute of Medicine and US Department of Health and Human Services, 2014; Jordan et al., 2011). Drawing on past experiences, it has been suggested that public education and communication can reduce adverse population outcomes (Boscarino et al., 2013; Covello et al., 2001; Foa et al., 2005). It has been previously suggested that effective “risk communication” can have the effect of not only reducing fear, but also promoting self-protecting behaviors, and preventing misinformation (Boscarino, Adams, Figley et al., 2006; Covello et al., 2001; Foa et al., 2005). Without these efforts, vulnerable persons, including the elderly and the disabled, might increase social disruptions and the burden of healthcare utilization in the community (Boscarino et al., 2003; Boscarino et al., 2014). The very nature of these threats make media coverage, risk communications, and social media critical, warranting advanced disaster planning considerations (Boscarino, Adams, Figley et al., 2006; Boscarino et al., 2014; Foa et al., 2005). As suggested, our post-WTC study indicated that simple, workplace “psycho-educational” interventions offered by NYC employers after the WTC disaster were highly effective in reducing future mental health problems among employees, including significant reductions in anxiety symptoms (Boscarino et al., 2005; Boscarino, Adams, Foa et al., 2006; Boscarino et al., 2011), clearly a positive public health finding.

In summary, while there is concern related to adverse events following the outbreak of EVD and gaps in knowledge currently exist, the research tools needed to mitigate the impact of these threats are available (Boscarino, Adams, Figley et al., 2006; Boscarino et al., 2014; Engel & Katon, 1999; Foa et al., 2005). Psychologists, physicians, and others in the public health sector need to be aware of these developments and become more involved with preparations related to the psychosocial mitigation of disease outbreaks, and other public health threats in the future.

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