Community Response to Disaster: The Role of the Workplace

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Disasters, natural and man-made, have a considerable impact on communities. Most recently, disasters stemming from terrorist attacks have become a leading cause of concern. The importance of work in the lives of employees, coupled with the vulnerability of workplaces as potential targets of terrorist attacks, suggests that workplaces can and should play a role in planning for, and responding to, disasters. This article addresses the role of the workplace in disasters, with an emphasis on the psychological impact of such events, by drawing upon experience and literature related to workplace violence and to other traumatic events in the workplace. (HARV REV PSYCHIATRY 2004;12:229–237.)

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Disasters can be defined as crisis events "in which the demands being placed on a human system by the event exceed the system's capacity to respond" or as "a category of environmental events that periodically, and with varying degrees of intensity, subject human systems to a wide range of disruptions and stress."[1] For the purposes of this article, the term will be used broadly to encompass natural or man-made traumatic events that cause actual psychological, physical, or material injury, or the fear that such injury will occur.

Since the 1990s, concerns about community disasters have focused on terrorist events, although man-made accidents and natural disasters are much more common events than acts of terrorism. For the most part, we look to government to play the central role in preparing for and preventing disasters, mitigating their impact, and facilitating a return to normal functioning. We should also recognize, however, that the workplace can play a significant role. Work is a central organizing factor and source of identity for most adults. In addition to providing income, insurance, and other benefits, work imparts a sense of purpose, interrelatedness, and belonging. The workplace serves as a major organizing factor in the lives of most adults and as a source of social support; it is an essential part of the local community.[2] When disaster strikes that community, the effects on the individual and the organization can be widespread and long lasting. In this article, we discuss the impact of disasters on work organizations and outline how the workplace can play an effective role in disaster response by pre-event planning, disaster response, and post-event actions that can help individuals, the work organization, and society return to normal psychological functioning and productivity.

THE WORKPLACE AS TARGET OF TERRORISM

Recent events suggest that workplaces and work-related activities are attractive targets for terrorists. The 1993 World Trade Center bombing, the 1997 Oklahoma City bombing, multiple attacks on abortion clinics, and the September 11, 2001, attacks on the Pentagon and World Trade Center were deliberate efforts to disrupt and destroy workplaces and to damage what those institutions represent. The implicated

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terrorists themselves have given those reasons for their actions. In the same vein, it is also now known that the U.S. Capitol, the White House, the headquarters of the FBI and CIA, and the tallest buildings in the states of California and Washington were additional potential targets of the 9/11 attacks.[3] The recent train bombings in Madrid, Spain, targeted commuters on their way to work.

Attacks on work environments have great potential for disruption of routine functioning of individuals, organizations, and nations. For several potential reasons, workplaces are logical target choices for those who seek to maximize terror in specific communities, promulgating a sense of vulnerability among the population as a whole. First, the workplace—particularly the targets that have been chosen so far—may symbolize beliefs, commerce, globalization, and the strength of a society and culture, all of which may be detested by the terrorists. If the goal of terrorism is to disrupt the fabric of a society, or a section of society, through destruction of the sense of security and trust,[4,5] then an attack on institutions that represent the mainstays of a country's life and prosperity—thereby creating a sense of fear and vulnerability—is a logical course of action.

Second, worksites and modes of transportation leading to work are attractive targets because they concentrate desirable victims such as workers in key industries, members of the military, government employees, and foreign embassy personnel. Workplaces, especially those located in urban areas, present convenient targets as places where large numbers of people gather, predictably, on a given day.[6]

Third, massive attacks on the economic infrastructure of a society can have both short- and long-term economic effects, disrupting normal social, business, and governmental activities. Targets are often chosen with a specific goal, such as economic disruption, in mind.[7]

Regardless of the reasons why workplaces may be targeted by terrorists, the attacks and other large-scale acts of violence have a profound effect on those working at a targeted site, on others at the scene, and on members in the surrounding community.[8,9]

THE PSYCHOLOGICAL IMPACT OF TRAUMATIC EVENTS: LESSONS FROM VIOLENCE, THREATS, AND HOAXES

Although the threat of terrorism has captured the attention of employees and their organizations in recent years, prior to that there had been long-standing concerns about more commonplace disasters, such as threats and acts of violence. Much of what we know about organizational response to violent events comes from workplace violence and other man-made and natural disasters unrelated to political or religious terrorism. Individual and organizational responses to these events can serve as useful models for addressing the impact of terrorist acts and other disasters.

Acts of violence, whether or not resulting in fatalities, have a demonstrated impact on employees and their organizations.[10] In a study of personal and organizational outcomes of workplace violence, Rogers and Kelloway[11] examined the impact of actual and threatened physical attacks on 194 bank tellers who were direct or vicarious victims. They documented that the fear of future workplace violence after an event results in impaired psychological and physical health. In contrast to other researchers,[12] Rogers and Kelloway did not find an adverse effect on commitment to the organization, although they did confirm findings[13] of an increased level of interest in leaving the job. Schat and Kelloway[14] showed that both direct and vicarious victims of violence were likely to experience fear reactions, with those reactions predictive of psychological and somatic symptoms. Numerous studies have documented additional adverse effects from incidents of workplace violence, including decreased productivity,[15] job neglect and decreased performance,[14,16] and job dissatisfaction.[15]

The psychological impact of violence and disasters varies with their source and their degree of intent. LeBlanc and Kelloway[17] demonstrated the differential effects of coworker-initiated versus public-initiated acts of violence. The former had negative effects on emotional well-being, psychosomatic well-being, and affective commitment to the organization; the latter were associated primarily with fear of future violence. Ryan and colleagues[18] found no significant change in employee attitudes regarding job satisfaction, supervisor evaluation, stress, and organizational commitment after the 9/11 attacks. The employees surveyed were U.S.-based and international employees of a multinational manufacturing corporation.

Studies show that the psychological consequences of intentional man-made disasters—for example, terrorist attacks and deliberate violent acts—are greater than those of man-made accidents and natural disasters.[19,20] There is especially compelling evidence that people who have witnessed intentionally violent deaths, as well as colleagues of the victims, experience intense, prolonged symptomatology. Moreover, among those whose loved ones are intentionally killed, there is evidence that symptoms tend to persist over time. In a study of 150 family members who lost loved ones as a result of homicide, Thompson and colleagues found that respondents whose loved ones had died 5 years previously still experienced virtually the same levels of symptomatology (anxiety, depression, posttraumatic stress syndrome [PTSD]) as those whose losses had occurred only 1.5 years before.[21,22]

The psychological impact of intentional acts of violence is exacerbated when the motivation for the act is unknown. For example, in the case of the anthrax attacks that

contaminated the U.S. postal system, the failure to ascertain the motivation of the terrorist(s) who unleashed the attacks added to the sense of vulnerability among potential target populations.[23]

The nature of the agent involved in threats or violent acts also influences their psychological impact. The release of some biological and chemical agents, for example, has a physical impact that extends beyond the primary site and the victims there. As a consequence with a release of an infectious agent at a workplace, fear of contamination spreads into the community far beyond the initial worksite or organization, since coworkers, family, and friends serve as potential vectors. Moreover, the difficulty of distinguishing infected from uninfected individuals during the presymptomatic phase, coupled with the often obscure nature of the illness and the ease of confusion with routine infections, results in an increase in false alarms, anxiety among worker populations and their families, and disruption of normal activities, including work.[24]

The post-9/11 anthrax attacks in the United States provide an example of the economic and psychological effects of actual bioterror attacks and related hoaxes. Those anthrax attacks had their greatest impact on workplaces. Anthrax contamination of the Brentwood postal facility in Washington, D.C., the Hart Senate Office Building, and the American Media, Inc. publishing offices in Boca Raton, Florida, led to the infection of 22 people, with the cases evenly split between cutaneous and inhalational anthrax. Eleven people, all with inhalational anthrax, died. Twenty of those infected (91%) worked for the U.S. Postal Service and are presumed to have been unintended victims of the perpetrator(s)[25]—exposed as the agents were in route to their intended targets. The end result of this attack was that the Hart Senate Office building and several other Capital Hill buildings were shut down for 14 weeks as several agencies of the federal government, most notably the Environmental Protection Agency, attempted what was the first large-scale decontamination of a bioweapons-attack site on U.S. soil. At the time of this writing, cleanup efforts by the EPA have cost the U.S. taxpayer over $25 million. The direct and indirect damages to the U.S. Postal Service may approach as much as $3 billion.[26]

Bioterror hoaxes, like actual bioterror and physical assaults, have a profound psychological impact. Hoaxes in the form of threats of violence or exposure to toxic agents are common in the wake of actual events. For example, immediately after the 9/11 attacks, Miami police had to evacuate six downtown buildings after anonymous callers reported that they had planted explosives inside. In Wilmington, Delaware, five buildings were evacuated for the same reason. In the three years prior to September 11, 2001, there were at least 175 anthrax hoaxes reported in the United States.[27]

Hoaxes have economic and psychological effects similar to actual events. An anthrax hoax at the Connecticut Department of Environmental Protection on October 11, 2001, required evacuation of the building, shut down a portion of downtown Hartford, and is estimated to have cost $1 million in lost employee-productivity alone.[28] Additional, uncounted costs included police and fire response, lost sales, requests for medical services, and decreased productivity in the extended community. As is the case with most hoaxes, the identity and motivation of the perpetrator are unknown. Possible motivations in bioterror and other hoaxes are disgruntlement on the part of employees or customers, psychological satisfaction from being able to control others and eliciting a response, or the desire to play a practical joke. The Connecticut incident reportedly was intended as a practical joke, with nondairy creamer sprinkled on a computer keyboard.

Mason and Lyons[29] documented the psychological impact of suspected exposure to anthrax spores among 13 individuals in New Zealand in 2001. Within 24 hours of each exposure, the suspect powder had been determined to be harmless. Using the Hospital Anxiety and Depression Scale, they found definite anxiety in 45% of their sample one week after the exposure. The authors were unaware of any previously published research showing increased anxiety in response to false alarms. Cole[30] described the behavioral consequences of anthrax hoaxes that occurred in the 1990s and involved the potential exposure of less than 300 individuals. The consequences included the evacuation of buildings, quarantine or evacuation of 13,000 individuals, forced outdoor decontamination in frigid temperatures, and physical altercations.

While terrorism has captured the national attention, workplace disasters more commonly take the form of mass accidents—for example, toxic gas leaks, the Three Mile Island reactor accident, fire (both accidental and arson), and natural disasters such as floods and earthquakes—rather than shootings or terrorist attacks. The psychological impact of these disasters has been well documented elsewhere.[31–33]

All of these disasters, whether natural or man-made, actual or hoax, have two things in common: workplace communities are significantly disrupted, and the impact is costly in both human and economic terms. There is, of course, the initial loss of life, physical injuries, and disruption of business. In addition, a large percentage of affected individuals will experience a range of emotional responses, with considerable variability from one person to the next.[34] In the months and years that follow, this emotional distress tends to decrease, with a small proportion of victims developing frank psychiatric illness,[35] delayed-onset medical illness,[36,37] decreased productivity, or employee anxiety that results in resignation—which may lead, in turn, to the closing of facilities or other significant alterations in normal business operations.[14–16] Because of acute anxiety or the development

of PTSD symptoms, employees who have suffered the severe trauma of a workplace disaster may find themselves unable to return to the site of the disaster. Disruption of business operations can lead to temporary or permanent unemployment, which is known to be associated with a wide variety of health problems.[38,39]

THE ROLE OF THE WORKPLACE IN MITIGATING THE IMPACT OF DISASTERS

Workplaces can take various steps to mitigate the effects of disasters, both potential and real. These steps include pre-event planning and training, responding competently during the event itself, and providing social support and post-event services.[40] From a business perspective, workplace involvement in disaster planning is important for multiple reasons. Of special note are (1) mitigation of the physical, psychological, and business impact of disasters, (2) legal obligations to engage in such planning, and (3) the positive effect of such activities on employees' relationships to the workplace. Organizations that engage in these activities and experience a disaster would be expected to see benefits in terms of job satisfaction, retention of employees, increased productivity, and decreased health consequences, as well as a reduction in possible legal liability.[41–43]

Pre-Event Planning

Disaster-management planning and rehearsal are believed to reduce morbidity and mortality in the event of a disaster. The value of planning and rehearsal is a central tenet of the policies and programs of the Occupational Safety and Health Administration (OSHA), Federal Emergency Management Administration (FEMA), the Department of Homeland Security (DHS), and the National Fire Prevention Association (NFPA). Disaster plans, fire drills, and rehearsals have face validity, and their efficacy in reducing morbidity, mortality, and property damage are supported by considerable anecdotal evidence. NFPA, for example, publishes accounts of instances in which education programs for dealing with fire appear to have saved lives.[44] The difficulties of randomized experimental studies in this area are obvious.

There has been some helpful research on the impact of individual preparation on response to disasters. Weisaeth[45] studied victims of a factory explosion and found that an individual's level of preparedness was the strongest predictor of an optimal outcome, defined by performance on seven variables of behavioral response to the event: cognitive function; "inadequate behavior" that increased risk to self or others; help received; leadership; cooperative activity; "absolute rescue effort" that helped reduce risk to self or others; and "relative rescue effort" (a measure of effort that takes into account reasonable behavior under the person's specific circumstances). Whereas 71% of those who had had disaster training or experience responded optimally, no one without such training and experience did so. Other factors that correlated with optimal behavior were male gender, age above 40, maritime occupational background, above-average intellectual ability, and a life history without mental health problems.

In addition to likely increasing optimal behavior and thus decreasing the risk of physical injury and property damage in a disaster, proper planning and rehearsal reduce stress by providing participants with a sense of control—and the effect extends through the event. This effect has been specifically demonstrated in the context of workplace violence. Schat and Kelloway[14] found that perceived control was associated with improved emotional well-being, either directly or indirectly through the reduction of fear. They also found that training (measured by asking whether respondents had received any training on how to deal with aggressive or threatening events at work) was associated with perceptions of increased control.

An earlier study by Tetrick and LaRocco[46] showed that understanding and perceived control had a moderating effect on perceived job stress and satisfaction in the wake of stressful events. They found an inverse relationship between three variables (understanding, prediction, and perceived control) and perceived stress. Of the three variables, only perceived control had a significant direct relationship to job satisfaction.

Individual preparedness can also have negative effects. Faupel and Styles[47] studied victims of Hurricane Hugo. Individuals who had attended disaster-education workshops and had been most involved in preparing for the event showed higher levels of physical and psychological stress after the hurricane than did unprepared individuals. One proposed explanation is that those who prepared had a greater sense of control, which led to distress when their preparation was inadequate to prevent injury and destruction of property.[48] More research on the level and content of disaster preparation, including best practices for conveying realistic expectations, is needed.

Community disaster-management plans generally include measures for conveying information to the public, for physical safety (including possible evacuation versus shelter in place), for food, shelter, and water, and for emergency medical treatment. In most cases, the plans also provide for acute mental health services, often through the American Red Cross.

Workplaces should not rely wholly on such community plans, however, for responding to a disaster. Individuals and organizations that lack disaster-management plans become passive victims when disaster strikes. That is, without a plan, they must attempt to balance critical interests—insuring safety to workers, limiting damage to the workplace

infrastructure, and early implementation of post-event support services and business resumption—while in crisis mode. In addition, they are dependent on local authorities, public communication systems, and public resources (including medical services) that will invariably be scarce during large-scale disasters.

A detailed description of a proper disaster-management plan is outside the scope of this article, but essential elements include: formation of a multifaceted crisis team (including mental health input, whether through employee assistance programs [EAPs] or individual, contracted providers); development of a policy and interface for actively communicating with local authorities responsible for emergency response and disaster planning; and regular, realistic rehearsal for events.

The workplace disaster-management plan should interface with the community plan and may even compensate for any weak spots in the community plan. The workplace plan should be modeled on the Incident Command System (ICS) developed by FEMA. The ICS is a structured approach to managing all aspects of a disaster, with designated leadership and tasks at all levels. The ICS is described by Bigley and Roberts,[49] and course materials are available on FEMA's Web site.[50] The workplace ICS, if modeled on the FEMA system, can be easily integrated into the community ICS as the situation evolves. In addition, it provides a structure for ongoing response if the community system fails or is not accessible.

The lack of a well-developed disaster plan may expose an employer to administrative penalties and claims of negligence in the event of a disaster in which employees are injured or killed. OSHA requires employers to have emergency action plans in a wide variety of situations and to communicate the plans to employees. The OSHA regulation on this subject specifies minimum elements of the plan, including procedures for reporting fires or other emergencies, evacuation procedures, procedures to be followed by employees who remain on-site, procedures to be followed for accounting for employees after evacuation, and training of employees. Failure to comply can result in administrative fines.[51]

Possible liability claims might arise from the absence of an emergency plan, inadequacy of a plan, and failure to follow the plan.[52] Employers and individual practitioners who provide mental health services under these plans or in times of crisis are also potentially liable for negligent planning or malpractice. Established plans that utilize best practices and intervention techniques will serve to reduce the risk of liability.

A well-conceived disaster-management plan, rehearsal of the plan, and facility inspections to ensure adequate lighting, ventilation, and firefighting and other response mechanisms would all help reduce the risk of liability in the event of a disaster. These measures would demonstrate good faith efforts to comply with legal requirements and to behave is a reasonable manner in the face of possible threats. Rehearsals should include a determination that the medical and mental health services and personnel that may be needed during and after the incident will be available and properly trained. As part of this determination, it should be established that already-contracted EAP services will be available to respond in case of a disaster and that the required skill sets will be present.

Response to an Ongoing Event

Disasters, by definition, are times of crisis and great stress. The success of responding to them will depend largely on the preparation and infrastructure developed in pre-event planning. The response of the workplace to an acute event should be focused on implementation of the disaster-management plan, with an emphasis on individual safety and on coordination with public authorities. All workplaces should be aware of the hierarchy of authority in their communities in times of declared disasters. For example, in some circumstances, different law enforcement agencies may have controlling authority, whereas in other circumstances, public health authorities may be in charge. In times of publicly declared emergencies, private control is ceded to public authority.

Even when public authorities have taken control of a declared disaster, the workplace can respond to the needs of its employees and the organization as a whole. Cooperation with public authorities can expedite the assessment of risks, including detection of hoaxes. Provision of accurate information to employees and their families can reduce anxiety and other emotional responses to the situation. The availability of accurate information and the demonstration of an ongoing leadership structure extends the benefits of stress and anxiety reduction, as described with pre-event planning.[53] Recommendations for the full range of business-continuity measures, including communications strategies, are available through many agencies.[54]

Mental health professionals and others who want to provide aid often flock to the scene of disasters—which is what occurred following the 9/11 attacks on New York and Washington, D.C. Many of these volunteers, while well-meaning, lacked expertise in disaster mental health and were not affiliated with established disaster relief organizations. The American Red Cross provided immediate disaster mental health services in New York and Washington, with the Pentagon Family Assistance Center subsequently taking over in Washington for security reasons.[55] Mental health professionals who wish to respond to disasters should consider participation and training as an American Red Cross Disaster Mental Health Services volunteer, since effective

immediate interventions (psychological first aid) in such circumstances differ from traditional psychotherapy.[56]

Post-Event Response

Workplaces may serve their most important role in the aftermath of a disaster. That role can be roughly divided into two types: provision of general social support and provision of specific services. The response to disaster is a product of complex interactions between individuals and their environment.[57,58] Faced with a disaster or other threat, individuals turn to social units with which they are familiar—which represent safety and security—for social support. The presence or absence of such support is associated with respectively better or poorer outcomes from traumatic events.[59–62]

Research based on natural disasters in the United States (tornadoes, earthquakes, and so on) indicates that ordinary people overwhelmingly tend to "watch out for one another"; this willingness to assist one another enables people to operate in an orderly manner under difficult circumstances. Most turn to friends, families, and coworkers for support of all types, as was evident in the immediate aftermath of 9/11.[63] Peer support from coworkers is an important part of any response plan and should be considered when developing post-event communication strategies.

Workplaces are an essential part of the social network for most people, and employers may be better positioned than other institutions to help restore that network. In the wake of a disaster, employers are often in a position to provide specific services immediately after the event, follow-up screening for chronic stress-induced responses, and subsequent support services. While the opportunity to provide such interventions clearly exists, the nature of the interventions to be provided has been the subject of some controversy. Critical incident stress debriefing/management (CISD/M) has been popular in recent years as a procedure that purportedly mitigates emotional distress and prevents future psychiatric illness following a disaster. CISD/M is a structured intervention intended to be provided to all victims and responders at the scene, as soon as possible after the disaster or other traumatic event. The goal is to guide victims through defined stages of recovery (introduction; the facts; thoughts and impressions; emotional reactions; normalization; planning for the future; and disengagement) by sharing their feelings and responses to events.[10,64–66]

CISD/M is ubiquitous. Indeed, this concept has become so popular that any postdisaster intervention in which one person speaks to a victim or responder is called "debriefing" even if it does not follow the CISD/M model. CISD/M has been widely and uncritically accepted until recently. A review of research on the efficacy of CISD/M indicated that the procedure, while well accepted by participants postdebriefing, does not reduce the incidence of PTSD and may, in some cases, increase its incidence.[67–69] The growing literature on this subject, both supportive and critical of CISD/M, will not be reviewed here. The evidence indicates, however, that CISD/M should not be accepted uncritically by employers and those who provide services to disaster victims and responders.[70,71]

Regardless of the criticisms of CISD/M and the concerns that they raise, there are compelling reasons for workplaces to provide some type of postdisaster support to their employees after traumatic events. Schat and Kelloway[72] studied the effects of nonspecific direct interventions and informational interventions on the response to episodes of violence/aggression in the workplace. They studied the differential effects of two types of organizational support—instrumental and informational—on the outcomes (individual and organizational) of such episodes. Instrumental support was defined as the provision of direct help to the person in need, and informational support as the provision of information that the person can use in coping with the situation. In essence, instrumental support is direct and informational support is indirect. For their study, instrumental support was rated by employees on a 7-point scale rating the degree of support from coworkers, supervisors, and managers. Informational support was rated on a dichotomous basis (yes/no) in response to a question as to whether respondents had received information on how to deal with aggressive or threatening events at work. Schat and Kelloway then analyzed whether the two types of organizational support buffered the effects of three dimensions of violence (physical violence, psychological aggression, and vicarious violence) on six outcome variables: fear of future violence at work, emotional well-being, somatic health, job-related affect, and neglect of job duties. For all three types of violence, instrumental support had a strong buffering effect on emotional well-being, affect, and somatic health. Informational support had a similar impact (and for all three types of violence) only in relation to emotional well-being. Lower levels of support were associated with lower scores on all dimensions. Neither type of support had a significant impact on the relationship between workplace violence and job neglect or fear of future violence.

Informational programs provided by mental health professionals familiar with trauma and disasters can foster a sense of community and provide employees with the information that they need in order to cope with the process of recovery. These sessions should focus on normalizing the range of responses to trauma for the individual employees and their family members. Those offering the sessions should be familiar with the impact of trauma and disasters on children, since many employees ask questions about what responses to expect from their children and how to discuss the events with their children. The sessions should also

include discussion of what symptoms may indicate the development of a more serious condition that should be assessed and treated by a clinician.[62]

Sanchez and colleagues[47] studied the effect of corporate support provided to employees after Hurricane Andrew. They found that tangible corporate support in the form of helping employees meet their primary postdisaster needs had the greatest positive impact on employee stress levels, resulting in a decrease in absenteeism and workers' compensation costs. They also posited that this basic assistance could improve employee attitudes toward the workplace following a disaster. Ryan and colleagues,[20] in a study that found no significant change in employee attitudes following 9/11, noted that the corporation in question (which had no employees in New York or Washington) had actively responded to the event. The corporation provided counselors, reminded employees of the availability of the EAP, and organized special collections for disaster relief. The authors also note the potential for different results had the employees been more directly affected by 9/11.

The experience of one of the authors (RS) in the aftermath of 9/11 suggests that it is the offer of support and services that is most important, rather than their utilization. At that time, he was asked to provide informational group sessions and on-site counseling services for two Boston-based, multinational companies with offices and also many customers in New York. Numerous employees knew victims (including one coworker) or had near misses (e.g., they missed being in the World Trade Center or on one of the airplanes only because of last-minute scheduling changes). A small number of employees, all of whom had had a near or actual loss, made use of the opportunity for individual meetings.

While few employees accepted the offer of individual counseling, numerous employees conveyed to the companies their appreciation for the offer of services. This appreciation appears to have been for the compassion shown by the employers—for the demonstrated awareness of the shared grief, emotional distress, and employees' need for information that would help them and especially their children cope with the event. Dutton and colleagues[73] discuss in detail the importance of compassion by leadership in times of crisis, noting that an organization's compassion can be assessed by looking at the scope, scale, speed, and degree of specialization of the response.

The essential components of post-event employer support are open to discussion and require further research. The current evidence suggests that both assistance with basic needs and efforts to provide social support are beneficial. Experimental studies of the differential short- and long-term impact of corporate support efforts are needed to help guide these interventions and encourage investment in effective programs.

CONCLUSION

The workplace is vulnerable to man-made and natural disasters, and is a potential target of terrorism. At the same time, it has the capacity to mitigate the effects of disasters through pre-planning, event response, and post-event interventions. Properly implemented workplace disaster-management plans have the potential to hasten both employees' and the entire community's emotional recovery from disaster. Maslow[74] noted that physiological and safety needs are the most fundamental in his hierarchy of needs; they certainly are in the wake of disaster, when the most immediate needs are for safety, medical attention, food, and shelter. Safety must be understood in the broad sense, however, as involving more than physical safety; it includes a sense of psychological security and the belief that the danger is under control, with life likely to return to normal. Normality, for most individuals, includes working in a place where one is free from unnecessary and unexpected hazards. Normality, for most communities, includes economic stability, availability of goods and services, and a sense that the wheels of commerce are turning.

Employers have multiple reasons to develop disaster-management plans and implement a program of regular review and rehearsal—ranging from altruism to business interests to the reduced risk of liability. Medical and mental health professionals can, in turn, play important roles in helping to develop the workplace response, in researching the best practices for minimizing psychological morbidity, and in providing service during and after the event. In so doing, we can serve an important public health function.

REFERENCES

1. Bolin R. Natural disasters. In: Gist R, Lubin B, eds. Psychosocial aspects of disaster. New York: John Wiley & Sons, 1989:61–85.
2. Hazan C, Shaver PR. Love and work: an attachment-theoretical perspective. J Pers Soc Psychol 1990;59:270–80.
3. National Commission on Terrorist Attacks upon the United States. Outline of the 9/11 plot. Staff Statement No. 16, June 16, 2004. At http://www.9-11commission.gov/hearings/.
4. Fullerton CS, Ursano RJ. Behavioral and psychological responses to chemical and biological warfare. Mil Med 1990;155:54–9.
5. Ursano RJ. Disaster psychiatry—individual and workplace responses and needs. Paper presented at the 14th Annual Conference of the Academy of Organizational and Occupational Psychiatry, Washington, DC, January 2003.
6. Molotch H, McClain N. Dealing with urban terror: heritages of control, varieties of intervention, strategies of research. Int J Urban Regional Res 2003;27:679–98.
7. U.S. Government Accounting Office. Review of studies of the economic impact of the September 11, 2001, terrorist

attacks on the World Trade Center. May 29, 2002. At http://www.gao.gov/docsearch/repandtest.html.
8. Galea S, Ahern J, Resnick H, et al. Psychological sequelae of the September 11 terrorist attacks in New York City. N Engl J Med 2002;346:982–7.
9. Schuster MA, Stein BD, Jaycox L, et al. A national survey of stress reactions after the September 11, 2001, terrorist attacks. N Engl J Med 2001;345:1507–12.
10. Miller-Burke J, Attridge M, Fass PM. Impact of traumatic events and organizational response. A study of bank robberies. J Occup Environ Med 1999;41:73–83.
11. Rogers KA, Kelloway EK. Violence at work: personal and organizational outcomes. J Occup Health Psychol 1997;2:63–71.
12. Braverman M. Post-trauma crisis intervention in the workplace. In: Quick JC, Murphy LR, Hurrel JJ, eds. Stress and well-being at work. Washington, DC: American Psychological Association, 1992:299–316.
13. Wykes T, Whittington R. Coping strategies used by staff following assault by a patient: an exploratory study. Work Stress 1991;5:37–48.
14. Schat AC, Kelloway EK. Effects of perceived control on the outcomes of workplace aggression and violence. J Occup Health Psychol 2000;5:386–402.
15. Budd JW, Arvey RD, Lawless P. Correlates and consequences of workplace violence. J Occup Health Psychol 1996;1:197–210.
16. Barling J, Rogers AG, Kelloway EK. Behind closed doors: in-home workers' experience of sexual harassment and workplace violence. J Occup Health Psychol 2001;6:255–69.
17. LeBlanc MM, Kelloway EK. Predictors and outcomes of workplace violence and aggression. J Appl Psychol 2002;87:444–53.
18. Ryan AM, West BJ, Carr JZ. Effects of the terrorist attacks of 9/11/01 on employee attitudes. J Appl Psychol 2003;88:647–59.
19. North CS, Smith EM. Post-traumatic stress disorder in disaster survivors. Compr Ther 1990;16:3–9.
20. Solomon SD, Green BL. Mental health effects of natural and man-made disasters. PTSD Res Q 1992;3:1–8.
21. Thompson MPNFH, Ruback RB. Comparative distress levels of inner-city family members of homicide victims. J Trauma Stress 1998;11:223–42.
22. Kaltman S, Bonanno GA. Trauma and bereavement: examining the impact of sudden and violent deaths. J Anxiety Disord 2003;17:131–47.
23. Holloway HC, Fullerton CS. The psychology of terror and its aftermath. In: Ursano RJ, McGaughey BG, Fullerton CS, eds. Individual and community responses to trauma and disaster. Cambridge: Cambridge University Press, 1994:31–45.
24. Baum A. Toxins, technology, disaster. In: Vanden Bos GR, Bryant BK, eds. Cataclysms, crises and catastrophes. Washington, DC: American Psychological Association, 1986:9–53.
25. Callahan MV. Perspectives on low technology endospore biological munition production. Paper presented at a National Academy of Science Special Meeting, Washington, DC, December 2001.
26. Heyman D. Lessons from the anthrax attacks: implications for U.S. bioterrorism preparedness. Washington, DC: Center for Strategic and International Studies & Defense Threat Reduction Agency, 2002.
27. Harper's Index, December 2001. At http://www.harpers.org/HarpersIndex.html.
28. Mahony EH. Anthrax hoax case falters. Hartford Courant, 5 June 2002.
29. Mason BW, Lyons RA. Acute psychological effects of suspected bioterrorism. J Epidemiol Community Health 2002;57:353–4.
30. Cole LA. Risks of publicity about bioterrorism: anthrax hoaxes and hype. Am J Infect Control 1999;27:470–3.
31. Barling J, Bluen SD, Fain R. Psychological functioning following an acute disaster. J Appl Psychol 1987;72:683–90.
32. Rubonis AV, Bickman L. Psychological impairment in the wake of disaster: the disaster-psychopathology relationship. Psychol Bull 1991;109:384–99.
33. McGaughey BG, Hoffman KJ, Llewellyn CH. The human experience of earthquakes. In: Ursano RJ, McGaughey BG, Fullerton CS, eds. Individual and community responses to trauma and disaster. Cambridge: Cambridge University Press, 1994:136–53.
34. Bonanno GA. Loss, trauma, and human resilience. Am Psychol 2004;59:20–8.
35. Bland SH, O'Leary ES, Farinaro E, Jossa F, Trevisan M. Long-term psychological effects of natural disasters. Psychosom Med 1996;58:18–24.
36. Centers for Disease Control. Injuries and illnesses among New York City Fire Department rescue workers after responding to the World Trade Center attacks. MMWR Morb Mortal Wkly Rep 2002;51:1–5.
37. Clauw DJ, Engel CC, Jr., Aronowitz R, et al. Unexplained symptoms after terrorism and war: an expert consensus statement. J Occup Environ Med 2003;45:1040–8.
38. Dooley D, Fielding J, Levi L. Health and unemployment. Ann Rev Public Health 1996;17:449–65.
39. Ferrie JE, Shipley MJ, Marmot MG, et al. An uncertain future: the health effects of threats to employment security in white-collar men and women. Am J Pub Health 1998;88:1030–6.
40. Stith Butler A, Panzer AM, Goldfrank LR. Preparing for the psychological consequences of terrorism. Washington, DC: National Academies Press, 2003.
41. Crabbs MA, Black KU. Job change following a natural disaster. Vocational Guidance Q 1984;32:232–9.
42. Sanchez JI, Korbin WP, Viscarra DM. Corporate support in the aftermath of a natural disaster: effects on employee strains. Acad Manag J 1995;38:504–21.
43. Ursano RJ, McCarroll JE. Exposure to traumatic stress: the nature of the stressor. In: Ursano RJ, McGaughey BG, Fullerton CS, eds. Individual and community responses to trauma and disaster. Cambridge: Cambridge University Press, 2004:46–71.
44. National Fire Protection Association. NFPA Real Life Fire Escape Stories. At http://www.nfpa.org/FPW/Planning/Escape_Stories/escape_stories.asp.
45. Weisaeth L. A study of behavioral responses to an industrial disaster. Acta Psychiatr Scand Suppl 1989;355:13–24.
46. Tetrick LE, LaRocco JM. Understanding, prediction, and control as moderators of the relationship between perceived stress, satisfaction, and psychological well-being. J Appl Psychol 1987;72:538–43.

47. Faupel CE, Styles SP. Disaster education, household preparedness, and stress responses following Hurricane Hugo. Environ Behav 1993;25:228–49.
48. Yates S, Aronson D, Tiedman K. The help-seeking process for distress after disasters. In: Gist R, Lubin B, eds. Response to disaster: psychosocial, community, and ecological approaches. Philadelphia: Brunner/Mazel, 1999:133–65.
49. Bigley GA, Roberts KH. The incident command system: high-reliability organizing for complex and volatile task environments. Acad Manag J 2001;44:1281–99.
50. Federal Emergency Management Agency. Preparation and prevention. At http://www.fema.gov/library/prepandprev.shtm.
51. Occupational Safety and Health Standards, Subpart E—Means of Egress. 29 C.F.R. §1910.38 (2001).
52. Binder B. Emergency action plans: a legal and practical blueprint. Univ Pittsburgh Law Rev 2002;63:791–814.
53. Glass TA, Schoch-Spana M. Bioterrorism and the people: how to vaccinate a city against panic. Clin Infect Dis 2002;34:217–23.
54. State of Oregon. Business Continuation Planning. At http://www.oregon.gov/DAS/Risk/BusinessContinuationKeyElements.shtml.
55. Current infrastructure in the United States for responding to the psychological consequences of terrorism. In: Stith Butler A, Panzer AM, Goldfrank LR, eds. Preparing for the psychological consequences of terrorism. Washington, DC: National Academies Press, 2003:64–98.
56. Developing strategies for minimizing the psychological consequences of terrorism through prevention, intervention, and health promotion. In: Stith Butler A, Panzer AM, Goldfrank LR, eds. Preparing for the psychological consequences of terrorism. Washington, DC: National Academies Press, 2003:99–134.
57. Ursano RJ, McGaughey BG, Fullerton CS. Individual and community responses to trauma and disaster. Cambridge: Cambridge University Press, 1994.
58. Kaniasty K, Norris F. The experience of disaster: individuals and communities sharing trauma. In: Gist R, Lubin B, eds. Response to disaster: psychosocial, community, and ecological approaches. Philadelphia: Brunner/Mazel, 1999:25–61.
59. Norris FH, Friedman MJ, Watson PJ, Byrne CM, Diaz E, Kaniasty K. 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981–2001. Psychiatry 2002;65:207–39.
60. Irving LM, Telfer L, Blake DD. Hope, coping, and social support in combat-related posttraumatic stress disorder. J Trauma Stress 1997;10:465–79.
61. Andrews B, Brewin CR, Rose S. Gender, social support, and PTSD in victims of violent crime. J Trauma Stress 2003;16:421–7.
62. Kaniasty K, Norris FH. A test of the social support deterioration model in the context of natural disaster. J Pers Soc Psychol 1993;64:395–408.
63. Tierney KJ. Strength of a city: a disaster research perspective on the World Trade Center attack. 2004. At http://www.ssrc.org/sept11/essays/.
64. Mitchell JT. When disaster strikes: the critical incident stress debriefing procedure. J Emerg Med Serv 1983;8:36–9.
65. Dyregov A. Caring for helpers in disaster situations: psychological debriefing. Disaster Management 1989;2:25–30.
66. Mitchell JT, Everly GS Jr. Critical incident stress debriefing: an operations manual for the prevention of traumatic stress among emergency services and disaster workers. Ellicott City, MD: Chevron, 1995.
67. McNally RJ, Bryant RA, Ehlers A. Does early psychological intervention promote recovery from posttraumatic stress? Psychological Science in the Public Interest 2003;4:45–79.
68. Rose S, Brewin CR, Andrews B, Kirk M. A randomized controlled trial of individual psychological debriefing for victims of violent crime. Psychol Med 1999;29:793–9.
69. Rose S, Bisson J, Simon W. Psychological debriefing for preventing post traumatic stress disorder. Cochrane Database Syst Rev 2001(4).
70. Lohr JM, Montgomery RW, Lilienfeld SO, Tolin DF. Pseudoscience and the commercial promotion of trauma treatments. In: Gist R, Lubin B, eds. Response to disaster: psychosocial, community, and ecological approaches. Philadelphia: Brunner/Mazel, 1999:291–326.
71. Gist R, Woodall SJ, Magenheimer LK. "And then you do the Hokey-Pokey and you turn yourself around . . ." In: Gist R, Lubin B, eds. Response to disaster: psychosocial, community, and ecological approaches. Philadelphia: Brunner/Mazel, 1999:269–90.
72. Schat AC, Kelloway EK. Reducing the adverse consequences of workplace aggression and violence: the buffering effects of organizational support. J Occup Health Psychol 2003;8:110–22.
73. Dutton JE, Frost PJ, Worline MC, Lilius JM, Kanov JM. Leading in times of trauma. Harv Bus Rev 2002;80:54–61, 125.
74. Maslow A. Motivation and Personality. 2nd ed. New York: Harper & Row, 1970.