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Individual and community responses to disasters

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While most of our work force returned to work soon after the hurricanes many were walking wounded. They were unfocused, spacey, not performing at their usual levels, and performance was inconsistent. I noticed this in other people before I realized that it was happening to me. The feelings and changes lingered longer than I would have thought – for months. The change in the environment – the loss of trees, ''blue tarp'' roofs, boarded-up houses that stayed boarded-up long after the threat of storms – and living in a dark cluttered home, all seemed to add to my deep sense of lethargy. It all weighed heavily on myself, my family, friends, and co-workers ... We didn't do any of the usual summer social get-togethers. The storms didn't just affect us when the wind blew, but changed the landscape of our lives ... I remember thinking that my neighborhood looked like an abandoned ghost town. The only neighbors I saw day to day were those who were out walking their dogs. Things are back to normal now, but there is still an edginess to us all I think. I guess now that the repairs are done it's time again to ''board-up'' and wait for this year's storms.

(Public Health Worker 9 months after five hurricanes had struck Florida in the summer of 2004)

In 2005, an estimated 162 million people worldwide were affected by disaster (i.e., natural disasters, industrial and other accidents, and epidemics). Over 105 000 people died and damages totaled over $176 million (World Health Organization, 2006). Concern for weather-related disasters – hurricanes and tsunamis – has increased over the past decade as has the concern for pandemic flu, which raises special issues of health protective behaviors such as adherence with medical recommendations, quarantine and travel restrictions. Terrorism and wars are human-made disasters. From the World Trade Center attacks of 2001, anthrax attacks in the United States, the 2004 train bombings in Madrid, the London tube attacks of 2005, to the ongoing terrorist attacks in the Middle East, terrorism has new prominence in disaster mental health planning for individuals, communities, and nations. In addition, there are at least 23 ongoing wars (http://en.wikipedia.org/wiki/Ongoing_wars) – with mass casualties, famine, and community devastation involving an estimated 40 countries (www.globalsecurity.org). Worldwide in the year 2000, over 300 000 people died from war (World Health Organization, 2001). Every disaster, natural or human-made, places extreme demands on health care and mental health care in particular across federal, state and local agencies, communities, and workplaces.

Disasters affect large and diverse populations. How the psychological response to a disaster is managed may be the defining factor in the ability of a community to recover (Holloway *et al.*, 1997). Interventions require rapid, effective, and sustained mobilization of resources (Ursano & Friedman, 2006). Sustaining the social fabric of the community and facilitating recovery depend on leadership's

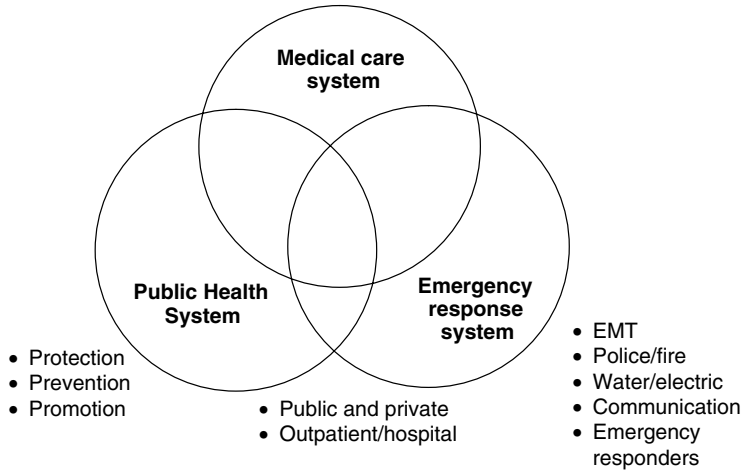

Figure 1.1 Coordinated systems approach

knowledge of a community's resilience and vulnerabilities as well as an understanding of the distress, disorder, and health risk behavioral responses to the event (Institute of Medicine, 2003; Raphael & Wooding, 2004). A coordinated systems approach across the medical care system, public health system, and emergency response system is necessary to meet the mental health care needs of a disaster region (see Figure 1.1).

Over time, the resilience of individuals and communities is the expected response to a disaster. But for some the effects can be severe and lasting. Experiencing an altered sense of safety, increased fear and arousal, and concern for the future affect not only those who may develop mental health problems but also those who continue to work and care for their families and loved ones. Consequence management for mental health – fostering resilience, decreasing and treating disorders and responding to health risk behaviors – requires preparing for, responding to, and focusing on the mitigation of disaster effects and recovery. For those directly exposed and those indirectly affected, the additional burdens of lost supports and increased demands are an ongoing part of disaster recovery. Importantly, in the aftermath of large-scale disasters, such as the Asian tsunami of 2004 which affected thousands, early identification of individuals at risk for developing psychiatric disorders from those experiencing transient distress is key to delivering effective treatment (Bryant & Njenga, 2006).

The nature of disaster

A disaster is the result of exposure to a hazard that threatens personal safety, disrupts community and family structures, and results in personal and societal loss creating demands that exceed existing resources. Disasters are grouped into two major types: natural and human-made. Human-made disasters include technological accidents resulting from human error and intentional human acts such as terrorism. In general, human-made disasters have been shown to cause more frequent and more persistent psychiatric symptoms and distress (for review see Norris *et al.*, 2002). However, this distinction is increasingly difficult to make. The etiology and consequences of natural disasters often are the result of human beings. For example, the damage and loss of life caused by an earthquake can be magnified by poor construction practices and high-density occupancy. Similarly, humans may cause or contribute to natural disasters through

poor land-management practices that increase the probability of floods. Interpersonal violence between individuals (assault) or groups (war, terrorism) is perhaps the most disturbing traumatic experience. Technological disasters may also bring specific fears about usually normal life events – for example, fear of flying after a plane crash or claustrophobia after a mine accident. Each of these may require public education or individual evaluation and intervention to assist population-level concerns or treat a persistent specific phobia and limit generalization to other areas of life (e.g., ''I cannot cook anymore because the boiling water reminds me of the explosion''). Mass violence is the most disturbing of disasters. A review of over 60 000 disaster victims found 67% of those exposed to mass violence were severely impaired compared to 39% of those exposed to technological disasters and 34% of those exposed to natural disasters (Norris *et al.*, 2002).

Psychiatric morbidity is associated with specific aspects of disasters. The risk of psychiatric morbidity is greatest for those with high perceived threat to life, low controllability, lack of predictability, high loss, injury, the possibility that the disaster will recur, and exposure to the dead and the grotesque (Boudreaux *et al.*, 1998; Epstein *et al.*, 1997; Green *et al.*, 1985; North *et al.*, 1999; Schuster *et al.*, 2001; Wain *et al.*, 2006; Zatzick *et al.*, 2001). Disasters with a high degree of community destruction and those in developing countries are associated with worse outcomes (for review, see Davidson & McFarlane, 2006). Terrorism can be distinguished from other natural and human-made disasters by the characteristic extensive fear, loss of confidence in institutions, unpredictability and pervasive experience of loss of safety (Fullerton *et al.*, 2003). In New York City after the terrorist attacks of September 11, 2001, 7.5% of southern Manhatten had probable posttraumatic stress disorder (PTSD; Galea *et al.*, 2002). Nearly one-third of people with the highest levels of exposure (e.g., 37% of those in the building or 30% of the injured) had PTSD. Rates of PTSD decreased to 0.6% 6 months later.

In addition the effects of terrorism can echo through a nation. In a longitudinal national study of the reactions to the September 11 disaster, 64.6% of the United States outside of New York City reported fear of future terrorism at 2 months and 37.5% at 6 months (Silver *et al.*, 2002). In addition, 59.5% reported fear of harm to family at 2 months and 40.6% at 6 months. In the weeks following the bombings in London, 31% of Londoners reported substantial stress and 32% reported that they intended to travel less (Rubin *et al.*, 2005). Those reporting greater stress were 3.8 times more likely to have thought they could have been injured or killed and 1.7 times more likely to report having difficulty contacting friends or family by mobile phone. Four to seven months after Hurricane Katrina in the United States, in the highest impact area (the city of New Orleans), 49.6% reported nightmares and 8% reported these nightmares were occurring nearly every night (Kessler *et al.*, 2006). Similarly, 58.2% reported being more jumpy or easily startled, and 79.4% reported being more irritable or angry. Findings following the Madrid March 11 train bombings again indicate that the magnitude of a terrorist attack is one of the primary determinants of the prevalence of PTSD (Miguel-Tobal *et al.*, 2006). Terrorism is one of the most powerful and pervasive generators of psychiatric illness, distress and disrupted community and social functioning (Holloway *et al.*, 1997; North *et al.*, 1999).

Community response to disaster

Disasters overwhelm local resources and threaten the function and safety of the community. With the advent of instantaneous communication and media coverage, word of a disaster is disseminated quickly, and often is witnessed in real time around the globe. The disaster community is soon flooded with outsiders: people offering assistance, curiosity seekers, and the media. This sudden influx of strangers affects the community in many ways. The presence of large numbers of media representatives can be experienced as intrusive and insensitive. Hotel rooms have no vacancies, restaurants are crowded with unfamiliar faces, and the normal

Table 1.1 Generic and unique challenges in natural disaster, technological disaster, and terrorism

Dimension	Natural disaster[a]	Technological disaster[b]	Terrorism[c]
Altered sense of safety	+++	+++	+++
Intentional			+++
Unpredictable	++	+++	+++
Localized geographically	+++	++	
Local fear	+++	+++	++
National fear			+++
National bereavement	+	+	+++
Consequences spread over time	++	++	+++
Loss of confidence in institutions	+	+++	+++
Community disruption	+++	+++	+++
Target basic societal infrastructure			+++
Overwhelm health care systems	+++	++	+
Hoaxes/copycats			+++

[a] Natural disaster, e.g., hurricanes, tornados, earthquakes.
[b] Technological disasters, e.g., nuclear leaks, toxic spills.
[c] Terrorism, e.g., bombings, hostage taking.

routine of the community is altered. In the face of disaster, communities tend to pull together often with outside assistance, such as the financial and humanitarian aid seen following the Asian tsunami (Ghodse & Galea, 2006). At a time when, traditionally, communities turn inward to grieve and assist affected families, the normal social supports are strained and disrupted by outsiders.

Disruption of the community and workplace increases distress, health risk behaviors and risk of post-traumatic stress disorders. In the immediate aftermath of a disaster or terrorist attack, individuals and communities may respond in adaptive, effective ways or they may make fear-based decisions, resulting in unhelpful behaviors. Psychiatric disease and psychological function, including the subthreshold distress of individuals, depend upon the rapid, effective, and sustained mobilization of health care resources as well as community-level responses and resources. Knowledge of an individual's and community's resilience and vulnerability before a disaster or terrorist event as well as an understanding of the psychiatric and psychological responses to such an event enables leaders and medical experts to talk to the public, in order to promote resilient healthy behaviors, sustain the social fabric of the community, and facilitate recovery (Institute of Medicine, 2003; Ursano *et al.*, 2003b). The adaptive capacities of individuals and groups within a community are variable and need to be understood before a crisis in order to target needs effectively after a disaster. For example, community embeddedness – the degree to which one belongs to and is connected in one's neighborhood and community – may be both a risk factor and a protective factor after community-level disasters (see Fullerton *et al.*, 1999; Sampson, 2003; Sampson *et al.*, 1997).

The community and workplace also serve as important physical and emotional support systems. The larger the scale of the disaster, the greater the potential disruption of the community and workplace. It is helpful to compare the generic and unique challenges facing survivors of an airplane crash as well as those confronting victims of disasters such as tornados, earthquakes, or terrorist attacks (see Table 1.1). If family members are involved in the same airplane crash, the plane crash

survivor can return home to family, friends, and coworkers. They will most likely go back to a structurally intact house, to a community unaffected by the accident, and to the same job with the same financial security. In contrast, a tornado involves additional factors that amplify the traumatic event itself. Although the tornado survivor may experience and witness comparably gruesome sights, the recovery environment is markedly different. Home and work site may have been destroyed, job lost, schools closed, food and water scarce, relatives and friends moved or perished, and coworkers may be dead, injured, or displaced. Thus, psychiatric morbidity is affected by both the degree of the disaster's impact on the community and its effects on the recovery environment (Gerrity & Steinglass, 1994; Hobfoll & Jackson, 1991; Steinglass & Gerrity, 1990; Noji, 1997).

The economic impacts of disasters are substantial. Loss of a job is a major post event predictor of negative psychiatric outcome (Galea *et al*., 2002; Nandi *et al*., 2004). These effects can be seen at the macro level; for example, a dip in consumer confidence was seen during and after the sniper attacks in the Washington, D.C. area in October 2002. Since terrorism targets the social capital of the nation – a nation's cohesion, values, and ability to function – economic behavioral changes may be substantial. Counterterrorism and national continuity are crucially dependent upon our having effective interventions to sustain the psychological, behavioral, and social function of the nation and its citizens. The psychological and behavioral consequences of disasters are a complex interaction between the disaster impact (e.g., destruction and death), the consequences of the response (e.g., economic loss, disruption, etc.), and the impact of subsequent preparedness or counterterrorism strategies themselves (e.g., behavioral and social ramifications of new security procedures).

Certain economic behaviors and decisions are affected by both the characteristics of disaster or terrorist attack and the psychological and behavioral responses to that disaster. For example, after Hurricane Katrina in the United States or the terrorist attacks seen on cities around the world, decisions and behaviors related to travel, home purchase, food consumption, and medical care visits were altered by changes in availability (Weisler *et al*., 2006), and also by changes in perceived safety, and optimism about the future. Terrorism also can affect economic behavior through threats and hoaxes. These also carry with them economic costs and consequences. The local or national economy may see altered savings, insurance and investment, as well as changes in work attendance and productivity, and broader national or industry-specific consequences such as altered financial and insurance markets or disrupted transportation, communication, and energy networks.

Early after disaster there is often a sense of cohesion and a ''honeymoon'' of working together (see Figure 1.2). Later, disillusionment, mistrust, and anger are common. Inevitably, after any major disaster, there are also rumors circulated within the community about the circumstances leading up to the event and the government response. Sometimes there is a heightened state of fear. For example, a study of a school shooting in Illinois noted that a high level of anxiety continued for a week after the event, even after it was known that the perpetrator had committed suicide (Schwarz & Kowalski, 1991). Similarly after the Hurricane Katrina in the United States, rumors and expectations of looting, and shootings by police changed trust in law enforcement and in the community. After the London bombings and the regrettable shooting of a fleeing individual by police, the community had to recover and understand.

Over time, anger often emerges in communities. Typically, there is a focus on accountability, a search for someone who was responsible for a lack of preparation or inadequate response. Mayors, police and fire chiefs, and other community leaders are often targets of these strong feelings. Scapegoating can be an especially destructive process when leveled at those who already hold themselves responsible, even if, in reality, there was nothing they could have done to prevent adverse outcomes. In addition, nations and communities experience

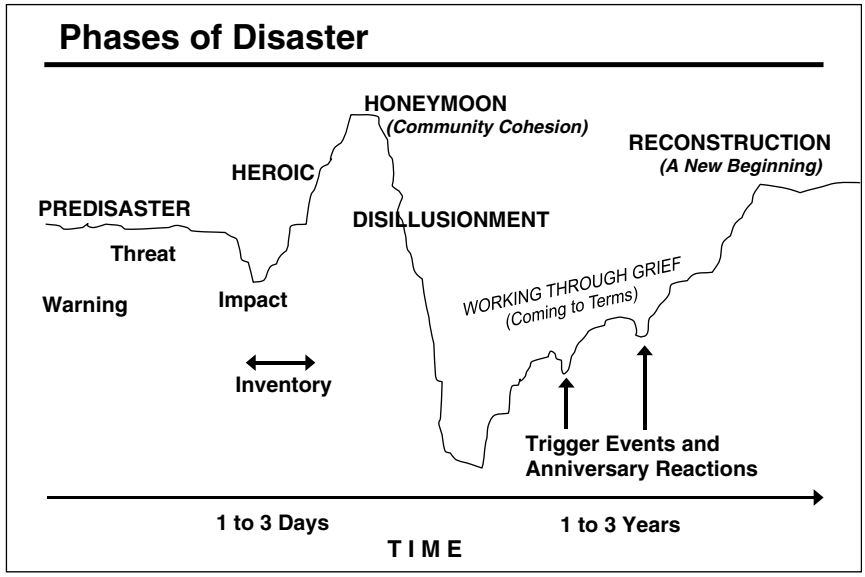

Figure 1.2 Phases of Disaster (adapted from Zunih & Myers, 2000)

ongoing hypervigilance and a sense of lost safety while trying to establish normality in their lives.

There are many milestones of a disaster which both affect the community and may offer opportunities for recovery. Outpourings of sympathy for the injured, dead, and their friends and families are common and expected. There are the normal rituals associated with burying the dead. Later, energy is poured into creating appropriate memorials. Memorialization carries the potential to cause harm as well as to do good. There can be heated disagreement about what the monument should look like and where it should be located. Special thought must be given to the placement of memorials: if it is situated too prominently so that community members cannot avoid encountering it, the memorial may heighten intrusive recollections and interfere with the resolution of grief reactions. Impromptu memorials of flowers, photographs, and memorabilia are frequently erected. It is important to distinguish between this type of spontaneous memoralization, e.g., candles and photos after 9/11, and more formalized and planned memorials. Churches and synagogues play an important role in assisting communities in their search for meaning from such tragedy and in assisting in the grief process. Anniversaries of the disaster (e.g., 1 year) often stimulate renewed grief.

Disorder, distress and health risk behaviors

The majority of people exposed to disasters do well; however, some individuals develop psychiatric disorders, distress, or health risk behaviors such as an increase in alcohol or tobacco use (see Figure 1.3). The effects of disaster may be rekindled by new experiences that remind the person of the past traumatic event (Holloway & Ursano, 1984). At times, disasters may also have unexpected beneficial effects by serving as organizing events and providing a sense of purpose and an opportunity for positive growth experiences (Foa *et al.*, 2000; Ursano, 1987).

Exposure to a traumatic event, the essential element for development of acute stress disorder (ASD) or post-traumatic stress disorder (PTSD), is a relatively common experience. Approximately 50%–70% of the United States population is exposed to a traumatic event sometime during their lifetime;

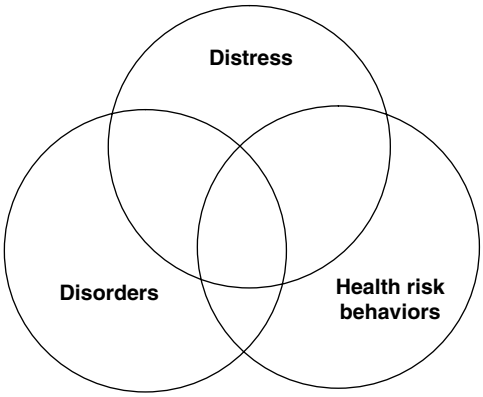

Figure 1.3 Disaster responses

Table 1.2 Trauma-related disorders

Psychiatric diagnoses
• Post-traumatic stress disorder
• Acute stress disorder
• Major depression
• Substance use disorders
• Generalized anxiety disorder
• Adjustment disorder
• Organic mental disorders secondary to head injury, toxic exposure, illness, and dehydration
• Somatization
• Psychological factors affecting physical disease (in the injured)

however, only 5%–12% develop PTSD. In a nationally representative study of 5 877 people aged 15–45 in the United States, the National Comorbidity Study (NCS) (Kessler *et al.*, 1995) found the lifetime prevalence of exposure to trauma to be 60.7% in men and 51.2% in women. In a nationally representative sample of women in the United States, the National Women's Study (NWS) (Resnick *et al.*, 1993) found that 69.0% of women were exposed to a traumatic event at some time in their lives. Over a lifetime, any given individual is very likely to be exposed to a traumatic event.

Disorder

Post-traumatic stress disorder has been widely studied following both natural and human-made disasters (for review, see Fullerton & Ursano 1997; Saigh & Bremner, 1999; Breslau *et al.*, 2005). Post-traumatic stress disorder is not uncommon following many traumatic events, from terrorism to motor vehicle accidents to industrial explosions. In its acute form, PTSD may be more like the common cold, experienced at some time in one's life by nearly all. However, when it persists, it can be debilitating and require psychotherapeutic and/or pharmacological intervention.

The NCS found rates of PTSD to be 7.8%, while the NWS found rates of PTSD to be 12.3%. In an epidemiological study of people belonging to an urban health maintenance organization in the United States, Breslau *et al.* (1991) found the lifetime prevalence of PTSD to be 9.2% for adults.

Post-traumatic stress disorder is not, however, the only trauma related disorder, nor perhaps the most common (Fullerton & Ursano, 1997; Norris *et al.*, 2002; North *et al.*, 1999) (see Table 1.2). People exposed to disaster are at increased risk for depression (e.g., Miguel-Tobal *et al.*, 2006), generalized anxiety disorder, panic disorder, and increased substance use (Breslau *et al.*, 1991; Kessler *et al.*, 1995; North *et al.*, 1999, 2002; Vlahov *et al.*, 2002). Nearly 40.5% of disaster workers following a plane crash met criteria for at least one diagnosis (i.e., acute stress disorder, PTSD, or depression) in a 13-month longitudinal study (Fullerton *et al.*, 2004). Exposed disaster workers with acute stress disorder were 7.33 times more likely to meet PTSD criteria at 13 months. Forty-five percent of survivors of the Oklahoma City bombing had a postdisaster psychiatric disorder. Of these 34.3% had PTSD and 22.5% had major depression (North *et al.*, 1999). Nearly 40% of those with PTSD or depression had no previous history of psychiatric illness (North *et al.*, 1999).

After a disaster or terrorist event, the contribution of the psychological factors to medical illness can also be pervasive – from heart disease (Leor *et al.*, 1996) to diabetes (Jacobson, 1996). Injured survivors often have psychological factors affecting their physical condition (Benedek *et al.*, 2002;

Kulka *et al.*, 1990; North *et al.*, 1999; Shore *et al.*, 1989; Smith *et al.*, 1990; Zatzick *et al.*, 2001).

Acute stress disorder was introduced into the diagnostic nomenclature in DSM-IV (American Psychiatric Association, 1994). Acute stress disorder is a constellation of symptoms very similar to PTSD but persists for a minimum of 2 days and a maximum of 4 weeks and occurs within 4 weeks of the trauma (see Bryant & Harvey, 2000). The only difference in symptom requirements between the two diagnoses is that dissociative symptoms must be present in order to diagnose ASD. The dissociative symptoms can occur during the traumatic event itself or after it. A common early response to traumatic exposure appears to be a disturbance in our sense of time, our internal time clock, resulting in time distortion – time feeling speeded up or slowed down (Ursano & Fullerton, 2000). Along with other dissociative symptoms this time distortion indicates an over four times greater risk for chronic PTSD and may also be an accompaniment of depressive symptoms. Acute stress disorder is diagnosed in 15%–20% of survivors of civilian trauma (Brewin *et al.*, 1999). As many as 80% of persons with ASD will develop PTSD at 6 months. However, it is also true that not everyone who develops PTSD had ASD in the first month. A recent review suggests that although acute dissociation is an important factor in early response to trauma, many people develop PTSD in the absence of dissociative symptoms (Bryant, 2005).

Major depression, generalized anxiety disorder, substance abuse, and adjustment disorders in disaster victims have been less often studied than ASD and PTSD, but available data suggest that these disorders also occur at higher than average rates (Galea *et al.*, 2002; Kessler *et al.*, 1999; Miguel-Tobal *et al.*, 2006). Major depression, substance abuse, and adjustment disorders (anxiety and depression) may be relatively common in the 6–12 months after a disaster and may reflect survivors' reactions to their injuries, to feelings stimulated by the disaster, and/or to their attributions of symptoms to the disaster. The occurrence of these psychiatric disorders is also mediated by secondary stressors following a disaster (Epstein *et al.*, 1998; Vlahov *et al.*, 2002). These include the problems of disaster recovery, such as negotiations with insurance companies for reimbursement, or unemployment secondary to destroyed businesses. Major depression and substance abuse (drugs, alcohol, and tobacco) are frequently comorbid with PTSD and warrant further study (Davidson & Fairbank, 1992; Rundell *et al.*, 1989; Shalev *et al.*, 1990). Increased substance use (without abuse) is also seen and affects morbidity and mortality through potential risk behaviors such as motor vehicle accidents, risky sexual behaviors, and family violence (Fullerton *et al.*, 2004; Galea *et al.*, 2002).

Grief reactions are common after all disasters, however little is known about complex grief as a disaster-specific outcome. Available studies of grief reactions following trauma do not greatly aid our understanding of who is at risk for persistent depression. Single parents may be at high risk for developing psychiatric disorders since they often have fewer resources to begin with, and they lose some of their social supports after a disaster (Solomon & Smith, 1994).

Distress and health risk behaviors

Distress and health risk behaviors include nonspecific distress (for review, see Norris *et al.*, 2002), stress-related psychological and psychosomatic symptoms (Ford, 1997; McCarroll *et al.*, 2002), sleep disturbance, increased alcohol, caffeine, and cigarette use (Shalev *et al.*, 1990; Vlahov *et al.*, 2002) as well as family conflict and family violence (see Tables 1.3 and 1.4). Following the 7 July, 2005 bombings in London, 31% of Londoners reported substantial distress and 32% of Londoners reported behavioral changes, i.e., the intent to travel less (Rubin *et al.*, 2005). Anger, disbelief, sadness, anxiety, fear, and irritability are expected responses following trauma. Anxiety and family conflict can accompany the distress and fear of recurrence of a traumatic event, the ongoing threat of terrorism and the economic impact of lost jobs and companies closing or moving as a result of a disaster.

Table 1.3 Post-traumatic distress

- Grief reactions and other normal responses to an abnormal event
- Altered interpersonal interactions (withdrawal, aggression, violence, family conflict, family violence)
- Decreased work functioning (ability to do work, concentration, absenteeism, quitting, effectiveness on the job)
- Change in safety/travel
- Sleep disturbance
- Loss of concentration

Table 1.4 Health risk behaviors

- Change in smoking
- Change in alcohol
- Balancing home and work
- Disaster behaviors
  - Evacuation
  - Overdedication
  - Adherence to medical recommendations

After September 11, substantial numbers of people wished to stay home and might well have met the diagnosis of separation anxiety.

Somatic symptoms can also be an indicator of disaster-related distress. Assessing exposure to disaster events may be overlooked by overburdened primary care physicians after a disaster. Somatization is common after a disaster and must be managed both in the community at large and in individual patients (Rundell & Ursano, 1996). Disaster and rescue workers also report increased somatic symptoms after disaster exposure (McCarroll *et al.*, 2002). Somatization is a frequent presentation of anxiety and depression in patients seeking care in medical clinics. Recognizing these symptoms as an indicator of distress can help in the appropriate diagnosis and treatment and minimize inappropriate medical treatments. Medical evaluation, which includes inquiring about family conflict, can provide reassurance as well as begin a discussion for referral, and be a primary preventive intervention for children whose first experience of a disaster or terrorist attack is mediated through their parents. Sleep disturbances following trauma are common clinical problems that present to clinicians for treatment. Sleep difficulties can be due to grief, anxiety related to recurrent disaster events (e.g., aftershocks), or the ongoing threat of terrorist attacks, or to underlying psychiatric disease such as depression or PTSD (Mellman *et al.*, 1995). Post-traumatic distress must be considered in the differential diagnosis and appropriate treatments initiated.

Hostility with its accompanying social disruption, feelings of frustration, and perception of chaos are also common following disaster (Forster, 1992; Ursano *et al.*, 1995). Although in some cases it is helpful for individuals to recognize that the return of anger can be a sign of a return to normal (i.e., it is again safe to be angry and express one's losses, disappointments, and needs), in others hostility should remind the care provider to assess the risk of family violence and substance abuse.

Disaster behavior, how one acts at the time of impact of a disaster, also affects morbidity and at times mortality. Studies of evacuation from the World Trade Center towers in 1993 after a terrorist truck bomb showed that those evacuating in groups greater than 20 took more than 6 min longer to decide to evacuate (Aguirre *et al.*, 1998). In addition, the more people knew each other in the group, the longer the group took to initiate evacuation. After the 9/11 attacks, rather than leave the disaster area, victims from the twin towers tended to congregate at the site (Gershon *et al.*, 2004). Overdedication to one's group can also lead firefighters, police, and other first responders to needlessly risk their lives. In pandemics, or after a bioterrorism attack, adherence to medical recommendations is a lifesaving behavior.

Bereavement and grief

Increasingly, traumatic loss and the bereavement and grief associated with the traumatic loss are recognized as posing special challenges to survivors of disasters and other traumatic events (Fullerton *et al.*, 1999; Prigerson *et al.*, 1999, 2000; Raphael

et al., 2004; Raphael & Minkov, 1999; Raphael & Wooding, 2004; Shear *et al.*, 2001, 2005). While the death of loved ones is always painful, an unexpected and violent death is most difficult. Even when not directly witnessing the death, family members may develop intrusive images based on information gleaned from authorities or the media. In children, traumatic play, a phenomenon similar to intrusive symptoms in adults, is both a sign of distress and an effort at mastery (Terr, 1981). Effective leadership after disasters includes ''grief leadership,'' an important aspect of giving permission to grieve, and teaching and showing people how to grieve (Ursano & Fullerton, 1990).

Table 1.5 High-risk groups

- Directly exposed to life threat
- Injured
- First responders
- Bereaved
- Single parents
- Children
- Elderly
- Women
- Individuals with:
  - Prior post-traumatic stress disorder
  - Prior exposure to trauma
  - Prior or current psychiatric or medical illness
  - Lack of supportive relationships

Risk factors and vulnerable populations

We are only beginning to understand why some people exposed to disasters develop post-traumatic psychopathology and some people do not (for two recent meta-analyses of risk factors for PTSD, see Brewin *et al.*, 2000; Ozer *et al.*, 2003). Protecting vulnerable individuals and communities against disaster is a critical component of disaster preparedness and response (Norris *et al.*, 2002; Somasundaram & van de Put, 2006). Special populations such as women, children and adolescents, individuals with pre-existing health problems, and the poor are at increased risk for psychological morbidity following disasters (for review, see Somasundaram & van de Put, 2006). Trauma severity, lack of social support, and life stress have a greater effect on the development of PTSD than pre-existing factors such as demographics, pre-existing psychiatric illness, and family psychiatric history (Brewin *et al.*, 2000).

Post-traumatic psychiatric disorders are most often seen in the primary victims, those directly exposed to the threat to life and the horror of a disaster. The greater the ''dose'' of traumatic stressors, the more likely an individual or group is to develop high rates of psychiatric morbidity. In addition, those who have significant attachments with the primary victims, first responders, and support providers are all at risk (Wright & Bartone, 1994) (see Table 1.5). Adults, children, and the elderly in particular who were in physical danger and who directly witnessed the events are at risk. Those who were psychologically vulnerable before exposure to a disaster are also buffeted by the fears and realities of job loss, untenably longer commutes or eroded interpersonal and community support systems overtaxed now by increased demands (Norris *et al.*, 2002).

Persons who are injured are at high risk, reflecting both their high level of exposure to life threat and the added persistent reminders and additional stress burden accompanying an onging injury and necessary rehabilitation. The Epidemiologic Catchment Area study of Vietnam veterans documented a higher rate of PTSD in wounded than in nonwounded veterans (Helzer *et al.*, 1987). Similar findings were noted in the Veterans Affairs study (Kulka *et al.*, 1990, 1991). Co-occurring psychiatric symptoms are frequently seen in injured survivors who may be dealing with the stress of their injury (Brandt *et al.*, 1997; Goenjian, 1993; Kulka *et al.*, 1990; North *et al.*, 1999; North *et al.*, 1989; Shore *et al.*, 1989; Zatzick *et al.*, 2001). Since studies indicate a high rate of psychiatric disorder in the physically injured, a proactive psychiatric consultation and liaison approach is a necessary part of a hospital emergency response plan.

Police, paramedics and other first responders who assist the injured and evacuate them to medical care, and hospital personnel who care for the injured need opportunities to process what happened to them in disaster events, education on normal responses, and information on when to seek further help. Those who are charged with cleaning up the site of a tragedy – and are exposed to death and the dead, as well as extended demanding work schedules – are also vulnerable to persistent symptoms. Overidentification with the victims (e.g., ''It could have been me'') and their pain and grief can perpetuate the fear response (Ursano *et al.*, 1999). This normally health and growth promoting mechanism of identification with victims and heroes can turn against us in this setting like an autoimmune disorder. Inevitably, each disaster situation will also contain individuals who are ''silent'' victims and often overlooked. By paying close attention to the patterns and types of exposure, these individuals can be identified and receive proper care.

Pre-existing psychiatric illness

Pre-existing psychiatric illness or symptoms are not necessary for psychiatric morbidity after a disaster, nor are they sufficient to account for it (Goldberg *et al.*, 1990; McFarlane, 1989; Ursano, 1981; Ursano *et al.*, 1981). However, people with pre-existing psychiatric illness are especially likely to experience psychiatric illness after a disaster (Bromet *et al.*, 1982; McFarlane, 1989; North *et al.*, 1989, 1994, 1999; Ramsay, 1990; Smith *et al.*, 1990; Weisaeth, 1985). Similarly, pre-existing personality features have been shown to predict the occurrence of postdisaster psychopathology including PTSD (Chen *et al.*, 2001; Liao *et al.*, 2002; Maes *et al.*, 2001; McFarlane, 1989; Roy, 1982; Southwick *et al.*, 1993).

Importantly, nearly 40% of survivors of the Oklahoma City bombing with PTSD or depression had no previous history of psychiatric illness (North *et al.*, 1999). Therefore, those needing treatment after a disaster will not all have the usually expected accompanying risk factors and coping strategies of the usual mental health populations, which has a much higher frequency of past psychiatric problems and altered coping and functioning. The less severe the disaster, the more important predisaster variables such as neuroticism or a history of psychiatric disorder appear to be (Fullerton *et al.*, 1999; McFarlane, 1986, 1988a, 1988b). The more severe the stressor, the less pre-existing psychiatric disorders predict outcome.

Demographic risk factors

Women are at greater risk for PTSD and major depression, and men are at greater risk for substance abuse after disasters (Kasl *et al.*, 1981a, 1981b; Lopez-Ibor *et al.*, 1985; Maes *et al.*, 1998; North *et al.*, 1999, 2002; Robins *et al.*, 1984; Steinglass & Gerrity, 1990; Weisaeth, 1985). However, for war stressors some data show no differences in female soldiers compared to male soldiers (Hoge *et al.*, 2004). This may reflect the importance of training and previous experience with traumatic events as protective factors for PTSD. Of the other demographic factors tested in the literature – including age, race, and socioeconomic status – either the findings have been mixed or the evidence has been insufficient to conclude that they have consistent associations with postdisaster outcome.

The role of race/ethnicity in the development of adverse mental health consequences in the aftermath of disasters remains unclear. Some studies have found racial/ethnic differences in the incidence of PTSD, depression, and anxiety after individual trauma and disasters (Kulka *et al.*, 1990; Ortega & Rosenheck, 2000; Penk *et al.*, 1989; Pole *et al.*, 2001; Ruef *et al.*, 2000) while others have not (Bromet *et al.*, 1998; Kessler *et al.*, 1995). Two recent meta-analyses of the risk factors for PTSD in trauma-exposed adults suggested that race/ethnicity was a predictor of PTSD in some populations, but not in others (Brewin *et al.*, 2000; Ozer *et al.*, 2003). A number of studies conducted among military populations have found an increased risk of PTSD symptoms among ethnic minorities, compared to Whites (Kang *et al.*, 2003; Orcutt *et al.*, 2004;

Ruef *et al.*, 2000; Sutker *et al.*, 1995), though it is unclear if these differences remain when accounting for differing combat exposure and other factors (Frueh *et al.*, 1998). Recent studies of New York City residents following the 2001 World Trade Center terrorist attacks show diversity in outcome as well as in utilization of mental health services among populations. In a large-scale epidemiologic study, one of the predictors of PTSD was Hispanic ethnicity (Galea *et al.*, 2002). African-American and Hispanic respondents were also less likely than White respondents to either use services or take medications. Asian Americans were less likely to seek emotional help from mental health specialists than White Americans. The authors attributed this to various cultural aspects, including cultural values of self-reliance, reservation, and passiveness to self-expression.

Few studies have explored the empirical link from ethnicity to preparedness for disasters (for review see, Peacock *et al.*, 1997). The frequency, intensity, and form of social interaction among members of ethnic groups are prime suspects in how disaster information is passed along, made acceptable, and integrated into appropriate disaster preparedness behaviors (Kirschenbaum, 2004). These networks create the social structural conditions for heightened interaction, increased trust and accepted lines for information dissemination. Ethnicity may be a catalyst for stimulating groups or individuals with similar cultural backgrounds, languages, values, and norms through emergent social networks to become sensitive to potential disasters and prepare for them. This sensitivity will then have a direct impact on how well prepared they are for a disaster and whether they may evacuate when asked, comply with quarantine or trust leadership and community interventions. In the face of Hurricane Katrina, Blacks across the disaster region were less inclined than Whites to evacuate before the storm because they did not believe the hurricane would be as devastating as it was (Elliott & Pais, 2006). Following the London bombings, being Muslim was associated with a greater presence of substantial stress (odds ratio 4.0) (Rubin *et al.*, 2005). After Hurricane Katrina in the United States, 40.6% of the disaster-exposed region reported experiencing five or more significant stressors (e.g., significant financial loss, had to be rescued, housing loss) (Kessler *et al.*, 2006). All of these stressors were more commonly reported by socially disadvantaged people (e.g., poor, minorities, low education). Of those in the lowest quartile of income, 47.6% experienced five or more stressors compared to 23% in the highest quartile of income.

Children are also vulnerable after disasters (see Bromet *et al.*, 2000; Cohen *et al.*, 2006; Pfefferbaum, 2005; Pynoos *et al.*, 1996; Shaw *et al.*, 1995, 1996; Shaw 2003; Chapter 3). The prevalence rates of PTSD symptoms 2 months following the Asian tsunami in children aged 7–14 years were 13% for children living in camps, 11% among children from affected villages, and 6% among children from unaffected villages (Thienkrua *et al.*, 2006). Delayed evacuation, feeling that you or a family member's life was in danger, and having felt extreme panic or fear were associated with PTSD symptoms. These rates did not decrease 9 months after the tsunami. Following 9/11 parents of children with greater levels of distress spent more time talking with their children, potentially trying to reassure them (Schuster *et al.*, 2001). However, in a situation in which parents as well as children may feel threatened, more information is needed regarding such parent–child conversations before such a conclusion can be reached. It is also possible that such parent–child conversations actually heighten children's worries and psychological reactions, particularly in those families whose parents caution children to avoid public places and take precautions against anthrax. Six months following 9/11, of children in grades 4–12 in the New York City public schools, 28.6% had one or more of six probable anxiety/depressive disorders (Hoven *et al.*, 2005). The most prevalent probable diagnoses were agoraphobia (14.8%), separation anxiety (12.3%), and PTSD (10.6%).

In studies in Israel of children with continuing exposure to terrorism, many children experienced insecurity, concerns with safety, and a readiness to

expect the worst (Shaw, 2003). Worries about being a victim of terrorism remained common in children several months after September 11 (Schuster *et al.*, 2001). Efforts are needed to monitor whether such changes in children's view of their safety might occur as a result of repeated warnings or threats about terrorism in the absence of actual terrorist events. Children's parents play a substantial role in moderating how children respond to terrorism, and in few other types of traumatic events are the potential threat to both parent and child comparable (see Bromet *et al.*, 2000; Shaw, 2000). Further research examining how parent–child dyads and family units respond to and are affected by terrorism will begin to build an evidence base that will allow more informed recommendations to parents about how to help their child cope with terrorism (see Cohen *et al.*, 2006; Schuster *et al.*, 2001).

The nature of homelessness requires people to live in a constant, crisis level of coping and adaptation in order to meet basic needs. Despite the high number of people who are homeless living in densely populated urban areas around the globe and in developed countries, few studies have examined the homeless during times of heightened crisis. Many surveys which employ phone and internet-based approaches typically exclude people who are homeless, unless they are done in cooperation with nonprofit social service agencies (Ahern *et al.*, 2004; Schlenger *et al.*, 2002). Consequently, little is known about this population's reactions to disaster and terrorism.

Social support and resources

Social support is linked to mental health outcomes (Bland *et al.*, 1997; Norris *et al.*, 2002; Regehr *et al.*, 2001). There is substantial evidence that the perceived availability of social support buffers the effect of stress on distress and psychological symptoms including depression and anxiety (see Cohen & Wills, 1985; Kawachi & Berkman, 2001; Norris *et al.*, 2002). Greater social supports are in general associated with lower stress symptoms (Ursano *et al.*, 2003). Although social support appears to strengthen the psychosocial adjustment of men, there is evidence that social networks may be more of a burden than a support for women (Solomon *et al.*, 1987). Social support, however, may be the result of an individual's psychosocial strength as well as a mediator. Those with good social support networks tend to be better adjusted regardless of disaster exposure. A longitudinal study of social support mobilization and deterioration after Mexico's 1999 flood showed lower social support in those who had experienced mass casualties and displacement, among women and persons with lower education (Norris *et al.*, 2005). These disparities grew larger as time passed, suggesting the importance of social as well as psychological functioning in the aftermath and in the long-term following disaster.

From a resource perspective, a critical goal of interventions postdisaster is to replace valued resources as quickly as possible (Hobfoll & Lilly, 1993). Loss can occur on multiple ecological levels such as family, organization, and community (Hobfoll & Jackson, 1991). The Conservation of Resources (COR) theory posits that people strive to obtain and protect resources (Hobfoll, 1989). These resources can include personal or material resources and life conditions. In the aftermath of disasters the losses incurred are related to one's survival, and the losses tend to be numerous and profound, resulting in high levels of stress. For example, in the case of natural disasters, people often lose their homes, job, and social network. In a recent large-scale study of terrorism in Israel, psychosocial resources and psychosocial resource loss and gain were significantly related to exposure to terrorism, greater PTSD, and depressive symptoms (Hobfoll *et al.*, 2006).

Organizations such as schools, churches, employee assistance programs, and employers who already have relationships with large and specific segments of the community play important roles after terrorism in particular (Institute of Medicine, 2003). These organizations are also well positioned to provide information and support to individuals with specific concerns or in need of additional support, thus

greatly enhancing the effectiveness of the overall response (Stein *et al.*, 2004a, 2004b). With prior education and planning, citizens are in a better position to utilize their existing infrastructures by shielding within their own communities rather than engaging in spontaneous evacuations to more vulnerable environments (Saathoff & Everly, 2002; Pilch, 2004).

Treatment, intervention, and recovery

The normal process of recovery includes talking with others about the disaster and available resources for recovery, learning new coping strategies, and seeking help. Effective treatments for post-traumatic disorder, acute stress disorder, depression and other post-traumatic disorders are available (see Ursano *et al.*, 2004). These include psychological and pharmacologic interventions (see Chapters 6–9) (for reviews, see Foa, 2006; Foa *et al.*, 2000; Ritchie *et al.*, 2006; Yehuda, 2002).

Importantly, treatment effectiveness depends on the cultural sensitivity of assessment and treatment tools (Bryant & Njenga, 2006). Early psychiatric interventions after disaster are directed to minimizing exposure to additional traumatic stressors and educating about normal responses to trauma and disasters (see National Institute of Mental Health, 2002; Chapter 6). Consultations with other health care professionals, who will see individuals seeking medical care for injuries, and with community leaders, who need assistance in identifying at-risk groups and understanding the phases of recovery, are also important early on. More traditional health care services such as advising people on when to seek professional treatment, assisting in the resolution of acute symptomatology occurring in the days and weeks after the initial exposure, identifying those who are at higher risk for the development of psychiatric disorders and engaging them in treatment and support are important to the health of the community. Educating patients and their families can also help them to identify worsening or persistent symptoms. Anxiety and family conflict can be triggered by the fear of new threats or by the economic impact of the loss of a job after a traumatic event.

Early symptoms usually respond to a number of approaches, such as helping patients and their families identify the cause of the stress and limiting further exposure (e.g., by avoiding excessive news coverage of the traumatic event) and advising patients to get enough rest and maintain their biologic rhythms (e.g., going to sleep at the same time each night, eating at the same times each day). Key components of early intervention can be provided by mental health professionals and by other health care providers (National Institute of Mental Health, 2002).

Psychological First Aid (PFA) is an evidence-informed approach designed to reduce the initial distress in the immediate aftermath of traumatic events and to foster adaptive functioning in children, adolescents, adults, and families (National Child Traumatic Stress Network and National Center for PTSD, 2005). The primary principles of early PFA for individual care are safety, calming, connectedness, efficacy (ability and belief that one can cope/respond), and optimism. Application of these principles is the present state of the art for early intervention.

Psychological First Aid applied across all domains involves meeting basic needs for physical safety, food, protection from the elements, connectedness, survival, and security (see Chapter 6; Young, 2006). It involves early assessment of needs, monitoring the rescue and recovery environment, outreach and information dissemination, technical assistance, consultation and training, fostering resilience/recovery, triage, and early treatment. The principles and techniques of PFA are: (1) consistent with evidenced-based research on risk and resilience following disaster; (2) applicable in field settings; (3) age appropriate for developmental levels across the lifespan; and (4) culturally informed and adaptable across cultures (National Child Traumatic Stress Network and National Center for PTSD, 2005).

One of the goals of psychiatric care is to facilitate the treatment of the injured by removing individuals

who do not require emergency medical care from the patient flow. Designation of a location near the hospital but separate from the chaos is important for initial treatment and triage. Hospitals or other institutions serving as entry points for care can act as locations where persons with psychologic symptoms can receive respite (Benedek *et al.*, 2002).

Interpersonal withdrawal and social isolation are particularly difficult symptoms and often bode a complex trauma response. Social withdrawal tends to limit the normal recovery mechanisms, e.g., the ''natural debriefing process'' (Ursano *et al.*, 2000), talking with others, active coping, and help seeking. Depression may be a primary contribution to withdrawal and requires evaluation and treatment.

Increased somatic symptoms have been frequently reported after disasters, particularly toxic exposures (Engel & Katon, 1999) and exposure to the dead (McCarroll *et al.*, 2002), and can be an expression of anxiety or depression. In these individuals, conservative medical management with education and reassurance are the core of medical treatment. Discussion of specific worries and fears can decrease symptoms, initiate the normal metabolism and digestion of stress symptoms, and identify any need for further specific treatment.

Risk and protective factors: resilience and response trajectories

Resilience and post-traumatic growth

Although the psychiatric consequences of disasters have been associated with debility that can persist for decades, the effects of traumatic events are not exclusively bad. Understanding the range of trajectories of response – e.g., resilience, distress, illness, recovery – is an important longitudinal perspective on disaster-exposed individuals and communities. In recent years there has been increased interest in the role of resilience in response to disaster (e.g., see Bonanno *et al.*, 2006; Connor, 2006; Wessely, 2005) and post-traumatic growth (for reviews see Linley & Joseph, 2004; Zoellner & Maercker, 2006). Resilience has been defined as having either no PTSD symptoms or one symptom (Bonnano *et al.*, 2006) and also as a measure of coping and personal qualities that allow individuals and communities to grow in the face of adversity (Connor & Davidson, 2003; Luthar *et al.*, 2000; Richardson, 2002). For some people trauma and loss can facilitate a move toward health (Card, 1983; Tedeschi *et al.*, 1998; Ursano, 1981).

Resilience and recovery need to be differentiated. Bonanno (2004) defined resilience as ''the ability of adults *in otherwise normal circumstances* who are exposed to an isolated and potentially highly disruptive event such as the death of a close relation or a violent or life-threatening situation to maintain relatively stable, healthy levels of psychological and physical functioning ... as well as the capacity for generative experiences and positive emotions'' (pp. 20–21). Key to this definition is the distinction between resilience and recovery. Whereas recovering individuals often experience subthreshold symptom levels, resilient individuals are hypothesized to experience transient perturbations in normal functioning (e.g., several weeks of sporadic preoccupation or restless sleep), but generally exhibit a stable trajectory of healthy functioning across time. A growing body of evidence has been garnered in support of this definition (for reviews see Bonanno, 2004; Bonanno & Kaltman, 2001), including a recent study examining the resilient trajectory among a high-exposure group of people who had been in or near the World Trade Center on September 11 when the first plane struck the towers (Bonanno, 2004). In addition to being in physical danger, most of these individuals had also witnessed death and injury to others. Not only did the majority fail to meet criteria for either depression or PTSD, the most common outcome trajectory was a resilient pattern of stable low symptom levels. This study also provided important validity data by showing a high concordance between the resilience trajectory and ratings of resilience provided independently by participants' close friends and relatives.

A traumatic experience can become the center around which a victim reorganizes a previously disorganized life, reorienting values and goals (Ursano, 1981, 1987). Traumatic events may function as psychic organizers by linking event-related feelings, thoughts, and behaviors that are later accessed en bloc following symbolic, environmental, or biological stimuli (Holloway & Ursano, 1984). Many survivors of the 1974 tornado in Xenia, Ohio experienced psychological distress, but the majority described positive outcomes: they learned that they could handle crises effectively (84%) and believed that they were better off for having met this type of challenge (69%) (Quarentelli, 1985; Taylor, 1977). This ''benefited response'' is also reported in the combat trauma literature. Sledge *et al.* (1980) found that approximately one-third of United States Air Force Vietnam-era prisoners of war reported having benefited from their prisoner of war experience; they believed that they had developed an important reprioritization of their life goals, placing new emphasis on the importance of family and country. The individuals reporting these benefits tended to be the ones who had suffered the most traumatic experiences. More recently, after Hurricane Katrina in the United States, 88.5% of the disaster-impacted population reported that their experiences with the hurricane helped them develop a deeper sense of meaning or purpose in life (Kessler *et al.*, 2006). The vast majority (89.3%) and 81% of the highest impacted area, the City of New Orleans, reported they would be better able to cope with future life stressors.

Meaning and cognitive appraisal of disaster events

Clinical studies and treatment interventions suggest that the psychiatric consequences following disasters are influenced by the meaning (i.e., cognitive appraisal) of the traumatic event (Bryant, 2006; Dollinger, 1986; Green *et al.*, 1985; Holloway & Ursano, 1984). Beliefs about the cause of the disaster and the ramifications of these beliefs (such as self-blame, the shattering of assumptions about human nature, and rage at ''those responsible'' when the event is viewed as preventable) should be assessed in psychiatric evaluation and represent potential areas for intervention. Chronic PTSD may be particularly related to the meaning of a disaster experience. Therapists can assist patients in modifying distorted attributions (e.g., ''It's all my fault; if only I had insisted that we not go away for the weekend, we wouldn't have been caught in the tornado and my wife would still be alive''). Cognitive models of responses to traumatic events indicate that the appraisal of the traumatic event and its consequences is critical to levels of stress and disorder after the event (Ehlers & Clark, 2000). Catastrophic appraisals in particular increase the experience of threat (Resick & Schnicke, 1993). Maladaptive appraisals appear related to altered beliefs in the safety of our world or our own sense of efficacy versus helplessness (Bryant & Guthrie, 2005; Foa & Rothbaum, 1998).

Some events are more likely than others to shatter one's faith in a just and safe world (Holloway & Fullerton, 1994). Consider the implications of the following scenarios: an individual has survived an airplane crash in which many people were injured and killed. Various explanations for the crash exist; each would stimulate a different meaning and emotional response. The plane may have crashed because of sudden and unexpected wind shears, because of uncomplicated pilot error, or because of ''complicated'' pilot error (e.g., the pilot was under the influence of drugs or alcohol). At the far end of this continuum would be a crash caused by an act of terrorism or greed in which the plane was destroyed to further the interests of a group or an individual.

The construction of meaning is an active process that affects the outcome of the disaster experience and recovery (Ursano & Fullerton, 1990; Ursano *et al.*, 1992). The meaning of a disaster to any one person results from the interaction of his or her past history, present context, and physiological state. The ascribed meaning will then direct individual behaviors of what to do, what to fix, and whom or what to blame. Meaning is dynamic, not

static: it changes over time as the individual's psychosocial context changes. Such alterations can aid or inhibit recovery. For example, immediately following the crash of an Air Force C-141 cargo plane, the remaining members of the squadron were convinced that the accident was caused by aircraft failure. However, this belief was modified as the date grew nearer for the squadron members to fly the same type of plane again. By that time, the squadron's belief had changed, and members thought that the crash must have been caused by human error. If it were human error, one could feel safe: ''I would never do that.''

Leadership is an important aspect of the construction of meaning in the aftermath of disaster and in preparedness for disaster. In the workplace, corporate leaders acknowledge that communicating to employees a recognition of their value to the corporation – of instilling in employees the idea that they ''mattered'' – was important to preservation of function in times of disaster and crises (Ursano, 2005).

Conclusion

Natural and human-made disasters will continue to be a primary cause of mental health need. Those most directly exposed, those most vulnerable, and the disaster community require individual care and population-level health interventions. Community leadership is critical to fostering recovery, providing treatment and maximizing community restoration.

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