

Textbook of Disaster Psychiatry

Edited by

Robert J. Ursano
Carol S. Fullerton

Uniformed Services University of the Health Sciences

Lars Weisaeth

University of Oslo

Beverley Raphael

University of Western Sydney



CAMBRIDGE
UNIVERSITY PRESS

Public health and disaster mental health: preparing, responding, and recovering

Robert J. Ursano, Carol S. Fullerton, Lars Weisaeth, & Beverly Raphael

Mental health experts are an essential part of planning for and responding to disasters. However, across nations, public mental health planning and care vary greatly from systems in which all healthcare is national and resources are substantial, to those in which no mental healthcare is available or the public resources are greatly limited. Regardless of resources, disasters challenge mental health systems in nearly all nations and communities.

In the United States, prior to the 1960s the mental health component of the public health system generally meant public mental hospitals. Beginning in the 1960s and continuing to the early 1970s, the public health-mental health system was the community mental health center. The early 1970s saw the start of a continuous erosion in the comprehensive mission originally included as part of community mental health. Today, with rare exception, the public health component of the United States mental health system refers to community based services for people with serious and persistent mental illness, not to a comprehensive public health approach to the entire mental health and behavioral needs of the community (Institute of Medicine, 2003). There is not a systematic approach to the provision of public medical care for mental health problems across the entire range of primary, secondary, and tertiary prevention including health behaviors and traditional mental health – from community-based prevention pro-

grams to outpatient clinics, inpatient hospital care, and care in the primary care setting where most mental health problems present. In times of disaster, this lack of a comprehensive system is particularly evident.

Disasters require that we respond not only to those who need direct care but also to populations that may need support, assistance, guidance, and psychological and health-related information. Emergency care providers must discriminate between physical and anxiety symptoms to assure the integrity of the medical system (see Chapter 8). Mental health providers must respond to a range of emotional and behavioral demands, e.g., anger, fear, depression, increased substance use, and in some disasters such as epidemics or bioterrorism, the special stresses of quarantine, shelter in place and altered travel behaviors that may threaten the economic stability of a nation. The public health system must address mental healthcare across all of its dimensions. Mental health and behavior are critically important elements of our healthcare system for responses to disasters. Mental health and behavioral preparedness are one step in the process.

Preparing for disasters including terrorism is a focused, yet often forgotten, need of disaster communities. A study conducted by The Marist Institute for Public Opinion for Columbia's Mailman School of Public Health (National Center for Disaster Preparedness, 2003) found 76% of

Americans were concerned about terrorism in the United States 2 years after September 11. A majority, however, lack confidence in the United States' health system's capacity to respond effectively to a biological, chemical or nuclear attack, and many Americans are unaware of emergency plans at their workplace or in their children's schools. Despite the fact that the most prevalent concern of Americans (66%) was the need to account for the whereabouts and safety of family members, the study found that fewer than one in four families (23%) actually have a basic emergency plan. Nationally, only 58% of parents are aware of the emergency or evacuation plans at their child's school, and only 19% are familiar with the details of their children's school plan. The Asian tsunami of 2004 and Hurricanes Katrina and Rita in the United States are powerful reminders of the critical need to include mental health services in the primary care setting before disaster strikes (Davidson, 2006; Weisler *et al.*, 2006).

The psychological and behavioral consequences of disasters include behavior change, distress symptoms and, for some, psychiatric illness (for review, see Norris *et al.*, 2002a, 2002b; North *et al.*, 1999) (see Figure 15.1). In the immediate aftermath of a disaster, individuals and communities may respond in adaptive, effective ways or they may

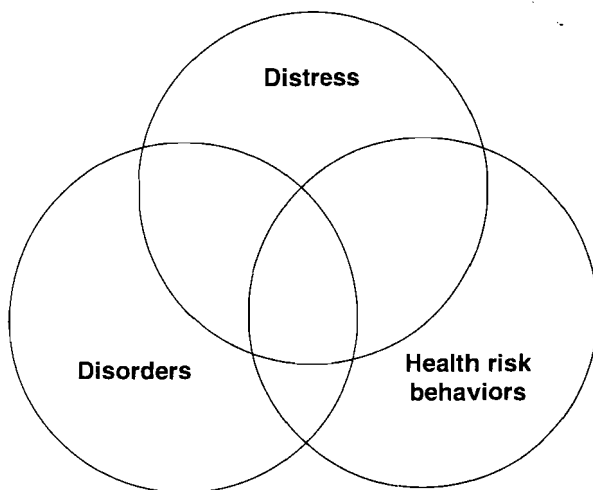


Figure 15.1 The psychological and behavioral consequences of disasters

make fear-based decisions, resulting in unhelpful behaviors. The adaptive capacities of individuals and groups within a community are variable, and need to be understood before a crisis in order to effectively identify postevent needs (Ursano & Norwood, 2003). Interventions to sustain psychological function and alleviate psychiatric disease as well as distress are dependent upon the rapid, effective, and sustained mobilization of resources. Knowledge of a community's risk and protective factors before a disaster or terrorist event, as well as understanding the psychological responses to such an event enables leaders and medical experts to talk to the public, promoting resilient healthy behaviors, sustaining the social fabric of the community, and facilitating recovery (Institute of Medicine, 2003).

Psychological casualties present a significant challenge to medical and health providers in the aftermath of disaster. Traditional natural disaster or transportation accident models of providing health services after a disaster must be altered for terrorist events. Effective, consistent health responses to the psychological, behavioral, and mental health needs after disaster require that preparedness and response activities fit within the framework of all-hazards disaster planning (Flynn, 2003).

New models of monitoring shifting community healthcare needs in realtime (i.e., mental health surveillance) as well as innovative models for delivering care are required (Bryant, 2006). A disaster mental healthcare response requires the collaborative efforts of the public health system, medical care system, and emergency response systems (see Figure 15.2). The mental healthcare system, as part of the medical care system, must join with the public health and emergency response systems to address needs for triage, surge capacity, and health surveillance in order to best provide care for communities exposed to disasters (Raphael, 2006). This invariably involves public health, health and mental health authorities, state and local emergency planners, disaster relief organizations, healthcare institutions and

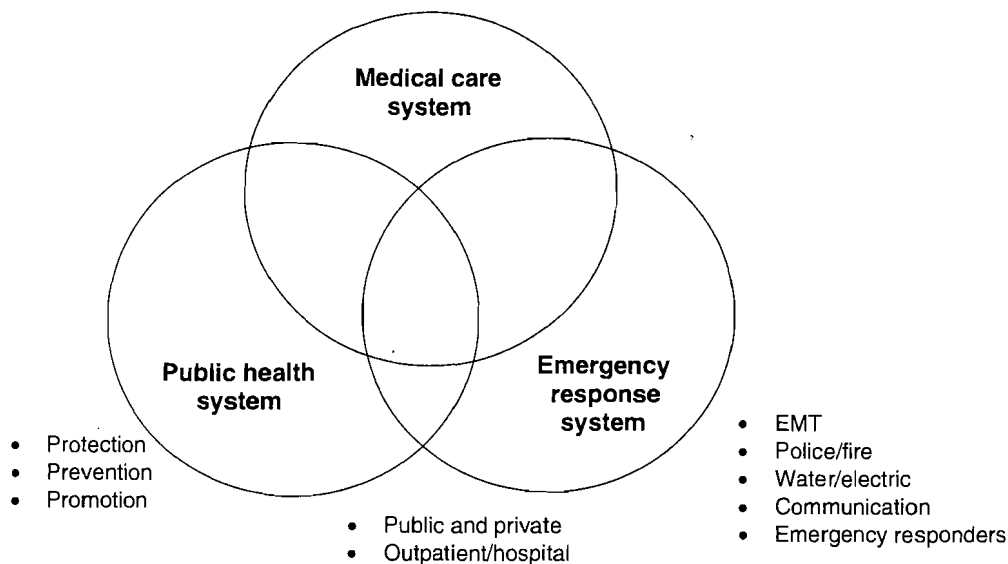


Figure 15.2 The disaster mental health response

providers and representatives of critical infrastructure entities (Ursano *et al.*, 2004). The knowledge base for the interventions draws from a variety of disciplines including sociology, risk communication, education, and disaster mental health. This knowledge can provide guidance to community leaders, local emergency planners, health and mental health planners, and healthcare providers to develop integrated plans and linked preparations for psychological and behavioral consequences of disasters (Litz *et al.*, 2002; National Institute of Mental Health, 2002). Scientists, healthcare responders, and national leaders must work together to assure health, order, and continuity of government and societal function.

For terrorism in particular it has been said that the mental health and behavioral consequences are the most significant, long-term, and most costly effects of a terrorist attack. The development of specific recommendations for the integration of mental health and public health is critical [Institute of Medicine (IOM), 2003; Joint Commission on Accreditation of Healthcare Organizations (JCAHO), 2003; Ursano *et al.*, 2001, 2002]. Preparedness planning is the first of the mental health and behavioral planning needs.

Preparing for the consequences of disasters and terrorism

Although exposure to disasters and other trauma is associated with debility that can persist for decades, resilience is by far the most common finding. For some people, trauma and loss may even facilitate a move toward health (Bonanno, 2004; Bonanno *et al.*, 2006; Card, 1983; Foa *et al.*, 2000; Kessler, 2006; Ursano, 1981; Wessely, 2005).

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 routine of the community is altered. At a time when, traditionally, communities turn inward to grieve and assist affected families, the normal

social supports are strained and disrupted by outsiders.

Disasters and terrorism strike at the fault lines of our society, increasing the chances of the rupture of society across ethnic, religious, racial, and socioeconomic differences. For example, following Hurricane Katrina, rumors circulated that the government had intentionally blown up the levees to flood the poor minority sections of New Orleans rather than the economically well off and primarily White parts of the town. Similarly in Washington, D.C. after the anthrax attacks the decision to provide ciprofloxacin to those on Capitol Hill and dicloxacillin to those in the post office in Washington, D.C. was interpreted as discriminatory (in fact the Supreme Court also received dicloxacillin). Both were appropriate medications. Avoidance and stigmatization of Arabs was widely reported after the London bombings as well as the World Trade Center attack in the United States.

Disaster behaviors and preparedness behaviors such as decisions about when and how to evacuate, and response to alerts and alarms are a relatively new focus of attention and intervention for mental health and behavior specialists. In addition, in any new infectious outbreak by a new agent – such as severe acute respiratory syndrome (SARS) or Avian influenza – the only available responses are adherence to behavioral interventions such as quarantine and protective behaviors until new vaccination and treatments can be developed. Disaster behaviors are critical to health and morbidity. For example, what determined the decision to evacuate in the face of disasters such as Hurricane Katrina (see Elliott & Pais, 2006)? A large percentage of the population of New Orleans (about one third) did not evacuate despite warnings of an impending hurricane (Kessler, 2006). Studies of the first World Trade Center disaster in New York City, the bombing in 1993, showed that nearly 32% of people had not begun to evacuate over 1 h after the bombing. (Only 36% of those in the tower had participated in a *previous* emergency evacuation.) The higher up one was in the building, the longer it took to decide to evacuate, and 30%

decided *not* to evacuate at all (Aguirre *et al.*, 1998). In addition, people in groups of greater than 20 took over 6 min longer to decide to evacuate. In addition, the more people knew each other in the group, the longer the group took to initiate evacuation (Aguirre *et al.*, 1998). Individual barriers to evacuation of the World Trade Center on September 11 delayed evacuation: doing last-minute work-related tasks, taking personal items, making calls, waiting for instructions/direction. Also, poor familiarity with World Trade Center building, fear of negative impact on job, disabilities and poor physical condition and footwear were associated with problems in evacuation (Gershon *et al.*, 2004).

After a disaster, particularly those that include risk or concerns about toxic exposures, traditional mental health problems may appear as physical health problems (Rundell, 2003). In the face of fears of contamination, multiple unexplained physical symptoms (MUPS) may be the presentation of distress in the outpatient and emergency setting (Engel, 2004; Engel *et al.*, 2003). Health education and risk communication can minimize the numbers seeking healthcare and strengthen the public health response in both the medical and mental health arena (Tucker, 1997).

Bereavement is an inevitable component of disasters (Prigerson *et al.*, 1999; Raphael & Minkov, 1999; Raphael & Wooding, 2004; Raphael *et al.*, 2004; Shear *et al.*, 2005). Both individuals and communities must grieve the loss of loved ones and the hoped-for future. Bereavement begins early, continues for months, and then becomes less of a community focus, often before the individuals themselves are recovered. Bereavement is complicated by ongoing identification of additional remains, the complex interaction of the financial remuneration for victims, and, in the eyes of many victims, the circuitous and puzzling track frequently taken by the criminal justice system.

Post-traumatic responses (not only illness) such as hypervigilance and difficulty sleeping are prominent early on and show rapid recovery for most. For some people symptoms of distress may persist for months. Individuals exposed to terrorism and

other disasters have been found to increase their use of alcohol, tobacco, and other drugs, especially those with pre-existing alcohol abuse or other psychiatric difficulties (Galea *et al.*, 2002; North *et al.*, 1999; Pfefferbaum & Doughty, 2001; Ursano & Norwood, 2003; Vlahov *et al.*, 2002). We do not know the course of these behavioral changes. In Manhattan, 1–2 months after September 11, residents south of 110th Street reported increased substance use (alcohol, cigarettes or marijuana), that remained the same 6 months later: 24.6% reported increased alcohol use; 9.7% showed increased cigarette smoking; and 3.2% increased use of marijuana (Vlahov *et al.*, 2002).

Increased cohesion of communities is also common early after a disaster. The period of cohesion is the time in which communities mobilize and natural support groups contribute to the recovery of the community. During this phase, the media serves as a vector for both knowledge and potentially for distress in how it transmits pictures of injury and fear or information and aid. Inevitably, after any major trauma, there are rumors circulated within the community about the circumstances leading up to the traumatic event and the government's 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).

Locating loved ones is the first and paramount concern after a disaster. The questions "Where is my loved one?", "Can I find them?", "Can I communicate with them?" comprise the first pre-occupation of both individuals and communities. Outpourings of sympathy for the injured, dead, and their friends and families are common and expected. Impromptu memorials of flowers, photographs, and memorabilia are frequently erected. Churches and synagogues play an important role in assisting communities to search for meaning from such tragedy, and in assisting in the grieving process.

Over time, anger often emerges in the community as disillusionment sets in. Typically, there is a focus on accountability, a search for someone who was responsible for a lack of preparation or an inadequate response. Mayors, police, and fire chiefs, and other community leaders are often targets of these strong feelings. A community becomes angry about why things were not done, why it happened, and why things couldn't have been done better. 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 ongoing hypervigilance and a sense of lost safety while trying to establish a new norm in their lives.

First responders following a disaster include the traditional firefighters, police, and military, but also healthcare providers. Because the medical community is a "first responder," particularly true in an epidemic or bioterrorist attack, a broad-based educational plan for healthcare providers and organizations is essential. Hospital response plans must incorporate mental health and behavioral interventions at all levels. Medical care for infected/injured people as well as for those people who fear they were infected must be based on proven psychological and behavioral principles (Joint Commission on Accreditation of Healthcare Organizations, 2003). One notable concern is healthcare worker compliance with recommended infection preparedness (e.g., pre-vaccination against smallpox), and the relationship of health-related fears and concerns with absenteeism and other activities at work (e.g., SARS, Avian influenza, anthrax).

The culture of a nation and of its communities influences both responses and possible interventions after a terrorist attack. The recent SARS epidemic is instructive in understanding some of the issues of importance to a bioterrorist attack. Responses to the SARS virus in Canada, Singapore, and China were quite different. In some nations it was possible to immediately mobilize everyone to accept quarantine or shelter in place or to use

masks. However, obtaining cooperation will vary in different cultures where control is experienced differently and in nations with different expectations of equitable treatment.

There are many milestones of a disaster that affect the community and may offer opportunities for recovery. There are the normal rituals associated with burying the dead. And later, energy is poured into creating memorials for those who died or performed heroic acts. Memorialization carries the potential to cause harm as well as to do good. There can be heated disagreement about what a monument should look like, and where it should be placed. If a monument 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. Anniversaries of an event (1 week, 1 month, 1 year) stimulate renewed grief and offer an opportunity to acknowledge community recovery and resilience.

Public health planning

Responding to the psychological consequences of terrorism

Public health planning for the psychological consequences of disasters must address the range of psychological and behavioral responses. Psychological function and psychiatric disease as well as the distress of individuals and communities are dependent upon the rapid, effective, and sustained mobilization of healthcare and community resources (Ursano & Norwood, 2003). Knowledge of a community's resilience and vulnerability before a disaster or terrorist event, as well as understanding the psychological responses to such an event enable leaders and medical experts to distribute resources, talk to the public, and thus promote healthy behaviors, sustaining the social fabric of the community and facilitating recovery (Joint Commission on Accreditation of Healthcare Organizations, 2003; Ursano *et al.*, 2001, 2002).

Preventive medicine, a familiar organizing structure for conceptualizing infectious outbreaks, can organize models and interventions for behavioral and psychological responses to disasters (Institute of Medicine, 2003; Pfefferbaum & Pfefferbaum, 1998). From the preventive medicine perspective, one identifies the pathogen, its source and vectors of propagation, and those exposed. For the psychiatric consequences of disasters, the stressful psychological, physiological, and social events of the disaster are the pathogens. Terrorist attacks differ from other disasters in the prominence of terror as another agent of disease and disruption.

Prevention can be primary (preparation before the event, sometimes thought of as "inoculation"), secondary (early identification and treatment to limit disability), or tertiary (rehabilitation to prevent chronic social disability) (Ursano *et al.*, 1996). Interventions may be universal (for all individuals regardless of exposure) or selective (meant for particular at-risk populations. Primary (pre-event), secondary (event) and tertiary (postevent) interventions can decrease the risk of maladaptive behaviors, distress, mental disorder, and disrupted functioning (Sorenson, 2002). Importantly, prevent interventions to decrease exposure to the traumatic event (e.g., evacuation planning, practice drills) or its severity (e.g., seat belts) are an important and often overlooked component of mental health disaster planning (Aguirre *et al.*, 1998; Institute of Medicine, 2003; Ursano, 2002). Identifying the groups of people that are most highly exposed to these stressors is the critical second step in determining the community consequences of a disaster or terrorist attack. Public health strategies to prevent and mitigate the effects of disaster include interventions that can occur before, during, and after a disaster event. (see Figure 15.3). Life-protecting preparedness behaviors, disaster behaviors, and recovery behaviors of individuals and communities are fostered. Such behaviors that increase morbidity or mortality require planning, training, and system interventions to minimize their likelihood.

	Agent: Terror/Injury	Vector: Terrorist	Population: Person
Pre	<ul style="list-style-type: none"> • Modify building design • Educate public to decrease terror 	<ul style="list-style-type: none"> • Screening of employees 	Preparedness behaviors: <ul style="list-style-type: none"> • Risk assessment • Information/plan
During	<ul style="list-style-type: none"> • Sprinkler system 	<ul style="list-style-type: none"> • Training police • Early detection of intrusion 	Disaster behaviors: <ul style="list-style-type: none"> • Active coping • Evacuation
Post	<ul style="list-style-type: none"> • Emergency response system 	<ul style="list-style-type: none"> • Justice system 	Response/recovery behaviors: <ul style="list-style-type: none"> • Psychotherapy • Medication

Figure 15.3 Intervention matrix. Interventions to prevent, mitigate and manage psychological and behavioral consequences of a workplace terrorist explosion

Fostering community and workplace resilience

Prevention of disease is not the only goal of preventive interventions. Increasing resilience and positive outcomes are an important but often forgotten goal of prevention strategies. Thus community resilience is a primary goal of preparation for disaster. Resilience in this case means both decreased adverse responses and more rapid recovery. Community leadership, community resources and functions, and the healthcare system in particular are central to this response. For example, town meetings prior to critical events can foster community efficacy and enable communities to develop neighborhood watch or neighborhood assistance programs, and plan for who will watch the children on the block if mom or dad is not home. If a child needs to be picked up from school, this becomes both a family and a school system responsibility. Around such efforts community cohesion can develop, as can community efficacy (Sampson, 2003; Sampson *et al.*, 1997). Fear may then have a channel in which to flow, constructive action, rather than increase community chaos. There are many decisions communities can make in neighborhoods which are usually defined by schools, churches, public services such as police or fire departments or even grocery/food marts.

The community and workplace serve as physical and emotional support systems. [For children

the school system is a major part of this support.] The larger the scale of a disaster, the greater the potential disruption of the community and workplace. Planning for resource distributions is important to preparing for the mental health consequences. Although the airplane crash survivor may experience and witness gruesome sights, for the tornado victim and the natural disaster victim, the recovery environment is also markedly different: home and work site may have been destroyed, and relatives, friends, and coworkers may be dead, injured, or displaced.

Following terrorism, there is the additional burden of continuing altered threat perception and safety experiences for the entire community. The impact of a terrorist event on psychiatric and behavioral morbidity is mediated in part by the effects on individual and community safety and threat perception (Grieger *et al.*, 2003a, 2003b). Before, during, and after a terrorist attack community leaders can foster community resilience through interventions that may directly aid recovery as well as promote hope for the future and the expectation that “we will prevail” (see Table 15.1).

Early intervention

Much work is needed for early mental health and behavioral intervention for disaster-exposed individuals and populations (see Ursano & Blumenfeld, 2006). Interventions to sustain the mental health

Table 15.1 Public health approaches to fostering community and workplace resilience

Early intervention
Planning for economic behaviors
Leadership
Mental health surveillance and community preparedness
Workplace preparedness

and performance of community first responders are a pressing need. Evidence-based selective and universal interventions to sustain population and group wellness and operational function are needed. These should build resilience, provide individual care, and foster recovery for communities and individuals. Although there will most likely never be randomized controlled trials of early mental health disaster interventions, specific interventions can be developed using proven mechanisms of change and recovery demonstrated in studies of risk factors, protective factors, and individual interventions.

The community mental health infrastructure is a critical part of a nation's health protection strategy and key to the rapid early intervention. Disaster communities require: (1) ongoing assessment and monitoring of mental health and behavioral needs of disaster communities; and (2) a range of population and individual interventions to foster useful and sustaining actions of the citizenry, reduce social and emotional deterioration, and support key personnel in critical infrastructure.

Psychological First Aid (PFA) (see Chapter 7) is the evolving first-line intervention for the large majority of individuals following disaster. However, PFA requires evaluation. People unlikely to benefit from PFA will require additional clinical assessment and appropriate intervention including pharmacological and psychological treatments.

Culturally informed interventions are a part of recognizing the diversity of every community. Emergent mental healthcare needs, not previously evident, also occur after disaster, such as those with previously untreated or under-treated illness

seeking care after disaster. Responding to this care-needing population is part of the disaster response. Since most mental health problems do not present to specialist care, primary care – the delivery of healthcare through routine primary care providers – is a fundamental component of early intervention for the mental and behavioral healthcare needs after disaster.

Planning for economic behaviors

Certain economic behaviors and decisions are affected directly by a disaster, and by the psychological and behavioral responses to the disaster. For example, after a terrorist attack, decisions and behaviors related to travel, home purchase, food consumption, and medical care visits are altered by changes in availability, but also by changes in perceived safety, optimism about the future, and belief in exposure to toxic agents. Similarly, work productivity and attendance are influenced by whether transportation routes have been destroyed, but also by pre- and post-disaster distress and nonadherence and noncompliance with preparedness and public health interventions such as vaccination, premedication, postmedication, or evacuation planning (e.g., childcare planning). For example, is there a dip in consumer confidence after a bombing or a hurricane? If so, how large and what is its duration? Did the decrease get worse as the crisis continued? Similarly the postdisaster period can bring large inflows of money to areas for construction, creating jobs, economic growth, and changed opportunities – perhaps not for the populations that were victims, but for those who were less affected. Did economic revival bring an economic boom or bust? Was it local, regional or national? Was it in the upper or middle class people or among people of all economic backgrounds?

The fact that warnings of disaster as well as threats and hoaxes of terrorism carry with them economic costs and consequences perhaps best illustrates the importance of psychological and behavioral effects on economic decisions and behaviors and their associated economic costs

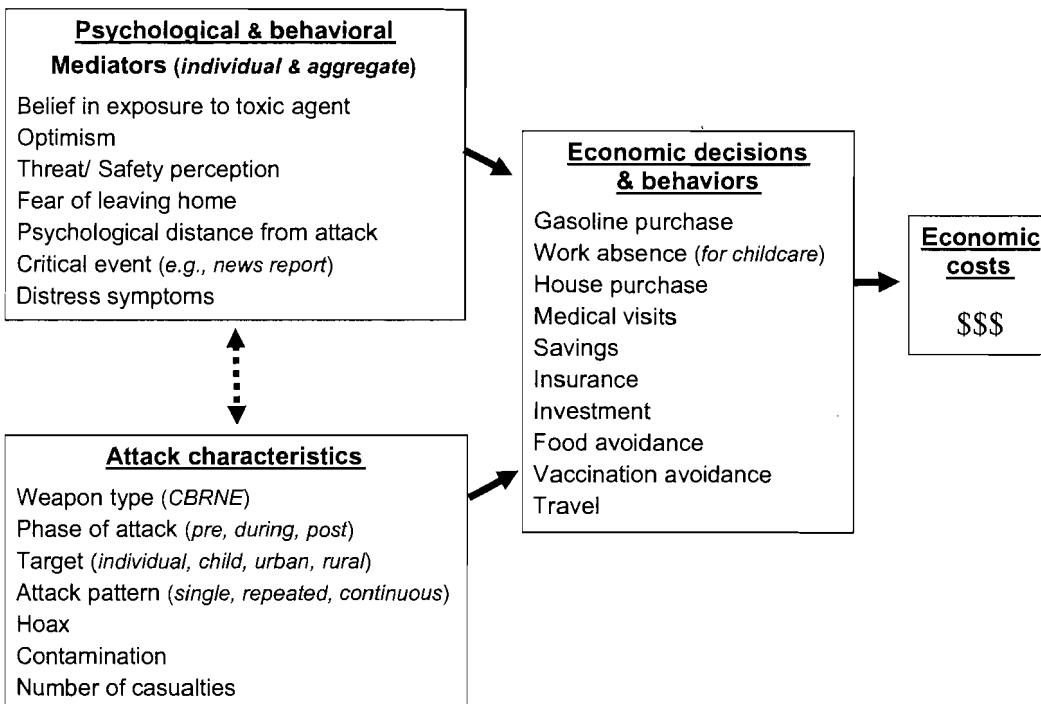


Figure 15.4 Model of economic decisions and behaviors

(see Figure 15.4). The spread of fear or hope via the media and social networks also affects economic decisions and behaviors. The impact of these economic decisions and behaviors on the local or national economy ranges from altered food consumption, savings, insurance, and investment, to 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. Previous disaster and terrorist attack scenarios used in training and tabletop exercises have often failed to consider the effects of psychological and behavioral (individual and aggregate) variables on economic behaviors. The elaboration of the resulting economic cost and consequence models and their derivative response decisions have been inadequate and require new models.

Leadership

A major part of the skill of a leader is his or her sensitivity to the community and the ability to

speak the right phrase at the right time to enable the community to speak as well. "Grief leadership" – how to lead a community through loss, mourning, and recovery—is of particular concern. Knowing when to change from rescue of survivors to body recovery is often the first and very delicate step in moving a community to recovery. A leader who says out loud that, "we need help." may allow others to say, "I need help." A leader who scorns the need for care can prohibit others in the community from being able to say they need care.

The stigma associated with psychiatric illness can be decreased by community leaders' acknowledgment of care needs and addressing of barriers to care. Acknowledging that all psychiatric illnesses (i.e., all mental disorders) are not "cancer," that treatment is available, and recovery is expected can be a step in this process. This includes public education by leaders that individuals can be expected to recover from "event-related disorders" (i.e., disorders related to life events) such as acute stress disorder and acute post-traumatic stress disorder. These may be the mental disease equivalent of the sore throat: some may become pneumonia, but

most people will recover through their normal healing processes.

Mental health surveillance and community preparedness

Mental health surveillance and adaptation monitoring (Flynn, 2003) have not yet been included in general public health planning. In the United States, Hurricane Katrina has had one of the few postdisaster systematic mental health surveillance programs (Kessler, 2006). Knowledge of an individual's and community's resilience and vulnerability before a disaster or terrorist event as well as understanding in real time the psychological responses to such an event can enable leaders and medical experts to talk to the public, promote healthy behaviors, sustain the social fabric of the community, and facilitate recovery and resource distribution. The adaptive capacities of individuals and groups within a community are variable, and should be understood before a crisis, as well as after, through ongoing mental health surveillance in order to target needs effectively.

Safety is an important and not well studied construct that appears to be related to, but not the same as, risk perception. Community and individual experiences of safety influence behaviors, hope, and family distress. Safety relates to feeling vulnerable, and to feeling protected. Optimism of a community is also an important determinate of emotional and cognitive responses. Optimism bias predicts that people believe they are less at risk for a number of hazards than they are. Optimism may be linked to feelings of controllability through which individuals believe they are safer than they are (e.g., the safety of driving is often rated higher than that of flying although that is not always true). Distance from an event, and the more random an event, the greater the sense of vulnerability and perhaps lower safety. The risk perception of a community is influenced by numerous cognitive and emotional factors. Cognitive (probability-based) and emotional-based risk contribute separately to anticipated changes in behavior (e.g., whether

you will travel) (see Fischhoff *et al.*, 2005). Anger (self-reported or as a result of a manipulation) tends to be associated with decreased risk perception (increased optimism), and fear with increased risk perception (emotion-based judgement) (Lerner *et al.*, 2003). More recent exposure to a threat increases risk perception (availability-based judgement). In contrast, hindsight bias is a well-known effect in which one tends to see past risk as colored by most recent beliefs (Fischhoff *et al.*, 2005).

An enhanced public health infrastructure for mental health requires the means to quickly detect, track, and monitor disaster- and terrorist-caused psychological and behavioral casualties. This entails enhancing the medical incident management infrastructure through standardizing and expanding the manner in which certain illnesses and symptoms are described, recorded, and tracked. In addition, the system requires improved ability to share this information quickly and efficiently, locally and across a nation.

As well as traditional mental health disorders and substance use and abuse, health risk behaviors and distress require community surveillance post-disaster. Additionally important are assessments of: (1) community risk perception; (2) safety perception; (3) changes in behavior, e.g., avoiding air transportation or subways, and purchase behaviors, such as deciding to buy or postpone travel or a major purchase and; (4) preparedness behaviors, e.g., family preparedness plans, evacuation plans (see Table 15.2).

Workplace preparedness

The workplace is a relatively newly recognized environment in which to address public health planning for the psychological consequences of disaster and terrorism (Institute of Medicine, 2003). Because most acts of terrorism in the United States have occurred where and when people work, it is essential that interventions for preparedness, response, and recovery occur in occupational settings. Sustaining the workforce, its

Table 15.2 Postdisaster community mental health surveillance

Distress
Psychiatric illness/symptoms
Health risk behaviors
Risk perception
Safety perception
Changes in behavior
Preparedness behaviors

organizational health, and the well-being of workers sustains communities and important national resources and services. The prevention of environmental effects on health is a traditional role of public health in the workplace. Following terrorism, the direct effects of threats to life as well as the propagation of terror, such as an agent infecting the workplace, require new and important attention to be paid to the mental health needs of occupational populations.

The behavioral and psychological health and well-being of occupational groups are critical to sustaining workplace health, capabilities, and infrastructure. Disasters including epidemics can result in altered workplace performance, absenteeism, presenteeism and disability. Interventions to prevent, mitigate, and foster recovery from mass trauma in the workplace are needed. Preparedness behaviors, disaster behaviors, and response/recovery behaviors are important targets for a healthy workplace. Workplace interventions include those to: (1) alleviate or mitigate mental health outcomes; (2) provide specific effective treatments in the workplace; and (3) carry out workplace mental health surveillance.

Workplace providers—employee assistance providers (EAPs), corporate medical directors, occupational health and wellness professionals, and human resource personnel—play an important role in disaster preparedness and response because their work includes prevention, health promotion, and treatment (or referral to treatment). In addition, they establish policies for personnel management.

Security directors are also an important part of the behavioral team as they affect many behaviors that decrease exposure to physically and psychologically traumatic events. Worksite health promotion is an integral part of internal EAPs, wellness, occupational health, and corporate medical programs, as are external behavioral care organizations, who view their role as providing health education as well as mental health services for client companies. Workplace health and mental health programs are ideal venues in which to incorporate education around workplace disaster preparedness for managers and supervisors, employees, and employees' families (Ursano, 2005).

Workplace health programs can educate the workforce about disaster-related mental health and behavioral disorders, as well as how to distinguish between normal responses and those that require further evaluation and treatment. This pre-event education can help individuals to self-identify conditions postdisaster requiring further evaluation and treatment, using confidential, interactive screening resources, and/or the in-person assessment and referral that many employers offer.

What we need to know to respond and recover

In order to develop public health approaches to disaster mental health needs, a number of areas must be addressed (see Table 15.3). Early intervention for populations and individuals requires research, planning, and evaluation. A well-supported community mental health system is required as part of the public health infrastructure. Primary medical care sites are important to the delivery of disaster mental healthcare. This requires a systematic approach to education of providers, patient education and assessment, and the availability of referral for specialty care. Adherence/compliance to medical recommendations (e.g., medication, quarantine, shelter in place) is not well understood or taught to healthcare providers. Yet management of these behaviors is as important as

Table 15.3 Public health needs for disaster mental health

-
- Integration of mental health care into primary care
 - Individual – and population-level early interventions
 - Interventions to foster adherence to medical recommendations
 - Mental health surveillance integrated into public health surveillance
 - Inclusion of mental health in training exercises
 - Knowledge of community, family, and cultural responses to disaster
 - Interventions to foster workplace preparedness and recovery
-

prescribing or delivering the correct interventions. Mental health and behavioral surveillance should be an integral part of ongoing public health surveillance to facilitate identifying resource needs postevent. This requires substantial rethinking of past paradigms to initiate and establish the utility of both ongoing and potentially real-time surveillance of mental health and behavioral and distress-related symptoms and behaviors.

Models of emergency screening to enable triage of those needing rapid decontamination or hospitalization from those with anxiety and somatic symptoms of distress are needed for our healthcare systems, which may need to respond to real or perceived toxic exposure events. Inclusion of mental and behavioral experts in the training and exercises can facilitate this process. Understanding and modeling economic behaviors postdisaster can facilitate planning for both public education and economic interventions to sustain the function of communities and nations.

Because of the central importance of public education, increased knowledge of public education's limits and possibilities to prepare, educate, motivate, and foster resilient responses is needed. Understanding the behaviors, emotions, and cognitions that affect family and community function (e.g., anticipatory fear, threat perception, risk, and safety perception, threat generalization, and social spread of fear) across the neurobiological and

interpersonal perspectives will enable effective interventions. To limit morbidity and mortality, public health planners will need increased knowledge of attachment behaviors in high stress environments that may increase health risk, and at other times decrease health risk (e.g., evacuation effects, warning effects, social supports, separation fears).

Developing better ways to prepare the workplace–business and industrial communities—to embrace the challenges of human continuity as part of their efforts to assure business continuity is a major challenge. An integrated approach that includes security, human resources, occupational health, and leadership may be most effective. Assuring continuity of human capital is as important as assuring the continuity of buildings and information systems, and requires consideration of integrated leadership, medical, employee, and human resource planning.

Overall, the public health challenges of disaster mental health span health services planning, intervention, treatment, training, education, and research into the neurobiological, psychological and sociocultural aspects of disaster behaviors, preparedness behaviors, and response behaviors of individuals and groups. The all-hazards approach can integrate these efforts and find common ground.

REFERENCES

- Aguirre, B.E., Wenger, D. & Vigo, G. (1998). A test of the emergent norm theory of collective behavior. *Sociological Forum*, **13**, 301–320.
- Bonanno, G.A. (2004). Loss, trauma, and human resilience: have we underestimated the human capacity to thrive after extremely aversive events? *The American Psychologist*, **59**, 20–28.
- Bonanno, G.A., Galea, S., Bucciarelli, A. & Vlahov, D. (2006). Psychological resilience after disaster: New York city in the aftermath of the September 11th terrorist attack. *Psychological Science: A Journal of the American Psychological Society*, **17**, 181–186.

- Bryant, R. (2006). Early intervention and treatment of acute stress disorder. Presented at conference *Early psychological intervention following mass trauma: the present and future directions*. Valhalla, New York: New York Medical College, School of Public Health.
- Card, J.J. (1983). *Lives after Viet Nam*. Lexington, Mass.: Lexington Books.
- Davidson, J.R.T. (2006). After the tsunami: mental health challenges to the community for today and tomorrow. *Journal of Clinical Psychiatry*, **67**, 3–8.
- Elliott, J.R. & Pais, J. (2006). Race, class, and Hurricane Katrina: social differences in human responses to disaster. *Social Science Research*, **35**, 295–321.
- Engel, C.C. (2004). Somatization and multiple idiopathic physical symptoms: relationship to traumatic events and posttraumatic stress disorder. In *Trauma and Health: Physical Health Consequences of Exposure to Extreme Stress*, eds. P.P. Schnurr & B.L. Green, pp.191–215. Washington, D.C.: American Psychological Association.
- Engel, C.C., Jaffer, A., Adkins, J. *et al.* (2003). Population-based health care: a model for restoring community health and productivity following terrorist attack. In *Terrorism and Disaster: Individual and Community Mental Health Interventions*, eds. R.J. Ursano, C.S. Fullerton & A.E. Norwood, pp.287–307. Cambridge: Cambridge University Press.
- Fischhoff, B., Gonzalez, R.M., Lerner, J.S. & Small, D.A. (2005). Evolving judgments of terror risks: foresight, hindsight, and emotion. *Journal of Experimental Psychology Applied*, **11**, 124–139.
- Flynn, B.W. (2003). Promoting psychosocial resilience in the face of terrorism. Briefing for members of the United States House of Representatives. Washington, D.C.
- Foa, E.B., Keane, T.M. & Friedman, M.J., eds. (2000). *Effective Treatments for PTSD: Practice Guidelines from the International Society for Traumatic Stress Studies*. New York: Guilford Press.
- Galea, S., Ahern, J., Resnick, H. *et al.* (2002). Psychological sequelae of the September 11 terrorist attacks in New York City. *New England Journal of Medicine*, **346**, 982–987.
- Gershon, R., Hogan, E., Qureshi, K.A. & Doll, L. (2004). Preliminary results from the world trade center evacuation study—New York City. *MMWR Morbidity and Mortality Weekly Report*, **53**, 815–817.
- Grieger, T.A., Fullerton, C.S. & Ursano, R.J. (2003a). Acute stress disorder, alcohol use, and perception of safety among hospital staff after sniper attacks. *Psychiatric Services*, **54**, 1383–1387.
- Grieger, T.A., Fullerton, C.S. & Ursano, R.J. (2003b). Posttraumatic stress disorder, alcohol use, and perceived safety after the terrorist attack on the pentagon. *Psychiatric Services*, **54**, 1380–1382.
- Institute of Medicine (IOM). (2003). *Preparing for the Psychological Consequences of Terrorism: A Public Health Strategy*. National Academies of Science, Washington D.C.: National Academies Press.
- Joint Commission on Accreditation of Healthcare Organizations (JCAHO). (2003). Health care at the crossroads. Strategies for creating and sustaining community-wide emergency preparedness systems. Washington, D.C.: Joint Commission on Accreditation of Healthcare Organizations.
- Kessler, R. (2006). Overview of baseline survey results: Hurricane Katrina community advisory group. Available at: www.hurricanekatrina.med.harvard.edu, accessed May 13, 2007.
- Lerner, J.S., Gonzalez, R.M., Small, D.A. & Fischhoff, B. (2003). Effects of fear and anger on perceived risks of terrorism: a national field experiment. *Psychological Science*, **14**, 144–150.
- Litz, B.T., Gray, M.J., Bryant, R.A. & Adler, A.B. (2002). Early intervention for trauma:current status and future directions. *Clinical Psychology: Science and Practice*, **9**, 112–134.
- National Center for Disaster Preparedness (NCDP). (2003). *How Americans Feel about Terrorism and Security: Two Years after 9/11*. New York: Columbia University Mailman School of Public Health in collaboration with The Children's Health Fund.
- National Institute of Mental Health. (2002). Mental health and mass violence: evidence-based early psychological intervention for victims/survivors of mass violence. A workshop to reach consensus on best practices. Available at: www.nimh.nih.gov/publicat/massviolence.pdf, accessed May 13, 2007. NIH Publication No. 02-5138, Washington, D.C.: US Government Printing Office.
- Norris, F.H., Friedman, M.J. & Watson, P.J. (2002a). 60,000 disaster victims speak. Part II: Summary and implications of the disaster mental health research. *Psychiatry*, **65**, 240–260.
- Norris, F.H., Friedman, M.J., Watson, P.J. *et al.* (2002b). 60,000 disaster victims speak. Part I: An empirical review of the empirical literature: 1981–2001. *Psychiatry*, **65**, 207–239.

- North, C.S., Nixon, S.J., Shariat, S. *et al.* (1999). Psychiatric disorders among survivors of the Oklahoma City bombing. *Journal of the American Medical Association*, **282**, 755–762.
- Pfefferbaum, B. & Doughty, D.E. (2001). Increased alcohol use in a treatment sample of Oklahoma City bombing victims. *Psychiatry*, **64**, 296–303.
- Pfefferbaum, B. & Pfefferbaum, R.L. (1998). Contagion in stress: an infectious disease model for posttraumatic stress in children. *Child and Adolescent Psychiatric Clinics of North America*, **7**, 183–194.
- Prieger, H.G., Shear, M.K., Jacobs, S.C. *et al.* (1999). Consensus criteria for traumatic grief: a preliminary empirical test. *British Journal of Psychiatry*, **174**, 67–73.
- Raphael, B. (2006). Systems, science and populations: effective early intervention following mass trauma: the roles of government, clinicians and communities. Presented at conference Early psychological intervention following mass trauma: the present and future directions. Valhalla, NY: New York Medical College, School of Public Health.
- Raphael, B. & Minkov, C. (1999). Abnormal grief. *Current Opinion in Psychiatry*, **12**, 99–102.
- Raphael, B. & Wooding, S. (2004). Early mental health interventions for traumatic loss in adults. In *Early Intervention for Trauma and Traumatic Loss*, ed. B.T. Litz, pp.147–178. New York: Guilford Press.
- Raphael, B., Martinek, N. & Wooding, S. (2004). Assessing traumatic bereavement. In *Assessing Psychological Trauma and PTSD*, 2nd edn., eds. J.P. Wilson & T.M. Keane, pp.492–510. New York: Guilford Press.
- Rundell, J.R. (2003). A consultation-liaison psychiatry approach to disaster/terrorism victim assessment and management. In *Terrorism and Disaster: Individual and Community Mental Health Interventions*, eds. R.J. Ursano, C.F. Fullerton & A.E. Norwood, pp.107–120. Cambridge: Cambridge University Press.
- Sampson, R.J. (2003). The neighborhood context of well-being. *Perspectives in Biology and Medicine*, **46** (3 Suppl), S53–S64.
- Sampson, R.J., Raudenbush, S.W. & Earls, F. (1997). Neighborhoods and violent crime: a multilevel study of collective efficacy. *Science*, **277**, 918–924.
- Schwarz, E.D. & Kowalski, J.M. (1991). Malignant memories: PTSD in children and adults after a school shooting. *Journal of the American Academy of Child and Adolescent Psychiatry*, **30**, 936–944.
- Shear, K., Frank, E., Houck, P.R. & Reynolds, C.F. (2005). Treatment of complicated grief. A randomized controlled trial. *Journal of the American Medical Association*, **293**, 2601–2608.
- Sorenson, S.B. (2002). Preventing traumatic stress: public health approaches. *Journal of Traumatic Stress*, **15**, 3–7.
- Tucker, J.B. (1997). National health and medical services response to incidents of chemical and biological terrorism. *Journal of the American Medical Association*, **278**, 362–368.
- Ursano, R.J. (1981). The Vietnam era prisoner of war: precaptivity personality and development of psychiatric illness. *American Journal of Psychiatry*, **138**, 315–318.
- Ursano, R.J. (2002). Post-traumatic stress disorder. *New England Journal of Medicine*, **34**, 130–131.
- Ursano, R.J. (2005). Workplace preparedness for terrorism: report of findings to Alfred P. Sloan Foundation. Available at: www.usuhs.mil/psy/WorkplacePreparednessTerrorism.pdf, accessed May 13, 2007.
- Ursano, R.J. & Blumenfeld, M. (2006). Concluding remarks. Presented at conference *Early psychological intervention following mass trauma: present and future directions*. Valhalla, NY: New York Medical College, School of Public Health.
- Ursano, R.J. & Norwood, A.E., eds. (2003). *Trauma and Disaster: Responses and Management*. Washington, D.C.: American Psychiatric Publishing.
- Ursano, R.J., Grieger T.A. & McCarroll, J.E. (1996). Prevention of posttraumatic stress: consultation, training, and early treatment. In *Traumatic Stress: The Effects of Overwhelming Experience on Mind, Body and Society*, eds. B.A. vander Kolk, A.C. McFarlane & L. Weisaeth, pp.441–462. New York: Guilford Press.
- Ursano, R.J., Fullerton, C.S. & Norwood, A.E. (2001). Planning for terrorism: behavioral and mental health responses to weapons of mass destruction and mass disruption (DTIC: A392688: 189 pages). Bethesda, Md.: Uniformed Services University of the Health Sciences.
- Ursano, R.J., Fullerton, C.S. & Norwood, A.E. (2002). Responding to terrorism: individuals and community needs (DTIC: A406540: 186 pages). Bethesda, Md.: Uniformed Services University of the Health Sciences.
- Ursano, R.J., Norwood, A.E. & Fullerton, C.S. (2004). Behavioral and mental health responses to bioterrorism: needs for the public's health. In *Bioterrorism: Psychological and Public Health Interventions*, eds. R.J. Ursano,

- A.E. Norwood & C.S. Fullerton, pp.332-348. Cambridge: Cambridge University Press.
- Vlahov, D., Galea, S., Resnick, H. *et al.* (2002). Increased use of cigarettes, alcohol, and marijuana among Manhattan, New York, residents after the September 11th terrorist attacks. *American Journal of Epidemiology*, **155**, 988-996.
- Weisler, R.H., Barbee, J.G. & Townsend, M.H. (2006). Mental health and recovery in the Gulf Coast after Hurricanes Katrina and Rita. *Journal of the American Medical Association*, **296**, 585-588.
- Wessely, S. (2005). Victimhood and resilience. *New England Journal of Medicine*, **353**, 548-550.