

# **Textbook of Disaster Psychiatry**

Edited by

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## Children and disasters: public mental health approaches

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Robert S. Pynoos, Alan M. Steinberg, & Melissa J. Brymer

### Introduction

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It has been estimated that, each year between 1990 and 1999, an average of 188 million people worldwide were affected by disaster, six times more than the average of 31 million people affected annually by conflict (International Strategy for Disaster Reduction, 2005). These figures for disasters do not include estimates for smaller disasters that typically are under-reported. Of particular concern around the world is that weather-related disasters have increased over the past decade, as evidenced by the devastating hurricanes across the Gulf Coast in the United States. Along with natural disasters, the possibility of Weapons of Mass Destruction (WMD) terrorism places significant numbers of children and families at enormous risk for psychosocial morbidity, and places extreme demands on shelters, schools, primary care settings, health and mental health care facilities, as well as federal, state and local agencies and organizations that play a role in coordinating or participating in disaster response. Children have unique risks from WMDs due to various physiological and psychological factors, including susceptibility to radiation, propensity to become hypothermic from mass decontamination, inadequate availability of pediatric emergency care and equipment, contraindications for pediatric use of standard treatments, and possible greater risk from the biological agents themselves (Pynoos *et al.*, 2005a). Pandemic flu represents another type of

catastrophic scenario, with special mental health aspects for children and families, including issues of potential quarantine for long periods.

To date, there are no reliable large-scale epidemiological data on the morbidity or mortality of children exposed to terrorism and disaster. However, individual studies of children and adolescents affected by acts of terrorism and specific disasters have begun to document a range of adverse mental health consequences. After massive trauma, a large segment of the child and adolescent population may experience post-traumatic stress reactions and traumatic grief. As evidenced by exceedingly high rates of chronic psychiatric morbidity among children after the devastating 1988 earthquake in Armenia (Goenjian *et al.*, 1995; Pynoos *et al.*, 1993), the existence of thousands of traumatized children in different stages of recovery may place special burdens on society. These may include widespread disturbances in moral development and conscience functioning (Goenjian *et al.*, 1999), impairment in school, peer, family and community functioning, and diminished resilience to future stress. Changes in outlook on the future may not only affect the individual child, but on a massive scale permeate and transform cultural expectations, altering the social ecology of the next generation.

Disaster is one of the few life stresses for which early access to affected children and their families in the United States is authorized as a public health measure. Section 413 of the US Disaster Relief Act

mandates such immediate assistance to states and local agencies within the disaster area "to help preclude possible damaging physical or psychological effects" (US Government, 1976). Subsequent to the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, federal guidance directs all states to address the unique needs of children and families in recognition that children are more susceptible to the untoward consequences of disasters because of a host of special circumstances, including biological and psychological vulnerability. As a result, there has been a significant modernization of public child and family mental health approaches to terrorism and disaster preparedness, response and recovery. This chapter will review some of these advances, placing particular emphasis on the importance of maintaining a child and adolescent developmental perspective.

### Key concepts

Recent theoretical and empirical work has contributed to a clarification of several key concepts that are central to discussion of the impact of disasters on children, and issues related to public mental health approaches to preparedness, response and recovery (see Table 3.1). The following deserve special consideration.

**Danger apparatus** refers to the systems of the brain and associated cognitions, emotions and behaviors that underlie evolving appraisal of and response to danger situations. Trauma is a subcategory in which efforts to prevent or protectively intervene to preclude the consequences of danger have failed. These systems undergo substantial maturation during the course of child and adolescent development, influenced by genetics, neurobiology, and experience (Pynoos *et al.*, 1997). Understanding the appraisal of and intervention considerations for children at different points of development, and under different environmental and cultural ecologies informs all aspects of disaster child mental health.

**Table 3.1** Key concepts

**Danger apparatus** – system of biological and experiential maturation that underlies evolving appraisal and response to danger situations

**Degree of exposure** – level of severity of objective and subjective features of the disaster and loss experience

**Vulnerability/risk** – susceptibility to increased distress and impairment

**Resistance** – capacity to buffer the impact on distress and impairment

**Resilience** – capacity for early, effective adjustment, restoration and progression

**Adjustment** – appropriate efforts to cope with effects over time

**Exertion** – effort needed for adjustment

**Maladjustment** – inadequate or ineffective efforts to cope with effects over time

**Developmental compromise** – adverse developmental ramifications

**Degree of exposure** refers to the nature and severity of disaster-related experiences and losses, including life-threat to self and others, injury to self, injury and death of others, witnessing of mutilation or grotesque injury and death, and loss of family members, friends, property, and community. A major objective feature of disaster exposure for children is separation from parents, siblings and other caretakers during the disaster and its immediate aftermath.

Exposure factors may also include subjective features associated with the appraisal of danger, including the experience of extreme fear, horror, and helplessness. In addition to these categories, hearing unanswered cries of distress from victims trapped in rubble can create unalleviated empathic arousal in children (Goenjian, 1993). Young children can experience an intolerable sense of passivity in the face of disaster; older children may endure a painful sense of ineffectiveness, even cowardliness; and adolescents can experience disturbing existential dilemmas over protection for themselves versus others, as well as struggles over engagement in efforts at rescue. Another key

subjective experience for young children is often the disruption of an expectation of a protective shield, where children's belief in parental protection is shattered. Numerous studies among children after disasters have indicated that both objective and subjective features of exposure make independent contributions to the severity and persistence of postdisaster distress and impairment (Goenjian *et al.*, 2001). That is to say, the higher the level of exposure, the more severe and persistent the subsequent distress and impairment.

**Vulnerability/risk** refers to an increased susceptibility to distress and adverse psychological, behavioral, functional, biological, and developmental outcomes attendant to a given level of exposure. It is worth noting that these factors may include both positive and negative mental health attributes, as, for example, capacity for empathy may serve as a vulnerability factor for increased distress, whereas disturbances in attachment may do the opposite. Vulnerability factors can include both child intrinsic characteristics (e.g., gender, age, neurobiological maturation, for example of the startle reflex, anxiety sensitivity, prior attachment disturbances, prior history of trauma and loss, and coping repertoire, including prior disaster experiences), and child extrinsic circumstances, (e.g., postdisaster stresses and adversities, prior and current family disruption, disturbed parent/child communication, parental substance abuse, caregiver psychological distress, physiological arousal and compromised functioning, caregiver physical disability or illness, and pervasiveness of trauma and loss reminders in the post-disaster ecology) (Pynoos *et al.*, 1995, 1999).

**Resistance** refers to the capacity of children and their families to buffer detrimental effects typically associated with exposure to disaster, thereby maintaining relative equilibrium and preserved psychological, behavioral, functional, biological, and developmental progression. Factors contributing to resistance can include child intrinsic factors as well as features of the child's family, school, and community.

**Resilience** refers to the capacity to adapt to and recover from disaster-related distress and

developmental disruption in a timely and effective manner (Pynoos & Steinberg, 2006; Steinberg & Ritzmann, 1990). Children and adolescents vary in their ability to tolerate postdisaster symptoms and distress without interference in daily functioning and disturbance in the acquisition of developmental competencies. Many of the same features noted above that contribute to vulnerability and resistance may also play a role in resilience. Children who are excessively anxious or have pre-existing anxiety disorder provide an example of the interplay of vulnerability and potential reduced resilience. These children may subjectively experience more catastrophic thoughts during the disaster disproportionate to their level of exposure, thereby increasing the severity of their post-traumatic stress symptoms. In the aftermath, they may also respond to reminders with more catastrophic thinking, be less responsive to reassurance or to seeking appropriate clarifying information or, through excessive clinging, reduce appropriate social support over time, all of which may negatively affect their ability to recover. In addition to the concept of "bouncing back," resilience can also include notions of "moving forward" developmentally, including post-disaster increased empathic capacity, accelerated moral development, and engagement in pro-social activity (Goenjian *et al.*, 1999).

**Adjustment** refers to appropriate and effective ongoing efforts to contend with disaster-related experiences and postdisaster stresses and adversities. There is a growing body of literature on the use and effectiveness of various coping and problem-solving strategies among children exposed to disaster (Almqvist & Hwang, 1999; Compas *et al.*, 2001; Halcon *et al.*, 2004; Kline & Mone, 2003; Vernberg *et al.*, 1996).

**Exertion** refers to the energy expended (costs to the child and family) in what are often extensive efforts at ongoing postdisaster adjustment. These efforts can seriously interfere with the resolution of postdisaster distress, and impact many areas of child and family functioning and development (Goenjian *et al.*, 1995). The co-occurrence of post-traumatic stress and grief reactions can significantly

tax the emotional resources of both child and family. The course of exertion is often difficult to predict in the aftermath of a disaster because of the potential for ongoing danger, the challenge of unexpected reminders, and the changing ecology of postdisaster hardships and adversities.

**Maladjustment** refers to inadequate or ineffective adjustment over time, thereby initiating a cascade of changes that may result in a complex constellation of adverse psychological, behavioral, functional, biological, and developmental outcomes.

**Developmental compromise** refers to adverse developmental ramifications for children and families after exposure to disaster. Developmental progression can be compromised through different, yet often interdependent pathways. There can be direct loss of recently acquired development achievements, interference with the acquisition of developmental competencies, decreased developmental opportunities associated with failure to acquire age-related skills, and decreased initiative to take on developmental challenges. These key concepts can be summarized as follows:

The concept of "degree of exposure" is central to any discussion of resistance, vulnerability, resilience, and adjustment. Researchers and clinicians have typically drawn mistaken conclusions from data across exposure groups that show that a majority of children or adolescents are "resilient" or only temporarily distressed, experiencing an unproblematic course of recovery. In an early study of children exposed to a sniper attack at an elementary school, strong dose-of-exposure effects were found over time (Pynoos *et al.*, 1987). Children who were in the direct line of fire in the playground were significantly more likely to have severe and persistent post-traumatic reactions over the next year, whereas children who were trapped in classrooms, one step removed from the direct assault, showed nearly the same levels of distress initially, but recovered at a much faster rate. Although there was some variability in recovery among the most-exposed group, their reactions did not subside commensurately with those of children with lower levels of exposure (Nader *et al.*, 1990; Pynoos *et al.*,

1987). Thus, care must be taken not to overuse the concept of "resilience" without adequately controlling for dose of exposure.

For example, it has been reported that 25% of children after disaster will typically remain distressed over time (Vogel & Vernberg, 1993). However, the rate can be nearly 90%–95% among children buried by a mudslide following a hurricane (Goenjian *et al.*, 2001). Whereas the rate of post-disaster distress at 3 months for children within the epicenter of the 1994 Northridge earthquake was under 40%, among the few hundred children who had been trapped the rate was 85% (UCLA Report to Los Angeles Unified School District, unpublished data, 1995). A structural equation model using data from a large cohort of adolescents exposed to war in Bosnia and Herzegovina showed that among those who experienced direct threats to their lives, injuries and/or traumatic war-related deaths of immediate family members, there was an unmoderated pathway to levels of current distress and impairment (Layne *et al.*, 2001).

### Impact of disasters on children and adolescents

Studies of the biological, psychological, and behavioral impact of natural disasters on children and adolescents have been growing steadily since the early 1990s, with earthquakes and hurricanes being the most widely investigated disasters. More recently, there has been a growing body of scientific literature concerning the adverse effects of political violence and terrorism. Such research is imperative if we are to better understand the full range of consequences of catastrophic events on this vulnerable population, and put in place effective preparedness and response programs to foster resilience and promote recovery.

More recent studies have included the September 11 terrorist attacks (Fairbrother *et al.*, 2004; Hoven *et al.*, 2005; Stuber *et al.*, 2005), the Oklahoma City bombing (Pfefferbaum *et al.*, 1999), Cambodian refugees exposed to war traumas (Kinzie *et al.*, 1998; Mollica *et al.*, 1997; Sack *et al.*, 1995; Savin *et al.*, 1996),

Hurricane Andrew (Shaw *et al.*, 1995; Vernberg *et al.*, 1996), the Three Mile Island nuclear disaster (Hanford *et al.*, 1986), the earthquake in Armenia (Goenjian *et al.*, 1995, 1997; Pynoos *et al.*, 1993), the earthquake in Greece (Roussos *et al.*, 2005) the Northridge Earthquake (Asarnow *et al.*, 1999), Hurricane Mitch in Nicaragua (Goenjian *et al.*, 2001), and Iraqi SCUD missile attacks on Israeli civilians (Laor *et al.*, 1997, 2001). Although reported rates have varied widely, traumatized children across studies have been found to have high prevalence rates of mental health problems. Table 3.2 indicates the adverse psychological reactions that have been reported.

From a developmental perspective, it is important to recognize that differing profiles of response are age-related. Young children may exhibit extreme fear of being alone, and reactions of helplessness or passivity. They may be confused about what happened and the danger being over, as they overhear things from adults or older children, see things on television, or just imagine that it is happening again. They are most susceptible to experiencing a failure in a "protective shield," which may require a substantial period of psychological recovery, during which they may act insecure in their attachments, separation behaviors and beginning sense of self-efficacy. They may regress to earlier stages of development that represent greater security, including reverting to thumb-sucking. Physiological regressions may also occur and contribute to symptoms such as bedwetting. School-age children are susceptible to major interruptions in their emerging self-efficacious behavior in regard to safety and danger. They can assume excessive responsibility or a sense of cowardliness, and experience deep shame and guilt. Their traumatic play many incorporate many efforts at successful protection and intervention, even through assuming extraordinary human powers. This age group often reports the most somatic complaints, with traumatic reminders rekindling similar somatic experiences that occurred during the disaster experience. Adolescents are more fully aware of their capacity to address danger directly, and can experience both heroic and anti-

**Table 3.2** Adverse psychological reactions

- 
- Acute stress disorder (ASD)
  - Post-traumatic stress disorder (PTSD)
  - Depression
  - Anxiety
  - Separation anxiety disorder
  - Incident-specific new fears
  - Agoraphobia
  - Phobic disorder
  - Traumatic bereavement
  - Somatization
  - Hostility/irritability
  - Dissociative reactions
  - Sleep disturbances
  - Diminished perceived self-efficacy and self-esteem
  - Reduced self-care
  - Learning problems, diminished school interest
  - Distressing reactivity to trauma and loss reminders
  - Disturbances in moral development and conscience functioning
  - Traumatic expectations/maladaptive cognitions (including those concerning interpersonal relationships, future orientation, career ambitions, plans for family life, trust in government and the social contract)
- 

heroic feelings. They often feel self-conscious about their post-traumatic stress reactions, considering them to feel childlike, and respond to traumatic reminders with engagement in high-risk behaviors and substance abuse. Radical changes in attitudes about danger and the future can instigate substantial changes in an adolescent's and young adult's future plans, and traumatic loss experiences can initiate abrupt changes in interpersonal relationships with peers and family members. A change in perception of danger after disasters can shift the prevalence of separation anxiety into school-age and adolescent-age groups, where it is less expected (Goenjian *et al.*, 1995; Hoven *et al.*, 2005).

It is important to be careful about over-diagnosing phobia among school-age children, where the development of incident-specific new fears is common (Yule *et al.*, 1990). Of importance, sleep disturbance across all age groups has major consequences, as it can be associated with interference

with concentration, attention, learning, and school failure. It is important to differentiate traumatic grief from post-traumatic stress disorder (PTSD) (Brown & Goodman, 2005; Cohen & Mannarino, 2004; Pynoos, 1992). Traumatic grief includes continued preoccupation with the circumstances of the death. This preoccupation can interfere with, or delay, the course of grief reactions, the ability to positively reminisce, and adaptation to the loss.

Research is also beginning to examine factors within the post-disaster ecology that mediate or moderate children's recovery (see Table 3.3).

Frequency of exposure to trauma reminders can significantly influence recovery postdisaster reactions are evoked by trauma reminders that are often pervasive in the postdisaster ecology. After disaster, children continue to encounter places, people, sights, sounds, and smells, and experience feelings that remind them of what happened. Reminders bring on distressing mental images, thoughts, and emotional/physical reactions. Common examples include: direct references to the type of disaster (e.g., high winds or rain after a hurricane), signs of physical damage (including destroyed buildings or debris), signs of injury (seeing people with disabilities), signs of people in distress (e.g., sirens of ambulances), specific locations, time or day associated with the disaster experience, and ongoing, often unexpected, encounters with television or radio news about the disaster and its consequences or stories about future dangers. Three months after the Northridge earthquake, having increasing difficulty calming down following aftershocks among children, parents and teachers was significantly associated with high levels of post-traumatic stress reactions, independent of degree of exposure (UCLA Report to Los Angeles Unified School District, 1995). Studies in Bosnia and Herzegovina suggest that post-war family conflicts may themselves be significantly mediated by the frequency of occurrence of trauma reminders (Layne *et al.*, 2006).

Of special importance is the difficulty in contending with family members who may themselves serve as reminders of disaster-related experiences

**Table 3.3** Factors that mediate or moderate children's recovery

- 
- Frequency of exposure to trauma reminders
  - Frequency of exposure to loss reminders
  - Type and severity of secondary stresses and adversities
  - Impairment in caregiver functioning
  - Quality of family functioning
  - Overcrowded or adverse living conditions
  - School and community milieu
  - Quality of peer relationships
  - Physical injury, disability, and rehabilitation
  - Inter-current trauma and loss
- 

and losses. This dynamic can perpetuate a sense of estrangement and of being misunderstood, and impede family communication. Loss reminders need to be differentiated from trauma reminders, and refer to times a child or adolescent may be reminded of the absence of a family member or friend. These reminders may induce unspoken grief reactions, including acting out, or more silent depressive responses.

Major studies have indicated that, as adversities accrue, there is a measurable increase in a range of child psychopathology, partly dependent on family or genetic history. Disasters can produce substantial adversities within a short period of time that persist over weeks, months or years. In addition, specific adversities, for example unemployment, reduced family income, overcrowded living situations, and parental disagreement over how to respond to adversities, is associated with increased risk of marital conflict, domestic violence, and child abuse. Often overlooked is the importance of the school community as a recovery environment for children and adolescents. Course of recovery may vary significantly due to variations in school administration support for additional school-related learning activities and sustained school-based disaster-specific mental health interventions. Physical injury and rehabilitation not only present their own challenges, but also serve as ongoing trauma reminders. Studies have indicated that inter-current trauma and loss, especially in the first year or two of recovery, are



important factors that can adversely influence outcome (Nader *et al.*, 1990).

This body of research on children and disasters has some distinct limitations (Steinberg *et al.*, 2006). Most studies to date have assessed reactions more than three months after the disaster, leaving a gap in our understanding of acute reactions and their course. Most studies have been "one-shot" or cross-sectional in design, lacking information about predisaster status and course of recovery. Of studies that were longitudinal, most began after the disaster, again making the findings of rates of distress and impairment difficult to interpret. Most studies have also had too few participants, with sampling strategies that were less than optimal, and without long-term follow-up. In addition, there have been too few studies in which young children have been included, and in which youth and adults have been sampled and compared in the same study. Finally, there are too few studies evaluating postdisaster interventions among children and adolescents (Cohen *et al.*, 2006).

The next decade of research should expand a narrow focus on symptoms to better characterize a broad range of impact and outcome, and assess factors that moderate or mediate these. Outcome domains need to be broadened to include: biological alterations and physical health; developmental disruptions; disturbances in peer and social relationships; family conflict; impairments in academic functioning; and effects on pro-social behavior, citizenship and motivation for learning and career. Among many others, moderating or mediating factors that need to be studied include: physical injury and disability; severity of postdisaster adversities; frequency of exposure to trauma and loss reminders; prior traumatic experiences and losses; history of psychopathology; coping repertoire and style; and level of peer, family, and social support.

A good deal of research is also needed to evaluate the effectiveness of mitigation, preparedness, response, and recovery strategies in schools, communities and nationally, as well as the effectiveness of acute, intermediate, and long-term interventions in promoting the recovery of children and

adolescents. In this regard, one study has shown positive results (Chemtob *et al.*, 2002a, 2002b), and a more recent longitudinal study has shown the beneficial effects at 5½ years postdisaster of a trauma/grief-focused intervention delivered 1 year postdisaster (Goenjian *et al.*, 2005).

An important area for research is the impact of media, especially television viewing, on the recovery of children and adolescents (Fairbrother *et al.*, 2003; Pfefferbaum *et al.*, 2001). Research on the effectiveness of risk communication and emergency public information is especially needed in regard to scenarios involving WMDs. There is also a need for more research among special populations, including orphans, unaccompanied minors, homeless children, children with special needs, refugees and displaced children, and children who have been exposed to multiple disasters and losses.

### Stages and strategies of postdisaster intervention

A modern public mental health approach to the postdisaster recovery of children, adolescents, adults, and families recognizes the importance of conceptualizing stages of disaster response (Pynoos *et al.*, 1995, 1998, 2005b). Although the timing, setting and service providers for delivery of acute, intermediate, and longer-term postdisaster interventions will vary by type of disaster and post-disaster ecology, it is generally accepted that different levels of intervention are needed for each of these stages. For children and families, schools represent a major setting for many modalities of intervention (individual, classroom, group, family).

Acute interventions are typically brief, and provided in the days and weeks post-event, while intermediate-stage interventions are offered over the first 18 months following a disaster. Children, adolescents, and adults who continue to experience difficulties months to years after a disaster can benefit from longer-term, more comprehensive trauma/grief-focused treatment that also addresses concomitant comorbid conditions and rehabilitation of developmental disruptions.

**Table 3.4** Stages of postdisaster intervention

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Psychological First Aid  
 Skills for psychological recovery  
 Enhanced services  
 Treatment

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These different stages of interventions represent more in-depth and extended efforts that encompass similar objectives, so that the main foci of intervention remain constant. For example, although postdisaster stresses and adversities may evolve over time, a focus on these remains an integral component across all stages of recovery. The same may be said for a focus on reactivity to trauma and loss reminders, despite the fact that the nature and frequency of exposure to reminders may vary over the course of recovery. The following sections provide an overview of the basic principles and goals of each of these staged interventions (see Table 3.4).

#### *Psychological First Aid*

Negative findings and controversy over the effectiveness of critical incident stress debriefing techniques have left a gap in the disaster field regarding effective acute interventions (McNally *et al.*, 2003). In response, the National Child Traumatic Stress Network and the National Center for PTSD has developed a Psychological First Aid (PFA) Field Operations Guide, second edition for the provision of early psychological assistance to children, adolescents, adults, and families after disaster and terrorism (Brymer *et al.*, 2006, National Child Traumatic Stress Network and National Center for PTSD, 2005). In the aftermath of Hurricane Katrina, with the enormous number of children and families directly affected and evacuated, PFA was released for use in the disaster-affected regions, including areas across the United States with large numbers of displaced children and families. The PFA Field Operations Guide was initially designed for use by mental health professionals. However, it has been widely used by

individuals from a variety of backgrounds. There are currently adaptations of PFA being developed for use by school crisis teams, clergy, first responders, emergency room personnel, pediatricians, and by the Medical Reserve Corps. The PFA Guide and various adaptations will be available on the website of the National Child Traumatic Stress Network, [www.nctsn.org](http://www.nctsn.org).

In developing the protocol, our group took advantage of numerous materials available from many agencies and organizations that coordinate or participate in disaster response, and from the current research literature and national and international experience in regard to principles that were found to be most effective in providing acute assistance after disasters. A distinct advantage of the PFA protocol is that, in contradistinction to most materials available, it includes interventions designed for both children and adults, and provides in-depth description of recommended strategies to accomplish the intervention goals, along with specific examples of what to say and do.

Psychological First Aid is deliverable in diverse settings. Such settings may include shelters, schools, hospitals, homes, faith-based locations, staging areas, feeding locations, family assistance centers, and other community settings. Following WMD events, PFA may be delivered in mass casualty collection points, hospitals, and in field decontamination and mass prophylaxis locations. The PFA Guide includes basic information-gathering techniques to help providers make rapid assessments of survivors' immediate needs and concerns, and to tailor interventions in a flexible manner. Of importance, concepts such as "clinical evaluation," "diagnosis," "symptoms," "disorder," and "psychopathology" are not components of the provision of immediate assistance provided through PFA.

The PFA Guide was developed to be as strongly evidence-informed as possible, and constructed from within a sound developmental and cultural framework (Pynoos *et al.*, 1995, 1998). Important features of PFA are the use of information-gathering strategies to tailor the intervention to the specific needs and concerns of affected children and

families, and informational handouts that are provided to those affected by disaster. The basic PFA objectives include:

1. Making contact
2. Ensuring immediate safety and comfort
3. Helping with stabilization
4. Gathering information
5. Providing practical assistance
6. Promoting use and provision of social support
7. Providing information on coping
8. Linking with collaborative services.

Handouts are included in PFA that provide information about common reactions after disasters, seeking and giving support, positive and negative coping strategies, tips for parents on assisting children at the preschool, school-age, and adolescent levels, basic relaxation techniques, alcohol use and abuse after disasters, and self-care strategies for providers implementing the PFA protocol. These materials allow survivors to continue to get assistance over the weeks and months of recovery by providing important information that they can use over time. The overarching approach is to empower children, adolescents, and families to actively utilize their natural recovery and support systems, and engage in proactive problem-solving to facilitate their own recovery. An important component of PFA is to help children and families understand expectable reactions, and how to connect with behavioral health and social services if these are needed in the future. Importantly, in light of findings regarding debriefing, the guide provides specific cautions about engaging children and adults in discussing details of their disaster-related trauma and loss experiences.

In clarifying disaster-related traumatic experiences, the Psychological First Aid provider should avoid asking for in-depth description of traumatic experiences as this may provoke unnecessary additional distress. It is especially important to follow the lead of the survivor in discussing what happened during the event. Individuals should not be pressed to disclose details of any trauma or loss. On the other hand, if individuals are anxious to talk about their experiences, let them know politely and respectfully that what would be most helpful now is to get some *basic*

information to be able to help with what is currently needed and plan for future care. Let them know that the opportunity to discuss their experiences in a proper professional setting can be arranged for the future.

The guide also recommends that, in providing assistance to disadvantaged and culturally diverse populations, providers consult local community leaders to better understand local customs in regard to specific religious and mourning rituals, social connectedness, and coping strategies.

The nature and course of grief is strongly influenced by family, cultural and religious beliefs and rituals related to mourning. You should inform yourself about cultural norms with the assistance of community cultural leaders who best understand local customs. Remember that it is important for families to decide from their own tradition of practices and rituals how to honor the death.

A special feature to be added to the PFA Guide is an evaluation component integrated within the intervention that also serves a therapeutic function. For example, in gathering information about concerns, worries, distress, and immediate needs of children, adults and families, survivors will be asked to rate their level of current distress, "put a number to it." At the conclusion of the intervention, providers will again obtain a rating in these areas to ascertain the intervention's immediate impact. There is a critical need for this type of evaluation, as well as longer-term follow-up studies, to begin to establish an evidence base for acute interventions.

#### *Skills for Psychological Recovery*

This intervention, "Skills for psychological recovery" (SPR), which is currently under development, is more extended and in-depth than PFA, and is designed to meet criteria for mental health interventions that are provided through the Crisis Counseling Program funded by the FEMA/Center for Mental Health Services (CMHS). SPA is designed for the weeks and months following a disaster. It includes more in-depth and systematic gathering of information to identify specific risks for post-disaster distress and problems, and to tailor the

intervention to the specific needs of children, adolescents, adults, and families. It also includes a wider range of strategies to accomplish the intervention objectives. As with PFA, SPR is organized around major goals, specific objectives within each goal, and provides operationalized strategies that can be employed to accomplish each of the objectives. As this is an intermediate postdisaster intervention, important additional objectives include:

- Assistance with problem-solving and coping with ongoing postdisaster stresses and adversities (e.g., coping with prolonged displacement, unemployment, physical rehabilitation)
- Strengthening capacity to manage on-going trauma and loss reminders, including in anticipation, during and after
- Focused assistance with singularly troubling aspects of disaster experience (e.g., preoccupation with action or inaction, or postdisaster viewing of a dead relative)
- Helping to restore family functioning and normal routines, including helping primary caregivers in enhancing effective parenting roles and responsibilities even during their own recovery course
- Assisting children and families in managing ongoing grief reactions and emerging depressive responses
- Promoting linkage with mental health, health, and social services
- Promoting youth and family developmental progression (e.g., integration into a new or reconstituted school system and peer group, and resumption of family activities)
- Enhancing information acquisition and management skills in regard to ongoing safety information (e.g., air quality, hazardous areas, quarantine and other public health measures, rebuilding efforts)
- Promoting constructive activities that improve peer, social, and community ecology.

#### *Enhanced Services*

A child and adolescent Enhanced Services model is a brief mental health intervention program

for children and adolescents who continue to experience moderate to severe reactions months to years after large-scale disasters. These interventions represent an intermediate step between crisis counseling services and longer-term mental health treatment. The goals are to accelerate recovery from ongoing or phasic distress toward a pre-disaster level, to mitigate long-term mental health difficulties or disorders, and to promote adaptive functioning. Enhanced Services interventions for children and adolescents have included 10–12 sessions that can be delivered individually or in a group setting. Enhancing parental understanding, family communication and disaster recovery parenting skills are an important component. In Florida for the 2004 hurricanes, Enhanced Services were developed for Project Recovery using a ten-session manualized protocol for children 8 years old and above (Allen *et al.*, 2006). Because of prior empirical evidence regarding the increased risk of anxiety-prone children to persistent and more severe post-hurricane distress, this intervention included addressing anticipatory anxiety and fear of recurrence, and provided hurricane-specific psychoeducation and anxiety management in regard to reactivity to hurricane-related reminders. A unique feature of this intervention involved the child and parents describing a timeline of their disaster-related experiences to promote a shared understanding of both overlap and differences in their objective and subjective experience and responses. Unlike PFA and SPR, Enhanced Services includes the use of instruments to evaluate baseline and postintervention levels of post-traumatic stress, anxiety, depression, and coping. An Enhanced Services intervention is currently being developed for preschool children and their caretakers.

#### *Treatment*

Over the past decade, there have been considerable advancements in the treatment of children and adolescents exposed to disaster. Approaches have included individual, family, group, and classroom

modalities. Randomized studies among school-age children have primarily examined trauma- and loss-focused cognitive-behavioral and interpersonal approaches. For example, using a staggered start comparison group, March and colleagues (1998) reported a robust beneficial effect of an 18-week cognitive-behavioral therapy (CBT) intervention after an industrial fire. There was a significant improvement in PTSD symptoms, depression, anxiety, and a reduction in anger. Two studies reported on the effectiveness of a brief six-session school-based trauma-focused intervention after a large-scale earthquake (Goenjian *et al.*, 1997, 2005). At both 3 years and 5 years post-earthquake, the treated group showed significant improvement in PTSD and stable depressive symptoms, whereas untreated adolescents suffered a worsening of PTSD and exacerbation of depression. The significance of these longitudinal studies from Armenia is that treatment gains persisted over a 4-year period post-treatment. After the sinking of the *Jupiter*, Yule (1992) reported that a CBT treatment for girls was associated with lower PTSD, depressive, and fear symptoms at 9 months postdisaster, compared with a no-treatment group. Another study, conducted after Hurricane Iniki using a psychosocial intervention in a randomized control design, found a significant reduction in trauma-related symptoms that was maintained at 10–12 months follow-up (Chemtob *et al.*, 2002a, 2002b). Layne *et al.* (2001) reported a significant reduction in PTSD, depression, and traumatic grief reactions among war-traumatized students from Bosnia-Herzegovina 2 years after a 20-session adolescent group, school-based intervention. Although open studies have identified medications with promise for use among traumatized children and adolescents, there have been no studies evaluating the effectiveness of medications in the recovery of children and youths after disasters (Cohen, 2005).

Postdisaster interventions for children and adolescents have included the following components: psychoeducation, anxiety management, problem-solving and coping skills, extended trauma narrative reprocessing, enhancing emotional regulation,

**Table 3.5** Primary therapeutic foci

Traumatic experiences
Trauma and loss reminders
Trauma-related bereavement
Postdisaster adversities
Developmental progression

progressive review of disturbing appraisals, cognitions and expectations, relapse prevention, and techniques for enhancing social support. Specific parent-child/youth sessions are incorporated into many of the treatment protocols. Five primary therapeutic foci have emerged as important components of postdisaster intervention for youth (see Table 3.5). These foci are briefly described below.

First, a comprehensive intervention for children and adolescents exposed to disaster must systematically address disaster-related *traumatic experiences*, both their objective and subjective features. This focus includes psycho-education about age-appropriate reactions to trauma and loss. This is essential in order to help children identify trauma/loss-related distress reactions and difficulties, and to reduce perception that reactions are related to personal shortcomings. Treatment must also include repeated opportunities to revisit the traumatic experience through trauma narrative exercises that promote remembering with immediacy. Children are guided to produce a coherent, temporally ordered narrative of their subjective experience. These sessions enhance understanding of the child's moment to moment appraisals, intervention considerations, somatic experience and emotional challenges. Progressive verbal and visual representations serve to enhance emotional regulation, especially in regard to "worst moments." Particular attention is also paid to attributions of excessive responsibility, moments of estrangement from others, failures of protective intervention and maladaptive beliefs. Two additional goals are to better identify sources of potential trauma reminders embedded in the experience, and points of disruption in a sense of a "protective shield" that will require psychological repair over time.

Second, *trauma and loss reminders* are features of the child's environment that trigger intrusive distressing thoughts, feelings, and memories. Reminders are often associated with strong emotional and physiological reactivity, traumatic avoidance, and reenactment behaviors that, at times, can be dangerous. Treatment must assist children in identifying current and future trauma/loss reminders, and in understanding the links between their disaster-related traumatic experience(s), reactions, and current maladaptive behavior. Efforts to increase coping and adaptive responses can include facilitating contextual discrimination between the present and past, increasing tolerance for expectable reactivity, reducing unnecessary exposures to unnecessary reminders, and the development of appropriate support-seeking and anxiety-management skills for the periods before, during, and after exposure to distressing reminders.

Third, when traumatic circumstances accompany the death of a family member or close friend, there is often interplay between trauma and bereavement. Normal grieving requires the ability to positively reminisce about the deceased. Often, loss of loved ones due to terrorism and disaster involves extreme traumatic elements. As a consequence, the grieving child may avoid thinking about the deceased because such efforts result in upsetting and painful memories. The result is a form of traumatic grief, with prolonged symptoms and maladaptive coping responses. The sequencing of therapeutic efforts is first to promote the receding of traumatic aspects that maintain preoccupation with details of the death; then, second, to facilitate the appropriate child's or adolescent's grief within the context of their individual, family, and cultural background. Specific therapeutic tasks undertaken toward this goal include psychoeducation about grief reactions and the course of bereavement, framing grief reactions and bereavement as beneficial processes that facilitate accommodation to the ongoing absence of the loved one, and, in cases in which traumatic intrusions interfere with positive reminiscing, construction of a non-traumatic mental representation of the deceased.

Other goals include increasing tolerance for current and future loss reminders, making healthy changes to further accommodate to the loss, and addressing conflicts over past interactions that evoke regret, guilt, or shame. This therapeutic work serves to promote acceptance of traumatic losses, and mobilize adaptive coping responses. Disasters and terrorism can further complicate adaptation to loss when there is no recovery of the deceased body or delay or disturbing aspects of body identification. Confirming the physical reality of the death has been reported to be important in the grieving process of even young children (Furman, 1973).

Fourth, effective treatment for children after disaster must focus on *postdisaster adversities*. Typically, a series of adverse life changes follow in the wake of disaster, including financial hardship, medical treatment and physical rehabilitation, relocation, and loss of friends, school, and community. Intervention for children is focused on enhancing coping skills, identifying current difficulties, developing pragmatic coping and problem-solving strategies to contend with adversities, and enhancing the social skills needed to communicate appropriately about trauma and loss to others (and handle uninvited social inquiries), and to seek appropriate forms of support. A group format has proven especially advantageous to improving constructive problem solving, especially among adolescents.

Fifth, it is critical that a comprehensive trauma-grief treatment program address ways in which trauma or grief-related reactions may have contributed to disturbance in *developmental progression*, including withdrawing from developmentally important activities and relationships, difficulties in academic and interpersonal life at school, and risk behaviors, often with newly formed maladaptive peer groups. Guided by an understanding of normative developmental competencies, tasks, transitions and expectations, a treatment program must identify missed developmental opportunities, support resumption of compromised developmental activities, address traumatic expectations governing current and future behavior, and facilitate pro-social activities and constructive future planning.

### Three tiers of postdisaster intervention

A three-tier model for providing postdisaster mental health interventions for children and families (Saltzman *et al.*, 2003; Pynoos & Steinberg, 2006; Pynoos *et al.*, 2005b) includes general psychosocial support to a broad population, specialized interventions for those with severe, persistent distress and impairment, and specialized treatment for high-risk cases that need more intensive psychiatric care. The following is a brief outline of some of the major characteristics of each tier.

#### *Tier 1: broad-scale intervention*

- The primary objective is to promote adaptive adjustment and normal developmental progression among children and adolescents, and prevent the onset of psychological, behavioral, functional, and developmental problems.
- The target population includes children, adolescents, and their indigenous support networks, including parents, family members, teachers, and school administrators.
- Implementation sites include schools, community mental health agencies, religious institutions, after-school programs.
- Implementing personnel can include trained teachers, school counselors, community mental health professionals, clergy.
- Program content can include presentations and/or printed materials designed to provide general, broad-spectrum information on common postdisaster distress reactions, coping skills, support-seeking and support-providing skills, and descriptions of signs suggesting the need for professional evaluation.
- Intervention modalities can include individual sessions, classroom-based interventions, school-wide presentations, parent meetings, school staff meetings, and discussions with peer support groups and mentorship programs, web-based informational material, and official risk communications.

#### *Tier 2: specialized intervention*

- The primary objective is to reduce psychological distress, promote normal developmental progression, and adaptive postdisaster adjustment among moderately to severely affected children and adolescents, and to provide early tertiary prevention of severe and persisting psychological, behavioral, functional, and developmental difficulties.
- The target population includes children and adolescents with severe levels of disaster-related trauma exposure and loss deemed at risk for chronic, severe distress reactions (especially PTSD, depression, and grief) and behavioral, functional, and developmental disturbance.
- Implementing personnel can include trained school counselors or community mental health professionals.
- Program content can include semi-structured risk screening interviews, and trauma/grief-focused group intervention protocols.
- Intervention modalities can include individual counseling, trauma/grief-focused individual or group interventions and family-based interventions.

#### *Tier 3: highly specialized intervention*

- The primary objective is to reduce severe psychological distress, suicidal risk, and other high-risk behaviors as tertiary prevention of severe psychological, behavioral, or developmental difficulties.
- The target population includes children and adolescents with severe psychiatric disorders whose specialized needs exceed the resources available at local schools. Markers of risk include signs or symptoms of severe depression, high suicide risk, antisocial behavior, extreme risk-taking, severe substance abuse, and psychosis.
- Implementation sites for youths who may be identified through risk screening methods at schools typically include community-based mental health agencies, although certain types of Tier-3 services may be provided at schools (e.g., a

psychiatrist may see students at a school-based health clinic), or combined with Tier 2 services (e.g., a psychiatrist may prescribe and monitor antidepressant medication for a student participating in school-based group intervention).

- Implementing personnel can include community mental health specialists (e.g., psychiatrists, psychologists).
- Program content includes traditional psychiatric/psychological treatments. These may be supplemented by concurrent or subsequent Tier 2 interventions.

### Stages of postdisaster data collection

Public concern regarding the impact of disasters on children, adolescents and their families has led to efforts to develop measures that can accurately identify youths whose exposure to traumatic situations, subjective responses, loss of loved ones and property, and post-event adversities increases their risk for severe, persisting distress, functional impairment and biological/behavioral/developmental disturbance. The focus on assessment is related to the importance of making an early estimate of the nature, extent, and severity of the postdisaster adverse impact, in order to plan for public mental health interventions to promote the recovery of different trauma/loss/adversity-exposed groups. Data collection can also inform ongoing efforts to monitor the course of recovery, the added impact of post-event circumstances, and the effectiveness of services and interventions. Stages of data collection can be categorized as follows:

1. Pre-event surveillance
2. Acute post-impact/triage
3. Needs assessment
4. Ongoing surveillance
5. Screening
6. Clinical evaluation
7. Outcome evaluation.

Pre-event surveillance can be systematically carried out through periodic national representative surveys of children and adolescents to track

demographically related rates of various types of exposure to trauma and loss, symptomatic response, functional impact, and help-seeking behavior. Such data can be invaluable in providing population-based baseline information for statistical comparison in interpreting findings from data collection efforts post-event. Collection of acute post-impact triage data from members of an affected population as they appear in a variety of acute emergency response settings can be effectively used to obtain early information about the impact of the event and its population distribution, and to link survivors early on with available services.

Needs assessment involves systematic data collection from a representative sample of an affected population to make a rigorous determination of the scope and impact of the disaster. Such data can be used for planning needed response strategies and resources. Ongoing surveillance is conducted to monitor the course of recovery among an affected population and the impact of new events and ongoing adversities. Screening more systematically targets members of an affected population for linkage with available recovery resources.

Clinical evaluation and intervention outcome data involve the rigorous clinical evaluation of affected individuals, and are used to examine the contribution of interventions to the course of recovery. These stages of data collection can be conceptualized as increasingly including more detailed metrics about objective and subjective features of trauma exposure, loss and traumatic bereavement, post-event stresses and adversities, ongoing distress, and behavioral, social and functional/developmental impairment.

There are a number of factors that strongly affect these data collection methods and respective metrics. These factors include: type of event, setting in which data are collected, individuals collecting the data, available resources and services, ethical issues, and available funding for data collection efforts.

The initial screening items typically capture basic exposure information about where children were



during the event, and what happened to them and those around them. This is followed by specific questions about high-risk experiences; for example, direct life-threat, being trapped or injured, witnessing grotesque injury, hearing screams of distress, being separated from family members or caretakers, or injury or death of family members. Additional exposure questions address the child's subjective appraisal of the event and associated emotional responses. These exposure questions are complemented by a brief evaluation of prior trauma and loss, prior mental health problems and substance abuse, family disturbances, and post-traumatic

For some of the continuous scales, psychometric studies have been conducted to determine their sensitivity and specificity in detecting PTSD. Abbreviated versions of instruments can be used to make an initial assessment of a child's level of distress. For example, Project Liberty in New York City used an abbreviated version of the UCLA PTSD Reaction Index for DSM IV (Steinberg *et al.*, 2004). Where sensitivity and specificity are high, abbreviated scales provide an efficient means for needs assessment and screening. For example, rating frequency of occurrence over the past month, eight items from the UCLA PTSD Index do

I get very upset, afraid or sad when something makes me think about what happened.	None <input type="checkbox"/> 0	Some <input type="checkbox"/> 1	Little <input type="checkbox"/> 2	Much <input type="checkbox"/> 3	Most <input type="checkbox"/> 4
I have upsetting thoughts or pictures of what happened come into my mind when I do not want them to.	None <input type="checkbox"/> 0	Some <input type="checkbox"/> 1	Little <input type="checkbox"/> 2	Much <input type="checkbox"/> 3	Most <input type="checkbox"/> 4
I feel grouchy, or I am easily angered.	None <input type="checkbox"/> 0	Some <input type="checkbox"/> 1	Little <input type="checkbox"/> 2	Much <input type="checkbox"/> 3	Most <input type="checkbox"/> 4
I try not to talk about, think about, or have feelings about what happened.	None <input type="checkbox"/> 0	Some <input type="checkbox"/> 1	Little <input type="checkbox"/> 2	Much <input type="checkbox"/> 3	Most <input type="checkbox"/> 4
I have trouble going to sleep, or wake up often during the night.	None <input type="checkbox"/> 0	Some <input type="checkbox"/> 1	Little <input type="checkbox"/> 2	Much <input type="checkbox"/> 3	Most <input type="checkbox"/> 4
I have trouble concentrating or paying attention.	None <input type="checkbox"/> 0	Some <input type="checkbox"/> 1	Little <input type="checkbox"/> 2	Much <input type="checkbox"/> 3	Most <input type="checkbox"/> 4
I try to stay away from people, places, or things that make me remember what happened.	None <input type="checkbox"/> 0	Some <input type="checkbox"/> 1	Little <input type="checkbox"/> 2	Much <input type="checkbox"/> 3	Most <input type="checkbox"/> 4
I felt as if it hadn't happened or was unreal.	None <input type="checkbox"/> 0	Some <input type="checkbox"/> 1	Little <input type="checkbox"/> 2	Much <input type="checkbox"/> 3	Most <input type="checkbox"/> 4

stress, depressive, anxiety, and grief reactions.

Both structured diagnostic instruments and continuous-scale child and adolescent PTSD measures have been employed after disasters. Structured instruments provide estimates of rates of disorder, while continuous scales invariably show greater sensitivity to exposure parameters.

almost as well as the full scale in predicting PTSD. These items include:

Ideally, collaborating community, state and federal systems should carry out data collection in the context of a broader public mental health response and recovery program, a "disaster system of care" (Pynoos & Steinberg, 2006). These systems can

include emergency medical services, disaster relief organizations (such as the American Red Cross), first responders, state and county public and mental health, and schools.

A body of data has emerged which suggests several important factors that should be taken into account whenever conducting postdisaster mental health assessments of children and adolescents. These factors include: the necessity of assessing multiple disorders; independent assessment of children's behaviors; assessment of family members, especially mothers; functional status; pre-existing risk factors; and cross-cultural differences (Balaban *et al.*, 2005).

There are a variety of instruments that have been specifically designed to assess levels of exposure to various types of disasters including wars, hurricanes, earthquakes, and fires. These questionnaires provide an important way to identify children and adolescents who may be at higher risk for developing postdisaster reactions. Event-specific exposure items vary with the type of event, i.e., earthquake, hurricane, catastrophic school violence or forms of terrorism. Before designing specific exposure items, interviews with key informants must be conducted to ascertain salient event-specific features of exposure. During the acute post-impact phase, exposure variables can be of use in identifying subgroups of an affected population that are at increased risk for severe and persistent distress reactions and behavioral and functional impairment. The inclusion of post-event adversity variables may add incremental validity to the assessment battery. Another important part of the exposure section of any postdisaster battery are questions related to loss of loved ones, along with questions about normal grief and complicated grief reactions (Layne *et al.*, 2001).

Postdisaster assessment should not be limited to the prevalence of any single psychological disorder. There is evidence that the prevalence of PTSD in children and adolescents may be related to the severity of the original trauma, while rates of

depression may be related to ongoing secondary adversities. This suggests that different assessments and interventions may be needed in the aftermath of disasters (Goenjian *et al.*, 1995; Sack *et al.*, 1994, 1995).

Assessing child mental health often requires input from several informants. Adults, in contrast, are generally reliable observers of children's behaviors, but have a tendency to underestimate children's internal distress. Whenever possible, assessments of children should include an adult's assessment of the child's behavior. Parent- and/or teacher-completed behavior rating scales can provide reliable, inexpensive, and easy to administer measures of children's disruptive behaviors.

If possible, the mental health status of primary caretakers should be assessed at the same time as children, as parental adjustment is an important predictor of children's mental health outcomes, particularly maternal reactions. Whenever possible, instruments that include questions about social and behavioral functioning should be used when assessing children and adolescents in disaster contexts. Empirical data on the relationship between psychopathology and functional status for children are still very limited, but it has been estimated that only between one-half and one-third of children with a DSM diagnosis show some significant impairment at home, in school or with peers (Sack *et al.*, 1995). A number of studies have reported the prevalence of psychiatric diagnoses, but not the proportion of those with impaired functioning. Further, appropriate and adaptive behaviors may be very different in the aftermath of disasters. Consequently, the presence of symptoms does not always indicate functional disability, nor does the absence of reported symptoms indicate lack of distress (e.g., Ahmad *et al.*, 2000; Jones & Kafetsios, 2002; Terr, 1983).

In addition to traditional categories related to psychological sequelae, recent postdisaster data collection efforts among children and adolescents have assessed a broader range of potential behavioral

and functional outcomes (depending on developmental stage). These have included:

- Alcohol and drug use
- Delinquency and antisocial behavior
- Teenage sexual activity
- School underachievement and failure
- Empathic and pro-social behavior/citizenship
- Quality of peer relationships
- Quality of family relationships
- Quality of romantic relationships
- Quality of work performance
- Physical health.

Although the contribution of age to children's post-traumatic reactions, behavior, and psychopathology still needs to be clarified, it is critically important that any assessment instruments be appropriate to age and stage of development.

As the strength of association between trauma exposure and distress may be influenced by psychological and socio-environmental factors, a number of vulnerability and resilience factors have been investigated. Data collection in the aftermath of disasters can usefully include items that relate to potential mediating or moderating variables to increase the predictive accuracy and inform public mental health and clinical strategies. As noted above, vulnerability and resilience factors have been suggested to include child intrinsic factors, family factors, and extra-familial/community factors. For terrorism, additional specific factors that may mediate or moderate outcome include emergency public information, levels of federal, state and community emergency response capability for multi-hazards (adequate evacuation plans, decontamination, mass prophylaxis) school emergency response plans and capacity, surge capacity of the emergency medical system specific to children, and availability of timely effective mental health services for children and families. A number of postdisaster studies among children and adolescents have strongly suggested that severe postdisaster adversities can exacerbate post-traumatic stress reactions, interfere with recovery from post-traumatic stress

reactions, and contribute independently to the presence and severity of other comorbid conditions, including depression, grief, anxiety, somatization, hostility, etc. (Goenjian *et al.*, 1995; Layne *et al.*, 2001).

Factors embedded within the postdisaster ecology that may be etiologic, or mediate/moderate the impact of disaster on intermediate and long-term recovery include:

- Frequency of exposure to trauma reminders
- Frequency of exposure to loss reminders
- Type and severity of secondary adversities, including:
  - Impairment in caregiver mental health
  - Quality of family functioning
  - Overcrowded or adverse living conditions
  - School and community milieu
  - Quality of peer relationships
  - Physical injury, disability, rehabilitation.

The methodological problems of psychological assessment are complex in the context of ethnic and cultural groups who may have differing levels of exposure to previous traumas, differing vulnerabilities and strengths, differing levels of coping resources, and differing cultural mores of the expression of mourning and grief. Scales must be used with caution when the population being assessed differs from that in which the validation of the instrument was established. Many assessment instruments may not be appropriately sensitive to culture and ethnicity. Of course, simply translating an instrument into another language does not guarantee that the same symptoms or the same disorders are being assessed. Since nearly all tests have been validated in Western, clinical populations, this is a serious problem for cross-cultural research. Other methodological issues that can arise in these settings include issues of translation, relevance of cultural categories of mental health and illness, biases against confiding personal feelings to people from other cultures, and difficulty in finding control groups of nontraumatized populations (Jones *et al.*, 2006).

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