Recent Disasters in Sri Lanka
Lessons Learned

Daya Somasundaram, MD, FRCPsych, FRANZCP, FSLCP\textsuperscript{a,b,*}

BACKGROUND: SRI Lankan SOCIETY BEFORE CONFLICT AND NATURAL DISASTER

Sri Lanka, a small island off the southern tip of India, has faced devastating disasters, both artificial and natural, in the recent past. Sri Lanka is a resource-poor, low-income developing country that has been struggling socioeconomically and politically to keep its head above water. However, the country has not always been this way, and recent history has important lessons to teach on how particular development trajectories can make countries and populations vulnerable to disasters. Man-made disasters like war can be prevented by conflict resolution strategies, and the impact of most natural disasters can be mitigated by appropriate planning and preparedness. It became clear in responding to the major disasters that widespread mental health and psychosocial consequences can best be addressed by appropriate public mental health measures.

Although Ceylon, as Sri Lanka was then called, received her independence from Britain in 1948 on a sound economic footing with a large sterling balance and well-developed plantation sector, world trends were not favorable. Belatedly, there was some diversification of her foreign exchange earnings with garments, tourism, and

KEYWORDS

- Disaster
- War
- Tsunami
- Collective trauma
- Community approaches

KEY POINTS

- It is worthwhile planning beforehand to prevent or mitigate the impact of disasters at the community and family levels.
- There should be regional and international mechanisms to protect civilians in times of conflict or when powerful leaders and states overstep boundaries of good governance and observation of basic rights.
- In the long-term, there is a need to create a culture of peace by social peace building.

BACKGROUND: SRI Lankan SOCIETY BEFORE CONFLICT AND NATURAL DISASTER

Sri Lanka, a small island off the southern tip of India, has faced devastating disasters, both artificial and natural, in the recent past. Sri Lanka is a resource-poor, low-income developing country that has been struggling socioeconomically and politically to keep its head above water. However, the country has not always been this way, and recent history has important lessons to teach on how particular development trajectories can make countries and populations vulnerable to disasters. Man-made disasters like war can be prevented by conflict resolution strategies, and the impact of most natural disasters can be mitigated by appropriate planning and preparedness. It became clear in responding to the major disasters that widespread mental health and psychosocial consequences can best be addressed by appropriate public mental health measures.

Although Ceylon, as Sri Lanka was then called, received her independence from Britain in 1948 on a sound economic footing with a large sterling balance and well-developed plantation sector, world trends were not favorable. Belatedly, there was some diversification of her foreign exchange earnings with garments, tourism, and

Disclosures: No conflict of interest.

\textsuperscript{a} Department of Psychiatry, University of Jaffna, Jaffna, Sri Lanka; \textsuperscript{b} University of Adelaide, Adelaide, South Australia

* Corresponding author. Department of Psychiatry, University of Jaffna, Jaffna, Sri Lanka.

E-mail address: manathu@gmail.com

http://dx.doi.org/10.1016/j.psc.2013.05.001

0193-953X/13/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
sending workers mainly to the Middle East, who remitted their wages. Lanka lacked easily exploitable natural resources. There continued to be heavy spending on welfare measures like health, education, social benefits, and subsidies to agriculture, rice, state-run institutions, and state ventures increasingly funded by foreign aid and loans. With the dramatic decrease in death rates from control of malaria, use of antibiotics, and improvements in medical health care, the population increased geometrically. The population density, particularly in the crowded southwest of the country, reached uncomfortable proportions for a small island nation, which made people naturally look for less populated areas. The tragedy for modern Lanka has been that it never produced a great statesman like a Nehru, Gandhi, or Mandela who could rise above petty sectarian differences and act for the national interest, to plan and lead the country to the much-coveted Newly Industrialized Country status. Instead, the country descended into bitter interparty feuding, with the two national parties using all their ingenuity and skills to come in to and stay in power. The democratic system implanted by Britain did not thrive, unlike in neighboring India. Increasingly, each election (both before, during, and after the election) became an orgy of threats, abduction, and killing of opposition candidates and their supporters; voter intimidation, rigging, ballot stuffing, impersonation, obstruction, and destruction of booths followed by violence by the victors against the losers (post-election curfew is routine practice). The goal was to win by any means possible and then stay in power. The charade of democracy, which none of the elite seemed to believe in, was enacted at election times for external and internal consumption. With more close election monitoring by national and international bodies, the level of violence has at least declined. On the positive side, there have been periodic elections with a parliament (although with decreasing power because of the introduction of an authoritarian presidential system, in which most of the ministers are given lucrative cabinet posts, attracting many in the opposition to cross over), press, judiciary, police, local government, and various committees even at institutional and organizational levels. However, the usual checks and balances that characterize democracy, the give-and-take of negotiations, debate and discussions, and the impartial rule of law have proved illusory. There is no real division of power between the executive, legislature, and judiciary. Gradually, particularly after the 1970s and the introduction of the presidential system, these powers became concentrated at the top, in the head of state. The freedom and independence of the press were gradually muzzled. Many of the more able journalists left the country, were killed, or were made to fall silent. The current press has become polarized and inflammatory, aggravating and engendering ethnic passions. The justice system has been cowed into partiality, silence and favoritism. More importantly, Lanka lacked the tradition and practice of democratic institutions, civil organizations, public discourse, respect and belief systems, and protection of civil liberties and minority rights that would have allowed democracy to function. The temptation behind the democratic façade had always been toward authoritarianism, with absolute, dictatorial control, much like the old feudal kings. Corruption, a close nexus between politicians and the criminal underworld, nepotism and clientism or patronage, by which stalwarts and loyalists were rewarded with jobs and influence in the bloated, inefficient state sector, and short-sighted, poor planning led the country to economic ruin, to the brink of becoming a failed state. The historic exclusion from governance and access to state resources and opportunities for the disgruntled rural and urban educated Sinhala youth in the south led to two Janatha Vimukthi Perumana (JVP) uprisings or manmade disasters in the 1970s and late 1980s. The state responded with the full might of its repressive apparatus with the help of India and other countries. The death toll in the second blood letting was variously estimated to be more than 60,000, with daily
reports of disappearances, of men being dragged from their families in the dead of night to be tortured and killed and their bodies destroyed on makeshift pyres of old tires (Derek Brown, *Manchester Guardian*, December 15, 1988). The same methods of repressive measures were then used by the state to squash the ethnic rebellion in the north and east.

Within the global trend since the end of World War II of increasing intrastate, ethnic civil wars,7,8 Sri Lanka is often studied as one of the examples of ethnic conflict that progressed to war,7,9–15 with a casualty list of more than 100,000 killed, and many more injured, mentally affected, displaced both internally and overseas, and communities, property, and ecosystems destroyed.16 Although the physical fighting drew to a close in May, 2009, it is pertinent to look at what caused the conflict and its psychosocial consequences to communities, because the underlying issues remain unresolved. Further, an understanding of what happened in Lanka helps shed light on similar contexts and dynamics elsewhere in the world and perhaps can lead to measures to prevent manmade disasters. After gaining independence in a postcolonial context, the Sinhala ruling elite representing the majority were unwilling to build a broad-based multicultural politics; the big power rivalry, economic interests, and the competition for jobs and resources could have played itself out in healthier ways, as in India,17 if the politics had not been shaped so strongly by exclusive nationalistic ideologies that created horizontal inequities.18 European theories of race, largely discredited by the early twentieth century, gave rise to virulent ideologies (Sinhala and its mirror image, Tamil), which have driven the ethnic conflict.

Although the health sector had been well developed and health care was free, mental health care continued to be neglected. Centralized care around the capital, Colombo, was available in a few archaic asylum like institutions, with few mental health professionals. Treatment approaches were mainly drug oriented for major psychotic disorders. There had been some belated efforts at decentralization, and limited mental health services were functioning at the district levels when the disasters struck. These systems were grossly inadequate to meet the sudden demands of major disasters and did not possess the multidisciplinary teams or the public mental health reach to deal with the large populations affected.

**RECENT DISASTERS**

**Manmade Disaster: War**

The Sri Lankan state, the various Tamil militants, in particular the Liberation Tigers of Tamil Eelam (LTTE, which for more than two decades fought to create a separate state), the Sinhala JVP (an ultraleftist militant group that made two attempts violently to overthrow the government), and India (during its short intervention in the island [1987–90] to impose peace), were all involved in a dirty war,19,20 with grave human rights violations and crimes against humanity.6,21 Critical at times, the international community, its many organizations, diplomatic missions, the United Nations (UN), and aid agencies giving technical support, military hardware, training, and the global network of socioeconomic ties and mutual relationships that give covert recognition, legitimacy, and tacit sanction as well as the Sri Lankan and Tamil diaspora communities that supported the conflict were also indirectly implicated.19,20,22 Although the physical fighting ended dramatically in the Vanni in May, 2009, with the state using indiscriminate shelling and bombing as the LTTE held the civilian population hostage that resulted in more than 40,000 civilians deaths, many more injuries, and unacknowledged war crimes,22–28 the underlying ethnocentrism and political causes remain unresolved.
Natural Disaster: Asian Tsunami of 2004

The gigantic Asian tsunami of December 26, 2004 was generated by one of the worst earthquakes on record, measuring 9 on the Richter scale, with an epicenter just off the coast in Aceh, Indonesia (Fig. 1).

A series of massive tidal waves sped across the Indian Ocean, killing more than 220,000 people in 12 countries spanning Southeast Asia, South Asia, and East Africa, and displaced more than 1.6 million people in addition to colossal property and infrastructure damage. In Sri Lanka, more than a million of its people were affected; the tsunami displaced more than 800,000 people, destroyed their homes and belongings, and killed 36,000 from the coastal communities of the northeast and south (Fig. 2). Ninety percent of those killed were from the fishing community and belonged to the lower socioeconomic class.

The suddenness and massive nature of the wave(s) overwhelmed and shocked everyone. The deaths, injuries, destruction, and chaos were unprecedented. Poignantly affected was the strong organic bond and intimate relationship that the coastal community, many of them fisher folks, had with the sea. Most depended on the sea for their livelihood and had grown up in the coastal environment of the sea. The rupturing of the organic bond and the fear for the sea would take time to heal. Many could not face the sea in the immediate aftermath and would not venture near the coast. The songs, the poems, drawings, narratives, and dramas from that time reflected this deep agony that was caused by the tsunami.

The World Health Organization (WHO) estimated that 30% to 50% of those affected were at risk of developing psychological distress or mental health problems needing help and support, whereas 5% to 10% would develop severe problems (such as pathologic grief, posttraumatic stress disorder [PTSD], and depression), needing specific intervention and treatment. There was an immediate and generous local response, in which people from all communities came forward to help those affected with support, shelter, clothing, and food. People from different ethnic communities (Sinhala, Tamil, Muslim and others), from different religions...
(Buddhist, Hindu and Muslim), different castes, ages and walks of life (military, milita-
tants, political parties, and ordinary folks) helped each other naturally and warmly
without barriers, animosity, or prejudice. There was a feeling of social solidarity,
cohesion, and camaraderie. For a brief moment, there was hope that the tsunami
had brought together the ethnic groups and healed the strife and conflict. There
was also an unprecedented massive international humanitarian response of sympa-
thy, aid and personnel, which poured into the country. A whole culture of non-
governmental organizations (NGOs) developed around the tsunami rehabilitation
work, which at times became overwhelming, taking on a carnival atmosphere.
The state response was tardy and discriminatory, marked by politics, favoritism, and
corruption.

The tsunami accentuated rather than ameliorated the conflict dynamics. In spite of
initial hopes that the tsunami response would provide a space to re-energize peace
negotiations, it had the opposite effect, deepening political fault lines. Protracted negotiations about the institutional arrangements for delivering tsunami assistance to the North-East mirrored earlier peace talks and exposed the deep underlying problems of flawed governance, entrenched positions, and patronage politics.35

The pre-disaster social conditions in northern Sri Lanka and the impact of the manmade and natural disasters, although they had many similarities, also had important differences (Table 1).

**AFTERMATH OF SRI LANKAN DISASTER**

Although the impact and mental health consequences of major disasters have many similarities, the nature, type, and severity can cause differences. It is helpful to conceptualize the impact along a time course of rescue, relief, rehabilitation, reconstruction, and development phases (Table 2). Different organizations, government departments, and international bodies like international NGOs and the UN have been responsible for the implementation of different interventions depending on the phase of the disaster. However, unlike the one-off natural tsunami, a chronic war situation did not lend itself to temporal divisions into neat phases, but was more of a continuing, complex (political) emergency going on for years with overlapping, periodic acute disaster situations for a community, like an episode of intense fighting for control of a region, a bombing raid, ambush, or a skirmish on a background of long-term displacement and then a prolonged postwar context.

**Tsunami**

In the immediate aftermath of the tsunami, survivors were overwhelmed, in shock, with an acute feeling of having lost everything. Acute stress reactions (ASRs) were common. ASRs typically lasted a few days. People were seen to be in a daze and highly emotional. Grief was the predominant psychological symptom. Factors that complicated grief reactions included guilt of failing to save family members. Many had repeated images of immediate family members, kin, and friends being swept away, being snatched from their hands, because they were unable to hold on. Anger and hostility were directed toward nature or the gods, at family members, or at outside agencies. Despair, crying, desolation, inability to accept what had happened, disbelief, and other emotional expressions were seen.

Anguish about missing relations when no body was recovered was common. Some recovery, relief workers, and volunteers experienced severe stress reactions and ASRs in response to traumatic experiences, such as witnessing the aftermath of the tsunami or disposing of dead bodies. There was suicidal ideation as a result of losing a large proportion of close family. Alcohol abuse was seen in men who had lost their wives and were struggling to cope with young children.

Fear of the sea and nightmares were initially common, as were fears relating to the future and the return to coastal areas. Most of the affected areas were fishing communities, and fear of the sea was expressed as “She, who gave everything, also destroyed everything.” An assessment of 71 children (aged 8–15 years) undertaken 3 to 4 weeks after the tsunami in Manalkadu by trained teachers showed that 40% were at risk of developing PTSD and many others showed significant symptoms.36

In the first few months, minor mental health conditions like depression, anxiety-related conditions including phobias, PTSD, somatoform disorders, traumatic grief reactions, alcohol abuse, and suicidal ideas and attempts were observed. They were treated with a combination of reassurance, mobilization of support networks, listening, counseling, group work, opportunity for creative expression through art, narrations,
<table>
<thead>
<tr>
<th>Table 1</th>
<th>Predisaster and postdisaster social ecology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Before Conflict</strong></td>
<td><strong>Conflict</strong></td>
</tr>
<tr>
<td><strong>Family</strong></td>
<td>Home (veedu), nuclear, extended, united, underreported Child abuse and domestic violence</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>Village (ūr), caste and hierarchical structures, networks, traditions, rituals</td>
</tr>
<tr>
<td><strong>Social processes</strong></td>
<td>Cohesion, communality, patriarchy, modernization, globalization</td>
</tr>
<tr>
<td><strong>Social effects</strong></td>
<td>Changing values, loosening of traditions, family system, village, cast, gender roles; nouveau riche</td>
</tr>
<tr>
<td><strong>Psychosocial interventions</strong></td>
<td>Psychoeducation, participation, development, empowerment, basic mental health</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Feature</th>
<th>Threat</th>
<th>Warning</th>
<th>Impact</th>
<th>Recoil</th>
<th>After Trauma</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration</strong></td>
<td>Months</td>
<td>Minutes to hours</td>
<td>Seconds to minutes</td>
<td>Hours</td>
<td>Monthly to years</td>
</tr>
<tr>
<td><strong>Cognition</strong></td>
<td>Expectation, anticipation, worry, threat, preparation</td>
<td>Warning messages</td>
<td>Shock</td>
<td>Relief</td>
<td>Inventory, loss, reality sense, coping</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emergency/denial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Emotion</strong></td>
<td>Fear, anxiety, insomnia</td>
<td>Apprehension, arousal, panic</td>
<td>Panic, shock, helplessness</td>
<td>Daze, inhibition, numbing, euphoria, emotional release</td>
<td>Grief, sadness, anger, hostility, despair</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Behavior</strong></td>
<td>Preparatory activity</td>
<td>Protective action, seeking safety, displacement</td>
<td>Self-preservation, survival, flight or fight</td>
<td>Hypoactivity or hyperactivity</td>
<td>Organized reconstruction adaptation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mental reaction</strong></td>
<td>Generalized anxiety disorder</td>
<td>Panic</td>
<td>Shock</td>
<td>Acute stress reaction</td>
<td>Phobic anxiety depression Alcohol and drug abuse Antisocial personality Development disorders Suicide</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td>Family and friends support and help. Long-term plans</td>
<td>Rumors, herd instinct, gathering together, evacuation</td>
<td>Family unity, clinging, hierarchical roles</td>
<td>Therapeutic community, social unity, breakdown of social barriers, loss of communality, social chaos</td>
<td>Refugees, rehabilitation, reconstruction, recovery, restitution, resettlement, social and cultural changes</td>
</tr>
</tbody>
</table>

drama, play (in children) and music, encouragement to return to habitual routines and social activities, medication when necessary, and follow-up. Individuals were observed to be more expressive of their losses, wanting to talk about them and showing signs of distress. These basic psychosocial interventions helped them recover in time. Most did not show overt mental health disorders but continued to have sleep disturbances, nightmares, and a sense of loss for varying periods of a few months.

There was an increase in relapse of schizophrenia, exacerbation of symptoms, and failure to follow regular treatment routines. Some patients lost their medical records and medications in the tsunami, whereas others could not keep their clinic appointments and treatments in the posttsunami chaos. Thus, as a result of lack of regular maintenance medication and follow-up, patients with schizophrenia had relapses or deterioration in their mental condition. Some cases of schizophrenic illness or other psychotic episodes were not identified, or misidentified as reactions to the disaster, and managed inappropriately with psychological methods.

Some aspects of the systems put in place after the tsunami to deliver aid seemed to lead to more difficulties for the affected people. There was a complex official registration process to receive aid, which many found stressful. Initially, agencies were poorly organized and coordinated, and there were some cases of political interference in the supply of aid and provision of psychosocial support. Many believed that this situation led to aid and psychosocial interventions not reaching all those in need, which caused resentment and anger amongst the affected people. Initially, only a few structured activities were available in the welfare centers, and this particularly affected children and adolescents who had lost parents. As time went on, there were reports of a lack of sensitivity and sympathy in some authorities dealing with tsunami survivors, including school principals and government officials, who expected survivors to return prematurely to normal functioning.

Previous experiences of being displaced (because of conflict) and dealing with trauma seem to have prepared those affected and the relief workers to deal with the effects of the tsunami. Local traditional healers and religious communities already had experience of helping people who had suffered traumatic experiences. The combined effects of resilience as a result of previous coping experiences with trauma, and quickly mobilized community psychosocial programs, might have prevented some from developing problems needing referral to hospital-level psychiatric services. Some workers providing psychosocial support had insufficient training, and misidentified severe mental health problems needing professional help, and rather attempted to manage them on their own. Since the tsunami, some services (particularly community-based programs) have been diverted to the tsunami-affected areas, and away from areas that have a high level of psychosocial need as a result of other factors, including poverty and conflict.

**War in Sri Lanka**

Individuals, families, and communities in Sri Lanka, particularly in the north, the east, and the so-called border areas of Sri Lanka, have undergone 25 years of war trauma, multiple displacements, injury, detentions, torture, and loss of family, kin, friends, homes, employment, and other valued resources. In addition to widespread individual mental health consequences, such as PTSD (13%), anxiety (49%), and depression (42%) in recent internally displaced persons (IDP’s) from the Vanni, families and communities have been uprooted from familiar and traditional ecological contexts such as ways of life, villages, relationships, connectedness, social capital, structures, and institutions. The results are termed collective trauma, which has
resulted in tearing of the social fabric, lack of social cohesion, disconnection, mistrust, hopelessness, dependency, lack of motivation, powerlessness, and despondency. The social disorganization led to unpredictability, low efficacy, low social control of antisocial behavior patterns, and high emigration, which in turn cause breakdown of social norms, anomie, learned helplessness, thwarted aspirations, low self-esteem, and insecurity. Social pathologies like substance abuse, violence, gender-based abuse and child abuse have increased. Kai Erikson gave a graphic account of collective trauma as “loss of communality” after the Buffalo Creek disaster in the United States. He and colleagues described the “broken cultures” in North American Indians and “destruction of the entire fabric of their culture” caused by the forced displacements and dispossession from traditional lands into reservations, separations, massacres, loss of their way of life, relationships, and spiritual beliefs. Similar tearing of the “social fabric” has been described in Australian indigenous populations.

**Mental Health Services in Sri Lanka**

Mental health services were not developed to meet the sudden demands of major disasters. There was insufficient recognition of disaster mental health needs or consequences. Structures or trained personnel did not exist to deal with the immense problems that were created. Our psychiatric training had not prepared us for disaster work, and knowledge of the principles of trauma and its consequences was rudimentary. Because of the massive need of patients coming for care and demand from organizations for relief of mental health problems, we had to learn about disasters from the available professional literature, follow special courses, and learn from the experience of others. Because the state did not acknowledge the mental health and psychosocial consequences of war, it was left to the international and local NGOs, UN agencies, and foreign aid to fill in this gap by supporting and funding Mental Health and Psychosocial (MHPS) work.

However, after the tsunami, for the first time, the need for psychosocial work was recognized at the national level. No coordination mechanism existed, and at that time, there were no Inter-Agency Standing Committee guidelines. At the local level, the preexisting and experienced primary health care and militant structures proved most effective in organizing services during the acute emergency. At the district level, spontaneous formation of committees to coordinate the psychosocial efforts (eg, the Mangrove in the east, Center for Health Care in the Vanni, and the Mental Health Task Force in Jaffna) was seen. Efforts were taken to organize mental health and psychosocial relief, recovery, and rehabilitation at the national level through the Center for National Operations Psychosocial Desk (and later, Task Force to Rebuild the Nation), Ministry of Health, Sri Lanka College of Psychiatrists, WHO, Consortium for Humanitarian Agencies, and many other organizations. However, links from the national level to the periphery, particularly in the north and east, for post-tsunami activities did not develop and the responses in the north (and east) were carried out in isolation from the well-resourced and well-funded programs at the national level.

**IMPLICATIONS AND LESSONS LEARNED**

We learned that just as disasters affect individuals, causing nonpathological distress as well as a variety of psychiatric disorders; massive and widespread trauma and loss affect family and social processes, causing changes at the family, community, and societal levels. This broader, holistic perspective becomes paramount in collectivist
cultures, which have traditionally been family and community oriented, the individual tending to become submerged in the wider concerns.\textsuperscript{48–50}

An idea of complex mental health needs at the different levels can be understood by using the WHO definition of health:

\begin{quote}
Health is a state of complete physical, mental, (familial), social, (cultural), (spiritual) and (ecological) well-being, and not merely an absence of disease or infirmity. (WHO)
\end{quote}

We have included the family (which is paramount in traditional Tamil society), spir- ituality (which is an essential part of the Tamil culture), culture, the important dimension of mental health,\textsuperscript{51} and ecology, which arises from Bronfenbrenner's\textsuperscript{52} and environmental models and systems theory that emphasize an overall holistic approach to the different levels, dimensions, and systems with different temporal trajectories, influencing each other to produce an interactive, dynamic (dys)functional whole (Table 3). The disaster itself has an impact on these systems and their interaction, and, moreover, has a temporal trajectory of its own.\textsuperscript{53,54} More recently, a growing consensus has been emerging on the need to look at these wider dimensions to understand the dynamics of the effects of disasters and to design effective interventions,\textsuperscript{55–57} even for western contexts in the aftermath of 9/11 and Hurricane Katrina.\textsuperscript{58}

Because of the widespread nature of the impact of major disasters, it may be more appropriate to use public mental health approaches to deal with affected populations. Apart from the equivocal evidence on the efficacy of individualized approaches based on medications and cognitive behavioral therapy for psychiatric conditions such as PTSD,\textsuperscript{59} the supraindividual trauma at the family and community levels in a collectivistic society would be best addressed through a community-based approach that would reach the largest population. A comprehensive and useful conceptual model (Fig. 3) for psychosocial and mental health interventions is an inverted pyramid, with five overlapping and interrelated levels of interventions prepared for UN and other disaster workers by the UN and International Society for Traumatic Stress Studies.\textsuperscript{60} At the top of the pyramid are societal interventions designed for an entire population, such as laws, public safety, public policy, programs, social justice, and a free press. Descending the pyramid, interventions target progressively smaller groups of people. The next two layers concern community-level interventions, which include public education, support for community leaders, development of social infrastructure, empowerment, cultural rituals and ceremonies, service coordination, training and education of grass root workers, and capacity building. The fourth layer is family interventions, which focus both on the individual within a family context and on strategies to promote well-being of the family as a whole. The bottom layer of the pyramid concerns interventions designed for the individual with psychological symptoms or psychiatric disorders. These interventions include psychiatric, medical, and psychological treatments, which are the most expensive and labor-intensive approaches and require highly trained professional staff. The main interventions we have used are given in Boxes 1 and 2.

Preventive medicine uses large-scale public health measures to protect populations and eradicate or mitigate causes. Much of the deaths and destruction caused by natural disasters can be avoided. This claim is even truer for human-caused (or technological) disasters and war. In many cases of natural disasters, poor and excluded communities were located in vulnerable areas, warnings were not issued or followed, or plans were forgotten. In the heat of battle, none of the protagonists maintained maps of where they laid landmines, as they are expected to do by international
### Table 3
Dimensions of health in disasters

<table>
<thead>
<tr>
<th>Dimensions of Health</th>
<th>Causes</th>
<th>Symptoms</th>
<th>Diagnosis</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Physical injury</td>
<td>Pain, fever, disability</td>
<td>Physical illness, psychosomatic, somatoform disorders</td>
<td>Drugs treatment, physiotherapy, relaxation techniques, massage</td>
</tr>
<tr>
<td></td>
<td>Infections, deficiencies, excesses</td>
<td>Somatization</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pain, fever, disability</td>
<td>Physical illness, psychosomatic, somatoform disorders</td>
<td>Drugs treatment, physiotherapy, relaxation techniques, massage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Somatization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological</td>
<td>Shock, stress</td>
<td>Tension, fear, sadness, learned helplessness</td>
<td>ASR, PTSD, anxiety, depression, alcohol and drug abuse</td>
<td>Psychological first aid, psychotherapy, counseling, relaxation techniques, cognitive behavioral therapy, testimonial therapy</td>
</tr>
<tr>
<td></td>
<td>Fear: terror, loss, trauma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>Death, disappearance, separation</td>
<td>Vacuum, disharmony, negative dynamics, violence, scapegoating</td>
<td>Family pathology</td>
<td>Family therapy, marital therapy, family support, family unity, cohesion, mutual understanding, relationships</td>
</tr>
<tr>
<td></td>
<td>Disability, poverty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>Unemployment, displacement, poverty, war, repressive ecology, genocide</td>
<td>Conflict, suicidal ideation, anomie, alienation, withdrawal, loss of communality, substance abuse, empty rituals</td>
<td>Parasuicide, suicide, violence, collective trauma</td>
<td>Group therapy, testimonio, trust, Rehabilitation, community mobilization, participatory methods, empowerment, social engineering, social cohesion, building social capital, collective efficacy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural</td>
<td>Racism, colonization, majoritarianism, cultural genocide, assimilation, domination, culture shock, acculturation stress</td>
<td>Depression, suicide Anger, violence Helplessness, despair Demoralization, crime</td>
<td>Fractured communities Drugs and alcohol Suicide, cultural bereavement, domestic violence, violence</td>
<td>Strengthening communities Cultural traditions, practices, healing rituals, ceremonies, traditional healers, elders, narrative therapy Recognition of the culture</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spiritual</td>
<td>Misfortune, bad period, spirits, angry gods, evil spells, karma</td>
<td>Despair, demoralization, loss of belief, loss of hope</td>
<td>Possession, dissociation</td>
<td>Logotherapy, rituals, traditional healing, meditation, contemplation, mindfulness, middle way, harmony</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecological</td>
<td>Disasters, pollution, climate change, loss of biodiversity, exploitation of resources, deforestation</td>
<td>Epidemics, malnutrition, starvation, stress, conflict, migration, loss of communality</td>
<td>Pandemics, disaster syndromes, ecocide</td>
<td>Sustainable development, conservation, renewable energy, environmental protection, holistic and integrative methods, equilibrium, homeostasis</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
convention, making it more difficult for demining and safe civilian resettlement. Wars and conflict can be prevented and psychosocial well-being ensured by appropriate conflict resolution mechanisms, equitable access to resources, power sharing arrangements, social justice, and respect for human and social rights. Techniques such as torture and disappearances cause long-term sequelae in individuals, their

**Box 1**

**Therapeutic interventions for disaster survivors**

1. Psychoeducation
2. Psychological first aid, crisis intervention
3. Psychotherapy
4. Behavioral-cognitive methods
5. Relaxation techniques
6. Pharmacotherapy
7. Group therapy
8. Family therapy
9. Expressive methods
10. Rehabilitation
11. Community approaches (see **Box 2**)

family, and communities,\textsuperscript{62,63} which can be prevented if international conventions, humanitarian law, and treaties are observed.

It is worthwhile planning beforehand to prevent or mitigate the impact of disasters at the community and family levels. There should be regional and international mechanisms to protect civilians in times of conflict or when powerful leaders and states overstep boundaries of good governance and observation of basic rights. Increasing powers to the UN Security Council and General Assembly to intervene with sanctions and peace-keeping forces, International Conventions and Court and the principles of right to protect\textsuperscript{64,65} are promising developments. In the long-term, there is a need to create a culture of peace by social peace building.\textsuperscript{66}

REFERENCES


