

# The Great East Japan earthquake in 2011; toward sustainable mental health care system

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In face with a triple disaster of earthquake, tsunami and nuclear power plant accident, the degrees of which are historically hardly preceded, immediate mental health countermeasure was taken by the initiative of the national and local government together with academic and clinical organizations. Based on previous experience of natural disasters, more than 50 mental health care teams have been organized and dispatched to the affected areas, scheduled by the Ministry of Health, Labor and Welfare. When 6 months have passed, the acute and temporal support system should be replaced with more sustainable local networks with aims at promoting resilience, though community psychiatric service should be developed as well. Existing guidelines should be respected but actually it tended to be only partially recognized. In Fukushima prefecture, where nuclear plant accident occurred, its mental health impact is most concerned and long-term follow-up of the residents' health has been being planned.

**Key words:** Earthquakes, mental health, natural disasters, post-disaster intervention planning.

## Outline of the disaster

At 14:46 local time on Friday, March 11, 2011, an unprecedented magnitude 9.0 earthquake occurred off the Pacific coast of northeastern Japan (the so-called Tohoku region), including Iwate, Miyagai and Fukushima prefectures, and the ordinance-designated city of Sendai, located within Miyagi prefecture. According to the Japan Meteorological Agency, the epicenter was located 130 km off the Oshika Peninsula and 24 km below sea level. A number of aftershocks followed, the largest one being of magnitude 7.7 occurring on the same day, followed by 6 quakes of magnitude 7 or more, 96 of magnitude 6 or more and 579 of magnitude 5 or more. Quakes of lesser magnitude occurred almost everywhere across the Japanese archipelago.

Historically, the affected areas had always been prone to major seismic events; the oldest record dates back to 879, when an earthquake with an estimated magnitude of 8.6 occurred, based on geological surveys. In recent years, magnitude 7–8 quakes also occurred in 1896, 1933 and 1968, all accompanied by tsunami. Therefore, it was assumed that local governments and inhabitants would have been well prepared for any tsunami disaster, having conducted escape training and building seawalls that were considered capable of withstanding waves several meters high.

The Meteorological Agency issued a tsunami warning as soon as 20 min after the initial major quake, but failed to appreciate its actual extent, which could not be measured adequately with ordinary equipment. The height of the tsunami was far beyond what had been anticipated, reaching 9.3 m in the Soma region of Fukushima and 8.5 m at Miyako city in Iwate prefecture, swallowing fields, houses and people. Some locals had placed such trust in the seawalls that they did not take immediate action to escape to higher ground. Others took refuge on the top floors of shore-front buildings in accordance with training instructions, but were engulfed by the tsunami.

## Initial response

With regard to mental health countermeasures in the acute phase, the main issues of concern were the continuation of previous psychiatric services and the supply of necessary medical drugs, as well as the treatment of acute mental disorders such as panic, delirium or acute stress reaction. Such issues were complicated by extensive disruption of the infrastructure by heaps of debris, making it difficult to supply gasoline, fuel and vital supplies. For these reasons, even local government officials had considerable problems getting into the affected coastal areas 100–200 km away.

All these factors made the community psychiatric services very fragile. Some hospitals had collapsed, or sufficient staff could not commute to them, making it impossible to continue inpatient services, or for

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outpatients to attend. Few community-based mental clinics were in place, and long-stay psychiatric hospitals were the main facilities of psychiatric care, in addition to a few psychiatric sections of general hospitals. The situation was particularly grave, as Tohoku was already known to have some of the highest rates of suicide and seasonal depression in Japan, and the area had been the focus of an active national suicide prevention strategy.

Immediate countermeasures following the disaster included dispatching mental health teams to the affected areas, based upon previous experiences after the Hanshin-Awaji (Shinfuku, 2002) and Niigata earthquakes (Shioiri, 2010) in 1995 and 2004, respectively. These teams comprised psychiatrists, nurses, psychologists, and/or social workers, many of whom initially travelled in land cruisers, equipped to be self-sufficient and self-supporting, and to provide medication and services for psychiatric outpatients whose treatment had been interrupted. Their activity was hampered by a lack of access to medical records, and also the fact that many of the patients' family members had been victimized in the disaster, or pharmacology prescription books lost along with the destruction of their homes. The teams regularly stayed on site for a week, but dispatching centers such as hospitals and institutions located in distant areas tried to rotate their own teams to maintain some form of continuity, which meant that such services were actually ongoing for several months after the disaster.

The transfer of psychiatric inpatients from mental hospitals that had been destroyed was also a major problem; three psychiatric hospitals in Miyagi prefecture had collapsed, and five near the Fukushima nuclear power plant had been closed for fear of radiation contamination. In this situation, the Ministry of Health, Labor and Welfare of Japan (MHLW) took the initiative and transferred around 1000 inpatients to nearby hospitals within the same or distant prefectures within a week.

Insufficiency of medical drugs due to transportation difficulties or damage to chemical plants in the affected areas was also a problem. The shortage of antidepressants and anti-convulsants was particularly serious, and resurgence of epileptic seizures was a concern. The MHLW and the Japanese Society of Psychiatry and Neurology played an organizing role and re-allocated the transportation of such drugs, restricting their use in other areas, especially around Tokyo, and systematically distributing them to the affected areas, despite problems with transport for a while.

### Policy of mental health care

The disaster highlighted differences in opinion among mental health professionals, or even among ordinary

volunteers, as to what should constitute post-disaster mental health support and intervention. In Japan, the euphemism *kokoro no keaa*, literally 'care of the spirit', has become widely used since the time of the Hanshin-Awaji earthquake to signify both psychiatric primary and secondary prevention as well as mental health promotion, mainly to avoid generating any stigma against psychiatric intervention. Such ambiguity is often related to a conviction that active listening to stories of traumatic experiences and letting people express profound fear and sorrow is an effective way of preventing a long-term traumatic response, medically referred to as post-traumatic stress disorder (PTSD).

This conviction has been conceptualized as psychological debriefing (Everly & Boyle, 1999), a technique introduced to Japan at the time of the Hanshin-Awaji earthquake, with a claim that it should be performed within 36 hours or so to effectively prevent the future development of PTSD. This led to confusion among care providers and proved to be a waste of resources that could instead have been used to tackle a broader range of stress-related reactions. During the years since the Hanshin disaster, a number of studies and reviews have repeatedly disproved the value of psychological debriefing (Rose *et al.* 2009). As early as 2004, the Japanese national guidelines for post-disaster local mental health urged caution against psychological debriefing, in line with later international guidelines such as those from the National Institute of Clinical Excellence. Although psychiatrists and mental health care providers in Japan have reached a consensus on this issue, we still hear someone claim the effectiveness of trauma dialogue in acute phase and criticize others who do not do so.

### Mental health care team

A number of mental health care teams were voluntarily organized and went to the affected areas, in a manner similar to the response at the time of the Hanshin-Awaji and Niigata earthquakes. Because the disaster involved several prefectures, the dispatch schedule was organized by the MHLW immediately after the disaster. As of September 1, 2011, 57 teams (3143 professionals) had been dispatched to work in collaboration with local mental health professionals to continue pre-disaster psychiatric services, and also to provide on-site treatment of acute stress reactions including delirium and acute stress disorder, although the majority of the affected people they saw remained within subclinical level. They also provided psychoeducation on an outreach basis at communal shelters. Most teams responded following the policies of the

Japanese guidelines for post-disaster community mental health, issued in 2004 mentioned below.

### Information provision

Provision of information was enormously important after the disaster to avoid confusion, not only among those affected but also among care providers. We had developed the Japanese guidelines for post-disaster mental health care in 2004 (Kim *et al.* 2004), with an emphasis upon resilience and watchful waiting in the acute phase, incorporating brief psychological first aid, much earlier than subsequent guidelines or manuals that had stressed similar factors. The guidelines were distributed to local governments and prefectural mental health centers, to serve as a uniform background for post-disaster mental health care provision. To reinforce the information, in the 3 days after the initial earthquake, the National Center of Neurology and Psychiatry launched a website for disaster-related information (National Center of Neurology and Psychiatry, Japan, 2011), containing more than 20 documents, manuals, assessment sheets, educational slides, etc. The Japanese Society of Neurology and Psychiatry, and the Japanese Society for Traumatic Stress Studies, worked hard to provide effective information as well, together with other academic and clinical bodies. The details of the initial response have been reported elsewhere (Kim & Akiyama, 2011a).

### Toward mid-term care provision

Now that more than 6 months have passed, mental health care teams are now pulling out, and there is serious discussion about how local resources can respond to any additional mental health needs resulting from the disaster, and the most suitable transition strategy. The problems currently being assessed are those related to prolonged reactions, which go beyond the level of a normal reaction, and more complex forms of disaster-related problems in addition to pre-existing ones. Overall, tolerability to stress has fallen at both the individual and community levels, and more serious cases have emerged in communities. The stigma against psychiatry and mental disorders mentioned above has been a problem, especially where psychiatric services have been offered predominantly at long-stay psychiatric hospitals.

In the recovery phase, although we anticipate that people's lives will recover, health-related and social disparity will persist for a long time. When temporary housing has been built and people have moved in, there will be a risk of personal isolation, and thus a risk of delayed recovery. The functions of hospitals

and clinics providing mental health care are becoming normalized, and prefectural governments have laid out a recovery plan for mental health services. The central government is now discussing revision of the budget plan to encompass most of the health-related programs. Local psychiatrists have reported that they have seen a surge of new patients in the last 6 months, a large proportion of whom have been from hospitals whose functions have been hampered by the devastation. Although at hospitals and clinics no increase of patients with depression or PTSD has been recognized so far, there have been more new patients with dementia whose cognitive and daily life function have worsened while attempting to adjust to the new lifestyle in shelters or temporary housing. In some areas, a stigma against mental health care has persisted at conventional psychiatric hospitals. Analysis of the records of mental health teams is still on the way, but the interim report from a seriously affected city shows that sleep problems and anxiety were initially predominant, and the number of those affected remained large. However, as time has passed, there has been an increase in the incidence of depression, alcohol problems, and grief.

The MHLW has formulated a recovery plan for mental health services. At the local level, discussions have started about the most appropriate form of community care to offer. A shift to community mental health has been emphasized, and the MHLW has relaxed an implementation policy of the community-based care of mental and social difficulties, at the same time building up 'outreach promotion program' or even establishing mental clinics themselves in those areas where psychiatric services had been very poorly equipped.

Another important issue is suicide. The affected area was already known to have a high suicide rate, even before the disaster. Past research has shown that suicide does not increase among the general population after massive disasters. However, it will be necessary to observe any future trends from now on, in view of the possible increase in depression and disillusionment about the recovery process, and the widening disparity of individual situations in the coming winter. Among local professionals, training of community workers and volunteers in mental health literacy and appropriate first aid has been discussed, along with levels of professional staffing, as the chance of adding any more mental health professionals to the current service is very slim.

### IASC guideline

In a wider international context, many exemplary models and lessons learnt have been compiled by major agencies and international NGOs over the last

several years, and a consensus in the form of the IASC guidelines was published (Inter-Agency Standing Committee, 2007). The World Psychiatric Association (WPA) was also committed to have psychiatrist be more involved in disaster response, and 2009, WHO and WPA held a workshop for selected psychiatrists to disseminate this guideline. Unfortunately, the guidelines have not spread globally, even among mental health professionals, as exemplified in a recent report (McCurray, 2011). We would like to again emphasize the importance of evidence and collective wisdom for a coordinated response to mental health needs, while respecting local resources (Suzuki & Weissbecker, 2011; Kim & Akiyama, 2011b).

The IASC guidelines highlight the coordination of services in the form of a service pyramid. To offer professional help effectively, we have to build on basic services, community resilience and collaboration with primary care. In Japan, public health nurses play an extremely important role as gatekeepers for persons at high risk, and prefectural mental health centers have played a major role in coordinating the work of these nurses.

The guidelines include a list of dos and do nots for disaster response operations. The following is an illustrative example of what has been unfolding following the recent disaster. First, it recommends establishing one overall coordination mechanism or group for mental health and psychosocial support. In this connection, the Japanese Society of Psychiatry and Neurology (JSPN) served as such a coordinating body for professional organizations at the national level and took steps to advocate mental health issues as a single voice, as recommended in the guidelines. Second, the importance of recognizing that people are affected by emergencies in different ways is emphasized. More resilient individuals may function well, whereas others may be severely affected and may need specialist support. However, some media focused mainly on severe traumatic reaction, and reported that there was a dearth of skilled therapists of trauma in the affected region. Third, the guidelines recommend asking questions in the local language(s) in a safe and supportive manner that respects confidentiality. In this recent disaster, a flood of care givers and researchers rushed from outside regions to ask about psychological reaction, neglecting local manner of expressions and copings, or even ignoring ethical procedure. The JSPN expressed serious concern about any survey without adequate ethical consideration, stating that it would cause additional distress to the participants, and in fact released statements to this effect (The Japanese Society of Psychiatry and Neurology, 2011).

To implement the IASC guidelines effectively in Japan, we had conducted a Delphi process to build

consensus among Japanese mental health experts who have had rich experience in disaster response. Our team had developed a manual that follows the principles of the IASC guidelines tailored to Japanese health and social structure and culture.

### **Fukushima nuclear power plant accident**

The tragedy was exacerbated by the accident at the Fukushima 1 nuclear power plant. The plant was automatically shut down in response to the earthquake, and a preset plan to cool down the reactors was initiated using emergency electrical generators. However, as these were located at ground level, they were engulfed by the tsunami, causing a total loss of emergency electricity. Unable to initiate the cooling process, the inner temperature of the reactors surged, followed by explosions due to hydrogen gas that had built up within the containment buildings, releasing radioactive substances into the air. Now it has been revealed that a level 7 meltdown had occurred at an early stage. In response to the leak of radioactive materials, the government ordered the evacuation of all inhabitants living within 3 km of the plant. The fragile or aged were carried out by the Japanese Self Defense Force, and people living within a 20-km radius were recommended to evacuate. The cooling down of the plant took several months, and radioactive contamination was found repeatedly, not only in Fukushima but also adjacent prefectures, although the levels rarely reached health-threatening levels.

In a review of the consequences 20 years after the Chernobyl accident disasters, the WHO concluded that mental health was the most serious public health problem (Bennet *et al.* 2006). A recent study (Kim *et al.* 2011) shows that psychological exposure to Nagasaki atomic bomb explosion, without substantial health harming radiological exposure, generated prolonged distress after half a century and the poor information provision was correlated. A study after Chernobyl has shown that diagnosis of depression and PTSD increased among clean-up workers 18 years after the accident (Loganovsky *et al.* 2008). Fukushima prefectural government and mental health professionals are seriously concerned about mental health problems among residents. As yet, the problems observed include anxiety about the health effects of radiation, and its effect on children, lifestyle, community and economy, most of which remain within natural reaction to the situation and thus do not need to be medicalized. In Fukushima, a long-term health survey including mental health assessment is being prepared together with supporting measures.

A sense of losing control over their lives and being powerless is another issue of concern (International Atomic Energy Agency, 2006). In order to empower local people again, it will be important to not merely offer services or health check-ups, but also to help them make their own decisions and take action based on sound information. Also, the health community must exercise more dialogue with local inhabitants to get them more actively involved. Mental health is a good agenda for encouraging this kind of response, because mental well-being is everyone's business and optimizing it is universally paramount.

### Conflict of interest

None.

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