Editorial

Fukushima, Mental Health and Suicide

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On March 11 in 2011, a huge tsunami struck the Tohoku area in Japan. The extensive damage to Fukushima Prefecture was further compounded by the severe accident of the Fukushima Daiichi Nuclear Power Plant (FDNPP). Specifically, the cooling system of the FDNPP was destroyed by the tsunami, leading to several explosions in the reactor buildings and subsequent massive diffusion of radioactive substances. The Japanese government decided to evacuate approximately 488,000 residents living within a 30-km radius of the FDNPP in the first 5 days after the accident. In spite of the gradual lifting of living restrictions within the evacuation zone, opinion surveys conducted by local governments showed that numerous former residents hesitated to return to their hometowns owing to fear of exposure to radioactivity, the delayed reconstruction and decontamination processes, and unclear future of their hometown. For example, in Naraha, a municipality where the entire territory was placed under evacuation orders since 2011, the government recently lifted the living restriction. However, an opinion survey of evacuees conducted by the Naraha government office about the question of return revealed that only 8 per cent wished to return as soon as possible.[1] To date, over 100,000 people have not returned to their homes in Fukushima Prefecture. Moreover, three types of discordance arose in Fukushima [2], each of which has led to dissonance within both families and the community: family members having different

opinions on the physical risk induced by radioactive exposure, interfamilial conflicts caused by differences in residential restrictions or compensations, frustrations between evacuees and people living in areas nearby about returning (e.g. Iwaki City). [2]

Fukushima Medical University (FMU) conducted a population-based survey of approximately 210,000 original residents living in the evacuation zone using self-administered questionnaires one year after the disaster.[3] The survey found that 65.7 % of the respondents had relocated more than three times since the disaster and 39.2 % of families had been separated.[3] Furthermore, 21.6% had possible post-traumatic stress disorder (PTSD) and 14.6% had probable depression.[3] These prevalence rates were considerably higher than those of the general population of Japan even 4 years after the disaster.[4] Compared with other prefectures affected mainly by the tsunami, such as Iwate or Miyagi Prefecture, the mental health problems in Fukushima evacuees seemed to be more complex and included not only PTSD and depression, but also chronic anxiety and guilt, a global sense of loss, separation of families and communities as described above, and both public and self-stigma.[2]

Suicide is another public health issue of growing concern in Fukushima. The rate of suicide in Fukushima Prefecture exceeded the average rate for Japan even before the Great East Japan Earthquake and Tsunami. After the 2011 disaster, the standardized

suicide mortality ratio decreased initially (108 in 2010, 107 in 2011, 94 in 2012, and 96 in 2013) but then rose to 126 in 2014, thus exceeding the pre-disaster level.[5] In addition, despite the occurrence of less damage from the tsunami in Fukushima, the number of disaster-related suicides is much higher than rates in other prefectures sustaining greater damage from the tsunami (Japanese Cabinet Office, 2015). We note that the determination of "disaster-related" is made by a very rigorous process at the local governmental level (e.g. verification of evidences such as a last note or a statement of the bereaved), as it is necessary for approval of monetary compensation.

The patterns and mechanisms explaining the associations between natural or manmade disasters, and suicide and suicide-related behavior (thoughts, plans) are complex. Kölves et al. reviewed 42 empirical studies and found that the pattern was not consistent across disasters.[6] In some instances, the rate of suicide and non-fatal suicide behavior initially declined, as occurred in Fukushima (an effect thought to occur during the post-disaster "honeymoon phase"), and then was followed by a delayed increase.[6] Matsubayashi et al., examining the relationship between the severity of natural disasters in Japan and the suicide rates using prefecture-level panel data between 1982 and 2010, further found that a decrease in suicide was only found after less destructive disasters, while massive disasters tended to be associated with an increased

rate.[7] They attributed this difference to a weakening connectedness of social ties among community members. In contrast, little is known about suicide behaviors following manmade disasters. To the best of our knowledge, the only studies to date reported an excess in suicide 3 years and 7+ years after Chernobyl among clean-up workers from Estonia.[8, 9]

With regard to relationship between disasters and suicide behaviors, Kölves et al. advocated for long-term monitoring of mental health after these events.[6] FMU and other local programs have embraced this aspect of health programming and have provided multiple, pro-active mental health programs (e.g., phone and visit services, or educational and self-help group meetings) to the population. The initial decrease in suicide in Fukushima may reflect the activities of these programs, though the lagged increase suggests that more needs to be done.[5] There are many difficulties that the Fukushima people are facing: delays in and lack of clarity regarding benefits; ongoing rumors and public stigma about radiation; distrust in government, management, and even medical authorities; and friction among community members stemming from different risk perceptions of radiation. These psychosocial factors, which serve to reduce pre-disaster community bonds and resilience, contributed to PTSD and depression, which are critical risk factors for suicide.

106 To prevent suicide or other self-destructive behaviors such as excessive drinking,
107 we are trying to establish new facilities and care networks providing targeted psychiatric
108 interventions as well as to enhance existing resources. For example, the FMU mental
109 health survey department has a team providing telephone intervention for survey
110 responders at risk of PTSD, depression and anxiety disorders.[10] Furthermore, a new
111 facility (the Fukushima Center for Disaster Mental Health) with 40 staff consisting of
112 psychologists, social workers and district nurses has been actively working in the
113 disaster area since 2012. It is providing outreach services, including psychological
114 assessment and psychoeducation, and is becoming a core organization in the care
115 network system in Fukushima. The long-term goals of these new programs are to
116 improve mental health and prevent suicide in Fukushima.
117 There are four important challenges that remain. The first is the need to clarify the
118 risk factors for suicide in Fukushima so that targeted prevention programs can be
119 designed. Case-control studies built on psychological autopsy methodology would help
120 fill this gap. The second is insufficient number of staff working with the affected
121 population of Fukushima, and a situation that has resulted in staff burn-out.[2] The third
122 is to provide intensive care focusing on people vulnerable to suicide, especially middle-
123 aged male unemployed. The sudden increase of the suicide rate in Japan from 1998

occurred mainly in middle aged males and was conceivably related to a major change in the employment system. [11] Finally, we should point out that people's stigma against psychiatric disorders is still strong in Japan.[12] Thus, Fukushima people often hesitate to receive psychiatric treatment, even if urgently needed. In order to provide effective interventions for people at risk of suicide, further efforts to dispel the stigma is needed.

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