

Lessons From the East Japan Earthquake Disaster

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On March 11, 2011, Japan suffered the triple earthquake-tsunami-nuclear disaster that remains deeply embedded within the minds of not only the people in Japan but also those of the rest of the world. A massive earthquake with a magnitude of 9.0 on the international Richter scale, with a seismic origin off the coast of Miyagi Prefecture, was followed by a massive tsunami and the consequent accident at the Fukushima Daiichi Nuclear Power Plant of the Tokyo Electric Power company. More than 20,000 people were killed or injured and, in addition, many survivors are still living in refuges or taking shelter with friends or relatives in other parts of Japan.

Disaster Medical Assistance Team (DMAT) members played an active role during the first week after the occurrence of this disaster, and search and rescue operations were conducted by many people including doctor-helicopter teams dispatched from various parts of Japan, the Self-Defense Forces (SDF), and US armed forces stationed in Japan. Subsequently, medical activities were taken over by Japan Medical Association Team (JMAT) members dispatched from around the country by the Japan Medical Association (JMA). These teams took charge of managing patients with chronic diseases and primary emergency medical services, and provided support until the local medical care system had been restored. In areas where nursing care or welfare service facilities for the elderly were severely damaged, problems related to patient transportation and acceptance were highlighted. Hospitals that were lightly damaged and maintained functions for providing medical care were

overwhelmed with patients coming from neighboring areas, and could not provide tertiary medical care, necessitating transport of some patients to distant facilities.

After the disaster, relief supplies were sent to affected areas from all over the country. However, the system for supplying materials to refuges and institutions was inadequate because communication systems were nonfunctional and no means of transport was available. In particular, it is apparent that special considerations for vulnerable people such as the elderly, infants, pregnant women, and the physically disabled were lacking.

While Japan is known to be a highly quake-prone country, this disaster was the strongest earthquake since modern seismic recording became available and the nuclear power plant accident was unprecedented. In addition, flaws in hazard-resistant power plants built based on data from past massive earthquakes raised the issue of the subsequent extensive radioactive contamination. Namely, the electric power company had viewed research on such past earthquakes as having little scientific basis, and neglected the advice of seismologists. Damage from the disaster was amplified by this ill-conceived attitude of the electric power company combined with errors in machine operation by personnel at the nuclear power plant.

Because this triple disaster occurred in early spring, there was major concern about the health status of disaster victims. Specifically, efforts to prevent, to the maximum extent possible, epidemics of influenza, pneumonia, acute gastro-

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enteritis, and so on, were necessary. Not only disaster victims but also all individuals involved in rescue work inevitably suffered cumulative physical and mental fatigue. Furthermore, the vague fear of radioactive contamination of agricultural and marine products continues to weigh heavily on peoples' minds. An off-limits zone was set around the nuclear power plant in Fukushima Prefecture, and this still prevents many residents from returning to their hometowns.

This disaster prompted people to learn about not just the primary industry but various other industries of the Tohoku district that had been supporting the life of the people. In the affected areas, the lifeline was destroyed. This caused a significant delay in recovery of the manufacturing bases of companies, and interrupted material flow still significantly impacts the whole country. As if all of Japan were a certain creature, damage in a part of the country is affecting the entire nation. This disaster caused increases in corporate bankruptcy and jobless/displaced workers, resulting in further deceleration of economic activities. After the disaster, the number of welfare recipients increased, exceeding 2 million nationwide. While more than 30,000 suicide victims per year have been reported since 1988, suicides related to the disaster have recently been reported, indicating the need for continuous mental health support in the future.

Another concern is the future of disaster orphans. The number of children who lost both parents in this disaster exceeded 500, and more than 16,000 children lost relatives, including some who lost one of their parents, brothers and/or sisters. Psychological as well as overall support for these children is urgently needed.

Along with recovery of the local infrastructure, restoration of the primary healthcare system is urgently needed. This means maintenance of the bases of healthcare services and cooperation among them. Considering the importance of primary care, health control of the general public and management of patients with chronic diseases represent the main roles of the healthcare bases. If there had been a good understanding of possibly vulnerable people in the community and pre-planned actions for such individuals, healthcare services at the time of the disaster could have been provided more smoothly. Careful considerations regarding daily living needs

are required in refuges. For instance, mental and physical stress from prolonged stays in such refuges as well as privacy protection for females, including dressing and breast-feeding, should be taken into account.

Preventive vaccination is also important. The current system of preventive vaccination should be improved by including pneumococcal vaccination in the elderly and preventive vaccinations in infants against cerebral meningitis due to pneumococci or *Haemophilus influenzae* type b in addition to conventional vaccination programs.

Securing of medical goods and the route of distribution were also significant issues. This time, pharmacists worked with the JMAT members, and their participation not only enabled drugs to be selected for patients with chronic diseases in disaster areas, but also helped minimize exacerbation of diabetes mellitus, cardiac disease, hypertension, chronic kidney disease, etc.

Long-term health surveys on radiation disease and studies of the impact on the environment are required henceforth. Using the knowledge obtained from the Chernobyl nuclear power plant accident in the former Soviet Union and the Three Mile Island accident in the US, and adding the results of careful studies conducted in Japan, the conventional disaster prevention plan should be reviewed and radically overhauled as soon as possible. Because Japan is the only country in the world to have suffered atomic bombing, our experience should be used to establish measures for preventing or reducing nuclear disaster, in order not to pass these problems to the next generation.

On the other hand, we should express our gratitude for the surprisingly enormous support from overseas. The profound support given by people around the world comforted and warmed the hearts of the afflicted to an immeasurable degree. Although the author formerly thought that rescue crews from overseas would be difficult to accept in an island nation like Japan, this was not the case. The US armed forces stationed in Japan joined Japan's SDF in search operations for missing people, and supported measures against radioactive contamination. Israeli teams brought medical care facilities with them to support provision of vital medical services. Support from various countries is continuing. Support from countries with different languages and cultures must have enormously encouraged people

beaten down by the disaster. However, good intentions of physicians from some countries were unfortunately wasted due to the lack of cross licensing with Japan.

Taking a cue from the nuclear power plant accident, such watchwords as “energy saving” and “eco-friendly” have frequently been used throughout Japan. People began to reduce electricity consumption as much as possible, using a higher temperature setting for air conditioners to minimize electricity use during the summer. The public began to focus on energy consumption and the resurgence of thermal and hydraulic power generation is now being discussed. Japan has few resources. Therefore this country imports energy from various parts of the world, relying on its own economic power. The triple disaster destroyed the electric power supply, a major economic base. This gave us

an opportunity to review our energy-consuming lifestyle.

Although it is easy to express the anti-nuclear power generation, fully decommissioning the nuclear reactor will require a huge amount of money and several dozens of years. Instead, improvements for safer and more efficient nuclear plants might be more achievable by Japan’s high-level science and technology.

After an earthquake disaster like this, how a new civilization is to be built on that destroyed is questioned. The disaster taught us how fragile and susceptible to nature’s forces the structures built by human beings are. In order to build the new civilization, in which human beings live side-by-side with nature, we must now move forward while continuing to consider it. In this regard, the world’s people are watching and learning from the recovery of Japan.