

# Japan Earthquake 2011 and Fukushima Nuclear Accident

## —Experience and physicians and veterinarians collaboration to recover—<sup>\*1</sup>

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### Great East Japan Earthquake and JMA's Responses

On March 11, 2011, earthquakes with the maximum magnitude 9 struck Japan. This Great East Japan Earthquake induced a massive tsunami and subsequent explosions at the Fukushima Daiichi Nuclear Power Plant, causing extensive damage. Many residents were forced to evacuate (**Fig. 1**).

The top priority in disaster is the protection of human lives and the health problems of disaster victims. The lives and health of the victims must be protected at each stage in disaster response, from immediately after a disaster strikes until it is fully contained.

To support medical care directly, Japan Medical Association (JMA) dispatched emergency medical teams called JMAT and cooperated on postmortem examinations. JMAT, which stands for Japan Medical Association Team, is a disaster medicine program of the JMA. Indirect support includes public health and infection control management at shelters, and transport of drugs to the affected areas. For example, to support the reconstruction of community medicine, we requested public financial aid and collected and allocated donations.

In addition to the JMAT, JMAT II was also sent to provide more extended health management and to supplement medical care in the

affected areas suffering from physician shortages. When adding both JMAT and JMAT II together, about 2,600 teams consisting of 11,000 members were dispatched.

The mission of JMAT was to provide medical care in disaster areas, by offering medical support at first-aid stations, clinics, and hospitals in the affected areas. Each JMAT typically consists of one physician, two nurses, and one administrative staff, and was deployed for three days to one week.

**Figure 2** shows the division of roles between DMAT and JMAT. DMAT, which stands for the Disaster Medical Assistance Team, is a medical team specially trained in acute disaster medicine with mobility. DMATs are dispatched by governments and responsible for healthcare in the hyper-acute phase of a disaster, that is the initial 48 hours. JMAT takes over after DMAT withdraws, to support medical care of the affected areas over extended period until community medicine is restored. JMA functions as a coordinator between prefectural medical associations that dispatch or receive JMAT.

**Figures 3 and 4** show the status of JMAT dispatches. The dispatch started immediately after the earthquake, and reached a peak from April to early May. On April 10 alone, a hundred teams were dispatched.

As a response to the nuclear accident, we created and distributed a map with actual radio-

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### Great East Japan Earthquake

- Date and Time: 14:46 JST or 5:46 GMT. Fri., **March 11, 2011**
- Epicenter: Off the Sanriku coast in the Tohoku area
- **Magnitude: 9.0**, Maximum Seismic Intensity: 7, in Kurihara City, Miyagi
- Type of Earthquake: Underwater earthquake
- Human Toll: 15,690 dead, 4,735 missing, 5,714 injured (as of Aug 11, 2011)
- Features:
  - Giant **Tsunami** hit an area stretching 500 km (310 mile) on the Pacific coast.
  - Serious accident occurred in reactors 1 to 4 at **Fukushima Daiichi Nuclear Power Plant**.
  - Afflicted areas experienced shortages in the supply of basic goods and food.



Japan Medical Association

Fig. 1

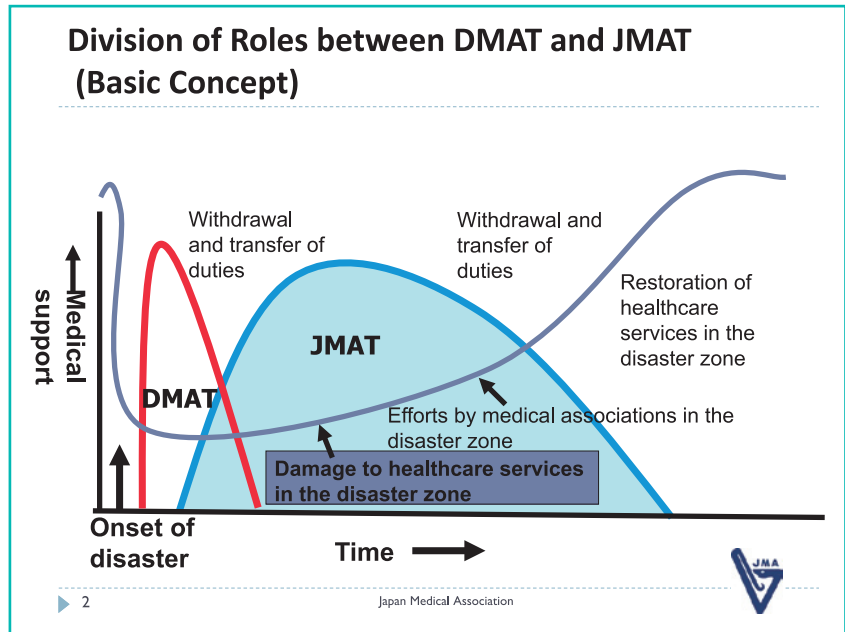


Fig. 2

activity readings in Fukushima every day. The map was referred to when dispatching JMATs to Fukushima. On April 19, the Ministry of Education, Culture, Sports, Science and Technology (MEXT), tentatively set the level of 20 milli-sievert per year as a radiation safety standard for

infants and children to be used for school grounds and buildings in Fukushima. They increased the standard from the original limit of 1 milli-sievert of exposure to 20 milli-sievert. So, the JMA immediately submitted a petition to the MEXT, asking for actions to minimize radia-

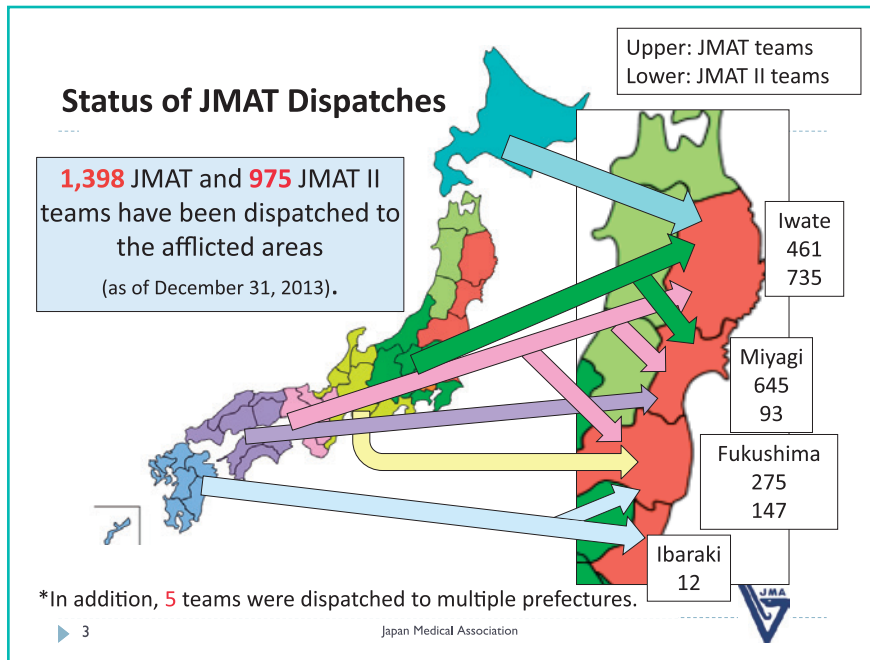


Fig. 3

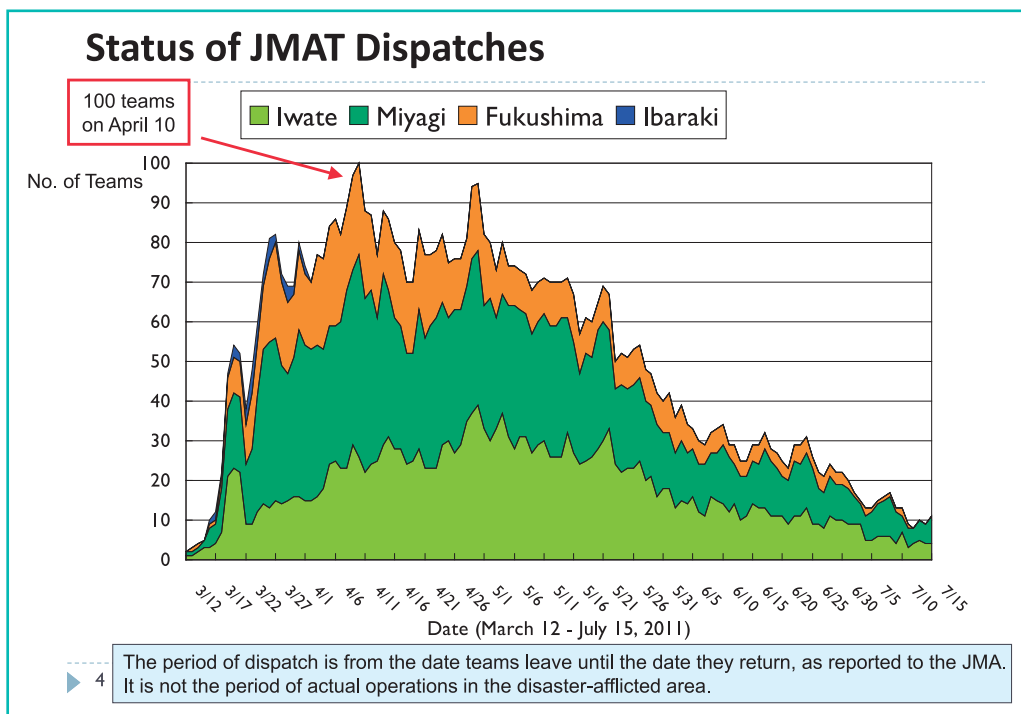


Fig. 4

tion exposure. After that, the MEXT withdrew the new recommendation.

Disaster medicine requires “crisis management” rather than “risk management.” Physicians who join JMAT are trained in wide-range of medical fields and serve local people as *kakaritsuke*<sup>\*2</sup> physicians every day. That is why JMAT was able to meet the local people’s health needs in the affected areas. JMAT activities are comprehensive medical activities. Its foundation lies in the origin of medicine that transcends fragmented domains of modern medicine. As long as this origin is shared, and when times and places are properly coordinated at disaster sites for community medicine, those involved would realize that all of their expertise and activity styles that vary among team members were actually needed.

In the aftermath of the March 11 earthquake, the JMA took a central role in establishing the Disaster Victims Health Support Liaison Council

consisting of major organizations involved in healthcare and long-term care (Fig. 5). The JMA President served as Chairman of the Council, and the JMA acted as Secretariat for the Council. This Council’s mission was to gather and organize information obtained from governments and healthcare organizations.

When the disaster struck northern Japan in 2011, normal Internet connection failed to function sufficiently. For that reason, JMA started investigating the use of high-speed Internet satellite “Kizuna” developed by the Japan Aerospace Exploration Agency (JAXA). On January 30, 2013, the JMA and JAXA concluded an agreement on the experimental application of Kizuna in disaster medical activities. The purpose of the agreement is to investigate how to use Kizuna in disaster countermeasures when a large-scale disaster has occurred, and to jointly conduct experiments relating to the application of the satellite in disaster medical support activi-

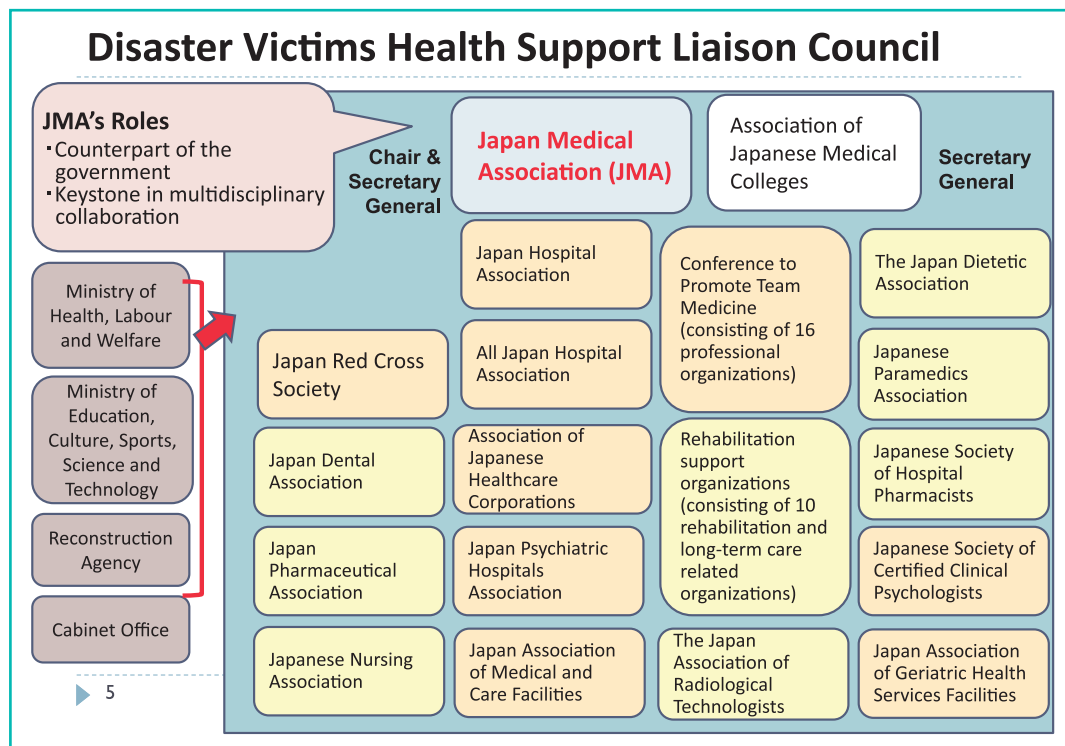


Fig. 5

\*2 *Kakaritsuke* physician is a physician who people can consult on any issues, is well versed in the up-to-date medical information, can refer a patient to a specialist or specialized medical institution when needed, and is a trustworthy and familiar figure with comprehensive capabilities entrusted with community medicine, health, and welfare.

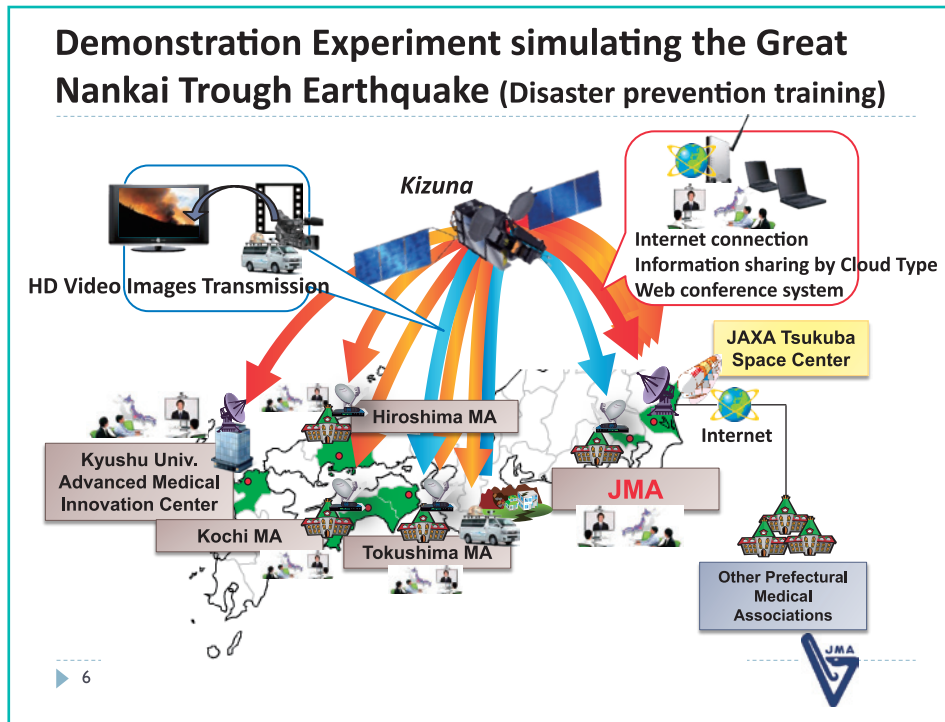


Fig. 6

ties on December 10, 2014.

In 2013 and 2014, experiments simulating the anticipated Great Nankai Trough Earthquake were conducted as an emergency drill, with the cooperation of the JAXA and National Institute of Information and Communications Technology (NICT) (Fig. 6). The Great Nankai Trough Earthquake is anticipated to cause extensive damage to extremely wide areas. In this training, we communicated with the affected areas through a Web-conference system using a satellite Internet channel, to share damage status and medical data over the cloud, and to request JMAT dispatch to prefectural medical associations. We will conduct a series of similar trainings from now on.

### Providing Seamless Care in the Community-based Comprehensive Care System

As Japan approaches a super-aged society, in order to establish disaster-resistant healthcare

provision system, the system must incorporate community-based comprehensive care that places geriatric care as the main focus in daily practice. JMA strives to enrich and strengthen the *kakaritsuke* physician’s function to realize sustainable medicine that the people of Japan can safely rely on.

Figure 7 shows the framework of “seamless medical and long-term care,” in which *kakaritsuke* physicians play the central role. Figure 8 shows the framework of the Community-based Comprehensive Care System. The needs of an elderly person will shift along with the red diagonal line. Anticipating possible needs at each stage will help secure medical and long-term care resources comprehensively.

For this reason, JMA requested the national government to bear the financial burden, which led to the General Security Fund for Community Medicine and Long-term Care with 90.4 billion yen\*3 (USD 752 million) for medicine and 72.4 billion yen (USD 602 million) for long-term care. Using this fund, we will do our best in support-

\*3 1 USD = 120 yen (as of May 12, 2015)

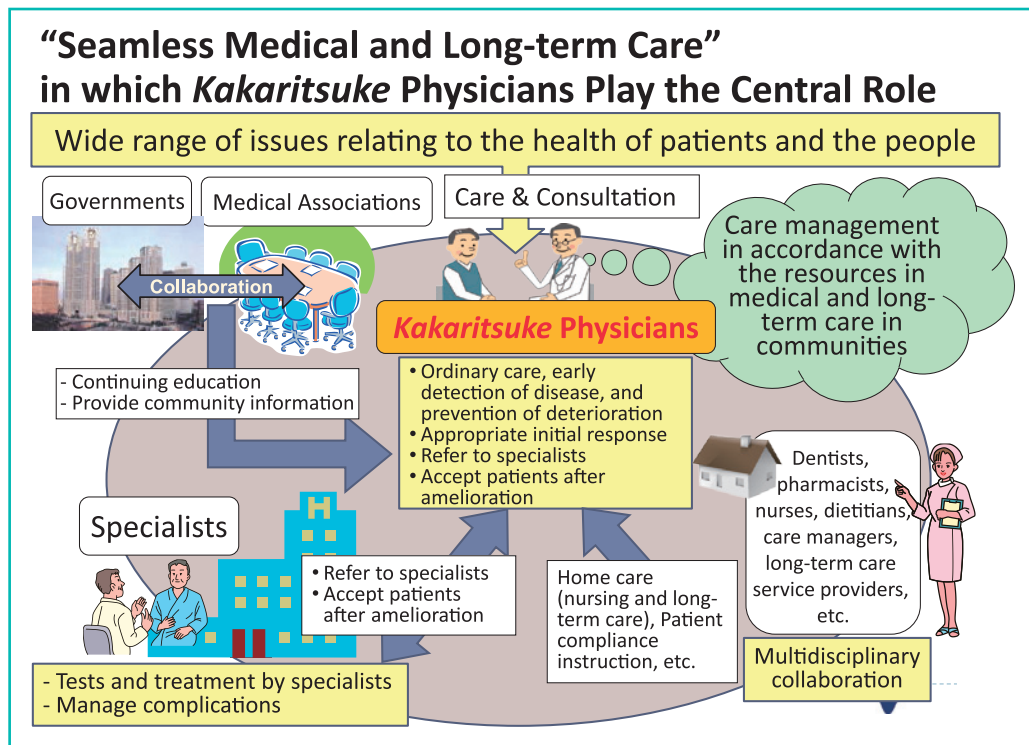


Fig. 7

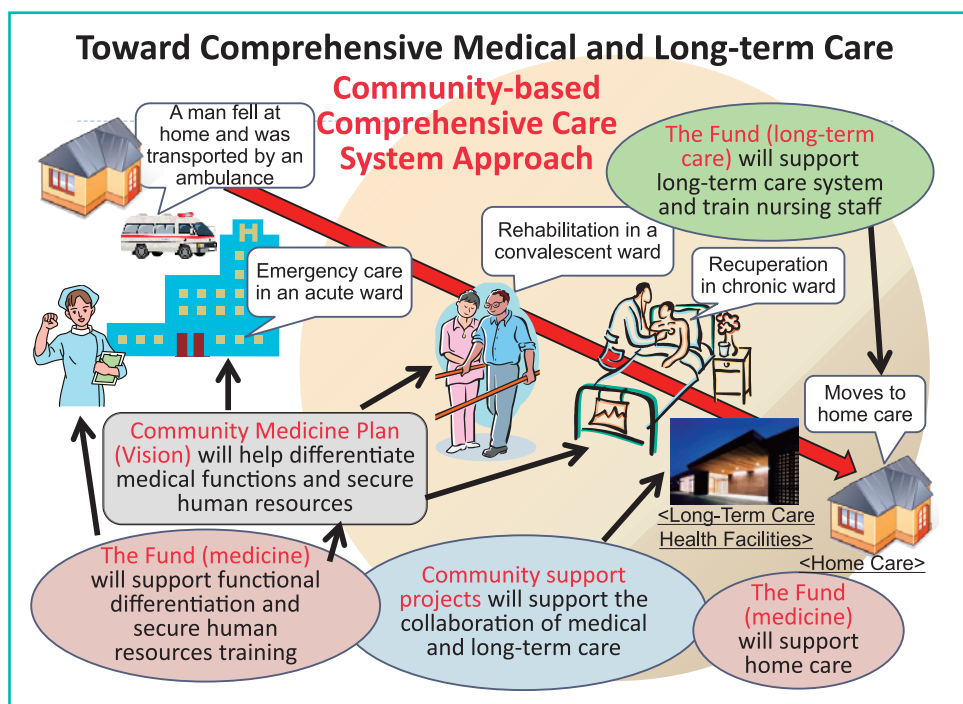


Fig. 8



ing any efforts by local medical associations that aim to realize effective and high-quality medical and long-term care.

### **Collaboration with Veterinarians**

Following the conclusion of a memorandum of understanding between the World Medical Association and the World Veterinary Association, to build a cooperative relationship pertaining to zoonotic diseases, food safety and others in October 2012, the JMA and the Japan Veterinary Medical Association (JVMA) concluded an agreement promoting academic cooperation in November 2013. At the prefectural level, veterinary associations and medical associations are also in the process of signing agreements, to strengthen the collaboration and partnership between veterinarians and physicians to establish a safe and secure society.

As the first step for promoting collaboration between the JMA and the JVMA, a symposium entitled “Zoonotic infection—Current status and management of rabies” was held in October, 2014. The JMA has been working to promote zoonotic infection control to raise awareness among people. One of our efforts is the publication of the zoonotic disease handbook. In addition, our Continuing Medical Education Program offers various seminars across the nation, of

which many concern infectious diseases.

Until now, physicians and veterinarians have been making efforts from their respective positions. When physicians and veterinarians share the concept of “One Health” and combine our intelligence, infection control planning will progress even more. It will also lead to further advancement of human medicine and veterinary medicine.

Better “disaster preparedness” lies in further participation in the national disaster management planning, collaboration with relevant agencies and organizations, and establishment of information sharing methods. These efforts are essential to effectively respond at the maximum ability in the event of a large-scale disaster. That is all the more reason that we believe it is essential to realize the need for physician-veterinarian collaboration and the importance of how we should approach it.

In order for the evacuation zones that resulted from the Fukushima nuclear accident to recover, the communities require health support for local residents as well as the reconstruction of environment in which healthy biodiversity can be sustained. Environmental monitoring for local residents and securing food safety are also vital. For these efforts to succeed, it is important for medical associations and veterinary medical associations to reinforce our collaboration.