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Take stock of the health impact of nuclear and radiological
disasters and accidents and integration within national
DRR plans
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I. Sendai Mandate on Nuclear and Radiological Disasters

We shall implement intergovernmental agreement to:

- (i) Include nuclear and radiological hazards in the scope of disaster of the Sendai Framework for DRR (Para.15);
- (ii) Measure progress in DRR using the indicators of global targets of the Sendai Framework and definition of terminologies including nuclear radiation hazards as part of technological hazards that are agreed upon in the Open-ended intergovernmental Expert Working Group on Indicators and Terminology relating to Disaster Risk Reduction (A/71/644 , P.20); and
- (iii) Promote a multi-hazard approach to disaster on the basis of "The Bangkok Principles for the Implementation of the Health Aspects of the Sendai Framework for DRR" which now addresses radiation hazards among other health-related disasters.

II. Characteristics of nuclear and radiological disasters

As addressed in the stock-taking of the Fukushima situation below, nuclear and radiological disasters comprise characteristics of three of the five types of disasters defined in the Sendai Framework (para.15):

- Large-scale disaster: affecting a society which requires national or international assistance.
- A slow-onset disaster whose effects emerge slowly but last over time.
- A sudden-onset disaster that emerges quickly or unexpectedly.

Nuclear and radiological disasters seem to be quite a new type of disaster. Our radiation medicine experts qualify them as a disaster with acute and chronic, and direct and indirect impacts and damages which require intensive evidence-based science-policy interface to implement a national multi-hazard disaster risk management plan.

III. Stock-taking of health impact

1. Evacuation

Right after the East Japan Great Earthquake and the Fukushima Nuclear Power Plant (NPP) Accident, there were 470,000 evacuees. As of April this year, the number

declined to 108,000. But 68,900 of them were of Fukushima. They are staying at temporary locations. The Fukushima evacuees along with a large number of the Fukushima population, have had socio-psychological stresses and remained in indeterminate and uncertain situation. About 20,000 evacuees are under 18 years old. Obesity is in remarkable increase. The family bondage often risks being broken and solitary deaths of elderly and aged persons are frequent. Still unfounded rumors on Fukushima food products as well as discriminatory attitude against Fukushima persist. Sustainable employment opportunities are lacking with declined industrial and agricultural output by some 20 %. The population of Fukushima has decreased from little over 2 million to 1.8 million.

The state of the Fukushima people affected by the nuclear and radiological disasters looms large as a major public health issue.

2. The risk of radiation-associated health consequences

The risk of radiation health consequences for residents in Fukushima is quite different from that of Chernobyl and, is considerably low based on the estimated radiation doses received by individuals during the accident. It is increasingly believed that the exposure doses on the thyroid as well as whole body are too low to detect any radiation-associated cancer risk. But the long-term impacts are still unknown. Identification of cause-and-disease relationship is very difficult as well as dose–responsive relationship. Because after any radiological and nuclear accidents, many confounding and modifying factors affect the chance of late malignancy.

3. Psychosocial and mental stresses

A large number of people have received psychosocial and mental stresses, aggravated by radiation fear and anxiety, and remained in indeterminate and uncertain situation having been evacuated but not relocated. This situation is shared throughout the general population.

IV. Experience of Kawauchi Village

Kawauchi Village, the first local community achieving return of all most all inhabitants and recovery from nuclear related hazards and evacuation provides the following lessons:

- 1) The comprehensive health check-up of all Individuals is indispensable for evaluating dose–responsive relationship and achieving resilience and a countermeasure against public fear and anxiety about radiation.
- 2) There shall be a paradigm shift from radiation safety principle based on radioactive doses, to the tackling with societal factors that are determinants of public health. Public

health not only of evacuees, but also the general population is very much affected by social, environmental and psychological impacts of both the nuclear accident and countermeasures, e.g. evacuation, relocation, decontamination and constraints on freedom of residence and movement as well as ecosystem use for livelihood.

- 3) Comprehensive risk management is required during crisis and post-crisis period after the NPP accident. There, the reliability and creditability of crisis communication is of a high priority together with post-crisis risk communication with the affected population to directly address face to face the concerns of inhabitants.
- 4) There is a pressing need for establishing an international recovery platform on nuclear disasters under the aegis of the ISDR to promote best practices, and professional capacity building and education in nuclear disaster risk management, reduction and recovery that are conducive to risk communication with the affected population and other stakeholders.

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