

## **Recommendations**

### **The Fifth International Expert Symposium in Fukushima on Radiation and Health: Chernobyl+30, Fukushima+5: Lessons and Solutions for Fukushima's Thyroid Questions**

#### ■ **Background**

Following the Recommendations of the First and Third International Expert Symposiums in Fukushima, the Fifth symposium was organized by The Nippon Foundation in cooperation with Fukushima Medical University, Nagasaki University and Sasakawa Memorial Health Foundation and was held on September 26 and 27, 2016 in Fukushima City. The symposium focused on “**Lessons and Solutions for Fukushima's Thyroid Questions**” following the 30 years of knowledge gained from the Chernobyl accident that occurred in 1986.

The Great East Japan earthquake, tsunami and the Fukushima Daiichi Nuclear Power Plant (NPP) accident disrupted the fabric of society and led to concerns about risk from radiation exposure. These concerns significantly affected health and wellbeing. After these events, the Fukushima Prefectural Government initiated the Fukushima Health Management Survey (FHMS) Program. This program is based on scientific surveys with the purpose of contributing to the long-term health care of the residents and is being carried out in response to their concerns. The survey program integrates several components, including individual dose estimates, evaluation of mental and physical health, and pregnancy and birth care. One element of this survey is the Thyroid Ultrasound Examination (TUE), which was launched on October 2011 to cover more than 300,000 children aged from 0 to 18 at the time of the accident. The results of the TUE were the main focus of this symposium.

#### ■ **Symposium Summary**

The Symposium noted that the accident at Fukushima was substantially different from Chernobyl, in terms of the amount of radioactive substances released into the environment, and the accident's evolution and its aftermath. The radiation doses to the thyroid received by members of the general population as a result of the Fukushima

accident was a tiny fraction of those from the Chernobyl accident. The TUE resulted in an increased ascertainment (screening effect) of diagnosed thyroid disorders, including some cancers, in the target population. This apparent increase of thyroid disorders incidence in Fukushima can be attributed to the effect of mass screening using highly sensitive ultrasound techniques. Based on the existing evidence and current knowledge of radiation-induced thyroid cancer, this apparent increase could not be caused by exposure to radiation from the Fukushima Daiichi Nuclear Power Plant accident.

In fact, the TUE uses highly sensitive ultrasonographic equipment for screening the thyroid gland, and the detected thyroid abnormalities — nodules, cysts and cancers — would have gone undetected if asymptomatic children had been examined using standard techniques. There are a number of features that support the conclusion that the increase in thyroid disorders is a screening effect rather than as a result of radiation exposure:

- Similar results were obtained when the same screening approach was performed in children living far away from the areas affected by the accident in Japan.
- The latency time for radiation induced thyroid cancer is longer than that elapsed since the accident, at the time of detection.
- Experience from Chernobyl suggests that any increase in thyroid cancer due to radiation exposure would be observed first in those who were very young (0-4 years of age) at the time of the accident. We would predict therefore that if radiation were the cause of any increase in thyroid cancer this would be observed first in the youngest participants of the TUE. This is not the case. To date, thyroid cancers were found in children in their late teenage years, but no cases were found in the most vulnerable group of very young children.
- The proportion of suspicious or malignant cases was almost the same across the entire Fukushima Prefecture.

In addition, there is extensive evidence, worldwide, that thyroid screening in other populations has resulted in an apparent increase of thyroid cancer incidence (detection rate). However, mass screening in other countries has not decreased mortality from thyroid cancer, which suggests that only a small fraction of thyroid cancers has the potential to progress to a lethal outcome. In contrast, combination therapy including thyroid surgery and treatment with radioiodine may have higher risks than those posed by the tumor itself. Furthermore, emerging evidence indicates that the diagnosis of

thyroid disorders can cause psychological stress to the participants, which can, in a proportion of them, result in a detriment to mental health and quality of life. Therefore, thyroid screening of people who do not have symptoms of possible thyroid disease has the potential to do more harm than good to the population, and should only be carried out, when clear benefits to the population can be defined. Studies evaluating risk-benefit and cost-effectiveness of a screening program may also support the decision-making with regard to the future of such screening programs.

■ **Recommendations for the Future**

- 1) **The future of the FHMS and in particular the TUE is an issue for local stakeholders**, i.e. those who are directly affected by the decisions to be made. The factors that should be taken into account when making decisions include the analysis of risks and benefits to individuals and the population as a whole, the demands placed on human and other resources of public health, and the experience of other countries that have conducted thyroid screening programs. Participation in the health surveys and the thyroid screening program should be voluntary.
- 2) **There needs to be clear communication to the screening participants and their families** in regard to why the examination is being conducted and the likely outcomes and risks, including the means and options for treatment if a thyroid disorder is detected. This should be done face to face, as part of an ongoing relationship with the participant. More trained personnel, including participants, advocates and members of the medical profession, as well as the networks to support this communication strategy, will be required. Communication with the unaffected general public should also be improved to avoid stigmatization of the survey participants.
- 3) **International collaboration with bodies such as the WHO, IAEA, ICRP, NCRP, UNSCEAR and IARC is important** in light of their extensive experience in radiation health related matters. Collaboration of national institutions with international organizations should be encouraged and strengthened in order to share Fukushima's experience with the global community.
- 4) **The government of Fukushima, in consultation with national and international organizations, should consider how best to benefit** from the lessons learned and being learned so that they can effectively continue stronger

coordinated cooperation in the long term. One possibility would be to convene expert working groups on issues related to the mitigation of health impacts of the Fukushima Daiichi NPP accident, and health monitoring. One of the expert working groups on “Nuclear Disasters and Health Monitoring”, especially focusing on thyroid problems, could provide professional recommendations to the current TUE in Fukushima in future. The international consensus should be shared with all stakeholders, such as national and local governments and public representatives of the affected communities, to improve the current TUE program.

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■ **The Organizing Committee of the Fifth International Expert Symposium in Fukushima (selected members)**

Yohei Sasakawa (Chair)	Chairman, The Nippon Foundation
Etsuko Kita	Chair, Sasakawa Memorial Health Foundation
Ohtsura Niwa	Chairman/Representative Director, Radiation Effects Research Foundation
Shunichi Yamashita	Trustee/Vice President, Nagasaki University
Jacques Lochard	Vice-Chair, International Commission on Radiological Protection
Geraldine Anne Thomas	Professor of Molecular Pathology, Imperial College London

In consultation with the invited experts

Zhanat Carr	World Health Organization
Wolfgang Weiss	Federal Office for Radiation Protection, Germany (retired)
Christoph Reiners	University of Wurzburg, Germany
Christopher Clement	International Commission on Radiological Protection
John Boice	National Council on Radiation Protection and Measurements, USA
Abel Gonzalez	Argentine Nuclear Regulatory Commission, Argentina
Malcolm Crick	United Nations Scientific Committee on the Effects of

Atomic Radiation

Ausrele Kesminiene

International Agency for Research on Cancer

Shigenobu Nagataki

Professor Emeritus, Nagasaki University

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