



Tokyo, 23 February 2014

## Workshop on Radiation and Thyroid Cancer Co-Chairs' Summary

An international workshop on radiation and thyroid cancer took place from 21-23 February 2014 in Tokyo, Japan, to support the efforts of Fukushima Prefecture and the Japanese government in enhancing public health measures. The workshop, which was to develop a state-of-the-art scientific understanding of thyroid cancer and radiation-induced thyroid cancer was co-organised by the Japanese Ministry of the Environment (MoE), Fukushima Medical University (FMU), and the Paris-based OECD Nuclear Energy Agency (NEA). The workshop brought together the world's top experts in the field, including medical doctors, epidemiologists, and radiological risk assessment specialists from ten countries.

### Latest figures

Because of the release of iodine-131 ( $^{131}\text{I}$ ) from the Fukushima Daiichi nuclear power plant accident<sup>1</sup> the exposed populations, in particular exposed children, might have an attributable-risk of developing thyroid cancer due to the accident, in addition to the baseline risk that exists regardless of the accident. To address this attributable-risk of thyroid cancer, shortly after the accident direct measurements of thyroid dose were carried out for 1,080 children in Fukushima Prefecture in March 2011. Dose assessments revealed that their thyroid equivalent doses were far less than 100 mSv (the level below which there have been no significant statistical increases in thyroid cancer). Furthermore, Fukushima Prefecture put in place a medical surveillance programme for the 2 million people living in the Fukushima Prefecture, which includes approximately 360,000 children. As of December 2013, 269,354 children have had preliminary thyroid ultrasound examinations, and of these 1,490 have undergone secondary examinations due to preliminary screening results.

As of December 2013, 33 children out of the 269,354 who had undergone thyroid ultrasound examinations were diagnosed with thyroid cancer (Among 34 surgical cases, 32 were diagnosed as papillary carcinoma, 1 case was diagnosed as a suspected poorly differentiated carcinoma, and 1 case was benign nodules). All of the children diagnosed have been cured through surgical intervention. In addition, the examinations identified 41 children who have a suspicion of thyroid malignancy, and the medical status of these children is being closely followed, and the majority will undergo surgical procedures.

Thyroid examination has been conducted as a screening of subjects who do not have any symptoms. Basically, in such an examination the number of thyroid cancer cases per examination can be larger than the incidence rate based on the cancer registry, which is calculated from records of diagnosis of the people who visit hospitals after displaying symptoms. This observed difference is known as a "screening effect".

### Background information

As with almost any large nuclear reactor accident the risk of thyroid cancer caused by exposure to  $^{131}\text{I}$  is a key concern. Experience from the Chernobyl accident, and from the Life Span Study of atomic bomb survivors in Hiroshima and Nagasaki, demonstrates that radiation exposure, either internal or external, can cause thyroid cancer in children (0 to 18 years of age), with younger children (especially from 0 to 5 years of age) being more at risk than older ones.

Following the Fukushima Daiichi accident, the initial ultrasound examinations of children in Fukushima Prefecture (269,354 out of 360,000 children have had preliminary thyroid ultrasound examinations thus far) was performed within the first three years after the accident, and is being

<sup>1</sup> The Fukushima Daiichi nuclear power plant accident released from about 100 to 500 petabecquerels (PBq) of  $^{131}\text{I}$  to the atmosphere; The Chernobyl accident released approximately 1760 PBq. Note that 1 PBq =  $10^{15}$  Bq.

followed by successive thyroid examinations from 2014 onwards. Residents will be monitored regularly thereafter.

To date, all preliminary thyroid ultrasound examinations have not been completed. The results of further examinations will be analysed, integrating other confounding factors to update the current medical understanding of thyroid cancer in Fukushima Prefecture.

Studies of those exposed by the Chernobyl accident, indicate that thyroid cancers, whose background incidence is small, begin to increase 4 or 5 years after exposure. Younger children (e.g. from 0 to 4 years old at time of exposure) are more at risk than older children (e.g. up to about 18 years old at time of exposure).

An important aspect of this will be stakeholder dialogues and risk communications in order to bring this information to stakeholders. The workshop discussed international experience and approaches of how radiological protection science can best be brought to the service of society, to better understand stakeholder concerns, and to better provide stakeholders (the public and deciders) with scientifically sound information that can be considered when taking decisions.

According to the Committee Meeting for Fukushima Health Management Survey, there is no identifiable evidence that thyroid cancers are increasing due to exposures from the nuclear power plant accident in March 2011. The following aspects support this evidence:

- According to the examinations carried out thus far, the thyroid exposures for children in the regions surrounding the nuclear power plant are significantly lower than the doses received by children as a result of the Chernobyl accident.
- The latency period of thyroid cancer is considered to be four to five years at the shortest, according to international observations. The results from the recent round of screenings have identified cancers that have appeared in some of the examined children very shortly after the nuclear power plant accident. Given the medical understanding that thyroid cancer grows slowly and gently, it is unlikely that these cancers were caused by the exposure from <sup>131</sup>I from the nuclear power plant accident in March 2011
- The children with identified thyroid cancer cases were not infants at the time of the accident, but teenagers. Infants are known to be more sensitive to radiation-induced thyroid cancer. The observed age distribution of thyroid cancer cases is consistent with our understanding of spontaneous incidence of thyroid cancer in children.

The World Health Organization (WHO) noted in its health risk assessment report that the health statistics data from 2006 already indicated that thyroid cancers were increasing in Japan. In general, good cancer registries are essential for the constant monitoring of cancer incidence rates..

**Workshop Co-Chairs**

Dr Shunichi YAMASHITA  
Trustee,  
Vice President of Nagasaki University  
Vice President of Fukushima Medical University

Dr Michael SIEMANN  
Head, OECD/NEA  
Division of Radiation Protection and  
Waste Management

**Press contact(s):**

**OECD**  
Dr Ted Lazo  
CRPPH Scientific Secretariat  
OECD Nuclear Energy Agency  
12, Boulevard des Isles  
92130 Issy-les-Moulineaux  
+33 1 45 24 10 42  
[Edward.Lazo@oecd.org](mailto:Edward.Lazo@oecd.org)

**MoE**  
Dr Yasuo Kiryu  
Director, Radiation Health Management Office  
Ministry of the Environment  
1-2-2 Kasumigaseki  
Chiyoda-ku, Tokyo 100-8975  
+81 3 5521 9248  
[Yasuo\\_Kiryu@env.go.jp](mailto:Yasuo_Kiryu@env.go.jp)