

Session 2.1

WHO's Thyroid Dose Estimation Following the Fukushima Daiichi NPP Accident

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The earthquake and tsunami in Japan on 11 March 2011 led to releases of radioactive material into the environment from the Fukushima Daiichi nuclear power station. Soon thereafter, WHO initiated a health risk assessment to estimate the potential public health impact of the accident, in line with its defined role in radiation emergency response among international organizations. The assessment covers infants, children and adults living in the Fukushima prefecture, nearby prefectures, the rest of Japan, neighbouring countries, and the rest of the world.

Because the health risk assessment requires an estimation of radiation doses delivered to the population, WHO first established an International Expert Panel to make an initial evaluation of radiation exposure of people both inside Japan and beyond, as a result of the accident. The ensuing *preliminary dose estimation* report¹ published in 2012 provides data on effective doses in members of the public resulting from exposure over the first year after the accident for different regions of the world. Equivalent doses to the thyroid are also assessed because the intake of iodine ¹³¹I was considered to be an important contributor to overall exposure.

The assessment considered all major routes of exposure – i.e. external exposure (from cloudshine and groundshine) and internal exposure (from ingestion of foodstuffs and inhalation). It was based on information publicly available from relevant Japanese government institutions, collected up to mid-September 2011. Given the limited information available during the time frame of this work, the assessment contains a number of assumptions (e.g. radioactive cloud composition and dispersion, time spent indoors/outdoors, and consumption levels). In particular, some assumptions regarding the implementation of protective measures were conservative and some possible dose overestimation may have occurred. All efforts were made to avoid any underestimation of doses.

The *health risk assessment* report² published in 2013 estimates additional lifetime risks associated with all solid cancers, leukaemia, breast cancer and thyroid cancer separately. Given the exposure to radioactive iodine during the early phase of the emergency, the lifetime attributable risk of thyroid cancer was specifically assessed in the general population and in emergency workers.

¹ Preliminary dose estimation from the nuclear accident after the 2011 Great East Japan Earthquake and Tsunami. WHO, 2012. http://www.who.int/ionizing_radiation/pub_meet/fukushima_dose_assessment/en

² Health risk assessment from the nuclear accident after the 2011 Great East Japan Earthquake and Tsunami based on a preliminary dose estimation. WHO, 2013. http://www.who.int/ionizing_radiation/pub_meet/fukushima_risk_assessment_2013/en