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## **Risk following exposure to radiation differs for adults and children, says UNSCEAR report**

Vienna 25 October 2013 (UN Information Service) – “Doses received by children and adults from the same source of ionizing radiation can have differing impacts, and therefore, should be considered separately in order to predict risk following exposure more accurately for children,” was the main thrust of the report “Effects of radiation exposure of children” presented today at the United Nations headquarters in New York. The report, which has been prepared by the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), has been in preparation over the last two years (since 2011) and was presented today to the UN General Assembly as part of the Report of the 60th session of UNSCEAR to the General Assembly.

“Because of their anatomical and physiological differences, radiation exposure has a different impact on children compared with adults,” said Dr. Fred Mettler, Chair of the Expert Group on the UNSCEAR Report on Effects of Radiation Exposure of Children. He presented the report as a valuable resource for the international medical and scientific community, because as such, children are generally assessed along with adults in epidemiological studies and comprehensive overviews of the effect of radiation on children are generally unavailable.

The report highlights some important issues. For instance, for a given radiation dose, infants and children are more at risk than adults of developing a variety of tumours. This risk is, generally, not always immediate but extends later into life. In all, the Committee reviewed 23 cancer types in their report, some of which are highly relevant for evaluating the radiological consequences of nuclear accidents and of some medical procedures. Children were found to be more sensitive than adults for the development of about 25 per cent of tumour types including leukaemia, and thyroid, brain and breast cancer. The risk can be significantly higher, depending on circumstances. On the other hand, for about 15 per cent of cancer types such as colon, children were found to have the same radiation sensitivity as adults, and for 10 per cent of cancer types, such as those affecting the lungs, children were less sensitive than adults. Data were too weak to reach any conclusions for 20 per cent of cancers such as those affecting the oesophagus and there was a weak or non-existent link between exposure and risk at any age for 30 per cent of cancers such as those of the prostate, rectum and uterus or Hodgkin’s disease.

For tissue effects that may occur soon after very high doses, the Committee concluded that as seen with carcinogenesis, there are some instances in which childhood exposure poses a higher risk than adult exposure (e.g. for effects on the brain, and for cataracts and thyroid nodules). There are other instances where the risk appears to be about the same (e.g. neuroendocrine system and on the kidneys) and there are a few instances where children’s tissues are more resistant (lung, marrow and ovaries).

“It is not recommended to use the same generalizations used for adults when considering the risks and effects of radiation exposure during childhood,” said Dr. Mettler. “The specifics of the exposure and situation play a significant role,” he added.

The Report also concluded that no heritable effects in offspring due to radiation exposure of their parents as children themselves had been explicitly identified in humans - including in the offspring of people who survived the atomic bombings as children.

It also pointed out that health effects are also dependent on a number of physical factors. For instance, when it comes to internal exposure to radiation, there are differences in the doses received

by children and adults from exposure to the same distribution of radioactive material in the environment. For example, children may receive higher doses from radioiodine in the environment due to higher intake of milk compared to adults.

Similarly, as infants and children have smaller body diameters, and their organs are less shielded by overlying tissues, with the same exposure the doses to their internal organs is higher than that to an adult. In addition, both metabolism and physiology vary with age, which also affects the concentrations of radionuclides in different organs and thus the dose to those organs for a given intake.

Infants and children can also receive significantly higher doses than adults in situations such as medical exposure if the technical settings are not adapted appropriately.

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**Note to editors:** *The Report of the 60<sup>th</sup> session of UNSCEAR to the General Assembly will be presented and discussed in the General Assembly in New York in the afternoon of Friday, 25 October 2013. This Report summarizes scientific findings on two subjects -*

- a. *Effects of Radiation Exposure of Children (is available on UNSCEAR website [www.unscear.org](http://www.unscear.org))*
- b. *Levels and effects of radiation exposure due to the nuclear accident after the 2011 great east-Japan earthquake and tsunami (Detailed scientific annexes underpinning the scientific findings are yet to be published).*

*The mandate of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), established in 1955, is to undertake broad reviews of the sources of ionizing radiation and the effects on human health and the environment. Its assessments provide a scientific foundation for United Nations agencies and governments to formulate standards and programmes for protection against ionizing radiation. It does not deal with or assess nuclear safety or emergency planning issues. The secretariat in Vienna, which is functionally linked to the United Nations Environment Programme (UNEP), organizes the annual sessions and manages the preparation of documents for the Committee's scrutiny.*