



## The Dangers of Low Dose Radiation 低濃度放射線の危険

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Independent researcher Ian Goddard (see website [here](#)) has carried out a survey of published research on the potential health effects of rates of radiation exposure that the Japanese government has declared safe (up to 20 mSv per year). While few in Japan have been exposed to this level to this point, officials are on record saying that 20 mSv areas are safe for habitation. In addition, there are those in the Japanese scientific establishment who have argued that zones up to 100 mSv per year should be deemed safe. Currently evacuated towns closest to Fukushima Daiichi are likely to see radiation levels at or in excess of the 20 mSv exposure level for a decade or more. If the Japanese government holds to its current policies and interpretations, it is possible that evacuees, including children who are particularly vulnerable to the effects of radiation, may be moved back to "safe" 20 mSv areas. In a video presentation on his website (PDF summary courtesy of Satoko Norimatsu of Peace Philosophy Centre [here](#)) Goddard argues that accepting 20 mSv as safe could lead to a public health disaster.

Here is a summary of important points:

The United States National Academy of Sciences has published a [study](#) of cancer risk and radiation exposure. The risk model data indicates that children under 10 years of age exposed to 20 mSv of radiation face an **increased lifetime cancer risk of between 0.5 and 1%** depending on age and gender. **Younger children and women are the most vulnerable.**

Importantly, the National Academy of Sciences has asserted that no dose of radiation can be called "safe". For examples, **female infants exposed to 2 mSv of radiation are estimated to have a 0.1% increased risk of cancer.** The cancer risk of an infant female is over 7 times that of a 30 year old man. Overall, girls are almost twice as vulnerable as boys of the same age.

The National Academy of Sciences numbers call into question Japanese government assertions that the effects of low dose radiation are a mystery. The NAS report was published in 2006 and Goddard has located a range of more recent scientific studies that suggest that it is either accurate or that it underestimates risk.

A study of over 400,000 nuclear workers from 15 countries was published in the journal *Radiation Research* in 2007 [E. Cardis, M. Vrijheid, M. Blettner, et al., "The 15 Country Collaborative Study of Cancer Risk among Radiation Workers in the Nuclear Industry: Estimates of Radiation-Related Cancer Risks", in *Radiation Research* (167, 2007)]. The average period of employment of the workers was 10.5 years, the average total radiation dose was 19.4 mSv, and the average annual dose was 1.85 mSv. The data revealed that **excess cancer risk was slightly higher than in the NAS risk model.**

Finally a [study](#) [P. Jacob, R. Ruhm, L. Walsh, M. Blettner, G. Hammer, H. Zeeb, "Is cancer risk of radiation workers larger than expected?", in *Occupational and Environmental Medicine* (66, 2009)] has determined that **"a number of recent studies challenge the assumption that low-dose-rate exposures to penetrating forms of ionizing radiation are less effective at causing cancer than high-dose-rate exposures."**

It is also notable that these studies are concerned with external exposure. Internal exposure (caused by consumption of contaminated food or inhalation of hot particles) likely poses significantly higher risks because it can deliver radiation effectively to small groups of cells, increasing cancer risk.

Asia-Pacific Journal articles on related topics include:

Asia-Pacific Journal Feature, [Radiation and Fukushima's Future](#)

Miguel Quintana, [Radiation Decontamination in Fukushima: a critical perspective from the ground](#)

Gayle Green, [Science with a Skew: The Nuclear Power Industry After Chernobyl and Fukushima](#)