



Fukushima Fallout Monitoring Needed

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福島発放射性物質放出監視の必要性

By Arjun Makhijani

Total releases of radioactive iodine-131 and cesium-137 from the damaged Fukushima Daiichi reactors in Japan now appear to rival Chernobyl. As a result, there is now fallout through the northern hemisphere, with hot spots appearing due to rain. For instance, rainwater in Boise, Idaho, on March 22, 2011, was reported by the Environmental Protection Agency at 242 picocuries per liter, about 80 times the U.S. drinking water standard *if the level persisted* for a prolonged time. The drinking water standard is a common reference number for water purity, even if the water is not used for drinking.

Preliminary risk calculations on the March 22, 2011, rainout event in Boise indicate that the risk from a single such event would be low, even if cows were mostly getting their feed from outdoor grazing, which may not have been the case. However, government agency measurements of milk contamination are limited and appear to be uncoordinated. Ingesting milk contaminated with iodine-131 increases the risk of contracting thyroid cancer, especially for female infants. A low dose would produce a low risk; the risk increases proportionally to the dose.

"We don't have data on iodine-131 levels in milk samples taken from the same areas where polluted rain fell," said Dr. Arjun Makhijani, IEER's president. "Such information is important for making reliable estimates of radiation dose and risk. We must ensure that fallout is not rising to levels that could repeat even a small part of the tragedy associated with atmospheric nuclear weapons testing in Nevada during the 1950s and 1960s."

IEER recommended that government actions should include:

- Designating water, food, and air radiation measurements as an emergency function to be kept operational in the event of a federal government shutdown due to lack of a budget resolution.
- Making coordinated measurements of Fukushima fallout in air, rainwater, milk, and drinking water, and making these data immediately available on a public web site.
- Air measurements should include results from charcoal filters or canisters to ensure that the gaseous forms of iodine-131 are captured.
- Coordinating measurements of rainwater with weather patterns and estimated arrival of fallout from Japan over the United States, and making these data available in as close to real time as possible, on a public web site.
- Advising those who might be using rainwater for drinking purposes by publication of rainout maps with iodine-131 data.
- Developing contingency plans for advising farmers in case high milk contamination levels are anticipated. Such plans may include of sheltering animals and feeding them stored, uncontaminated grain and hay so that clean milk can be produced in the event of greater fallout than has been reported so far.
- Publication of the protocol used for sampling air, water, and milk.
- Use of consistent risk statements based on the 2006 risk study by the National Academies (<http://www.nap.edu/openbook.php?isbn=030909156X>)

"It is lamentable that the U.S. government is not speaking with a coherent, science-based voice on the risks of radiation," said Dr. Makhijani. "There is no safe level of radiation exposure in the sense of zero risk. Period. This has been repeatedly concluded by official studies, most recently a 2006 study done by the National Academies. Yet there is no shortage of unfortunate official statements on radiation that may seek to placate the public about 'safe' levels of radiation, but actually undermine confidence."

As an example, IEER cited a statement by the Nuclear Regulatory Commission that "In general, a yearly dose of 620 millirem from all radiation sources has not been shown to cause humans any harm." (<http://www.nrc.gov/about-nrc/radiation/around-us/doses-daily-lives.html>). This annual dose includes medical uses of radiation, including CAT scans, and other voluntary exposures, from which people get some benefits. It also includes indoor radon, which the EPA estimates "is the number one cause of lung cancer among non-smokers.... Overall, radon is the second leading cause of lung cancer [after smoking]. Radon is responsible for about 21,000 lung cancer deaths every year. About 2,900 of these deaths occur among people who have never smoked." (<http://www.epa.gov/radon/healthrisks.html>)."

While the NRC is saying the 620 millirem a year on average has not been shown to cause harm, the EPA is saying that only about one-third of this total average annual dose attributable to indoor radon, is responsible for thousands of cancer deaths every year," said Dr. Makhijani. "The NRC statement is an appalling misrepresentation of the science that underlies its own regulations as well as published statements on radon risks by the EPA. Using the 2006 National Academies risk estimates for cancer, 620 millirem per year to each of the 311 million people in the United States would eventually be associated with about 200,000 cancers each year; about half of them would be fatal."

Dr. Makhijani continued, "The largest risks by far are in Japan; the risks from Fukushima in the United States, based on the limited data so far, appear to be very low at the individual level. But they are being experienced by large populations, as they were during Chernobyl fallout. More intensive measurements, a frank

portrayal of both individual and population risks, for children and adults using National Academies risk numbers, and prompt publication are essential. If the government does not provide accurate, science-based, trustworthy information, how can people make well-informed decisions for themselves and their families at a confusing time?"

Related materials:

- National Cancer Institute. [SEER Cancer Statistics Review 1975-2007](#), Table 1.4 Age-Adjusted SEER Incidence and U.S. Death Rates and 5-Year Relative Survival (Percent) By Primary Cancer Site, Sex and Time Period.
- U.S. Environmental Protection Agency. RadNet Laboratory Data: [Japanese Nuclear Emergency: Radiation Monitoring](#), 2011

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