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WHO : Post-Fukushima radiation levels in Japan 'low'

The meltdown at Fukushima plant led to thousands being evacuated

Radiation levels in most of Japan are below cancer-causing levels a year after the Fukushima plant accident, a World Health Organisation (WHO) report published on Wednesday says.

Two areas near the plant have relatively higher levels of radiation, but radiation levels in surrounding countries are close to normal.

The preliminary report is part of a wider ongoing health assessment by WHO.

Fukushima nuclear plant was badly damaged in the 2011 Japan earthquake.

Separately a UN scientific committee said several workers at the plant had been "irradiated after contamination of their skin".

"Six workers have died since the accident but none of the deaths were linked to irradiation," said a statement issued on interim findings by the United Nations Scientific Committee on the Effects of Radiation (UNSCEAR).

Namie town and Itate village, near the plant in eastern Japan, are exposed to radiation levels of 10-50 millisieverts (mSv), while the rest of Fukushima has radiation levels of 1-10 mSv, the WHO report said.

Most of Japan has levels of 0.1-1 mSv, while neighbouring countries have less than 0.01 mSv.

The report says that levels outside Japan are below those regarded by the international radiological protection community as "very small".

People are exposed on average to around 2 mSv of radiation a year from the natural environment, although there is considerable variation between individuals. The single-year limit for occupational exposure of workers is 50 mSv.

To avoid any underestimation of radiation levels, the report used conservative assumptions, and says some of the levels may have been overestimated.

The earthquake and tsunami in Japan in March 2011 triggered a nuclear meltdown at Fukushima Daiichi nuclear plant, causing radiation leaks and forcing the evacuation of thousands of people.

Fukushima-exposed children and workers 'OK for now'

- 10:15 25 May 2012 by **Andy Coghlan**
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Most children and workers exposed to radioactive fallout from the Fukushima Dai-Ichi nuclear disaster on 11 March last year received reassuringly low doses of radiation, but some highly-exposed workers will need close monitoring for health problems in the future.

That's the main conclusion of an interim report on the health impacts of fallout from Fukushima issued yesterday in Vienna by the UN Scientific Committee on the Effects of Atomic Radiation (UNSCEAR).

"For the time being, we don't see anything of major concern," says Wolfgang Weiss, chairman of the committee of 70 scientists. "The levels of exposure are much lower than what we saw at Chernobyl."

The committee evaluated data on how much radiation was released from the stricken plant, how much has been absorbed by plant workers, and how much reached the general public – especially children. They also looked at contamination levels among wildlife on land and in the sea.

The report reveals that children in villages with the heaviest fallout received relatively modest doses, although most exceeded the 20 millisieverts considered an acceptably safe annual cumulative dose for workers in the radiation industry.

Thyroid risk

The biggest risk faced by the children in closest proximity to the plant was accumulation of radioactive iodine in their thyroid glands, which can lead to cancer. Among those living near the site of the Chernobyl nuclear disaster there have been 6000 cases of thyroid cancer since 1986, although most have been successfully treated.

In the hotspots around Fukushima, thyroid radioactivity monitoring of 1080 children under 15 revealed that none received doses higher than 100 millisieverts, an amount 10 times smaller than the typical exposure levels of children around Chernobyl. Measurements outside the "hotspot" zones in Fukushima prefecture suggested that the maximum thyroid dose for children was around 35 millisieverts.

The committee has demanded more information and data on how the doses were assessed, and UNSCEAR should have detailed ultrasound thyroid scans on 300,000 children from the hotspots around Fukushima within the coming weeks. But Weiss says, "The data we've seen for the children is reassuring."

For some of the 20,000 workers who've been labouring to bring the four stricken reactors at

Fukushima under control, the outlook is less certain.

Reassuringly, two-thirds of the workers received total radiation doses lower than 10 millisieverts. But 167 workers received doses exceeding 100 millisieverts. Of these, six received doses exceeding 250 millisieverts. "That's equivalent to 12 years of receiving a full dose that's considered acceptable within the industry," says Weiss.

Most in danger

Two workers received exceptional doses of around 680 millisieverts. "That gets towards the range where you see acute effects that can kill you," says Weiss. "At Chernobyl, 28 workers more or less died on the spot, or within a couple of days, from acute radiation syndrome."

"The levels we saw in those two workers are substantial, and we need to keep a very close watch on them," says Weiss.

The committee has also demanded more information on how worker doses and exposures have been established, and what assumptions were made in calculating them. For instance, Weiss says that in the early days of the disaster, some workers may have been exposed to high-energy neutrons as fuel melted and went critical, but there's no exposure data because their dosimeters can't detect neutrons.

For the population as a whole, Weiss says the risks from radioactive iodine have long passed, as most of it decayed away within a month of the disaster. But the potential risks from two radioactive caesium isotopes remain. Half of any amount of caesium-134 decays away within two years, for caesium-137 it is 30 years.

The committee is due to deliver its final report to the UN next May, after incorporating additional data from the Japanese authorities, US military and navy vessels exposed to fallout from Fukushima, and local surveys of sediments, fish and other marine life. Also, to assess the risks from food, the committee will analyse 130,000 samples of produce from around Fukushima gathered since the disaster by the UN Food and Agriculture Organization.

Tuna carry Fukushima radiation to California

- 20:00 28 May 2012 by **Sara Reardon**

The levels might not be high enough to harm you if you tucked into a tuna sandwich, but some tuna are still carrying radioactive caesium from the leak at the Fukushima Daiichi plant last March. Researchers hope that similarly low levels of radiation in turtles, sea birds and sharks will allow the migration patterns of little-studied species to be tracked.

Daniel Madigan, a marine biologist at Stanford University in California, was already studying how Pacific bluefin tuna (*Thunnus orientalis*) migrate across the Pacific Ocean when the Japanese tsunami put a new twist on his experiment.

The leak at the Fukushima Daiichi reactor released caesium isotopes into the Pacific, and fish can pick up the radioactive material from the water they swim in and from the food they eat.

Mysterious migrations

Juvenile tuna can take between one and four months to swim the 9000 kilometres from Japan to California. The researchers measured caesium isotopes in young tuna caught off the coast of San Diego, and found detectable levels of caesium-134 in 15 fish. The isotope could not be detected in fish that were caught before 2011.

Because caesium-134 has a half-life of two years, Madigan expects that researchers will be able to find it in the long-lived fish for some time to come. Tuna migration patterns are well known, he says, but the radiation may be useful in tracking other species such as salmon sharks (*Lamna ditropis*). If these sharks behave as researchers suspect they do, the migratory males would carry Fukushima radiation, but the stationary females would not.

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