



## **Questions and answers about radiation in Fukushima**

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**Answers to common questions about radiation have been developed with the help of Professor Shinichi Yamashita, MD, Radiation Health Risk Management Advisor to Fukushima Prefecture. Dr. Yamashita is affiliated with Nagasaki University and the Atom Bomb Disease Institute. He has extensively investigated health effects arising from the 1986 nuclear power plant accident in Chernobyl. This Q&A updates a similar one released on April 9, taking account of new information and helpful feedback from readers. Fukushima Medical University is committed to providing up-to-date, accurate information to prefectural residents and to concerned individuals worldwide.**

### **Question 1**

Environmental radiation in my local area is reported as a few microsieverts per hour ( $\mu\text{Sv/hr}$ ). After a few weeks or months, this could add up to a few millisieverts (mSv). What effect might this have on children, infants, fetuses or future pregnancy?

### **Answer 1**

Officially reported radiation levels are measured in the open air. Indoor radiation levels are generally 1/2 to 1/10 of open-air values. Therefore, a person's actual radiation exposure will be less than what is calculated directly from official numbers. It is natural to feel anxious about the health risks of cumulative radiation exposure, but present levels, while elevated, are unlikely to expose people to more than 100 mSv per year. A one-time exposure to 100 mSv might be significant, but, for example, 100 exposures to 1 mSv are unlikely to have any effect on health.

Pregnant mothers concern themselves with any possible health risks to a fetus. The incidence of microcephaly increased in children born to mothers who were exposed to the Nagasaki atomic bomb in early pregnancy. However, the burst of radiation from an atomic bomb is incomparably higher than the slightly elevated radiation around Fukushima Prefecture. At Chernobyl, an increased incidence of thyroid cancer was observed mainly in children who were 0 to 5 years old when that nuclear accident happened. However, there was no reported increase in thyroid cancer among children

who were fetuses at that time. No additional concern is needed for future pregnancies. Current radiation levels are gradually decreasing, and are not expected to affect children's health.

## **Question 2**

I am pregnant now, and decided to use mineral water for drinking and making miso soup. I am nervous about using tap water to wash vegetables. What should I do?

## **Answer 2**

It is wise not to consume water with radioactive iodine in excess of safety standards. It is also wise not to worry if you have already had some glasses of tap water with elevated levels. Safety standards are based on long-term, continuous consumption. Even if bottled mineral water is not available, depriving an infant of water or milk can have an adverse health effect. Tap water for activities of daily living is still safe. This includes using tap water to wash vegetables, and tap water for personal hygiene (washing, showering, bathing, and doing laundry).

## **Question 3**

I am concerned about elementary school children. Can they play outside? I am worried about sending my children to school in this situation. Hanging laundry outside to dry is also a concern. My house has a 24-hour ventilation system. Should I turn it off?

## **Answer 3**

As previously reported, outdoor radiation levels of up to 10 microsieverts per hour, and annual totals of 100 millisieverts are considered safe. Stricter policies have since been applied to schools, in accordance with the precautionary principle. Thus, a threshold of 3.8 microsieverts per hour is used to make specific recommendations about how much outdoor time children should be allowed, including playtime and commuting to school. The goal of specific policies is to limit children to a total of 20 millisieverts per year. Students may be asked to wash exposed skin (e.g. hands and face), gargle, and dust off clothing after outdoor activities. As for outdoor laundry, it is also prudent to sweep off any dust before taking it inside. In other words, the common rules of hygiene and household cleanliness also serve as countermeasures to indoor radiation.

exposure. It is not necessary to turn off your household ventilation system.

#### **Question 4**

What radiation levels should prompt us to stay indoors or leave the area?

#### **Answer 4**

A single point-in-time measurement should not provoke evacuation. Government authorities make recommendations to stay indoors or evacuate based on cumulative exposure forecasts: 10~50 mSv for external exposure or 100~500 mSv for internal exposure.

Please pay attention to radiation levels and forecasts announced by national or prefectural government authorities, and follow national, prefectural or local government advice when it is announced.

#### **Question 5**

I was living within 20 km (12.4 miles) of the nuclear power plant, and followed official advice to evacuate. I only packed essentials for a short-term evacuation. Can I return to collect things for a longer-term absence? How long can I be within 20 km of the nuclear plant?

#### **Answer 5**

The area within 20 km (12.4 miles) around the nuclear power plant is closed. No area designated for evacuation should be re-entered without explicit authorization of the national government.

#### **Question 6**

Safety recommendations mentioned on TV include wearing a mask, washing hands, putting cloths into a plastic bag, avoiding outdoor precipitation, and washing wet umbrellas. This advice makes me nervous. What protective steps are most important when I go out?

#### **Answer 6**

Wearing a mask is not a meaningful countermeasure against breathing airborne radioactivity. Clothes do not need to be put in a plastic bag. It is better to just gently sweep dust from your coat after coming home. It is OK to hang your coat indoors,



even if it is slightly wet with rain, but you may feel better using an umbrella outdoors when it rains. An umbrella can be kept at the entrance of your home without washing. “Immediate” washing of hands or hair after coming home is not necessary, but proper attention to Japanese standards of cleanliness will serve well to minimize total radiation exposure.

### **Question 7**

Does a water purifier remove radioactive material from tap water? How about boiling?

### **Answer 7**

Radioactive cesium can be removed at water purification plants and need not be a concern. Radioactive iodine cannot be removed at water purification plants and will pass through a water purifier. Boiling does not remove radioactive iodine because its boiling point is higher than that of water.

### **Question 8**

Does one’s radiation exposure infect other people?

### **Answer 8**

Radiation exposure itself is not infectious. Being exposed to radioactivity does not make a person radioactive. Radioactive material that lands on one’s outdoor clothes will not be passed from person to person if it is gently swept off.

### **Question 9**

News reports that “there is no immediate health hazard” are upsetting. What does “immediate” mean, and what about longer-term effects?

### **Answer 9**

Safety standards for food and water containing radioactive materials are based on risks that might arise with continuous consumption over a year. So “immediate” means there is no health hazard from short term or small quantity consumption of food or water slightly over published safety standards.

**More information from Fukushima is available at [www.cbbstoday.org](http://www.cbbstoday.org).**