Course on Radiation in Everyday Life - Know the Facts Right Next to You

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An Approach that Eases the Concerns of the Citizens

On March 11, 2011, the Great East Japan Earthquake struck, causing an accident at the Fukushima Daiichi nuclear power plant. This accident resulted in radioactive material resulting as product of fission in the nuclear reactor to be released into the atmosphere, contaminating a large area.

Because of this, it is essential for people to educate themselves and to take care of their health. At present, knowledge about radiation and radioactive material and knowing the facts about exposure to natural radiation is essential.

In addition, we must not forget that it is the citizenry that that makes the final decision about safety and peace of mind, based on the extent to which the situation differs from natural radiation. Although contamination from radioactive material is certainly nothing to be happy about, it is important for people to know about the situation of radiation exposure in one way or other so they can manage their health at home. Now it is especially important for people to deepen their understanding of radiation to be prepared in the future. To watch their health, people are making use of not only thermometers, but also sophisticated scales and blood pressure monitors at home, but it is beginning to becoming important to consider radiation exposure levels, at least in homes and schools. I have been continuing my activities with these things in mind.

110 Lectures, Aiming to Convey the Accurate, Uninterpreted Truth and Share Information

I work at the Ibaraki University Department of Science and Engineering, studying proteins using radiation and lasers and teaching chemistry. I have given 110 lectures to the general public since the nuclear accident.

Yam Fields in Ibaraki Prefecture where Measurements were Taken (September 2011)

When conducting relief work in the form of taking measurements, with almost no exception, we have to visit the actual location and talk with the farmers and people living there, relying on their experience. This is because there are many things you learn from dialogue with the locals that would otherwise escape your notice. I have avoided oversimplification and hypothetical situations in our measurement supporting activities and lectures, so that the impression I might give does not come first. I have made an effort to introduce the scientific truth objectively so that someone with a high school education can understand, also introducing doubts that we may share and thinking about them together.

In doing this, I have heard of people who stopped having unnecessarily high levels of fear once they took the information they received, understood it, and double-checked it themselves. I believe that telling people what to think is not important, but rather carefully providing them with the information to do so on their own.

I emphasize the following 5 points in my lecture.

1 - Radioactive material observed naturally.
2 - I introduce the types and properties of radiation.
3 - I explain people's natural exposure to radiation.
4 - I introduce the fact that the element Cesium, which has been an issue lately, has low levels of toxicity, and that the effects of radiation deserve our attention instead.
5 - I introduce the units used to measure radiation levels.

Radioactive Cesium 137 releases beta and gamma rays when it decays. The use of the word "decay" when this happens seems to give the impression that it turns into some unidentified substance. When I tell people that Cesium 137 turns into Barium 137, which does not emit radiation, people have expressed relief once they understand that it turns into a known thing.

Although anybody would worry about an unknown substance, it should be reassuring to know that it has been proven to turn into an element that is already known. The opposite of this is talking about unknown abstractions, which leads people to alarm even if the thing being discussed is the same. For me, this shed light on the importance of concrete examples in risk communication.

The Current State of Radioactive Material in Daily Life

Since late March 2011, I have measured radiation levels in over 1500 types of crops and processed seafood from mostly Ibaraki, along with Iwate, Miyagi, Yamagata, and Fukushima Prefectures.

In April 2011, precipitation of Iodine 131 was detected in certain crops, but this does not mean that everything was screened. Sometimes, plants grown inside greenhouses were screened but not those grown outdoors.

Then, after May, screening for Iodine 131 came to an almost complete stop. At first, there were concerns about several crops absorbing radioactive Cesium through their roots, but it is a fact that currently it is not detected in most rice plants or leafy and root vegetables. This pattern does not change in Fukushima or elsewhere. Despite efforts to read even relatively small amounts of radiation, nothing can be detected.

The transmission of radioactive material to crops and fish is complex and involves many factors. There are also times when nobody other than farmers and fishermen notice subtle changes in their farmland or fishing grounds. Hereafter, careful, meticulous investigation and research needs to be conducted in concert with farmers and fishermen.

What's Necessary for Risk Communication: An Approach to Thinking Together

It is important to provide not just numerical data with measurements, but to include the accuracy of the measurements, consider the significance of the readings, and understand the extent of the radiation levels before communicating this information. 100 becquerel/kg is almost equivalent to the radioactivity from the radioactive Potassium in 1 kg of bananas. To be honest, this may seem like a trick, but when measured, it is a convincing truth.

What I have realized in conducting measurements is the importance of not only telling producers and consumers the measurement readings, but also taking the measurements with them and thinking about them together. It is important to provide you the public with concrete information on which to make a decision, not just to stress one person's view of things.

Unfortunately, since the nuclear accident, there have been insufficient explanations about radiation and misinterpreted information everywhere you turn. Society is unable to hide its confusion. I think that these problems may be due to a failure in risk communication. Though there are various reasons for this, one-sided information and insufficient explanations can be considered factors. From the beginning, consideration must be given to whether average people can understand and make decisions based off of what is being said. Detailed explanations are necessary. Why the nuclear reactor is being cooled with water has yet to be explained.

Looking back on the experiences of this past year, due to information suppliers thinking together with recipients and providing information for each citizen to think for themselves, people are coming to accept the truth and calm down once more. In order to rebuild communication, it would be best to change our means of conveying information into a "think together" approach.