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Critical mass

Even Japan's political leaders struggle to get answers regarding the Fukushima disaster. It is just the latest example of the government's lack of independent scientific advice.

More than nine months after the nuclear-reactor disaster at Fukushima, fundamental questions about what happened remain unanswered. Without answers to these questions, Japan, and the rest of the world, is in the dark on what went wrong, what must be done now, and how to avoid similar accidents in future.

A Comment in this week's issue summarizes these concerns (see page 313). For the Japanese public, one of the most troubling things about the article should be the identity of its authors: two ruling party politicians, including a former prime minister. Surely they should be able to get some answers?

Following the accident, the Tokyo Electric Power Company, which operated the Fukushima plant, initially released only a heavily redacted nuclear-reactor manual. When finally released in an undoctored format in late October, the manual revealed just how lacking the company was in terms of contingency measures. This concealment gives some idea of why even senior political figures struggled for answers in the wake of the disaster, and why they have now chosen to pose their questions in this very public way.

This all points to a problem in Japan that predates Fukushima and seems to afflict every Japanese regime: the absence of a strong and independent scientific voice to advise the government. In this case, such a voice — be it from a chief scientist appointed by the government or from a truly independent nuclear regulator — could have helped to direct evacuations, medical relief, screening for radiation and decontamination efforts. It also would have helped to lead the studies needed to find answers to the questions mentioned above.

Many times in Japan's recent history, the government has handed responsibility for dealing with issues involving tricky scientific concepts to bureaucrats or politicians. All too often, these officials, not understanding the issues, do what governments shouldn't do — hide the problem and hope it will go away. In the meantime, politicians fumble for answers, while ill-informed government spokespeople tell confused stories that can make them look foolish, irresponsible or deceitful.

This is how the government handled Minamata disease caused by industrial mercury poisoning in the 1950s and 60s, the HIV-tainted blood products problem in the 1980s, and the BSE scare of a decade ago. And now it is how it has handled Fukushima. Fear of spreading panic, for example, prevented warnings being issued on the dangers of radiation predicted by simulations. As a result, more residents than necessary were exposed.

The government's main sources for scientific information for Fukushima were the industry ministry's Nuclear and Industrial Safety Agency and the Nuclear Safety Commission. Although these bodies might have expertise in nuclear-reactor physics, they also have ties to the nuclear industry that create a conflict of interest. And they were not an effective and prompt source for quick decisions on decontamination or health risks. The government recognized this by shifting nuclear monitoring and safety regulation functions to a new, as yet unproven, nuclear-energy agency under the environment ministry. It has also promised to produce its own independent report on the accident, but its workings are far from transparent.

Japan should go further and open broader and more permanent channels for scientific advice. Fukushima should be the incident that finally forces the government to put in place a structure that could bring fast and decisive action on critical situations in the future.

"Politicians fumble for answers, while spokespeople tell confused stories."

Japan could start by following the example of countries such as the United States and the United Kingdom, and take on a science adviser. Five years ago, Japan did claim to establish such a system, installing a scientist as a special adviser to the cabinet (see *Nature* **443,** 734–735; 2006). But that was based more on hopes of encouraging innovation than dealing with the broad range of scientific issues that a proper science adviser takes on — and the experiment lasted only two years. Now there is no science adviser. Efforts to give the Science Council of Japan a more influential role, akin to the US National Academy of Sciences, have also come up short (see *Nature* **428,** 357; 2004).

Scientists can help to understand what is known and, critically, what cannot be known about a situation. In the absence of certainty, they can help to understand the risks involved. They can help to explain this cogently and clearly to people at large. They can do this from an unbiased and apolitical perspective, so that even if circumstances change they can change their assessment with less risk of being criticized for political motives. And they give the politicians both cover for unpopular decisions and, in the case of a political appointee such as an adviser, a trusted personal relationship.

Japan can do better. The Japanese people deserve better. ■

Error of judgment

The European Court of Justice was wrong to weigh in on the definition of a human embryo.

The question of when a formless clump of developing cells can truly be said to become a human will never have a clear answer. It depends on whom you ask: biologists, theologians, and pro-life and pro-choice campaigners have all wrestled with the concept for years. Regulations that cover the relevant scientific fields and issues should take all these conflicting views into account. Not everybody will be happy with the outcome, but, by definition, not everybody can be.

In October, the European Court of Justice (ECJ) took on the