Commentary by Dr. Steven Becker, Department of Environmental Health - No two disasters are precisely the same, and the unfolding emergency at the Fukushima Daiichi nuclear facility in Japan has several unique characteristics. The main one is the combination of circumstances that produced the crisis: a massive earthquake followed by an immense tsunami. Still, the Japanese nuclear crisis has important similarities with past emergencies and is a reminder of some crucial lessons.

One lesson is that in the 21st century, the distinction between natural and technological disasters is becoming increasingly blurred. With a variety of hazardous materials facilities located near populated areas around the world, natural disasters can quickly unleash serious secondary technological disasters. For example, an earthquake in Turkey in 1999 damaged several industrial plants, and the resulting releases of hazardous materials caused thousands of people to evacuate and some earthquake search and rescue operations to be abandoned. Despite the growing risks of such combined disasters, few countries are adequately prepared to deal with the kinds of cascading impacts, complex health effects, and special challenges that such natural-technological disasters pose.

The situation in Japan also reminds us that all radiation emergencies are ultimately international. In an age where commerce and tourism are globally integrated, an accident like the one in Fukushima inevitably involves people, commerce, governments, and healthcare systems from many nations. The 1986 Chernobyl nuclear disaster demonstrated this, but even a smaller event such as the 2006 poisoning of Alexander Litvinenko with radioactive polonium meant that health authorities in countries thousands of miles away had to organise screening programmes for their citizens who had visited London. Consequently, radiation emergencies mean that health authorities everywhere need to be prepared for a flood of questions; demands for guidance; and the possibility of having to identify, screen, and follow up potentially affected citizens. Equally, nations must be able to provide rapid, accurate, incident related information to health officials in other countries.

Another key lesson is that however serious the radiation related effects of a nuclear accident might be, the resulting psychosocial footprint is even larger. Radiation is one of the most feared of all hazards, and when that fear is coupled with the trauma of a disaster, people can experience anxiety disorders, depression, a persistent subjective sense of ill health, deep fatalism about the future, and multiple unexplained physical symptoms. These effects can even occur “as a result of perceived, and not actual, radiation exposure.” The importance of psychosocial aspects was emphasised in the World Health Organization’s analysis of the after effects of the Chernobyl disaster. Psychosocial effects, concluded WHO, have been “the largest public health problem caused by the accident to date.” Even decades later, fears show no sign of diminishing and “may even be spreading beyond the affected areas into a wide section of the population.”

In the aftermath of any large scale radiation emergency, health authorities will need to take this into account. At a minimum, medical care and psychosocial support need to be fully integrated. Healthcare professionals and other response personnel also need to be aware of groups at high risk. For example, research from Chernobyl and the 1979 Three Mile Island nuclear incident shows that mothers with young children are at considerably higher risk of psychological effects after radiation emergencies.

The situation at Fukushima is also a reminder of one of the most crucial lessons learnt from earlier nuclear accidents: that the provision of timely, accurate, clear, and credible information may be the single most important way to save lives, reduce injuries and illnesses, prevent psychosocial effects, and help maintain people’s trust and confidence. Inadequate and conflicting information given after the Three Mile Island incident resulted in mass flight of the population. After Chernobyl, the failure of authorities to warn the population not to consume milk and milk products contaminated by the disaster caused many people to receive substantial doses of iodine-131. Subsequently the result was
a dramatic increase in thyroid cancer in children.

The response to the nuclear emergency at Fukushima has already shown communication problems. In particular, soon after the incident, information provided by the power company (and to some extent the government) was seen by many as inadequate, confusing, and unclear. The immediate result has been public mistrust and anger, fear, and anxiety. More recently, government agencies have stepped up efforts to improve the provision of information. It is important for public health that such efforts continue.

After any radiation emergency, healthcare professionals have a vital role in providing information to the public. Potassium iodide (KI) is one key area. As has been widely reported, masses of people have been frantically trying to acquire KI or, when it has not been available, other substances imagined to be good substitutes. In China, crowds have mobbed stores to buy iodised salt; in other places, warnings have been issued telling consumers not to drink iodine based disinfectants; the US Food and Drug Administration has had to issue a warning about fake KI tablets and liquids; and there have already been cases of people overdosing on herbal supplements taken as a substitute for KI. Healthcare professionals should clearly explain to people when and how KI should be used, the risks of taking it when it is not needed, and the dangers of taking iodine containing substances not meant for internal consumption. Public health agencies—for example, the Centers for Disease Control and Prevention and the Health Protection Agency—have been issuing such guidance. In addition, a comprehensive single source of information for healthcare professionals developed by the US Department of Health and Human Services can be found at the Radiation Emergency Medical Management website (www.remm.nlm.gov).

In any radiation emergency, healthcare professionals should provide information and advice to pregnant women. Studies have suggested that in the aftermath of the Chernobyl disaster women may have unnecessarily elected to terminate pregnancies because of concerns about radiation. Specific advice about how to advise pregnant women has been compiled by the Centers for Disease Control and Prevention (https://emergency.cdc.gov/radiation/).

Children may be exposed to the same traumatic events as adults but not have the coping skills and emotional maturity to understand the situation. Healthcare professionals, working with behavioural health specialists, can help by developing and providing information about radiation emergencies that is age appropriate. This is particularly important if children have to be screened for radioactive contamination. At the present time few such age appropriate informational materials exist, so this is a pressing need.

In the coming months the world will need to continue providing whatever assistance it can to people affected by this disaster. Likewise, nations will need to redouble efforts to remember past lessons and learn new ones so that we are better prepared for future disasters.

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