Japan's *E. coli* outbreak elicits fear, anger

The recent outbreak of mass food poisoning among school children in Japan caused by a deadly strain of the bacteria *Escherichia coli* is exposing Japan's inability to protect its citizens' health against emerging disease. Parents of infected children have been outraged about the initial apparent lack of concern shown by officials, and the government is being strongly criticized for its management of the deepening crisis.

The first reports of food poisoning by *E. coli* 0157:H7, a rare variety of *E.coli* that produces large quantities of potent toxins that cause severe damage to the lining of the intestine, came in late May following the death of two children in Okayama prefecture west of Osaka. By early August, more than 8,500 people in 42 of Japan's 47 prefectures had been affected, including 6,000 school children in Sakai City near Osaka. Eight people have died so far, and many others are in a critical condition.

Infection with this strain of *E. coli* has been known colloquially as the "hamburger disease" after it was described in connection with a hamburger chain in the United States in 1983. Health officials in Japan, which is more famous for raw fish than hamburgers, have had great difficulty in tracing the source of infection (see box), although poor hygiene standards at food processing establishments and the popularity of eating raw meat are suspected to be responsible. Secondary infection has added to the problem, leading to what the World Health Organization describes as an "unparalleled level" of infection.

Senior researchers in Tokyo argue that a shortage of epidemiologists and the lack of any centralized institution to coordinate a response to the outbreak has exacerbated the situation, leading to widespread confusion over how to treat those infected. In early June, the Ministry of Health and Welfare notified prefectural governments throughout Japan about precautionary measures, but this information was not passed on to clinicians. Thus some local doctors were initially unaware of the bacteria, and confused the symptoms with those of the common cold. On 2 August, the Ministry finally issued a treatment manual to doctors, but the manual gives unclear advice on the critical issue of using antibiotics, saying instead that current medical opinion is divided on the issue. Although antibiotics can kill the bacteria, they also might trigger the release of large amounts of toxin, according to some Japanese scientists.

Critics argue that the slow and ineffectual response from the central authorities and poor communication with those affected by the crisis mirror almost identically the problems the Japanese government had in dealing with the 1995 Kobe earthquake, which killed more than 5,000 people.

One plan under consideration to combat this problem is to expand the role of the National Institute of Health (NIH) to something similar to the US Centers for Disease Control and Prevention (CDC). Haruo Watanabe, a department director at the health institute welcomes the proposal, saying that it is essential for one organization to coordinate efforts and hold information on both patients and pathogens. But he stresses that to make the institute function like the CDC will require many more employees (Japan's NIH currently employs only 392 people, compared with approximately 5,000 at CDC). But Ministry of Health officials are not planning to increase staff numbers.

Some medical experts argue that the crisis reflects problem deeply rooted in Japanese medical society, as many Japanese clinicians are not aware of standard international medical practice and do not read up-to-date text books and state-of-the-art papers in international journals. Japan is linguistically and geographically handicapped, according to Masanori Fukushima, a long time campaigner for reform of Japan's medical care system, which leads to the slow dissemination of the latest information on new treatments and emerging diseases. For example, the internationally respected *Merck Manual*, which gives a detailed description of the symptoms, treatment and complications of infection by *E. coli* 0157:H7, is not yet widely read in Japan despite the release of a Japanese edition in 1994. The publisher of the Japanese edition recently sent copies of the manual to the Knock Yokoyama, the Osaka prefectural governor, the major of Sakai, and the head of the Osaka Medical Association to help them deal with the crisis.

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Bacterial source remains elusive

In mid-August, under extreme pressure to find the source of the *E. coli* epidemic raging through Japan, the country's Ministry of Health and Welfare released a report suggesting that it could be white radish sprouts (*kaiware daikon*), a popular vegetable used in Japanese cuisine.

However, the evidence cited by the ministry in support of this theory was purely circumstantial. The bacteria has not been detected in the radish sprouts themselves, nor at the specific farm the ministry believes to be the source of infection. The ministry's investigation team has only determined that radish sprouts were contained in meals eaten at schools in Sakai and at the nursing home in Habikino just before the outbreak of the food poisoning.

Some scientists in Japan have openly expressed doubts that radish sprouts are the primary source of infection, as this particular strain of *E. coli* is normally found in the intestines of cows, and is sometimes carried in cow's meat and manure. In the only case where the source of contamination has been identified, it was traced to a meal containing raw cow's liver.

Despite the slim evidence, national supermarket chains have removed radish sprouts from their shelves and restaurants have stopped dishing up radish sprouts for their customers. Radish farmers throughout Japan are angry, protesting that the ministry's action is premature and is threatening their livelihood.

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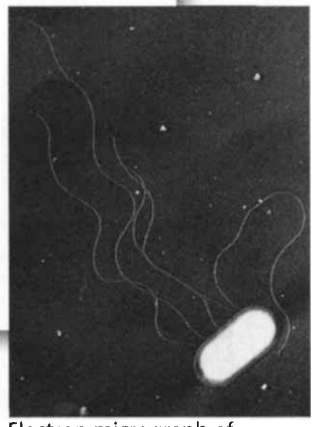

Electron micrograph of *Escherichia coli* bacterium.