

NEWS

Viral outbreak in China tests government efforts

Researchers call for greater focus on surveillance and genomics.

An outbreak of hand, foot and mouth disease in China, which since January has killed 19 children and made nearly 42,000 ill, has researchers calling for a better surveillance system to detect the disease and for action to speed up vaccine development.

“The situation of preventing and containing hand, foot and mouth disease is very serious at the moment,” Deng Haihua, spokesman for China’s health ministry, said last week. More cases are expected, as the disease normally peaks between May and July. In the absence of a drug treatment, the ministry is focusing on prevention and containment.

The outbreak is the latest in a series to have hit China in recent years, caused by a fast-spreading virus called enterovirus 71. “The persistence of enterovirus 71 outbreaks in China is a wake-up call,” says Jane Cardosa, a virologist at the University Malaysia Sarawak

in Kota Samarahan. In 1997, Sarawak saw the first outbreak of hand, foot and mouth disease in the Asia-Pacific region.

The disease causes flu-like symptoms, along with rashes on the hands and feet, and mouth ulcers. It can be caused by many types of human enterovirus belonging to the Picornaviridae family, which are mainly transmitted through faecal or oral routes. Although normally mild, the disease can be life-threatening; some viruses, particularly enterovirus 71, can cause inflammation of the brain stem, resulting in heart failure and fluid accumulation in the lungs.

In 1997 in Sarawak, more than 2,600 cases of the disease were reported and 29 people died. The next year in Taiwan, there were 129,000 reported cases and 78 deaths. In mainland China, the first reported case was in Shenzhen, Guangdong province, in 1999.



China has seen several outbreaks of hand, foot and mouth virus in recent years.

At first, outbreaks were local and there were no reported fatalities (L. Li *et al. J. Clin. Microbiol.* 43, 3835–3839; 2005). But since 2004, the outbreaks have become more severe and widespread, says Xu Wenbo, an infectious-disease expert at the Beijing-based China Center for Disease Control and Prevention.

AP PHOTO

Australian cap-and-trade plan comes under fire

The Australian government’s proposed cap-and-trade scheme to regulate greenhouse gases, released in draft legislation last month, is facing mounting criticism from opposition politicians. Prime Minister Kevin Rudd, whose Labor party holds a slim majority in the House of Representatives and none in the Senate, is under pressure to alter the plan or risk defaulting on a promise to implement a system by 2010.



Australian climate-change minister Penny Wong.

Opposition leader Malcolm Turnbull of the Liberal party has called the scheme “irresponsible”, and says it will cost jobs in a time of economic crisis. Meanwhile, the left-leaning Greens party argues that the emissions-reduction target, of 5–15% below 2000 levels by 2020, is “worse than useless”.

Australia produces less than 2% of the world’s greenhouse gases, but its per-capita emissions are among the highest in the world and rising (see chart).

Decisive action from Australia could help build momentum for international climate-change negotiations in Copenhagen this December, says Senator Penny Wong, Australia’s minister for climate change and water, who spoke on 30 March in Washington DC at a talk hosted by the Pew Center on Global Climate Change, based in Arlington, Virginia. “The best chance of an agreement at Copenhagen is for as

many countries as possible to act,” she says. “Australia is one of those.”

In November 2007, a wave of public concern about climate in drought-ridden Australia helped Rudd win office over incumbent John Howard. On 10 March

2009, his government released draft legislation of an emissions-trading scheme that would begin on 1 July 2010.

Under the proposal, the roughly 1,000 Australian companies that emit 25,000

or more tonnes of carbon dioxide per year or the equivalent in other greenhouse gases would be required to obtain permits to emit, which could be bought at government auctions or traded. The country’s total emissions would be controlled by a cap intended to achieve reductions by 2020 of at least 5% — up to 15% if other nations agree to similar targets — with a long-term goal of a 60% reduction below 2000 levels by 2050.

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In May 2008, the country's health ministry added hand, foot and mouth to its category 'C' of notifiable diseases, meaning that all diagnosed cases must be reported through a national web-based system for disease surveillance, and took measures to streamline reporting requirements. The ministry also vowed to

take a tough stance against cover-ups and last month sacked four health officials in Henan province for concealing the number of infections and deaths.

This year, enterovirus 71 has caused nearly all of the laboratory-confirmed cases in two hot-spots, the provinces of Henan and Shandong. Xu suspects that the disease's increasing virulence may be due to a genetic change in the circulating virus strain. Before 2004, the predominant strain was called C4b; since then, a different strain, C4a, has been most common (Y. Zhang *et al. J. Clin. Virol.* **44**, 262–267; 2009).

What caused this switch isn't clear, says Xu, as little is known about the genetics and transmission trends of the fast-mutating virus. Most studies have been clinical, aimed at, for example, identifying the strains behind a given outbreak and the disease's clinical features, especially when there are neurological complications. Many researchers say it is time to step up efforts to understand the basic biology of enterovirus 71 to speed vaccine development.

In a major push financed by the Chinese health ministry and the Center for Disease Control and Prevention, Xu and his colleagues



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measured the infection rate in adults and children during last year's outbreak and analysed stool samples and throat swabs taken from more than 18,000 patients. Preliminary results suggest that the infection rate is alarmingly high, meaning that there are large populations of virus carriers who do not show any symptoms of the disease.

Experts are divided as to how worried the world should be about the virus. Tom Solomon, a neurologist at the University of Liverpool, UK, argues that enterovirus 71 infection is underappreciated on a global scale and may pose a bigger risk to public health than is currently thought. But Hans

"The persistence of enterovirus 71 outbreaks in China is a wake-up call."

Troedsson, the World Health Organization's representative in China, says "there is no cause for alarm". The public-health impact of hand, foot and mouth disease, including cases caused by enterovirus 71, is no more serious than other common childhood diseases, he says.

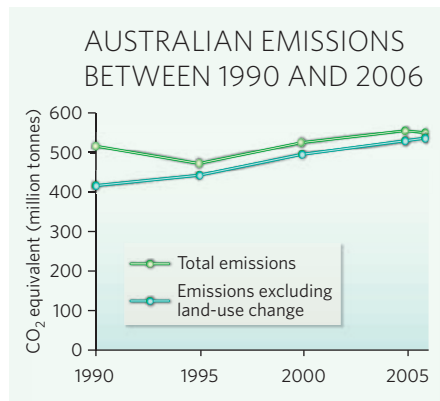
Troedsson thinks that the recent apparent increase in enterovirus 71 infection might be due to higher reporting rates rather than an increase in disease prevalence. "We will closely monitor the situation and decide policies accordingly," he says.

Jane Qiu

The plan also offers assistance to certain industries, which some opponents argue is too generous. As outlined in a government white paper released in December, emissions-intensive industries vulnerable to trade competition would get 60–90% free permits in the first year, and coal-fired power generators would receive an estimated Aus\$3.9 billion (US\$2.7 billion) in assistance over 5 years. Agriculture and deforestation, which account for about 27% of Australia's emissions, would not initially be included.

Two Senate committees are due to deliver reports reviewing the proposed scheme this month and next, and the government hopes to push the legislation through parliament by June. For the bill to pass, Rudd will need support from the Coalition, made up of the Liberal and National parties, or the Greens, says Andrew Macintosh, associate director of the Australian National University's Centre for Climate Law and Policy in Canberra. Although some industry representatives have opposed the bill, he says, others "recognize that this is still a very good deal" and could pressure the Liberals to accept it.

But the possibility of delays has raised concerns that companies will be rushed into auctions if the bill passes with a July 2010 timetable, says Brian Fisher, chief executive of consulting firm Concept Economics in Canberra, who worked on climate policy for the Howard administration. "Everybody's now panicking that they won't have time to see how this thing will work before they're forced to buy their first permits," he says. The government should set an initial low ceiling on permit prices to test the system



and protect export industries, he says.

Turnbull has argued that Australia should not finalize a scheme until after the negotiations at Copenhagen and after the United States reveals its plans. The latter came a step closer this week, as the US House of Representatives energy and commerce committee was set to release a draft cap-and-trade bill as *Nature* went to press. And on 20 March, the US Environmental Protection Agency submitted a proposed finding to the White House, widely thought to state that the greenhouse gases are pollutants endangering the public's health. Australia's experiences wrestling with cap-and-trade design issues could provide useful lessons for the United States as it formulates its own system, says Eileen Claussen, president of the Pew Center on Global Climate Change.

In Australia, the recent heat wave, wildfires and floods point to a need for urgent action, says Chris Cocklin, a sustainability policy expert at James Cook University in Townsville. "Every year we wait," he says, "it's just too damn long."

Roberta Kwok

SOURCE: UNFCCC NATIONAL GREENHOUSE GAS INVENTORY DATA FOR THE PERIOD 1990–2006