China's H7N9 outbreak slows but experts remain wary

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For **Chinese and US CDC study** see http://wwwnc.cdc.gov/eid/article/19/8/13-0662_article.htm

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The novel strain of H7N9 avian influenza that appeared in China in February, 2013, is waning nearly as rapidly as it had emerged. The upward march of new cases—which climbed by more than 120 during April—slowed to a crawl in May, with just five reported as of May 14. After 3 weeks with no new cases in Shanghai, officials declared an end to the emergency response they activated on April 2, although hospitals will continue to monitor influenza-like illnesses and live poultry markets remain shuttered.

Some aspects of the outbreak that were murky in the first weeks have grown clearer. It is evident that the virus can cause severe illness: most reported cases required hospital admission and more than 20% of patients died. However, authorities have been concerned about the possibility of mild, unreported infections in the general population, which could provide the virus with additional opportunities to adapt to human hosts.

Last week, a team of researchers from the Chinese and US Centers for Disease Control and Prevention (CDC) offered evidence to rebut these concerns. In a study of 20 739 cases of influenza-like illness in Chinese provinces where the disease is present, just six individuals tested positive for H7N9, which suggests that few mild infections are going undetected by the country's surveillance system.

Other puzzles remain. Surprisingly, authorities still do not know where the virus is coming from. Unlike other strains of avian influenza that leave a trail of ill or dead birds when they pass through a flock, H7N9 is not highly virulent and could remain invisible. The virus has also eluded tests by the public health authorities. Juan Lubroth, Chief Veterinary Officer of the Food and Agriculture Organization, says that although about 400 000 samples have been taken from birds and other animals at markets in the immediate vicinity of confirmed human cases, only around 50 have tested positive for H7N9. "That is a very low number compared to what we would have anticipated", he explains.

The virus displays genetic hallmarks of having originated in an avian species, says Andrew Pekosz, an expert on respiratory viruses at Johns Hopkins University (Baltimore, MD, USA), but it is difficult to respond effectively to the outbreak without confirming the animal reservoir. "Something out there is moving the virus into contact with humans and until we can really identify that, it's going to be a very difficult struggle to put countermeasures in place", he comments. Authorities have begun serological testing of animals for the presence of viral antibodies, because these detect past exposure even if the infection is no longer present.

If incidence of the disease continues to fall, public health authorities might have to work against public indifference, especially because the outbreak has not ended. "This infection is simmering", says Pekosz. "That's still a concern, because any significant number of human cases represent interactions with the virus and its host that you want to minimise."

Closures of poultry markets in Shanghai and other cities could have slowed transmission to people, but the fall in incidence could also be a product of warmer weather. The seasonality of influenza often makes apparent changes in incidence difficult to interpret, says Marc-Alain Widdowson, who leads the International Epidemiology and Research Team of the US CDC's Influenza Division. The virus is still there, he explains, and is "ready to come back into action when the season is more suitable for its transmission".

The important question is how many evolutionary steps the virus would have to take to allow efficient transmission between people. Nancy Cox, director of the Influenza Division of the US CDC, says that the virus's genetic material puts it between avian-adapted and human-adapted viruses. "It's almost as if nature was giving us a peek into how influenza viruses evolve. And it's not entirely clear what host it's evolving in, but this virus has evolved more towards being able to infect humans efficiently than regular avian influenza viruses have", she comments.

In the short term, it may be a challenge to contain the virus within China. On April 27, the southern province of Guangdong reported its first H7N9-positive bird, suggesting that the virus might already be endemic in the area. Thousands of live birds are traded between China and neighbouring Vietnam under normal circumstances, and trading might be even higher now, because poultry prices in China have been depressed by the outbreak. Widdowson says that disease surveillance in poultry markets in northern Vietnam is being increased. But international spread of the virus may only be a matter of time.

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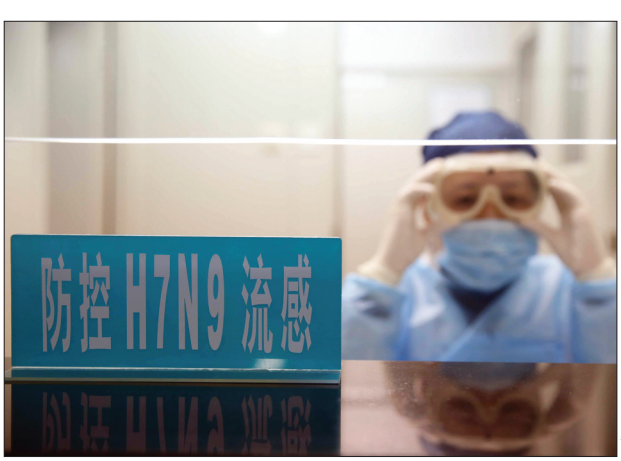

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