

Vigilance needed to avert spread of bird flu to humans

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Health experts are calling for tighter biosecurity measures in global poultry production, from farms to markets, to monitor bird flu (avian influenza) following its spread among dairy cows in the United States.

Since 2003, [888 cases of human infection](#) with the [avian influenza virus](#), also known as H5N1, have been reported from 23 countries, of which 463 were fatal, according to the World Health Organization (WHO). Vietnam, Cambodia, and Indonesia are among the worst affected.

"Although the number may appear not as big as many other outbreaks, we need to bear in mind that each infection in humans is an attempt of the virus to try to establish itself in [the] human population," says Wenqing Zhang, head of the WHO's global influenza program, in a video released this week (Monday).

"Although the chances are slim so far, as long as it succeeds just once, it is a start of an influenza pandemic."

Symptoms in humans range from mild upper respiratory problems to severe illness such as pneumonia and multi-organ failure.

The recent outbreak among dairy cows in the U.S. indicates that H5N1 is expanding its range beyond birds, sparking concerns worldwide especially in many Asian countries where avian influenza has become endemic.

While the virus has not shown signs of adapting to allow human-to-human transmission, the WHO is calling on countries to enhance surveillance measures and improve food hygiene practices.

Anyone exposed to infected live or dead poultry or infected animals, or contaminated environments such as live bird markets, is at risk, says Zhang.

'Compromised biosecurity'

Bangladesh is considered a "hotspot" for the emergence of zoonotic

infectious diseases due to its dense population, diverse wildlife and increasing urbanization and deforestation.

Here, surveillance in live bird markets, also known as wet markets, reveals a high prevalence of avian influenza in poultry and the surrounding environment, which heightens the risk of so-called "zoonotic spillover"—the transmission of virus from animals to humans—says Nadia Rimi, associate scientist and coordinator of the Program for Emerging Infections at ICDDR,B, an international health research institute in Dhaka.

In Bangladesh, the H5N1 virus has become endemic in poultry, Rimi tells SciDev.Net.

"There are numerous small-scale poultry farms and live bird markets across the country with compromised biosecurity conditions and hygiene practices, which create a conducive environment for spreading of infectious pathogens," she says.

Other countries in the region have similar poultry farming and selling practices and biosecurity conditions. India, Pakistan and Nepal have also reported a few cases of human H5N1 infection.

"What's also concerning and what would precipitate greater spread is if the [avian influenza] virus were to find itself into the pig population... a perfect vessel through which an even more virulent strain could emerge," said Nirav Shah, principal deputy director at the US Centers for Disease Control and Prevention, in a Council on Foreign Relations briefing earlier this month (1 May).

According to Rimi, the greatest risk is the "probability of coinfection and genetic reassortment" with other [influenza viruses](#) in humans, which could lead to the emergence of a novel influenza virus strain "with

pandemic potential."

The H5N1 strain of the virus has widely spread among [wild birds](#), poultry, land and marine mammals and now in [dairy cows](#). So far, only one case of cow-to-human transmission has been confirmed in a U.S. dairy worker.

The WHO recommends that people worldwide consume pasteurized milk as preliminary tests show that pasteurization kills the virus detected in raw milk.

Early bird flu control

A recent study by scientists from the interdisciplinary research and development program, One Health Poultry Hub, highlights that [bird flu](#) control for pandemic prevention must start before poultry reaches wet markets.

Rimi says that controlling chickens entering the market and vaccinating them requires multipronged interventions at the farm and transportation level as well as the markets themselves.

"We are currently implementing interventions in the live bird markets, including weekly rest days, routine cleaning and disinfection...to explore if these are acceptable, feasible and effective for these resource-poor settings," she adds.

The findings from the study—based on computer modeling using data from Bangladesh—showed that nine in ten chickens that entered live bird markets without having been previously exposed to the H9N2 subtype of avian influenza virus became infected with it when they remained there for one day.

The time between a bird being infected with H9N2 and it becoming contagious could be less than five and a half hours in a live bird market and one in ten birds arrived at the markets already exposed to H9N2, according to the researchers.

Vietnam on alert

In April, Vietnam reported its first human infection with the H9N2 strain.

Pawin Padungtod, senior technical coordinator at the Food and Agriculture Organization's Emergency Center for Transboundary Animal Diseases in Vietnam, says the virus is being closely monitored in the Greater Mekong sub-region under a One Health approach, which balances the health of people, animals and ecosystems.

He says poultry vaccination against viruses has been a crucial strategy in Vietnam's bird flu control efforts. Regular surveillance is conducted to detect and monitor the incursion of any new avian virus and determine the efficacy of vaccines.

"These surveillance activities have been providing crucial information to support vaccine selection and identification of areas where [avian influenza] outbreaks are more likely to occur," Padungtod tells SciDev.Net.

"Vietnam has been removing unsold chickens and it uses H9 vaccine to reduce exposed birds entering the market. We can further use the evidence provided in this study to advocate for [bird flu] vaccination in animals and strengthen live bird market biosecurity in the country."

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