

Health authorities in Cambodia report a young girl has died from bird flu

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An 11-year-old girl in Cambodia died Wednesday night of H5N1 virus, the first known human infection with avian flu since 2014, according to Youk Sambath, Secretary of State of the Ministry of Health. The child, from the rural southeastern province of Prey Veng fell ill only a week previously.

The young patient was transferred to the capital, Phnom Penh, for treatment when her condition worsened. Her viral illness with H5N1, designated Highly Pathogenic Avian Influenza (HPAI) and reportable to the World Health Organization (WHO), was eventually diagnosed on Wednesday just prior to her death.

Health officials have since surveyed the village near the child's home and taken samples from a dead wild bird at a conservation area, according to the Associated Press. They have also cautioned residents to avoid contact with sick or dead birds and to keep children from feeding farm birds or collecting their eggs.

The latest development from Cambodian health officials and the WHO have confirmed that of the 12 suspects, only the father of the child that died was positive, and, as of this writing, is asymptomatic. The eleven other suspected contacts have been confirmed negative.

The initial symptoms of infection with H5N1 are no different than other flu viruses, with the constellation of coughs, aches, and fevers. However, the highly virulent H5N1 virus can lead to a rapidly fatal pneumonia.

The HPAI H5N1 was first identified in 1996 among commercial geese in the Guangdong province of China, followed by the first fatal human case of H5N1 in 1997 in Hong Kong. Since then, at least 870 human infections have been documented across 21 countries, with 457 fatalities. Although the case fatality rates with such infections have declined to around 30 percent, these may be attributable to early interventions and treatments. An Ecuadorian child last month whose case caught media

attention was treated with anti-viral medicine. She survived her infection.

The epidemiological investigation of these infections over the course of the next few days will be crucial to determine if there has been a pattern of human-to-human transmission, rather than bird-to-human only, which would imply the virus has undergone as of yet unknown mutations that allow it to replicate and transmit among humans.

Although the WHO and health experts have continued to state that such an occurrence remains a low-risk scenario, it is precisely such an event that is of utmost concern. Given the high fatality rate among the rare cases that have occurred mainly among domestic bird handlers, a novel respiratory contagion with such lethal characteristics would be catastrophic for the planet's population, especially in light of the failed lessons of the COVID pandemic.

Jeremy Farrar, a former member of the UK's Scientific Advisory Group for Emergencies (SAGE) and Chief Scientist-designate of the WHO, remarked, "We're not going to face that scenario, I don't think, but if we allow an avian virus to which none of us has got any immunity to continue to circulate in birds and then increasingly, whether it's minks or seals, come across into the mammalian sector and therefore start to adapt, there's a risk there. You can't quantify it. But we don't have an H5N1 vaccine tomorrow ready to go."

He told the *Telegraph* that if the world failed to act immediately to develop new vaccines against the influenza viruses and improve biosecurity in markets and farms, it would be seen in hindsight as a "tragic omission." Farrar added, "Imagine, tomorrow morning at nine o'clock there's a report that there's 100 people admitted to a hospital somewhere with a nasty respiratory virus, and it happens to be H5N1. That's my concern; that we're in slow motion watching something which may

never happen but if it were to happen, would we look back and say, ‘Why didn’t we do more?’”

The WHO’s director-general, Dr. Tedros Adhanom Ghebreyesus, warned that the recent spillovers into mammals such as otters, sea lions and minks are of significant concern that the virus is evolving at a pace and in a direction that is problematic. He warned, “H5N1 has spread widely in wild birds and poultry for 25 years, but the recent spillover to mammals needs to be monitored closely.” Although there has not been any sustained transmission among people, “we cannot assume that will remain the case,” he warned.

The present outbreak of HPAI H5N1 pandemic among wild and domestic birds is evolving into a sustained wave of infections without any seasonality. The current clade (common ancestral grouping) of H5N1, called 2.3.4.4b, is well suited to spread efficiently among wild birds and poultry across multiple regions of the world. It has become endemic among wild birds and since October 2021, more than 140 million poultry have died from disease or been culled, according to the World Organization for Animal Health (WOAH).

Among chickens, avian flu is extremely contagious and almost 100 percent lethal. In the US, since last February, around 58 million farm-raised birds have been killed, the deadliest outbreak on record, according to the *Wall Street Journal*. With over 48 million egg-laying hens having perished, egg inventories have fallen by a third and the price of eggs has risen fivefold since 2021.

Influenza pandemics have been common to human civilizations and the 1918 “Spanish” flu, which killed an estimated 50 million people worldwide, is the archetype of such events. Genetic investigation on the origin of the 1918 flu linked it to the H1N1 virus with genes of avian origin.

The negative-sense single-stranded RNA virus mutates quickly, with two to eight substitutions per 1,000 sites each year. Because of SARS-CoV-2’s genetic “proofreading” mechanism, it has a much lower mutation rate by comparison.

Additionally, two different influenza viruses that co-infect a cell can reassort their genes with each other, increasing their evolutionary pace and potential virulence. For instance, HPAI strains have a protease which expands the tissue tropism of the virus (the range of areas of body that can be infected), thereby facilitating systemic disease.

The ability of the virus to infect mammals and the recent experience in Galicia, Spain, where the H5N1 spread through a densely packed mink farm, have only

added to the concerns raised by the WHO on the pandemic potential of the avian flu virus within human populations.

In a report published last month in the journal *Science*, Imperial College London virologist Tom Peacock explained that samples from four mink showed genetic mutations that help the H5N1 virus replicate more efficiently in mammals. Fortunately, a protein on the surface of the virus that binds to the host receptor has not changed. “We may still have been lucky with this one,” he said.

In a report titled “Flu: When Spillovers Spill Over,” published on November 9, 2022, in *Think Global Health*, the authors note, “In 2014, a new lineage of HPAI H5N1 (referred to as 2.3.4.4 [the current clade]) was found to infect but not always kill wild birds, providing the virus ample opportunity to spread into North America for the first time. This lineage has been dominant in outbreaks globally, including what we have seen so far in 2022, which has also involved some localized reassortment of lower-pathogenicity Eurasian and North American lineages.”

They then ask, “A pressing question is whether these recent reassortments may be, in part, responsible for the apparent increased transmissibility of the virus to mammals, or if mammalian cases are merely the result of greater spread and opportunity of exposure. What needs to be determined, and quickly, is the ‘where.’ In what intermediate host is the reassortment happening?”

The essence of the current bird flu pandemic is the carrying out in real time of a natural “gain of function” experiment, with the virus as the mad scientist seeking to perfect its own infectiousness, the planet as the laboratory, and human beings as potentially the next subjects in the process.

These developments and concerns need to be urgently heeded and immediate action taken to prevent the emergence of another pandemic that would make COVID seems like a preliminary by comparison. Recent developments have already been allowed to go further than they should have.



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