

The next pandemic? It's already here for Earth's wildlife, says biologist

March 12 2024, by Diana Bell



Credit: Pixabay/CC0 Public Domain

I am a conservation biologist who studies emerging infectious diseases. When people ask me what I think the next pandemic will be I often say that we are in the midst of one—it's just afflicting a great many species

more than ours.

I am referring to the highly pathogenic strain of avian influenza H5N1 (HPAI H5N1), otherwise known as [bird flu](#), which has killed millions of birds and unknown numbers of mammals, particularly during the past three years.

This is the strain that emerged in domestic geese in China in 1997 and quickly jumped to humans in south-east Asia with a mortality rate of [around 40-50%](#). My research group [encountered the virus](#) when it killed a mammal, an endangered [Owston's palm civet](#), in a captive breeding program in Cuc Phuong National Park Vietnam in 2005.

How these animals caught bird flu was never confirmed. Their diet is mainly earthworms, so they had not been infected by eating diseased [poultry](#) like many captive tigers in the region.

This discovery prompted us to collate all confirmed reports of fatal infection with bird flu to assess just how broad a threat to wildlife this virus might pose.

This is how a newly discovered virus in Chinese poultry came to threaten so much of the world's biodiversity.

The first signs

Until December 2005, most confirmed infections had been found in a few zoos and rescue centers in Thailand and Cambodia. Our analysis in 2006 showed that nearly half (48%) of all the different groups of birds (known to taxonomists as "orders") contained a species in which a fatal infection of bird flu had been reported. These 13 orders comprised 84% of all [bird species](#).

We reasoned 20 years ago that the strains of H5N1 circulating were probably highly pathogenic to all bird orders. We also showed that the list of confirmed infected species included those that were globally threatened and that important habitats, such as Vietnam's Mekong delta, lay close to reported poultry outbreaks.

Mammals known to be susceptible to bird flu during the early 2000s included primates, rodents, pigs and rabbits. Large carnivores such as Bengal tigers and clouded leopards were reported to have been killed, as well as domestic cats.

Our 2006 paper showed the ease with which this virus crossed species barriers and suggested it might one day produce a pandemic-scale threat to global biodiversity.

Unfortunately, our warnings were correct.

A roving sickness

Two decades on, bird flu is killing species from [the high Arctic](#) to [mainland Antarctica](#).

In the past couple of years, bird flu has spread rapidly across Europe and infiltrated North and South America, killing millions of poultry and a variety of bird and [mammal species](#). [A recent paper](#) found that 26 countries have reported at least 48 mammal species that have died from the virus since 2020, when the latest increase in reported infections started.

Not even the ocean is safe. Since 2020, 13 species of aquatic mammal have succumbed, including American sea lions, porpoises and dolphins, often dying in their thousands in South America. A wide range of scavenging and predatory mammals that live on land are now also

confirmed to be susceptible, including mountain lions, lynx, brown, black and polar bears.

The UK alone has [lost over 75%](#) of its great skuas and seen a 25% decline in northern gannets. Recent declines in sandwich terns (35%) and common terns (42%) were also [largely driven by the virus](#).

Scientists haven't managed to [completely sequence](#) the virus in all affected species. Research and continuous surveillance could tell us how adaptable it ultimately becomes, and whether it can jump to even more species. We know it can already infect humans—one or more genetic mutations may make it more infectious.

At the crossroads

Between January 1 2003 and December 21 2023, 882 cases of human infection with the H5N1 virus were reported from 23 countries, of which [461 \(52%\) were fatal](#).

Of these fatal cases, more than half were in Vietnam, China, Cambodia and Laos. Poultry-to-human infections were first recorded in Cambodia in December 2003. Intermittent cases were reported until 2014, followed by a gap until 2023, yielding 41 deaths from 64 cases. The subtype of H5N1 virus responsible has been detected in poultry in Cambodia since 2014. In the early 2000s, the H5N1 virus circulating had a high human mortality rate, so it is worrying that we are now starting to see people dying after contact with poultry again.

It's not just H5 subtypes of bird flu that concern humans. The H10N1 virus was originally isolated from wild birds in South Korea, but has also been reported in samples from China and Mongolia.

[Recent research](#) found that these particular virus subtypes may be able to

jump to humans after they were found to be pathogenic in laboratory mice and ferrets. The first person who was confirmed to be infected with H10N5 [died](#) in China on January 27 2024, but this patient was also suffering from seasonal flu (H3N2). They had been exposed to live poultry which also tested positive for H10N5.

Species already threatened with extinction are among those which have died due to bird flu in the past three years. The first deaths from the virus in mainland Antarctica have just been [confirmed in skuas](#), highlighting a looming threat to penguin colonies whose eggs and chicks skuas prey on. Humboldt penguins have already been [killed by the virus](#) in Chile.

How can we stem this tsunami of H5N1 and other avian influenzas? Completely overhaul poultry production on a global scale. Make farms self-sufficient in rearing eggs and chicks instead of exporting them internationally. The trend towards megafarms containing over a million birds must be stopped in its tracks.

To prevent the worst outcomes for this [virus](#), we must revisit its primary source: the incubator of intensive poultry farms.

This article is republished from [The Conversation](#) under a Creative Commons license. Read the [original article](#).

Provided by The Conversation

Citation: The next pandemic? It's already here for Earth's wildlife, says biologist (2024, March

12) retrieved 27 April 2024 from <https://phys.org/news/2024-03-pandemic-earth-wildlife-biologist.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.