

# New avian flu virus jumps from birds to mammals, kills New England's baby seals

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A novel avian influenza virus has acquired the ability to infect aquatic mammals and was responsible for an outbreak of fatal pneumonia that recently struck harbor seals in New England, according to scientists at the Center for Infection & Immunity (CII) at Columbia University's Mailman School of Public Health, the National Oceanic and Atmospheric Association, New England Aquarium, USGS National Wildlife Health Center, SeaWorld and EcoHealth Alliance.

This research is published in *mBio*.

Wildlife officials first became concerned in September 2011, when seals with severe [pneumonia](#) and skin lesions suddenly appeared along the coastline from southern Maine to northern Massachusetts. Most were infants (less than 6 months), and a total of 162 dead or moribund seals were recovered over the next 3 months.

Pathogen screening was conducted in a subset of afflicted seals, using sensitive diagnostic tools developed at the CII, and a new strain of avian H3N8 [influenza virus](#) was identified as a culprit.

"When initial tests revealed an avian influenza virus, we asked the obvious question: how did this virus jump from birds to seals?" says Simon Anthony, D.Phil, postdoctoral research scientist at the CII and the lead author of the study.

Based on full genome sequencing and phylogenetic analysis, seal H3N8

descended from an avian strain that has been circulating in North American waterfowl since 2002, which implies recent transmission from wild birds to seals.

Accordingly, seal H3N8 has acquired the ability to bind sialic acid receptors that are commonly found in the mammalian respiratory tract. Mutations in the HA and PB2 genes – required for cell entry and replication, respectively – suggest enhanced virulence and transmission in mammals, but these putative attributes require further investigation. Given these findings along with the long history of the spread of avian influenza to humans—most notably H1N1 and H5N1—seal H3N8 could pose a threat to public health.

"Our findings reinforce the importance of wildlife surveillance in predicting and preventing pandemics, says W. Ian Lipkin, director of the Center for Infection and Immunity and John Snow Professor of Epidemiology, at the Mailman School of Public Health. "HIV/AIDS, SARS, West Nile, Nipah and [influenza](#) are all examples of emerging infectious diseases that originated in animals. Any [outbreak](#) of disease in domestic animals or wildlife, while an immediate threat to wildlife conservation, must also be considered potentially hazardous to humans."

Provided by Columbia University's Mailman School of Public Health

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