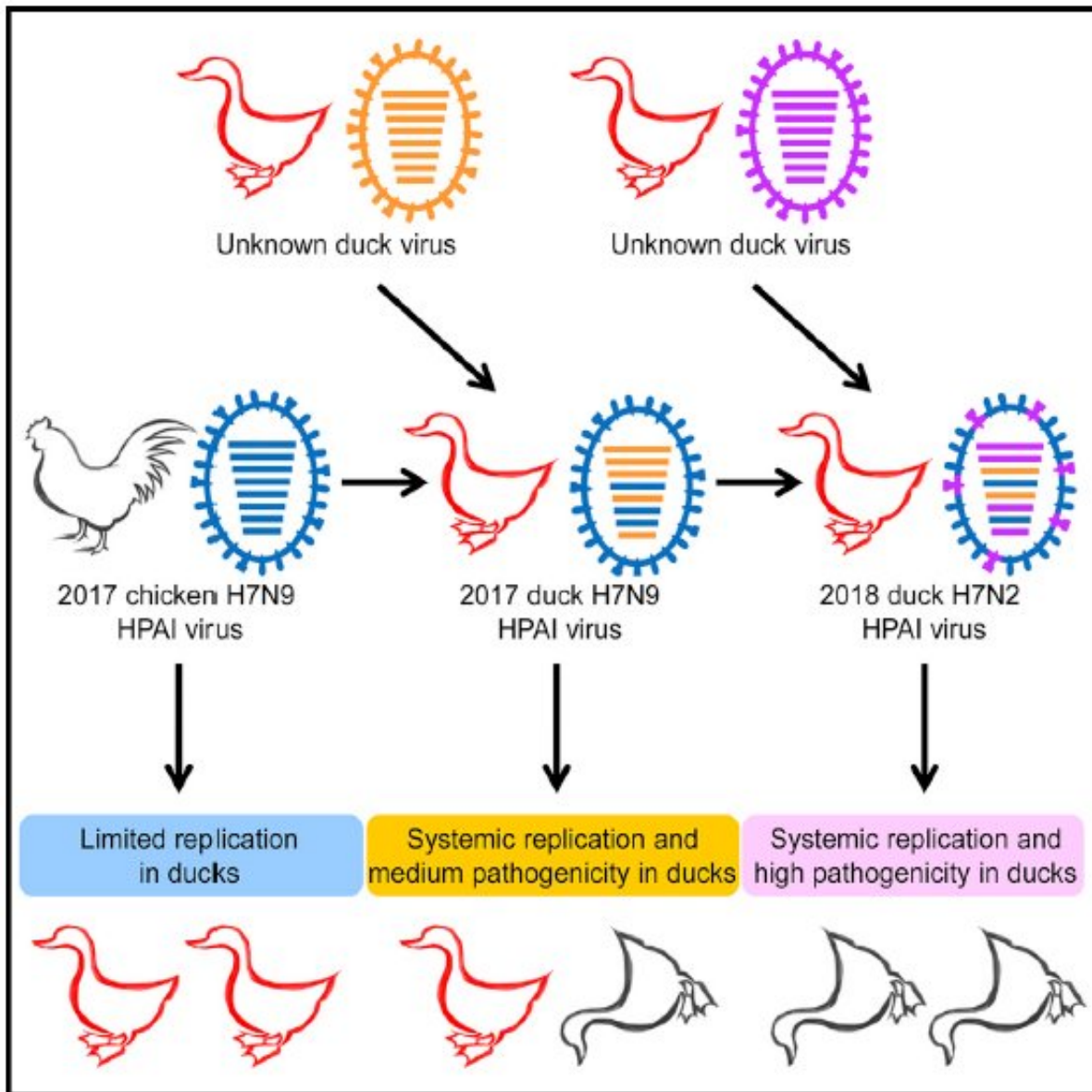


# New bird flu viruses in ducks after vaccines largely prevented H7N9 in chickens

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A graphical abstract: H7N9 highly pathogenic avian influenzaviruses emerged in

China in 2017, prompting vaccination in poultry. Shiet al. examine H7N9 viruses across China before and after vaccination, revealing rapid evolution into subtypes and genotypes. Although vaccination reduced infections, some H7N9 and H7N2 viruses exhibit heightened virulence and expansion to ducks. Credit: Chen et al. / *Cell Host & Microbe* 2018

In response to bird flu pandemics starting in 2013, officials in China introduced a new vaccine for chickens in September 2017. Recent findings suggest that the vaccine largely worked but detected two new genetic variations of the H7N9 and H7N2 subtypes in unvaccinated ducks. These findings will be published in the journal *Cell Host & Microbe* on September 27.

"It surprised me that the novel, highly pathogenic subtypes had been generated in and adapted so well to ducks, because the original highly pathogenic form of H7N9 has very limited capacity to replicate in ducks," says Hualan Chen, a senior author on the paper and an animal virologist at the Harbin Veterinary Research Institute.

Chen's team collected over 37,928 chickens and 15,956 [duck](#) genetic samples 8 months before and 5 months after the vaccine's introduction. They isolated 304 H7N9 viruses before the vaccine's release, and only 17 H7N9 viruses and one H7N2 [virus](#) after.

"Our data show that vaccination of chickens successfully prevented the spread of the H7N9 virus in China," says Chen. "The fact that human infection has not been detected since February 2018 indicates that consumers of poultry have also been well-protected from H7N9 infection."

The [bird flu virus](#) replicates in host cells and often mutates and reassorts

over time. When Chen's team looked closely at the genetic types of the disease-causing strains in ducks, they found that an H7N2 and an H7N9 virus had picked up certain gene segments from other duck influenza viruses, improving their ability to infect ducks.



Chickens. Credit: Jianzhong Shi

"Influenza viruses mutate as long as they replicate, but it's very difficult to predict when the H7N9 virus will obtain a particular harmful mutation," says Chen. "It is possible that the virus may adapt in other



species in the future if it cannot be eliminated soon."

Chinese consumers eat roughly three billion ducks per year (compared to 14 billion chickens). To prevent further human infection, Chen and her team believe that the virus should be eliminated in ducks as soon as possible.

"Fortunately, our study indicates that the current vaccine will work well in ducks, so we do not need to develop a new one," says Chen. "We suggest applying the H7 [vaccine](#) in ducks immediately."

**More information:** *Cell Host & Microbe*, Chen et al.: "Rapid Evolution of H7N9 Highly Pathogenic Viruses that Emerged in China in 2017" [www.cell.com/cell-host-microbe ... 1931-3128\(18\)30434-7](http://www.cell.com/cell-host-microbe ... 1931-3128(18)30434-7) , DOI: [10.1016/j.chom.2018.08.006](https://doi.org/10.1016/j.chom.2018.08.006)

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