

## Catastrophe in the Wings?

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# BioScience

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American Institute of Biological Sciences

### Catastrophe in the Wings?

**A**uthorities on avian influenza are close to united in believing that a global pandemic of the H5N1 strain of that disease, thought to have a 50 percent mortality rate in humans, is possible, if not likely. Emerging facts leave little room for complacency.

Some are well known. As of mid-February, avian H5N1 cases had been recorded in more than a dozen countries in Asia, Europe, and Africa; human infections, almost all apparently acquired directly from poultry, had been detected in Cambodia, China, Indonesia, Iraq, Thailand, Turkey, and Vietnam. The number of confirmed human cases as *BioScience* went to press was fewer than 200, but the great fear of virologists is that H5N1 could undergo genetic reassortment in a person harboring both H5N1 and a variant more readily transmitted between humans. The resulting hybrid might thus combine easy human-to-human infection and high lethality. The influenza virus is infamous for sudden changes that confound acquired immunity.

Other facts about avian influenza are less well known, and some suggest that North and South Americans have little cause to feel protected. An outbreak of bird flu (not the H5N1 strain, however) originating at a duck farm in British Columbia last year led to the destruction of 60,000 birds, and a worse outbreak in 2004 led to the destruction of 19 million birds. Research by H. Chen and colleagues, published in February in the early edition of the *Proceedings of the National Academy of Sciences*, provides strong evidence for what had been only surmise: H5N1 viruses can be transmitted over long distances by migratory birds. Although H5N1 has caused mass mortality in domestic poultry, many migratory ducks survive infection, and they can shed the virus for up to seven days. That means that infected migratory birds could carry the virus long distances—which is probably how H5N1 spread from its epicenter in southern China to poultry in Siberia. Not for nothing are ornithologists in Alaska now testing for H5N1 influenza in geese and ducks, which are little deterred by the few tens of miles of ocean that separate US territory from Russia.

One would like to think that authorities in industrialized nations are well prepared, but, again, the facts do nothing to assuage concern. The story of an H5N1 outbreak among birds at a quarantine facility near London, described by Joseph P. Dudley on p. 182, will send chills down the spine of anyone who works with birds. Had the virus been more easily transmitted to humans, thousands might have been infected, because the response to the first deaths was bungled. Migratory birds are not, Dudley points out, the only way that H5N1 avian influenza might reach the Americas.

Minimizing human exposure to the pathogen is a probable way to reduce the risk that a human-adapted form will evolve, yet experts are unimpressed by the level of organized surveillance of birds in the United States. It behooves anyone who works with birds to be aware of the now very real risks, and to respond with alacrity to unexplained cases of illness among birds or their handlers.

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