

**STEVEN GORDON, MD**Department of Infectious Diseases,
The Cleveland Clinic Foundation

Avian influenza: A wake-up call from birds to humans

THE CURRENT OUTBREAK of avian influenza ("bird flu") should serve as a wake-up call to the medical community to redouble its efforts in influenza prevention. In particular, we need to make sure more people are vaccinated each year, including *all* health care workers.

The 2003–2004 flu season started badly enough with an early and severe epidemic of influenza A, in which demand for vaccine outstripped supplies. But now (March 2004), an unprecedented epidemic of avian influenza (specifically the A [H5N1] strain) is spreading through Asia.

■ WHY SHOULD WE CARE ABOUT BIRD FLU?

Why should we care about bird flu? For one thing, its spread among domestic birds will result in large economic losses and food scarcities in some areas.

But potentially more serious is that, as of February 9, 2004, 23 human cases have been reported, including 18 deaths.¹ Influenza, like severe acute respiratory syndrome (SARS), is a zoonosis and yet another reminder that most of the new and emerging diseases of the past decade have derived from animals.

All of the human cases of bird flu to date are believed to have resulted from direct contact (via aerosols) with infected chickens, with the exception of two possible cases in Vietnam, where person-to-person spread may have occurred.

Bird-to-human infections are alarming, because if the H5N1 virus should mutate, perhaps through a reassortment with a human influenza strain in a person infected with both

strains, a resultant pathogenic and highly transmissible strain could set off a global pandemic, with widespread person-to-person transmission.

■ WHY CONTAINMENT WAS LESS SUCCESSFUL THIS YEAR

Prior outbreaks of H5N1 strains among chickens in Hong Kong in 1997 and 2003 (in which bird-to-human cases were also documented) were controlled through mass slaughtering ("culling") of millions of birds. However, culling appears to be less effective in halting the spread of avian influenza in Asia this year, for several reasons:

- There was a delay in recognizing and reporting the epidemic.
- Compensation was inadequate for the Vietnamese chicken farmers who probably sold about 1 million of them instead of culling.
- The virus has spread rapidly through infection among migratory aquatic fowl such as ducks, geese, swans, and flamingos.

Although large-scale vaccination of domestic flocks of healthy birds has been proposed, its effectiveness in preventing bird-to-human cases is unknown.

■ WHAT MUST BE DONE

Preparing for a flu pandemic has many of the same components as does preparing for SARS or a bioterrorism event. We can hold our breath and hope that a pandemic does not occur, or we can take proactive steps:

We can do nothing and hope a pandemic does not occur—or we can take proactive steps to prevent one



Develop new vaccines

Efforts are under way to develop a vaccine to prevent avian influenza in humans, using new technologies such as reverse genetics. The traditional methods of vaccine production rely on growing the virus in fertilized chicken eggs, but some avian viruses are lethal to the eggs.

Monitor animal diseases better

Avian flu, like SARS, has revealed vulnerabilities in the global public health network and the need for continued partnership between veterinary and human medicine. Outbreaks of human illness have often followed epizootic illness (eg, die-off of crows in West Nile fever), underscoring the importance of systems to monitor animal diseases.

To improve the surveillance of animal diseases and to contain outbreaks at an early stage, laboratory facilities must be improved, diagnostic testing must be made widely available, and information must be shared among health agencies and governments. Interventions must take into account the local economies and the interests of farmers in developing countries and give them incentives to act responsibly and in a timely fashion.

Persuade more people to be vaccinated

Vaccination, the primary option for reducing the impact of influenza in the United States, is seriously underused.

The licensed vaccine contains three strains of inactivated virus—people cannot acquire the flu by being vaccinated. It has excellent efficacy. Yet, of the 185 million Americans for whom vaccination is recommended (soon to be expanded to include all

children older than 6 months), fewer than 40% actually receive it.

Apparently, the public does not perceive flu vaccination to be as valuable as it truly is. We must close this knowledge gap so that the other 60% get accustomed to baring their arms each year. Vaccinating more people would go a long way toward preventing the more than 30,000 deaths and 100,000 hospitalizations that influenza causes each year. It would also create incentives for drug companies to create better and potentially more effective vaccines.

Vaccinate all health care workers

Health care workers should lead by example, but vaccination rates among health care workers—one of the groups for whom vaccination is recommended—are no better than in the general population.

I therefore want to go on record as recommending a policy of mandatory immunization for all health care workers, except for those with valid contraindications or precautions against it.

One could view this policy as a patient safety issue, to prevent nosocomial transmission of influenza to patients at high risk for complications from the flu, particularly immunocompromised patients. Workers themselves would also benefit by reducing their personal risk of influenza from exposures at work and at home.



REFERENCES

- 1 Centers for Disease Control and Prevention. Outbreaks of avian influenza A (H5N1) in Asia and interim recommendations for evaluation and reporting of suspected cases—United States, 2004. *MMWR* 2004 Feb 13; 53(5).

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