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Fowl flu fuels fears

For decades, scientists have warned of the possibility of a flu pandemic. The recent outbreak of a deadly form of avian influenza in Asia has added urgency to that threat, highlighting how ill-prepared we are for a pandemic that could match or exceed the devastation of the Spanish flu in 1918. The avian flu outbreak has also revealed flaws in the way some governments have handled the health crisis—by concealing or ignoring information, they have contributed to the magnitude of the current problem.

The avian flu virus largely affects domestic fowl, but there is evidence that it can be transmitted from birds to humans, resulting in death in about 70% of cases. Presently, the most serious worry is the possible appearance of a viral strain that can be readily transmitted between humans. Although there are no data yet that such transmission can occur, the lack of evidence offers little comfort. The large reservoir of infected birds and the resulting viral load makes the appearance of a human-to-human transmissible virus all but inevitable. Were it to emerge through recombination between avian and human flu viruses, such a strain might be extraordinarily difficult—perhaps even impossible—to control.

Current efforts to prevent a pandemic have focused on culling the infected birds and using reverse genetics to develop a human vaccine. Culling on a massive scale might reduce the viral load, but reports indicate that this is not taking place fast enough; in some countries, there is little incentive for a farmer to kill his chickens in exchange for minimal monetary compensation. From a national perspective, admitting to the presence of the disease in domestic fowl has immediate economic repercussions that some governments might not be prepared to face. Secrecy and delayed disclosure from some Asian countries regarding the spread of the disease in animals, and perhaps humans, manifestly compromise our chances to prevent an outbreak.

The search for a vaccine is making good strides, as reported in page 214 of this issue. However, specific regulations need to be defined before a candidate vaccine generated by reverse genetics can be approved; there are no precedents for the use of this technology in the production of human vaccines. Progress is being made on the regulatory front in the US and Europe and, owing to the urgency of the situation, guidelines will most likely be in place by the time they are needed. But it

is unclear whether we will have enough time to perform rigorous clinical trials of the vaccine, and carry out longitudinal safety studies.

Why have we waited so long to develop a human vaccine against avian flu despite evidence—dating back to 1997—of human infection? This question is particularly poignant at a time when bioterrorism concerns have fueled funding for research on deadly viruses and strategies to fight them. For example, the budget of the US National Institute of Allergy and Infectious Diseases has grown significantly over the past two years, in the midst of a climate of economic stagnation for other divisions of the National Institutes of Health. Still, concrete initiatives to deal with an eventual human flu outbreak, such as the identification of candidate strains for the development of a vaccine, began appearing only last year.

The unfolding situation requires that affected countries be forthright about the magnitude of the animal epidemic, and about the identification and handling of new human cases. This requirement extends beyond Asia, as migratory birds might already have carried the virus to other continents. Indeed, there have been recent reports of bird flu cases in Europe and America, and human flu outbreaks of unknown origin killed hundreds of people in Africa last year.

If a safe vaccine is developed, we must make sure that its large-scale production meets the needs of the whole world. It is crucial that patent laws do not impede the availability of the vaccine available to those who need it most. The World Health Organization (WHO) is leading the discussions on intellectual property but its involvement in the problem has unfortunately been rather limited, owing to its lack of authority over local governments. The international community should seriously consider endowing a global organization such as the WHO with executive powers and a wide sphere of influence to deal with emerging health crises.

Predicting the circumstances under which a new infectious disease is likely to emerge is not simple. Many considerations influence the decision to invest human and financial resources on developing preventive measures for a putative pandemic that might not occur, but these do not justify our current lack of preparation. The lessons from the unfolding avian flu saga are important. Hopefully we won't have to learn them the hard way.