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Bird Flu Outbreak in United Kingdom Reveals Global Vulnerabilities

JOSEPH P. DUDLEY

An outbreak of H5N1 avian influenza (“bird flu”) in a bird-import quarantine facility in the United Kingdom in October 2005 met nearly all of the requisite enabling conditions for a human pandemic. Two people living on property where the bird quarantine facility was located commuted between their home and their workplace at a large public hospital where they were both employed throughout the three weeks the outbreak was in progress. Had the outbreak involved a new strain of H5N1 bird flu with enhanced human-transmission capabilities, the result could easily have been a public health catastrophe. Had either of the residents at this bird quarantine facility been employed in the poultry industry instead of in the public health sector, the result could have been an agricultural disaster: The United Kingdom would most likely have had to implement a poultry quarantine and culling program more drastic, in terms of the numbers of animals sacrificed, than the one necessitated by the foot-and-mouth disease outbreak in 2001.

The United Kingdom was categorized as an “extreme pandemic risk” country by a recent study that calculated bird flu risk indices for 161 countries worldwide, and ranked as the developed country with the highest likelihood of being affected by an avian influenza pandemic, should the virus develop enhanced human-to-human transmission capabilities (<http://maps.maplecroft.com/loadmap?template=map&issueID=56>). Fortunately, there is as yet no firm evidence that the virus has developed those enhanced human-to-human transmission capabilities, and the bird flu incident in the United Kingdom did not result in a

pandemic. Nonetheless, the circumstances that could have led to a pandemic “perfect storm” in the United Kingdom highlight the need for improved biosecurity in key areas of the international trade and public health sectors. The ongoing outbreaks of bird flu in Asia and Europe must be regarded as serious threats to agriculture and public health worldwide.

The controversy surrounding the circumstances of the UK outbreak, and the evident long delays in the laboratory testing of diseased birds at the facility, precipitated external and internal reviews of bird-import quarantine policies that might well lead to sweeping changes in bird importation and quarantine regulations within the United Kingdom. The private residence where the H5N1 outbreak occurred belonged to a husband and wife, both of whom are reportedly longtime employees of the Southend General Hospital (SGH), a modern 840-bed facility that employs more than 3900 staff and provides outpatient services for more than 300,000 people each year. The manager of the quarantine facility is a part-time maintenance engineer for SGH, where his wife is the head of the custodial services division. A rough back-of-the-envelope calculation suggests that 20,000 or more patients could have been treated at the SGH complex during the three-week period when the H5N1 outbreak was in progress at the backyard bird quarantine facility where these two hospital employees resided.

This combination of circumstances suggests that, had the outbreak involved a readily human-transmissible strain of the H5N1 bird flu virus, the Essex quarantine facility could have become ground

zero for a pandemic centered on a large public hospital near one of the world’s largest cities—a city that is connected through two major international airports to virtually all of the world’s largest cities and metropolitan areas.

The UK Department for Environment, Food and Rural Affairs (Defra) first reported confirmation of the H5N1 virus in a South American parrot, but later said that this finding was erroneous and resulted from a “pooled sample” containing material from birds imported from South America and Taiwan. The official Defra report on the outbreak (www.defra.gov.uk/animalh/diseases/notifiable/disease/ai/pdf/ai-epidemrep111105.pdf), however, attributed the origin of the H5N1 outbreak at the quarantine facility to a consignment of three species of captive-bred wild birds (mynah, mesia, and laughing thrush) imported from Taiwan, which arrived at Heathrow Airport on 27 September 2005. (Media sources cite a total of 218 birds in the original shipment, whereas Defra reports mention estimated totals of 216 or 186 birds.) These birds were transported the day after their arrival from Heathrow Airport across the city of London to the quarantine facility in the county of Essex in eastern England, one of 83 such government-licensed but privately operated bird import quarantine facilities in the United Kingdom.

The official Defra report states that although the bird consignment was inspected on 29 September by an official government veterinarian, none of the five birds found dead were tested for disease pathogens. Furthermore, no records were kept of the exact dates of death or of the clinical presentations of the 93 birds that died during the outbreak at the

Essex facility. Worse, no birds from the consignment were tested until 18 October, at least three weeks after the consignment arrived in the United Kingdom.

Defra reports that the first birds tested were brought to the official veterinarian's office on Friday, 14 October, after the deaths of about 25 percent of the 334 birds in the quarantine facility. However, no official veterinarian visited the quarantine facility until 20 October, following laboratory confirmation of a possible bird flu outbreak at the facility. Veterinary officials in Taiwan have asserted—with considerable justification—that given the inadequate record keeping at the facility and the absence of any clinical data on the dead birds present in the shipment when it first arrived, the available evidence cannot prove that the birds imported from Taiwan were in fact the source of the H5N1 outbreak in the facility.

It is important to emphasize that the H5N1 outbreak in Essex occurred while veterinary authorities across Europe were in the midst of an intense surveillance campaign for H5N1 bird flu in migratory birds, and during the exact same period when the H5N1 bird flu was first confirmed from birds in Croatia, Romania, and Turkey. Migratory waterfowl have been cited as the probable source for H5N1 outbreaks in many countries. As of 20 February, wild swans carrying the H5N1 virus had been confirmed from Austria, Azerbaijan, Bulgaria, Croatia, Germany, Greece, Hungary, Iran, Italy, Mongolia, Romania, Russia, and Slove-

nia. However, the wild birds involved in at least some outbreaks may have been infected by domesticated poultry locally or in other countries. For example, the first known H5N1 infections of wild swans in Romania were discovered only weeks after the first reported outbreaks in domestic poultry, and in areas close to the border with Ukraine. Farmers in Ukraine report that bird flu outbreaks in poultry began there during September 2005, at least three months before outbreaks were confirmed by government officials.

Migratory birds are only one of several possible mechanisms by which the H5N1 virus could be introduced to new regions. Illicit poultry vaccines from Mexico or Guatemala were implicated as the cause of outbreaks of H5N2 avian influenza virus in Japan in 2005, and illegally imported wild birds and fighting cocks have caused major outbreaks of the highly pathogenic exotic Newcastle disease in commercial poultry flocks in the United States. The documented smuggling of H5N1-infected eagles from Thailand into Belgium, and reported seizures of illegally imported poultry products from China and Thailand in the United States, Italy, and the United Kingdom indicate a high risk that H5N1-infected birds or poultry products could be transported through commercial and clandestine international trade networks.

The recent explosive expansion of bird flu into Africa and Europe proves the need for increased H5N1 surveillance in wild birds and poultry. We need to con-

tinue expanding and strengthening global surveillance networks for the H5N1 bird flu virus and other potentially dangerous zoonotic pathogens in wildlife, poultry, and livestock. We must be acutely aware of the potential threats to biosecurity and public health presented by avian influenza viruses and other animal diseases transmittable to humans, and support efforts to increase the capacity to prevent and contain zoonotic disease outbreaks in animals or people. We must greatly reduce the time necessary to identify and confirm infections of H5N1 bird flu in birds and humans, and work to reduce the chances that live creatures or animal products infected with avian influenza viruses and other potentially dangerous animal or zoonotic pathogens can be imported—knowingly or unknowingly, legally or illegally—into the United States or other countries.

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