

### **Emergence of Highly Pathogenic Avian Influenza**

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During the summer of 2005, highly pathogenic avian influenza (HPAI, subtype H5N1) started spreading westward out of Southeast Asia, where it had been circulating for several years. By the fall, HPAI was reported in poultry and/or wild birds in countries in central Asia and around the Black Sea and eastern Mediterranean. The range of HPAI expanded rapidly beginning in 2006, and by the end of April, H5N1 virus had been found in 34 countries not previously reporting the disease (Table 1). In the preceding 2½ years, 15 countries, mostly in Asia, reported HPAI. In addition to its dramatic spread in birds during 2006, HPAI also was reported in several feral domestic cats in Germany, and in a marten and mink in Germany and Sweden, respectively. It is believed these animals acquired the disease from eating infected wild birds. Worldwide, since 2003, 10 countries have documented 230 human infections with H5N1 virus, and more than 130 people have died from the disease. During 2006 there have been 86 confirmed human cases of H5N1, including 56 fatalities.

#### **Summary of reported information on HPAI (H5N1) January through April, 2006**

- 34 countries experienced first outbreaks during the reporting period.
- 24 (71 percent) of the 34 countries reported HPAI in wild birds.
- 18 (53 percent) of the 34 countries reported HPAI in poultry.
- 15 (44 percent) of the 34 countries reported avian influenza only in wild birds.
- 10 (29 percent) of the 34 countries reported avian influenza only in poultry.
- Of the 24 countries with wild birds affected, 13 (54 percent) first reported the disease in swans, and at least 17 (71 percent) had cases that involved swans.
- Nine (26 percent) of the 34 countries reported avian influenza in both wild birds and poultry.

Within these nine countries:

- Five countries first identified the disease in wild birds (Azerbaijan, France, Germany, Serbia and Montenegro, and Sweden).
- Three countries first identified the disease in poultry (Nigeria, Afghanistan, and Cote d'Ivoire).
- One country (Egypt) identified wild and domestic birds as infected at the same time.

We found no specific patterns among countries that first identified HPAI in wild vs. domestic birds, or in the time span of spread from one avian sector to another (Figure 1). However, there were some general regional patterns in the distribution of HPAI. In western and northern Europe, H5N1 virus has affected mainly wild birds, especially swans, ducks, and birds of prey. In contrast, in Eastern Europe, Africa, the Middle East, and the Indian subcontinent, H5N1 has affected mostly backyard poultry flocks and commercial poultry production facilities. To some extent, these patterns probably reflect different surveillance systems and biosecurity practices in both commercial and non-commercial poultry in more developed countries, vs. greater reliance on small production backyard flocks for subsistence use in less developed countries. Also important are regional ecological differences in wild and domestic bird populations, which affect levels of contact between species. In addition, the timing and severity of HPAI outbreaks may have dictated the focus of surveillance efforts and, therefore, the known distribution of disease in domestic and wild birds.

Different hypotheses have been advanced to explain the rapid spread of HPAI in recent months, and there has been much debate about the roles of migratory birds, poultry movements, and husbandry practices (e.g., see ProMED, February 27 and 28, 2006; <http://www.promedmail.org/pls/promed/f?p=2400:1000>). There is evidence to support different mechanisms of spread. We know that HPAI irrupted almost simultaneously in wild and domestic birds, and that ducks, chickens, and large or otherwise conspicuous wild birds (especially swans) are good sentinels. Several countries reported extraordinary increases in numbers of swans this past winter, due apparently to unusually cold weather in traditional wintering habitats further north and east. Peculiar climatic conditions therefore may have contributed to the spread and detection of HPAI. And, heightened awareness of H5N1 virus has spurred increased surveillance, leading to discovery of HPAI in new areas.

Nearly three-fourths of the countries reporting first outbreaks of HPAI since January 2006 have found the disease exclusively in wild or domestic birds. If this statistic reflects the actual distribution of HPAI, it suggests that transmission of H5N1 virus (in its present form) between wild birds and poultry is a relatively rare event. Currently in the wild, HPAI, like other avian influenza viruses, appears to be mainly a disease of aquatic birds (swans, ducks, geese, grebes, etc.). As long as it remains so, and where H5N1 has not already been introduced into terrestrial farmed birds, it may be feasible to manage husbandry practices to prevent the uncontrolled spread of HPAI in poultry. Western European countries, in particular, have been successful in limiting the establishment of HPAI in poultry, despite widespread occurrence of the disease in wild birds. Their success may provide a model for management of the disease, if and when it enters the United States.

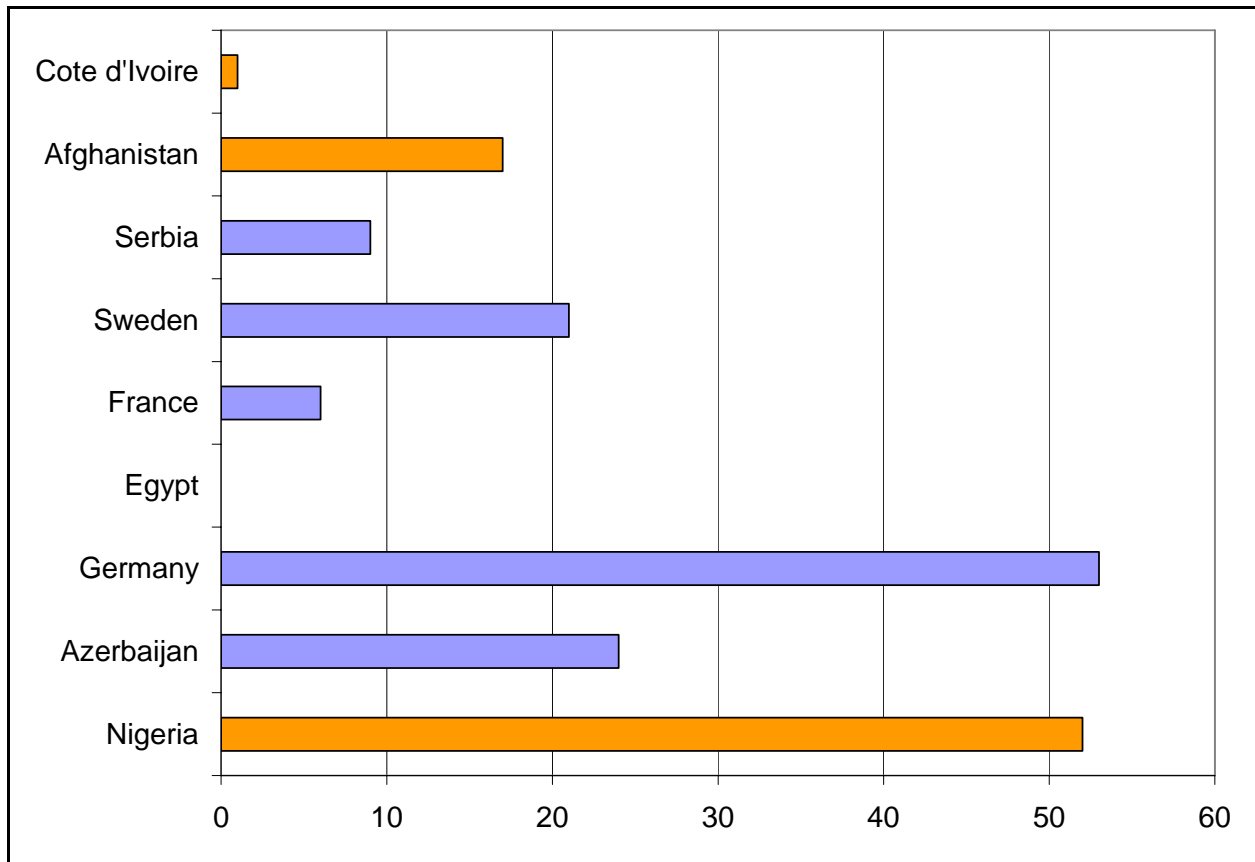
**Table 1. HPAI outbreaks reported by country, January – April, 2006**

Country	Start Date	Poultry	Poultry start date	Initial species	Wild bird	Wild bird start date	Initial species	Human
Nigeria	10-Jan		10-Jan	poultry		3-Mar	vulture	
Iraq	18-Jan		18-Jan	pigeons				
India	27-Jan		27-Jan	chickens				
Azerbaijan	29-Jan		22-Feb	poultry		29-Jan	migratory birds	
Greece	30-Jan					30-Jan	swan	
Bulgaria	31-Jan					31-Jan	mute swan	
Italy	1-Feb					1-Feb	Mute swans	
Iran	2-Feb					2-Feb	whooper swans	
Hungary	4-Feb					4-Feb	Mute swans	
Germany	8-Feb		2-Apr	turkeys		8-Feb	mute swans, whooper swan, goshawk	
Slovenia	11-Feb					11-Feb	mute swan, grey heron	
Austria	13-Feb					13-Feb	swans	
Niger	13-Feb		13-Feb	poultry				
Albania	16-Feb		16-Feb	chickens, turkeys				
Bosnia-Herzegovina	16-Feb					16-Feb	swans	
Egypt	17-Feb		17-Feb	backyard poultry		17-Feb	migratory birds	
France	17-Feb		23-Feb	turkeys		17-Feb	common pochards (duck)	
Slovakia	17-Feb					17-Feb	Smew (duck)	
Cameroon	21-Feb		21-Feb	ducks				
Georgia	23-Feb					23-Feb	swans	
Pakistan	23-Feb		23-Feb	poultry				
Switzerland	26-Feb					26-Feb	common merganser	
Serbia and Montenegro	28-Feb		9-Mar	chicken		28-Feb	mute swan	
Burkina Faso	1-Mar		1-Mar	guinea fowl				
Poland	1-Mar					1-Mar	swans, hawk	
Afghanistan	2-Mar		2-Mar	chickens, turkeys		19-Mar	crow	
Myanmar	8-Mar		8-Mar	chickens, quail				
Denmark	12-Mar					12-Mar	common buzzard	

Country	Start Date	Poultry	Poultry start date	Initial species	Wild bird	Wild bird start date	Initial species	Human
Pakistan	23-Feb		23-Feb	poultry				
Israel	16-Mar		16-Mar	turkeys				
Czech Republic	20-Mar					20-Mar	mute swan	
Jordan	23-Mar		23-Mar	turkeys, chickens				
United Kingdom	30-Mar					30-Mar	whooper swan	
Cote d'Ivoire	30-Mar		30-Mar	chickens, ducks		31-Mar	sparrow hawk	

Source: OIE disease information reports

**Figure 1. No. of days between identification of HPAI in wild birds and poultry**



Countries in which HPAI was found in both wild and domestic birds, January – April, 2006  
 Orange = disease discovered first in poultry Blue = disease discovered first in wild birds)