

CRS Report for Congress

Foreign Countries' Response to the Avian Influenza (H5N1) Virus: Current Status

Updated March 1, 2007

Emma Chanlett-Avery, Coordinator
Foreign Affairs, Defense and Trade Division

Susan Chesser, Thomas Coipuram, Jr., Hannah Fischer, Hussein Hassan, Kim Klarman, George Mangan, Mari-Jana "M-J" Oboroceanu, Barbara Salazar Torreon
Knowledge Services Group



Prepared for Members and
Committees of Congress

Foreign Countries' Response to the Avian Influenza (H5N1) Virus: Current Status

Summary

This report highlights recent efforts by affected countries to control the spread of the avian influenza (H5N1) virus. Included is statistical information on confirmed human cases and deaths through February 27, 2007. For more background information on earlier efforts by these countries and international organizations through September 2006, see CRS Report RL33349, *International Efforts to Control the Spread of the Avian Influenza (H5N1) Virus: Affected Countries' Responses*. This report will be updated as events warrant.

For additional information on the H5N1 virus, U.S. international assistance to countries struggling with the spread of the virus, U.S. domestic preparedness efforts, and potential impact on trade and agricultural issues, please see the following reports: CRS Report RL33219, *U.S. and International Responses to the Global Spread of Avian Flu: Issues for Congress*, by Tiaji Salaam-Blyther; CRS Report RL33145, *Pandemic Influenza: Domestic Preparedness Efforts*, by Sarah A. Lister; CRS Report RL33795, *Avian Influenza in Poultry and Wild Birds*, by Jim Monke and M. Lynne Corn; and CRS Report RS22453, *Avian Flu Pandemic: Potential Impact of Trade Disruptions*, by Danielle Langton.

Contents

Introduction	1
U.S. Funding for International Avian Flu Control Efforts	1
Overview of International Response	2
Antiviral Production	3
Summaries of Country and Regional Responses	5
Azerbaijan	5
Cambodia	6
China	6
Djibouti	7
Iraq	7
Egypt	7
Indonesia	8
Laos	8
Nigeria	9
Thailand	10
Turkey	10
Vietnam	10
Selected Responses by International and Regional Organizations	11
African Union (AU)	11
Asia-Pacific Economic Cooperation (APEC)	11
Association of South East Asian Nations (ASEAN)	11

List of Figures

Figure 1. Map of Human H5N1 Cases and Deaths	5
----------------------------------------------------	---

List of Tables

Table 1. Total Number of Human Cases and Deaths by Country Through February 27, 2007	4
-----------------------------------------------------------------------------------------------	---

Foreign Countries' Response to the Avian Influenza (H5N1) Virus: Current Status

Introduction

A strain of the avian influenza virus known as H5N1 first appeared in birds and humans in Hong Kong in 1997. Since re-surfacing in late 2003, the virus has spread throughout Asia and caused over 165 reported human deaths from Vietnam to Egypt while appearing in birds in Africa and Europe. Although media coverage of the virus abated significantly in 2006, both the number of cases (116 in 2006 versus 97 in 2005) and deaths (80 in 2006 versus 42 in 2005) accelerated. The H5N1 virus has been confirmed in humans in ten countries, with an overall mortality rate of about 60%.¹ The virus disproportionately affects children and young adults. Although avian influenza is still considered to be extremely inefficient in human-to-human transmission, there have been cases of limited human-to-human transmission in Indonesia. Some health authorities continue to stress that H5N1 has the potential to cause a major human pandemic. In January 2007, the World Health Organization (WHO) warned that avian influenza could again spread across Asia to Europe in 2007.²

Birds, mostly domestic poultry, remain the primary source of human infection. Confirmed cases of H5N1 infection in birds have appeared in over 50 countries, including new outbreaks in East Asia, Central Asia, the Middle East, and Europe in early 2007.³ In some countries, the virus is considered endemic, meaning that avian influenza is an ongoing risk to humans in the area.

U.S. Funding for International Avian Flu Control Efforts⁴

Congress has provided funds for U.S. international avian flu efforts through three appropriations. P.L. 109-13, FY2005 Emergency Supplemental Appropriations, provided \$25 million to combat the spread of avian influenza. The act also permitted the Secretary of State to transfer up to \$656 million for U.S. avian flu initiatives. Ultimately, \$6.3 million was transferred to USAID for those purposes, providing a

¹ According to the WHO, as of January 22, 2007. [http://www.who.int/csr/disease/avian_influenza/country/cases_table_2007_01_22/en/index.html]

² "Europe Warned Over Seasonal Resurgence of Deadly Bird Flu," *Financial Times*. January 15, 2007.

³ For a full list of countries with confirmed cases of infection in birds, see [http://www.oie.int/downld/AVIAN%20INFLUENZA/A_AI-Asia.htm].

⁴ See CRS Report RL33219, *U.S. and International Responses to the Global Spread of Avian Flu: Issues for Congress* by Tiaji Salaam-Blyther.

total of \$31.3 million for U.S. global avian flu activities from those appropriations. P.L.109-148, FY2006 Defense Department appropriations, included \$3.8 billion to address pandemic influenza. P.L.109-234, FY2006 Emergency Supplemental Appropriations, provided \$2.3 billion for avian and pandemic flu efforts, of which \$30 million was appropriated to USAID for international avian flu efforts and \$200 million was appropriated to the Centers for Disease Control and Prevention (CDC) for global and domestic disease surveillance, laboratory capacity, research, and other activities. Relevant FY2007 U.S. department and agency budget justifications included some \$205 million for global H5N1 initiatives. As in previous fiscal years, U.S. agencies and departments might commit additional resources to global avian flu efforts that were not specifically appropriated for those purposes.

Overview of International Response

Responding effectively to the spread of avian influenza has continued to challenge national governments and international organizations. While more developed countries have largely been able to stem the tide of the virus, less affluent states lack the resources to improve local preparedness, the veterinary services to provide surveillance and early warning, and established biosecurity systems to prevent outbreaks in poultry. Meanwhile, a number of more developed Asian governments, such as Singapore and Hong Kong, have developed sophisticated programs to research the virus and respond to potential outbreaks. The World Bank, the European Commission, and United Nations agencies, including WHO, the Food and Agriculture Organization (FAO), and the World Organization for Animal Health (OIE), have all provided financial support and distributed donations to poorer nations to help improve their capacity to prevent the spread of H5N1. The United States has continued to work with many of the affected countries as part of its strategy to use global partnerships to respond to the outbreaks.⁵ Australia indicated its concern by carrying out an elaborate pandemic flu simulation in October 2006, involving over 1,000 people, inviting representatives from 15 countries to observe the exercise.⁶

Asia continues to be the epicenter of human cases of H5N1. Indonesia remains the most critical of the affected countries, with 63 fatal confirmed cases to date, all of them since 2005. Analysts contend that the effectiveness of Indonesia's response is limited in part by the fact that international health authorities are based in Jakarta but have little reach outside of the city and among the dispersed population. Scientists also point out that Indonesia has not been able to replicate the successful strategies employed by Vietnam and Thailand because of its widespread use of backyard farms. Thailand and Vietnam have a larger percentage of commercial poultry farms, which are more easily regulated.⁷ Some have expressed concern with Vietnam and China's poultry immunization programs (China's alone is estimated to

⁵ For a detailed account of U.S. funding for H5N1, please see CRS Report RL33219, *U.S. and International Responses to the Global Spread of Avian Flu: Issues for Congress*, by Tiaji Salaam-Blyther.

⁶ "Bird Flu Fever," *Wall Street Journal Asia*. January 17, 2007.

⁷ "Avian Flu Outbreak in Indonesia Prompts Cull of Millions of Birds," *Financial Times*. January 16, 2007.

cover over 14 billion birds). Critics question whether the immunizations eliminate or only reduce the level of infection. Skeptics argue that birds that are immunized but still infected could be a risk to humans and make the virus more difficult to track. A new confirmed human case in China in January 2007, the first reported case in six months, renewed alarm about China's potential to suffer another outbreak.

The countries of the European Union (EU) appear to have successfully stemmed the spread of the H5N1 virus: no cases have been confirmed in humans and only limited, sporadic infections in birds have been detected. Health authorities give credit to strong and consistent veterinary measures carried out by EU governments as directed by EU legislation.⁸ On the other side of the spectrum, surveillance in Africa remains very weak. In Africa, only Egypt suffered further human cases and deaths in 2006, but concern remains that sub-Saharan Africa lacks the infrastructure and resources to deal effectively with an outbreak in humans.

Antiviral Production⁹

Production of the antiviral treatment oseltamivir (marketed as Tamiflu) has accelerated. Swiss manufacturer Roche produced approximately 190 million courses of the drug in 2006, and claimed that it could produce up to 400 million courses annually in the future. In response to pressure and increased demand, Roche granted licenses to drugmakers in India and China to produce less expensive versions of the antiviral, and dozens of countries now have stockpiles of the treatment.¹⁰ However, concern about Tamiflu's effectiveness against mutations of H5N1 were raised when a new strain in Egypt was found to be resistant to oseltamivir. An alternative drug, zanamivir (marketed as Relenza), was effective against the strain, but it is more expensive and more difficult to use and ship than oseltamivir.¹¹ The discovery of a new strain underscored the difficulty and expense of governmental programs to stockpile antiviral treatment as the virus mutates. Most scientists continue to argue that oseltamivir at present remains the most effective and promising treatment.

⁸ "Highly Pathogenic Avian Influenza A/H5N1 - Update and Overview of 2006," *Eurosurveillance*, Vol. 11, Issue 12. December 21, 2006.

⁹ For more information, see CRS Report RL33159, *Influenza Antiviral Drugs and Patent Law Issues*, by Brian T. Yeh.

¹⁰ "Scientists Still Wary of Bird Flu Pandemic," *Wall Street Journal Asia*. January 16, 2007.

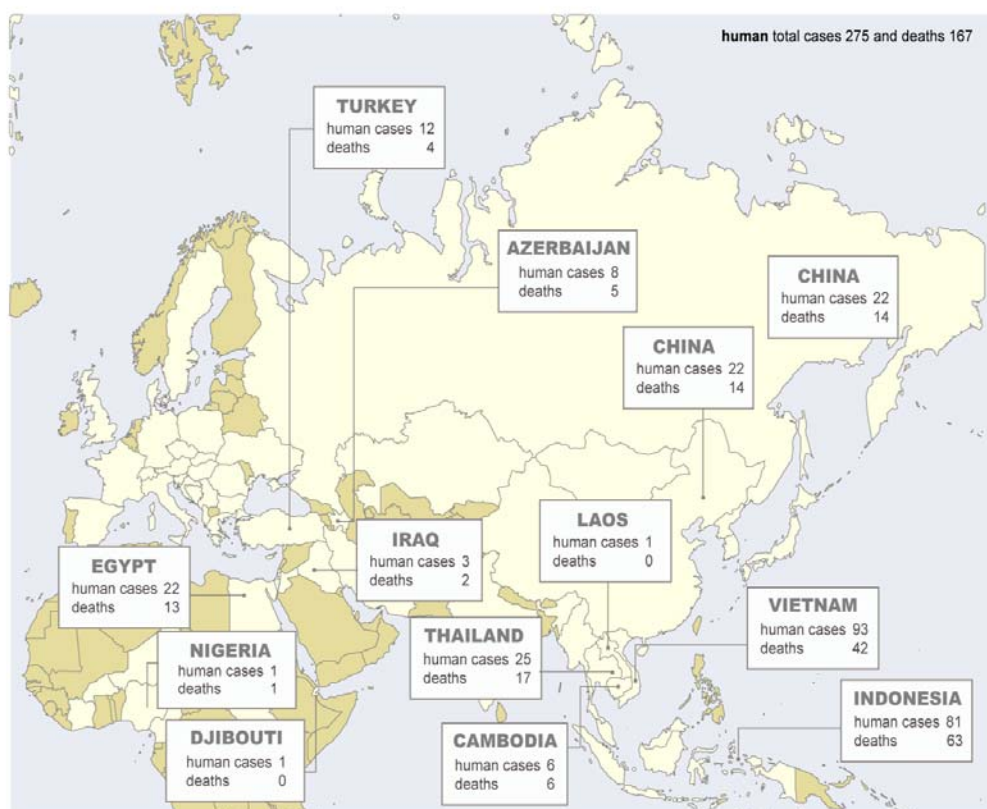
¹¹ "New Strain of Bird Flu Found in Egypt is Resistant to Antiviral Drug," *New York Times*. January 18, 2007.

Table 1. Total Number of Human Cases and Deaths by Country Through February 27, 2007

Country	Human cases since 2003	Human Deaths since 2003
Azerbaijan	8	5
Cambodia	6	6
China	22	14
Djibouti	1	0
Egypt	22	13
Indonesia	81	63
Iraq	3	2
Laos	1	0
Nigeria	1	1
Thailand	25	17
Turkey	12	4
Vietnam	93	42
Total	275	167

Source: World Health Organization: Cumulative Number of Confirmed Human Cases of Avian Influenza A/H5N1 Reported to the World Health Organization as of February 27, 2007, [http://www.who.int/csr/disease/avian_influenza/country/cases_table_2007_02_27/en/index.html].

Note: WHO reports only laboratory-confirmed cases.

Figure 1. Map of Human H5N1 Cases and Deaths

Source: Information based on the World Health Organization (WHO) website, and the World Organization for Animal Health (OIE) website. Adapted by CRS. (3/1/07)

Summaries of Country and Regional Responses

The following countries have reported human cases of H5N1 infection. For additional background on earlier efforts by these countries to contain the virus through September 2006, see CRS Report RL33349, *International Efforts to Control the Spread of the Avian Influenza (H5N1) Virus: Affected Countries' Responses*.

Azerbaijan¹²

There were eight confirmed human cases of Avian Influenza and five deaths in 2006. The World Bank provided funding for the improvement of laboratories involved in avian flu detection, prevention, and treatment in Azerbaijan. The program, announced in November 2006, also involves measures to provide training and equipment for the Azerbaijani veterinary service and to expand the country's public awareness campaign. No new cases have been reported since March 2006.

¹² This section prepared by Kim Klarman, Information Research Specialist, 7-6088.

Cambodia¹³

WHO reports that there have been six confirmed human cases of avian influenza in Cambodia since February 2005. All six Cambodians have died from the H5N1 avian influenza. Health experts predict that more cases in Cambodia are likely. Cambodia has had difficulty monitoring its poultry stocks, because its poultry farms are small and numerous, many chickens roam freely, and transportation and communications links are poorly developed.¹⁴ Despite warnings, many villagers have eaten birds that had been infected rather than go hungry. U.N. experts estimated that Cambodia needs \$18 million to develop programs to stem the spread of the virus.¹⁵

China¹⁶

The Chinese Center for Disease Control reported one human case of avian influenza in China on January 8, 2007, China's first in six months. The man who fell ill in December 2006, a 37-year-old from the eastern province of Anhui, appeared to make a complete recovery within a month. His case of avian influenza is being counted as a 2006 case by the World Health Organization, bringing China's total of human cases for the year 2006 to 22, with 8 deaths.¹⁷

The close proximity of millions of people, birds, and animals in southern China has made it a common breeding ground for deadly viruses that jump the species barrier to humans, including the H5N1 virus. Additionally, China's poor public health infrastructure and the communist government's traditional lack of transparency have made international health specialists particularly concerned that China could become the origin of an H5N1 global flu pandemic.

Observers are closely watching to see if China's record of withholding information and specimens from the SARS epidemic will be repeated with H5N1 outbreaks. Some question Beijing's ability to deal responsibly with public health concerns while trying to maintain political control. In November 2006, Beijing officials publicly redressed Hong Kong-based scientists who had conducted research on the mainland on the spread of H5N1. The criticism underscored the government's frustration with surveillance carried out independent of state-controlled agencies. In January 2007, Margaret Chan, Hong Kong's former health director, assumed the director general's position at the World Health Organization, becoming the first Chinese person to lead a United Nations agency. International observers will look

¹³ This section prepared by Mari-Jana "M-J" Oboroceanu, Information Research Specialist, 7-6329.

¹⁴ For more information on the avian flu in Cambodia, see CRS Report RL32986, *Cambodia: Background and U.S. Relations*, by Thomas Lum.

¹⁵ "Cambodia Needs \$18 Million for Bird Flu Fight — UN," *Reuters*, December 16, 2005.

¹⁶ This section prepared by Hannah Fischer, Information Research Specialist, 7-8989.

¹⁷ For earlier efforts by the Chinese government to contain the virus, see CRS Report RL32227, *SARS, Avian Flu, and Other Challenges for China's Political, Social, and Economic Transformation*, by Kerry Dumbaugh and Wayne Morrison.

for indications that Chan, an expert on avian influenza and SARS, has autonomy from Beijing. In the past, China has been criticized for withholding information and specimens about infectious diseases from the WHO.

Djibouti¹⁸

WHO officials confirmed one human infection in Djibouti in a young girl in April 2006, the first human case in the horn of Africa. The case was not fatal. In response, authorities in Djibouti initiated a program to slaughter domestic poultry, but met resistance from farmers because of the lack of a compensation program. Health Minister Abdallah Abdillahi Miguil appealed to the international community for funding for training, surveillance networks, and laboratory equipment, saying that over \$4.4 million would be needed to fight the spread of the virus. No more cases have appeared after the initial confirmation.

Iraq¹⁹

The WHO confirmed three cases of human infection in Iraq, the third retrospectively after a shipment of specimens for external verification was disrupted. The first two were fatal, but the third recovered. Iraq has not reported any new cases since the initial outbreak.

Egypt²⁰

In Egypt, the first case of the H5N1 virus in humans was detected in March 2006. Since then, 22 people have been reported to have contracted the avian flu, second only to Indonesia in number of cases and deaths in 2006. With one exception, all the deceased were women. Traditionally, in rural parts of the country, women are in charge of tending birds that are domestically kept, making them more vulnerable to the H5N1 virus.

In late 2006, the Egyptian Ministry of Health and Population informed the WHO of three new human cases. All three cases were fatal, and all three victims were from a 33-member extended family in Gharbiyah province. It is believed that the deceased had contact with sick ducks. The surviving family members remain healthy, but were under close observation by the Ministry of Health and Population following the deaths. In December 2006, Egypt requested financial and technical aid to bolster its prevent efforts. Geographically, Egypt's heavily populated Nile valley has had one of the largest concentrations of bird flu infection. The Nile valley lies on a major migratory route for wild birds.

¹⁸ This section prepared by Hussein Hassan, Information Research Specialist, 7-2119.

¹⁹ This section prepared by Hussein Hassan, Information Research Specialist, 7-2119.

²⁰ This section prepared by Hussein Hassan, Information Research Specialist, 7-2119.

Indonesia²¹

In 2006, Indonesia outpaced all other countries in number of confirmed human cases and deaths. Fifty-one Indonesians died from the H5N1 virus in 2006 and early 2007, bringing the total number of deaths to date since the first outbreak in July 2004 to 63. One of the early 2007 deaths was a woman from Tangerang, Banten Province, whose son was also hospitalized with a confirmed case of H5N1. Their shared infection again prompted questions of whether the virus was transmitted by human-to-human contact or by exposure to the same environmental source.

On December 29, 2006, Bayu Krisnamurthi, Chief Executive Officer of Indonesia's National Committee for Avian Influenza Control and Pandemic Influenza Preparedness (Konmas FBPI), announced a focused bird flu control program for 2007. Plans for 2007 include expanding the public awareness and social mobilization program, reinforcing animal and human disease surveillance and control programs, overhauling the poultry industry, and highlighting pandemic contingency planning. Authorities claimed that kits that can confirm a diagnosis of bird flu within two hours, rather than the standard three to five days, will be available in March 2007.

Of the measures, restructuring the poultry industry may prove to be the most challenging. Unlike Vietnam and Thailand, with mostly commercial poultry farming, most chickens are reared in small "backyard" operations in Indonesia. Although authorities in Jakarta ordered that all non-commercially reared birds in the affected provinces should be killed, the compensation program (12,500 rupee, or about \$1.40 per bird) is seen as too modest to be successful. Public opposition is widespread.

Research indicates that approximately 20% of all stray cats roaming the major cities of Indonesia are infected with H5N1, worrying scientists of the ability of the virus to attack and spread among mammals.²² Only 44 hospitals around the vast country are currently prepared to handle the virus, although additional hospitals are reportedly being readied. The Indonesian government recently began culling poultry in the three highest-risk provinces and the city of Jakarta.

Laos²³

The first case of an H5N1 human infection in Laos was confirmed in February 2007, although the country had reported outbreaks in poultry since 2004. Tens of thousands of birds were lost through infection or culling on commercial farms; however, the vast majority of poultry-rearing in Laos takes place on smaller, family-run farms. Some experts argue that there is an urgent need for foreign health organizations to focus upon and assist Laos, given its proximity to other countries with the disease and the lack of government capacity, particularly its weakness in

²¹ This section prepared by Susan Chesser, Information Research Specialist, 7-9547.

²² "Stray Cats Found with Bird Flu Virus," *South China Morning Post*. January 16, 2007.

²³ This section prepared by Barbara Salazar Torreon, Information Research Specialist, 7-8996.

surveillance. The central and local governments have limited capabilities for collecting and disseminating information, monitoring avian populations, and conducting laboratory analysis to confirm cases of the virus. In addition, according to a U.S. government assessment team that visited Laos, Cambodia, and Vietnam, the country's health care system faces "severe limitations" and would be "quickly overwhelmed" in the event of a large-scale human outbreak. The FAO and the WHO reportedly have strong working relationships with the Lao government. In October 2005, the United States signed a cooperation agreement with Lao officials in which it pledged \$3.4 million to Laos for controlling outbreaks of avian flu.

Nigeria²⁴

In February 2007, the WHO confirmed the presence of H5N1 virus in a 22-year-old deceased female from Lagos. H5N1 virus had been identified in poultry outbreaks in Nigeria. The WHO is working with the government of Nigeria to carry out surveillance and investigate any additional reports of suspected cases. The outbreak in Nigeria is notable because Nigeria is the most populous country in Africa and because health authorities view it as the likely source of H5N1 detected in poultry in Niger and Cameroon. Nigeria's poultry population is estimated at 140 million, with backyard farmers accounting for 60 percent of all poultry producers.²⁵

After initial outbreaks in poultry in 2006, Nigerian authorities responded to the detection of H5N1 by quarantining affected farms, destroying suspected infected birds, and testing poultry and people who have close contact with poultry on commercial farms. Officials have launched public information campaigns providing safety and education messages about bird flu and advising the public to report bird deaths, and reportedly compensated some farmers for losses due to H5N1 control measures.²⁶

USAID worked with the U.S. Department of Agriculture (USDA) and other organizations to respond to H5N1 in Djibouti and Nigeria and deployed thousands of Personal Protective Equipment (PPE) sets for surveillance and culling purposes and is also supported communications and public awareness efforts in the country.²⁷ In addition, USAID disseminated more than 25,000 public awareness tool kits and supported the reproduction of these kits in sub-Saharan Africa. The kits include key messages and educational materials for preventing the spread of H5N1 in animals and for limiting human exposure.

²⁴ This section prepared by Tom Coipuram, Information Research Specialist, 7-4296.

²⁵ "WHO Experts on Bird Flu Arrive in Nigeria," *Agence France Presse*. February 5, 2007.

²⁶ "Region: Cases and Context. H5N1 has been confirmed in Niger and Cameroon in areas along the U.N. Integrated Regional Information Networks (IRIN) reports, February 2006.

²⁷ USAID Situation Update #37, "Avian and Pandemic Influenza Management and Response Unit, May through June 9, 2006. [http://www.usaid.gov/our_work/global_health/home/News/ai_docs/ai_update_060906.pdf]

Thailand²⁸

One of the hardest hit countries during the early outbreaks of the human H5N1 virus, Thailand has had 25 cases of confirmed infection and 17 deaths since the disease began affecting humans there in 2004. Thai officials have taken an aggressive stance towards the spread of the disease, but continued to struggle with periodic outbreaks in poultry and 3 human deaths in 2006. In early 2007, the discovery of avian flu in pigeons and other wild birds in the Suphan Buri province in northeastern Thailand worried health officials. Of particular concern is the spread of the virus by wild birds migrating through Thailand.

Thailand continues to actively work to contain the virus through anti-viral production, poultry extermination, and widespread surveillance efforts.²⁹ In July 2006, the Thai Ministry of Public Health, U.S. Centers for Disease Control (CDC) and Prevention, and the World Health Organization sponsored the first international training program for rapid response to avian and pandemic influenza in Bangkok. Thailand also recently opened an Avian Flu Operations Center. This center, referred to as the “war room,” will be staffed 24 hours a day with doctors, nurses, and avian flu experts. Any suspected cases of the disease will be reported daily by the Center to the Thailand Ministry of Public Health.

Turkey³⁰

In 2006, Turkey reported 12 confirmed cases of human H5N1 virus, which resulted in the deaths of four children. Researchers reported that the deaths were caused by migratory birds that carried the virus from Asia to Turkey. Although Turkish officials were criticized for their slow detection and acknowledgment of the initial virus outbreak, the Turkish Ministry of Agriculture and Rural Affairs reportedly is taking an active role. Their efforts include surveillance, along with promotion of the central government’s public awareness campaign, prohibitions against the transportation of poultry and hunting of winged animals, and the establishment of national and local illness control centers. Turkey’s prevention efforts have been closely followed by the international health community because of concern that the virus will spread to other areas of Europe.

Vietnam³¹

Vietnam has undertaken a robust culling and immunization program for its poultry farming industry, and no human cases were reported in 2006. However,

²⁸ This section prepared by Kim Klarman, Information Research Specialist, 7-6088.

²⁹ See CRS Report RL33349, *International Efforts to Control the Spread of the Avian Influenza (H5N1) Virus: Affected Countries’ Responses*, coordinated by Emma Chanlett-Avery, which outlines Thailand’s efforts to combat the virus.

³⁰ This section prepared by Kim Klarman, Information Research Specialist, 7-6088.

³¹ This section prepared by Mari-Jana “M-J” Oboroceanu, Information Research Specialist, 7-6329.

outbreaks in poultry resurfaced in early 2007, reinforcing concern that the virus could re-emerge in humans.

Selected Responses by International and Regional Organizations

The largest global surveillance, information-sharing, early warning, and response efforts have been led by three main agencies: for H5N1 infections in humans, the WHO, and, for livestock, the Food and Agriculture Organization (FAO) and the World Organization for Animal Health (known by its French acronym OIE). The World Bank has taken the lead on coordinating the funding of countries to enhance preparedness and prevention efforts, and is providing about \$500 million in low-interest loans. These efforts are discussed in detail in CRS Report RL33219, *U.S. and International Responses to the Global Spread of Avian Flu: Issues for Congress*, by Tiaji Salaam-Blyther. Below are examples of some of responses undertaken by regional organizations and groupings.

African Union (AU). The AU and the government of Mali hosted the 4th International Conference on Avian Influenza in Bamako, Mali, December 6-8, 2006, attended by health and agricultural ministers from around the world. The conference was intended to provide insight into worldwide efforts to boost financial support for preparedness and the latest information on regional strategies and vaccinations. The U.S. Special Representative on Avian and Pandemic Influenza, John E. Lange, announced that the United States would increase its original pledge of \$334 million, which was first announced in Beijing in January 2006 and raised to \$362 million in June 2006, to a total of \$434 million.³² The leading donors at the Mali summit were the European Commission and the European Union (\$131 million); the United States (\$100 million); Canada (\$92.5 million); and Japan (\$67 million).

Asia-Pacific Economic Cooperation (APEC). At the APEC forum meeting held in Hanoi in November, leaders adopted a plan to improve surveillance and increase technical cooperation in the struggle against avian influenza. APEC ministers pledged to improve the transparency of communications regarding outbreaks and share research samples to improve preparedness. Intentions to improve response capacities and maintain cooperation with international health organizations through the International Partnership on Avian and Pandemic Influenza (IPAPI) were reaffirmed.

Association of South East Asian Nations (ASEAN). The ASEAN agriculture and forest ministers, at their annual meeting in November 2006, agreed to establish a new fund to fight the spread of animal diseases, including avian influenza and “mad cow” disease. The ministers, on behalf of the ten member countries, pledged \$1.8 million over the next five years to fund programs providing training for farmers in combating infectious animal diseases, health care worker training, and public education. South Korea pledged to train experts from each member nation in the detection and isolation of bird flu cases, and to provide bird flu

³² U.S. State Department Press Release, December 11, 2006, at [<http://www.state.gov/r/pa/prs/ps/2006/77616.htm>].

detection kits to speed up the quarantine process through quick and accurate testing of samples.

In January 2007, Japan pledged a total of \$4 billion in assistance over the next five years to ASEAN nations to enhance cooperation in a wide range of areas including avian influenza prevention and control. The same month Australia pledged to provide \$5 million in assistance to ASEAN countries to fund laboratory improvements, disease spread monitoring, and response team improvements.