

# CRS Report for Congress

## U.S. and International Responses to the Global Spread of Avian Flu: Issues for Congress

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## Summary

Influenza A/H5N1 is one of many influenza (flu) strains currently spreading throughout the world. Although it is a bird flu, it has infected some people and killed more than half of those infected. Since 1997, when the first human contracted H5N1 in Hong Kong, the virus has resurfaced and spread to more than 50 countries across Asia, Europe, the Middle East, and Africa — infecting more than 260 people and killing more than 150 of those infected. In February 2006, the virus spread from Asia and central Europe to western Europe. By March 2006, health experts had confirmed new bird flu cases in more than 20 countries across Europe, Asia, and Africa. The first human H5N1 fatalities outside of Asia occurred in that year, with Turkey and Iraq reporting H5N1-related human deaths for the first time in January and February, followed by Azerbaijan and Egypt in March.

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 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.

This report provides an up-to-date account of global H5N1-related human infections and deaths, outlines U.S. global avian flu programs, and presents some foreign policy issues for Congress. This report will be updated should Congress provides additional funds for global purposes, and then only if H5N1 becomes effectively transmissible from person-to-person. For information on U.S. domestic preparedness efforts, agricultural issues, and anti-avian flu efforts of overseas governments, see CRS Report RL33145, *Pandemic Influenza: Domestic Preparedness Efforts*; CRS Report RS21747, *Avian Influenza: Agricultural Issues*; and CRS Report RL33349, *International Efforts to Control the Spread of the Avian Influenza (H5N1) Virus: Affected Countries' Responses*.

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# U.S. and International Responses to the Global Spread of Avian Flu: Issues for Congress

## Background

Influenza A/H5N1 is one of many strains of avian influenza that can cause illness in poultry. Bird (or avian) flu outbreaks have occurred at various times around the world.<sup>1</sup> Until 1997, there were no known human H5N1 cases. That year, 18 people in Hong Kong contracted the virus; of whom 6 died. To contain the virus, 1.5 million birds were killed. Since 2003, when the virus resurfaced and killed 4 people, scientists have closely monitored resurgent H5N1 outbreaks. When analyzing the viral spread and severity of H5N1, some health experts prefer to consider the average H5N1 human fatality rate since the virus emerged in 2003 (more than 50%). The World Health Organization (WHO), however, considers the annual change of human fatality rates.<sup>2</sup> The overall human fatality rate was highest in 2004 (73%), followed by 63% to date in 2006, and 43% in 2005 (**Table 1**).

There has been some debate about whether H5N1 will cause a global pandemic. WHO ranks the current global H5N1 outbreak in pandemic alert phase three, which means a virus new to humans is causing infections, but not spreading easily from one person to another (**Table 4**). Some predict that if H5N1 were to become transmissible among humans, the virus could cause an “influenza pandemic” (worldwide disease outbreak).<sup>3</sup> Skeptics argue that such predictions are exaggerated, because if the virus were able to transform into a strain that is efficiently transmissible among people it would have already done so. WHO warns that the virus is continuing to spread and that the threat has not been eliminated. Thus, in the latter view, governments should continue to prepare for some sort of pandemic and not become complacent even though H5N1 has not yet become transmissible between people.

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<sup>1</sup> For a list of past avian flu outbreaks see CRS Report RS21747, *Avian Influenza: Agricultural Issues*, by Jim Monke.

<sup>2</sup> WHO, “*Avian influenza — epidemiology of human H5N1 cases reported to WHO.*” June 30, 2006. [[http://www.who.int/csr/don/2006\\_06\\_30/en/index.html](http://www.who.int/csr/don/2006_06_30/en/index.html)]

<sup>3</sup> During the Spanish flu pandemic of 1918, it is estimated that between 20 and 50 million people died, and between 200 million and 1 billion were infected around the world. If a flu pandemic were to occur on the same scale as the Spanish flu, estimates of human deaths have ranged between 30 million and 384 million people.

At last count, H5N1 has infected birds in more than 50 countries<sup>4</sup> and infected 261 people, of whom 157 have died.<sup>5</sup> More than 200 million birds in Europe, the Middle East and Africa have either died from H5N1 or have been culled in containment exercises.<sup>6</sup> From December 2003 to August 2004, nine Asian countries reported H5N1 outbreaks in poultry. In late July 2005, Russia identified H5N1 in its poultry for the first time. By October 2005, birds in Croatia, Kazakhstan, Mongolia, Romania, and Turkey had contracted H5N1. In 2006, human H5N1 cases were being reported outside of Asia for the first time. While Iraq has reported human H5N1 cases, the strain has not been detected among its birds.

**Table 1. Human Cases of Avian Influenza A/H5N1**

COUNTRY	2003		2004		2005		2006		TOTAL	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
<b>Azerbaijan</b>	0	0	0	0	0	0	8	5	8	5
<b>Cambodia</b>	0	0	0	0	4	4	2	2	6	6
<b>China</b>	1	1	0	0	8	5	12	8	21	14
<b>Djibouti</b>	0	0	0	0	0	0	1	0	1	0
<b>Egypt</b>	0	0	0	0	0	0	15	7	18	10
<b>Indonesia</b>	0	0	0	0	19	12	55	45	74	57
<b>Iraq</b>	0	0	0	0	0	0	3	2	3	2
<b>Thailand</b>	0	0	17	12	5	2	3	3	25	17
<b>Turkey</b>	0	0	0	0	0	0	12	4	12	4
<b>Vietnam</b>	3	3	29	20	61	19	0	0	93	42
<b>Total</b>	<b>4</b>	<b>4</b>	<b>46</b>	<b>32</b>	<b>97</b>	<b>42</b>	<b>111</b>	<b>76</b>	<b>261</b>	<b>157</b>

**Source:** WHO, Cumulative Number of Confirmed Human Cases of Avian Influenza A/H5N1.

<sup>4</sup> The World Organization for Animal Health (OIE) has confirmed H5N1 among birds in the following countries and territories: Afghanistan, Albania, Austria, Azerbaijan, Bosnia and Herzegovina, Britain, Bulgaria, Burkina Faso, Burma, Cambodia, Cameroon, China, Côte d'Ivoire, Croatia, Czech Republic, Denmark, Djibouti, Egypt, France, Georgia, Germany, Greece, Hungary, India, Indonesia, Iran, Israel, Italy, Japan, Jordan, Kazakhstan, Korea, Malaysia, Mongolia, Niger, Nigeria, Palestinian Autonomous Territories, Pakistan, Poland, Romania, Russia, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sudan, Sweden, Switzerland, Thailand, Turkey, Ukraine, and Vietnam. [<http://www.oie.int/>]

<sup>5</sup> WHO, *Cumulative Number of Confirmed Human Cases of Avian Influenza A/H5N1*, December 27, 2006. [[http://www.who.int/csr/disease/avian\\_influenza/country/en/](http://www.who.int/csr/disease/avian_influenza/country/en/)].

<sup>6</sup> WHO, Address by the Director-General to the 59th World Health Assembly, May 22, 2006. [[http://www.who.int/gb/ebwha/pdf\\_files/WHA59/A59\\_3-en.pdf](http://www.who.int/gb/ebwha/pdf_files/WHA59/A59_3-en.pdf)]

## Sources of Transmission

There is some debate over the primary source of H5N1 transmission. Some experts contend that wild migratory birds infected with H5N1, notably water fowl, are the main vectors, or media of transmission. H5N1 has been detected in migratory birds in multiple countries, and in some instances, its spread has correlated with seasonal migrations of certain wild species. In some countries, H5N1 has only been found in wild birds. Some veterinarians point out that detecting H5N1 in wild birds can be difficult, because some of the infected birds are asymptomatic, harboring but not exhibiting disease symptoms or ill effects from the virus.<sup>7</sup>

Other experts, however, maintain that other important modes of transmission should not be underestimated, such as cross-border trade of infected poultry and transmission through poor agricultural practices. Indications that may support such assertions include: the detection of H5N1 on commercial farms among caged poultry that are unable to mingle with wild fowl; the detection of H5N1 on farms located far from wetlands where migratory birds seasonally dwell; and the detection of H5N1 in regions where H5N1-linked wild fowl die-offs have not been reported. In some countries, such as in Nigeria, there are some indications that wild fowl may not be implicated in the transmission of H5N1.<sup>8</sup>

Some epidemiologists contend that the limited human-to-human transmission of H5N1 and other avian influenza viruses that have occurred should also be closely monitored. WHO asserts that the limited cases should not cause alarm, because the virus had not spread beyond a first generation of close contacts or caused illness in the general community. WHO adds that it has not elevated the pandemic risk of H5N1, because data from the incidents suggest that transmission requires very close contact with an ill person.

## Congressional Response

P.L.109-13, FY2005 Emergency Supplemental Appropriations, provided the first appropriation for global avian flu efforts, though agencies and departments had already launched initiatives to combat the virus. The act provided the U.S. Agency for International Development (USAID) \$25 million for ongoing efforts to prevent and contain the global spread of H5N1. USAID transferred \$15 million of the funds to the Centers for Disease Control and Prevention (CDC). The Department of State (DOS) transferred an additional \$6.3 million of tsunami relief funds to USAID for

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<sup>7</sup> See FAO, *Wild birds and Avian Influenza*, Sept. 2005, among other sources. For more information on avian flu among poultry, see CRS Report RS21747, *Avian Influenza: Agricultural Issues*.

<sup>8</sup> See Ellen Paul [Exec. Dir., Ornithological Council], "What We Don't Know About Bird Flu," *Washington Post*, Dec. 27, 2005; BirdLife Int., "Are High Risk Farming Practices Spreading Avian Flu?," Jan. 18, 2006; and BirdLife Int., "Autumn Waterbird Migration Ends Without Spread of H5N1 Bird Flu," Aug. 12, 2005; David Brown, "Poultry, Not Wild Birds, Most Often Carries Deadly Avian Flu to Africa," *Washington Post*, Feb. 16, 2006; and AFP, "Bird flu outbreak in Nigeria stirs fresh row over migrant birds," Feb. 8, 2006.

international avian influenza activities,<sup>9</sup> as permitted by the law. Including the latter transfer, FY2005 emergency supplemental appropriations provided \$31.3 million for global avian flu efforts.

In FY2006, the President submitted a \$7.1 billion emergency supplemental request for avian and pandemic influenza preparedness.<sup>10</sup> Congress provided \$6.1 billion for those efforts in two supplemental appropriations; appropriating \$3.8 billion in P.L.109-148, FY2006 Defense Appropriations<sup>11</sup> and \$2.3 billion in P.L.109-234, FY2006 Emergency Supplemental Appropriations. U.S. agencies and departments might contribute additional resources to global avian flu efforts not specifically provided through these appropriations. Some activities that could support the control of avian flu include infectious diseases and influenza programs, global surveillance efforts, and influenza research initiatives.

In FY2007, some appropriations bills included additional funds for global avian and pandemic influenza preparedness. Congress did not enact any of those measures. Instead, it amended P.L.109-289 (Division B), which provides funding at the lesser of FY2006 enacted, FY2007 House-passed, or FY2007 Senate-passed levels until February 15, 2007.

## U.S. Executive Branch Response

On November 1, 2005, the President released the National Strategy for Pandemic Influenza.<sup>12</sup> The National Strategy was to provide a framework for future U.S. planning efforts that were consistent with The National Security Strategy and the National Strategy for Homeland Security. The President requested \$7.1 billion to fund the National Strategy for Pandemic Influenza, some of which he suggested be set aside for international activities. The majority of the funds, \$6.7 billion, were requested for HHS.

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<sup>9</sup> FY2007 State Department Function 150 Budget Request, see [<http://www.state.gov/s/d/rm/rls/iab/2007/>]. Of the \$6.3 million, \$1.8 million went to Asia and the Near East region, \$3.0 million to Europe and Eurasia, and \$1.5 million to sub-Saharan Africa.

<sup>10</sup> The Administration requested \$3.2 billion for obligation in FY2006, \$2.3 billion in FY2007, and \$1.2 billion for FY2008.

<sup>11</sup> H.Rept. 109-359, the conference report to P.L.109-148, FY2006 Defense Appropriations, contains \$3.8 billion for avian influenza initiatives. \$3.3 billion of the \$3.8 billion is directed to the Department of Health and Human Services (HHS) (of which \$267 million is committed to international initiatives, disease surveillance, vaccine registries, research, and clinical trials). An additional \$500 million is reserved for international assistance, monitoring and tracking, and research and development, of which \$131.5 million is directed to USAID, \$130 million to the Department of Defense, \$91.4 million to the Department of Agriculture, \$47.3 million to the Department of Homeland Security, \$20 million to FDA, \$27 million to the Department of Veterans Affairs, \$31 million to the Department of State, and \$11.6 million to the Department of the Interior.

<sup>12</sup> Find the National Strategy at [<https://www.whitehouse.gov/homeland/nspi.pdf>]. For more on U.S. avian flu and pandemic preparedness see [<http://www.pandemicflu.gov>].

One day later, on November 2, 2005, the Department of Health and Human Services (HHS) released its Influenza Plan. The HHS plan provided a detailed explanation of how the department would implement its part of the National Strategy. Some were disappointed by the relatively small proportion of funds reserved for international efforts in the National Strategy and in HHS' Plan. Advocates of greater spending on global avian flu efforts argued that if more resources were allocated to containing the virus abroad, Americans would be better protected, domestic pandemic preparedness efforts would be enhanced, and the likelihood that H5N1 would continue to spread and become efficiently transmissible between people would be lessened.

Of the \$7.1 billion related to international activities, the President requested:

- \$200.0 million for HHS to undertake a number of activities, including international pandemic preparedness planning initiatives and pandemic influenza disease surveillance;
- \$18.3 million for the U.S. Department of Agriculture (USDA) to undertake research and development initiatives and to provide avian influenza surveillance and prevention technical assistance globally;
- \$120.0 million for the Department of Defense (DOD) to increase worldwide surveillance and upgrade related equipment;
- \$10.0 million for DOD to assist military partner nations in procuring protective equipment, portable field assay testing equipment, and related laboratory equipment;
- \$17.0 million for DOS to implement public diplomacy, training, and international outreach activities related to avian influenza and pandemic preparedness;
- \$1.5 million for DOS International Visitors Program to provide 100 additional professional exchanges of doctors, health practitioners, and non-governmental organizations (NGOs);
- \$75.2 million to USAID for efforts that encourage behavior change and raise awareness about avian flu awareness, diagnostic support initiatives, and pandemic preparedness and planning activities; and
- \$56.3 million for International Disaster and Famine Assistance Funds of USAID to pre-position supplies and equipment, such as antiviral medication and protective equipment.<sup>13</sup>

In May 2006, the White House released the Implementation Plan for the National Strategy for Pandemic Influenza, which was released in November 2005.<sup>14</sup> The Plan outlined how various U.S. agencies and departments would integrate the implementation of more than 300 actions that respond to an influenza pandemic threat. According to a status report on the Plan, released in December 2006, 92% of those actions have been completed and the United States has invested \$434 million

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<sup>13</sup> FY2006 Emergency Request for Avian and Pandemic Influenza Preparedness. [[http://www.whitehouse.gov/omb/budget/amendments/supplemental\\_11\\_01\\_05.pdf](http://www.whitehouse.gov/omb/budget/amendments/supplemental_11_01_05.pdf)]

<sup>14</sup> [[https://www.whitehouse.gov/homeland/nspi\\_implementation.pdf](https://www.whitehouse.gov/homeland/nspi_implementation.pdf)]



in international efforts (**Table 5**).<sup>15</sup> The section below summarizes the role of each agency and department involved in international efforts, as outlined in the Plan, and highlights appropriations Congress provided to each.

## Department of State (DOS)

DOS is responsible for coordinating the U.S. international response to H5N1, including the interagency process to identify countries requiring U.S. assistance, identify priority activities, and ensure federal government assistance reflects those priorities. The department also informs American citizens abroad about where they can obtain up-to-date information and pandemic risk level assessments, enabling them to make informed decisions and take appropriate personal protective measures. Through its Office of International Health Affairs (OES/IHA), DOS facilitates policy-making regarding bioterrorism and health security, environmental health, infectious diseases (e.g., avian and pandemic influenza, SARS, and polio), health in post-conflict situations, and surveillance and response.

On September 14, 2005, President Bush announced at the United Nations (U.N.) that the United States would develop an International Partnership on Avian and Pandemic Influenza (IPAPI). IPAPI utilizes diplomatic initiatives to enhance public health, improve surveillance capacity, promote transparency, and encourage reporting and rapid sharing of samples. IPAPI works closely with regional organizations, including the Association of Southeast Asian Nations (ASEAN) and the Asia Pacific Economic Cooperation (APEC) forum, to address avian influenza and the threat of an influenza pandemic.<sup>16</sup> Key activities of IPAPI include:

- extending the issue of avian and pandemic influenza preparedness beyond the health sectors to the national level;
- coordinating efforts among donor and affected nations;
- mobilizing and leveraging resources;
- increasing transparency in disease reporting and surveillance; and
- building capacity to identify, contain, and respond to pandemic influenza.

In the FY2006 supplemental request, the President proposed that DOS receive \$38.5 million in FY2006 for international response coordination; diplomatic outreach; exchanges of U.S. and foreign medical personnel; and protecting U.S. government employees and families at U.S. missions overseas from avian and pandemic influenza. The Administration proposed that about \$20 million of those funds be reserved for the potential evacuation of U.S. government personnel and dependents from overseas missions. Though Congress did not appropriate funds to DOS for avian flu efforts, OMB reports that in FY2006, DOS had spent some \$6 million on diplomatic support and international response coordination (**Table 5**).<sup>17</sup>

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<sup>15</sup> [<http://www.whitehouse.gov/news/releases/2006/12/20061218.html>]

<sup>16</sup> [<http://www.state.gov/g/oes/c1874.htm>]

<sup>17</sup> OMB reports that DOS committed an additional \$25 million to support health activities (continued...)

The Administration did not request funds in FY2007 for DOS' international avian flu activities, and neither chamber proposed appropriating funds for these efforts.

## U.S. Agency for International Development (USAID)

USAID works with more than 88 foreign governments, international organizations, and other U.S. government partners to enhance global avian and other influenza pandemic preparedness. The agency plays a critical role in connecting the response between the human and animal health sectors to ensure that the efforts are comprehensive and cross-sectoral. With technical guidance from HHS and USDA, USAID works closely with WHO and FAO to ensure strong coordination and standardization of efforts to prepare for, identify, and respond to outbreaks of influenza with pandemic potential in either animal or human populations. In its work with non-governmental organizations (NGOs) and the private sector, USAID improves outbreak detection capacities and supports behavior change efforts, including mass communications initiatives. USAID's key activities include:

- **Planning and preparedness** initiatives to support the development of national avian influenza task forces and preparedness plans.
- **Surveillance and case detection** activities to support animal and human disease-monitoring efforts.
- **Communications** projects to support mass media and community-level outreach to rural populations, which raises public awareness and promotes behaviors that help reduce risks for disease transmission.
- **Commodity stockpiling** programs involving training first responders to use personal protective equipment (PPE), collecting and shipping viral samples, detecting diseases using improved laboratory equipment, and responding to infectious disease outbreaks. Since January 2006, USAID has amassed 1.5 million PPE kits, 100 laboratory kits, and 15,000 decontamination kits. Over 200,000 PPE kits have been deployed to 71 countries for use by responders in the field, including surveillance workers and outbreak response teams. In anticipation of new avian influenza outbreaks, USAID is pre-positioning PPE kits, decontamination kits, and laboratory kits in 20 countries.<sup>18</sup>
- **Emergency outbreak response** programs to promote safe culling and disposal procedures, and demonstrate improved biosecurity practices in poultry-raising settings. The initiatives also help countries to develop standard procedures for health facilities at the central and peripheral levels.

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<sup>17</sup> (...continued)

at embassies and make evacuation contingency plans at overseas missions. Funding for these activities is not included in Table 5, because it is not considered a part of foreign assistance.

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[[http://www.usaid.gov/our\\_work/global\\_health/home/News/news\\_items/ai\\_activities.html](http://www.usaid.gov/our_work/global_health/home/News/news_items/ai_activities.html)]

P.L.109-72, FY2005 Emergency Supplemental Appropriations, provided \$16.3 million to USAID for global avian flu efforts, though OMB reports that it spent \$21.4 million on the programs in that fiscal year (**Table 5**). Supplemental appropriations attached to P.L.109-148, FY2006 DOD Appropriations, provided \$131.5 million to USAID for global avian flu efforts. Congress provided an additional \$30 million for the programs in P.L.109-234, FY2006 Emergency Supplemental Appropriations. OMB estimates that in FY2005 and FY2006, USAID has committed \$191 million to bilateral avian and pandemic influenza efforts. The Administration requested \$55 million for USAID's avian and pandemic influenza preparedness efforts in FY2007. The Senate Foreign Operations subcommittee reported out \$25 million for USAID's global avian flu efforts, \$30 million below requested levels. The House did not include a specific amount for such efforts.

## **U.S. Department of Health and Human Services (HHS)**

HHS and its related agencies and institutes lead U.S. influenza surveillance and detection efforts abroad, which include U.S. participation in collaborative international human influenza research. In conjunction with WHO and other technical partners, including other U.S. departments and agencies, HHS also implements a number of other activities related to global avian and pandemic influenza preparedness, including:

- supporting rapid containment of localized outbreaks of novel human influenza viruses;
- training foreign health professionals to recognize and treat influenza;
- training and guiding national and local public health authorities in foreign nations to use, time, and sequence community infection control measures;
- working with USAID to develop local-language campaigns overseas to communicate information related to pandemic influenza;
- supporting U.S. participation in international efforts to stockpile countermeasures against possible influenza pandemics;
- supporting the advancement of cell-based influenza vaccines;
- evaluating new H5N1 vaccine candidates;
- developing global capacity to produce large quantities of pre-pandemic vaccine;<sup>19</sup> and
- working with USDA and the Department of the Interior (DOI) to sequence influenza viruses from wild birds, live bird markets, and pigs in Asia and North America.

Within HHS, the National Institutes of Health (NIH) fund international research grants related to avian and pandemic influenza. Research activities include assisting countries to develop and test vaccines and other drugs; expanding the clinical trials infrastructure and research in southeast Asia; and conducting human-animal interface

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<sup>19</sup> Pre-pandemic vaccines are developed with the strain of H5N1 that is currently circulating among poultry.

studies, including disease surveillance among animals in the region.<sup>20</sup> CDC officials provide technical assistance in improving governments' capacity to detect infectious disease outbreaks, preparing and planning for a possible influenza pandemic, strengthening epidemiology and avian influenza surveillance, enhancing laboratory safety, developing and training rapid response teams, and supporting stockpiling efforts.

In FY2005 and FY2006, three appropriations specified funding for international avian and pandemic preparedness at HHS. P.L.109-72, FY2005 Emergency Supplemental Appropriations, provided CDC \$15 million for international avian flu initiatives. Supplemental appropriations attached to P.L.109-148, FY2006 Department of Defense Appropriations, provided \$150 million to CDC for global and domestic disease surveillance, laboratory diagnostics, and rapid response. P.L.109-234, FY2006 Emergency Supplemental Appropriations, provided \$200 million to CDC for the same activities indicated in P.L.109-148. OMB estimates that HHS has allocated \$208 million towards international avian and pandemic preparedness efforts in FY2005 and FY2006 (**Table 5**).

The Administration requested \$145 million for HHS global pandemic influenza and preparedness initiatives in FY2007. S. 3708, FY2007 Labor, HHS, and Education Appropriations, proposed the allocation of \$40 million for international and domestic surveillance, diagnosis, and epidemic investigations. The bill also proposes the provision of additional funds for pandemic preparedness and avian flu, though not specifically for global avian flu efforts. For example, the Committee suggested that \$130 million be appropriated to expand laboratory capacity, research and support for detecting and characterizing influenza and other pathogens. The House did not suggest a specific amount for global avian flu efforts, though some funds were reported out for domestic avian flu and pandemic preparedness.<sup>21</sup>

## Department of Agriculture (USDA)

USDA is responsible for collaborating with international organizations, such as the Food and Agriculture Organization (FAO) and the Organization for Animal Health (OIE) on a range of activities, including animal health research, risk analyses, and transboundary movement of animals and animal products.<sup>22</sup> In an effort to strengthen accurate diagnosis of H5N1 among animals, USDA has developed and applied a real-time diagnostic protocol to analyze influenza in animal specimens and is assisting countries to adopt and apply this protocol in support of surveillance and response programs for avian influenza among animals. Other related activities include:

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<sup>20</sup> HHS FY2007 budget request. [<http://www.hhs.gov/budget/07budget/2007BudgetInBrief.pdf>]

<sup>21</sup> For more on the domestic response, see CRS Report RL33145, *Pandemic Influenza: Domestic Preparedness Efforts*.

<sup>22</sup> For more on responses to avian flu in the agriculture sector, see CRS Report RS21747, *Avian Influenza: Agriculture Issues*.

- encouraging host countries' compliance with international standards on matters concerning animal health;
- conducting agricultural research and technical and policy outreach with public and private stakeholders;
- analyzing short- and long-term economic impacts of influenza outbreaks among animals, as well as the impact of a potential pandemic on the agricultural sector;
- pursuing prevention and control strategies to support international agricultural systems and commerce.

P.L.109-148, FY2006 Emergency Supplemental Appropriations, provided \$91.3 million to USDA for avian flu and pandemic preparedness initiatives, of which \$19.5 million was committed to global efforts. OMB estimates that the agency has committed \$19.5 million to global programs, though the agency reports that it has allocated a total of \$21 million for international avian flu efforts.<sup>23</sup> The Administration's FY2007 budget request included \$5 million for USDA's global avian flu activities. H.R. 5384, FY2007 Agriculture Appropriations, as reported out of committee, included \$4.5 million for U.S. Department of Agriculture's international avian flu efforts. The Senate did not include a specific amount for such efforts.

## Department of Defense (DOD)

In June 1996, President Clinton issued Presidential Decision Directive NSTC-7, which established a national policy to address the threat of emerging infectious diseases through improved domestic and international surveillance, prevention, and response measures.<sup>24</sup> The Department of Defense Global Emerging Infections Surveillance and Response System (DOD-GEIS), which was developed in response to that directive, facilitates early recognition and control of diseases that threaten national security.<sup>25</sup> The directive expanded DOD's mission to include support of global surveillance, training, research, and response to emerging infectious disease threats. DOD-GEIS are designed to strengthen the prevention of, surveillance of, and response to infectious diseases that are a threat to military personnel and families, reduce medical readiness, or present a risk to U.S. national security. The key objectives of DOD-GEIS is to increase DOD's emphasis on the prevention of infectious diseases, strengthen and coordinate DOD's surveillance and response efforts, and create a centralized coordination and communication hub to help organize DOD resources and link them with U.S. and international efforts.

The DOD-GEIS network partners with Navy and Army laboratories, and with WHO's Global Outbreak Alert and Response Network (GOARN) (described in "International Response" section) to collect avian influenza isolates from people

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<sup>23</sup> USDA reports that DOS transferred an additional \$1.5 million to the agency for global avian flu efforts, from P.L.109-13, FY2005 Emergency Supplemental Appropriations. [<http://www.usda.gov/documents/PandemicPlanningReport180.pdf>]

<sup>24</sup> [<http://fas.org/irp/offdocs/pdd/index.html>]

<sup>25</sup> GEIS website, [<http://www.geis.fhp.osd.mil/>].

around the world and share them with CDC and world public health officials for molecular analysis and formulation of influenza vaccines.<sup>26</sup> Key activities specifically related to avian and pandemic influenza include:

- sharing weekly infectious disease surveillance reports;
- developing pandemic influenza emergency response plans for various DOD branches;
- monitoring incidences of influenza among military populations;
- training healthcare workers in rapid detection and management of influenza illnesses;
- implementing cooperative influenza surveillance activities in Asia, the Middle East, and the Central Asian Republics; and
- evaluating emergency response plans of foreign governments, federal agencies, and international organizations.<sup>27</sup>

Emergency supplemental funds attached to P.L.109-148, FY2006 Department of Defense Appropriations, provided \$130 million for avian flu activities, of which \$120 million were committed to the Defense Health Program and \$10 million to Operation and Maintenance. OMB estimates that in FY2005 and FY2006, a total of \$10 million of DOD avian influenza funds were committed to global activities (**Table 5**). Neither the FY2007 budget request nor P.L.109-289, FY2007 Defense Appropriations, included funds for global avian and pandemic preparedness efforts.

## Other U.S. Agencies and Departments

A number of other U.S. agencies and departments participate in global avian and pandemic influenza preparedness efforts, including:

**Department of Homeland Security (DHS).** DHS supports DOS in its coordination of U.S. global avian flu efforts. It also works with the Department of Transportation (DOT) to encourage international transportation associations and groups to participate in avian and influenza pandemic preparedness efforts. In the event of a pandemic, DHS is collaborating with DOS, DOT, and HHS, to encourage foreign entities to share information on travelers exposed to pandemic influenza, and to screen and limit their entry into the United States.

**Department of Transportation.** In addition to its collaborative efforts with DHS on transportation and border security, DOT conducts outreach with its public and private stakeholders, provides emergency management and guidance for civil transportation resources and systems, and leads U.S. international transportation planning and emergency activities.

**Department of the Treasury.** The Department of the Treasury assists in analyzing potential economic impacts of an influenza pandemic, and in monitoring

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<sup>26</sup> DOD-GEIS FY2005 Annual Report.  
[[http://www.geis.fhp.osd.mil/GEIS/DODGEISNews/GEIS\\_AR\\_05.pdf](http://www.geis.fhp.osd.mil/GEIS/DODGEISNews/GEIS_AR_05.pdf)]

<sup>27</sup> Ibid.

and preparing policy responses to possible pandemic-related international economic developments. The department also encourages multilateral development banks and international financial institutions to assist countries impacted by avian influenza.

**Department of Commerce (DOC).** DOC facilitates the expedited interagency review for any export licenses needed for the global shipment of items related to avian influenza, including test kits and equipment, and technology that allows rapid identification of strains.

## International Response

In November 2005, more than 600 delegates from over 100 countries convened in Geneva, Switzerland, to develop a global action plan to control avian influenza in animals and to limit the threat of a human influenza pandemic. Participants agreed that capital and other resources were needed to support countries which had already been affected by avian influenza, to assist countries bordering those with H5N1 cases, and to boost global capacity to identify and respond to a human pandemic if one were to occur. At the conference, experts and officials discussed key financing needs for countries attempting to develop a comprehensive response to H5N1.

The World Bank estimated that countries would need some \$1 billion over the next three years to meet their needs, though the estimate did not include the additional costs of developing human or animal vaccines, purchasing antiviral medicines, or compensating farmers who lose income when animals are culled. In January 2006, the World Bank, the European Commission, and the Chinese government co-sponsored a donor's conference in Beijing, China, to garner support for global avian and pandemic influenza action plans. Representatives from approximately 100 countries and 20 international organizations attended and ultimately pledged about \$1.9 billion for avian flu assistance.<sup>28</sup> The top five donors included: the World Bank (\$500 million), the United States (\$334 million), Japan (\$159 million), the EU Member States (\$138 million), and the European Commission (\$121 million).<sup>29</sup>

In June 2006, members of the international community reconvened in Vienna, Austria, to confirm the financial resources already pledged at the Beijing conference and to reconsider the financial needs of those nations contending with H5N1. Since the last conference was held in Beijing, the virus had spread to Europe and Africa, increasing the amount of funds and other resources that would be needed to contain

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<sup>28</sup> Pledges include the amounts that donors anticipate providing directly to countries through bilateral assistance, contributions to international organizations, and loans provided by international lending institutions. The pledges that the United States makes at these conferences include funds previously outlined in this report.

<sup>29</sup> World Bank, "Avian and Human Influenza: Update on Financing Needs and Framework." November 30, 2006. [<http://www.worldbank.org>]

the virus. At the conference, the newly established ALive Platform<sup>30</sup> estimated that African countries facing H5N1 cases needed an additional \$700 million.<sup>31</sup> Health experts also expressed concern about the continued spread of the animal virus in southeast Asia, particularly in Indonesia. The United States announced at the conference that it would increase its pledge by about \$28 million.

Between December 6 and December 8, 2006, the international community met in Bamako, Mali, to assess progress made in controlling the spread of H5N1 avian flu since the previous conferences held in Geneva, Beijing, and Vienna. At the conference, donors pledged an additional \$475 million to fighting H5N1.<sup>32</sup> The United States again increased its pledge to reach a total of \$434 million (**Table 5**). Details were not provided on how the additional funds would be allocated.

## **Allocations of Pledges to Global Avian Flu Activities**

In preparation for the Bamako conference, the World Bank released a report which highlighted how much the international community had pledged to global avian flu activities, and how those pledges were committed as of October 31, 2006 (**Table 2**).<sup>33</sup> By then, donors had committed \$1.4 billion of the \$1.9 billion pledged at the Beijing conference.<sup>34</sup> Donors preferred to target their assistance to country programs, reserving about 36% of committed funds for bilateral efforts. Nearly half of all funds committed for bilateral programs were provided by multilateral banks in the form of loans and credits (low-interest loans); bilateral funds provided by donor government are usually given in the form of grants.<sup>35</sup> Donors targeted about 17% of committed funds to international organizations like WHO, FAO, OIE, and UNICEF; and 14% to regional organizations, such as the Association of Southeast Asian Nations (ASEAN), Inter-African Bureau for Animal Resources (IBAR), and South Asian Association for Regional Cooperation (SAARC).

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<sup>30</sup> The ALive Platform, a multi-partner program initiated by the World Bank, focuses on livestock in Africa and their relationship to economies and public health. ALive coordinates and fills gaps in existing livestock programs, strengthens veterinary services, and initiates programs focused on poverty reduction, economic growth, research, and regional and international market access. For more information on the ALive Program, see [[http://www.oie.int/eng/press/en\\_040720.htm](http://www.oie.int/eng/press/en_040720.htm)] and [[http://www.fao.org/docs/eims/upload/217651/hpai\\_strategy\\_africa\\_en.pdf](http://www.fao.org/docs/eims/upload/217651/hpai_strategy_africa_en.pdf)].

<sup>31</sup> OIE press release, “SOM meeting on Avian Influenza and Human Pandemic Preparedness concludes its work in Vienna.” July 7, 2006. [[http://www.oie.int/eng/press/en\\_060607.htm](http://www.oie.int/eng/press/en_060607.htm)]

<sup>32</sup> FAO press release, “International donors up funding to fight H5N1 avian flu.” [<http://www.fao.org/newsroom/en/news/2006/1000461/index.html>]

<sup>33</sup> The World Bank defines a commitment as a finalized agreement between the donor and recipient for the designated purposes, and a firm decision that prevents the use of the allocated amount for other purposes.

<sup>34</sup> World Bank, “Avian and Human Influenza: Update on Financing Needs and Framework.” November 30, 2006. [<http://www.worldbank.org>]

<sup>35</sup> Key multilateral banks include: the World Bank, the African Development Bank (AfDB), the Asian Development Bank (ADB), and Inter-American Development Bank (IDB).



**Table 2. Donor Commitments for Global H5N1 Activities**  
(\$ in millions)

Donor	Country Program	AHI Facility	International Organizations	Regional Organizations	Other	Total	% of Commitments
Bilateral Donors	\$218	\$17	\$216	\$155	\$330	\$936	67%
European Commission	\$48	\$58	\$0	\$38	\$41	\$185	13%
Multilateral Banks	\$242	\$0	\$20	\$0	\$19	\$281	20%
Total	\$508	\$75	\$236	\$193	\$390	\$1,402	100%
% of Commitments	36%	5%	17%	14%	28%	100%	

**Source:** World Bank, "Avian and Human Influenza: Update on Financing Needs and Framework."

Due to the continued spread of H5N1, the World Bank estimated that countries would need between an additional \$1.2 billion and \$1.5 billion over the next few years. The Bank estimated that Africa needed the largest amount of additional support because of the spread of H5N1 to the region, and the relatively poor conditions of veterinary and public health services in most countries throughout the area (**Table 3**). As of October 31, 2006, 18% of total commitments for bilateral assistance were targeted at Africa, of which less than half were in the form of grants. A loan from the World Bank to Nigeria comprised more than half of all commitments to Africa, leaving \$44.2 million for 8 additional countries contending with the H5N1 threat.<sup>36</sup>

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<sup>36</sup> The World Bank has since increased funding to Nigeria to \$65 million.

**Table 3. Additional Assistance Needs**  
(\$ in millions)

Regions and Organizations	Additional Financing Need	Commitments for Country Programs	% of Commitments for Country Programs
Sub-Saharan Africa	\$466	\$94.2	18.3%
East Asia and the Pacific	\$221 — \$404	\$232.9	45.4%
Europe and Central Asia	\$33 — \$52	\$151.5	29.5%
Latin America & the Caribbean	\$2 — \$3	\$9.6	1.9%
Middle East and North Africa	\$70 — \$113	\$17.6	3.4%
South Asia	\$85 — \$113	\$7.7	1.5%
U.N. Agencies <sup>a</sup>	\$300	\$0.0	
OIE <sup>a</sup>	\$25	\$0.0	
<b>Total</b>	<b>\$1,202 — \$1,476</b>	<b>\$513.5 <sup>b</sup></b>	<b>100.0%</b>

Source: World Bank, "Avian and Human Influenza: Update on Financing Needs and Framework."

a. Reflects financial needs for 2007 only.

b. CRS recognizes the difference between the figure provided for committed funds targeted at country programs in Column 2 of Table 3 and Column 1 of Table 2.

## The World Bank

The World Bank is responsible for reviewing country preparedness plans, estimating the costs of implementing those plans, and managing and tracking international pledges for the plans. In addition, it is providing \$500 million in low-interest loans to countries heavily affected by H5N1. The funds will be used to supplement government resources, strengthen veterinary systems, and assist in culling and animal vaccination programs. The World Bank funds global avian and pandemic flu preparedness efforts through two mechanisms: the Global Program for Avian Influenza (GPAI) and the Avian and Human Influenza Facility (AHIF). The Bank anticipates providing some \$500 million in loans, credits (low-interest loans), or grants to about 25 countries through GPAI. GPAI funds are provided through the International Development Association (IDA). Nearly half of the funds have already been committed (\$244.2 million).<sup>37</sup> AHIF grants are intended to supplement loans, credits and other grant assistance provided from other sources. AHIF funds are

<sup>37</sup> Albania (\$6.1 million), Armenia (\$9.3million), Azerbaijan (\$5.1 million), Georgia (\$10.3 million), the Kyrgyz Republic (\$6.4 million), Laos (\$13.6 million), Moldova (\$10.6 million), Nigeria (\$65.0 million), Romania (\$47.7 million)Tajikistan (\$6.8 million), Turkey (\$55.2 million), and Vietnam (\$6.2 million), and West Bank and Gaza Territories (\$10.0 million).

flexible and are not earmarked. International donors have contributed about \$75 million to this fund to date.

## **World Organization for Animal Health (OIE)**

OIE, FAO, and WHO are the three lead international organizations responsible for coordinating the global response to H5N1.<sup>38</sup> OIE promotes and coordinates surveillance and control of animal diseases throughout the world. The organization also establishes guidelines to help countries improve animal disease control and eradication methods. In 1995, the Agreement on the Application of Sanitary and Phytosanitary Measures (the “SPS Agreement”) of the World Trade Organization (WTO) came into force. The SPS Agreement established basic rules for food safety and animal and plant health standards. WTO Members created the SPS Agreement, because of the risks posed by trade in animals and animal products. The standards, guidelines, and recommendations issued by OIE were designated as the international reference in the field of animal diseases and zoonoses.<sup>39</sup>

Utilizing funds raised at the three international conferences on avian flu (see the World Bank subsection), OIE has begun evaluating veterinary services in 15 pilot countries on all five continents. The evaluations identified issues that needed to be resolved in order to comply with international veterinary services standards. OIE reports that the countries used feedback from the evaluations to make political and budgetary reforms, and where necessary, prepare their applications for international funding. The World Bank refers to the evaluations when setting funding levels for countries seeking to improve their animal health infrastructure. OIE aims to evaluate 105 countries over a three-year period.<sup>40</sup>

## **United Nations Response**

In September 2005, U.N. Secretary-General Kofi Annan appointed Dr. David Nabarro as the Senior U.N. System Coordinator for Human and Avian influenza. Dr. Nabarro is responsible for coordinating the avian influenza containment efforts of various U.N. agencies. Dr. Nabarro is also tasked with encouraging global support and implementation of the WHO Global Influenza Preparedness Plan, which outlines WHO’s goals and actions, as well as recommended actions for individual nations at each pandemic phase.<sup>41</sup> FAO and WHO are the two key U.N. agencies implementing

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<sup>38</sup> OIE is not a U.N. agency. [[http://www.oie.int/eng/avian\\_influenza/](http://www.oie.int/eng/avian_influenza/)]

<sup>39</sup> For more information on the SPS Agreement see [[http://www.wto.org/english/tratop\\_e/sps\\_e/spsund\\_e.htm](http://www.wto.org/english/tratop_e/sps_e/spsund_e.htm)].

<sup>40</sup> OIE press release, “Support for governance relating to the prevention and control of animal diseases: the OIE takes another step forward.” November 24, 2006. [[http://www.oie.int/eng/press/en\\_061124.htm](http://www.oie.int/eng/press/en_061124.htm)]

<sup>41</sup> Find the WHO Global Influenza Preparedness Plan at [[http://www.who.int/csr/resources/publications/influenza/WHO\\_CDS\\_EPR\\_GIP\\_2006\\_2/en/index.html](http://www.who.int/csr/resources/publications/influenza/WHO_CDS_EPR_GIP_2006_2/en/index.html)].

global avian influenza and pandemic preparedness initiatives, though other U.N. agencies are involved in the global response.<sup>42</sup>

FAO, OIE, and WHO have each developed early warning and response systems that collect, verify, analyze and respond to information gathered from a variety of sources. OIE and WHO are the official sources of disease notification or infection outbreaks for the international community, with OIE reporting on animal cases and WHO on human ones. In July 2006, the three organizations launched a joint Global Early Warning and Response System for Major Animal Diseases (GLEWS).<sup>43</sup> In October 2006, OIE and FAO launched a Crisis Management Center, which houses health experts ready to be rapidly dispersed to countries contending with plant and animal disease outbreaks.<sup>44</sup> The United States provided \$5.1 million and three veterinarians to the center.

**Food and Agriculture Organization (FAO).** In conjunction with OIE, FAO coordinates the global surveillance and response to H5N1 among livestock. Specific activities include technical assistance in developing national avian influenza prevention and control plans; advice on contingency planning; training of veterinarians; and provision of equipment and supplies, such as laboratory equipment and vaccines. In January 2006, at the Beijing donor conference, FAO presented a plan that it developed with OIE to control and eradicate H5N1 in animals. Key components of the program to be implemented by FAO and OIE included: coordinating and managing the global response to H5N1; supporting countries with H5N1 cases to control and eradicate the disease; and assisting countries without H5N1 cases to develop preparedness plans. The plan, which was accepted at the Beijing conference, included a budget of \$476 million for a three-year cycle. FAO estimated that it would need \$130 million to fulfill its part of this global effort.

As H5N1 continued to spread, requests for assistance simultaneously rose. In response, FAO and OIE revised their plan, particularly to expand assistance to Africa,<sup>45</sup> Latin America, and the Caribbean. The revised plan anticipated that \$882 million would be required to address H5N1 in the animal health field, excluding farmer compensation costs. FAO would need \$308 million of the funds to undertake

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<sup>42</sup> Other U.N. agencies that participate in the global response include: U.N. Children's Fund (UNICEF), U.N. Development Program (UNDP), U.N. Office for the Coordination of Humanitarian Affairs (OCHA), and World Food Program (WFP).

<sup>43</sup> OIE press release, "Launch of global early warning system for animal diseases transmissible to humans." July 24, 2006.

[[http://www.fao.org/docs/eims/upload/217837/agre\\_glews\\_en.pdf](http://www.fao.org/docs/eims/upload/217837/agre_glews_en.pdf)]

FAO also released a report on the initiative entitled, "The Global Early Warning and Response System for Major Animal Diseases including Zoonoses (GLEWS)"

[[http://www.fao.org/docs/eims/upload/217837/agre\\_glews\\_en.pdf](http://www.fao.org/docs/eims/upload/217837/agre_glews_en.pdf)]

<sup>44</sup> FAO press release, "New Crisis Management Center launched by FAO." October 12, 2006. [<http://www.fao.org/newsroom/en/news/2006/1000421/>]

<sup>45</sup> For more on FAO's proposal on responding to H5N1 in Africa, see "Highly Pathogenic Avian Influenza in Africa: A Strategy and Proposed Program to Limit Spread and Build Capacity for Epizootic Disease Control."

[[http://www.fao.org/docs/eims/upload/217651/hpai\\_strategy\\_africa\\_en.pdf](http://www.fao.org/docs/eims/upload/217651/hpai_strategy_africa_en.pdf)]

its part of the global effort. As of September 30, 2006, donors had pledged \$94.4 million to FAO and an additional \$39.5 million had been promised to the organization.<sup>46</sup> At last count, the United States was the largest donor to FAO; providing more than 20% of pledged funds.<sup>47</sup>

FAO has established a flexible spending account, Special Fund for Emergency and Rehabilitation Activities (SFERA), which is used to respond to geographical and thematic areas of greatest need. FAO encourages donors to pledge funds to this account since the funds are not earmarked. SFERA funds are allocated irrespective of the region, project, or disease. Although FAO prefers that donors channel more of their contributions to SFERA, as of September 30, 2006, donors have committed \$24.9 million to the account.<sup>48</sup> The United States is not a contributor to this account.

**World Health Organization (WHO).** WHO is the U.N. agency responsible for coordinating the global response to human cases of H5N1, monitoring the spread of the virus among humans, and determining when a virus has caused a global pandemic. It also provides the international community with guidelines, procedures, and recommendations on addressing infectious disease outbreaks, including H5N1.<sup>49</sup> In an effort to respond to the global spread of diseases, such as H5N1, and to minimize their interference with international traffic and trade, the World Health Assembly revised the International Health Regulations (IHR) in May 2005. The revised international legal instrument, which is to come into force in June 2007, outlines the roles of WHO and its Member States in identifying and responding to infectious disease threats, and compels Member States to share information about infectious disease outbreaks and other public health emergencies of international concern.<sup>50</sup>

Under the revised IHR, Member States are required to develop and strengthen surveillance and response capacities, respond to public health risks and public health emergencies, and report public health events, such as infectious disease outbreaks, to WHO. The revised IHR mandates the WHO to evaluate governments' public health capacities, provide technical assistance, offer logistical support, and mobilize financial resources for building capacity in surveillance and response. Although the revised IHR do not include an enforcement mechanism, all WHO Member States are bound to them, except those that have objected to them. WHO and a number of countries, including the United States, have already taken steps towards implementing the revised IHR and improving countries' capacities to respond to international health risks and emergencies.

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<sup>46</sup> FAO, "Interim Report on the Global Programme for Control and Eradication of Highly Pathogenic Avian Influenza (H5N1)." September 2006. [[http://www.fao.org/docs/eims/upload//217280/rep\\_hpai\\_sfera\\_en.pdf](http://www.fao.org/docs/eims/upload//217280/rep_hpai_sfera_en.pdf)]

<sup>47</sup> [<http://www.fao.org/newsroom/en/focus/2006/1000348/index.html>]

<sup>48</sup> FAO, "Interim Report on the Global Programme for Control and Eradication of Highly Pathogenic Avian Influenza (H5N1)." September 2006. [[http://www.fao.org/docs/eims/upload//217280/rep\\_Hpai\\_sfera\\_en.pdf](http://www.fao.org/docs/eims/upload//217280/rep_Hpai_sfera_en.pdf)]

<sup>49</sup> [[http://www.who.int/csr/disease/avian\\_influenza/guidelines/en/](http://www.who.int/csr/disease/avian_influenza/guidelines/en/)]

<sup>50</sup> [<http://www.who.int/csr/ihr/en/>]

One of the first steps taken was to develop the Global Outbreak Alert and Response Network (GOARN); a system that manages critical information about outbreaks and ensures accurate and timely communications among key international public health professionals. Another critical step was to establish a global stockpile of influenza treatments. In August 2005, WHO estimated that it would need about 3 million doses of antiviral treatments to avert a global pandemic.<sup>51,52</sup> Tamiflu is an antiviral treatment that has been effective in treating people infected with H5N1. Many health experts hope that Tamiflu remains effective if H5N1 becomes effectively transmissible among people.

On April 19, 2006, Roche officials handed over 3 million Tamiflu courses<sup>53</sup> to WHO.<sup>54</sup> Half of the treatments are being held in Switzerland and the other 1.5 million courses are being stored in the United States. Under a separate agreement, Roche has donated an additional two million courses to WHO. The courses are to be used to treat people in those developing countries which are most likely to be affected by avian influenza and least likely to be able to purchase the drug.<sup>55</sup>

According to WHO, it has made significant progress in implementing the goals and strategies outlined in its Global Influenza Preparedness Plan. In the Plan, all activities and goals were grouped into five key strategies (which are bolded). At the end of May 2006, key accomplishments in the five areas included:<sup>56</sup>

- **reduced human exposure to the H5N1 virus** — distributed 4,920 PPE; provided biopacking for international shipment of infectious substances, viral transport media, and other laboratory supplies; conducted assessment missions in 30 countries to determine the capacity and effectiveness of health infrastructures and resources; and provided technical support in 8 countries and the West Bank and Gaza territories;
- **strengthened the early warning system** — developed guidelines on collecting, preserving and shipping specimens for the diagnosis

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<sup>51</sup> [[http://www.searo.who.int/LinkFiles/Avian\\_Flu\\_Stockpile\\_Oseltamivir.pdf](http://www.searo.who.int/LinkFiles/Avian_Flu_Stockpile_Oseltamivir.pdf)]

<sup>52</sup> WHO, “Donation of three million treatments of oseltamivir to WHO will help early response to an emerging influenza pandemic.” August 24, 2005. [<http://www.who.int/mediacentre/news/releases/2005/pr36/en/index.html>].

<sup>53</sup> A course of medication is a period of continuous treatment with a drug, sometimes with variable dosage.

<sup>54</sup> WHO press release, “Handover of Rapid Response Stockpile for pandemic influenza containment.” April 19, 2006. [[http://www.who.int/dg/lee/speeches/2006/pandemic\\_influenza\\_containment/en/](http://www.who.int/dg/lee/speeches/2006/pandemic_influenza_containment/en/)]

<sup>55</sup> Roche press release, “*Roche reaches agreement with Aspen to provide influenza medicine for Africa.*” May 16, 2006. [<http://www.roche.com/med-cor-2006-05-16>]

<sup>56</sup> WHO, “WHO Activities in Avian Influenza and Pandemic Influenza Preparedness.” [[http://www.who.int/csr/disease/avian\\_influenza/WHOactivitiesJanMay2006.pdf](http://www.who.int/csr/disease/avian_influenza/WHOactivitiesJanMay2006.pdf)]

of H5N1 virus infection;<sup>57</sup> supported the strengthening of field epidemiology in southeast Asia; supported the improvement of surveillance and early warning systems in Burkina Faso, Cameroon, Côte d'Ivoire, Niger, and Nigeria; aided countries to diagnose H5N1; strengthened laboratory diagnostic capacity for H5 diagnosis in Nigeria, Cameroon, and Côte d'Ivoire;

- **intensified rapid containment operations** — co-sponsored meetings and conferences to develop an early containment protocol;<sup>58</sup> developed guidelines on managing a stockpile of antivirals; and drafted operating procedures on the deployment of antivirals, including those stockpiled by WHO (explained below);
- **built capacity to cope with a pandemic** — worked with governments to strengthen national preparedness plans; held a meeting with technical experts and potential pharmaceutical manufacturers to assess antiviral drug capacity in southeast Asia; and developed recommendations for the pharmacological management of patients with H5N1 infection;<sup>59</sup> and
- **coordinated global scientific research and development** — held a number of meetings on developing and increasing pandemic influenza vaccines;<sup>60,61</sup> made available several new recombinant H5N1 prototype vaccine strains; and published a bibliography of research on avian influenza.

## Issues for Congress

### Providing Additional Funds for Global Avian Influenza Efforts

Some Members have suggested that a greater portion of influenza pandemic preparedness funding be spent on global efforts. During a House Foreign Operations Subcommittee hearing on pandemic flu in March 2006, Representative Kolbe stated that the \$55 million that USAID requested for FY2007 global avian flu initiatives were insufficient, and encouraged the agency to request additional funds if necessary. Representative Kolbe also questioned why such a small proportion of the FY2007 requested funds were allocated to Africa (less than \$10 million).

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<sup>57</sup> [[http://www.who.int/csr/resources/publications/surveillance/WHO\\_CDS\\_EPR\\_ARO\\_2006\\_1/en/index.html](http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_EPR_ARO_2006_1/en/index.html)]

<sup>58</sup> WHO in conjunction with other governments developed a global protocol on how to contain the transmission of a pandemic virus at its source. For a draft of the protocol see [[http://www.who.int/csr/disease/avian\\_influenza/guidelines/protocolfinal30\\_05\\_06a.pdf](http://www.who.int/csr/disease/avian_influenza/guidelines/protocolfinal30_05_06a.pdf)].

<sup>59</sup> [[http://www.who.int/medicines/publications/WHO\\_PSM\\_PAR\\_2006.6.pdf](http://www.who.int/medicines/publications/WHO_PSM_PAR_2006.6.pdf)]

<sup>60</sup> [[http://www.who.int/csr/disease/influenza/WHO\\_OIE\\_FAOMeetingreport.pdf](http://www.who.int/csr/disease/influenza/WHO_OIE_FAOMeetingreport.pdf)]

<sup>61</sup> [[http://www.who.int/vaccine\\_research/diseases/influenza/Working\\_Paper\\_2.pdf](http://www.who.int/vaccine_research/diseases/influenza/Working_Paper_2.pdf)]

Appropriators did not enact any of the FY2007 appropriations that included specific funding for global avian flu activities. Instead, Congress amended P.L. 109-289 (Division B), which provides funding at the lesser of FY2006 enacted, FY2007 House-passed, or FY2007 Senate-passed levels until February 15, 2007. Supporters of greater spending on global avian flu efforts urge Congress to provide additional funds for international efforts and to enact legislation in the 110<sup>th</sup> Congress similar to those bills introduced in the 109<sup>th</sup> Congress which sought to increase resources to global avian and pandemic influenza preparedness (for a list of the bills see the **Appendix**).

## **Expanding Access to Drugs and Vaccines**

Intellectual property rights has become an increasingly contentious issue in global health, particularly since companies began threatening to produce generic versions of HIV/AIDS treatments without the patent holders' permission. Some drug manufacturers in developing countries have argued that Tamiflu and other patented antivirals are too expensive for most poor countries.<sup>62</sup> In October 2005, a representative from an Indian drug manufacturer threatened that the company would develop and sell a generic version of Tamiflu "at a humanitarian price" in developing nations, and not in the United States or Europe.<sup>63</sup> Since then, Roche has granted sublicenses to manufacturers in China, India, South Africa, and the United States.<sup>64</sup> In the event of a pandemic, some assert that the United States will not export the antivirals that it is stockpiling. In that light, some observers are advocating that Congress provide funds to support countries in developing the capacity to develop and purchase antivirals. Still others contend that the United States could help to contain the spread of H5N1 by exporting generic antivirals to non-producing countries that can not afford to purchase the drugs (see H.R. 3369, S. 969, and H.R. 4392).

Some epidemiologists have expressed similar concerns related to H5N1 vaccine availability. If H5N1 vaccines are developed, they would be a primary mechanism for controlling the spread of the virus and reducing associated mortality and morbidity. Due to a number of uncertainties, including unpredictable market demand and pricing, liability and intellectual property considerations, and regulatory and tax issues, global and domestic vaccine research and manufacturing capacity is limited. Global health experts contend that some of the most affected countries do not have the capacity to produce vaccines, nor will they have the ability to purchase sufficient quantities of the vaccine in the event of a pandemic. One article in the *Journal of Public Health Policy* pointed out that "almost 40% of the world's supply of

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<sup>62</sup> For more information on this issue, see CRS Report RL33159: *Influenza Antiviral Drugs and Patent Law Issues*.

<sup>63</sup> McNeil Jr., Donald, "Indian Company to Make Generic Version of Flu Drug Tamiflu." *New York Times*. October 14, 2005. [<http://www.nytimes.com>].

<sup>64</sup> Roche press release, "*Roche donates a further 2 million treatment courses of antiviral Tamiflu to the WHO for regional stockpiling.*" January 17, 2006. [<http://www.roche.com/med-cor-2006-01-17>] Also see [<http://www.roche.com/med-cor-2005-12-23>], [<http://www.roche.com/med-cor-2005-10-18>], and [<http://www.roche.com/med-cor-2006-05-16>].



interpandemic influenza vaccines is used in countries that do not produce their own vaccines.”<sup>65</sup> Some health experts would like Congress to increase funding for HHS’ activities related to improving global vaccine research and development capacity.

## **Improving Health Systems and Disease Surveillance**

A number of health experts advocate greater U.S. investment in the strengthening of foreign health systems overall. Proponents argue that the spread of H5N1 and the inability of countries like Indonesia to contain the virus demonstrates the need to increase support for public health systems. Supporters also argue that increased spending might encourage state openness and responsibility, and enhance global cooperation and containment efforts.

Due to the poor state of health infrastructures in a number of countries, key sectors that are critical in identifying and containing the spread of H5N1 — such as disease surveillance and veterinary services — are ill-equipped. Many health experts are concerned that a pandemic might progress before it is discovered in a country where H5N1 is endemic. Supporters of this idea argue that ill-equipped surveillance systems will be slow to determine the source of a pandemic, evaluate the rate of viral transmission, ascertain whether H5N1 has become efficiently transmissible among humans, or rate the effectiveness of anti-flu initiatives. Some health experts would like Congress to enact legislation in the 110<sup>th</sup> Congress, similar to measures introduced in the 109<sup>th</sup> Congress, that would strengthen health systems and veterinary health services in developing countries (see H.R. 4476, S. 1912, S. 2170, H.R. 4245, and H.R. 4603).

## **Combating Bird Flu Among Animals in Affected Countries**

Mass culling of infected poultry and in regions surrounding infected animals is the most widely used containment measure. WHO has expressed concern that some farmers in poorer countries might not cull their poultry, because they depend on poultry farming and their governments might not be able to compensate them. Some scientists propose researching the effectiveness of alternative containment strategies, such as implementing cleaning days (when all live markets are simultaneously emptied and cleaned) and separating ducks and chickens in live poultry markets to decrease viral transmission. Others advocate the development of a global fund to support countries in their farmer compensation efforts. Some encourage Members to enact legislation in the 110<sup>th</sup> Congress similar to bills introduced in the 109<sup>th</sup> Congress (see H.R.4062, S.1821, and H.R. 4603).

## **Planning for Global Economic Impacts**

In connection with the Bamako Conference on avian and pandemic influenza, the World Bank released a report that predicted the economic impacts of a global influenza pandemic. If the pandemic was mild, killing about 1.4 million people

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<sup>65</sup> Fedson, David, “Preparing for Pandemic Vaccination: An International Policy Agenda for Vaccine Development.” *Journal of Public Health Policy* 2005, Volume 26, Issue 1, April 2005. p.11.

(seasonal flu kills between 0.2 million and 1.5 million people annually), the World Bank estimated global output would decline by less than 1%. A more moderate pandemic, killing 14.2 million people, could cause global GDP to fall more than 2%, representing about \$200 billion in one quarter or \$800 billion over a year. A severe pandemic, modeled after the 1918 Spanish flu, could cut global GDP by almost 5%, constituting a major global recession. The World Bank predicts that developing countries would be hardest hit.<sup>66</sup>

Many economists assert that health and non-health related sectors could be severely affected by a global influenza pandemic, though it would be difficult to predict the costs of those effects.<sup>67</sup> For example, Canadian and Asian hospitality and tourism sectors were considerably impacted during the SARS outbreak. In 2002 and 2003, SARS cost the Asia-Pacific region about \$40 billion.<sup>68</sup> Additionally, flights to the region fell by about 45%, crippling the airline and hotel industries. Canada estimated that it lost approximately \$1.2 billion, with about \$763 million spent on the health-care system.<sup>69</sup>

Some analysts caution that Congress should be prepared to respond to the impact that potential fluctuations in supply and demand from key Asian markets might have on the U.S. economy. In the 109<sup>th</sup> Congress, some Members introduced legislation to establish a National Pandemic Influenza Economic Advisory Committee that would prepare a report that comprehensively analyzes the potential economic gains and losses to the U.S. economy in a pandemic scenario due to changes in Asia's economy (see H.R. 4062, S. 969, and H.R. 3369). Supporters of this idea suggest that Congress enact similar legislation in the 110<sup>th</sup> Congress.

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<sup>66</sup> World Bank, "Evaluating the Economic Consequences of Avian Influenza." [<http://siteresources.worldbank.org/INTTOPAVIFLU/Resources/EvaluatingAIEconomics.pdf>]

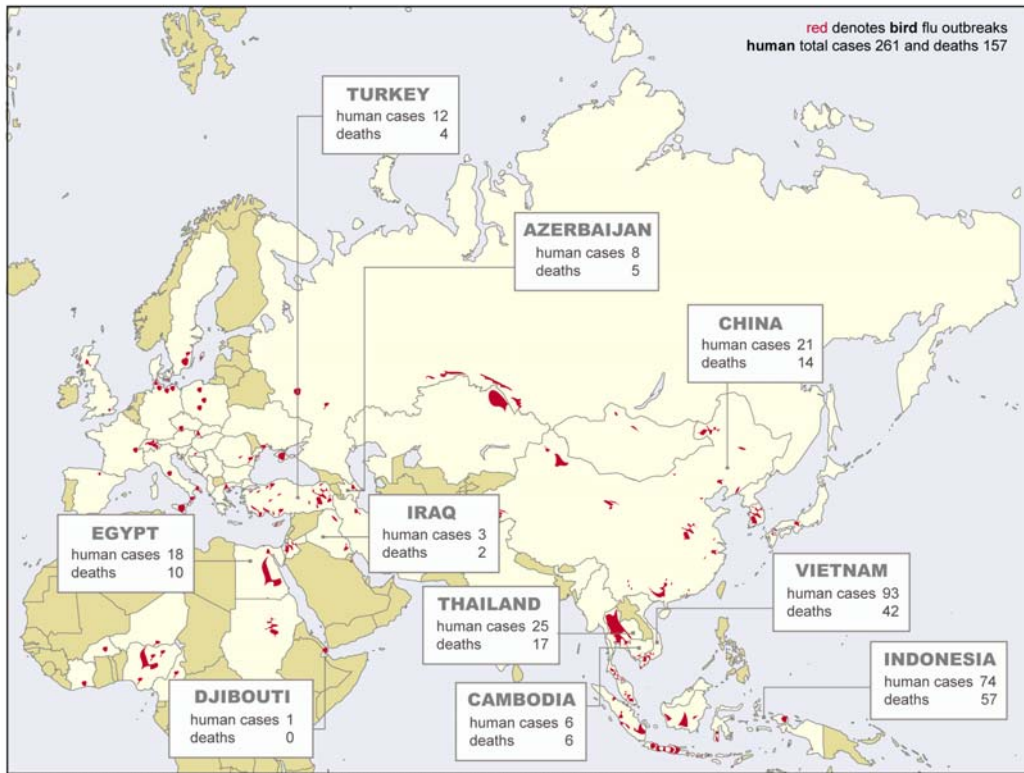
<sup>67</sup> For more on the economic impacts of avian influenza, see CRS Report RS22453, *Avian Flu Pandemic: Potential Impact of Trade Distortions*.

<sup>68</sup> Osterholm, Michael, "Preparing for the Next Pandemic." *Foreign Affairs*, July/August 2005. [<http://www.foreignaffairs.org>]

<sup>69</sup> *Ibid.* Country-specific SARS-related information, including costs and fatalities can be found in CRS Report RL32072, *Severe Acute Respiratory Syndrome (SARS): The International Response*, by Rhoda Margesson and Tiaji Salaam.

# Appendix

Figure 1. Map of Human and Animal H5N1 Cases



Source: Information based on the World Health Organization (WHO) website, and the World Organization for Animal Health (OIE) website. Adapted by CRS. (1/2006)

**Table 4. WHO Pandemic Phases**

<b>Phase</b>	<b>Description</b>	<b>Overarching Public Health Goals</b>
<b>Interpandemic Period</b>		
<b>Phase 1</b>	No new influenza virus strains have been detected in humans. A virus strain that has caused human infection may be present in animals. If so, the risk of human infection is considered to be low.	Strengthen global influenza pandemic preparedness at the global, regional and national levels.
<b>Phase 2</b>	No new influenza virus strains have been detected in humans. However, a circulating animal influenza virus strain poses a substantial risk of human disease.	Minimize the risk of transmission to humans; detect and report such transmission rapidly if it occurs.
<b>Pandemic Alert Period</b>		
<b>Phase 3</b>	Human infection(s) with a new strain, but no human-to-human spread, or at most rare instances of spread to a close contact.	Ensure rapid characterization of the new virus strain, and early detection, notification and response to additional cases.
<b>Phase 4</b>	Small cluster(s) with limited human-to-human transmission, but spread is highly localized, suggesting that the virus is not well adapted to humans.	Contain the new virus within limited foci or delay spread to gain time to implement preparedness measures, including vaccine development.
<b>Phase 5</b>	Larger cluster(s), but human to human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).	Maximize efforts to contain or delay spread, to possibly avert a pandemic, and to gain time to implement pandemic response measures.
<b>Pandemic Period</b>		
<b>Phase 6</b>	Pandemic: increased and sustained transmission in the general population	Minimize the impact of the pandemic.

Source: World Health Organization.

**Table 5. U.S. Pledges for Global Avian and Pandemic Influenza**  
(\$ in millions)

FY2005 Funding Source	Amount Pledged			
	Beijing	Vienna	Bamako	Total
<b>Reprogrammed Funds from USAID Missions</b>	<b>5.14</b>	<b>1.75</b>	<b>0.0</b>	<b>6.89</b>
<b>P.L.109-13, FY2005 Emergency Supplemental</b>	<b>31.30</b>	<b>0.00</b>	<b>0.00</b>	<b>31.30</b>
- HHS	(15.00)	(0.00)	(0.00)	(15.0)
- USAID	(16.30)	(0.00)	(0.00)	(16.3)
<b>HHS Base Funding</b>	<b>17.70</b>	<b>25.30</b>	<b>0.00</b>	<b>43.00</b>
- OPHEP	(4.20)	(0.00)	(0.00)	(4.20)
- CDC	(3.50)	(0.00)	(0.00)	(3.50)
- NIH	(10.00)	(0.00)	(0.00)	(10.00)
<b>TOTAL FY2005</b>	<b>54.14</b>	<b>27.05</b>	<b>0.00</b>	<b>81.19</b>
FY2006 Funding Source	Amount Pledged			
	Beijing	Vienna	Bamako	Total
<b>P.L.109-148, FY2006 Defense Appropriations</b>	<b>279.50</b>	<b>1.57</b>	<b>0.00</b>	<b>281.07</b>
- USAID	(131.50)	(0.00)	(0.00)	(131.50)
- HHS Research Programs	(31.00)	(0.00)	(0.00)	(31.00)
- Other HHS Programs	(83.00)	(0.00)	(0.00)	(83.00)
- USDA	(18.00)	(1.57)	(0.00)	(19.57)
- DOD	(10.00)	(0.00)	(0.00)	(10.00)
- Department of State	(6.00)	(0.00)	(0.00)	(6.00)
<b>P.L.109-234, FY2006 Emergency Supplemental</b>	<b>0.00</b>	<b>0.00</b>	<b>66.00</b>	<b>66.00</b>
- HHS	(0.00)	(0.00)	(36.00)	(36.00)
- USAID	(0.00)	(0.00)	(30.00)	(30.00)
<b>Reprogrammed Funds from USAID Missions</b>	<b>0.00</b>	<b>0.00</b>	<b>6.50</b>	<b>6.50</b>
<b>TOTAL FY2006</b>	<b>279.50</b>	<b>1.57</b>	<b>72.50</b>	<b>353.57</b>
<b>TOTAL FY2005 AND FY2006</b>	<b>333.64</b>	<b>28.62</b>	<b>72.50</b>	<b>434.76</b>

Source: OMB, December 11, 2006

**Note:** The figures in this table reflect funds pledged to global avian influenza activities. Some of the funds that OMB reports agencies and departments committed to global activities were not specifically appropriated for those purposes.

## Bills Introduced in the 109<sup>th</sup> Congress That Would Have Increased Resources to Global Avian Flu

### Appropriations Bills.

**H.Rept. 109-463** to **H.R. 5384**, FY2007 Agriculture Appropriations, would have provided \$4.5 million for U.S. Department of Agriculture's international avian flu efforts. The Senate did not include a specific amount for such efforts.

**S.Rept. 109-277** to **H.R. 5522**, FY2007 Foreign Operations Appropriations, would have provided \$25 million for USAID's global avian flu efforts, \$30 million below requested levels. The House did not include a specific amount for such efforts.

**S. 3708**, FY2007 Labor, HHS, and Education Appropriations, proposed \$40 million for international and domestic surveillance, diagnosis, and epidemic investigations. Additional funds would have been provided in the bill for pandemic preparedness and avian flu, though not specifically for global avian flu efforts. For example, the Committee proposed \$130 million to expand laboratory capacity, research and support for detecting and characterizing influenza and other pathogens. The House did not propose a specific amount for global avian flu efforts, though some funds would have been appropriated to avian flu and pandemic preparedness.

### Other Bills.

**H.R. 4062** and **S. 1821**, *Pandemic Preparedness and Response Acts* proposed developing a "Pandemic Fund" to augment ongoing U.S. and international avian flu and pandemic preparedness initiatives.

**H.R. 4476** and **S. 1912**, *Global Network for Avian Influenza Surveillance Acts*, would have increased support for initiatives that prevent the spread of H5N1 among animals.

**H.R. 3369** and **S. 969**, *Attacking Viral Influenza Across Nations Acts*, would have provided funds to support U.S. efforts to strengthen surveillance capacity within affected countries.

**H.R. 4245**, *Influenza Preparedness and Prevention Act*, would have increased the number of international public health sites and staff abroad in countries impacted by pandemic influenza.

**S. 2170**, *Global Pathogen Surveillance Act of 2005*, would have provided \$1 billion for a real-time international threat detection system, offers training and education for epidemiologists in developing countries, offered training and consultation on disease and syndrome surveillance, and provided assistance to developing countries for the purchase and maintenance of public health laboratory equipment and supplies.

**H.R. 4603**, *Pandemic and Seasonal Influenza Act of 2005*, would have provided funds to establish a global network for avian influenza surveillance, offer technical assistance to countries for disease detection, strengthen veterinary systems, and institute a Coordinator of U.S. Assistance to Combat Avian Influenza.

**H.R. 4392**, *To provide for the importation of pharmaceutical products under a compulsory license as provided for under the World Trade Organization*, would have permitted the United States to export generic antivirals to non-producing countries.