

**ASIA: GROUND ZERO FOR THE NEXT
PANDEMIC?**

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Asia: Ground Zero for the Next Pandemic?

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Summary: This paper assesses the potential threat of pandemic influenza and the measures adopted for its prevention. We conclude by pointing out that even if avian influenza does not cause a human influenza pandemic, it is probably time to invest more resources in Asian (and African) countries if our aim is to prevent such pandemics from emerging in the future.

Introduction

The world has experienced three cases of pandemic influenza over the past century, all of which are thought to have originated in East Asia. More recently there has been a serious outbreak of severe acute respiratory syndrome (SARS) in South-East Asia. Because of very consistent action, the SARS outbreak was contained before it reached a pandemic scale but, nevertheless, it managed to affect people in countries across the globe in a matter of weeks. Now, only a couple of years after the SARS scare, the WHO has issued a new pandemic alert. This time the threat is known as avian influenza. Hence, it is fair to say that East Asia, and particularly South-East Asia, is a breeding ground for new types of severe human illness. This paper assesses the potential threat of pandemic influenza and the measures adopted for its prevention. We conclude by pointing out that even if avian influenza does not cause a human influenza pandemic, it is probably time to invest more resources in Asian (and African) countries if our aim is to prevent such pandemics from emerging in the future.

Understanding the Threat of a Pandemic Influenza

Although a novel influenza virus could emerge anywhere in the world at any time, scientists across the globe are particularly concerned about the possibility of the avian influenza virus (H5N1) giving rise to the next pandemic among human beings.

Outbreaks of H5N1 have occurred among poultry in several countries in Asia since 1997. Avian influenza, as its popular name indicates, mainly affects poultry and wild birds. As is the case of human influenza, it can appear in multiple forms, although there are two main variants: (1) the so-called 'low pathogenic'; and (2) the 'high pathogenic'. While the former causes mild symptoms and might even go undetected, the latter is far more virulent. In its highly pathogenic version the virus spreads extremely rapidly in poultry flocks and has a mortality rate approaching 100%, often within 48 hours. One of the virus subtypes causing avian influenza in its highly pathogenic form is known as H5N1, and is probably one of the most terrible bird-to-bird influenza viruses of all time. More than 150 million birds have died of the disease or been culled to control it. More recently the virus has spread to Europe and Africa, transmitted by migrating wild birds. At present, the virus is primarily transmitted from bird to bird and the only real victims of the avian influenzas are the world's bird populations. However, on very rare occasions infected birds have passed the

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virus on to human beings, with very severe consequences. According to the WHO, from 2003 to February 2006 there have been 173 known cases of people who have contracted the illness after having been in close contact with birds infected with the H5N1 virus, of which 93 have died.¹

Although the seriousness of the possibility of the virus's bird-to-human diffusion should not be underestimated, neither should it be exaggerated. The fact that birds can pass on the virus means that the necessary precautions should be taken to avoid such a possibility. Simply put, the logic behind this is that the more infected birds there are, the higher the risk of bird-to-human transmission.

The second reason why human beings should beware an avian influenza pandemic among the world's bird population is still only theoretical, but of far greater concern. Researchers say that if the H5N1 virus undergoes genetic changes and gains the ability to spread quickly among people, it could touch off a lethal worldwide epidemic, or pandemic. The question is how likely it is for the virus to undergo such a change, making human-to-human transmission possible.

It is impossible to know at this stage whether the H5N1 virus poses any real and significant threat to human health. However, the fact that all three pandemics in the 20th century –the Spanish flu in 1918, the Asian flu in 1958 and the Hong Kong flu in 1968– were the result of the genetic transformation of a bird flu virus, provides sufficient empirical evidence to suggest that it could indeed be very likely for the H5N1 virus to become a serious human health problem.

There are two possible outcomes as regards the H5N1 virus:

- (1) The virus never mutates and, hence, there is no immediate threat of a pandemic.
- (2) At some point in the future the virus acquires human-to-human transmission capacity, through either:
 - (a) An exchange with a human influenza virus.
 - (b) Gradual adaptation.

Both transformation scenarios gain credibility as the incidence of infection in birds increases. In addition, the likelihood of a genetic combination rises in line with the possibility of contact between infected birds and other species, which follows naturally from the first condition. If the virus ends up exchanging genetic codes with a human influenza virus, the human population is likely to have some resistance to the 'new' resulting virus, since many people might have been exposed to at least one of the new H and N virus subtypes. This is the reason given by some experts as to why the pandemics in 1957 and 1968 were far less severe in terms of mortality than the 1918 pandemic, which according to recent research was caused by a virus that mutated gradually by itself without the interference of a human influenza virus. The way the H5N1 virus is currently evolving does not rule out the risk of a severe pandemic similar to those of 1918 and 1919.

The Damage to Health and the Economy by a Pandemic Influenza

To deal effectively with the pandemic threat, the important question is: what is the potential damage that can be expected from an influenza pandemic?

Given the uncertainty regarding the virus's capacity to inflict damage once –and if– it has

¹ Data on H5N1 infections in human beings are available at the WHO website (www.who.int).

acquired a human-to-human transmission capacity; it is extremely difficult to forecast the damage it can cause to society. The WHO, in assessing the potential lethal impact of a new pandemic, usually considers the death rates of the 1957 and 1968-69 pandemic as a point of reference. However, since (a) the H5N1 virus has a demonstrated capacity to kill people when they are infected by birds, (b) there is probably not going to be an effective vaccine until several months after the onset of the new pandemic and (c) there is no assurance that existing anti-viral drugs will be effective against the new virus, there is a possibility that a pandemic caused by a mutated H5N1 could be as deadly as –or even deadlier than– the virus that caused the 1918 pandemic.

However, it is not only mortality that is an issue when assessing the possible damage of a new pandemic. Other issues, such as the number of people falling ill and the number of people that require some form of medical assistance, are also important to consider. Studies aimed at assessing the general impact of an influenza pandemic typically cite 30% as a likely overall attack rate.² Of course, the number could be much higher. Attack rates of between 30% and 70% have been observed in particular countries in all three pandemics. It is important to note that the attack rate is likely to be high regardless of the virus's severity in terms of mortality.

Furthermore, studies aimed at assessing the impact of pandemics on the healthcare system estimate that between 40% and 50% of those affected require some form of medical attention/consultation, and that 2% to 3% of those requiring medical attention also require hospitalisation.^{3 4} However, hospitalisation rates are dependent on the virus's virulence and some experts do not rule out a ten-fold increase in the hospitalisation rate should a pandemic be caused by a virus with a similar lethal capacity to the 1918 strain.⁵

Table 1. Hypothetical scenarios of health damage in the case of an influenza pandemic (numbers in millions)

		World	Africa	Asia	Europe	Latin America	North America	Oceania
Number of people falling ill	All scenarios	1939,42	271,78	1171,62	218,52	168,40	99,18	9,92
Number of people requiring medical assistance	All scenarios	872,74	122,30	527,23	98,33	75,78	44,63	4,46
Excess hospitalisation	Mild scenario	26,18	3,67	15,82	2,95	2,27	1,34	0,13
	Severe scenario	261,82	36,69	158,17	29,50	22,73	13,39	1,34
	Very severe scenario	349,10	48,92	210,89	39,33	30,31	17,85	1,79
Excess mortality	Mild scenario	4,53	0,63	2,73	0,51	0,39	0,23	0,02
	Severe scenario	36,20	5,07	21,87	4,08	3,14	1,85	0,19
	Very severe scenario	174,55	24,46	105,45	19,67	15,16	8,93	0,89

² M.I. Meltzer, N.J. Cox and K. Fukuda (1999), 'The Economic Impact of Pandemic Influenza in the United States', *Emerging Infectious Diseases*, vol. 5, nr. 5, p. 659-671.

³ J. Kavet (1977), 'A Perspective on the Significance of Pandemic Influenza', *American Journal of Public Health*, vol. 67, nr. 11, p. 1063-1070.

⁴ Data on hospitalisation rates in pandemic years are difficult to come by and are usually only available for the 1957 and 1968-69 pandemics. One of the few studies reporting the excess hospitalisation rate for the 1968-69 pandemic indicates a spike of 140% compared with a year of low epidemic activity (see W.H. Barker and J.P. Mullooly (1980), 'Impact of Epidemic Type A Influenza in a Defined Adult Population', *American Journal of Epidemiology*, vol. 112, nr. 6, p. 798-813.

⁵ GlobalSecurity.org: http://www.globalsecurity.org/security/ops/hsc-scen-3_flu-pandemic-deaths.htm.

Table 1 illustrates the potential impact of a new pandemic –given the data reported above– for three different scenarios: a mild scenario, a severe scenario and a very severe scenario. It should be borne in mind that slight changes in the attack rate, or in any other assumption regarding the other variables, would immediately render them useless. The purpose is simply to illustrate the scope of the potential damage that a new pandemic could have on world health given a set of pre-set assumptions.

The mild Scenario is based on the experience of the 1957 and 1968-69 pandemics. The assumptions regarding excess hospitalisation are that around 3% of all those requiring medical assistance would also require hospitalisation.⁶ Excess mortality is assumed to be around 69/100,000 inhabitants, which is approximately the world excess mortality rates reported for the 1957 pandemic. The severe scenario assumes a more virulent virus. It foresees a ten-fold increase in excess hospitalisation compared with the mild scenario and a mortality rate of 560/100,000 inhabitants, which is equal to the mortality rate reported in the US during the Spanish flu pandemic but lower than the world mortality rate during this particular episode. Finally, the very severe scenario extrapolates the mortality rates observed in the 1918 pandemic, which has been estimated at 2777/100,000 inhabitants.⁷ The hospitalisation rate in this scenario is assumed to be 33% higher than in the severe scenario. All three scenarios assume similar attack rates and a similar number of people requiring some form of medical assistance.

Regardless of scenario, the estimates of the number of people falling ill (close to 2 billion people) and the number of people requiring medical attention (close to 900 million people) or hospitalisation (26-350 million people depending on the scenario) reported in Table 1 suggest that a new pandemic would put the world's healthcare systems under very significant pressure. Contingency planning would be absolutely necessary to avoid the system's total breakdown as well as to ensure the necessary means for delaying any further diffusion of the virus. In the event of a more virulent virus emerging, other problems would be likely to appear, including security-related issues as a result of people panicking, the distribution and supply of food, water and energy and other services. Asia, being home to the largest share of the world's population and the most densely populated area in the world would face an enormous human health challenge in absolute terms. As many Asian countries are both poor and densely populated it cannot be ruled out that excess mortality could be far higher in these countries. In the 1918 pandemic, India was the country to be hardest hit: some sources believe that as many as 20 million people died there as a result.

The sheer numbers of people falling sick implies that a large part of the workforce around the globe would be absent due to influenza-related illness, with a sharp decline in productivity world-wide. In the event of mortality rising significantly, substantial economic losses can be expected due to the fall in the active population. Thus, it is not far fetched to expect a serious economic backlash if a new pandemic should come to pass.

McKibbin and Sidorenko (2006)⁸ have simulated the global macroeconomic consequences of a pandemic influenza for a set of 20 countries/economic regions. Their findings give reasons to be concerned. McKibbin and Sidorenko model the global macroeconomic effects of several pandemic scenarios based partly on the experience from the SARS outbreak and the type of forecast shown in Table 1. Their findings suggest that even in the case of a mild scenario (similar to the mild scenario described above) we

⁶ See J. Kavet (1977), *op. cit.*

⁷ Note that estimates for the Spanish flu's death toll vary widely from 20 million to more than 100 million people. In this paper 50 million is used as a benchmark for the very severe scenario.

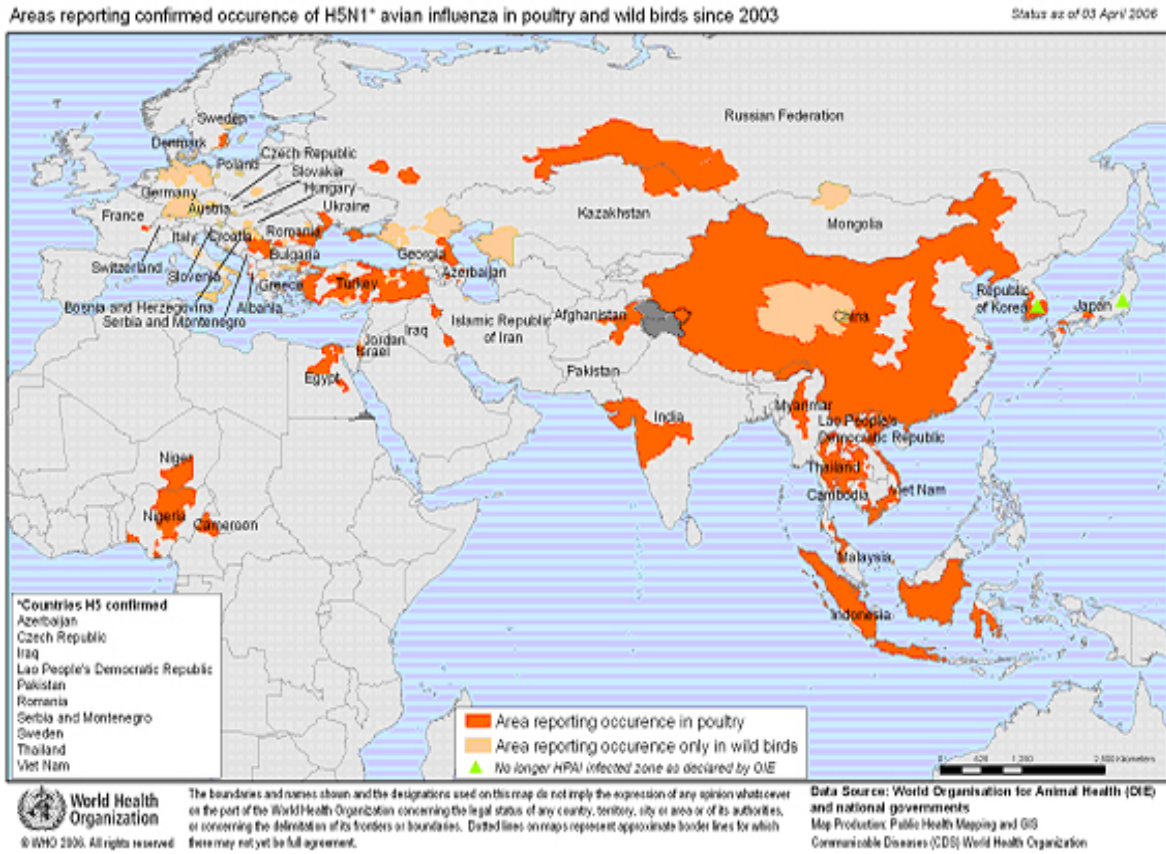
⁸ For a detailed analysis of the economic consequences described in this section see W.J. McKibbin and A.A. Siderenko (2006), *Global Macroeconomic Consequences of Pandemic Influenza*, Lowy Institute Analyses, Lowy Institute for International Policy, Sidney, Australia.

could face a loss in global economic output of close to US\$330 billion or 0.8% of world GDP. If the next pandemic were to imply human health risks in line with those described above for the very severe scenario, McKibbin and Sidorenko's model predicts that the loss in economic output could approach US\$4.4 trillion or 12.6% of global GDP. What is more, the authors predict that the economic backlash would not be uniform across countries and regions. While the European and US economies could stand to lose around 5% of their GDP if the next pandemic is severe, South-East Asia could face losses ranging from 10%-15% (China, India, Korea, Taiwan and Thailand) to 20%-50% (the Philippines, Singapore, Indonesia and Hong Kong).

To summarise, although avian influenza is currently spreading rapidly the key to avoid a pandemic is still to contain the disease in the world's bird populations. The reason for this is simple: as the number of cases of bird-to-human contagion increase so do the odds that the virus should acquire the capacity to spread from human to human. While such a plan is easy to put into practice and execute in developed countries, that is not the case in other parts of the world. Pandemics are a global phenomenon, that is, no matter how good we are in preventing bird-to-human contagion at home, if other countries fail in the task we would still be exposed to the risk of a new pandemic. Currently, the weak links in this global collective action venture are Asia and Africa. Many of the countries in these two continents are highly dependent on poultry for their survival and they simply do not have the resources or the knowledge to deal with outbreaks of avian influenza effectively enough to reduce the risk of a human pandemic. And, as explained in the brief section above, there are strong human and economic reasons for investing a large volume of resources in measures aimed at preventing a pandemic. The remaining part of this paper will focus on international initiatives that are currently in place to deal with avian influenza outbreaks in Asian countries.

The Situation in Asia: Affected Countries

In Asia, national programmes are at the forefront of the control of animal and human influenza. But the capacities of individual countries vary widely: some possess all key technical capacities while others have almost none.



Source:
http://gamapservr.who.int/mapLibrary/Files/Maps/Global_SubNat_H5N1inAnimalConfirmedCUMULATIVE_20060403.png

Cambodia

Four Cambodians have been confirmed to have died from H5N1. Health experts predict that more cases in Cambodia are likely. Although the Cambodian government is working with the WHO, the government has only a limited capacity to contain outbreaks of the disease. In Cambodia, chicken farms are ubiquitous, which makes monitoring the nation's poultry stocks much more difficult. The United States, FAO and WHO have strong working relationships with Cambodia. Moreover, some 200 international donors and non-governmental organisations (NGOs) operating in the country are ready to help to mobilise an effective response to an outbreak of avian flu. On October 12, 2005 the United States signed a cooperation agreement with Cambodia, pledging US\$1.8 million to help the country guard against the spread of H5N1. In December 2005, Germany said it would provide US\$3 million to help Cambodia fight the disease. The United Nations estimates that Cambodia needs US\$18 million to stem the spread of the virus.

China

There have been eight human deaths from H5N1 in China. China is not only the world's most populous nation, but also the world's biggest poultry producer. The close proximity of millions of people, birds and animals in southern China make it a hotbed for H5N1 (China has as many as 14 billion chickens, geese and ducks). WHO says that H5N1 is endemic in parts of China, afflicting not only domestic poultry and migratory birds, but also parts of China's pig population.

China has taken assertive measures to combat H5N1. The Ministry of Health has established more than 60 influenza monitoring laboratories throughout China and has published an emergency plan for an influenza pandemic. It has also implemented

contingency regulations that require officials at the provincial and municipal levels to notify the central government within four hours after a new influenza outbreak.

On November 2, 2005 China said that it would allot US\$420 million from its current budget to fight avian flu. It also said it would ban poultry imports from 14 countries affected by the virus. Moreover, in December 2005, Roche said it had reached an agreement with China on developing a generic version of Tamiflu.

Together with the World Bank and the European Commission, on January 17-18, 2006 China co-hosted an international conference in Beijing on avian and human influenza. The event was attended by representatives from about 100 countries and 20 international organisations, who together pledged US\$1.9 billion to fight the disease in developing countries. Among the donors, the World Bank promised US\$500 million, the United States pledged US\$334 million, Japan offered US\$159 million, EU member states donated US\$138 million and the European Commission pledged US\$120 million. Of the US\$1.9 billion in pledges, US\$635.2 million will go to East Asia and the Pacific, US\$224.6 million to Eastern Europe and Central Asia, US\$147.1 million to Africa, US\$110.1 million to the Middle East and Africa, US\$76 million to South Asia and US\$9.2 million to Latin America and the Caribbean.

Indonesia

The first human death from H5N1 in Indonesia was confirmed in July 2005. Three more people died of the disease in October 2005. In December 2005, Indonesia announced a three-year national strategic plan to contain H5N1.

Indonesia has a population of 200 million people and a chicken population of 1.3 billion. In September 2005, the Indonesian government said it was not capable of containing the spread of H5N1 and asked for international assistance. Since then, international donors have pledged US\$140 million in assistance and the Indonesian government has allotted US\$60 million for the prevention of avian influenza.

Laos

There have been no known human cases of H5N1 in Laos, and there were no reports of avian influenza in birds in the country in 2005. However, Laos lacks the ability to monitor the disease, and the United States believes that the lack of documented cases in Laos has more to do with inadequate surveillance than an absence of infection. An American team that visited Laos in October 2005 said the country could be quickly overwhelmed in the event of a large-scale human outbreak. The United States has pledged US\$3.4 million to help Laos fight avian influenza.

Thailand

There have been more than 14 human deaths from H5N1 in Thailand. As such it is one of the most badly effected countries in Asia. Its economy has also been hit hard: Thailand is the fourth-largest poultry exporter in the world. More than 40 million birds were culled in 2005, leading to a 5% year-on-year contraction of the agricultural sector. Thailand bans the use of H5N1 vaccines in its poultry population because the government fears it could lead to a further mutation of the virus.

Thailand has implemented several measures to contain the spread of avian influenza. The Department of Livestock Development, which is part of the Ministry of Agriculture, is the lead agency for fighting the virus. In 2004 the National Committee on Avian Influenza Control mapped out a national strategy and in December 2005 the Ministry of Public Health announced that Tamiflu would be produced and distributed to the Thai public at subsidised prices.

Vietnam

There have been 42 human deaths from H5N1 in Vietnam. The total poultry population in Vietnam is estimated to be around 250 million birds and the government estimates that 65% of farm households nationwide raise poultry. Some 40 million birds have been culled, but the lack of compensation for farmers acts as a disincentive for them to report signs of infection.

Vietnam has established an inter-agency working group that includes WHO and FAO. Moreover, the government is drafting a national pandemic preparedness plan. In January 2006 the Ministry of Agriculture and Rural Development said that over 240 million birds had been vaccinated under a mass poultry vaccination programme. Vietnam signed a bilateral health cooperation agreement with the United States in October 2005. The United States has pledged some US\$5 million to help Vietnam fight H5N1.

Dealing with the Pandemic Threat Posed by Avian Influenza: US Initiatives in Asia

An influenza pandemic has the potential to cause more death and illness than any other public health threat. If a pandemic influenza virus with a similar virulence to the 1918 strain were to emerge today, it is estimated that in the absence of intervention 1.9 million Americans could die and almost 10 million could be hospitalised over the course of the pandemic.⁹ Although the timing, nature and severity of the next pandemic cannot be predicted with any certainty, preparedness planning is imperative to lessen its impact.

US President George W. Bush unveiled his National Strategy for Pandemic Influenza on November 1, 2005. The strategy is based on three fundamental principles: first, finding a flu outbreak as soon as it appears and then containing and treating it to the best extent possible; secondly, developing strong protections like vaccines and antiviral medications; and, thirdly, responding quickly to save lives.

This was followed by the release of the US Department of Health and Human Services (HHS) Pandemic Influenza Plan on November 2, 2005. The strategy calls for Congress to appropriate US\$7.1 billion in emergency funds to purchase vaccines and antiviral medication, bolster national and international disease surveillance and prepare federal, state and local response measures.

Approximately US\$5 billion will be used to build domestic vaccine production capabilities and purchase vaccines and treatments for the US National Stockpile. The US pandemic readiness plan calls for health officials to buy enough of the antiviral medication called Tamiflu to treat one in four Americans, or about 75 million people.

Of the US\$7.1 billion in White House funding for avian flu and pandemic preparedness, about US\$388 million is for global initiatives. Of the US\$388 million, US\$200 million is for HHS to bolster international surveillance capacity; US\$131.5 million for the US Agency for International Development (USAID) to implement avian influenza containment efforts globally; an additional US\$18.5 million for the US State Department for pandemic preparedness activities; US\$20 million for the potential evacuation of US government personnel in case of a pandemic; and US\$18.3 million for the US Department of Agriculture to provide technical assistance in international animal surveillance. What follows is a summary of the response of the US executive branch.

⁹ Data on the US in this section are taken from Globalsecurity.org:
<http://www.globalsecurity.org/security/ops/hsc-scen-3.htm>.

US State Department

The Department of State is coordinating the US international response to the global spread of H5N1. The Senior Coordinator for Avian Influenza and Infectious Diseases is Ambassador Nancy Powell. She oversees the work of the technical implementing agencies: the Department of Health and Human Services (HHS), the Agency for International Development (USAID), the Department of Agriculture (DOA) and the Department of Defense (DOD).

In an effort to elevate the issue of avian influenza on national agendas, as well as to coordinate efforts between donor and affected nations, on September 14, 2005 the White House announced the International Partnership on Avian and Pandemic Influenza (IPAPI). IPAPI seeks to generate momentum and coordinate action for addressing the threats of avian and pandemic influenza based on a set of four core principles: enhancing preparedness, prevention, response and containment activities. Over 80 countries and eight international organisations attended the first meeting of IPAPI, which was held in Washington, DC on October 7, 2005.

In Asia, the US State Department is also working closely with regional organisations, including the Association of South-East Asian Nations (ASEAN) and the Asia Pacific Economic Cooperation (APEC) group, to address avian influenza and the threat of an influenza pandemic. The work includes efforts to encourage comprehensive national pandemic preparedness plans.

US Department of Health and Human Services (HHS)

Within HHS, the Centres for Disease Control (CDC) is the key agency responsible for implementing US anti-influenza activities around the world. The Coordinating Centre for Infectious Diseases and the Field Epidemiology Training Programme are also major components of HHS global pandemic planning, which includes: training in avian influenza surveillance; laboratory safety and skills instruction; epidemiology training; developing and training rapid response teams; stockpiling support; and deployment of expert disease control teams.

The Global Disease Detection (GDD) Initiative at CDC funds most of H5N1 and pandemic influenza planning. The objective of GDD is to quickly recognise infectious disease outbreaks, to improve the ability to control and prevent outbreaks and to detect emerging threats.

The US Secretary of Health and Human Services, Michael Leavitt, led a fact-finding mission to flu-stricken regions in South-East Asia in October 2005. During the trip he signed cooperation agreements with Cambodia, Laos and Vietnam.

US Agency for International Development (USAID)

USAID coordinates its global H5N1 and influenza response with other US agencies. It also works closely with the World Health Organisation (WHO), the Food and Agriculture Organisation of the United Nations (FAO) and other international governments and organisations to support national influenza and H5N1 prevention efforts.

The former USAID Administrator, Andrew Natsios, said that avian influenza was the single most important challenge facing the Agency, even more important than its efforts in Iraq and Afghanistan. In this context, he directed all 89 USAID missions around the world to take immediate steps to work with national governments to assess the level of national readiness and to identify specific actions USAID can take to support national responses.

Globally, USAID committed some US\$14 million in 2005 to support efforts to contain avian influenza and to minimise the risk posed to animal and human health. In Asia, USAID has allotted US\$7.5 million to Cambodia, China, Indonesia, Laos and Vietnam to strengthen disease surveillance, laboratory diagnosis and rapid containment of animal outbreaks. USAID has also granted US\$2.85 million for communication campaigns in Cambodia, Laos, Indonesia and Vietnam which are aimed at reducing animal handling practices that place humans at risk. USAID has provided WHO with US\$250,000 for personal protective equipment (PPE) used in handling and disposing of infected poultry.

US Department of Agriculture (USDA)

At USDA, the Animal and Plant Health Inspection Service (APHIS) works to keep avian influenza from becoming established in the US poultry population. APHIS believes that addressing avian flu at its source (in affected poultry abroad) provides the best opportunity to reduce or eliminate the risk of an H5N1 pandemic. APHIS has launched an outreach campaign called 'Bio-Security for the Birds' which provides poultry farmers with the latest information on bio-security to prevent the spread of avian infections on farms. USDA is translating the brochures for use in South-East Asia.

US Department of Defense (DOD)

At DOD, the Global Emerging Infections System (GEIS) has a network of overseas medical research laboratories that track, prevent and treat infectious diseases globally. The objective is to protect the US military and strengthen its ability to address the challenges related to pandemic influenza, including compromised health and readiness of US military forces. GEIS is a partner in the WHO's Global Outbreak Alert and Response Network (GOARN).

In Asia, DOD has provided a staff veterinary surgeon to serve as a member of the WHO-GOARN team in Laos and to conduct training workshops in detecting and diagnosing avian flu cases. DOD has also placed a US Navy microbiologist at the Institute Pasteur in Ho Chi Minh City, Vietnam, to hold training sessions on rapid-diagnostic test methodology. Meanwhile, DOD monitors the emergence of infectious diseases in South-East Asia through its Armed Forces Research Institute of Medical Sciences (AFRIMS), which is based in Bangkok, Thailand.

The Naval Medical Research Unit 2 (NAMRU-2) is also part of the Pentagon's international effort to prevent H5N1 from becoming a human pandemic. NAMRU-2 supports GEIS through four programmes: emerging diseases, enteric diseases, parasitic diseases and virology. NAMRU-2 is an overseas research laboratory based in Jakarta, Indonesia, with related activities in South-East Asia and the Pacific Islands. NAMRU-2 also supports a satellite laboratory in Phnom Penh, Cambodia, in cooperation with the Cambodian National Institute of Health.

Dealing with the Pandemic Threat Posed by Avian Influenza: Multilateral Initiatives in Asia and Other Developing Countries

The main multilateral animal health agencies coordinating global information exchange and technical support to regional and national programmes are the UN Food and Agriculture Organisation (FAO) and the World Organisation for Animal Health (known by its French acronym OIE). The World Health Organisation (WHO) coordinates overall information and technical support for control of human influenza. The World Bank and other multilateral and bilateral donors target investments to enhance the effectiveness of disease control programmes.

World Health Organisation (WHO)

WHO is the main actor in the global response to the outbreak of H5N1 avian influenza. In September 2005 the UN Secretary General, Kofi Annan, appointed Dr David Nabarro as the Senior UN System Coordinator for Human and Avian influenza. Nabarro, seconded from WHO, coordinates the avian influenza containment efforts of the various UN agencies.

Nabarro is also responsible for implementing the WHO Global Influenza Preparedness Plan. The plan outlines WHO goals and actions, as well as recommended actions for individual nations. The plan contains recommendations to nations for 'non-pharmaceutical public health interventions' such as isolation, quarantine and travel restrictions. WHO believes that wealthy and poor countries must develop pandemic preparedness plans collectively to reduce national and international viral transmission.

WHO has requested US\$150 million to establish a global stockpile of influenza vaccines. WHO hopes to use the stockpile to halt a potential pandemic by containing the virus at the first sign of an outbreak. Some US\$30 million has been pledged to fund the stockpile. Roche Laboratories Inc, the Swiss pharmaceuticals company that holds the patent to the antiviral drug called Tamiflu, announced that it would donate three million doses of the drug to WHO for use in developing countries. In January 2006, WHO announced that Roche would donate an additional two million doses of Tamiflu, bringing the total to five million.

At the United Nations, the General Assembly has also established an emergency fund called the Central Emergency Response Fund (CERF) to provide quick initial funding during the early stages of emergencies. The United Nations hopes to have a US\$500 million revolving budget that could be used within three to four days of the start of an emergency. The United Nations has received more than US\$200 million of the fund, which should be operational by March 2006.

UN Food and Agriculture Organisation (FAO)

FAO coordinates global surveillance and response activities for animal influenza strains with pandemic potential, such as H5N1. FAO works closely with the OIE. FAO has spent US\$7.5 million on H5N1 initiatives since 2004. USAID is providing the FAO with a US\$6 million grant and the German government has pledged US\$20 million. FAO is asking international donors for an additional US\$175 million.

The World Bank

As mentioned earlier in this paper, a human influenza pandemic would seriously threaten the world economy. As a result, the World Bank has moved quickly to provide funding as well as to mobilise grant funding from other donors with a view to prevent a pandemic from occurring. Specifically, the World Bank is providing low-interest loans to countries heavily affected by H5N1. The World Bank is also coordinating efforts between countries and is encouraging them to develop pandemic plans. In September 2005, representatives from the World Bank, WHO, FAO and OIE met with health experts from the United Nations, the European Union and H5N1-affected countries to discuss the global spread of avian influenza.

In Asia, the World Bank said on November 4, 2005 that it would provide US\$500 million in loans to poor South-East Asian countries that are struggling to combat avian influenza. The funds will be used to supplement government resources, strengthen veterinary systems, and assist in culling and animal vaccination programmes. But the World Bank estimates that up to US\$1 billion might be needed over the next three years.

The World Bank, WHO, FAO and OIE co-sponsored a meeting about avian and human pandemic influenza on November 7-9, 2005, in Geneva, Switzerland. The meeting, which was designed to develop an integrated global plan, enabled donors and the international organisations to sit at the same table as affected countries and identify needs at the country level.

The European Union

The European Union has focused most of its efforts on establishing pre-emptive measures designed to monitor, prevent and/or control avian influenza outbreaks in Europe. These include increasing surveillance in domestic poultry and wild birds, and strengthening bio-security measures.

The Standing Committee on the Food Chain and Animal Health, which is part of the European Commission, monitors the status of H5N1 in Asia, and implements safeguard measures as appropriate. As a result, it has banned imports into the Europe Union of live birds and risky poultry products –such as fresh poultry meat and untreated feathers– from Cambodia, China (including Hong Kong), Indonesia, Laos, Malaysia, North Korea, Pakistan, Thailand, Vietnam, Russia and Kazakhstan.

Although the European Commission has provided emergency technical and financial support to the concerned countries (especially Vietnam) to help control H5N1 in poultry and other birds, it believes that the eradication of avian influenza from Asia is not a realistic short-term objective. It has therefore focused on planning and coordinating control measures. EU agriculture ministers met on February 21, 2006 to discuss growing demands for an immediate programme of preventive vaccination against bird flu, but Europeans are divided over whether vaccinations of commercial poultry stocks can be effective.

The European Commission pledged €80 million (US\$120 million) at the International Pledging Conference on Avian and Human Pandemic Influenza held in Beijing on January 17-18, 2006. The pledge is made up of €50 million from the European Commission's 2006 External Relations budget and €30 million from the European Development Fund (EDF), which is the main instrument for development cooperation in Asian, Caribbean and Pacific (ACP) countries. The €30 million remains subject to approval of the ACP countries. At the same time, EU member states individually donated another US\$138 million at the conference.

Dealing with the Pandemic Threat Posed by Avian Influenza: Regional Initiatives in Asia

Association of South-East Asian Nations (ASEAN)

ASEAN is South-East Asia's main multilateral forum. ASEAN has created a Highly Pathogenic Avian Influenza (HPAI) Taskforce, as well as an ASEAN Expert Group on Communicable Diseases and the ASEAN Animal Health Trust Fund. At the ASEAN Summit in Kuala Lumpur, Malaysia, in December 2005, ASEAN leaders agreed to establish a regional vaccine stockpile that would channel the stocks to the most affected countries in order to control the spread as quickly as possible.

Asia Pacific Economic Cooperation (APEC) Forum

The APEC Initiative on Preparing for and Mitigating and Influenza Pandemic calls for collective, transparent measures to exchange expertise and information to prevent a possible pandemic.

East Asia Summit

The East Asia Summit is the newest regional grouping. During its inaugural meeting in December 2005, EAS leaders drafted an avian influenza declaration that commits them to establish regional avian influenza and pandemic preparedness strategies backed by supporting national legislation.

Conclusion

Many of the initiatives described above are designed to contain avian influenza once an outbreak is reported, and in this way prevent the virus from causing a human influenza pandemic. While, at this stage, there is no direct alternative approach to dealing with the pandemic threat posed by the H5N1 virus, it is hardly the ideal strategy if the aim is to prevent a pandemic from developing in the first place. One of the reasons why the H5N1 virus –and other bird influenza viruses before it– poses a threat to human health is that in Asia and Africa humans beings are over-exposed to new viruses as human beings, poultry and other animals live together and interact much more frequently than in other parts of the world. Given the way the animal farming sector currently operates in Asia and Africa, it is likely that there will be more incidences of new potentially dangerous viruses emerging as a result of human-animal interaction and the interaction between animals of different species. Hence, the real issue is what the developed world will do about this problem in the future. It is clear that if the objective is to avoid a pandemic caused by a virus that is originally species specific to poultry, pigs or livestock much more work is needed to establish global standards and routines for the handling of farm animals. Should this be achieved, the threat of pandemics in the future would not be eliminated but it would significantly reduce the threat posed by the current avian influenza from reoccurring in the future. For such a venture to be successful, the aid initiatives in Asia – and particularly South-East Asia– should be executed in a more coordinated way than is currently the case. For instance, the US and Europe, together with Asian and African countries, would have to cooperate far more closely to forge a strategy aimed at preventing the interaction that facilitates animal-specific viruses from developing into human pandemics.

As for the current problem, it is clear that it could have been avoided by the type of strategies just described. However, in their absence, Asia is again ‘ground zero’ for a potentially dangerous disease. The SARS outbreak caused substantial damage to the Asian economy. If the avian influenza develops into a human pandemic, Asia will suffer more economically than most other regions world-wide and the total cost would amply exceed not only the cost inflicted by the SARS epidemic but the damage inflicted to other parts of the world. A new pandemic has the potential to throw the Asian countries back by decades in terms of recent development.

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