

## Pandemic and Avian Influenza

A pandemic is a global epidemic of disease. Pandemics spread to all parts of the world very quickly and cause illness in more than 25 percent of the total population. An influenza pandemic occurs when a new strain of a flu virus emerges. Because it is unlike previous viruses for which people have been vaccinated, or to which they have been exposed, there is no built up immunity to it. Therefore, most or all of the world's population would be vulnerable to this virus.

Estimates of potential deaths from influenza vary, but an influenza pandemic could cause more deaths globally in just weeks than HIV/AIDS has caused in decades. The most severe pandemic of the 20<sup>th</sup> century was a flu that originated in birds and jumped to humans.<sup>1</sup> Known as the “Spanish Flu,” it killed an estimated 20-50 million people worldwide between 1918 and 1919.<sup>2</sup>



A young woman in Laos with a healthy duck. Avian influenza has been discovered in ducks, chickens and many other birds.

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Disquiet is growing about the possibility that avian influenza may cause the next pandemic. A current strain of avian influenza, or bird flu, has already killed more than 50 people in Asia, and concerns are that a type of bird flu will cross over from animals to humans, jump borders and traverse oceans, spawning the next pandemic. Scientists agree the question is when, not if, the next pandemic will occur. The timing and exact nature of the virus is impossible to know. When a pandemic hits, it will strike hardest at the people CARE serves—the poorest, marginalized groups in developing countries with

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<sup>1</sup> “Danger of Flu Pandemic Is Clear, if Not Present” article in The New York Times by Denise Grady, published Oct. 9, 2005

<sup>2</sup> Of the total deaths over 500,000 were in the U.S.

few if any of the necessary resources to plan for or mitigate the impact of the disease. For example, during the 1918 pandemic, India suffered a quarter of the total global deaths and it is estimated that Ghana lost five percent of its population in only two months. The world's population has not only increased since then, but more people are now concentrated in urban areas than before, especially in the developing world. As one of the world's largest NGOs, CARE has the opportunity – and responsibility – to play a major role in preparedness, response, impact mitigation, and advocacy to lessen the consequences of pandemic flu in the poorest nations and most vulnerable groups of people.

CARE has the presence, skills, and experience to contribute substantially to national pandemic planning and response in the countries where we work, especially around community-based surveillance, education, and mitigation of the health and economic impacts of a pandemic. This is why CARE is taking steps now to protect the health of



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poor communities we work with around the world. In most countries where CARE operates, resources are very limited for undertaking major public health and other prevention measures so this is an area where CARE can make a vital contribution. Health education and communications materials informing people of the necessary changes in behavior to prevent the spread of the disease will be

particularly important. Step one is to disseminate information about a possible pandemic and basic preventative measures as widely as possible.

### **How Does Influenza Spread?**

Influenza pandemics occur when a new virus strain circulating in animals develops the ability to infect humans and spread efficiently from person to person.<sup>3</sup> Influenza viruses easily swap genetic material when a host is infected with two different viruses at the same time. If this happens between avian and human flu, a new hybrid virus may emerge. Or, as in 1918, an avian virus can develop the ability to cross over directly to people...

Currently, there is a strain of avian influenza called H5N1 that has a documented ability to pass directly from birds to people. However, this strain has not been successful in finding an efficient way to make the jump from species to species. The virus has not crossed over to humans very often. But once this strain is transmitted to human beings, it causes severe illness and has a high fatality rate. A human vaccine is still in trial stages

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<sup>3</sup> Prerequisites for start of a pandemic; 1) A novel virus subtype must emerge to which the general population will have no/little immunity 2) The new virus must be able to replicate in humans and cause serious illness 3) The new virus must be efficiently transmitted from one human to another causing community-wide outbreaks

and its effectiveness against a potential hybrid virus has yet to be demonstrated. Its cost, and the amount produced, may place it out of reach of the developing world. Since December 26, 2003, the World Health Organization (WHO) has confirmed 116 human cases of avian influenza in humans in four countries (Vietnam, Cambodia, Thailand, and Indonesia) and 60 deaths (51 percent fatality rate)



CARE is distributing literature to educate people on ways to decrease the risk of human infection, suitable ways to handle sick or dead birds, management of backyard flocks, handling and cooking poultry; and the appropriate use of protective equipment.

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Outbreaks of avian influenza have occurred among poultry in Asia since 1997. The virus is now also found in a wide variety of birds in addition to chickens and ducks. It has even affected tigers and other large cats in zoos where the animals have been fed poultry. In controlled experiments, the virus has also been seen in house cats, however there is no evidence that this has occurred outside a laboratory setting.<sup>4</sup> Avian influenza (AI) is now endemic in Asia and unlikely to be eradicated. Affected countries have included Korea, Japan, Indonesia, Vietnam, Cambodia, Malaysia, Thailand, and China; recently, AI has also been detected in Russia and Kazakhstan, where migratory birds were the likely source. It was recently reported in Turkey, Romania and Tajikistan. Further spread to Europe and beyond is likely.

### **A Pandemic Alert**

The World Health Organization currently classifies avian influenza (type H5N1) as a Phase 3 Pandemic Alert. Scientists are not sure how a new pandemic strain will evolve. It's possible that it will take several steps for a strain to develop the ability to spread very easily and quickly from person to person (Phases 4 and 5) or that this will happen in a single evolutionary leap, as with the "Spanish Flu" (Phase 6).

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<sup>4</sup> "Danger of Flu Pandemic Is Clear, if Not Present," The New York Times, by Denise Grady, published Oct. 9, 2004

**Table 1. WHO classification of pandemic influenza periods and phases**

<p><i>Phase 1.</i> An influenza virus subtype that has caused human infection may be present in animals but the risk of human infection is considered to be low.</p>	<p><i>Phase 2.</i> A circulating animal influenza virus subtype poses a major risk of human disease.</p>	<p><b>Phase 3. No human-to-human spread or at most rare instances of spread to a close contact</b></p> <p><b>CURRENT LEVEL</b></p>	<p><i>Phase 4.</i> Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.</p>	<p><i>Phase 5.</i> Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming better adapted to humans but may not yet be fully transmissible.</p>	<p><i>Phase 6.</i> Increased and sustained transmission in the general population.</p>
<p>INTERPANDEMIC PERIOD (No new influenza virus subtype detected in humans.)</p>		<p>PANDEMIC ALERT PERIOD (Human infection with a new influenza virus subtype.)</p>			<p>PANDEMIC PERIOD (Sustained, efficient transmission of a new influenza virus subtype between people.)</p>

### Preparing for a Pandemic

More than 50 countries have developed, or are developing, pandemic preparedness and response plans. In the US, a government plan was drafted in August 2004, and work is underway to finalize it. Although much work remains to be done, all state health departments in the United States also have drafted plans.

There are four primary ways to reduce the effects of influenza pandemic: **vaccination, antiviral drug use, quality medical care, and public health measures** to decrease the spread or extent of disease.

- *Vaccination* – It is recommended that people get vaccinated with the current human flu vaccine as a mitigating measure against avian influenza and to prevent any cross over between virus strains that would facilitate transmission to people. However, at present, pharmaceutical laboratories around the world that manufacture human flu vaccine do not have the capacity to produce enough doses for the global population. This would require billions of doses of vaccine. In industrialized countries vaccines may be made available to priority groups (those at high risk or those in critical jobs). Stockpiling vaccine on a large scale is a risky strategy because the exact configuration of virus strain that may cause a pandemic cannot be predicted.

Currently, there is no approved human vaccine for the H5N1 strain of avian influenza although trials are being conducted.

- *Antiviral drugs* –Oseltamivir (Tamiflu) has been the focus of preparedness activities. Global oseltamivir production capacity is limited so the major available supply is likely to be the amount stockpiled<sup>5</sup> before the pandemic. Zanamivir, known as Relenza, is another anti-viral drug which is prescribed for the treatment of uncomplicated influenza virus. Both drugs are most effective when taken within two days of infection; however the H5N1 strain has recently shown some resistance to Tamiflu<sup>6</sup>. Oseltamivir is currently being manufactured by only one pharmaceutical company and there are reports that the company is already facing problems in meeting demand. Low resource countries are unlikely to be able to secure or afford these drugs... Neither drug is an influenza vaccine.
- *Quality medical care* –Even in wealthier countries, the ability to provide quality inpatient<sup>7</sup> and outpatient medical care will be under stress, and may be overwhelmed by the sheer numbers of those affected, the burden of carrying out the necessary medical protocols for highly contagious disease, staff shortages, and limited supplies and equipment. In developing countries, where medical systems are already inadequate, understaffed, and ill equipped, the toll of preventable deaths is likely to be high. In addition, mortality rates in these settings are likely to be greater due to HIV/AIDS, other chronic/endemic diseases, and chronic under-nutrition.
- *Public health measures* – Early in a pandemic, before disease has spread across the globe, governments may take several measures to slow the advance of the disease, including travel advisories and restrictions, isolation and quarantine, closing schools and canceling public gatherings. But these steps are likely to have limited value. Regardless of interventions, all communities are likely to experience pandemic disease and death, social disruption, and economic loss. Large urban slums in developing countries will make it particularly hard to contain the virus there.

## CARE's Role

In countries where CARE has a strong presence, we can contribute to pandemic prevention and preparedness by sharing our expertise in developing and disseminating materials and messages that will inform the public of what preventive measures to take.

- A. *Community-based programs* can provide information, education and tools for:
1. Ways to decrease the risk of human infection from contact with poultry;
  2. Suitable ways to handle sick or dead birds;
  3. Management of “backyard flocks” (small flocks of poultry kept by small farmers versus commercial poultry farms);
  4. Handling and cooking poultry; and

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<sup>5</sup> In the US the Department of Health and Human Services has announced the intent to purchase 20 million courses of treatment for the Strategic National Stockpile.

<sup>6</sup> Tamiflu is approved for use in preventing infection ahead of time (prophylaxis) whereas Relenza is not. Although currently most preparedness plans do not include Tamiflu use for prophylaxis

<sup>7</sup> Hospital care for influenza is supportive and may include mechanical ventilation, supplemental oxygen, intravenous fluids, and antibiotics to treat secondary bacterial infections, most commonly pneumonias.

5. Appropriate use of personal protective equipment (PPE).

B. CARE can assist national surveillance activities by:

1. Identifying and reporting (or encouraging reporting of) sick poultry;
2. Increasing understanding among medical care providers of the clinical and epidemiological features of infection;
3. Facilitating dialogue and close collaboration between government public health and veterinary staff on the ground; and
4. Facilitating referrals for diagnosis for persons with histories of consistent exposure and serious respiratory illness.

C. CARE can assist in development of pandemic preparedness and response plans by:

1. Joining working groups on national pandemic preparedness and response led by Ministries of Health and supported by WHO;
2. Advocating at national and ministry of health level for creation of national pandemic preparedness and response working groups where they do not already exist;
3. Developing strategies, materials and training to facilitate an effective response;
4. Advocating for strategies that address the needs and risks of the poorest and most vulnerable groups; and
5. Engaging CARE partners and civil society in this critical effort.

### CARE Is Taking Action

CARE is already actively assisting in AI pandemic prevention and preparedness in Vietnam. CARE Vietnam has been leading the way in taking action against AI—not only within CARE but in the wider community of nongovernmental organizations. As



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early as February 2004, CARE responded when the Vietnamese government requested international emergency assistance on its avian influenza epidemic. That year, it implemented the first avian influenza project in Binh Dinh province, in the south central part of the country. The project trained veterinary staff, strengthened the province's prevention and control network on the disease at district and village

levels, and improved systems providing feedback and reporting on avian flu. It also established a poultry database for provincial and district veterinary services and implemented a comprehensive avian influenza impact assessment.

From December 2004 to January 2005, CARE in Vietnam conducted a survey of small holder farmers in Binh Dinh province, gathering facts about their knowledge, attitudes

and practices (KAP) regarding avian flu. That survey revealed many high risk practices and little understanding of the disease:

- Less than 50 percent of respondents correctly and adequately understood the sources of infection for avian influenza
- Almost 30 percent of respondents believed that there was no risk in letting their children play with poultry
- Approximately 30 percent of respondents believed that there was nothing they could do to protect their poultry from AI
- 67 percent of households interviewed let their poultry roam free at least some of the time, with almost 30 percent allowing poultry to roam in household areas

As a result of these findings, CARE Vietnam launched its “STOP AI” project in Binh Dinh and Long An provinces (in the Mekong River Delta) to ensure a comprehensive approach to prevention, control and management of avian influenza. The ongoing program involves raising community awareness about the disease, providing bio-safety and clinical equipment to the animal and public health services such as a disinfectant spraying machine, disinfectant, disposable masks, gowns and gloves. The program also trains public and animal health workers to detect and prevent the disease, particularly how to promote safe poultry farming practices to lessen the risk of poultry getting infected and passing the virus on to people. The program is reaching approximately 66,000 people in both provinces.



Carol Sherman, CARE country director for Vietnam, and the head of the Department of Agriculture and Rural Development meet at a ceremony to distribute avian influenza equipment and information.

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In addition, nearly 250 veterinary staff and other representatives from provincial and district government entities attended CARE Vietnam's workshops on AI this year. These workshops promote collaboration and information sharing among government agencies and other local organizations. They cover diagnosis of avian influenza, culling of poultry, and vaccination of animals, safe farming practices and safe, hygienic practices for people. For the first time, at these workshops, animal and human health agencies began to discuss both immediate and long-term measures to contend with AI and reduce and contain animal-to-human and human-to-human transmission of the virus. There has been no outbreak of avian influenza in these provinces to date and that is a very positive sign.

CARE is building on that success by conducting new communications training at the commune level and has created television public service announcements currently airing on television in Binh Dinh and Long An provinces. These announcements are expected to reach 1,500,000 people—approximately 60 percent of the total population of both provinces—and are designed to raise public awareness of AI. They provide information on who can become infected with AI, how people can protect themselves and their families from the virus, and how farmers can keep their flocks of poultry from getting the disease. CARE has also distributed more than 60,000 leaflets on avian influenza in the provinces. Working closely with its local partners on the ground, CARE is in the process of updating existing booklets on avian influenza. These booklets, “How to recognize and prevent the bird flu,” and “avian influenza bio-safety approaches and measures for those working with poultry,” will include findings from CARE's survey on knowledge, attitudes and practices on avian influenza. CARE plans to print 40,000 copies in November. CARE is seeking ways to make booklets and training materials on the avian flu used in Vietnam available to other CARE offices around the globe. These materials are also being reviewed by the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) for possible translation and use in wider contexts.

CARE is working across government ministries for human and animal health, building the capacity of local partners, and providing an invaluable link into the community of small poultry farmers. It has taken the lead in developing culturally appropriate communications and training materials, and in advocating for the needs of the poorest and most vulnerable groups. This type of role facilitates preparedness and response at the country and international level. It also clearly demonstrates to institutions such as WHO and FAO the valuable contributions international nongovernmental organizations and civil society can make in addressing the global challenge of influenza.

### **Human cases of avian influenza**

It is believed that most cases of avian influenza in humans have resulted from direct contact with infected poultry or infected materials. The symptoms of avian influenza in humans range from typical flu-like symptoms (such as fever, cough, sore throat and muscle aches) to eye infections, pneumonia, severe respiratory disease (breathing difficulties) and other serious and life threatening complications. The symptoms of avian influenza may depend on which virus caused the infection.

**If you suspect you may have avian influenza, seek medical attention immediately. Contact the nearest health facility as your first step.**

## Steps to Prevent Avian Influenza

In order to keep bird flu from spreading to humans, it is essential to contain it in animals.



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Chickens, fighting roosters, ducks, turkeys, and geese, domestic and wild birds can all be infected. Excrement can also be infectious. Birds such as ducks can be infected with the H5N1 virus and yet show no signs of sickness.

### Bio-safety

For those working with or exposed to poultry, basic personal

bio-safety measures should be followed to protect personal health and the health of livestock. Bio-safety measures are simple actions that can be taken to prevent the spread of germs (e.g. viruses) and disease. By following these practices you can reduce the risk of catching avian influenza.

### Examples of groups of people who may be exposed to avian influenza include:

- Poultry farmers (including small-scale backyard farming)
- People who purchase and transport poultry
- People who collect and cull sick poultry
- People who slaughter poultry at home and in markets
- People who sell poultry products
- Veterinarians and animal health workers
- Local people who live in areas where there is an avian influenza outbreak
- Hunters and owners of fighting cocks
- Children who care for or play near poultry farms
- Those who care for or visit relatives that have avian influenza
- Those who eat sick or not properly cooked poultry, or poultry blood products

Different levels of bio-safety are required for different groups. The table below outlines some basic bio-safety measures for the groups listed above.

### Bio-safety measures for those who may be exposed to avian influenza

Groups	Bio-safety measure
For all groups	<ul style="list-style-type: none"> <li>▪ Wash hands thoroughly with soap and clean water, shower and change clothes after handling poultry or poultry products</li> <li>▪ Make sure you understand how bird flu is spread and the signs and symptoms</li> <li>▪ Wear personal protective equipment when in contact with poultry including:               <ul style="list-style-type: none"> <li>▪ Face mask</li> <li>▪ Latex gloves</li> <li>▪ Overalls</li> <li>▪ Safety goggles</li> <li>▪ Nylon cap</li> <li>▪ Boots</li> </ul> </li> <li>▪ Monitor your health; if you are suffering from fever, cough, sore throat or breathing difficulties seek medical attention</li> <li>▪ If suffering from flu-like symptoms avoid exposure to poultry until fully recovered.</li> </ul>
People who collect and cull poultry People who regularly slaughter poultry Veterinarians and animal health workers	Have a vaccination against human influenza 15 days prior to any contact with poultry. Contact your local health facility
Veterinarians and animal health workers	Pregnant women, breast-feeding women and those who have an existing respiratory illness should avoid undertaking this work.
Local people who live in areas where there is an avian influenza outbreak Hunters Children	Avoid contact with poultry and wild birds where possible.
Those who care for or visit relatives that have avian influenza	Follow the instructions of doctors to minimise the chance of infection, including wearing protective clothing and washing hands thoroughly with antiseptic soap and clean water.

Anyone who has been in contact with poultry infected with the avian influenza virus or dead poultry should monitor their health carefully and seek treatment at the nearest health facility if experiencing any symptoms of avian influenza.

Although there is currently no vaccine to protect humans from the H5N1 bird flu virus, observing the simple practices described here will greatly reduce the chance of infection.

## More Resources on Avian Influenza

### *World Health Organization*

- <http://www.who.int/csr/disease/influenza/en/>  
Includes links to the global preparedness plan and other planning documents.
- [http://www.who.int/csr/disease/avian\\_influenza/en/index.html](http://www.who.int/csr/disease/avian_influenza/en/index.html)  
Includes updates on avian influenza including number of human cases, deaths, and countries affected.

### *Centers for Disease Control and Prevention*

- <http://www.cdc.gov/flu/>  
Information on influenza, vaccine, antiviral drugs, diagnosis, patient education,
- <http://www.cdc.gov/flu/avian/gen-info/>  
Information on avian influenza.
- <http://www.cdc.gov/flu/professionals/infectioncontrol/>  
Information on infection control for influenza including resources on influenza symptoms, personal protective equipment, and hygiene.

### *Department of Health and Human Services*

- <http://www.pandemicflu.gov>  
Site under construction will be a primary reference on pandemic influenza and will include links to WHO and CDC sites.
- <http://www.hhs.gov/nvpo/pandemicplan/>  
Includes the August 2004 draft HHS pandemic influenza preparedness and response plan.

### *Public Health Agency of Canada*

- <http://www.phac-aspc.gc.ca/influenza/index.html>  
Includes links to the completed Canadian pandemic plan (particularly strong on diagnosis and management).

### *General Avian Influenza sites (Genera)*

- <http://www.vetmed.wsu.edu/courses-jmgay/FADAvianInfluenza.htm>  
Updates situation reports
- <http://www.cidrap.umn.edu/cidrap/content/influenza/avianflu/index.html>

### *Staff safety and security guidance to country offices:*

[www.cdc.gov/ncidod/hip/ppe/PPEslides6-29-04.ppt](http://www.cdc.gov/ncidod/hip/ppe/PPEslides6-29-04.ppt)