SAFETY BULLETIN 02/06

AVIAN INFLUENZA

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Avian Influenza Preparedness

Hospitals, clinics, doctors and government agencies relied on the industrial gases suppliers to supply the necessary medical gases during the SARS outbreak several years ago. The possibility of an Avian Influenza pandemic is a real possibility in Asia and will pose a great challenge for the industry to supply the necessary medical gases while protecting employees. AIGA encourages all locations to develop and implement Avian Influenza Preparedness and Business Continuity plans immediately as a precautionary measure.

Overview of Avian Influenza

Avian influenza A/H5N1, or “bird flu”, is a contagious disease of animals caused by viruses that normally infect only birds and, less commonly, pigs. Avian influenza viruses are highly species-specific, but have on rare occasions crossed the species barrier to infect humans.

In domestic poultry, infection with avian influenza viruses causes two main forms of disease, distinguished by low and high extremes of virulence. The so-called “low pathogenic” form commonly causes only mild symptoms (ruffled feathers, a drop in egg production) and may easily go undetected. The highly pathogenic form is far more dramatic. It spreads very rapidly through poultry flocks, causes disease affecting multiple internal organs, and has a mortality rate that can approach 100%, often within 48 hours.

Influenza A viruses[1] have 16 H subtypes and 9 N subtypes[2]. Only viruses of the H5 and H7 subtypes are known to cause the highly pathogenic form of the disease. However, not all viruses of the H5 and H7 subtypes are highly pathogenic and not all will cause severe disease in poultry. The present understanding is that the H5 and H7 viruses are introduced to poultry flocks in

1 Influenza viruses are grouped into three types, designated A, B, and C. Influenza A and B viruses are of concern to human health. Only influenza A viruses can cause pandemics.

2 The H subtypes are epidemiologically most important, as they govern the ability of the virus to bind to and enter cells, where multiplication of the virus then occurs. The N subtypes govern the release of newly formed viruses from cells.

their low pathogenic form. When allowed to circulate in poultry populations, the viruses can mutate, usually within a few months, into the highly pathogenic form. This is why the presence of an H5 or H7 virus in poultry is always cause for concern, even when the initial signs of infection are mild.

The role of migratory birds in the spread of highly pathogenic avian influenza is not fully understood. Wild waterfowl are considered the natural reservoir of all influenza A viruses. They have probably carried influenza viruses, with no apparent harm, for centuries. They are known to carry viruses of the H5 and H7 subtypes, but usually in the low pathogenic form. Considerable circumstantial evidence suggests that migratory birds can introduce low pathogenic H5 and H7 viruses to poultry flocks, which then mutate to the highly pathogenic form.

In the past, highly pathogenic viruses have been isolated from migratory birds on very rare occasions involving a few birds, usually found dead within the flight range of a poultry outbreak. This finding has long suggested that wild waterfowl are not agents for the onward transmission of these viruses. However, recent events suggest it is likely that some migratory birds are now directly spreading the H5N1 virus in its highly pathogenic form. Further spread to new areas is expected.

What is a Pandemic?

An influenza pandemic is a global outbreak of disease that occurs when a new influenza A virus appears or “emerges” in the human population, causes serious illness, and then spreads easily from person to person worldwide. Pandemics are different from the seasonal outbreaks or “epidemics” of influenza. Seasonal outbreaks are caused by subtypes of influenza viruses that already circulate among people, whereas pandemic outbreaks are caused by new subtypes, by subtypes that have never circulated among people, or by subtypes that have not circulated among people for a long time. Past influenza pandemics have led to high levels of illness, death, social disruption, and economic loss.

Three conditions must be met for a pandemic to start: 1) a new influenza virus subtype must emerge; 2) it must infect humans and cause serious illness; and 3) it must spread easily and in a sustained manner (i.e., continues without interruption) among humans. The H5N1 virus in Asia and Europe meets the first two conditions; it is a new virus for humans (H5N1 viruses have never circulated widely among people), and it has infected more than 200 humans, killing over half of them (Table 1). However, the third condition, the establishment of efficient and sustained human-to-human transmission of the virus, has not occurred. For this to take place, the H5N1 virus would have to change in such a way that it could spread more easily among humans.

Bird flu is a global concern. The H5N1 virus may undergo genetic changes that would allow it to spread easily from person to person. If this were to occur, the world could face a global pandemic. Experts predict as many as 25% of people worldwide would fall ill, and 2 to 150 million could die worldwide if there is a flu pandemic. Previous flu pandemics caused between 1 million deaths (in the 1968

Hong Kong flu pandemic) to more than 20 million deaths (in the 1918 Spanish flu pandemic) worldwide.

The Asia Development Bank projects that even a relatively mild pandemic could cost Asia around US$90 billion to US$110 billion. Others predict it will cause a worldwide recession.

Table 1

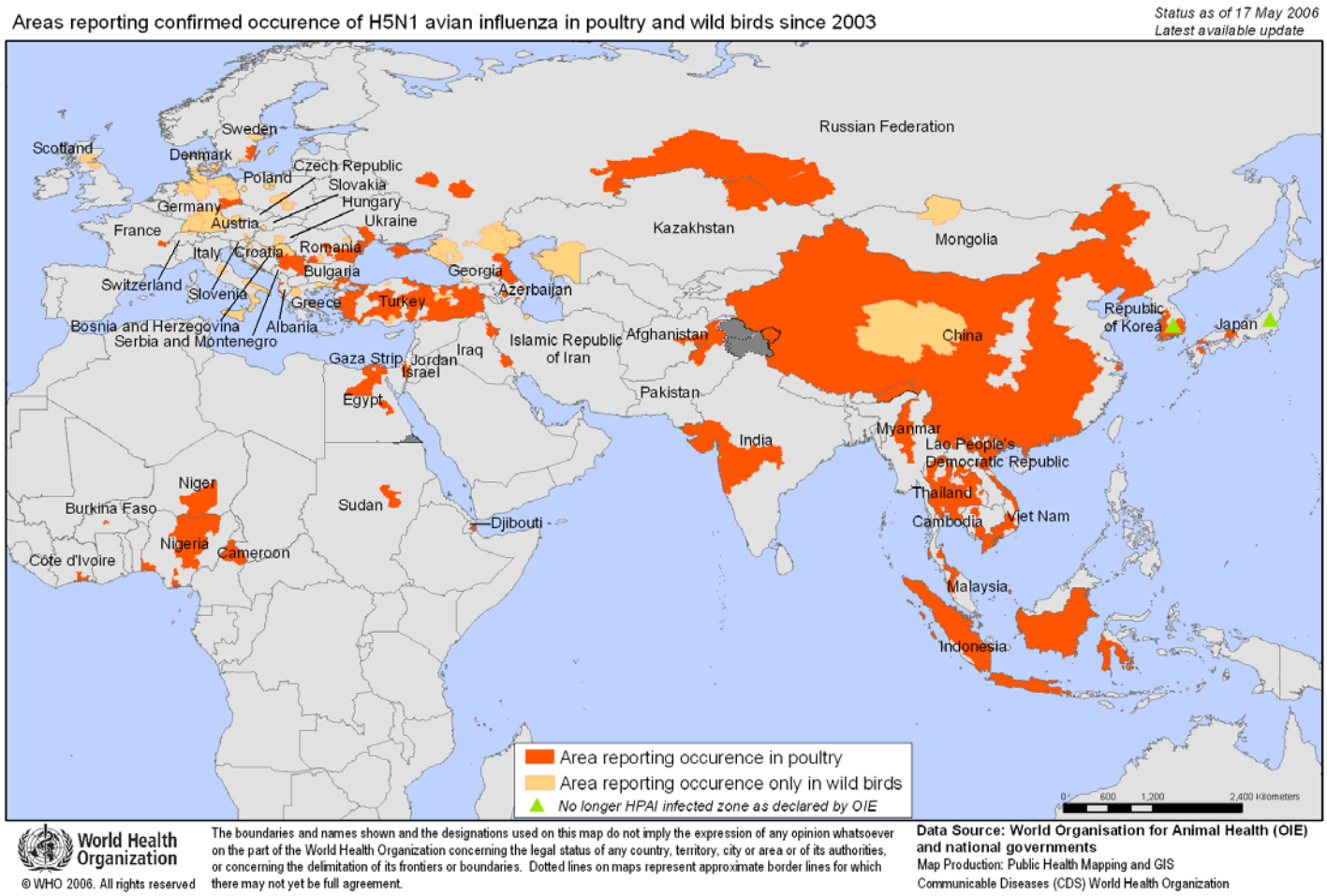
Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO

(As at 29 May 2006)

Country	2003		2004		2005		2006		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	0	0	0	0	0	0	8	5	8	5
Cambodia	0	0	0	0	4	4	2	2	6	6
China	0	0	0	0	8	5	10	7	18	12
Djibouti	0	0	0	0	0	0	1	0	1	0
Egypt	0	0	0	0	0	0	14	6	14	6
Indonesia	0	0	0	0	17	11	31	25	48	36
Iraq	0	0	0	0	0	0	2	2	2	2
Thailand	0	0	17	12	5	2	0	0	22	14
Turkey	0	0	0	0	0	0	12	4	12	4
Viet Nam	3	3	29	20	61	19	0	0	93	42
Total	**3**	**3**	**46**	**32**	**95**	**41**	**80**	**51**	**224**	**127**

Total number of cases includes number of deaths.
WHO reports only laboratory-confirmed cases.

Areas reporting H5N1 in Poultry and Wild Birds



Pandemic Alert Levels

The World Health Organization has established influenza and pandemic preparedness plans to assist WHO Member States and those responsible for public health, medical and emergency preparedness to respond to threats and occurrences of pandemic influenza. These plans define the various phases and periods of a pandemic. Governments throughout Asia have adopted these phases (modified slightly in some cases) in their country plans. Your organization needs to be familiar with these phases and your preparedness/business continuity plans should include these phases in the planning process.

The following are the phases as defined by WHO:

Inter-pandemic Period (New virus in animals, no human case)	
Phase 1	**Low risk of human cases**
Phase 2	**Higher risk of human cases**

Pandemic Alert Period (New virus causes human cases)	
Phase 3	**No or very limited human-to-human transmission**
Phase 4	**Evidence of increased human-to-human transmission[b]**
Phase 5	**Evidence of significant human-to-human transmission [b]**

Pandemic Period	
Phase 6	**Pandemic phase: Efficient and sustained human-to-human transmission.[b]**

Post-pandemic Period	
	Return to interpandemic period.

a. The distinction between *phase 1* and *phase 2* is based on the risk of human infection or disease resulting from circulating strains in animals. The distinction would be based on various factors and their relative importance according to current scientific knowledge. Factors may include: pathogenicity in animals and humans; occurrence in domesticated animals and livestock or only in wildlife; whether the virus is enzootic or epizootic, geographically localized or widespread; other information from the viral genome; an/or other scientific information

b. The distinction between *phase 3*, *phase 4* and *phase 5* is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include: rate of transmission; geographical location and spread; severity of illness; presence of genes from human strains (if derived from an animal strain); other information from the viral genome; and/or other scientific information.

Pandemic Preparedness

AIGA encourages all businesses to develop and implement preparedness plans specific to your country and locations within the country. These plans should include the following key items:

- Crisis management team and crisis management centre (if applicable).
- Business continuity plans
    - Identifying key people and skills

    - Developing a phase approach consistent with the WHO phases
    - Plans for dealing with major workforce absentees
    - Defining potential risk scenarios and impact on the business
    - Developing contingency plans to address the risk scenarios
    - Developing plans for dealing with shortage of supplies from external sources
    - Conducting exercises/drills to identify gaps or weaknesses in the plan
- Measures to reduce risks to employees:
    - Distancing from other people and avoiding crowds
    - Controlling access of visitors to locations
    - Managing flu cases within the workforce
    - Travel restrictions
    - Personal hygiene training
    - Avian Flu PPE – masks, gloves, disinfectants, hand cleaners, etc.
    - Quarantining and disinfecting cylinders used in hospitals or clinics that may be exposed to the virus
    - Developing procedures for employees delivering product to quarantine areas or medical facilities
- Communication with employees
- Awareness and personal hygiene training

To assist in the planning process, you can use the Planning Checklist from the United States Department of Health and Human Services below. Although this checklist was developed for large businesses, the majority of the list applies to businesses of all sizes.

Business Pandemic Influenza Planning Checklist (from the United States Department of Health and Human Services)

In the event of pandemic influenza, businesses will play a key role in protecting employees' health and safety as well as limiting the negative impact to the economy and society. Planning for pandemic influenza is critical. To assist you in your efforts, the Department of Health and Human Services (HHS) and the Centre for Disease Control and Prevention (CDC) have developed the following checklist for large businesses. It identifies important, specific activities large businesses can do now to prepare, many of which will also help you in other emergencies. Further information can be found at www.pandemicflu.gov and www.cdc.gov/business.

1.1 Plan for the impact of a pandemic on your business:

Completed	In Progress	Not Started	
☐	☐	☐	Identify a pandemic coordinator and/or team with defined roles and responsibilities for preparedness and response planning. The planning process should include input from labor representatives.
☐	☐	☐	Identify essential employees and other critical inputs (e.g. raw materials, suppliers, sub-contractor services/products and logistics) required to maintain business operations by location and function during a pandemic.
☐	☐	☐	Train and prepare ancillary workforce (e.g. contractors, employees in other job titles/descriptions, retirees).
☐	☐	☐	Develop and plan for scenarios likely to result in an increase or decrease in demand for your products and/or services during a pandemic (e.g. effect of restriction on mass gatherings, need for hygiene supplies).
☐	☐	☐	Determine potential impact of a pandemic on company business financials using multiple possible scenarios that affect different product lines and/or production sites.
☐	☐	☐	Determine potential impact of a pandemic on business-related domestic and international travel (e.g. quarantines, border closure).
☐	☐	☐	Find up-to-date, reliable pandemic information from community public health, emergency management, and other sources and make sustainable links.
☐	☐	☐	Establish an emergency communications plan and revise periodically. This plan includes identification of key contacts (with back-ups), chain of communications (including suppliers and customers), and processes for tracking and communicating business and employee status.
☐	☐	☐	Implement an exercise/drill to test your plan and revise periodically.

1.2 Plan for the impact of a pandemic on your employees and customers:

Completed	In Progress	Not Started	
☐	☐	☐	Forecast and allow for employee absences during a pandemic due to factors such as personal illness, family member illness, community containment measures and quarantines, school and/or business closures, and public transportation closures.
☐	☐	☐	Implement guidelines to modify the frequency and type of face-to-face contact (e.g. hand-shaking, seating in meetings, office layout, shared workstations) among employees and between employees and customers (refer to CDC recommendations).
☐	☐	☐	Encourage and track annual influenza vaccination for employees.
☐	☐	☐	Evaluate employee access to and availability of healthcare services during a pandemic and improve services as need.
☐	☐	☐	Evaluate employee access to and availability of mental health and social services during a pandemic, including corporate, community, and faith-based resources, and improve services as needed.
☐	☐	☐	Identify employees and key customers with special needs, and incorporate the requirements of such persons into your preparedness plan.

1.3 Establish policies to be implemented during a pandemic:

Completed	In Progress	Not Started	
☐	☐	☐	Establish policies for employee compensation and sick-leave absences unique to a pandemic (e.g. non-punitive, liberal leave), including policies on when a previously ill person is no longer infectious and can return to work after illness.
☐	☐	☐	Establish policies for flexible worksite (e.g. telecommuting) and flexible work hours (e.g. staggered shifts).
☐	☐	☐	Establish policies for preventing influenza spread at the worksite (e.g. promoting respiratory hygiene/cough etiquette, and prompt exclusion of people with influenza symptoms.
☐	☐	☐	Establish policies for employees who have been exposed to pandemic influenza, are suspected to be ill, or become ill at the worksite (e.g. infection control response, immediate mandatory sick leave).
☐	☐	☐	Establish policies for restricting travel to affected geographic areas (consider both domestic and international sites), evacuating employees working in or near an affected area when an outbreak begins, and guidance for employees returning from affected areas (refer to CDC travel recommendations).
☐	☐	☐	Set up authorities, triggers, and procedures for activating and terminating the company's response plan, altering business operations (e.g. shutting down operations in affected areas), and transferring business knowledge to key employees.

1.4 Allocate resources to protect your employees and customers during a pandemic:

Completed	In Progress	Not Started	
☐	☐	☐	Provide sufficient and accessible infection control supplies (e.g. hand-hygiene products, tissues and receptacles for their disposal) in all business locations.
☐	☐	☐	Enhance communications and information technology infrastructures as needed to support employee telecommuting and remote customer access.
☐	☐	☐	Ensure availability of medical consultation and advice for emergency response.

1.5 Communicate to and educate your employees:

Completed	In Progress	Not Started	
☐	☐	☐	Develop and disseminate programs and materials covering pandemic fundamentals (e.g. signs and symptoms of influenza, modes of transmission), personal and family protection and response strategies (e.g. hand hygiene, coughing/sneezing etiquette, contingency plans).
☐	☐	☐	Anticipate employee fear and anxiety, rumors and misinformation and plan communications accordingly.
☐	☐	☐	Ensure the communications are culturally and linguistically appropriate.
☐	☐	☐	Disseminate information to employees about your pandemic preparedness and response plan. Provide information for the at-home care of ill employees and family members.

☐	☐	☐	Develop platforms (e.g. hotlines, dedicated websites) for communication pandemic status and actions to employees, vendors, suppliers, and customers inside and outside the worksite in a consistent and timely way, including redundancies in the emergency contact system.
☐	☐	☐	Identify community sources for timely and accurate pandemic information (domestic and international) and resources for obtaining counter-measures (e.g. vaccines and antivirals).

1.6 Coordinate with the external organizations and help your community:

Completed	In Progress	Not Started	
☐	☐	☐	Collaborate with insurers, health plans, and major local healthcare facilities to share your pandemic plans and understand their capabilities and plans.
☐	☐	☐	Collaborate with federal, state, and local public health agencies and/or emergency responders to participate in their planning processes, share your pandemic plans, and understand their capabilities and plans.
☐	☐	☐	Communicate with local and/or state public health agencies and/or emergency responders about the assets and/or services your business could contribute to the community.
☐	☐	☐	Share best practices with other businesses in your communities, chamber of commerce, and associations to improve community response efforts.

Treatment and Vaccination for H5N1 in Humans

The H5N1 virus causes human illness and death in Asia is resistant to amantadine and rimantadine, two antiviral medications commonly used for influenza. Limited evidence suggests that some antiviral drugs, notably oseltamivir (commercially know as Tamiflu), can reduce the duration of viral replication and improve prospects of survival, provided they are administered within 48 hours following the onset of symptoms. However, prior to the outbreak in Turkey, most patients were detected and treated late in the course of illness. For this reason, clinical data on the effectiveness of oseltamivir are limited. Moreover, oseltamivir and other antiviral drugs were developed for the treatment and prophylaxis of seasonal influenza, which is a less severe disease associated with less prolonged viral replication. Recommendations on the optimum dose and duration of treatment for H5N1 avian influenza, for both adults and children, need to undergo urgent review. This has been undertaken by WHO.

In suspected cases, oseltamivir should be prescribed as soon as possible (ideally within 48 hours following symptom onset) to maximize its therapeutic benefits. However, given the significant mortality currently associated with H5N1 infection and evidence of prolonged viral replication in this disease, administration of the drug should also be considered in patients presenting later in the course of illness. The availability of oseltamivir and government restrictions on procuring supplies vary from country to country in Asia. As part of your plan, it is strongly recommended that you discuss the availability of oseltamivir in your country/location with the appropriate government officials and, at a minimum,

identify which hospitals/clinics/pharmacies have supplies available to the public in the event of an outbreak.

There is currently no commercially available vaccine to protect humans against the H5N1 virus that is being seen in Asia and Europe. However, vaccine development efforts are ongoing. Research studies to test a vaccine to protect humans against the H5N1 virus began in April 2005, and a series of clinical trials is underway.

Useful Websites

World Health Organization (WHO)

Main Page: http://www.who.int
Avian Flu : http://www.who.int/csr/disease/avian_influenza/en/

Other WHO Links:

Bangladesh http://www.whoban.org/

India http://www.whoindia.org/EN/Index.htm

Indonesia http://www.who.or.id/eng/index.asp

Maldives http://www.who.org.mv/EN/Index.htm

Myanmar http://www.whomyanmar.org/EN/Index.htm

Thailand http://www.whothai.org/en/index.htm

WHO Western Pacific region office: http://www.wpro.who.int/

Cambodia	China
Australia	Japan
Malaysia	Papua New Guinea
Philippines	Republic of Korea
Singapore	Viet Nam

WHO South East Asia region office: http://w3.whosea.org/

Bangladesh	Bhutan
DPR Korea	India
Indonesia	Maldives
Myanmar	Nepal
Sri Lanka	Thailand
Timor	

Centre for Disease Control and Prevention (CDC): http://www.cdc.gov/
CDC information on Avian Flu: http://www.cdc.gov/flu/avian/

Department of Health and Human Services (USA): www.pandemicflu.gov

Hong Kong (Simplified and Traditional Chinese, plus English)
http://www.info.gov.hk/info/flu/chi/

Korea (Korean): http://www.cdc.go.kr

Korea (English): http://www.cdc.go.kr/webcdc/english/index.jsp

Thailand (Thai and some in English):
http://thaigcd.ddc.moph.go.th/Bird_Flu_main_en.html

Taiwan (Chinese and English): http://www.cdc.gov.tw/index1024.htm

Singapore (English and Chinese): http://www.birdflu.gov.sg/

Sources of information and data:

World Health Organization
United States Department of Health and Human Services

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