

Pandemic Influenza: Be Informed, Be Prepared

A Guide for Pastors and Churches

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The information contained in this guide has been derived mainly from resources of the CDC, HHS, and the PA Department of Health.

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Comments, corrections, and feedback appreciated

Preface

If you read nothing else in this document, turn right now to **Sections 5 and Section 6.**

Section 5 tells you how the avian influenza virus is transmitted, and offers strategies for controlling its spread.

Section 6 tells you some things you need to be thinking about and planning for in the church.

But you are encouraged to read the entire document. Clergy are in a position to be points of information and guidance in crisis situations. Be informed. Be prepared. Read this document.

New in this revision: Section 7 has been added to include safety information for hunters, information on food handling and preparation, and dealing with H5N1 in the wild bird population.

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1. Pandemic Influenza - Background

A. Introduction

Pandemic influenza is one of the most extreme examples of an acute infectious disease outbreak. Many infectious disease outbreaks – including ones such as Severe Acute Respiratory Syndrome (SARS), Ebola, HIV, anthrax, or West Nile Virus – can have devastating effects. However, these disease outbreaks typically are limited in their spread to either localized areas or regions, or to certain at risk populations because of demographic, climactic, behavioral or other factors. Influenza pandemics, by contrast, are explosive global events in which most, if not all, persons worldwide are at risk for infection and illness. In past pandemics, influenza viruses have spread worldwide in less than a year’s time, and are expected to spread even more quickly given modern travel patterns. Pandemic viruses also have the ability to infect, within a year, one third or more of large populations and lead to tens of millions deaths.¹

It is the sheer scope of influenza pandemics, with their potential to rapidly spread, overwhelm and disrupt societies, and cause illnesses and deaths among all age groups, which distinguishes pandemic influenza from other emerging infectious disease threats and makes pandemic influenza the most feared emerging infectious disease threat of all.²

B. Influenza Viruses

The agent of pandemic influenza is the influenza virus, which also is responsible for causing seasonal influenza, known by most persons as the flu. Influenza is a common but frequently serious disease characterized by signs and symptoms such as fever, fatigue, body pain, headache, dry cough and sore throat that affects large numbers of people each year. Although most people infected with influenza recover, it is still responsible for approximately 36,000 deaths and 114,000 hospitalizations each year. The familiarity of seasonal influenza epidemics in the US has led to a great under-appreciation of their true health impact.³

C. Seasonal Influenza vs. Pandemic Influenza

Several features distinguish pandemic influenza from seasonal influenza. Pandemics of influenza are unusual events and their timing cannot be predicted. For example, only three pandemics occurred in the 20th Century (1918, 1957, and 1968). The infrequency and unpredictable timing of these events is explained by the fact that influenza pandemics occur only when a new (or novel) influenza A virus emerges and spreads globally. By definition, most people have never been exposed to these viruses and therefore are susceptible to infection by them. By contrast, seasonal influenza virus strain variants are modified versions of influenza A viruses that already are in widespread circulation. Therefore, there usually is some level of pre-existing immunity to strain variants. Because of the frequent appearance of new variants, virus strains contained in influenza vaccines must be updated annually.⁴

An annual influenza season in the US, on average, results in approximately 36,000 deaths, 114,000 hospitalizations, and between \$1 billion and \$3 billion in direct costs for medical care in the United States. This impact occurs because influenza infections result in secondary complications such as pneumonia, dehydration, and worsening of chronic lung and heart problems. Despite the severity of influenza epidemics, the effects of seasonal influenza are moderated because most individuals have some underlying degree of immunity to recently circulating influenza viruses either from previous infections or from vaccination.⁵

¹ US Department of Health and Human Services, *Pandemic Influenza Response and Preparedness Plan*, Draft Version, August 8, 2004, “Annex 3: Overview of Influenza Illness and Pandemics,” page 2

² Ibid.

³ Ibid.

⁴ HHS, Annex 3, page 4

⁵ Ibid.

By contrast, pandemic influenza has the potential to pose disease control challenges unmatched by any other infectious disease event. Pandemic influenza viruses can spread across nations within months, or weeks, and are capable of causing infection in all age groups. Although the ultimate number of infections, illnesses and deaths is unpredictable, an influenza pandemic in the 21st century has the potential to cause enough illnesses to overwhelm current public health and medical care capacities at all levels, despite the vast improvements made in medical technology during the 20th century.⁶

D. Increased Potential for More Severe Pandemics

While the medical care system is very different today than it was at the time of the 1918 influenza pandemic, certain modern trends might be increasing the potential for pandemics to cause more illnesses and deaths than occurred in earlier pandemics. There are several reasons for this assessment.

First, the global population is larger and increasingly urbanized, allowing viruses to be transmitted within populations more easily.

Second, levels of international travel are much greater than in the past, allowing viruses to spread globally more quickly than in the past.

Third, populations in many countries consist of increasing numbers of elderly persons and those with chronic medical conditions, thus increasing the potential for more complicated illnesses and deaths to occur.

Taken together, this combination of factors suggests that the next pandemic may lead to more illnesses occurring more quickly than in the past, potentially overwhelming countries and health systems that have not made adequate preparation.⁷

The 1957 pandemic, during an era with much less globalization, spread to the US within four to five months of when it was first detected in China. The 1968 pandemic spread to the US from Hong Kong within two to three months. As was amply demonstrated by the recent SARS outbreak, modern travel patterns may significantly reduce the time needed for pandemic influenza viruses to spread globally to a few months or even weeks. The major implication of such rapid spread of an infectious disease is that many, if not most, countries will have minimal time to implement preparations and responses once pandemic viruses have begun to spread. While SARS infections spread quickly to multiple countries, the epidemiology and transmission modes of the SARS virus greatly helped to contain the spread of this infection in 2003, along with quarantine and isolation and other control measures. Fortunately, no widespread community transmission took place. By contrast, influenza spreads more rapidly between people and can be transmitted by those who are infected but do not yet have symptoms. The spread of pandemic influenza to multiple countries is expected to lead to the near simultaneous occurrence of multiple community outbreaks in an escalating fashion. No other infectious disease poses the same threat for causing increases in infections, illnesses and deaths so quickly in the US and worldwide.⁸

2. Avian Influenza – Background

A. Introduction

Avian influenza (also known as “bird flu”) is a type of influenza virulent in birds. It was first identified in Italy in the early 1900s and is now known to exist worldwide.

Avian influenza spreads in the air and in manure. Wild fowl often act as resistant carriers, spreading it to more susceptible domestic stocks. It can also be transmitted by contaminated feed, water, equipment and clothing; however, there is no evidence that the virus can survive in well cooked meat.

⁶ Ibid.

⁷ Ibid.

⁸ HHS, Annex 3, pp. 4-5

Since 1997 the following types of avian influenza virus has been confirmed to outbreak infecting humans: H5N1, H7N2, H7N3, H7N7, and H9N2. The current concern is about H5N1.

B. H5N1 History

The H5N1 avian influenza strain passed from birds to humans in 1997 in Hong Kong. Eighteen people were infected, of whom six died. The outbreak was limited to Hong Kong. All chickens in the territory were slaughtered. Because of rapid response and the complete culling of all chickens, the outbreak of the virus was contained.

In January 2004, a major new outbreak of H5N1 avian influenza surfaced in Vietnam and Thailand's poultry industry, and within weeks spread to ten countries and regions in Asia, including Indonesia, South Korea, Japan and mainland China. Intensive efforts were undertaken to slaughter chickens, ducks and geese (over 40 million chickens alone were slaughtered in high-infection areas), and the outbreak was contained by March, but the total human death toll in Vietnam and Thailand was 23 people. In February 2004, avian influenza virus was detected in pigs in Vietnam, increasing fears of the emergence of new variant strains.

In August 2004 avian flu was confirmed in Malaysia. An outbreak of avian influenza in January 2005 affected 33 out of 64 cities and provinces in Vietnam.

Vietnam and Thailand have seen several isolated cases where human-to-human transmission of the virus has been suspected. In one case the original carrier, who received the disease from a bird, was held by her mother for roughly 5 days as the young girl died. Shortly afterwards, the mother became ill and perished as well. In March, 2005 it was revealed that two nurses who had cared for avian flu patients tested positive for the disease.

In May 2005, the occurrence of Avian influenza in pigs in Indonesia was reported ("swine flu"). Along with the continuing pattern of virus circulation in poultry, the occurrence in swine raised the level of concern about the possible evolution of the virus into a strain capable of causing a global human influenza pandemic. Health experts say pigs can carry human influenza viruses, which can combine with the avian virus, swap genes and mutate into a form which can pass easily among humans.

In July 2005, a man's death in Jakarta was the first confirmed human fatality in Indonesia. The deaths of the man's two children, neither of whom were reported to have had close contact with poultry, further raised concerns of human-to-human transmission (although infection by eating undercooked poultry may be a more likely explanation). Also, in July 2005, it was confirmed H5N1 had appeared in Russia's Novosibirsk region, probably carried by migratory birds. On July 28th, avian influenza was reported to have killed two more people in Vietnam.

In August and September 2005, the number of suspected and confirmed cases in Indonesia increased significantly. Concerns were raised once again that human to human transmission was occurring. Indonesia was slow to respond to the outbreak, replaced government staff persons related to disease control, and appealed for international help in controlling the outbreak.

In late September 2005, the UN health representative responsible for coordinating a response to an outbreak, David Nabarro, stated that a flu pandemic could happen at any time and kill from five to 150 million people. He further stated that as the virus had spread to migratory birds, an outbreak could start in Africa or the Middle East, rather than Southeast Asia as has been widely assumed. At the same time, agricultural ministers of Association of South East Asian Nations announced a three-year plan to counter the spread of the disease.

In early October 2005, Romanian officials detected H5N1 in a Danube delta village. This was the first time the virus had been officially detected in Europe. Also in October 2005, the EU Health Commissioner confirmed that tests on dead turkeys found on farms in Kiziksa, Turkey, showed that they had died from the H5N1 strain. It is believed that the disease had spread from migratory birds that landed at a nearby bird sanctuary on their way to Africa.

From October through the end of 2005, outbreaks among birds were recorded in China, Croatia, Russia, Kuwait, and Ukraine. Additional outbreaks continued to occur in Thailand, Vietnam, and Indonesia. Illnesses and deaths in humans occurred in China, Indonesia, and Thailand.

In January 2006, Turkey and Iraq reported human cases of H5N1. Iraq was unique in that a human case was reported prior to infected birds being detected.

In February 2006, Nigeria reported outbreaks in poultry, raising concerns that the virus would spread across the African continent. Many nations began to identify H5N1 among birds, including Azerbaijan, Bulgaria, Greece, Italy, Slovenia, Iran, Austria, Germany, Egypt, India, France, Hungary, Slovakia, Bosnia-Herzegovina, Georgia, Niger, India, and Sweden. The disease reappeared in Malaysia, which had been considered H5N1-free for over a year.

In March 2006, Switzerland, Serbia-Montenegro, Poland, and Albania confirmed H5N1 in birds. Germany confirmed H5N1 in two cats and a stone marten, showing that the virus was adapting to mammalian hosts. Human deaths were confirmed in Azerbaijan and Egypt. Deaths continued to be reported in Indonesia and China. Additionally, a dog was confirmed as infected in Azerbaijan.

C. United States Response to H5N1

The Centers for Disease Control (CDC), Department of Health and Human Services (HHS), and World Health Organization (WHO) have been raising concerns of the risk of pandemic influenza for the past several years. These organizations drafted pandemic response plans and encouraged federal, state, and local agencies to do the same. They also monitored developments of the virus Southeast Asia.

In 2005 officials at the CDC, such as Dr. Julie Gerberding, began to voice concerns over the importance of preparing for pandemic influenza. In February 2005, she said, "This is a very ominous situation for the globe... the most important threat that we are facing right now."

In April 2005 President Bush signed an executive order authorizing federally enforced quarantines in case of an influenza pandemic.⁹

In September 2005, HHS Secretary Mike Leavitt announced the purchase of vaccine and antiviral medications that could be used in the event of a potential influenza pandemic. Earlier in 2005, Secretary Leavitt established an HHS-wide Influenza Task Force to coordinate all HHS activities affecting the public health preparedness for seasonal influenza outbreaks and an influenza pandemic. Long term objectives include an effective and efficient global surveillance network for outbreaks of influenza-like illness in humans and animals, and interoperable local, state, and federal government response plans for influenza outbreaks within the United States -- including strategies and plans for effective coordination with response partners, public and private and timely communication with the public. These investments are part of a comprehensive US approach to prepare for an influenza pandemic. HHS supports pandemic influenza preparedness in several other areas such as enhanced surveillance in Southeast Asia and improved vaccine production methods and capacity.

At the end of September 2005 Secretary Leavitt held private briefings with key lawmakers on Capitol Hill to present the administration's case for an expanded preparedness program. The response was almost immediate. Several members issued public statements endorsing a broader campaign, and the Senate approved a measure calling for \$3.9 billion in new funding.

At the beginning of October 2005, the Bush administration announced they were preparing a multibillion-dollar request to Congress to stockpile vaccines and antiviral medicines to meet the increased threat of an avian-flu outbreak in the US. The estimated costs were estimated at between \$6 billion and \$10 billion. The proposal was described as substantially more comprehensive than the \$3.9 billion package the Senate approved in September as part of a defense-spending bill.

On October 6 and 7, 2005 the US State Department hosted a two-day meeting of officials from more than 65 nations and international organizations concerned about preventing the spread of H5N1. On October 7, 2005, President Bush met with vaccine manufacturers in an effort to coordinate a strategy for preparing the country for a possible avian flu pandemic. Immediately after the State Department event, HHS Secretary

⁹ Executive Order: Amendment to E.O. 13295 Relating to Certain Influenza Viruses and Quarantinable Communicable Diseases, <http://www.whitehouse.gov/news/releases/2005/04/20050401-6.html>

Mike Leavitt departed to Southeast Asia for a week long tour of Thailand, Cambodia, Laos, and Vietnam. Indonesia was later added to his itinerary.

On October 18, 2005 Swiss pharmaceutical company Roche Holding AG announced that was building a new plant in the United States to boost production of its Tamiflu drug amid fears of a major bird flu outbreak, and was ready to seek help from other companies to meet surging demand.

On November 1, 2005, President Bush spoke at the National Institutes of Health, outlining the administration's approach to avian and pandemic flu preparedness -- a \$7.2 billion plan for vaccine subsidies, stockpile enhancements, new antiviral treatments and money for state and local efforts. In addition, the White House released a document titled "The National Strategy for Pandemic Influenza." On the following day, November 2, 2005, the US Department of Health and Human Services released their revised "Pandemic Influenza Plan."¹⁰ The Department of Health and Human Services in conjunction with the White House also launched a website, "Pandemicflu.gov."

Funding for the President's plan was held up in funding debates in congress. In December Congress approved \$3.8 billion for pandemic flu preparedness. Just over half the amount requested by the Bush Administration.

Secretary of Health and Human Services Mike Leavitt in January 2006 began a tour of pandemic preparedness presentation across the states. His message was that "in the first six months of a pandemic we are dependent on basic public health, social distancing; every business, every school, every church, every county to have a plan," adding, "We are overdue (for a pandemic) and under-protected, but we are moving with dispatch." Leavitt also was skeptical that the federal government could provide all localities with the full arsenal of basic medical equipment, such as ventilators, masks, gauze and gloves, needed during a pandemic.

Critics of the government's response continue to point out the inadequacy of American preparedness for an influenza pandemic. For example, the nation is still rebuilding relationships with suppliers of regular flu vaccine, after the supply shortages of 2004. Other concerns are raised over the availability of antiviral drugs, which are in high demand worldwide, the possible need to ration healthcare services, the possible use of the military to enforce quarantines, and the need for increased communication and coordination between federal, state, and local agencies.

3. H5N1 Symptoms and Treatment

A. Symptoms

Symptoms of H5N1 infection are common to other influenza infection. Clinical symptoms of influenza can range from mild upper respiratory tract illness with no elevation in temperature to illness characterized by high fever, constitutional symptoms, and cough. Young children may present with sepsis-like syndrome (high fevers, low blood pressure and rapid heart rate) or febrile seizures, and one-third may have diarrhea. Thus, the symptoms of influenza are often non-specific and wide-ranging, making influenza difficult to differentiate from other causes of respiratory illness based on the clinical presentation alone. Complications of influenza include viral and/or bacterial pneumonia, heart failure, muscle aches and inflammation ("myositis"), Reye syndrome, and inflammation of the brain ("encephalopathy"), among others.¹¹

There are some "emergency warning signs" that may accompany regular flu symptoms. These warning signs require urgent medical attention. In children, emergency warning signs that need urgent medical attention include: fast breathing or trouble breathing, bluish skin color, not drinking enough fluids, not waking up or not interacting, being so irritable that the child does not want to be held, flu-like symptoms improve but then return with fever and worse cough, and fever with a rash. In adults, emergency warning signs that need urgent medical attention include: difficulty breathing or shortness of breath, pain or pressure in the chest or abdomen, sudden dizziness, confusion, severe or persistent vomiting.¹²

¹⁰ Both the White House and HHS documents are available at www.pandemicflu.gov

¹¹ US Department of Health and Human Services, *Pandemic Influenza Response and Preparedness Plan*, Draft Version, August 8, 2004, "Annex 8: Strategies to Limit Transmission," page 2

¹² PA Department of Health, "Influenza Pandemic Response Information Document," July, 2005, page 8

B. Treatment

As with other type A viruses, the body's immune system can be rapidly overcome by the H5N1 infection. Most cases of H5N1 to date have required hospitalization because of the severity of the infection, although there have been some milder cases of infection. Respirators are often used to assist breathing. Antibiotics are used to combat secondary infections. Antiviral drugs are administered to slow the spread of the virus in the infected individual.

Hospitals isolate infected individuals and use precautions to prevent infection of healthcare workers or transmission to other patients.

C. Antiviral Drugs

Antiviral drugs are a class of medication used specifically for treating viral infections. Like antibiotics, specific antivirals are used for specific viruses.

Two different antiviral drugs are thought to be effective against the H5N1 virus. The antiviral drugs must be given to infected patients within 36 hours of symptom development. The drugs interfere with the ability of the virus to replicate, thus allowing time for the body's immune system to respond to, and not be overcome by, the virus.

Zanamivir is a neuraminidase inhibitor used in the treatment of and prophylaxis of both influenza A and influenza B. Zanamivir was the first neuraminidase inhibitor commercially developed. It is currently marketed by GlaxoSmithKline under the trade name **Relenza**®.¹³

Oseltamivir is an antiviral drug, a neuraminidase inhibitor used in the treatment of and prophylaxis of both influenza A and influenza B. Oseltamivir was the first orally active neuraminidase inhibitor commercially developed. It was developed by Gilead Sciences and is currently marketed by Hoffman La Roche (Roche) under the trade name **Tamiflu**®.¹⁴

On March 1, 2005, the British government announced that it would be stockpiling enough oseltamivir to treat a quarter of the country's population, in preparation for a possible H5N1 avian flu pandemic. Other countries soon followed suit. At the end of September 2005 the United States announced plans to also stockpile Tamiflu and Relenza.

At the end of May 2005 Roche Holding AG confirmed that the huge demand for Tamiflu® was causing a production bottleneck, with new customers likely to face waiting time of up to two years. In order to satisfy US demand, Roche planned to open a new production plant in North America. The building of this plant was announced on October 18, 2005.

In September 2005 some studies began to suggest that the circulating strains of H5N1 may be resistant to oseltamivir. Researchers are quick to point out that until a pandemic occurs and tests are confirmed on humans infected with the circulating pandemic virus, the effectiveness of the antivirals is uncertain.¹⁵

D. Vaccines

In August 2005, scientists announced that they had successfully tested in people a vaccine that they believe can protect against the strain of avian influenza that is spreading in birds through Asia and Russia. The vaccine is based on strains of the virus from Vietnam and Hong Kong.

Due to the amount of time needed to manufacture a vaccine that could prevent deaths from a human influenza pandemic, Dr. Anthony S. Fauci, director of the US National Institute of Allergy and Infectious Diseases,

¹³ For more information on this product, visit http://www.gsk.com/products/relenza_us.htm

¹⁴ For more information on this product, visit <http://www.tamiflu.com>

¹⁵ Time.com, "Bird Flu: The Perils of Relying on a Single Drug," September 30, 2005. Compare to *Nature: International weekly journal of science*, "Avian Flu: Isolation of drug-resistant H5N1 virus," October 14, 2005

announced that the United States would order additional doses of the vaccine. The initial order was for 2 million doses. A larger second order was placed in September 2005.

Testing of the vaccine has proven that it is effective in stimulating an autoimmune response to H5N1, but requires multiple doses to gain effectiveness. Researchers also point out that as with the antiviral drugs, the current vaccine's effectiveness remains questionable until an outbreak occurs. Therefore, part of the government's response plan involves increasing production capabilities for vaccines, so that when a pandemic virus emerges, the vaccine could go into rapid production. This would avoid having a stockpile of ineffective vaccine.

In March 2006, HHS Secretary Mike Leavitt announced that second vaccine against human H5N1 influenza was being developed. Leavitt said that he has authorized the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC) to start work on a second vaccine. The decision is routine, according to the HHS. A spokesman for HHS added, "We've been following the virus and trying to monitor it. We have determined there is a strain that is distinct enough from the Asian strain that first arose." It was isolated in Indonesia, so it's named after that country: A/Indonesia/5/2005. "If a third strain were to evolve, which is very likely, we would do the same thing," he said.

Production capacity for vaccines is limited, and Chiron corporation reported that they would be switching over to production of regular seasonal flu vaccine in March 2006. Chiron plans to switch back to producing the H5N1 vaccine this fall, after production of the seasonal vaccine is finished.

4. Stages of a Pandemic

The World Health Organization (WHO) has developed a global influenza preparedness plan, which defines the stages of a pandemic, outlines WHO's role and makes recommendations for national measures before and during a pandemic.¹⁶

As of early March 2006, the WHO and most sources place the current avian influenza epidemic at phase 3. There is ongoing debate as to the current phase.

The phases are defined as:

Interpandemic Period

Phase 1: No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low.

Phase 2: No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.

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 is 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, and/or other scientific parameters.

Pandemic Alert Period

Phase 3: Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.

Phase 4: Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans.

Phase 5: 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).

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), and/or other scientific parameters.

Pandemic Period

Phase 6: Pandemic: increased and sustained transmission in general population.

The pandemic stage 6 may be marked by two or more waves. For example, the initial wave of the Spanish Influenza pandemic of 1918 resulted in some fatalities, but was mild enough in its effects to receive the dismissive nickname of the "three day flu." But the second wave which hit North America a few months later in the summer of 1918 was lethal. Apparently in the interim the novel H1N1 pandemic strain had added the gene or genes that made the final wave a killer. Perhaps the effects of the lethal second wave would have been even more devastating if the innocuous first wave had not already passed through the population, leaving in its wake at least some immune response to the H1N1 antigens that were present in both waves.

¹⁶ World Health Organization, "WHO Global Influenza Preparedness Plan", 2005, page 2

5. Transmission and Infection Control

A. Transmission

The ability of one person to infect another relates, in part, to the amount of virus shed by the infected person during their acute infection. Studies in healthy persons have shown that the amount of virus shed correlates with the height of an infected person's temperature. However, approximately 50 percent of persons infected with influenza do not develop symptoms, but still may shed virus. The relative importance of asymptotically or mildly asymptotically infected persons in the spread of influenza is unknown, but may allow for unrecognized transmission.¹⁷

Direct and indirect contact transmission

Direct transmission involves direct body-to-body surface contact. Indirect transmission occurs via contact with contaminated intermediate objects such as contaminated hands or inanimate objects such as door handles.

Droplet transmission

Droplet transmission occurs when contagious droplets produced by the infected host are propelled a short distance through coughing or sneezing and can come into contact with another person's eye, nose, or mouth tissues.

Droplet nuclei (airborne) transmission

This entails the production of infectious droplet nuclei, generally 5 micrograms or less in diameter. In contrast with larger droplets, these droplets can remain suspended in the air and be disseminated by air currents in a room or through a facility to be inhaled by a susceptible host.

Evidence supporting the relative contribution of each route of transmission for influenza is limited; however, droplet transmission is thought to be the predominant form of spread in a setting with an appropriate number of air exchanges and standard ventilation. In the absence of appropriate ventilation and air exchange, airborne transmission may play a greater role, such as in a crowded space where air exchange is limited. Experimental studies on the transmission of influenza are restricted mostly to animal studies. However, observations in hospitals and nursing homes indicate that influenza outbreaks in these settings are more likely explained by droplet transmission or by contact with health care workers rather than by airborne transmission through the ventilation systems.¹⁸

B. Precautions in Health Care Settings¹⁹

The patient should be placed in a private room or a room with other influenza-infected patients. During a pandemic, suspected or confirmed infections may be placed in a specific section of a hospital, or may even be placed in a specific hospital.

Although airborne spread is not believed to play a major role in influenza transmission, if feasible early in a pandemic, the patient should be placed in a negative air pressure room or placed together with other patients with suspected or proven influenza in an area of the hospital with an independent air supply and exhaust system.

Health care personnel should wear a surgical mask when entering the room of a patient with known or suspected influenza.

Health care personnel should use standard plus droplet and contact precautions, including hand washing, use of gloves, and gown and eye protection if they are apt to come into contact with body fluids or contaminated surfaces.

The number of healthcare workers coming into contact with infected patients should be limited.

Limits should be placed on the number of visitors to the patients.

¹⁷ HHS, Annex 8, pp. 2-3

¹⁸ HHS, Annex 8, p. 3

¹⁹ HHS, Annex 8, pp. 3-5

C. Community Transmission Control Strategies

Outside of healthcare settings, there are several steps that individuals and communities can take to control transmission of the influenza virus. The following are recommended by the CDC and PA Department of Health.²⁰

Basic hygiene measures

The practice of proper hand hygiene. Frequent hand washing, especially when there has been contact with other people or with potentially contaminated surfaces can be very helpful. Also, alcohol-based hand cleansers should be made available in all settings.

Following proper respiratory etiquette. The best precaution is to cover your nose or mouth with a tissue when you cough or sneeze and then dispose of the tissue. If a tissue is not available, placing one's hand in front of the mouth when coughing or sneezing can somewhat limit the dispersal of droplets. However it has been suggested recently that covering one's mouth and nose with one's hand is not very effective in stopping the spread of germs as these germs are retained in the hand, and are then deposited on doorknobs, on to others through handshakes, etc. Current thinking suggests coughing or sneezing into the crook of one's arm would be preferable to limit germ spread.

Masks could be used in public settings. No mask can provide a perfect barrier but products that meet or exceed the NIOSH N95 standard recommended by the World Health Organization are thought to provide good protection. Other well-fitting masks can be helpful but much less effective. Any mask may be useful to remind the wearer not to touch his face. This can reduce infection due to contact with contaminated surfaces, especially in crowded public places where coughing or sneezing people have no way of washing their hands.

Hand shaking should be discouraged.

Doors, surfaces, and other points of hand contact should be disinfected regularly.

Individuals should be trained to identify cases early through public self-assessment for symptoms, including fever, leading to early isolation at home or in healthcare settings.

Individuals should do their best to stay away from people who are sick.

Individuals who are sick should avoid work, school, and other public settings.

More extensive community measures

Contacts of suspected cases may be quarantined.

Large group gatherings (size to be determined by federal, state, and local officials) may be cancelled.

Schools (including colleges and universities) may be closed.

Travel could be limited, especially travel in and out of areas of high infection.

Public transportation may be suspended, due to the risk of transmission in close spaces.

Unnecessary visits to hospitals should be avoided. Elective surgeries may be postponed or cancelled.

Healthy individuals and people with medical training may be asked to volunteer and assist at clinics or other emergency response action sites.

²⁰ HHS, Annex 8, pp. 4-12 and PADOH, pp. 4-5

6. Considerations for Churches and Pastors

A. Introduction

Churches are in a special position to be a positive force in the response to an influenza pandemic. They are one of the few remaining social structures that bind people together for support and fellowship. Many churches reach out beyond their own congregations to address the needs of their communities. And although the Christian faith has been increasingly marginalized from public life over the past decades, people still turn to the church in times of crisis, seeking meaning, peace, and healing.

At the same time, however, churches are equally at risk for the devastating effects of pandemic influenza. In a pandemic situation, churches need to immediately put changes into place to avoid contributing to the spread of the influenza virus.

B. Practicing Prevention Strategies

Churches should consider all aspects of their common life, and, in a pandemic situation, eliminate practices that increase the risk of virus transmission. In addition to the basic hygiene measures listed previously in this document, there are specific considerations for congregations.

Shaking hands is practiced in most churches, as people greet one another. Many churches place a greeter at the door to shake hands as people enter the church, and the pastor at the door to shake hands as people leave the church. Throughout the church school time and worship time, many people shake hands with dozens of people. In a pandemic situation, this common practice should be discouraged. The exchanging of hugs is also a risky practice that should be discouraged. This also could mean eliminating ritual handshakes and hugs, as in the passing of the peace.

The passing of offering plates, attendance registers, and other items should also be discouraged. Churches can instead place offering plates or collection boxes in the sanctuary for people to make their offerings. Churches may also follow the style of some Roman Catholic churches and use collection baskets with handles.

Communion presents a special challenge, because it is central to the worship life of many churches. There is no risk free way to share communion in a pandemic situation. Consider some of the standard means of serving communion. For intinction, bread is dipped into a common cup, sometimes along with fingers. Passing of bread in pews, or trays of bread and cups, means handling common objects. There are some safer ways to administer communion. The person serving should sanitize his or her hands before serving. The server should be the one to touch bread and wafers and lightly place the bread or wafer in the receiving person's hands, avoiding hand to hand contact. Individual cups of juice or wine can be handed to recipients. Empty cups should be disposed of and not returned to a common tray. Perhaps the safest way of serving communion would be to use the "Chasid Cup" set. The "Chasid Cup"²¹ is a prefilled disposable communion cup consisting of juice and bread packaged in a double-sealed plastic cup. These prefilled juice and wafer sets could be placed in advance at the seats of members of the congregation, although there are liturgical concerns for the zone of consecration in some traditions. Regardless of the means chosen for serving communion, there may be members of the congregation who choose not to receive because of safety concerns.

Churches should have available ample hand sanitizer and tissues. Tissues should be located next to a trash receptacle so that they may be immediately discarded.

The housekeeping/custodial staff should give extra attention to the cleaning of door handles and other surfaces which are contacted by hands. Glove and mask precautions should be observed when emptying trash containing used tissues.

Water fountains should be marked as not to be used.

²¹ Available at www.communionsource.com

Members should be urged to avoid worship when they are sick. Clergy also should avoid worship if symptomatic.

The church should consider closing nursery facilities. At a minimum, sanitizing of toys and nursery equipment should be done regularly.

Children's Sunday School and other programming should be suspended. The church may consider following the closing and reopening of public schools as a guide to determine when programs should be suspended. The same applies to church sponsored preschool or daycare programs.

C. Facilities

Many churches function as public spaces for polling stations, blood drives, and support group meetings. Churches can become points of education, distributing literature and information to members and the general public. Information can also be shared in newsletters, bulletins, and worship gatherings. Parish nurses can help to distribute reliable information and point people to proper healthcare resources.

Church buildings could be offered as vaccination centers if and when a vaccine becomes available.

Because healthcare facilities may be quickly overwhelmed, church buildings could be used as clinics or for treatment sites.

D. Pastoral Care

Clergy and other pastoral caregivers have an important role to play in the lives of members. Clergy will be asked to visit the sick, and to preside at funerals.

Precautions should be observed when visiting in hospitals, according to hospital guidelines. Many pastors carry Bibles or prayer books with them during pastoral visitation. Bibles and other items should not be taken into the room of an infected person. Instead Bible verses and prayers should be printed on paper and left with the patient, or disposed of following the visit.

Masks and gloves should be used when visiting infected members in homes.

Special thought should be given to pastoral care for those who are quarantined. If direct contact is not allowed, the pastor should consider telephone and email to keep in contact with the quarantined.

Keep in mind that clergy themselves may be quarantined simply for coming in contact with an infected person. Also, clergy can be carriers of the virus, transmitting it throughout the church. Clergy should take seriously any symptoms of influenza during a pandemic and limit their contact with other people.

Funerals can be expected in record numbers, with many unchurched asking for the services of clergy. Funerals themselves may be limited in gathering size, or even prohibited altogether.

In nursing homes, the primary source of transmission of influenza from resident to resident is via staff. Clergy should use care when moving between residents, observing proper hand washing procedures.

The virus will claim victims of all ages, creating emotional and financial turmoil for families. Pastors and other skilled persons in the church should be available for counseling. The church can also respond to families affected by the flu, by preparing meals, running errands, even welcoming non-infected members of another family into their homes.

E. Bans on Large Group Gatherings

During an influenza pandemic, bans may be placed on large group gatherings.

Congregations may be able to divide worship into smaller groups and have people assigned to a specific section and time of worship. Worshipers could be seated in specific rows of the worship space to create increased distance between worshippers. Outdoor worship should be considered if possible.

If churches are closed altogether, churches could consider the web casting of a worship service. Other alternatives could be the taking of cassette tapes of worship or videos to members. Worship could be facilitated in members' homes with mailings of prayers, scriptures, sermons, or devotions.

Many churches see a correlation between worship attendance and financial offerings. The closing of a congregation for several weeks or even months could be detrimental to churches that are already struggling financially. Churches would have to be creative and sensitive in the collection of offerings, recognizing that a member's main concerns may be focused on other matters.

7. Considerations for H5N1 in Wild Bird Populations

A. Introduction

The rapid spread of H5N1 from Asia to Europe and Africa during the winter of 2005-2006 surprised the scientific community. In February and March 2006, scientists and government officials began to anticipate the spread of H5N1 among wild birds into the North American continent. Predictions are that H5N1 could arrive in the upper parts of North America, such as Alaska, in the spring of 2006. Within six months, migrating birds could carry H5N1 to all of North America and into South America. Therefore, unless a human pandemic breaks out during this time period, the United States may first experience H5N1 in birds.

B. Cautions for Hunters

According to the Alaska Department of Fish and Game, hunters should be prepared to follow safety procedures related to game birds. There is a risk that certain mammals may also be infected, as H5N1 has been confirmed in cats, dogs, and stone martens. Therefore, hunters would be best advised to follow safety procedures in dealing with all game.

There are no known cases where H5N1 has been transmitted from wild birds to humans. However, even apparently healthy wild birds can be infected with other microorganisms and parasites that can move between wildlife and people. Therefore, it is always a wise and safe practice to wear some basic protection, and keep tools and work surfaces clean when preparing game animals. Clean and sanitary handling of animals and meat prevents common infections that can become serious.²²

Viruses like H5N1 are shed from birds in fluid discharges and fecal material, so avoiding contact with these materials while plucking and cleaning birds is a good practice. Most viruses do not persist very long after they have left their host and can be neutralized with heat, drying, and disinfectants.²³

Practical hygiene for hunters includes:

- Do not handle or butcher game animals that are obviously sick or are found dead;
- Do not eat, drink, or smoke while cleaning game;
- Wear rubber gloves and washable clothing when cleaning game;
- Wash your hands with soap and water or alcohol wipes immediately after handling game;
- Wash tools and working surfaces with soap and water, then disinfect with a 10 percent solution of chlorine bleach; and
- Cook game meat thoroughly—poultry should reach an internal temperature of 155-165 degrees Fahrenheit.²⁴

²² Alaska Department of Fish and Game, "What Hunters Should Know About Avian Influenza," September, 2005.

²³ Ibid.

²⁴ Ibid.

C. Food Handling Cautions

There is no evidence that anyone has been infected with the Asian bird flu or other bird flu virus by eating properly cooked eggs or other cooked poultry products derived from infected birds. Cooking food to 160 degrees Fahrenheit (71 degrees Celsius) will kill bird flu virus if it is present. Nearly all of the more than 100 human cases of the Asian bird flu that have been diagnosed recently in Asia have had direct contact with infected chickens, ducks, turkeys, or their environment. This suggests that close contact with infected birds has been the primary route of transmission for the Asian bird flu infections, rather than eating food derived from infected birds.²⁵

Although strains of bird flu virus like the Asian bird flu that cause severe disease in poultry can result in the contamination of egg shells and the inside of the egg (the yolk and albumen or the egg white), hens with severe bird flu usually stop laying eggs, so few contaminated eggs are likely to be marketed. Furthermore, the U. S. government has taken steps to prevent infected birds or their products, including their eggs, from entering the U.S. food supply.²⁶

FDA discourages the consumption of eggs that have not been adequately cooked. FDA advises consumers to avoid eating or tasting foods that may contain raw or lightly-cooked eggs, such as raw batter, filling, or cookie dough made with raw eggs; eggnog and other egg-fortified beverages that are not thoroughly cooked; homemade and fresh-made dressings and sauces made with raw eggs such as Caesar salad dressing, Béarnaise sauce, Hollandaise sauce, Aioli sauce, mayonnaise; homemade ice cream; mousse; meringue; or tiramisu.²⁷

Commercial mayonnaise, dressings, and sauces that contain pasteurized eggs are safe to eat. Egg mixtures made with an egg-milk base cooked to an internal temperature of 160 degrees Fahrenheit (71 degrees Celsius) also are safe. Use a thermometer to make sure the mixtures reach the correct temperature.²⁸

The same measures that are recommended to prevent egg-associated infections with *Salmonella Enteritidis* are effective for the very small risk of infection with bird flu virus. Consumers can play an active role in preventing infections both with bird flu virus and with common food-borne pathogens by following safe food handling guidelines:

- Wash your hands with soap and water after handling raw poultry and eggs to remove the virus.
- Wash countertops, knives, cutting boards, and other utensils with hot soapy water to prevent cross-contamination from contaminated poultry and eggs to other foods.
- Follow recommended cooking times and temperatures for eggs. Cook foods containing eggs thoroughly (cook until the egg yolk and egg white are firm; scrambled eggs should not be runny, and casseroles and other dishes containing eggs should be cooked to 160 degrees Fahrenheit. Refrigeration and freezing do not kill influenza virus.
- For recipes that call for eggs that are raw or undercooked when the dish is served-Caesar salad dressing and homemade ice cream are two examples-use either shell eggs that have been treated to destroy *Salmonella*, by pasteurization or another approved method, or pasteurized egg products. Treated shell eggs are available from a growing number of retailers and are clearly labeled, while pasteurized egg products are widely available.²⁹

D. Pets

With the detection of H5N1 in cats and dogs, concern has been raised over household pets being vectors for H5N1 transmission to humans. In Germany, officials recommended that household cats be kept indoors and dogs kept on leashes when outside. Animal advocate agencies stress that as of mid-March 2006, there has been no instance recorded of an H5N1 infection passing from a household pet to a human.

²⁵ US Food and Drug Administration, "Questions and Answers on Avian Influenza and Food Safety," March 2004, updated November 2005.

²⁶ Ibid.

²⁷ Ibid.

²⁸ Ibid.

²⁹ Ibid.

E. Sick Birds, Bird Carcasses, and Bird Droppings

There are currently no official guidelines for American citizens in terms of interaction with sick or dead birds and bird droppings in or around households, businesses, or communities.³⁰

If H5N1 is detected in the United States, citizens may be given state or local contact phone numbers for reporting sick or dead birds. States such as Florida are currently putting such alert systems into place. Obviously, contact should be avoided with birds that appear sick. Disposal of dead birds creates a challenging situation. The USGS National Wildlife Health Center currently lists the following recommendations regarding avian influenza:³¹

- As a general rule, people should observe wildlife, including wild birds, from a distance. This protects people from possible exposure to diseases and minimizes disturbance to the animal.
- Avoid touching wildlife. If there is contact with wildlife, do not rub eyes, eat, drink, or smoke. Thoroughly wash your hands with soap and water.
- Do not pick up diseased or dead wildlife.
- Contact your state, tribal, or federal natural resource agency if you find a sick or dead animal.

Should it become necessary to dispose of dead birds, one could refer to guidelines that the USGS created for birds suspected of sickness or death from West Nile Virus. Similar guidelines may apply to disposal of birds suspected to have died from avian influenza. The guidelines include the use of coveralls, boots, gloves, eye protection/face shield, face mask, washing hands and other exposed surfaces.³² The challenging part will be the disposal of the bird carcass so that it does not pose additional risk to other people. Disposal in the trash could pose problems of exposure for sanitation workers and create problems at landfills. Currently in Asia and Europe dead birds are burned, buried, or incinerated.

Bird droppings pose another potential risk. Studies have shown that H5N1 can survive in droppings from infected birds for significant periods of time, generally longer in colder weather. Recommendations may be given for disinfecting solutions made from chlorine or similar cleaning agents. Other precautions that have been suggested in Europe include keeping a pair of “outdoor” shoes and exchanging them for “indoor” shoes when entering a home.

³⁰ The pandemicflu.gov site does include links to USGS sites and state wildlife sites with some basic recommendations.

³¹ http://www.nwhc.usgs.gov/disease_information/avian_influenza/frequently_asked_questions.jsp#7b

³² http://www.nwhc.usgs.gov/disease_information/west_nile_virus/bird_handling_guidelines.jsp

8. Resources

www.pandemicflu.gov

The official United States government information site.

National Geographic, October 2005: “The Next Killer Flu, Can We Stop It?”

An excellent, easy to understand article about the history of influenza and the impact of H5N1.

World Health Organization

www.who.int/csr/disease/avian_influenza/en/

This WHO website monitors the spread of avian flu to humans, provides information on control measures, and discusses why scientists are so concerned about a future pandemic.

Centers for Disease Control and Prevention

www.cdc.gov/flu/avian

Log on to this site to get a wealth of information on avian flu including details on the H5N1 virus, the antiviral drugs available to combat it, the plans formulated to prepare and respond to a pandemic, and travel advisories for countries experiencing avian-flu outbreaks.

PA Department of Health

www.dsf.health.state.pa.us

Faith-Based & Community Organizations Pandemic Influenza Preparedness Checklist

<http://pandemicflu.gov/plan/faithcomchecklist.html>