Iowa Department of Public Health

Pandemic Influenza Annex Executive Summary

November 4, 2005

Background

According to the World Health Organization (WHO),

> "An influenza pandemic occurs when a new influenza virus appears against which the human population has no immunity, resulting in several simultaneous epidemics worldwide with enormous numbers of deaths and illness. With the increase in global transport and communications, as well as urbanization and overcrowded conditions, epidemics due to the new influenza virus are likely to quickly take hold around the world."

Influenza is a highly contagious respiratory virus that is responsible for annual epidemics in the United States and other countries. Each year an average of 200,000 people are hospitalized and 36,000 die in the U.S. from influenza infection or a secondary complication. During an influenza pandemic the level of morbidity and mortality from influenza will likely increase dramatically worldwide.

During the last century, three influenza pandemics caused increased mortality, morbidity and societal burden throughout the world above the levels seen with usual yearly epidemics. The "Spanish" influenza pandemic of 1918 killed over 500,000 people in the United States and had a worldwide mortality of 20 to 40 million. The virus that year was notorious for its predilection for severely affecting healthy young adults. Since 1918, two global outbreaks of influenza A occurred. In 1957, Asian influenza caused approximately 80,000 deaths in the United States. During the Hong Kong pandemic in 1968-69, mortality in the United States was estimated at 30,000 deaths, with 51 million Americans affected by influenza.

Influenza viruses are grouped into three types designated as A, B and C. Viruses of the C type are common but usually cause no symptoms or only very mild respiratory illness. They are not considered to be a public health concern. Type B viruses cause sporadic outbreaks of more severe respiratory disease, particularly among young children in school settings. Type A viruses typically cause the majority of morbidity and mortality each year during the influenza season. Both B and C viruses normally only infect humans. C viruses are stable, but A and B viruses are prone to mutation.

Every year influenza viruses change because they have the ability to mutate genetically. Both influenza A and B viruses can undergo the minor genetic variations known as antigenic drift. Antigenic drift is a gradual change caused by minor point mutations in the viral genes that results in small changes to the surface proteins of the influenza virus. Antigenic drift occurs continuously, and is the reason that the make-up of the influenza vaccine is changed almost every year.

Influenza A virus is unique in that it can infect a variety of animals, with wild birds being the natural reservoir. It can undergo the major genetic reassortment known as antigenic shift. This sudden change happens infrequently and often occurs as a result of a recombination of human influenza A with an animal influenza A virus. This

recombination results in a new subtype of influenza A to which the human population has little or no immunity. An antigenic shift is often the impetus for an influenza pandemic.

The impact of an influenza pandemic on the healthcare system could be devastating. It is likely that 15-35% of Iowa's population will be affected. Through modeling studies it is estimated that in the United States there could be:

- 1.8 million health care provider visits, which could equate to 180,000 visits for Iowans;
- 300,000–700,000 hospitalizations in the United States, which could equate to 3,000–7,000 hospitalizations in Iowa;
- 90,000–200,000 influenza-related deaths in the United States, which could equate to 900–2,000 deaths in Iowa.

There is a potential for high levels of morbidity and mortality, as well as the significant disruption to society, making planning for the next influenza pandemic imperative.

Response Plan Mission

The purpose of this plan is to ensure an immediate and effective response in the event of pandemic influenza to limit the morbidity and mortality of Iowans and to keep economic loss and social disruption to a minimum. The plan will address the roles of the Iowa Department of Public Health (IDPH) and the University Hygienic Laboratory (UHL) should pandemic influenza occur.

Objectives Addressed in Bioemergency Response Plan

The Bioemergency Response Plan serves as the department's overall emergency response plan and addresses many response objectives that would be similar for all bioemergencies, including a pandemic influenza event. Part A of the plan addresses organization-wide objectives and Part B addresses function-specific objectives such as:

- Command and control
- Surveillance of cases and contacts
- Isolation and quarantine for health care settings, providers and the community
- Preparedness and response plans for health care facilities and health care providers
- Community containment measures
- Managing international and national travel related risk
- Rapid and efficient laboratory diagnostics
- Effective communication utilizing the incident command system
- Mass fatalities management
- Management of psychological consequences
- Administration and finance
- Information and technology management services
- Logistics

Response Plan Annex Assumptions

1. Planning is an ongoing process. This plan will be revised as additional guidance becomes available from the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC).
2. To some extent everyone will be affected by an influenza pandemic.
3. There may be multiple pandemic waves; the entire pandemic may last two to three years.

4. All persons will likely be susceptible to the pandemic strain.
5. The term health care provider is inclusive of those occupations that may have direct or the potential for direct patient contact [e.g. physicians, nurses, emergency medical services (EMS), etc.].
6. Incident command, conforming with the National Incident Management System, (NIMS) will be established.
7. Routine surveillance mechanisms will be enhanced.
8. Sequential progression from phase to phase will be guided by surveillance information available to IDPH.
9. Training and promoting awareness activities for pandemic influenza to health care facilities and local public health agencies (LPHA's) will take place through the Learning Management System (LMS), the Iowa Health Alert Network (HAN) and Iowa Communication Network (ICN).

Response Plan Annex Objectives

1. Implement a continuous process of providing public information and risk communication to the public.
2. Monitor the evolving pandemic in real time to guide the selection of response measures that will become apparent once the new virus has emerged.
3. Identify where, in the state, virus activity is increasing and/or decreasing, how many people are affected and to identify which groups are most severely affected (epidemiological data).
4. Provide rapid and accurate testing services and report the results to facilitate control and management of the outbreak.
5. Contain exposure to and transmission of the virus to individuals throughout the community by implementing non pharmaceutical control measures (i.e. ban on mass gatherings, closing of schools, quarantine, and travel restrictions) that match the behavior of the virus and that have the greatest chance of reducing the number of cases and delaying spread.
6. Provide efficient and rapid allocation, distribution, and administration of antivirals and or vaccine to officially designated high priority groups.
7. Manage international and national travel risk in Iowa associated with an influenza pandemic.
8. Monitor the effectiveness of non pharmaceutical control measures and health interventions.
9. Monitor hospital surge capacity associated with an influenza pandemic.

Organization of the Plan Annex

WHO Pandemic Influenza Phases

The Pandemic Influenza annex has been organized using the WHO's Pandemic Influenza Phases. This six-phase system approach allows each of the eight focus areas addressed in this annex to organize its activities according to each phase. There are three levels within Phase 6 that further detail the possible scenarios for Iowa. It is assumed that for phases 1-5, all cases of influenza caused by the pandemic strain will occur outside the U.S.

<u>Inter-pandemic period-</u>

Phase 1: No new influenza virus subtypes in humans; subtype that has caused human infection may be present in animals.

Phase 2: As above, but circulating animal subtype poses substantial risk of human disease.

Pandemic alert period-

Phase 3: Human infection with new subtype, no human to human spread, or rare spread to close contact.

Phase 4: Small clusters with limited human to human transmission, highly localized spread, suggesting virus is not well adapted to humans.

Phase 5: Larger clusters, but human to human spread still localized, virus increasingly better adapted to humans, but not yet fully transmissible.

Pandemic period-

Phase 6: Increased and sustained transmission in general population.

Iowa Pandemic Period Progressions

Once the pandemic alert period has begun, there will be three progressions that describe the location of the pandemic relative to Iowa. The progressions are part of Phase 6 or the Pandemic period described above. This plan is designed to outline the objectives regardless of the order in which progressions might appear. For example, the pandemic strain may appear in Iowa before any other state and the objectives in this plan would still apply.

The progressions are the following:

1. Pandemic strain is circulating throughout the world but is not yet in the U.S.
2. Pandemic strain is circulating in the U.S. but is not yet in Iowa.
3. Pandemic strain is circulating in Iowa.

Iowa Department of Public Health Focus Areas

The Iowa Dept. of Public Health has identified nine focus areas that this annex will specifically address for each phase of pandemic influenza. The focus areas are as follows:

- Pre-vaccine preparedness
- Consideration of antivirals
- Prioritization of vaccine once available
- Distribution of vaccine and antivirals
- Surveillance
- Laboratory
- Personal protective equipment (PPE) and infection control
- Travel related issues
- Hospital surge capacity

Pre-vaccine preparedness

Although vaccine will likely be the central prevention strategy in the event of a pandemic, a strain-matched vaccine will likely not be available until the pandemic has been underway for some time. For this reason, it will be necessary to prepare for the following:

- Maintaining communication between local, state and federal levels;
- Education on antiviral considerations;
- Activation of emergency plans;

- Formation of Infectious Disease Advisory Committee who will provide advisement on potential use of antivirals; and
- Contain exposure to and transmission of virus to individuals throughout the community by implementing non pharmaceutical control measures (i.e. ban on mass gatherings, closing of schools, quarantine, and travel restrictions) that match the behavior of the virus and that have the greatest chance of reducing the number of cases and delaying spread.

Prioritization of vaccine once available

It is assumed that when there is vaccine available it will trickle into the state in a limited number and that the federal government will provide guidance on prioritization of the population. In order to prepare the following will have to occur:

- Infectious Disease Advisory Committee (IDAC) will provide advisement on vaccine prioritization, etc.;
- Determination of how many Iowans fall into the prioritization categories as defined by the Centers for Disease Control and Prevention (CDC);
- Development and implementation of education efforts and communication means to inform health care providers and the public on antiviral use, vaccine availability and distribution, and respiratory hygiene etiquette; and
- Preparation for a second-wave.

Consideration of antivirals

The current medications available for chemoprophylaxis and treatment of influenza includes two main classes of antiviral agents, the adamantanes (amantadine and rimantadine) and the neuraminidase inhibitors [zanamivir and oseltamivir (brand name Tamiflu®)]. The adamantanes only have activity against only influenza A, while the neuraminidase inhibitors have activity against both influenza A and B. Recent evidence indicates that amantadine has no, or only limited, activity against the H5N1 avian influenza A strains currently emerging and circulating in Asia and Europe. While the adamantanes are much less expensive and in greater supply compared to the neuraminidase inhibitors, current evidence suggests that the neuraminidase inhibitor oseltamivir may be the best antiviral to stockpile for chemoprophylaxis and treatment during the next influenza pandemic. The potential for development of resistance to antivirals must always be taken into account.

If sufficient stockpiles of antivirals exist at the time the pandemic reaches the United States and the use of antivirals is determined to be effective against the pandemic strain, chemoprophylaxis efforts in Iowa may be prioritized. Priority groups should include those persons deemed at high risk of exposure and indispensable to carrying out public health, clinical and public safety-related functions during the early stages of the pandemic while vaccine is being produced and vaccination clinics are being established and placed in operation. If there are insufficient stockpiles of antiviral agents for chemoprophylaxis, treatment should be directed toward those same groups and target groups at increased risk of morbidity and mortality, as prioritized by the CDC and evaluated by IDAC.

Early epidemiology of disease associated with the next pandemic strain may identify high-risk groups or special populations that are somewhat different from those identified during prior influenza pandemics and outbreaks of to pandemic influenza viruses. Current knowledge indicates infants and children six months to five years,

adults who are age 65 and older, the immunocompromised, and persons with chronic disease (e.g., asthma and diabetes, etc.) are those primarily at risk for increased morbidity and mortality due to influenza. During the typical influenza season, those at higher risk for morbidity and mortality from influenza include children 23 months of age or younger, those over 65, pregnant women, those who are immunocompromized and those who have chronic medical conditions such as asthma, diabetes and heart disease.

Distribution of vaccine and antivirals

It is assumed that in the time of a pandemic, once vaccine is available, large quantities of vaccine will need to be distributed. If vaccine is publicly (e.g., federal or state funds) purchased it may be distributed in one of four ways suggested below:

- Public system distribution;
- A mixed public-private system;
- Maintenance of the current, largely private system; and
- Vaccine orders are processed through the state and distributed by the manufacturer or using a 3rd party distributor.

Surveillance

In the early phases of a pandemic, surveillance systems will have the sensitivity to detect early human cases of novel virus in the state. The surveillance systems currently in Iowa are:

- Iowa Influenza Surveillance Network;
    - Sentinel providers
    - Schools, child care and long-term care facilities (LTCF's)
    - Reporting of outbreaks within schools and LTCF's
    - Virologic surveillance (UHL)
    - 122-Cities Pneumonia and Influenza Mortality Reporting
- State and Territorial Influenza Activity Level; and
- Animal surveillance (IDALS).

In the later phases, enhanced surveillance will require the capacity to assimilate large amounts of data to determine age-specific attack rates, morbidity, and mortality. Enhanced surveillance will include:

- Additional large employers, sentinel physician sites, schools, and child care center absenteeism rates;
- Monitoring of ILI in persons who have traveled from an affected area; and
- Additional surveillance activities as directed by CDC.

Laboratory

The primary objectives of the laboratory are:

- Provide rapid and accurate testing services and report the result to facilitate control and management of the outbreak;
- Timely identification of circulating or novel virus strains, including those from avian and animal sources, is important for pandemic detection and vaccine preparation;
- Monitoring influenza disease activity is fundamental to facilitate resource planning, communication, intervention, and investigation; and
- Rapid detection of unusual influenza outbreaks, identification of possible pandemic viruses and immediate alert to the CDC is paramount for a timely and efficient response to pandemics.

They will accomplish the objectives through:

- Testing
- Reporting/Data Management
- Specimen Collection and Transport
- Maintaining a skilled staff
- Communication with other laboratories
- Meeting regulatory requirements
- Planning for surge capacity

Personal protective equipment (PPE) and infection control

The purpose of this focus area is to help health care facilities prepare for the presence of novel influenza virus in their facility. The term "health care provider" refers to any person who may provide care in a health care setting. Therefore, for the purpose of this annex, providers would include emergency medical service personnel, law enforcement, hospital or clinic-based providers and public health officials.

This section provides guidance to health care facilities on:

- Recommendations for vaccination of all health care workers;
- Respiratory Hygiene/Cough Etiquette;
- Education;
- Standard and droplet precautions;
- Screening mechanisms;
- Assessing availability of vaccines, antiviral agents, supplies, and equipment;
- Infection control;
- Develop criteria for health care worker furloughs and work restrictions;
- Hospital access controls;
- In-hospital post-mortem care; and
- Home instructions for patients.

Travel-related issues

Due to the ability of influenza transmission by air and direct contact, crowded populations in enclosed spaces are particularly vulnerable to virus transmission. Conveyances, such as airplanes, can facilitate spread. It is therefore important to prevent spread from an ill passenger to others and to identify and monitor contacts on affected conveyance(s) for symptoms compatible with influenza like illness.

In the absence of effective control measures, infectious disease can spread rapidly around the globe through travel, including travel through Iowa's airports, bus and train stations. Screening and evaluating passengers for symptoms, public education, reporting illnesses in travelers and in certain situations restricting travel can reduce the likelihood of spreading illness to others. The purpose of this focus area is to manage international and national travel risk in Iowa associated with an influenza pandemic.

Six general objectives have been identified within this focus area. Some or all of the objectives listed below may or may not apply to all circumstances.

- Reduce the risk of introduction and spread of an influenza pandemic virus within Iowa by travelers (inbound travelers).

- Minimize the risk of exposure to cases with an influenza pandemic virus for travelers leaving Iowa (outbound travelers) and the risk of spreading the culprit disease to people at the respective destinations of those travelers.
- Reduce the risk of transmission of an influenza pandemic virus to passengers when they are on a conveyance with a case.
- Monitor other passengers and crew who have traveled on the same conveyance as a case to detect subsequent onset of illness consistent with influenza and take precautions to prevent further spread.
- Reduce or eliminate travel related disease control measures that have gone into effect, as the situation warrants.
- Support regional and/or local efforts to evaluate and manage disease transmission during an influenza pandemic.

Hospital surge capacity

Hospital surge capacity is defined as a health care system's ability to rapidly expand beyond normal services to meet the increased demand for qualified personnel, medical care and public health in the event of bioterrorism, large-scale public health emergencies, or natural disasters.

During any phase, a surge capacity crisis may become evident. The definition of surge capacity crisis will be that hospitals are unable to admit patients to their inpatient units due to a lack of available beds. The goal of surge capacity crisis management will be to assure that patients are transferred to an appropriate level of care, while maximizing the availability of intensive care beds at tertiary facilities. IDPH will provide technical assistance with the Capacity Reporting System for Bed Registry and assistance to Emergency Management for transfer information. Hospitals will be directed to transfer non-acute patients to the nearest hospital with available beds, and patients requiring intensive care to the nearest tertiary facility with beds.

Should the need arise for off-site care facilities; IDPH will direct the activation of the off-site care facilities. The location of these facilities will be determined based on the bed requirements and the available assets.

This section provides guidance on hospital surge capacity as it relates to:

- monitoring of bed capacity
- movement of non acute and acute patients
- alerting and notification of hospitals

In the event of a surge capacity crisis, hospitals will need to rely on the local EMS system to transport patients to other medical facilities. When the local EMS system is no longer capable of providing timely transport of patients, the hospitals would require additional assistance from other EMS services.

Objectives

- Gather needed information concerning the number and level of staffed ambulances needed, when and where they are to report.
- Using the System Registry, rapidly identify the most appropriate transport resources and dispatch them.
- Manage resource allocation through resource tracking.
- Monitor the EMS response; analyze the need for further resources.