Iowa Department of Public Health

Pandemic Influenza Response Plan Annex

Draft

October 2005

Version 3.3

Table of Contents

Acknowledgements

Core Pandemic Influenza Planning Team Members:

Aileen Buckler, M.D., M.P.H.
Center for Acute Disease Epidemiology
Iowa Department of Public Health

Judy Goddard, R.N., A.I.C.P.
Center for Acute Disease Epidemiology
Iowa Department of Public Health

Carmily Stone, M.P.H.
Center for Acute Disease Epidemiology
Iowa Department of Public Health

Donna Schneider, R.N.
Center for Acute Disease Epidemiology
Iowa Department of Public Health

Meghan Harris, M.P.H.
Center for Acute Disease Epidemiology
Iowa Department of Public Health

Marnell Kretschmer, M.P.H.
Bureau of Immunization
Iowa Department of Public Health

Principle authors of the Focus Area content include:

Aileen Buckler, M.D., M.P.H.
Center for Acute Disease Epidemiology
Iowa Department of Public Health

Don Callahan
Bureau of Disease Prevention and Immunization
Iowa Department of Public Health

Carmily Stone, M.P.H.
Center for Acute Disease Epidemiology
Iowa Department of Public Health

Tina Patterson
Bureau of Disease Prevention and Immunization
Iowa Department of Public Health

Sarah Brend, M.P.H.
Center for Acute Disease Epidemiology
Iowa Department of Public Health

Randy Mayer, M.S., M.P.H.
Bureau of Disease Prevention and Immunization
Iowa Department of Public Health

Joshua Yoakam, M.P.H.
Center for Acute Disease Epidemiology
Iowa Department of Public Health

Claudia Corwin, M.D., F.A.C.S.
Acute Disease Prevention and Disaster Response
Iowa Department of Public Health

Judy Goddard, R.N., A.I.C.P.
Center for Acute Disease Epidemiology
Iowa Department of Public Health

John Carter, M.P.H., R.N., EMT-P
Acute Disease Prevention and Disaster Response
Iowa Department of Public Health

Luca Flamigni, M.D., M.S.
Center for Acute Disease Epidemiology
Iowa Department of Public Health

Sandy Jirsa
University Hygienic Laboratory

Susan Brockus, D.V.M., M.P.H.
Center for Acute Disease Epidemiology
Iowa Department of Public Health

Michael Pentella, Ph.D.
University Hygienic Laboratory

Marnell Kretschmer, M.P.H.
Bureau of Disease Prevention and Immunization
Iowa Department of Public Health

Jim Gill, M.D., Ph.D.
University Hygienic Laboratory

I. Introduction

A. 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.

B. Mission

The purpose of this plan is to ensure an immediate and effective response in the event of an influenza pandemic 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 an influenza pandemic occur.

C. 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.

D. 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).

E. Objectives Addressed in Bioemergency Response Plan

Additional response objectives that would be similar for all bioemergencies, including a pandemic influenza event, are addressed in Part A and Part B of the Bioemergency Plan. Part A addresses organization-wide objectives and Part B addresses function-specific objectives:

- 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

F. Organization of the Plan Annex

1. 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.

2. Focus Areas

The Iowa Department 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

G. Introduction to the Iowa Department of Public Health focus areas

1. Pre-vaccine preparedness

The pre-vaccine focus area outlines actions that should be taken in the event that a vaccine is not available or is in development for the control and prevention of pandemic influenza.

Assumptions

1. Vaccine will not be available for six to nine months after detection of the pandemic strain.
2. Anti-viral drugs will be available; however the efficacy and actual availability cannot be accurately anticipated.
3. An Infectious Disease Advisory Committee (IDAC) will be established to provide expertise and to make critical decisions that must be made regarding antiviral distribution and use in Iowa.

2. Consideration of antivirals

Antiviral medications may play an integral role in the treatment and prevention of pandemic influenza, however the certainty of their efficacy against a pandemic strain of influenza is currently unknown. Unlike the influenza vaccine, certain antiviral medications are already available, though there may be barriers in attempting to use them as a treatment and prevention tool in the event of pandemic influenza.

Assumptions

1. The pandemic strain of influenza may be or may become resistant to known antivirals.
2. Known antivirals may not be effective against the pandemic strain.
3. Prolonged use of antivirals may cause other major health problems.
4. Antivirals may be in short supply and prioritization may be necessary.

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.

3. Prioritization of vaccine once available

Prioritization determinations will be made when vaccine becomes available and before vaccine is distributed. The CDC has created tiers for vaccine prioritization for use in the routine influenza season that may initially be used in the event of an influenza pandemic (see Appendix A). Planners will take into account the amount of vaccine available, including most current prioritization tiers, and the means of distribution. These tiers may need to be revised in the event that early pandemic epidemiology reveals different high-risk groups.

Assumptions

1. It will take 6-9 months for a vaccine against the pandemic strain to become available.
2. When vaccine does become available, it will be in short supply.
3. Vaccine will become available in small amounts over a period of time (e.g. 10,000 doses a week for six months).
4. By the time the vaccine is available, public health should have information on the characteristics of the strain, who is most affected and which groups of people are most likely to suffer complications or die from the strain.
5. It is likely that two doses (separated by approximately 30 days) will be needed for complete protection because it will be a unique strain. However, with limited vaccine supplies, a second dose may not be available and vaccine should not be held back to ensure that persons receive their second dose.
6. Prioritization guidance will be provided at the federal level from the CDC/Advisory Committee on Immunization Practices (ACIP).
7. Iowa will follow federal guidance for vaccine prioritization unless needs in Iowa are substantially different than those nationally.
8. The IDAC will provide clarification of vaccine prioritization guidelines.
9. If the situation in Iowa is significantly different from the national one, the IDAC will make recommendations on prioritization guidelines.

4. Distribution of vaccine and antivirals

Assumptions

1. During a pandemic, available vaccine and antivirals will need to be distributed in a timely and efficient manner.
2. The State of Iowa will work to facilitate the purchase and distribution of vaccine and antivirals though the mechanism for purchase and distribution will likely be determined at the federal level.
3. If vaccine is publicly (e.g. federal or state funds) purchased it may be distributed from the manufacturer to identified locations.

There are several possibilities for vaccine and antiviral purchase and distribution. In an effort to ensure vaccine and antivirals are distributed in the most timely, effective and

appropriate manner, this focus area addresses the four potential scenarios for the distribution of medication.

- **Scenario A**- Public system purchase and distribution. CDC or state will purchase the vaccine and distribute to the private sector.

- **Scenario B**- A mixed public-private system where public sector supplies may be targeted to specific priority groups. The proportion of vaccine for each sector may change as target groups and available vaccine supply changes during the course of the pandemic response.

- **Scenario C**- Maintenance of the current, largely private system (i.e. many hospitals and clinics offer vaccination as a service not sponsored by state or federal government). If the new vaccine is shipped primarily to private providers through the current system, IDPH will continue its current VFC distribution practices, giving priority to the new influenza vaccine.

- **Scenario D**- CDC or the state will purchase the vaccine and it may be distributed directly from the manufacturer or distributor to identified locations.

5. Surveillance

In the event of an influenza pandemic, routine surveillance systems will be rapidly adapted or enhanced to respond to the challenges of a pandemic. Enhanced surveillance would be any additional component or improvement to the current surveillance system. Examples on enhanced surveillance might include: recruiting additional providers or screening for travelers for disease or exposures at conveyance locales.

In the early phases of a pandemic, surveillance systems will need to have the sensitivity to detect early human cases of pandemic influenza virus in the state. In the later phases, surveillance will require the capacity to compile and analyze large amounts of data to determine age-specific attack rates, morbidity, and mortality.

Iowa's routine influenza surveillance is conducted from October to May each year; yet some influenza components of the surveillance is system are conducted year-round. In the event of an influenza pandemic, Iowa would enhance surveillance as needed.

Assumptions:

1. The Center for Acute Disease Epidemiology (CADE) will routinely evaluate the current Iowa Influenza Surveillance Network (IISN) to identify and address gaps in surveillance.
2. WHO and CDC will coordinate surveillance at the international and national level.
3. IDPH will coordinate surveillance at the state level.
4. Routine state influenza surveillance systems will need to be expanded during an influenza pandemic.
5. Influenza surveillance systems during a pandemic will need to be flexible. They will need to be readily adapted to provide the information needed to assess and monitor the epidemiology of the disease caused by the pandemic influenza virus.

The following outlines Iowa's current influenza surveillance activities:

Iowa Influenza Surveillance Network
The IISN has five components: sentinel physician providers, schools, child care and long term care facilities reporting, 122-Cities Pneumonia and Influenza Mortality reporting system, reporting of outbreaks and laboratory testing and surveillance conducted at the University Hygienic Laboratory.

a. Sentinel provider surveillance
Health care providers participating in the Iowa and U.S. Sentinel Provider Network are to conduct an essential component of influenza surveillance. Health care providers participating in this network identify clinical illness cases of illness consistent with influenza, termed influenza-like illness (ILI). ILI is defined as a fever $\geq$100ºF and cough and/or sore throat in the absence of another known cause other than influenza. These providers submit weekly reports of both the total number of patient visits for any reason during the previous week and the number of patient visits for ILI during the previous week, by age group (0-4, 5-24, 25-64, $\geq$65 years). From the data, the percent of patient visits for ILI is calculated on a national, regional, and state level. These providers also submit a representative sample of isolates to UHL for testing. The number of isolates submitted changes based on influenza activity. National guidelines recommend a sentinel influenza health care provider for every 1/250,000 persons or a minimum of 10 providers in states with smaller populations. This would be equal to 11 providers in the state of Iowa. During the 2005-2006 influenza season, there were 24 providers who participated in the Iowa and U.S. Sentinel Providers Network. This represented approximately 1 per 150,000 people. Sentinel physicians are distributed geographically throughout the state's six bio-emergency planning regions, assuring that the population under surveillance is spread throughout the state.

b. Schools, Child Care and Long-Term Care Facility Reporting
A second component of the surveillance network is the reporting of absenteeism and illness within schools and, child care centers and of ILI in long-term care facilities. Several schools and child care centers track the total enrollment and number of absent students each day throughout the influenza season. Long-term care facilities track the total number of residents each day and total number of ill. Schools and child care centers are currently able to report data online weekly. Long term care facilities will eventually have the same ability.

A baseline level of absentee rates within these schools is established early in the season and is monitored for changes throughout the influenza season. Participating schools are distributed geographically among the state's six bio-emergency regions, assuring that the population under surveillance is spread throughout the state. For the 2005-2006 influenza season, there were approximately 45 schools, four child care centers and two long-term care facilities reporting into the network.

c. 122-Cities Pneumonia and Influenza Mortality Reporting (Des Moines)
Each week, 122 cities across the nation report to the CDC the total number of death certificates filed and the number of those for which pneumonia and/or influenza was listed as the underlying or contributing cause of death. In Iowa,

the city of Des Moines participates in this reporting system. Each week the influenza surveillance coordinator for CADE reviews death certificates for all of Polk County, which includes the city of Des Moines. This data is analyzed on a national level, not to estimate the total number of influenza related deaths in the U.S., but to determine when the proportion of deaths with pneumonia and/or influenza listed on the death certificate is above what would be expected for that week if influenza viruses were not circulating. The CDC publishes the data each week in its Morbidity and Mortality Weekly Report.

d. Reporting of outbreaks
The reporting of outbreaks in long-term care facilities and schools is an ongoing process. Schools in Iowa are required to notify IDPH when school absenteeism exceeds 10% of their total enrollment on any given day. This reporting occurs regardless of whether they are enrolled in the IISN.

e. University Hygienic Laboratory
All reporting influenza-like illness reported by laboratories and health care providers is voluntary and conducted through surveillance sites that are recruited throughout Iowa on an annual basis. In Iowa, surveillance sites collect specimens from patients with ILI and submit them to UHL for virus isolation, identification, typing and sub-typing. In addition to the surveillance sites, UHL communicates with clinical laboratories throughout the state and requests submission of specimens to confirm influenza and provides them assistance in investigating unusual events. The combination of ILI reporting and laboratory data provide information regarding where, when, and which influenza viruses are circulating within the state. As previously mentioned, UHL conducts testing on all influenza specimens for providers in the IISN.

Two additional components of routine influenza surveillance are described below:

Activity level reporting to CDC
State influenza surveillance coordinators and/or the state epidemiologists throughout the country report the level of influenza activity weekly, throughout the influenza season. Activity level is determined using the surveillance network data, voluntary reports of outbreaks by schools and long-term care facilities and both confirmed and rapid influenza positive test results reported. Using the above-mentioned data, disease activity is classified into one of five categories based on specific definitions. All 50 states, New York City, Puerto Rico and Washington DC, report the level of influenza activity each week. This report is the only state level influenza data that the CDC makes available publicly (refer to chart in Appendix C).

Animal Surveillance
The Iowa Department of Agriculture and Land Stewardship (IDALS) conducts disease surveillance on animal populations in Iowa, which includes surveillance for avian influenza in poultry. IDALS and IDPH maintain ongoing communication regarding disease(s) in animal populations that may affect humans. IDALS notifies IDPH of epizootic and zoonotic disease events in animal populations that may affect humans.

6. Laboratory

The primary objectives of the laboratory are to provide rapid and accurate testing services and report the results to facilitate detection of cases of influenza and management of the outbreak.
Rapid detection of unusual influenza strains and outbreaks is fundamental for timely and efficient response to potential pandemics. Influenza laboratory data provides insight as to where, when and which influenza viruses are circulating within the state and whether they may be connected to activity outside of Iowa.
UHL has the following general responsibilities:

- testing;
- reporting/data management;
- specimen collection and transport;
- maintaining a skilled staff;
- communication with other laboratories;
- meeting regulatory requirements; and
- plans for surge capacity.

Assumptions

1. Prolonged pandemic influenza may test the surge capacity of the laboratory.
2. Increased urgency and volume may impede the ability of the lab to communicate results.

7. Personal protective equipment and infection control in health care settings
Adequate personal protective equipment and infection control measures may greatly reduce the spread of influenza within a health care setting. It is therefore essential to plan, train on the proper use of, and provide appropriate levels of PPE and infection control for each phase of pandemic influenza. Many of the recommendations for PPE and infection control within this document are based on guidelines used for outbreaks of diseases such as SARS or other highly pathogenic respiratory agents.

Assumptions

1. The term "health care setting" applies to any situation where medical care is provided to a person potentially infected with a pandemic strain of influenza.
2. 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.
3. CDC Guidelines for isolation in health care settings will be followed, including using standard precautions for all patients and using droplet, contact and/or airborne precautions are utilized when indicated in health care settings.
4. Within health care settings, respiratory hygiene and cough etiquette guidelines are currently being followed.
5. Health care providers may choose to not wear PPE for personal reasons (e.g. interferes with ability to perform duties).
6. All health care workers are expected to provide care for patients with known or suspected pandemic influenza virus, as well as comply with PPE, infection control and public health recommendations.
7. Transmission risk in health care facilities (including hospitals, long-term care, and outpatient facilities) will depend on multiple factors including the extent of virus activity in the community, virus activity in the facility and compliance with PPE, infection control and public health recommendations.

8. Decisions regarding the need for escalating infection control measures will be based on virus activity and transmission risks.

Planning considerations
The incubation period for human influenza virus is usually one to three days (range one to seven days) for most influenza viruses.

Routes of transmission
Transmission of human influenza is predominately by large (>5 microns) respiratory droplet nuclei, and to a lesser degree by the fine droplet nuclei that are expelled from the respiratory tract during coughing, sneezing and even talking. Transmission also occurs through direct contact with articles contaminated with respiratory secretions followed by touching the nose, eyes or mouth.

8. Travel related issues
Crowed populations in enclosed spaces are particularly vulnerable to influenza virus transmission due to its ability to spread through air easily and by direct contact. 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 persons who were 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.

Assumptions
1. Infectious disease can spread rapidly around the world through travel, including by travel through Iowa's conveyances.
2. Airport personnel and those affiliated with other methods of conveyance within Iowa will work with IDPH to initiate active surveillance and travel restrictions when necessary.
3. Airport personnel and those affiliated with other methods of conveyance within Iowa will communicate with IDPH regarding remarkable incidents of infectious disease and will ask for consultation in dealing with these incidents.

A list of general objectives is identified within this focus area. The specific activities associated with meeting each of these objectives will depend on the characteristics of the virus responsible, the outbreak, and particularly the location where novel cases or the outbreak originates. More specific recommendations will be developed, in accordance with federal guidance, as soon as is reasonably possible following the threat or onset of a pandemic. Some or all of the objectives listed below may not apply to all circumstances.

Objectives:
- 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.[1]

Regardless of the current pandemic phase, airports and other ports of entry should be instructed to communicate with or obtain information from IDPH regarding a potential or actual infectious disease emergency, by notifying CADE.

9. 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. The hospitals will direct requests for bed availability to IDPH. 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, hospitals will be encouraged to coordinate the activation of these facilities with IDPH.

Assumptions

1. The average surge capacity of Iowa hospitals is 6,217 patients; maximum surge capacity of Iowa hospitals is 7,655 patients.
2. IDPH maintains a capacity list for all hospitals in the State of Iowa that includes number of staffed beds, number of physicians and nursing staff, personal protective equipment inventory, isolation capacity and morgue capacity.
3. All hospitals have the ability to place at least one patient in negative-pressure isolation.
4. All hospitals have established surveillance procedures and perform surveillance for infectious disease.
5. All hospitals have a decontamination shower and are capable of decontaminating over 1,000 ambulatory patients per hour and 533 non-ambulatory patients per hour.

[1] Because jurisdictions and authorities at airports and other ports of entry overlap, it is important that local, state, and federal staff establish protocols and agreed upon roles and responsibilities in advance of a bioemergency. Roles and responsibilities should be outlined for the various partners and the various levels of jurisdictions (local, state, and federal) for each component of the response.

6. Hospitals will use the Hospital Emergency Incident Command System during a public health emergency.

Emergency Medical Services

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.

II. Phases 1 and 2

Phase 1 refers to the inter-pandemic period. There are no new influenza subtypes in humans, although a subtype that has caused human infection may be present in animals.

Phase 2 includes the level of activity described in phase 1, but a circulating animal subtype poses a substantial risk of causing human disease.

Focus areas

A. Pre-vaccine preparedness

Objectives for pre-vaccine preparedness in Phases 1 and 2:

- Provide technical assistance to LPHA's for planning and policy development:
  - On the receipt, handling, and storage of antiviral medications and immunizations;
  - For plans for distribution within the community and at health care facilities;
  - On the development and release general educational materials for the public on issues surrounding pandemic influenza; and
  - On the planning of localized vaccine clinics.
- Develop and release general educational materials for the public on issues surrounding pandemic influenza
- Review the current draft of *the Department of Health and Human Services Plan for Requesting, Receiving, and Distributing the Strategic National Stockpile* and update it as necessary for receipt and distribution of influenza antivirals.

B. Consideration of antivirals

Objectives for consideration of antivirals in Phases 1 and 2:

- Evaluate the efficacy of antiviral medication against currently circulating animal strains of influenza.
- Explore the feasibility and potential benefit of stockpiling antivirals at the state level and through the SNS.

C. Prioritization of vaccine once available

Objectives for prioritization of vaccine in Phases 1 and 2:

- Establish an Infectious Disease Advisory Committee

An Infectious Disease Advisory Committee (IDAC) will be utilized for consultation. This committee is comprised of a group of statewide experts that can be pulled together on an as-needed basis to offer advice in the event of a bioemergency involving the state of Iowa. The committee may meet if circumstances surrounding the current influenza year require expert opinion and input.

Members of this committee are drawn from both the state and local levels and include representatives from the medical, public health, and hospital arenas.

The following groups are considered for representation on the IDAC:

- IDPH (state epidemiologist, immunization CDC representative, immunization program manager, CADE medical director, public health veterinarian, ER physician from governing board of EMS)
- Iowa Medical Society
- Iowa Osteopathic Medical Association
- Iowa Hospital Association
- Iowa Immunization Coalition
- Attorney General's Office
- Iowa Department of Public Safety
- University Hygienic Laboratory
- Homeland Security and Emergency Management

Other members of the IDAC will likely include representatives from LPHA's, Iowa infectious disease physicians, other community physicians, and an ethicist.

D. Distribution of the vaccine and antivirals

Objectives for distribution of vaccine and antivirals in Phases 1 and 2:

- IDPH will distribute seasonal influenza vaccine to both private and public providers participating in the VFC program.

E. Surveillance

Objectives for surveillance in Phases 1 and 2:

- Continue current routine influenza surveillance methods:
    - Iowa Influenza Surveillance Network;
        - Sentinel physician providers
        - Schools, child care and long-term care facilities (LTCF's) reporting
        - Passive 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).
- Maintain communication with IDALS allowing for rapid communication should a strain which affects humans and animals be detected by either branch.

F. Laboratory

Objectives for laboratory in Phases 1 and 2:

- UHL maintains a relationship with other laboratories: Before an event, UHL will assess the capabilities and establish contact with the clinical, veterinary and private labs.
- UHL is expected to coordinate result reporting from clinical (sentinel) laboratories and other providers performing rapid tests. UHL maintains current contact information to communicate with partners.
- When influenza virus is not known to be circulating in a community, the likelihood of a false positive result is high because of the low predictive value of some tests. At the beginning of the influenza season, the first positive test results obtained in clinical facilities performing rapid influenza testing should be sent to UHL for confirmation. IDPH is notified of all test results confirmed by UHL.

- To maintain competency, UHL participates in the proficiency-testing program sponsored by the College of American Pathologists at performing influenza and other viral testing.
- UHL identifies and defines the role of available tests and is knowledgeable as to what tests are utilized in other laboratories throughout Iowa. UHL provides recommendations on the test or tests that will be the most beneficial to controlling an outbreak.
- UHL staff is trained regarding laboratory safety, has available necessary personal protective equipment (PPE), utilizes appropriate biosafety level practices and equipment, and complies with all University of Iowa Employee Health and Health Protection Office recommendations.
- If there is suspicion of a pandemic strain, a courier service or overnight delivery service is utilized to transport specimens to UHL from health care settings.
- UHL maintains a system of electronic reporting to CDC and IDPH to facilitate rapid transmission of results.
- UHL cross-trains the staff, identifies expertise and special skills needed to respond, maintains a plan for shift coverage, and can mobilize resources to meet the testing needs of an event.
- UHL maintains contact with CDC and the Association of Public Health Laboratories (APHL) before an event by participating in conference calls, meetings and participating in the Epi-X list-serve.

G. Personal Protective Equipment and infection control

Objectives for personal protective equipment in Phases 1 and 2:

- Encourage routine influenza vaccination of all health care workers
- Ensure ongoing appropriate respiratory hygiene/cough etiquette programs in health care settings (see Appendix D).
- Ensure health care facilities are following CDC Guidelines for isolation precautions in hospitals (http://www.cdc.gov/ncidod/hip/ISOLAT/Isolat.htm)

H. Travel related issues

Objectives for travel related issues in Phases 1 and 2:

- Outline surveillance efforts with regard to travel.
    - Obtain and/or develop passenger-screening tools for inbound travelers.
    - Obtain and/or develop screening tools for inbound travelers for use in health care settings.

I. Hospital surge capacity

Objectives for hospital surge capacity issues in Phases 1 and 2:

- The HAN will be tested twice yearly for all hospitals and local public health agencies.
- The 800 mHz radios will be tested monthly.
- The Capacity Reporting System will be tested as it is implemented.
- Alerts will be sent to hospitals as appropriate.

III. Phase 3

Phase 3 involves human infection with a new subtype, no human to human spread, or rare spread to close contacts.

Focus Areas

A. Pre-vaccine preparedness

Objectives for pre-vaccine preparedness in Phase 3:

- Continue ongoing activities from previous phases as appropriate.
- Release influenza alert statements to IDAC, LPHA's, health care providers and others as appropriate.

B. Consideration of antivirals

Objectives for consideration of antivirals in Phase 3:

- Continue ongoing activities from previous phases as appropriate.
- Maintain ongoing communication with CDC and other organizations as necessary for updates on antiviral efficacy against the strains.
- Establish ongoing communication with IDAC members to confirm their willingness to participate on the current situation, as they may be needed if the pandemic virus becomes more of a threat.
- Assess availability of antiviral agents.
- Develop educational materials related to antiviral administration.

C. Prioritization of vaccine once available

Objectives for prioritization of vaccine in Phase 3:

- Continue ongoing activities from previous phases as appropriate. Communicate with members of the IDAC to update them on the current situation.
- Assess availability of vaccines:
  - When available, adequate supplies of vaccines will be determined.
  - Educational materials related to vaccine administration will be developed.
  - Public health will determine the target population and high-risk groups for vaccine administration.
  - Routine influenza vaccine administration will be promoted, as this will decrease the potential for re-assortment between routine influenza strain and pandemic virus strain.

D. Distribution of vaccine and antivirals

Objectives for distribution of vaccine and antivirals in Phase 3:

- Continue ongoing activities from previous phases as appropriate.
- IDPH will distribute VFC Influenza vaccine to both private and public VFC providers as described in the introduction.

E. Surveillance

Objectives for surveillance in Phase 3:

Continue ongoing activities from previous phases as appropriate.

If this phase is reached during the summer months and schools are not in session, consider recruiting large child care centers and LTCF's around the state to monitor and report ILI or monitor and report the current case definition of illness.

- IDPH will monitor and revise recommendations from the CDC for any additional surveillance activities that should be undertaken.

- Consider expanding virologic and disease-based surveillance to year-round surveillance. This could be accomplished by:
    - asking all current sentinel providers to monitor ILI year-round;
    - asking a subset of current sentinel providers to monitor ILI year-round;
    - asking all current school, child care and long-term care participants to report year-round; or
    - asking a subset of current school, child care and long-term care participants to report year-round.
- Recruit additional providers to monitor ILI and send isolates to UHL year-round.
- Recommend viral testing and case investigation for ILI outside of the "typical" influenza season. UHL will contact clinical laboratories in Iowa and request submission of any specimen that tests positive using a rapid influenza assay.
- Monitor for ILI in persons traveling from geographic areas in which pandemic strains have been isolated and/or in areas where there has been confirmed highly pathogenic avian influenza (HPAI) activity.
- Monitor and determine with IDALS if animal influenza surveillance and biosecurity measures should be expanded.

F. Laboratory

Objectives for laboratory in Phase 3:

- Continue ongoing activities from previous phases as appropriate.
- Contact clinical laboratories in Iowa and request submission of any specimen that tests positive using a rapid influenza assay. All positive rapid tests will be screened within 24 hours of receipt by PCR to determine the accuracy of the rapid test result and the strain of virus detected. All PCR negative specimens will be cultured for other viruses.
- Information on specimen collection and transportation will be posted on the UHL and IDPH websites.

G. Personal protective equipment (PPE) and infection control

Objectives for PPE and infection control in Phase 3:

- Continue ongoing activities from previous phases as appropriate.
- Develop the ability to institute 24-hour telephone triage system as well as translation services as needed.
- Develop and index of suspicion tool for use with patients hospitalized with ILI or pneumonia.
- Assess availability of PPE supplies and equipment.
- Develop educational materials related to the use of PPE and infection control equipment.
- Develop a plan for the reinforcement of compliance with PPE and infection control measures in the event of a pandemic of influenza.
- Designate staff to assist infection control practitioners (ICP's) in the event of an influenza pandemic.
- Develop criteria for health care worker furloughs and work restrictions. Include detail for home/work restrictions to ensure sufficient staffing levels. Restrictions on travel to and from work will also be included.
- Ensure health care providers have access to mental health professionals to help them cope with the emotional strain of managing a pandemic. Examples include an employee assistance program and Critical Incident Stress Management and Psychiatry.

H. Travel related issues

Objectives for travel related issues in Phase 3:

- Identify appropriate contact persons for state agencies and other partners responsible for or with vested interest in transportation and bioemergency response related issues. (DPH, HLSEM, DOT, etc.)
- Determine which agencies have legal authority to restrict interstate and international travel for health reasons.

I. Hospital surge capacity

Objectives for hospital surge capacity related issues in Phase 3:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.

IV. Phase 4

Phase 4 occurs when the world is experiencing small clusters of cases of a novel influenza with limited human-to-human transmission and highly localized spread, suggesting virus is not well adapted to humans.

Focus Areas

A. Pre-vaccine preparedness

Objectives for pre-vaccine preparedness in Phase 4:

- Continue ongoing activities from previous phases as appropriate.
- Communicate with members of the IDAC and update them on current situation.
- Maintain ongoing communication with CDC and other organizations as necessary for updates on antiviral efficacy against novel influenza strains and for information on vaccine development.

B. Consideration of antivirals

Objective for consideration of antivirals in Phase 4:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.

C. Prioritization of available vaccine

Objectives for prioritization of vaccine in Phase 4:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- Keep IDAC on notice of any pending situations that may require action by the committee.

D. Distribution of vaccine and antivirals

Objectives for distribution of vaccine and antivirals in Phase 4:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- IDPH will distribute VFC Influenza vaccine to both private and public VFC providers as described in Appendix B.

E. Surveillance

Objectives for surveillance in Phase 4:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.

F. Laboratory

Objectives for laboratory in Phase 4:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.

G. Personal protective equipment and infection control

Objectives for PPE and infection control in Phase 4:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.

H. Travel related issues

Objectives for travel in Phase 4:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- Gather partners and prepare control strategies to prevent spread of infection to Iowa from affected areas.
- Determine the appropriateness of implementation of any control strategies to support federal efforts.
-

I. Hospital surge capacity

Objectives for hospital surge capacity in Phase 4:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.

V. Phase 5

Phase 5 involves larger clusters of influenza disease, but human-to-human spread is still localized and the virus is increasingly better adapted to humans, but not yet fully transmissible.

Focus Areas

A. Pre-vaccine preparedness

Objectives of pre-vaccine preparedness in Phase 5:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- Gather partners and assess control strategies to be implemented and develop an implementation plan.
- Identify resources necessary to implement control strategies.
- Contact liaison with neighboring states to coordinate efforts.
- Implement control strategies.
- Release updates to public health departments, health care facilities and clinics as appropriate.
- Provide recommendations regarding other ways to promote respiratory hygiene, hand washing, avoiding school, work and public places when ill.

B. Consideration of antivirals

Objectives of consideration of antivirals in Phase 5:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- Evaluate the availability of antiviral drugs within Iowa that are recognized to be effective against the virus with plan to purchase if not available.
- Review and update antiviral chemoprophylaxis and treatment protocol based on information obtained.
- IDAC will communicate by email with health care and public health professionals about any CDC guidance on antiviral use or epidemiology information on the virus.
- Develop an antiviral allocation plan for counties based on CDC guidelines and recommendations for antiviral prophylaxis and treatment.
- Integrate already existing state procedures for distribution of Strategic National Stockpile (SNS) assets into antiviral distribution plan.
- Educate and train on the receipt, handling and storage of antiviral medications.
- Prepare to provide technical assistance to local health departments/counties to ensure readiness for receipt, storage and distribution of antivirals.
- Communicate with local health departments the expected delivery date(s) of needed supplies and antiviral drugs.
- Consider the use of antivirals for international travelers.
- Verify legality of distribution and redistribution of anti-viral medication with the AG's office.

C. Prioritization of vaccine once available

Objectives of prioritization of vaccine in Phase 5:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- IDAC should be in immediate communication by email.
- Communication of vaccine prioritization to public.

Considerations for priority determination
Once developed, the priority determination list will also be subject to change, potentially on short notice, depending on additional epidemiologic and clinical features exhibited by the pandemic strain.
Some of the factors that would go into making the prioritization decisions would be:

- virulence and whether it disproportionately affects certain populations;
- pathogenicity; and
- efficacy of antivirals.

As the priority group recommendations from the federal government become available, the IDAC will meet. Its role at this point will be to issue any clarifications of CDC/Advisory Committee on Immunization Practices guidelines, to determine if any deviations from these guidelines are required for Iowa, and make decisions about how to allocate possibly extremely limited supplies of vaccine. The decisions of the IDAC will go to the Director of IDPH for approval and public health orders will be issued to ensure compliance.

Iowa population distribution assessment
CADE and the Bureau of Disease Prevention and Immunization (DPI) will work together to determine the number of Iowans that fall into each of the CDC/ACIP defined priority groups. This information will be used to help determine vaccine allocation and distribution strategies.

Public education campaign/formulation of public message and dissemination
IDPH [CADE, DPI and Center for Disaster Operations and Response (CDOR)] will develop an education campaign to explain the federal prioritization guidelines and the process by which limited supplies of vaccine will become available. As more vaccine becomes available, further education will be conducted to update the public, LPHA's and medical providers on vaccine distribution and any changes to the prioritization guidelines. Education on other ways to prevent the spread of influenza (respiratory hygiene, hand washing, avoiding school, work, and public places when ill) will continue throughout this phase. Information will also be provided on how adverse reactions to the vaccine will be reported through the Vaccine Adverse Events Reporting System system.

D. Distribution of vaccine and antivirals
Objectives for distribution of vaccine and antivirals in Phase 5:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- Assessment and assignment of the distribution scenario.

Scenario A- Public system purchase and distribution. CDC or state will purchase the vaccine and distribute to the private sector.

Scenario B- A mixed public-private system where public sector supplies may be targeted to specific priority groups. The proportion of vaccine for each sector may change as target groups and available vaccine supply changes during the course of the pandemic response.

Scenario C- Maintenance of the current, largely private system (i.e. many hospitals and clinics offer vaccination as a service not sponsored by state or federal government). If the new vaccine is shipped primarily to private providers through the current system, IDPH will continue its current distribution practices, giving priority to the new influenza vaccine.

Scenario D- All vaccine orders are purchased from CDC or the state and distributed from the manufacturer or using a 3rd party distributor.

Planning will also take into account whether vaccine purchase recommendations will apply only to a pandemic and will not alter existing vaccine purchase and distribution mechanisms for annual influenza vaccination

Redistribution

In the event that some counties or areas have sufficient supply of vaccine to reach the targeted population and other counties or areas are still in need, redistribution of vaccine will need to be undertaken. This activity will be coordinated by DPI. Staff from the Immunization Program along with community partners are currently working on a vaccine shortage redistribution plan. Specifics of redistribution will be defined in the vaccine shortage redistribution plan.

E. Surveillance

Objectives for surveillance in Phase 5:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- IDPH will monitor and revise recommendations from the CDC for any additional surveillance activities that should be undertaken.
- Distribute a case definition, based on description of known cases from affected countries, to public health departments, health care facilities and clinics.
- Continue current routine influenza surveillance methods and/or activate system if outside the normal October-May surveillance season.
- Recruit additional schools to report weekly absentee levels within regions of the state where there are no schools in the IISN.
- Recruit additional physicians/sentinel sites to report ILI from regions of the state where there are no sentinel providers or select sites that will allow identification of influenza in specific subpopulations. (e.g. high-risk groups, hospital and emergency rooms, children, healthy adults and work-based populations, those likely to travel)

Monitor ILI in persons traveling from geographic areas in which pandemic strains have been isolated and/or in areas where there

F. Laboratory

Objectives for laboratory in Phase 5:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- Testing may be prioritized based on criteria provided by IDPH.

G. Personal protective equipment and infection control

Objectives for PPE and infection control in Phase 5:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- Develop strategies for hospital and outpatient clinic infection control.

H. Travel related issues

Objectives for travel related issues in Phase 5:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- Obtain and review federal guidance with regard to implementation of travel advisories, precautions or restrictions.
- Establish intervention units at designated airports for international travelers returning from foreign countries where a pandemic strain has been identified.

I. Hospital surge capacity

Objectives for hospital surge capacity issues in Phase 5:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.

VI. Phase 6

In this phase, a global pandemic has been declared. There are *three distinct progressions* within Phase 6 according to the location and spread of the pandemic virus. They are the following:

A. Pandemic strain is circulating in the world but is not yet in the U.S.
B. Pandemic strain is circulating in the U.S. but is not yet in Iowa.
C. Pandemic strain is circulating in Iowa.

Organization

For this phase of the plan, the activities for each focus area specific to the progression are listed under each progression area. Each progression has a general preparedness section in addition to the IDPH focus areas.

A. Pandemic virus has not yet reached the United States

Focus Areas

1. General preparedness

Objectives for general preparedness in progressions of Phase 6:

- Maintain weekly/daily electronic and/or phone contact with CDC and other organizations as necessary for updates on virus activity and epidemiology.
- Release weekly updates to public health departments, health care facilities and clinics.
- Conduct education regarding voluntary home quarantine for Iowans who have traveled internationally to affected countries.
- Conduct education regarding voluntary home isolation for symptomatic Iowa travelers returning from affected countries.
- Establish toll-free number for communication with public health departments and health care facilities.
- Establish toll-free number for communication with citizens in multiple languages.
- Provide recommendations to local public health departments, health care facilities, and EMS to re-familiarize themselves with their emergency plans.
- Disseminate CDC's assessment data that contains the percentages of high-risk populations and target populations for chemoprophylaxis and treatment.
- Disseminate CDC's guidelines and recommendations for chemoprophylaxis and treatment, including prioritization of specific target populations/groups.
- Assist with the calculation and review of county specific high-risk target population data (e.g. infants 6-23 months, children less than 5 years, adults over 65 years, immunocompromised, cardiopulmonary disease, or other groups identified by CDC).
- Assist with the maintenance of health care capacity and quality, and maintenance of public safety. These populations may include health care workers, hospital ancillary staff, first responders, law enforcement, public safety personnel, and others.
- Assist with the calculation and review of county-specific antiviral doses required for chemoprophylaxis or treatment of identified high-risk populations and other target groups identified to receive chemoprophylaxis or treatment.

2. Pre-vaccine preparedness

Objectives of pre-vaccine preparedness in all progressions of Phase 6:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- Release updates to public health departments, health care facilities and clinics as appropriate.
- Provide recommendations for education on standard precautions and personal protection. These recommendations will be distributed to public health departments, health care facilities and clinics.
- Provide recommendations for isolation precautions for suspected influenza (routine and otherwise). These recommendations will be distributed to public health departments, health care facilities and clinics.
- Provide recommendations regarding other ways to promote respiratory hygiene including hand washing and when to avoid school, work and public places.

3. Consideration of antivirals

Objectives of consideration of antivirals in all progressions of Phase 6:

- Continue ongoing activities from previous phases. Expand as needed.
- If the person-to-person spread is in the U.S., the IDAC committee may decide to meet and discuss any antiviral information available and begin looking at which populations are being most affected by the particular influenza strain.
- Provide technical assistance to local health departments/counties to ensure readiness for receipt, storage and distribution of antivirals.
- Communicate with local health departments the expected delivery date(s) of needed supplies and antiviral drugs.
- Consider the use of antivirals for international travelers.

4. Prioritization of vaccine once available

Objectives of prioritization of vaccine in all progressions of Phase 6:

- Continue ongoing activities from previous phases. Expand as needed.
- IDAC will develop prioritization guidelines based on CDC guidance.
- IDAC should be available at any time to communication by email.
- Any CDC guidance on possible vaccine production or epidemiology information on the virus should be evaluated by IDPH and IDAC.
- If the person-to-person spread is in the U.S. the committee may decide to meet and discuss any vaccine information available and begin looking at which populations are being most affected by the particular influenza strain.
- Formulate and disseminate public information campaign.
- Continue to effectively communicate priorities for antiviral drugs and vaccine use to ensure appropriate utilization of medications.
- Evaluate and modify control strategies based on epidemiological investigation and surveillance data.
- CADE and DPI will work to determine the number of Iowans that fall into each of the CDC/ACIP defined priority groups. This information will be used to help determine vaccine allocation and distribution strategies.

Development of prioritization recommendations for Iowa

Vaccine is not likely to be available at the beginning of the pandemic period. It is assumed that the WHO/CDC will have begun vaccine development when Phase 5 is reached. Guidance from the federal level will become available on the prioritization of

vaccine as enough surveillance data is collected to get an idea of which populations are most affected.

Once developed, the priority determination list will be subject to change, potentially on short notice, depending on additional epidemiologic and clinical features exhibited by the pandemic strain.
Some of the factors that would go into making the prioritization decisions would be:

- Virulence and whether the viral strain disproportionately affects certain populations;
- pathogenicity; and
- the efficacy of antivirals.

As the priority group recommendations from the federal government become available, the IDAC will meet. Its role at this point will be to issue any clarifications of CDC/Advisory Committee on Immunization Practices guidelines, to determine if any deviations from these guidelines are required for Iowa, and make decisions about how to allocate possibly extremely limited supplies of vaccine. The decisions of the IDAC will go to the Director of IDPH for approval and public health orders will be issued to ensure compliance. A number of goals will be considered when formulating prioritization guidelines including:

- limiting mortality among high-risk groups;
- reducing morbidity in the general population;
- minimizing social disruption and economic losses; and
- Maintenance of elements of community infrastructure that are essential to carrying out the pandemic response plan.

Public education campaign/formulation of public message and dissemination
IDPH [CADE, DPI and Center for Disaster Operations and Response (CDOR)] will develop an education campaign to explain the Iowa prioritization guidelines and how limited supplies of vaccine will become available. As more vaccine becomes available, further education will be conducted to update the public, LPHA's and medical providers on vaccine distribution and any changes to the prioritization guidelines. Education on other ways to prevent the spread of influenza (respiratory hygiene, hand washing, avoiding school, work, and public places when ill) will continue throughout this phase. Information will also be provided on how adverse reactions to the vaccine will be reported through the Vaccine Adverse Events Reporting System (VAERS) system.

Continued situational assessment
The first wave will begin to taper off as the seasons change. This should allow recovery to occur in communities and the health care system. Vaccine production will continue and administration will help to decrease susceptibility for the next wave. If needed IDAC will continue to meet to review effectiveness of control strategies and modify recommendations.

Based on past experience, a second wave of outbreaks may occur within three to nine months of the initial epidemic. Subsequent waves are likely to be less severe because a large portion of the population will be less susceptible having had the disease or having been vaccinated during the previous season. Vaccine supply is likely to be greater given ongoing production and higher yields as manufacturers improve methods. This greater supply may lead to different strategies for vaccination, possibly including greater reliance on delivery by the private sector as occurs during annual influenza

epidemics. Response activities implemented during this phase will be similar to those in Phases 1 and 2.

5. Distribution of vaccine and antivirals

Objectives of distribution of vaccine and antivirals in all progressions of Phase 6:

- Continue ongoing activities from previous phases. Expand as needed.
- Assessment and assignment of the distribution scenario.
- If possible, IDPH will coordinate the distribution of vaccine according to the distribution scenario.
- Consider the variations in scenarios depending on the severity of the pandemic.
- Consider whether vaccine purchase and distribution scenarios will apply only to a pandemic and will not alter the purchase and distribution of vaccine for annual influenza vaccination.

6. Surveillance

Objectives for surveillance in all progressions of Phase 6:

- Continue ongoing activities from previous phases. Expand as needed.
- Continue current routine influenza surveillance methods or activate system if outside the normal October-May surveillance season.
- Consider initiating travel screening methods at incoming Iowa conveyance locations and in health care settings for ILI and international exposure.

Strategies if current systems of ILI surveillance and lab testing are exceeding capacity:

- If sentinel providers are unable to report specific numbers ask them to estimate a level of ILI in their practice on a weekly basis. CADE may choose to switch to active surveillance and call providers on a weekly basis.
- Use *Iowa's Capacity Reporting System* (estimated to be operational winter 2005) to monitor ILI within hospitals. *Iowa's Capacity Reporting System* will provide real-time information on the capacity of Iowa's hospitals and EMS transport services in the event of a disaster. The system can be modified so IDPH can request that hospitals relay information from their Infection Control Providers on the number of inpatients within their facility meeting a defined case definition of illness in the event of a pandemic. The system could also be used to identify how many persons are presenting to Iowa's emergency departments who meet the defined case definition for influenza-like illness. (*Iowa's Capacity Reporting System* could be activated at any phase and level). Iowa's Health Alert Network will be used in conjunction with the *Iowa Capacity Reporting System* to notify hospitals and EMS transport services.
- Consider requesting schools enrolled in the IISN to return back to reporting weekly absentee rates versus the enhanced daily absentee rates.
- Develop a system to assess vaccine coverage and determine number of persons who remain unprotected.
- Consider using antibody testing to determine who may be immune if the public situation becomes extreme and immunologically-protected volunteers are needed.
- IDPH will monitor and revise recommendations from the CDC for any additional surveillance activities that should be undertaken.

After the first pandemic wave ends, surveillance methods should return to enhanced surveillance methods activated before or in Phase 5. Maintaining this level of surveillance will help to determine the onset of a subsequent pandemic wave.

- Prepare hospitals, providers and health departments for the possibility of a second wave.
- Assess vaccine efficacy, safety and impact during the pandemic.
- Assess vaccine coverage and determine number of persons who remain unprotected.
- Assess antiviral effectiveness, safety, and cost-effectiveness.

7. Laboratory

Objectives for laboratory for all progressions of Phase 6:

- Continue ongoing activities from previous phases. Expand as needed.
- Reagents and supplies sufficient to test a minimum of 500 up to 1000 specimens will be maintained. This par level will be adjusted daily to meet the needs of the state based on information received from IDPH and CDC.
- Availability of trained personnel and backup personnel will be determined and augmented if necessary. Sufficient staff may be reassigned and the hours/days of operation may be adjusted to meet the needs identified.
- Equipment status will be confirmed and the availability of backup equipment will be arranged.
- Additional Personal Protective Equipment (PPE) will be ordered to meet the needs of the event.
- Facility space needs for testing will be evaluated during the incident.
- "Rule-out" testing, i.e. the laboratory diagnosis of the cause of a respiratory disease due to an agent other than influenza virus will be available at UHL throughout this phase. All specimens will be screened first by polymerase chain reaction (PCR). All PCR negative specimens will be cultured for other viruses. When the PCR test is positive and not the pandemic strain of influenza virus, the specimen will be cultured to determine the strain of influenza virus circulating in Iowa.
- Testing may be prioritized based on criteria provided by IDPH.
- UHL will maintain contact with CDC and APHL in an event by participating in conference calls, meetings and participating in Epi-X.

Communication channels and protocols among laboratories and between laboratories and other response partners

- UHL will send information to clinical laboratories throughout the state via the Iowa Laboratory Response Network (LRN) whenever there is a change in the progression.
- UHL will keep Iowa laboratories informed of diagnostic testing information and issue updated testing instructions as necessary.
- At the beginning of the event, UHL will provide instructions to Iowa laboratories for specimen collection and shipping.
- Instructions will be posted on the UHL and IDPH websites and HAN.
- Instructions will be sent via Iowa Laboratory Response Network email to all sentinel laboratories.
- Biohazard information and safety guidelines will be included with shipping instructions.

Results reporting

- All test results will be reported with an explanation and interpretation of results, focusing on the strengths and limitations of the assay, per CDC guidelines.
- Positive test results will be reported immediately to the submitter, IDPH, and others as needed by electronic reporting, when possible.
- Negative results will be reported electronically or by U.S. mail depending on facility abilities. (In some situations, negative results will be reported immediately by phone to IDPH and health care provider.)
- Information regarding influenza activity will be posted on the UHL web page and HAN.

8. Personal protective equipment and infection control

Objectives for PPE and infection control in all progressions of Phase 6:

- Continue ongoing activities from previous phases. Expand as needed.
- Implement screening areas separate from usual health care setting entrances.
- Increase communication with health care providers by any and every efficient mean.
- Implement hospital access controls.

Hospital strategies

Screening of patients and those with them should ideally occur in a pre-designated area and masks should be provided to symptomatic patients before entering the facility. Signs (in multiple languages) should be placed at the entrances to Emergency Departments (ED) and outpatient facilities requesting that persons with certain epidemiologic criteria coupled with an influenza-like illness identify themselves to the registration clerk or triage nurse, who should be using appropriate PPE.

The following should also be available at those facilities:

- Posted visual alerts will recommend respiratory hygiene precautions.
- Masks should be available for patients prior to them entering the ED/outpatient facilities.
- The ability to screen persons accompanying the patient for evaluation for symptoms of the influenza virus prior to entering the facility.
- If possible, a separate waiting area should be provided for patients with respiratory symptoms.
- Active screening of symptomatic patients for either a personal or contact history of travel to geographic area with pandemic virus activity.

Screening measures should ideally occur in a pre-designated area and masks should be provided to symptomatic patients before entering the facility.

Communication

Clinicians, intake, and triage staff will be regularly updated on the status of the pandemic locally, nationally, and internationally by any and every efficient means of communication (i.e. via email, memoranda, Health Alert Network, or meetings).

Intake and triage staff should be trained on how to assess risks for the pandemic strain of influenza and use any applicable tools (thermometers, CDC or state forms, etc) to screen patients. The pre-identified coordinators will develop a strategy to assign responsibility.

Hospital access controls
When pandemic influenza is present in the community, preventing patients with an unrecognized pandemic strain of influenza from entering the facility will be essential. Triage should occur outside or in an alternate location (tent, trailer, mobile home, etc.). Those admitted should wear a mask during transport within the health care facility and immediately be placed in appropriate isolation.

Consider limiting hospital visitors and involve police services to enforce access limitations in the event when there are cases of pandemic influenza in the facility but no nosocomial transmission.

Consider limiting hospital admissions, transfers, and discharges (in accordance with local/state recommendations and regulations) in the event that nosocomial transmission of a pandemic strain of influenza occurs.

Establish criteria and protocols for closing the facility to new admissions and transfers in the event that nosocomial transmission of a pandemic strain of influenza occurs (i.e., health care workers ill). This should be done in consultation with the IDPH.

9. Travel related issues
Objectives for travel related issues in Phase 6, virus not in U.S.:

- Continue ongoing activities from previous phases. Expand as needed.
- Release a travel advisory utilizing IDPH issued statements, press releases and mass media.
- Gather partners and assess control strategies to be implemented and develop an implementation plan.
- Identify resources necessary to implement the control strategies.
- As needed, liaison with neighboring states to coordinate efforts.
- Implement control strategies.

10. Hospital surge capacity
Objectives for hospital surge capacity issues in Phase 6, virus not in U.S.:

- Continue ongoing activities from previous phases as appropriate. Expand as needed.
- Increase regular testing of HAN, 800 mHz radio system and Capacity Reporting System to a monthly basis.
- Request inpatient capacities weekly.
- Request that hospitals immediately notify IDPH is overall census exceeds 90% or if their Intensive Care Unit (ICU) exceeds 80%.

B. Pandemic Influenza Virus not identified in Iowa but identified in the U.S.

Focus Areas

1. General preparedness

Objectives for general preparedness in previous progression and virus in U.S.:

- Continue ongoing activities from previous phases. Expand as needed.
- Activation of state and local emergency operation centers may occur.
- Consider mandatory home quarantine or isolation, if ILI is present, of Iowans who have traveled to areas of pandemic spread.
- Provide recommendations regarding active testing of patients with influenza-like symptoms.
- Provide recommendations and education regarding limited interstate travel.
- Provide recommendations for public health departments, health care facilities, and EMS to activate their emergency plans.
- Coordinate response efforts with appropriate agencies, including law enforcement, homeland security, and transportation.

2. Please refer to "Pandemic Influenza Virus identified in world but not in U.S." for the objectives for the following focus areas: Pre-vaccine, post-vaccine, consideration of antivirals, surveillance, laboratory and personal protective equipment.

3. Travel related issues

Objectives for travel related issues in previous progression and virus in U.S.:

- Continue ongoing activities from previous phases. Expand as needed.
- Outline surveillance efforts with regard to travel.
- Obtain and/or develop passenger-screening criteria for inbound travelers.
- Determine staffing requirements to implement inbound traveler screening.
- Determine appropriateness of isolation and/or quarantine for ill and exposed travelers.
- Make arrangements for rapid testing and specimen collection for symptomatic ill inbound travelers.
- Obtain and/or develop procedures for the use of antivirals and vaccine for the treatment or prophylaxis of ill individuals and exposed persons. Consider ring containment around ill travelers.
- Establish a mechanism for timely trace back with cooperation of airlines to identify possible contacts during course of travel from point of origin for ill individuals.
- Establish a mechanism to track development of illness in contacts.

4. Hospital surge capacity

Objectives for hospital surge capacity related issues in previous progression and virus in U.S.:

- Continue ongoing activities from previous phases. Expand as needed.
- Increase regular testing of HAN, 800 mHz radio system and Capacity Reporting System to a weekly basis.
- Request that hospitals limit transfer of non-urgent patients to tertiary facilities.

C. Pandemic Influenza Virus identified in Iowa

Focus Areas

1. General preparedness

Objectives for general preparedness in previous progressions and virus in Iowa:

- Continue ongoing activities from previous phases. Expand as needed.
- State Emergency Operations Center (EOC) fully staffed.
- IDPH EOC fully staffed.
- Consider closure of certain high population density venues including, but not limited to:
    - Schools
    - Malls
    - Theaters
- Increase staffing of toll-free numbers.
- Consider quarantine of affected geographic areas.
- Provide recommendations to health care facilities regarding cohorting of symptomatic patients.
- Provide recommendations regarding establishment of alternative care facilities as appropriate.
- Provide recommendations for isolation precautions for suspected influenza (routine and otherwise). These recommendations will be distributed to public health departments, health care facilities and clinics.
- Provide recommendations regarding other ways to promote respiratory hygiene, hand washing, avoiding school, work and public places when ill.

2. Please refer to "Pandemic Influenza Virus identified in world but not in U.S." for the objectives for the following focus areas: Pre-vaccine, post-vaccine, consideration of antivirals, surveillance and laboratory.

3. Personal Protective Equipment and Infection Control

Objectives for personal protective equipment in previous progressions and virus in Iowa:

- Continue ongoing activities from previous phases. Expand as needed.

Additional considerations

a. Screening

In the presence of a formal pandemic declaration, screening should be coordinated with access controls, a triage station outside the facility to screen patients before they enter the facility, priority triage of persons with respiratory symptoms, and/or telephone screening of patients with appointments.

Institute a strategy to monitor the health of staff and patients who are potentially exposed to the pandemic influenza strain.

In the presence of pandemic activity in Iowa, all persons entering the facility will be screened.

b. Droplet precautions

Strict adherence to standard and droplet precautions (and other recommended precautions) for patients with ILI is to be practiced by all health care personnel.

- Place patient's with ILI into a private room. If a private room is not available, cohort suspected influenza patients with other patients suspected of having influenza. Cohort confirmed influenza patients with other patients confirmed to have influenza. Maintain three feet of separation between patients.
- Remove the mask when leaving the patient's room and dispose of the mask in a waste container. Perform hand hygiene.
- If patient movement or transport is necessary, patient must wear a surgical mask.

c. Patient movement
Movement and transport of patients with influenza should be limited as much as possible. If a patient must be transported, adhere to the following guidelines:

- Place surgical mask on patient.
- Always notify recipient area prior to patient transport.
- Follow a pre-designated alternate route designated for transport of influenza patients (separate from main traffic route).
- Consider limiting hospital admissions, transfers, and discharges (in accordance with local/state recommendations and regulations) in the event that nosocomial pandemic influenza transmission occurs.

d. Visitors
- Should be limited to reduce the likelihood of pandemic influenza transmission among visitors, patients, and health care workers.
- The Director of Infection Control/ Hospital Epidemiology in consultation with state or local public health authorities should set guidelines on the number of people that may visit hospitalized patients.
- Visitors will receive infection control training and comply with infection control measures.
- Symptomatic persons with ILI or those exposed to pandemic influenza patients will be excluded from visitation.

e. In-hospital post-mortem care
- Health care workers must follow standard precautions when caring for a patient with pandemic influenza who is deceased.
- Full personal protective equipment (PPE) must be worn if the patient died during the infectious period (i.e. within seven days after resolution of fever in adults and 21 days after the onset of symptoms in children).
- Transfer to the mortuary should occur as soon as possible after death.
- If the family wishes to view the body, they may be allowed to do so. If the patient died during the infectious period, the family should wear gloves and a gown.

f. Home setting (may be required if number of cases is very large)
Home isolation guidelines:
- Patients who do not require hospitalization should be cared for at home. Persons should be isolated in a room or area separate from other family members when possible. For patient movement outside the isolation area, a surgical mask must be worn if respiratory symptoms are present.

- Family members who enter the room or area must wear a surgical mask that fits snugly; disposable gloves must be worn for direct contact with the patient.
- Unexposed persons must not enter the home. Health care personnel and others who enter the home to provide patient-related services should exercise standard and droplet precautions, gowns, gloves, surgical masks, and eye protection as indicated.
- Hand hygiene (i.e. hand washing with soap and water or use of an alcohol-based hand rub) must be performed by infected persons and household contacts frequently, and particularly after touching body sites, clothing, linens, or environmental surfaces that may have had contact with infectious lesions.
- Laundry (e.g. bedding, towels, clothing) may be washed in a standard washing machine with hottest water possible and detergent; bleach may be added but is not necessary. Follow washing with hot air drying. Care should be used when handling soiled laundry to avoid direct contact with contaminated material. Soiled laundry must not be shaken or otherwise handled in a manner that may aerosolize infectious particles.
- Dishes and other eating utensils must not be shared, but segregation of specific utensils for use by the infected person is not necessary. Soiled dishes and eating utensils must be cleaned in a standard dishwasher, if one is available. If no dishwasher is available use hot water and soap. An alternative is to use disposable items.
- Contaminated surfaces must be cleaned and disinfected. Standard household cleaning/disinfectants may be used in accordance with manufacturer's instructions.

4. Travel related issues

Objectives for travel related issues in previous progressions and virus in Iowa:

- Continue ongoing activities from previous phases. Expand as needed.
- Outline surveillance efforts with regards to travel.
- Provide access to preventative treatment for non-immunized inbound travelers who have been exposed to known or suspected pandemic influenza.
- Obtain and/or develop passenger-screening criteria for outbound travelers.
- Determine staffing requirements to implement outbound traveler screening.
- Ensure proper authority to restrict movement of outbound travelers exhibiting symptoms consistent with pandemic influenza to non-endemic areas.
- Determine or provide recommendations regarding when to discontinue commercial interstate passenger travel.
- Determine or provide recommendations regarding when to limit and/or discontinue commercial intrastate passenger travel.

5. Hospital surge capacity

Objectives for hospital surge capacity in previous progressions and virus in Iowa:

- Continue ongoing activities from previous phases. Expand as needed.
- Request inpatient capacities daily.

Appendix A

TABLE. Priority groups for vaccination with inactivated influenza vaccine and estimated vaccination coverage for 2003*

Tier	Priority group†	Population in 2003§ (millions)	Estimated vaccination coverage (%)	Estimated no. of persons vaccinated (millions)
1 A	Persons aged ≥65 years with comorbid conditions	18.2	70.9¶	12.9
	Residents of long-term–care facilities	1.7	80.0**	1.3
	Total	**19.9**	**71.4**	**14.2**
B	Persons aged 2–64 years with comorbid conditions	42.4	34.3††	14.5
	Persons aged ≥65 years without comorbid conditions	17.7	60.8¶	10.8
	Children aged 6–23 months	6.0	48.4††	2.9
	Pregnant women	4.0	12.8¶	0.5
	Total	**70.1**	**40.9**	**28.7**
C	Health-care personnel	7.0	40.1¶	2.8
	Household contacts and out-of-home caregivers of children aged <6 months	5.0	17.3††	0.9
	Total	**12.0**	**30.6**	**3.7**
2	Household contacts of children and adults at increased risk for influenza-related complications	70.3	18.2††	12.8
	Healthy persons aged 50–64 years	17.7	29.8¶	5.3
	Total	**88.0**	**20.6**	**18.1**
3	Persons aged 2–49 years without high-risk conditions	105.5	14.8¶	15.6

* Estimates are for 2003–04 season for most adult groups and the 2004–05 season for most pediatric groups because national influenza vaccination data on children were not available for 2003.
† Certain persons might be included in more than one group.
§ Based on 2003 population estimates from the U.S. Census Bureau.
¶ Based on the 2003 National Health Interview Survey (NHIS) for noninstitutionalized adults (CDC, unpublished data, 2005).
** Based on the 1999 National Nursing Home Survey (CDC, unpublished data, 2003).
†† Vaccination coverage for pediatric groups is based on estimates from the Behavioral Risk Factor Surveillance System (*MMWR* 2005;54:304–7). Vaccination coverage for adults is based on the 2003 NHIS.

Appendix B

The role of the IDPH Vaccines for Children Program

The IDPH distributes Vaccines for Children (VFC) Influenza vaccine to both private and public VFC providers.

Children eligible for the VFC program include:

- Medicaid eligible
- Uninsured (no health care coverage)
- American Indian/Alaskan Native
- Underinsured – is a child that has health care coverage but the benefit plan does not include immunizations. Patients that have a deductible or co-pay are not considered underinsured. Underinsured children can only be seen at rural health clinics (RHC's) or Federally Qualified Health Centers (FQHC's). In addition, Public Health Clinics are supplemented with vaccine purchased with 317 grant funds to vaccinate underinsured children.

The following groups of VFC-eligible children can receive influenza vaccine through the VFC program:

- All infants and children ages six-23 months,
- Children and adolescents two-18 years of age who are household contacts of people with risk factors,
- High-risk children 6 months-18 years.

IDPH does not distribute non-VFC influenza vaccine. Approximately 85 percent of annual influenza vaccine doses distributed in the U.S. are purchased by the private sector. Private sector providers and mass vaccinators effectively deliver more than 80 million doses of vaccine during a several month period in the fall before the annual influenza season. However, this primarily private vaccine purchase and delivery system may not be optimal in a pandemic.

The VFC vaccine is purchased through the Centers for Disease Control and Prevention (CDC) contract and ordered through CDC's software program (VACMAN). Once orders are received and approved at CDC, the pharmaceutical companies receive the order. The vaccine is then distributed to IDPH through a commercial carrier.

When vaccine is received at IDPH, personnel from the Immunization program verify the order against the packing slip for accuracy (amount shipped, lot number, expiration date). It is then stored in refrigerators that are located in the basement of the Lucas Building in Des Moines where IDPH is located. The receipt data is entered into VACMAN. This data is then transmitted to CDC in acknowledgement of receipt in order to process payment to the manufacturer.

Once orders are received from Iowa's VFC providers and IDPH has received the vaccine from the manufacturers, vaccine orders are processed and shipped. Vaccine is packaged in Styrofoam coolers using icepacks and filler material. The packages are shipped overnight via United Parcel Services (UPS).

IDPH asks VFC providers to pre-book the amount of VFC influenza vaccine needed for the upcoming influenza season in early March.

Appendix C

Activity Level	ILI activity* / Outbreaks		Laboratory data
No activity	Low	**And**	No lab confirmed cases[†]
Sporadic	Not increased	**And**	Isolated lab-confirmed cases
	OR		
	Not increased	**And**	Lab confirmed outbreak in one institution[‡]
Local	Increased ILI in 1 region**; ILI activity in other regions is not increased	**And**	Recent (within the past 3 weeks) lab evidence of influenza in region with increased ILI
	OR		
	2 or more institutional outbreaks (ILI or lab confirmed) in 1 region; ILI activity in other regions is not increased	**And**	Recent (within the past 3 weeks) lab evidence of influenza in region with the outbreaks; virus activity is no greater than sporadic in other regions
Regional (doesn't apply to states with ≤ 4 regions)	Increased ILI in ≥ 2 but less than half of the regions	**And**	Recent (within the past 3 weeks) lab confirmed influenza in the affected regions
	OR		
	Institutional outbreaks (ILI or lab confirmed) in ≥ 2 and less than half of the regions	**And**	Recent (within the past 3 weeks) lab confirmed influenza in the affected regions
Widespread	Increased ILI and/or institutional outbreaks (ILI or lab confirmed) in at least half of the regions	**And**	Recent (within the past 3 weeks) lab confirmed influenza in the state

[1] ILI activity can be assessed using a variety of data sources including sentinel providers, school/workplace absenteeism, and other syndromic surveillance systems that monitor influenza-like illness.

[2] Lab confirmed case = case confirmed by rapid diagnostic test, antigen detection, culture, or PCR. Care should be given when relying on results of point of care rapid diagnostic test kits during times when influenza is not circulating widely. The sensitivity and specificity of these tests vary and the predicative value positive may be low outside the time of peak influenza activity. Therefore, a state may wish to obtain laboratory confirmation of influenza by testing methods other than point of care rapid tests for reporting the first laboratory confirmed case of influenza of the season.

[3] Institution includes nursing home, hospital, prison, school, etc.

[4] Region: population under surveillance in a defined geographical subdivision of a state. A region could be comprised of one or more counties and would be based on each state's specific circumstances. Depending on the size of the state, the number of regions could range from two to approximately 12. The definition of regions would be left to the state but existing state health districts could be used in many states. Allowing states to define regions would avoid somewhat arbitrary county lines and allow states to make divisions that make sense based on geographic population clusters. Focusing on regions larger than counties would also improve the likelihood that data needed for estimating activity would be available.

Appendix D

Respiratory Hygiene / Cough Etiquette Program Guidelines

- Post visual alerts instructing patients and persons who accompany them to inform personnel if they have symptoms of respiratory infection.
- Provide tissues to patients and visitors to cover their mouth and nose when coughing and sneezing.
- Provide easily accessible disposal containers for tissues.
- Provide dispensers of alcohol-based hand rubs.
- Ensure supplies for hand washing are available at sinks.
- Offer masks to persons who are coughing.
- Encourage coughing persons to sit at least three feet away from others or having a separate waiting area for them.
- Ensure health personnel observe droplet precautions in addition to standard precautions.

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.