Arkansas's Influenza Pandemic Plans

In the list of potential bioterrorist agents, influenza would be classified as a category C agent. While previous influenza pandemics were naturally occurring events, an influenza pandemic could be started with an intentional release of a deliberately altered influenza strain. Even if a deliberately altered strain is not released, an influenza pandemic originating from natural origins will inevitably occur and will likely cause substantial illness, death, social disruption, and widespread panic.

Globally, the 1918 pandemic killed at least 20 million people. This figure is approximately double the number killed on the battlefields of Europe during World War I. In the United States alone, the next pandemic could cause an estimated 89,000–207,000 deaths, 314,000–734,000 hospitalizations, 18–42 million outpatient visits, and 20–47 million additional illnesses. These predictions equal or surpass many published casualty estimates for a bioterrorism event. In addition to the potential for a large number of casualties, a bioterrorism incident and an influenza pandemic have similarities that demand that public health planners simultaneously plan and prepare for both types of emergencies.

ASSUMPTIONS

- An influenza pandemic in Arkansas will present a massive test of any emergency preparedness system. Advance planning for Arkansas' emergency response could save lives and prevent substantial economic loss.
- Although pandemic influenza strains have emerged mostly from areas of Eastern Asia, variants with pandemic potential could emerge in Arkansas or elsewhere in the United States.
- Many geographic areas within the state (or the entire state) may be affected simultaneously.
- A pandemic will pose significant threats to human infrastructure responsible for critical community services (in health and non-health sectors) due to widespread absenteeism.
- Widespread illness in the community will increase the likelihood of sudden and potentially significant shortages of personnel in other sectors who provide critical community services such as military personnel, police, firemen, utility workers, and transportation workers, just to name a few.
- Effective preventive and therapeutic measures (vaccines and antiviral medications) may be in short supply.
- There may be critical shortages of health care resources such as staffed hospital beds, mechanical ventilators, morgue capacity, temporary holding sites with refrigeration for storage of bodies and other resources.
- Assuming that prior influenza vaccination(s) may offer some protection (even against a novel influenza variant,) the annual influenza vaccination program, supplemented by pneumococcal vaccination when indicated, will remain a cornerstone of prevention.
- Surveillance of influenza disease and virus will provide information critical to an effective response.
- The Federal government may or may not assume the costs for purchase of vaccines, antiviral medications and related supplies.

- An effective response to an influenza pandemic will require the coordinated efforts of a wide variety of organizations – private as well as public and health as well as non-health related.

GENERAL INFLUENZA INFORMATION

World Health Organization Phases for Pandemic Influenza

The World Health Organization (WHO) has developed a staged plan, based on its surveillance program, for responding to a pandemic threat. Recognition of a novel influenza strain in humans triggers a series of responses identified as phases that can ultimately lead to the declaration of a pandemic. Interpandemic activities are designated as Phase 1 and 2 in which a circulating animal influenza virus is circulating and could pose a substantial risk of human disease. Phases 3, 4, and 5 are considered the pandemic alert period. These phases describe difficult to spread human to human transmission. Phase 6 is the onset of the pandemic. More than one wave of infection can occur in a pandemic possibly due to seasonal influences and the existence of a large pool of susceptible individuals in the population.

Definition of Preparedness Levels:

Interpandemic activities

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

- Review influenza pandemic plan at least yearly and continue to educate and update all those involved in the plan
- Practice the plans at least annually
- Encourage everyone to be immunized against influenza each year

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

- Continue to review plan and update as needed
- Keep medical community up to date
- Encourage health care providers to consider influenza infection in ill patients with travel or epidemiological link to an affected country
- Encourage annual influenza vaccination

Pandemic Alert Period

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

- Alert and update all those involved in the plan
- Keep healthcare personnel up to date with available information as well as the general public
- Encourage health care providers to consider influenza infection in ill patients with travel or epidemiological link to an affected country

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

- If outbreak occurs outside the U.S., notify and educate the news media about the virus and issue travel advisories as per CDC's recommendations
- Prepare generic news releases about virus and what public can do to protect themselves and have ready to distribute when needed (Also see communications p. 17)
- Encourage health care providers to consider influenza infection in ill patients with travel or epidemiological link to an affected country and report immediately
- Alert and update all those involved in the plan
- Keep healthcare personnel up to date with available information

Phase 5. Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).

- If outbreak occurs outside the U.S., notify and educate the news media about the virus and issue travel advisories as per CDC's recommendations
- Prepare generic news releases about virus and what public can do to protect themselves and have ready to distribute when needed (Also see communications p. 17)
- Notify Arkansas physicians and keep them updated about new virus, etc.
- Encourage health care providers to consider influenza infection in ill patients with travel or epidemiological link to an affected country and report immediately
- Each local health unit should review their mass clinic plan and update their volunteer list

Pandemic Period

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

- Continue to update news media as well as public, especially concerning self protection as well as protection of others
- Issue stronger travel advisories, both for intrastate, or interstate
- Consider closing or limiting public gatherings, such as schools, churches, all business or social gatherings, including sports events
- Isolate all ill persons
- Vigorous contact tracing and quarantine of close contacts
- Consider "snow days" where people would be asked to stay home for a specified period of time
- All ADH employees will be "available if needed" 24/7

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

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

End of the first pandemic wave
The increase in outbreak activity in the initially affected countries or regions has stopped or reversed, but outbreaks and epidemics of the new virus are still occurring elsewhere.

- Continue to update news media and public
- Consider relaxing previous recommendations regarding travel and meetings.

Second or later waves of the pandemic
Based on past experiences, at least a second severe wave of outbreaks caused by the new virus would be expected to occur within 3-9 months of the initial epidemic in many countries.

- According to the CDC, the influenza virus sweeps through the population once, infecting 30% or less of the population, then circulates again among those not infected the first time. This may occur because of the relatively lower level of population immunity. Influenza viruses are circulating year-round in tropical regions with low levels of circulation during the summer in the U.S. This may permit evolution of the virus' H and N protein (antigenic drift) to better adapt to infecting more people.

End of the pandemic
WHO will report when the Pandemic Period has ended, which is likely to be after 2-3 years. The indications for this will be that indices of influenza activity have returned to essentially normal inter-pandemic levels and that immunity to the new virus subtype is widespread in the general population.

Influenza Epidemiology:

Influenza A, B and C viruses are known to cause disease in humans. While influenza B and C viruses are strictly human pathogens, influenza A viruses are readily isolated from avian species, pigs and other animals. Influenza A viruses are divided into subtypes based on differences in their surface glycoprotein antigens, hemagglutinin (HA) and neuraminidase (NA). There are 14 recognized HA subtypes and 9 recognized NA subtypes. All of these subtypes have been isolated in birds but only 3 different HA and two different NA subtypes have been isolated in humans.

There are three theories for the emergence of pandemic viruses: genetic reassortment between human and animal viruses, direct transfer of viruses between animals and humans, and re-emergence of viruses from unrecognized or unsuspected reservoirs. Genetic reassortment is a likely explanation, for example, as to how type A(H3N2) viruses arose in 1968 that had acquired a new hemagglutinin gene compared to the predecessor H2N2 Asian influenza viruses. Reassortment could possibly occur by mixed infection in swine which can be susceptible to viruses from avian and human sources. Agricultural practices and ecological circumstances in China and in other comparable locations may provide ideal opportunities for such co-infections to occur. The second theory is the most likely explanation for the 1918 pandemic virus. The third theory has been advanced to explain the reappearance of H1N1 virus in 1977 that resembled virus from 1950, although it is not currently understood where and how any influenza virus could remain unrecognized for many years.

The influenza viruses are unique amongst the respiratory viruses in that they undergo significant antigenic variation. Antigenic drift involves minor antigen changes from one season to the next and may result in epidemic spread of the new strain. Antigenic shift involves major antigenic changes of the HA and NA molecules and occurs only with Influenza A viruses. These changes can result in the appearance of pandemic viruses.

It is now thought that new subtypes of influenza that cause pandemics in humans arise because of the acquisition of a gene from an animal or avian virus as the result of a genetic reassortment event. In the last two decades it has become accepted that influenza viruses from aquatic birds, particularly ducks, and more recently pigs, are the primary host of influenza A viruses. Birds are thought to be the direct source of virus for reassortment in humans; however, it appears more likely that there is an intermediate host such as the pig which may act as "a mixing vessel" and transmit the virus to humans. There is no doubt that influenza viruses from pigs can infect humans and cause disease. The first documented outbreak of an animal influenza virus in humans was demonstrated at Fort Dix in the United States in 1976 with the outbreak of influenza which caused infection in 230 military personnel (with one fatal outcome) which was clearly derived from swine influenza virus.

The most recent pandemics are thought to have arisen in China which has become known as the "epicenter" for the origin of pandemic influenza viruses. Living conditions in China seem to make it particularly feasible for animal to human transmission of influenza virus. In the villages of rural China, pigs are sometimes raised in the same living quarters as their owners. This close contact is thought to promote interspecies transmission of the virus. The 1957 epidemic (H2N2) became known as the "Asian Flu" pandemic. The 1968 (H3N2) pandemic became known as the "Hong Kong flu". Only the 1918 influenza pandemic which was caused by the H1N1 subtype is thought not to have arisen in China but in Europe and has become known as the legendary "Spanish Flu". Each of these pandemics has been characterized by a major shift in one or both of the hemagglutinin or neuraminidase subtypes.

Clinical Case Definition: (and/or according to CDC guidelines for pandemic)
When influenza is circulating in the community, the presence of fever and cough of acute onset are good predictors of influenza. The positive predictive value increases when fever is higher than 38°C (100.4 F) and when the onset of the clinical illness is acute (less than 48 hours after the prodromes). Other symptoms, such as sore throat, rhinorrhea, malaise, rigors or chills, myalgia and headache, although non-specific, may also be present.

Confirmed cases of influenza are cases with laboratory confirmation (i.e., virus isolation from respiratory tract secretions, identification of viral antigens or nucleic acid in the respiratory tract, or a significant rise in serum antibodies) or clinical cases with an epidemiological link to a laboratory confirmed case.

Modes or routes of transmission of infectious agents have been classified as contact, droplet, airborne, common vehicle and vectorborne. Routes pertinent to influenza are contact, droplet and airborne.

Contact Transmission: Includes direct contact, indirect contact and droplet (large droplet transmission). Routine practices should prevent most transmissions by the contact route. Although droplet transmission is a type of contact transmission, it is considered separately as it requires additional precautions.

- **Direct Contact Transmission** occurs when the transfer of microorganisms results from direct physical contact between an infected or colonized individual and a susceptible host.
- **Indirect Contact** involves the passive transfer of microorganisms to a susceptible host via an intermediate object such as contaminated hands that are not washed between patients or contaminated instruments or other inanimate objects in the patient's immediate environment.
- **Droplet Transmission** Refers to large droplets, greater than or equal to 5 μm in diameter, generated from the respiratory tract of the source (infected individual) during coughing or sneezing, or during procedures such as suctioning or bronchoscopy. These droplets are propelled a distance of less than one meter through the air and are deposited on the nasal or oral mucosa of the new host (newly infected individual) or in the immediate environment. These large droplets do not remain suspended in the air; therefore, special ventilation is not required since true aerosolization (see below) does not occur.
- **Airborne Transmission** Refers to the dissemination of microorganisms by aerosolization. Organisms are contained in droplet nuclei, airborne particles less than 5 μm that result from the evaporation of large droplets, or in dust particles containing skin squames and other debris that remain suspended in the air for long periods of time. Such microorganisms are widely dispersed by air currents and inhaled by susceptible hosts who may be some distance away from the source patients or individuals, even in different rooms or hospital wards. Control of airborne transmission is the most difficult as it requires control of air flow through special ventilation systems.

Evidence for the Mode of Influenza Transmission

Organisms, especially respiratory viruses expelled in large droplets, remain viable in droplets that settle on objects in the immediate environment of the patient. Both influenza A and B viruses have been shown to survive on hard, non-porous surfaces for 24-48 hours, on cloth paper and tissue for 8-12 hours and on hands for 5 minutes. The virus survives better at the low relative humidity encountered during winter in temperate zones.

Contact with respiratory secretions and large droplets appears to account for most transmissions of influenza. In a report of an outbreak in a nursing home, the pattern of spread was suggestive of contact rather than airborne transmission because patients who were tube fed or required frequent suctioning had higher infection rates than those who did not require such care.

Whether or not influenza is naturally transmitted by the airborne route is controversial. An outbreak of influenza on an airliner has been attributed to airborne spread; however, large droplet spread could have been responsible because the passengers were crowded together and moved about for several hours in a small, grounded airplane. Although experimental airborne transmission of influenza A virus to mice has been reported, there is no evidence of such transmission in humans.

Mode of Influenza Transmission

Influenza is directly **transmitted primarily by droplet contact** of the oral, nasal, or possibly conjunctival mucous membranes with the oropharyngeal secretions of an infected individual. Influenza is indirectly transmitted from hands and objects freshly soiled with discharges of the nose and throat of an acutely ill and coughing individual.

Prevention of Transmission
Certain routine practice and additional precaution recommendations may be feasible only in the early phases of the pandemic as they may not be achievable as the pandemic spreads and resources (equipment, supplies and workers) become scarce. Because the complexity of managing high risk patients will be greatest in acute care hospitals, it seems reasonable that the highest priority for infection control resources should be given to the acute care settings.

Strict adherence to hand washing/hand antisepsis recommendations is the cornerstone of infection prevention and may be the only preventive measure available during a pandemic.

Use of Masks During a Pandemic
Although there is a lack of evidence that the use of masks prevented transmission of influenza during previous pandemics; in the early phase of an influenza pandemic, it may be prudent for health care workers (HCWs) to wear masks when interacting in close face-to-face contact with coughing individuals to minimize influenza transmission. This use of masks is advised when immunization and antivirals are not yet available but is not practical or helpful when pandemic influenza has entered the community. There is no evidence that the use of masks in general public settings will be protective when the virus is circulating widely in the community.

Masks may be worn by HCWs to prevent transmission of other organisms from patients with undiagnosed cough. For the purpose of this document the term "mask" refers to surgical masks, not to special masks or respirators. Special masks (i.e., high-efficiency dust/mist masks) are required for patients with infectious tuberculosis and for non-immune HCWs entering the room of a patient with measles or disseminated varicella.
When using surgical masks :

- Should be used only once and change if wet (because masks become ineffective when wet).
- Should cover both the nose and the mouth.
- Avoid touching it while it is being worn
- Discard them into an appropriate receptacle.
- Must not be allowed to dangle around the neck.

Infectivity of the Influenza Virus
The **incubation period** for influenza is from 1-3 days. The **period of communicability** (duration of viral shedding) continues for up to 7 days after the onset of illness, probably from 3-5 days from clinical onset in adults and up to 7 days in children.

Individuals infected with influenza tend to shed more virus in their respiratory secretions in the early stages of the illness and **patients are most infectious during the 24 hours before the onset of symptoms** and during the most symptomatic period. Viral shedding may be longer in infants and prolonged in young children and immunodeficient patients. It has not been well established whether elderly long term care residents shed viruses longer than other adult populations.

There is no information to determine if the period of communicability will be different with pandemic influenza. The duration of shedding of a novel virus (pandemic strain) is unknown. It is possible that prolonged shedding could occur with pandemic influenza because the

immune system would not have had prior experience with related strains.

Hands can be contaminated with influenza virus by contact with inanimate surfaces or objects in the immediate environment of a patient with influenza infection. **Influenza A and B viruses have been shown to survive for 24-48 hours on hard, nonporous surfaces; for up to 8 to 12 hours on cloth, paper and tissues; and on hands for up to 5 minutes after transfer from environmental surfaces. "The influenza virus is readily inactivated by hospital germicides, household cleaning products, soap, hand wash or hand hygiene products."** Therefore, neither antiseptic hand wash products in health care settings nor antibacterial hand wash products in home setting are required because routine products, along with proper hand washing procedures, will inactivate the influenza virus.

During an influenza pandemic, adherence to infection prevention and control policies and procedures is critical to minimize the transmission of influenza and other infectious diseases. It is anticipated that neither influenza immunization nor chemoprophylaxis will be available in the early stages of a pandemic and perhaps not even available in later stages, necessitating an **emphasis on infection prevention and control practices**.

Planning should include ensuring that adequate supplies of hand hygiene products are a priority for all health care settings as there may be an interruption to the supply or shortages of hand antisepsis products, soap and hand towels as well as masks/eye protection/face shields, gloves, gowns, due to the increased complexity and management issues of hospitalized patients.

Any public health measures that will be undertaken during the pandemic must be performed early in the outbreak. These measures will only "slow down" the spread of disease, not stop it completely, and the public must understand this concept. The following should be considered very early in the outbreak to help "slow down" the disease spread, in hopes that vaccine will be available for more and more individuals, and the health care system will not be overwhelmed:

1. Limit travel (in state, out of state)
2. Isolation of ill persons
3. Quarantine
4. Early and vigorous contact tracing
5. Cancellation of events
6. Snow days

A decision should be made as to when the "threshold" has been reached, such that the above measures can be "relaxed".

Following the 1957 epidemic in Japan, the policy on influenza immunization was changed as it was determined that school attendance played an important part in spreading that epidemic. There were wide-spread school closures with attack rates as high as 60% in some areas and approximately 8,000 deaths. The new policy stated that "because school children are the major disseminators of the disease, they should be immunized". In a study to review whether the policy of vaccination of school children in Japan (over a 25-year period) reduced the incidence and mortality attributed to influenza among older persons, the authors concluded that the vaccination of school children in Japan disrupted the spread of influenza to older persons.

There is evidence that closing schools may change the course of transmission. Studies conducted both during pandemic years and interpandemic years demonstrate that age-specific attack rates are highest among school children. Additional studies noted that the age distribution of culture-positive patients changed during the course of epidemics. Initially, school children were culture positive followed by a shift to preschool children and adults during the latter part of the epidemic. The authors observed that school absenteeism was often followed by employee absenteeism during the influenza epidemics studied.

It is thought that management of exposure, as an approach to the prevention of a pandemic, is not possible because of the current high levels of international travel and the expansion of populations into many regions of the world. Options for slowing the spread of pandemic influenza have been suggested and include the use of antiviral prophylaxis, limiting congregations of people and, possibly, quarantine.

In preparation of an influenza pandemic and in an attempt to curtail community transmission, there are neither data nor guidelines to determine which public gatherings to close and when to close them. The severity of the pandemic strain and the stage of the pandemic, as it unfolds globally, will be considered when making this determination. If public gatherings are restricted they should be restricted early enough to affect transmission. Examples of public gatherings include: transportation (ground, rail and air), childcare facilities, schools, retail settings, workplaces, places of worship, funerals and community events (cultural/sporting).

Visitors to a hospital should be informed when the acute care facility has influenza activity. Those who have not yet had the pandemic strain of influenza or who have not been immunized against the pandemic strain should be discouraged from visiting. Close relatives of terminally ill patients can be exempt, but they should restrict their visit to that individual only and they should wash their hands on exit from the patient's room. Wearing a mask upon entry to the facility is only useful if there is no influenza in the community.

The risk of influenza transmission to funeral service workers will be through their contact with families and friends of the deceased, not the deceased. There is no additional risk of transmission of influenza to funeral home workers related to handling of bodies of persons suspected of having or confirmed to have died from influenza. Deceased bodies (confirmed of having or suspected to have influenza during interpandemic or pandemic years) require routine handling only.

As the number of influenza cases increase, our health care system will be overwhelmed. Hospitals will be unable to admit all influenza cases. At this point, triage systems should be in place. Triage centers may be located at doctor's offices, clinics, and in non-traditional (NT) sites such as schools, churches, community centers, military field hospitals, etc. When possible, hospitals should assign a special "emergency" area for the triage, secondary assessment and treatment of influenza patients, avoiding the passage of these patients through the regular hospital emergency rooms (ERs).

Strategy should be developed for tracking of recovered, presumably immune, cases. These people may be needed as volunteers, etc., at hospitals, local health units (LHU's), and other public places during this crises.

There are six "essential components" to responding to an influenza pandemic:

1. Command and Control Procedures
2. Surveillance
3. Vaccine Delivery
4. Antiviral Medication Delivery
5. Emergency Medical Services
6. Risk Communications

COMMAND AND CONTROL

During an influenza pandemic (or within expectations of its soon arrival) the Governor of Arkansas may declare a state of emergency. The central office work unit involved will communicate with the business unit leaders, the Associate Director for Science in the Center for Health Protection, State Epidemiologist, Deputy State Public Health Officer and Chief Science Officer, and will consult with the CDC as needed. A central office team consisting of the State Epidemiologist, Medical Director for CD/Immunization work unit (or designee) and Liaison of Public Health Regions, will determine if a special team is needed to monitor outbreak control activities. Other appropriate work unit colleagues (i.e. lab, communications, environmental health services, etc.) will be asked to serve on the team depending on the type of disease involved and the disease burden.

The State Epidemiologist, Infectious Disease Director and/or Medical Director of CD/Immunization work unit will have overall responsibility for any infectious disease outbreak in Arkansas. This colleague will need to be continually available and involved in the response activities and decisions. (see outbreak response plan) This will be in close coordination with ADEM (Arkansas Department of Emergency Management).

ADH has been given the power to contain and control outbreaks by the following law: "Power is conferred on the State Board of Health to make all necessary and reasonable rules and regulations of a general nature for the protection of the public health and safety; for the general amelioration of the sanitary and hygienic conditions within the state; for the suppression and prevention of infectious, contagious, and communicable diseases; for the proper enforcement of quarantine, isolation, and control of such diseases; and for the proper control of chemical exposures that may result in adverse health effects to the public"Arkansas Code 20-7-109, 2000.

SURVEILLANCE

Arkansas has an active influenza surveillance which is carried out by each of our 94 local health units . This surveillance begins on December 15 and continues until April 1st of each year. Each LHU is required to make 2 calls weekly; one to a school and the second to one of the following: a hospital ER, a physician's office, or a nursing home The following information is obtained: the number of patients ill/day/week; total number of patients seen; age groups affected; illness in vaccinated vs. unvaccinated persons, and predominant symptoms.
Influenza surveillance will also continue to be performed by local physicians/offices/hospitals throughout the state who are required to report outbreaks. Cultures will be done at ADH as well as viral subtyping (if available). Following early indication of an epidemic, ADH would initiate a short term surveillance of the larger hospitals in the state assessing ER respiratory visits, ICU bed census,

pediatric and adult deaths from respiratory illness, and hospital admissions for respiratory illness. This would be reported to ADH daily via a secure site on ADH web site or by fax. The Infection Control personnel at each hospital would be the most appropriate persons to perform this task.

Other surveillance should include the national product reporting data that is available in order to keep up with increased over-the-counter product purchases.

VACCINE

The next pandemic will pose a number of challenges for vaccine delivery particularly to State and local health departments which clearly must serve as the "linchpin" of vaccination efforts:

- The target population for vaccination will be expanded far beyond the typical "high-risk" groups to encompass, ideally, the entire U.S. population.

- The "warning period" preceding spread of the pandemic strain in the U.S. is likely to be relatively short, so that vaccine will have to be distributed and administered as rapidly as possible.

- Because a pandemic strain can arise and be detected at any time, and because current manufacturing procedures dictate that a minimum of 6-8 months would elapse before tens of millions of doses would become available for distribution, it is likely that a severe and/or moderate vaccine shortage is likely to exist, especially early on during the course of the pandemic. Moreover, it is possible that no vaccine will be available.

- Immunologic responses following vaccination of unprimed (seronegative) individuals is generally poor, so the emergence of a pandemic strain with new hemagglutinin (HA) and/or neuraminidase (NA) antigens will likely require a second dose of vaccine about 28-30 days later.

It is hoped that yearly vaccination might give cross-over immunity should a new influenza virus emerge. Because of this, we will do the following:

- ADH will continue to offer yearly influenza vaccine to anyone that comes into one of the LHUs as well as encourage all private physicians to vaccinate their patients. ADH needs to encourage all health care providers as well as first responders to obtain their influenza vaccination yearly.

- ADH will also continue to give pneumococcal vaccine to all nursing home patients (as required by law) and encourage private physicians to vaccine all their patients that are 65 years and older and/or at high risk.

VACCINE DELIVERY

Should vaccine be available, the central office at ADH would be responsible for receiving and storing all the vaccine. Vaccine may be stored at the SNS(strategic national stockpile) site and or another site to be determined. Distribution to the county health units would be accomplished by the County Sheriffs, State Police, or by SNS protocol. A policy will be in place describing the process including documentation of vaccine pick-up and documentation of vaccine delivery at the local health units.

The LHUs are responsible for developing pandemic influenza planning documents to complement the state planning document. Each LHU is responsible for the following within its jurisdiction:

- Defining command and control;
- Ensuring that the local Emergency Management Plan includes influenza pandemic related materials;
- Assessing health and related resources and deficiencies (e.g., numbers of hospital beds, potential non-hospital alternate medical care facilities, physicians, nurses);
- Identifying appropriate public facilities to serve as mass vaccination sites/ alternative treatment centers (with security);
- Ensure that contingency plans have been considered for emergency distribution of unlicensed vaccines using emergency IND (investigational new drug) provisions. Such provisions call for strict inventory control and record-keeping along with completion of a signed consent form.
- Maintaining a "call back" list in the event 2 doses of vaccine are needed.
- Maintaining and updating lists of key partners;
- Promoting inter-pandemic routine influenza and pneumococcal vaccinations to designated high-risk groups;
- Coordination of care for individuals confined to their homes.

Vaccine Distribution:
Priorities for vaccination need to be established during the interpandemic period in order to facilitate planning for an efficient and consistent pandemic immunization strategy. In keeping with the overall goal of pandemic response, the prioritization process must consider the impact the vaccine will have on: 1) reducing morbidity and mortality by maintaining the health services response and by individual protection of high risk groups, and 2) minimizing societal disruption by maintaining the essential services upon which everyone depends. The pandemic vaccine will become available in lots and supply is likely to be limited during the early stage of the pandemic. Furthermore, it is likely that two doses of vaccine will be required to achieve a protective response in the vaccinee. Therefore, when vaccine becomes available it is essential that it be distributed in a pre-defined equitable and consistent manner across all counties.

The priority groups will need to be reassessed, and possibly altered, as soon as epidemiologic data on the specific pandemic virus becomes available to ensure that they are consistent with the overall goal of the pandemic response and/or CDC gives different recommendations according to their data. Once data on the epidemiology of the pandemic becomes available, ADH will be the lead in the final identification and prioritization of population groups to receive influenza vaccine. These

recommendations will be distributed as state guidelines as soon as possible with the expectation that they will be followed by all counties in order to ensure a consistent and equitable program.

In the pre-pandemic period, contact and education will be made with all large employers, state, county, and local governments, as well as first responders. Each employer should plan ahead by identifying their employees who are deemed as essential to maintain "business as usual". A list of essential personnel (minimal requirements to continue services) should be completed and made available upon request.

Plans should be made to stockpile extra syringes, cold packs and other essential items to be able to utilize vaccine as soon as it is available. All states will need extra supplies as well so there is a good likelihood that these items may be in short supply.

Recommended Priority Groups

An estimate of population size is encouraged for each county/town in these priority groups as a part of their pandemic planning activities.

Group 1: Health care workers, paramedics/ambulance attendants and public health workers

Rationale: The health care and public health sectors will be the first line of defense in a pandemic. Maintaining the health service response and the vaccine program is central to the implementation of the response plan in order to reduce morbidity and mortality. Health services workers may be considered in the following work settings for vaccine program planning:

1. acute care hospitals
2. long term care facilities/nursing homes
3. private physicians' offices
4. home care and other community care facilities
5. public health offices
6. ambulance and paramedic services
7. pharmacies
8. laboratories

Group 2: Essential service providers

Rationale: The ability to mount an effective pandemic response may be highly dependent on persons, within the groups listed below, being in place to maintain key community services. Those individuals that are essential to the response or to maintaining key community services may vary between jurisdictions. Local plans will likely reflect these differences; however, they are likely to include:

1. police
2. fire-fighters
3. the armed forces
4. key emergency response decision makers (e.g., elected officials, essential government workers and disaster services personnel)
5. utility workers (water, gas, electricity and essential communications systems)
6. funeral service/mortuary personnel
7. people who work with institutionalized populations (e.g.., Department of Corrections)
8. persons who are employed in public transportation and the transportation of essential goods (such as food)

Vaccine eligibility criteria should be defined based on the work/duties the individual performs rather than position label.

Group 3: Persons at high-risk of severe or fatal outcomes following influenza infection
Rationale: To meet the goal of reducing morbidity and mortality, persons most likely to experience severe outcomes should be vaccinated. For planning purposes this priority group is based on the high risk groups identified by the CDC guidelines. Additional groups have also been included based on evidence indicating an elevated risk. For example, during the annual epidemics, young infants experience rates of hospitalization similar to the elderly.

Prioritization of the following subgroups within Group 3 would depend on the epidemiology of influenza disease in the time of a pandemic.

1. persons in nursing homes, long-term care facilities, homes for the elderly e.g. lodges;
2. persons with high-risk medical conditions living independently in the community;
3. persons over 65 years of age living independently and not included in 1 and 2;
4. children 6 months to 23 months of age (current vaccines are not recommended for children under 6 months of age);
5. pregnant women .
6. household contacts of infants 6 months -23 months of age

Group 4: Children 24 months to 18 years of age
Rationale: This group is at the lowest risk of developing severe outcomes from influenza during annual epidemics but play a major role in the spread of the disease. While children's absence from school might not have the direct economic and disruptive impact of illness in adults, it could have that effect indirectly since care for ill children would be required.

Group 5: **Healthy adults** *Rationale:* This group is at lower risk of developing severe outcomes from influenza during annual epidemics but is the major work force and represent the most significant segment of the population from an economic impact perspective. Vaccination of healthy adults would also reduce demand for medical services and allow individuals to continue normal daily activities. Simultaneous absence of large numbers of individuals from their site of employment could produce major societal disruption even in non-essential personnel. Medical facilities could also be overwhelmed by demand even for outpatient services. This might compromise care of those with complications.

A decision to vaccinate healthy adults and healthy children (Groups 4 and 5) depends on having an adequate supply of vaccine. A much larger amount of vaccine would need to be used to prevent hospitalization and death than for older persons and those with underlying conditions because of demographic considerations and differences in risks.

ANTIVIRAL MEDICATION DELIVERY

If antiviral medication is available through the CDC stockpile, it will be shipped to the central office of ADH. ADH Pharmacy Services will be in charge of the security and distribution of the drug to each hospital as well as each county. Decisions will need to be made (in conjunction with the LHU's) as to where a mass distribution clinic for the various priority groups will be held and which pharmacists in each county will be in charge (refer to BT National Stockpile Plan). These clinics will need continuous security personnel until all antivirals have been distributed.

It is the opinion of ADH that the amount of antivirals that might be available in local pharmacies in the state would be insignificant as well as impossible to control. The expense of buying bulk antivirals would be prohibitive as well as impossible within ADH's budget. On the assumption that little to no vaccine would be available, each person would have to have at least a 3 month supply of an antiviral medication for protection. Under the current conditions, ADH will provide recommendations (priorities) for antiviral medications but must rely on primary care providers to prescribe these antivirals.

Antiviral Drug Recommendations: (These may change pending CDC recommendations)

Priority groups have to be in keeping with the overall goal of reducing morbidity and mortality and secondly, to reduce societal disruption. Since it will not be possible to determine a "risk level" for individuals until the pandemic virus has started causing illness in a population, these groups were identified based on past experience with severe influenza seasons and historic accounts of past pandemics. It is important to recognize that during a pandemic the definition of "high-risk persons" will be based on the epidemiologic data available at that time.

What is known is that in order to ensure an optimal pandemic response it will be imperative to provide as much protection as possible against influenza to health care workers and other essential emergency service workers. Since onset of the pandemic is expected to precede the availability of an effective vaccine, antiviral drugs represent one method of preventing infection until these workers can achieve protection through immunization.

Typically, immunity is assumed to have been conferred 2 weeks after influenza immunization; however, this may differ for the pandemic vaccine and it may be necessary to give two doses of vaccine to each individual before immunity is assured.

Priority group 1: To be consistent with the goal of reducing morbidity and mortality and considering the optimal use of these drugs in relation to onset of illness, those who are hospitalized within the first 48 hours of onset of illness should be highest priority for treatment. This would hold true unless ADH is able to detect the first few Arkansas cases at which time all symptomatic contacts of initial cases would be treated, as well as all healthcare workers exposed to initial cases, in order to limit expansion of the epidemic.

Priority group 2: Considering the essential role that health care providers and emergency service workers will have in the pandemic response, influenza cases in these groups that are identified within the first 48 hours of onset of illness should be

high priority for treatment.

Priority group 3: Persons with underlying heart and lung conditions or those who are immunocompromised, who present to ambulatory settings within 48 hours of onset of symptoms (before they get sick enough to be hospitalized) will also be considered high priority for treatment since they are at high risk for complications.

Priority group 4: Until an effective vaccine becomes available or during the interval between administration of an effective vaccine (or vaccine series) and induction of immunity, antivirals should be provided for HCWs, including public health staff, since their continuing functions are essential to the pandemic response plan and to the care of patients with other conditions.

Priority group 5: Reducing the impact of influenza outbreaks in institutions where the most vulnerable persons reside will contribute to the objectives of reducing morbidity and mortality and reduce health care demands.

Priority group 6: Emergency service workers (ESWs) will be important for maintaining the pandemic response, key community services and national defense. Prophylaxis of this group will minimize societal disruption and include the following:

1. police, fire, correctional services
2. armed forces
3. key emergency response decision makers (e.g., elected officials, essential government workers and disaster services personnel)
4. funeral services
5. utilities (water, gas, electricity)
6. telecommunications
7. public transport and transportation of essential goods (e.g., food)

Priority group 7: High-risk persons hospitalized for conditions other than influenza related complications will be at risk for acquiring influenza while in hospital given the large numbers of patients and hospital staff who may be infected during a pandemic. Influenza may result in influenza-related complications in such patients as well as an increase in severity of their underlying illness, prolonged hospital stay and death. Prophylaxis of this group will contribute to the objectives of reducing morbidity and mortality and reduce health care demands.

Priority group 8: Prophylaxis of high-risk persons who have not received influenza vaccine or for whom the effectiveness of the vaccine may be reduced is a current recommendation. This group is likely to experience severe illness during a pandemic and prophylaxis with anti-influenza drugs should be considered if an effective vaccine is not available. Prophylaxis of this group will contribute to the objectives of reducing morbidity and mortality and reduce health care demands.

Second Wave

Typically in a pandemic, the number of new cases of influenza peaks and then declines giving the impression that the pandemic is over. Then within a few months, influenza incidence once again

increases. State and local officials and health care providers need to remain vigilant for a return of the epidemic activity. This is especially difficult given that all personnel and supplies involved in responding to the epidemic will be exhausted by efforts to respond to the pandemic. The perceived "end of the pandemic" may be viewed as an opportunity to relax and recover. However, all essential functions should be restored to return to pandemic imminent status.

ADEM (Arkansas Department of Emergency Management) will be relied upon for contact with first responders, ambulances and hospital availability. After the primary wave of influenza has passed, they will be the lead agency for the recovery effort. Communication will also be coordinated with ADEM and all partners will need to work closely together during this time.

COMMUNICATION

ADH relies on the press, weekly faxes/e-mails and a web site for routine dissemination of public information. Along with all the above, ADH will establish a "hotline" for the general public to utilize. A "hotline" for physicians should also be considered. ADH has developed "message mapping" for all of the Class A bioterrorism organisms. This plan also includes "messages" for the influenza pandemic.

The External Communications Group has lead responsibility for developing and approving material for the press and the public. They will set up a "JIC" (joint information center) with ADEM and any other needed parties for the coordination of all information needed for public education.

The ADH website will be emphasized as a coordinating resource for timely communication of vital information to healthcare providers, emergency responders and public health professionals as well as for status updates of benefit to the general public.

Funding from the CDC has helped ADH to develop a "Health Alert Network" (HAN) under its bioterrorism initiative. Expansion of this system (hardware, software, numbers of users, security provisions) is underway and will result in a system that provides a graduated response utilizing alert messages via alpha-numeric pagers, list serving e-mail, secure web pages and synthesized telephonic voice as appropriate for the situation.

ADH needs to establish a means of rapid, two-way communication between local health units (e.g., health officers and communicable disease coordinators) and hospitals (infection control practitioners and emergency department directors).

Communication with the public (TV, radio, newspaper, etc.) should include the following:

1. Information about the virus itself: What is known? What is not known? How lethal is it?
2. What are the Signs and Symptoms?
3. What steps or actions can the public take to protect self and family?
    a. decrease travel or eliminate
    b. if ill, stay at home
    c. businesses should send ill persons home until free of symptoms
    d. good handwashing

    e. cover nose and mouth when coughing or sneezing
4. What steps or actions are being taken to protect the people of Arkansas?
    a. restriction of travel
    b. possible snow days
    c. possible quarantine (explain that it will only help early in disease)
    d. contact tracing followed by quarantine
    e. possible cancellation of large gatherings (events, school, etc.)
5. How effective will these steps be?

Remember to be honest, give correct information and make sure everyone gives the same message!

ADH is currently conducting an inventory of health care personnel including current and retired MDs, DOs, RNs and other nursing personnel, veterinarians, others with medical training (e.g., emergency medical technicians), and State National Guard and other potential volunteers that may be called upon in a time of emergency to help with vaccine clinics as well as in hospitals, etc.

As the pandemic wanes, ADH will become a secondary player and ADEM will take the lead in the recovery phase.

Early Influenza Quarantine Chart