

# Arizona Pandemic Influenza Response Plan



Arizona  
Department of  
Health Services

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\*Note – Each supplement can be considered a stand-alone document

## **Primary Agencies**

**State:** Arizona Department of Health Services (ADHS)  
**Federal:** Centers for Disease Control and Prevention (CDC)  
**International:** World Health Organization (WHO)

## **Support Agencies**

**State:** Arizona Division of Emergency Management (ADEM)  
Office of Attorney General  
Governor's Office  
State Board of Funeral Directors and Embalmers  
Department of Agriculture  
Department of Corrections  
Department of Economic Security  
Department of Administration

**County/Tribal:** Health Departments/Emergency Preparedness  
County Hospitals  
Emergency Management Departments  
Medical Examiners

**Local:** Metropolitan Medical Response Systems (MMRS)  
Incorporated Community Governments  
City Emergency Managers

**Federal:** Federal Emergency Management Agency (FEMA)  
U.S. Public Health Service (USPHS)  
Office of Emergency Preparedness (OEP)  
Centers for Disease Control and Prevention (CDC)  
Indian Health Service (IHS)  
Veterans Administration (VA) Medical Centers  
U.S. Department of Agriculture (USDA)

<b>Private:</b>	<p>Local Medical Facilities</p> <p>Arizona Chapter of the American Academy of Pediatrics</p> <p>Arizona Health Care and Hospital Association</p> <p>Arizona Funeral Directors Association</p> <p>Arizona Chapter of American College of Emergency Physicians</p> <p>Arizona Medical Association</p> <p>Arizona Infectious Disease Society</p> <p>Arizona Osteopathic Medical Association</p> <p>Arizona Chapter of the Emergency Department Nurses Association</p> <p>Arizona Nurses Association</p> <p>Association of Practitioners of Infection Control</p>
<b>Volunteer:</b>	<p>American Red Cross</p> <p>Critical Incident Stress Debriefing – Arizona Chapter</p> <p>Arizona Voluntary Organizations Active in Disasters (AzVOAD)</p> <p>Salvation Army</p> <p>University of Arizona (medical/nursing/pharmacist/public health students)</p>

## **Organizational Roles and Responsibilities**

### **State Government**

#### ***State Board of Pharmacy***

- Provide guidance regarding proper certification and utilization of pharmacists in an emergency response (ex. mass vaccination clinics)

#### ***Arizona Department of Economic Security***

- CPS program-assist with the placement of orphans in foster care

### **Local Government**

#### ***County Emergency Management***

- Operate the County Emergency Operations Center (CEOC)
- Maintain contact with the State Emergency Operations Center (SEOC)

#### ***County/Tribal Health Departments***

- Recruit sentinel sites and other reporting sources as appropriate to the pandemic phase/level
- Ensure timely and consistent reporting from sentinel sites and other reporting sources
- Provide county surveillance information to state surveillance personnel; maintain regular communications with state surveillance personnel
- Conduct additional primary surveillance as needed
- Set-up and administer mass vaccination sites
- Implement Isolation and Quarantine as needed

### ***Metropolitan Medical Response System (MMRS)***

- Administer vaccine to first responder and law enforcement communities
- Assist in providing PPE to first responder and law enforcement personnel

## **Federal Government**

### ***Centers for Disease Control and Prevention***

- Provide on-going surveillance updates and guidance
- Provide criteria for influenza vaccine and antiviral use
- Provide local assistance as requested
- Consult with vaccine and antiviral manufacturers on availability
- Investigate alternative resources (manufacturers) of vaccine and antivirals

### ***Indian Health Service (IHS)***

#### **IHS Area Offices**

- Work with ADHS, tribes and counties in influenza pandemic response planning
- Supply framework and oversight for Service Units in developing their influenza pandemic response plans
- Provide behavioral health support to service unit patients and hospital staff as needed
- Translation of patient and visitor information (if needed) for service units
- Provide training to service units to enable them to develop their own programs
- Consult with tribes to provide guidance, oversight, and implementation of quarantine on tribal lands

#### **IHS Service Units**

- Prepare their individual influenza pandemic response plans that address the following criteria:
  - Hospital Surveillance
  - Communications
  - Triage, clinical evaluation and admission procedures
  - Triggers for surge capacity
  - Prioritization of vaccine administration
  - Education and training for hospital personnel
  - How the facility will participate in the community plan for distribution of vaccine or antiviral drugs
  - Security
  - Mortuary Issues
  - Occupational Health Issues

### ***Food and Drug Administration***

- Oversee the safety and viability of vaccines and pharmaceuticals

## **Private Organizations/Volunteer Organizations**

- Supply resources and volunteers for mass dispensing sites



## I. Executive Summary

It is likely that another influenza pandemic will occur sometime in the future. Arizona needs to be prepared for such an event. To lessen the impact of an influenza pandemic, the State of Arizona has created this Influenza Pandemic Response Plan to promote an effective response throughout the pandemic. The plan was originally crafted in 2000, through a coordinated effort of the Arizona Department of Health Services (ADHS), Arizona Division of Emergency Management (ADEM), local health departments and other partners and stakeholders, and updated again in 2006. It is also an annex to the Arizona State Emergency Response and Recovery Plan (SERRP).

The United States Department of Health and Human Services (HHS) has incorporated the World Health Organization (WHO) Pandemic Planning Periods and Phases into its influenza pandemic response plan. These periods represent different levels of impact on society, based on the progression of a novel influenza virus and its potential to cause a pandemic; therefore, pandemic preparedness requires determining the appropriate capabilities, roles, and responsibilities needed to respond to the different periods. In keeping with the national model, the Arizona Influenza Pandemic Response Plan identifies responsible parties and prescribes necessary actions, based on the WHO/HHS pandemic periods. (\*Note - in 2009, WHO revised the Pandemic phase descriptions, retaining the use of the six-phased approach; these revisions have been incorporated into this publication).



While a pandemic response is primarily a public health response, many agencies, organizations, and private institutions will need to work in a coordinated and collaborative manner to ensure an effective overall response in Arizona:

- ADHS is the lead agency for preparedness and response to an influenza pandemic in Arizona.
- Local health departments (including county and tribal health departments) are the critical local response entities and should be the center of gravity for community level planning.
- Emergency management and homeland security agencies will be important for ensuring overall coordination of government resources.
- First responder agencies have important manpower and logistical resources that will be necessary for ensuring the safety of individuals and communities.
- Hospitals and health care institutions will be the frontline of a pandemic and are essential planning partners at the local and state level.
- Volunteer agencies are always important partners in emergency response activities.

These entities are addressed in this plan, and are encouraged to develop their own influenza pandemic response plans that coordinate with the Arizona Influenza Pandemic Response Plan.

The heart of the Arizona Influenza Pandemic Response Plan is the Response Activity Supplements. The Response Activity Supplements address the concepts listed below. These Supplements are subject-area specific and provide very detailed planning and response activities. The Response Activity Supplements are subject to change and will be updated with changes in planning assumptions, response capacities, or information on potential pandemic strains and subsequent disease.

*Surveillance and Epidemiology* - Arizona's influenza surveillance system, which monitors influenza activity in the state, will provide the surveillance data needed to guide response efforts during a pandemic.

*Laboratory Diagnostics* - The capability of identifying pandemic influenza viruses depends not only on rapid detection and characterization but also on strong partnerships between clinical and public health laboratories.



*Health Care Coordination and Surge Capacity* - The health care system in Arizona will experience significant strains on its resources during a pandemic; preparedness issues include surge capacity and mortuary issues.

*Infection Control* - The ability to limit transmission of the influenza virus already exists in health care settings – this supplement outlines the appropriate and thorough application of infection control measures.

*Clinical Guidelines* - Early identification and appropriate medical intervention are essential for patients who are experiencing suspected pandemic influenza symptoms.

*Vaccine and Antiviral Distribution and Use* - During a pandemic, vaccines and antivirals may or not be effective or available, they will likely be in short supply and will have to be allocated on a priority basis.

*Community and Travel-Related Disease Control* - Public health interventions, such as quarantine and social distancing, will be necessary during a pandemic to slow the transmission of disease within communities.

*Public Health Communications* - Response officials will need to provide accurate and timely coordinated messages to the public leading up to, and during, a pandemic; an informed public is an asset to the overall response.

*Workforce Support* - Response agencies and organizations need to ensure the safety and well being of response personnel to ensure a sustained and effective response.

*Influenza Pandemic Information Management* - Information management is the central nervous system of a complex response system, and a pandemic presents many needs for capturing, analyzing and sharing information.

*Guidance for County and Tribal Health Departments* - This guidance is designed to help spotlight important planning and response activities that are necessary at the local health department level.



The state of Arizona has many differing facets: an international border, numerous Indian Nations, diverse and rich cultures, a rural vs. urban health care divide, a collaborative emergency response structure, and both a strong sense of community and rugged individualism. Understanding and appropriately addressing these facets will allow Arizona to be as prepared as possible for the unthinkable.

## **II. Introduction and Background**

Influenza pandemics struck three times in the 20<sup>th</sup> century causing varying degrees of increased illness and death over annual influenza outbreaks. Of particular note is the 1918 Pandemic, oft referred to as the Spanish Flu, where upwards of 50 million people died around the world and untold number of illnesses along with catastrophic disruption to society as a whole. In June 2009, the World Health Organization (WHO) declared the new strain of swine-origin H1N1 as a pandemic, this novel virus spread worldwide and had caused about 17,000 deaths by the start of 2009. It is likely that another influenza pandemic will occur sometime in the future, however, the State of Arizona needs to be prepared for these events.

According to the World Health Organization (WHO), “An influenza pandemic (or global pandemic) occurs when a new influenza virus subtype appears, against which no one is immune.” In past pandemics, influenza viruses have spread worldwide within months, and are expected to spread even more quickly given modern travel patterns as well as urbanization and overcrowded conditions in some areas. There may be as little as one to six months warning before outbreaks begin in the United States. Outbreaks are expected to occur simultaneously, preventing shifts in resources that commonly occur in other natural disasters. An influenza pandemic is considered to be a high-probability event, and some experts consider it to be inevitable.

In Arizona, an influenza pandemic would result in numerous persons falling ill with the virus. The number of persons hospitalized would exceed the capacity of Arizona’s healthcare institutions. Additionally, the number of deaths due to influenza like illness (ILI) would rise above regular influenza seasonal rates. The Arizona Influenza Pandemic Response Plan was developed to promote an effective and coordinated response, from Phase I through the Post Pandemic Phase.

To prepare for the next pandemic, public health officials from around the world have initiated a planning process. The development of Arizona's plan is a coordinated effort and is based on the U.S. Department of Health and Human Services' *Pandemic Influenza Plan*, dated November 2005 <http://www.hhs.gov/pandemicflu/plan/> and the *Pandemic Influenza Incident Appendix* to the *State Emergency Response and Recovery Plan (SERRP)*. (\*Note – at the time of revising this plan, the U.S. Department of Health and Human Services had not published an updated version of their Pandemic Influenza Plan).

### III. Organization of the Plan

This plan is an Incident Annex to the Arizona Department of Health Services Emergency Response Plan. The response activities will be carried out in collaboration with the Arizona Division of Emergency Management, local health departments and other local, state and federal agencies.

The World Health Organization (International and national pandemic planning) has retained the use of a six-phased approach and grouped them so that they range from the absence of a new virus subtype to resolution of the pandemic. The phases are:

- **Phase 1-3 (Limited Human Spread)**
- **Phase 4 (Sustained Human-to-Human Spread)**
- **Phase 5-6 (Widespread Human Infection or Pandemic)**
- **Post-Peak**
- **Post Pandemic**

See Appendix B for specific, definitions of the phases.



The Arizona plan follows the WHO guidelines and the national HHS model of prescribing necessary activities and identifying responsible parties by the first three periods containing six phases. The main plan provides a general overview of the ADHS response followed by 13 subject specific supplements.

### IV. Planning Assumptions

The development of the Arizona Influenza Pandemic Response Plan is based on the following assumptions:

- An influenza pandemic is likely to occur sometime in the future.
- A new virus subtype will likely emerge in a country other than the United States, although a novel strain could first emerge in the United States.
- Although there may be isolated pockets, the pandemic could affect all geographic areas of the state.
- When the pandemic occurs, vaccines and medicines will be in short supply and will have to be allocated on a priority basis.
- The federal government has assumed responsibility for devising a liability program for vaccine manufacturers and persons administering the vaccine.
- Arizona's temporary residents, winter visitors, migrant workers and tourists will create a potential vaccination target population of nearly double that of the permanent resident population.
- The emergency response element will require the substantial interaction of state and local agencies in addition to the local health departments.
- Response to the demand for services may require non-standard approaches, including:
  - Discharge of all but critically ill hospital patients
  - Expansion of hospital capacity by using all available space and equipment on the hospital campus
  - Adjust patient-to-hospital staff ratio
  - Recruitment of volunteers who can provide custodial services under the general supervision of health and medical workers

- Relaxation of practitioner licensure requirements as deemed appropriate
- Utilization of general purpose, functional needs shelters and alternate care sites as temporary health facilities.
- Expansion of mortuary services capacity
- The federal government has assumed responsibility for developing “generic” guidelines and information templates, including fact sheets, triage and treatment of influenza patient protocols, and guidelines for the distribution and use of antiviral agents that can be modified at the state and local level. Until these are developed and available, the state has the responsibility to develop such guidelines for its citizens.
- Secondary bacterial infections following influenza illness may stress antibiotic supplies.

## V. Concept of Operations

The Pandemic Flu response strategy involves the following elements:

- Federal guidance and direction
- Local support
- Public Health Incident Management System (PHIMS)
- Statewide Emergency Response
- Liability
- Tribal Activities
- Border Activities
- Functional Needs Support Services Executive and Regional Planning Committees
- Response Activity Supplements
  1. Surveillance and Epidemiology
  2. Laboratory Diagnostics
  3. Health Care Coordination and Surge Capacity
  4. Infection Control
  5. Clinical Guidelines
  6. Vaccine Distribution and Use
  7. Antiviral Drug Distribution and Use
  8. Community Disease Control and Prevention
  9. Managing Travel-Related Risk of Disease Transmission
  10. Public Health Communications
  11. Workforce Support: Psychosocial Considerations and Information Needs
  12. Influenza Pandemic Information Management
  13. Guidance for County and Tribal Health Departments



## VI. Federal Guidance and Direction

As the pandemic develops, the World Health Organization (WHO) will notify the Centers for Disease Control and Prevention (CDC) and other national health agencies on the progress of the pandemic. CDC will communicate with ADHS and other state and territorial health departments about pandemic stages, information about the virus (laboratory findings), vaccine availability, recommendations for prioritizing vaccine and antivirals/antibiotics, national response coordination and other recommended strategies for pandemic detection, control and response. ADHS serves as the main conduit for communications with the CDC for all statewide entities.

## **VII. Local Support**

There is integration between local and state emergency management structure. The primary response is at the local level with coordination and support from ADHS. Local health departments (LHDs) (including county and tribal health departments) will carry out the components of the pandemic flu response in their communities. Each county is expected to have its own pandemic flu plan that is consistent with the Department's plan. Necessary local health department actions are detailed in the Response Activity Supplements. Examples of local health departments' activities include: conducting flu surveillance in their jurisdictions; receiving, distributing and administering flu vaccine, if available; and responding to all crises in their jurisdiction, such as health care facility surge capacity, public inquiry and media requests, etc.

ADHS will provide support to the local health departments if their resources are exceeded. Additionally, ADHS will provide regular updates on pandemic status and response activities to the local health departments, through conference calls, Secure Integrated Response Electronic Notification (SIREN) (see Supplement 12) postings, health alerts and other avenues.

## **VIII. Public Health Incident Management System (PHIMS)**

The ADHS incident management structure used in the Department is the "Public Health Incident Management System," or PHIMS, as described in the ADHS Public Health Emergency Response Plan. Please refer to Appendix C – PHIMS Organization. This structure is compliant with the National Incident Management System (NIMS) and is in place but inactivated during normal day-to-day operations. In the event of an emergency or when activities become overwhelming, the Director will assign an Incident Commander within Public Health Services to coordinate the Department's activities and report to the command staff. The command staff and the Incident Commander work together to keep the Agency Administrator (Director) well informed. It is also essential to coordinate with the local health departments and other agencies.

The PHIMS command staff will devise the overall structure and responsibilities of "command and control" operations. The command staff will oversee planning, response, recovery, and mitigation efforts.

## **IX. Statewide Emergency Response**

If the Governor declares a State of Emergency, the State's emergency management structure is put into place (refer to the State Emergency Response and Recovery Plan (SERRP) [www.dem.azdema.gov/preparedness/planning/SERRP.html](http://www.dem.azdema.gov/preparedness/planning/SERRP.html)). According to the *Pandemic Influenza Incident Annex* of the SERRP, the ADHS is listed as the primary agency and will provide the Incident Commander to oversee all of the statewide activities. ADEM will operate the State Emergency Operations Center (SEOC) and provide other logistical support. ADHS and ADEM will work together, in conjunction with local health departments, local emergency management, and other partners and stakeholders. The responsibilities of agencies will increase with each successive phase of the pandemic.

In addition to the SERRP, which is designed to provide support to the State's counties and cities, each State agency has written a Business Continuity Plan (BCP). The goal of the BCP is to assist each state agency to prepare for, mitigate, respond to and recover from an emergency event capable of either causing significant injuries to employees, the public or disrupting normal business operations and damaging the environment. Each agency has identified its critical business functions and the interdependency among the various agencies to support the resumption of these functions. The highly infectious characteristics of an influenza pandemic represent an incident that could limit the available workforce and have a substantial effect on these services.

## **X. Legal Authorities/Liability**

Numerous Federal and state statutes authorize relevant public health actions to address pandemic influenza. Knowledge of these authorities is essential for planning and implementing an effective response to an influenza pandemic, while protecting volunteers, first responders and healthcare professionals. ADHS will ensure it has the strategies in place to slow the spread of the disease, as well as to protect the health of all Arizonans. Appendix D (Legal Authorities) details those Federal and state authorities that may be relevant during a pandemic.



## **XI. Ethical Considerations**



In a situation such as an influenza pandemic, there will likely be a shortage of medical personnel and resources such as vaccines, antivirals and hospital bed space. Under these conditions, ethical considerations become apparent as decisions regarding which persons receive the scarce resources must be made. In addition, enforcing isolation and quarantine measures and anticipating the amount of risk medical personnel are willing to take, are issues that also involve ethical components such as civil liberties and professional codes of conduct.

Processes and policies for these and other areas should be carefully considered and fairly implemented. Close collaboration with community leaders and the Department's legal council in developing these approaches is essential. Public education programs covering the rationale for such decisions can improve their effectiveness.

## **XII. Tribal Health Activities**

For several years, preparedness activities and coordination have taken place among ADHS, the Arizona tribes, Indian Health Service, county health departments and the Intertribal Council of Arizona (ITCA). This includes writing response plans, attending training opportunities and furthering the development of mass vaccination strategies and resources. Due to the varied nature of public health services for the 21 different Indian Nations in Arizona (e.g., tribal health agency-only, IHS-only, tribal agency-IHS combination), this plan does not provide specific response actions at the tribal level. Refer to Supplement 13, where ADHS addresses general guidance for both county and tribal health agencies to assist these entities in the creation of their respective plans.

## **XIII. Border Health Activities**

In the event of a Binational public health emergency, the ADHS Office of Border Health (OBH) serves as the conduit for communication and coordination with the Sonoran state health department. The OBH shares disease surveillance information with the Secretaria de Salud de Sonora (Sonoran State Health Department), specifically with the State Epidemiologists, as well as with local border health authorities via secure email, telephone, and/or fax.

The OBH is instrumental in coordinating Binational emergency preparedness and response planning with the Arizona border county Health Departments, the Tohono O'odham Nation, Indian Health Services, and the Sonora State and municipal health departments in the Arizona-Sonora border region. The OBH and the border partners utilize the Health Services Gateway (MEDSIS and SIREN email) for bi-national disease surveillance, communication and emergency preparedness and planning coordinating efforts.

## **XIV. Special Needs and At-Risk Populations**

Special needs include those persons who are physically disabled, mentally impaired, the elderly, those that live in rural communities or whose primary language is not English. Commonly used methods of risk communication may not reach or have little impact among these persons and therefore more creative measures are needed. Accurate translation of risk communication materials and use of community agencies and spokespersons to provide key messages are important approaches that would be effective to communicate to various special needs populations. HHS has adopted the following definition of at-risk individuals: Before, during and after an incident, members of at-risk populations may have additional needs in one or more of the following functional areas: communication, medical care, maintaining independence, supervision, and transportation.



## **XV. Response Activity Supplements**

The heart of the Arizona Influenza Pandemic Response Plan is the Response Activity Supplements. The following gives general information about concepts and activities in the Response Activity Supplements, which are imbedded within this plan following the Appendices. These Supplements are subject-area specific and provide very detailed planning and response activities. The activities listed are subject to change and will be updated with changes in planning assumptions, response capacities, or information on potential pandemic strains and subsequent disease.

### **Supplement 1: Surveillance and Epidemiology**

Arizona's influenza surveillance system, which monitors influenza activity in the state, will provide the surveillance data needed to guide response efforts during a pandemic. This supplement provides a summary of influenza surveillance activities conducted during normal influenza seasons as well as proposed enhancements to surveillance that would be implemented in the event of a pandemic.

### **Supplement 2: Laboratory Diagnostics**

The public health laboratory is a critical component of the overall public health response to an influenza pandemic. The capability of differentiating common influenza from pandemic influenza depends upon the rapid detection and characterization that is available only at public health laboratories. Supplement 2 identifies the role of clinical and hospital laboratories and the State Public Health Laboratory as well as recommended activities.

### **Supplement 3: Health Care Coordination and Surge Capacity**

The health care system in Arizona will experience significant strains on its resources during a pandemic. This supplement describes the planning and actions necessary for the provision of care in hospitals and other health care settings including surge capacity and mortuary issues.

### **Supplement 4: Infection Control**

The ability to limit transmission of the influenza virus in health care settings will rely heavily on the appropriate and thorough application of infection control measures. This section provides guidance to health care and public health partners on the basic principles of infection control including personal protective equipment for limiting the spread of pandemic influenza.

### **Supplement 5: Clinical Guidelines**

The role of clinical guidelines magnifies itself during a pandemic from its use during a normal influenza season but involves the same components. Early identification and appropriate medical intervention are essential. Supplement 5 focuses on the initial screening, assessment and management of patients who present from the community with fever and/or respiratory symptoms during the pandemic periods.

### **Supplement 6: Vaccine Distribution and Use**

Before an influenza vaccine that is effective against the circulating pandemic virus strain is made available, criteria for its use must be established based upon scientific information as well as projections of available supply. This supplement provides actions and recommendations to state and local partners and other stakeholders on planning for the different elements of a pandemic vaccination program.

### **Supplement 7: Antiviral Drug Distribution and Use**

Appropriate use of antivirals during an influenza pandemic may reduce morbidity and mortality and diminish the overwhelming demands that will be placed on the health care system. Supplement 7 provides recommendations to state and local partners and to health care providers in Arizona on the distribution and use of antiviral drugs for treatment and prophylaxis during an influenza pandemic.



## **Supplement 8: Community Disease Control and Prevention**

For the purposes of this response plan, “Isolation” refers to the separation of an individual with influenza from non-infected individuals. “Quarantine” refers to the separation of an individual or individuals exposed to influenza from non-infected and non-exposed individuals. As the phases of an influenza pandemic progress, use of quarantine to suspend transmission may have limited success and broader community containment measures may be utilized. This section defines and lists strategies and activities for implementation of community containment measures to be used during a pandemic, it also contains legal preparedness templates.

## **Supplement 9: Managing Travel-Related Risk of Disease Transmission**

In a world of modern air travel and a relatively short incubation period of the influenza virus disease spread will likely be rapid during an influenza pandemic. Supplement 9 details travel-related containment strategies and activities to be used during different phases of an influenza pandemic.

## **Supplement 10: Public Health Communications**

Solid tools and approaches of proven risk communication methods are an essential component to education and action by all affected during an influenza pandemic. The overarching goal of the Communications Strategy is to provide timely, accurate and pertinent information to the public and other stakeholders. This supplement covers education and information dissemination to the general public, health care providers, response agencies and organizations, community leaders, and other groups of individuals.

## **Supplement 11: Workforce Support: Psychosocial Considerations and Information Needs**

The response to an influenza pandemic will pose substantial physical, personal, social and emotional challenges to health care providers, public health officials and other essential service workers. Supplement 11 addresses the psychological and social (“psychosocial”) needs of the occupational groups that will participate in the Arizona response to an influenza pandemic.

## **Supplement 12: Pandemic Influenza Information Management**

Public Health Informatics is the systemic study of information in the public health system. Specifically, how it is captured, retrieved and used in making decisions as well as the tools and methods used to manage this information and support decisions. This supplement describes the role and activities for informatics systems that support surveillance, vaccine and pharmaceutical delivery, emergency response and communications needs during an influenza pandemic.

## **Supplement 13: Guidance for County and Tribal Health Departments**

Supplement 13 is a guidance document designed to assist county and tribal health departments in detailing the local health responsibilities during an influenza pandemic in accordance with the Arizona Influenza Pandemic Response Plan.

## **APPENDIX A**

### **Acronyms**

<b>AAC</b> – Arizona Administrative Code	<b>CSTE</b> – Council of State and Territorial Epidemiologists
<b>ADEM</b> – Arizona Division of Emergency Management	<b>DBHS</b> – Division of Behavioral Health Services
<b>ADES</b> – Arizona Department of Economic Security	<b>DMAT</b> – Disaster Medical Assistance Teams
<b>ADHS</b> – Arizona Department of Health Services	<b>DMORT</b> – Disaster Mortuary Operational Response Teams
<b>AEFI</b> – Adverse Events Following Immunization	<b>DOD</b> – Department of Defense
<b>AH1, AH3, AH5, AH7</b> – Types of Influenza A Virus (H=Hemagglutinin)	<b>EAP</b> - Employee Assistance Program
<b>AIPO</b> – Arizona Immunization Program Office	<b>EDC</b> - Epidemiology and Disease Control
<b>AOMA</b> – Arizona Osteopathic Medical Association	<b>EDR</b> – Electronic Death Registration
<b>APHIS</b> – Animal and Plant Health Inspection Service	<b>EIP</b> – Emerging Infections Program
<b>ARMA</b> – Arizona Medical Association	<b>ELR</b> – Electronic Laboratory Reporting
<b>ARC</b> – American Red Cross	<b>EMSCOM</b> – Emergency Medical Systems Communications
<b>ARS</b> – Arizona Revised Statutes	<b>EPA</b> – Environmental Protection Agency
<b>ASIIS</b> – Arizona State Immunization Information System	<b>EPI-X</b> – Epidemic Information Exchange
<b>ASL</b> – Arizona State Public Health Laboratory	<b>ESAR-VHP</b> – Emergency System for the Advanced Reporting of Volunteer Health Professionals
<b>AZEIN</b> – Arizona Emergency Information Network	<b>EMS</b> – Emergency Medical Services
<b>AzVOAD</b> – Arizona Voluntary Organizations Active in Disasters	<b>EUA</b> – Emergency Use Authorization
<b>AzVOL</b> – Arizona Veterinary Diagnostic Laboratory	<b>EWIDS</b> – Early Warning Infectious Disease Surveillance
<b>BCP</b> – Business Continuity Plan	<b>FEMA</b> – Federal Emergency Management Agency
<b>BPHEP</b> – Bureau of Public Health Emergency Preparedness	<b>FDA</b> – Food and Drug Administration
<b>BSL</b> – Laboratory Biosafety Level	<b>H5-N1</b> – Avian Influenza A
<b>CBER</b> – Center for Biologics Evaluation and Research	<b>HAN</b> – Health Alert Network
<b>CBRNE</b> – Chemical Biological Radiological Nuclear Explosive	<b>HAZMAT</b> – Hazardous Materials
<b>CDC</b> – Centers for Disease Control and Prevention	<b>HEICS</b> – Hospital Emergency Incident Command System
<b>CEOC</b> – County Emergency Operations Center	<b>HHS</b> – U.S. Department of Health and Human Services
<b>CHC</b> – Community Health Center	<b>HPAI</b> – Highly Pathogenic Avian Influenza
<b>CHD</b> – County Health Department	<b>HSP</b> – Health Services Portal
<b>CIR</b> – Community Information and Referral	<b>IDES</b> - Infectious Disease Epidemiology Section
<b>CISA</b> – Clinical Immunization Safety Assessment	<b>HEOC</b> – Health Emergency Operations Center
<b>CISM</b> – Critical Incident Stress Management	<b>HI</b> – Hemagglutination Inhibition
	<b>ICS</b> – Incident Command System
	<b>IDES</b> – Infectious Disease Epidemiology Section

<b>ILI</b> – Influenza Like Illness	<b>PIO</b> - Public Information Officer
<b>IHS</b> – Indian Health Service	<b>PPE</b> – Personal Protective Equipment
<b>IND</b> – Investigational New Drug	<b>Q &amp; A</b> – Question and Answer(s)
<b>IRB</b> – Institutional Review Board	<b>RACES</b> – Radio Amateur Civil Emergency Service
<b>IRMS</b> – Inventory and Resource Management System	<b>RBHA</b> – Regional Behavioral Health Authority
<b>ITCA</b> – Intertribal Council of Arizona	<b>RRT</b> – Rapid Response Team
<b>ITS</b> – Information Technology Services	<b>RT - PCR</b> – Real Time - Polymerase Chain Reaction
<b>JENC</b> – Joint Emergency News Center	<b>SARS</b> – Severe Acute Respiratory Syndrome
<b>JIC</b> – Joint Information Center	<b>SEOC</b> – State Emergency Operations Center
<b>JTF-CS</b> – Joint Task Force Civil Support	<b>SERRP</b> – State Emergency Response and Recovery Plan
<b>KAB</b> – Knowledge, Attitude and Beliefs	<b>SNS</b> – Strategic National Stockpile
<b>LHD</b> – Local Health Department	<b>UA</b> – University of Arizona
<b>LIMS</b> – Laboratory Information Management System	<b>USDA</b> – United States Department of Agriculture
<b>LITS</b> – Laboratory Information Tracking System	<b>USNORTHCOM</b> – United States Northern Command
<b>MAM</b> – MEDSIS Arbovirus Module	<b>USPS</b> – United States Public Health Service
<b>MEDSIS</b> – Medical Electronic Disease Surveillance Intelligence System	<b>VA</b> – Veterans Administration
<b>MMRS</b> – Metropolitan Medical Response System	<b>VACMAN</b> – Vaccine Management System
<b>NCHS</b> – National Center for Health Statistics	<b>VAERS</b> – Vaccine Adverse Event Reporting System
<b>NDMS</b> – National Disaster Medical System	<b>VAPAC</b> – Vaccine and Antiviral Prioritization Advisory Committee
<b>NIMS</b> – National Incident Management System	<b>VFC</b> – Vaccines For Children Program
<b>NMRT</b> – National Medical Response Team	<b>VS</b> – Veterinary Services
<b>NNDSS</b> – National Notifiable Disease Surveillance System	<b>WHO</b> – World Health Organization
<b>NRDMS</b> – National Retail Data Monitoring System	<b>WMD</b> - Weapons of Mass Destruction
<b>NREVSS</b> – National Respiratory and Enteric Virus Surveillance	
<b>NRP</b> – National Response Plan	
<b>NVPO</b> – National Vaccine Program Office	
<b>NVSN</b> – New Vaccine Surveillance Network	
<b>OEP</b> – Office of Emergency Preparedness	
<b>OIDS</b> – Office of Infectious Disease Services	
<b>OTC</b> – Over the Counter	
<b>PHILS</b> – Public Health Information System	
<b>PHIMS</b> – Public Health Incident Management System	

## APPENDIX B

### World Health Organization (WHO) Pandemic Descriptions - 2009

#### Phase 1

No animal influenza virus circulating among animals has been reported to cause infection in humans. . Uncertainty of pandemic probability.

#### Phase 2

An animal influenza virus circulating in domesticated or wild animals is known to have caused infection in humans and is therefore considered a specific potential pandemic threat. Uncertainty of pandemic probability.

#### Phase 3

An animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people, but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks. . Uncertainty of pandemic probability.

#### Phase 4

Human-to-human transmission of an animal or human-animal influenza reassortant virus able to sustain community-level outbreaks has been verified. Medium to high probability of pandemic..

#### Phase 5

The same identified virus has caused sustained community level outbreaks in at least two countries in one WHO region. High to certain pandemic probability.

#### Phase 6

In addition to the criteria defined in Phase 5, the same virus has caused sustained community level outbreaks in at least one other country in another WHO region. Pandemic in progress.

#### Post-Peak Period

Levels of pandemic influenza in most countries with adequate surveillance have dropped below peak levels.

#### Post Pandemic Period

Levels of influenza have returned to the levels seen for seasonal influenza in most countries with adequate surveillance.

In 2009 the World Health Organization (WHO) revised the pandemic phases. The six phase structure was retained, but the phases were regrouped and redefined to make them easier to understand, more precise and to more accurately reflect pandemic risk and the epidemiological situation based upon observable phenomena.

**Phase 1 through 3:** Strengthening Pandemic preparation and response capacities, the risk during these phases is simply unknown, therefore it is possible to have situations which pose an increased pandemic risk, but do not result in a pandemic.

**Phase 4:** Containment

**Phase 5 through 6:** Response

**Post-Peak Period:** Addressing health and social impacts and preparing for future waves

**Post-Pandemic Period:** Restoration of normal health and social functions and addressing long-term impacts.

## APPENDIX C

### PHIMS Organization

The **Public Health Incident Management System (PHIMS)** is the Department's Incident Management System. It is an organizational framework within which the Department responds to an emergency that is compliant with the National Incident Management System (NIMS). During an emergency, Department resources such as personnel, equipment, communication systems and procedures may need to be mobilized across programs. The PHIMS response provides a systematic, proactive approach guiding the agency to work seamlessly to prepare for, prevent, respond to, recover from and mitigate the effects of incidents, regardless of cause, size, location or complexity, in order to reduce the loss of life and property, and harm to the environment.

#### PHIMS Staff

*(See the Sample PHIMS Response Organizational Chart located after this introduction as a visual example)*

The Agency Administrator consists of the Department Director or their designee who oversees the response. A Public Policy Advisory Group may be assembled as needed and is comprised of selected Division Directors, and Bureau/Office Chiefs to assist the Agency Administrator in developing public policy recommendations. The Agency Administrator then assigns an Incident Commander who is responsible for managing the Department's response activities by coordinating the Operations, Planning, Logistics and Finance/Administration sections. In addition, this individual develops the Public Health Incident Action Plan (IAP) in conjunction with the Planning Section.

The Incident Commander is supported by a command staff that is represented by the State Epidemiologist, Information Officer, Liaison Officer, Safety Officer and a Chief for each of the Operations, Planning, Logistics and Finance/Administration sections.

The PHIMS Command Staff is comprised of an Information Officer, Liaison Officer and a Safety Officer. The Information Officer develops material, has it reviewed internally and releases it to the media. The Liaison Officer maintains relations between the Department and outside agencies and the Safety Officer oversees the safety of the response.

The PHIMS General Staff includes Operations, Planning, Logistics, and Finance/Administrative responsibilities. These responsibilities remain with the Incident Commander (IC) until they are assigned to other individuals. When the Operations, Planning, Logistics or Finance/Administrative responsibilities are established as separate functions under the IC, they are managed by a section chief and can be supported by other functional units (Group Supervisors and Unit Leads)

- The Operations Staff is responsible for carrying out the response activities described in the Incident Action Plan (IAP). The Operations Section Chief coordinates Operation Section activities and has primary responsibility for receiving and implementing the IAP. The Operations Section Chief reports to the Incident Commander and determines the required resources and organizational structure within the Operations Section. Here are some examples of activities that the Operations Section might be involved in:
  - Conduct human case surveillance and characterize an outbreak
  - Conduct human case follow-up
  - Disseminate data (cases, geographical distribution)
  - Handle public, media and health care provider inquiries
  - Develop messages covering clinical information and prevention
  - Make regular updates to local health departments
  - Identify need and broker vaccine/antivirals
  - Provide Behavioral Health Services to ADHS staff
  - Support resource and information requests from Arizona hospitals and clinics

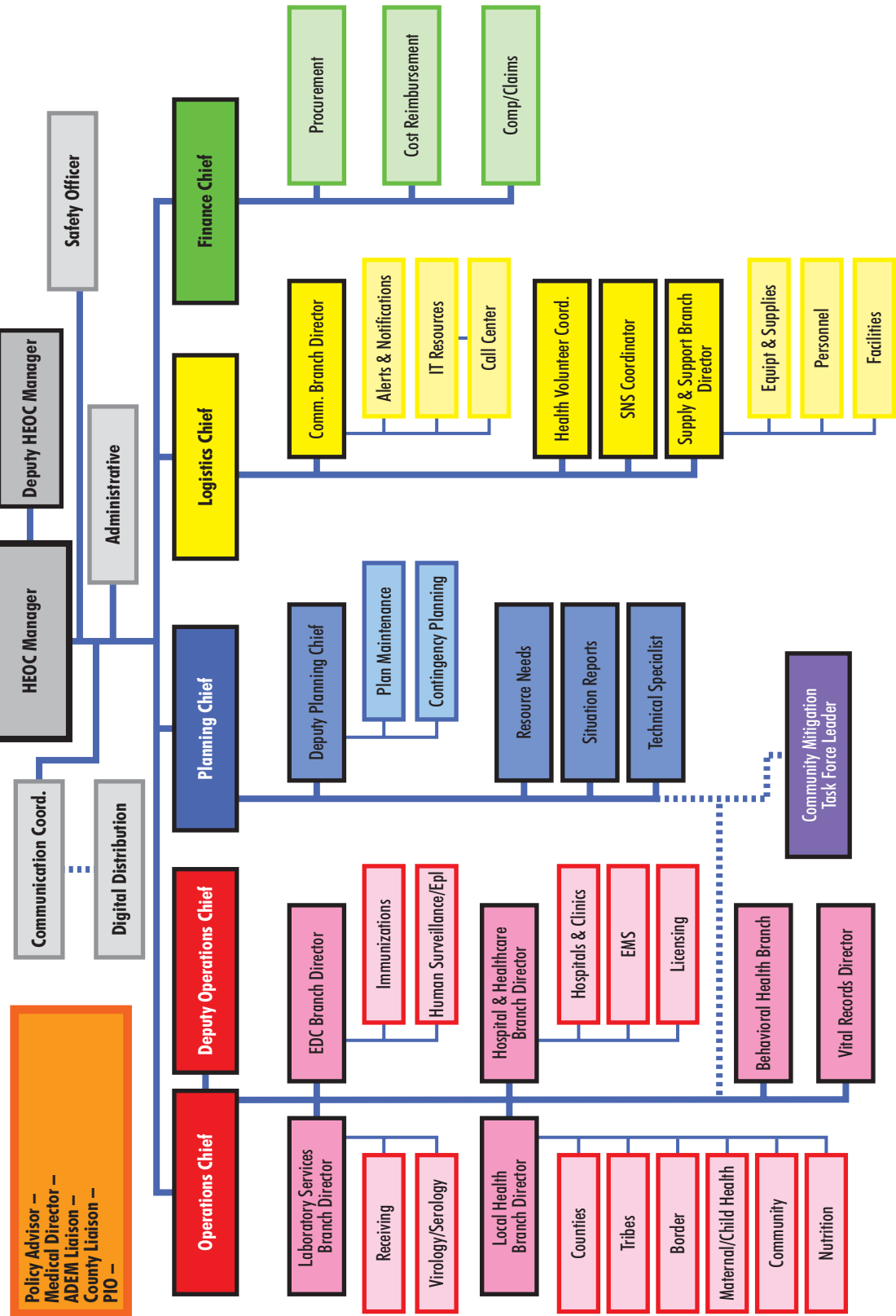
- The Planning Staff is responsible for the collection, evaluation, dissemination and use of information about the development of the incident and status of resources. This section's responsibilities also include creation of the Incident Action Plan (IAP) which defines the response activities and resource utilizations for a specified time period.
  - Coordinate staffing rosters to support operations
  - Provide input to the IC and Operations in preparing the IAP
  - Development of IAP
  - Compilation of PHIMS Updates/Briefs into the weekly/daily Situation Report
  - Conduct and facilitate planning meetings
- The Logistics Staff is responsible for providing additional facilities, personnel (volunteers), communications, supplies and materials for the incident response.
  - Additional equipment for HEOC, Communications, Call Center, etc.
  - Health Messaging
  - Facilities
  - Personnel (volunteers)
- The Finance and Administration Staff is responsible for all financial, administrative, and cost analysis aspects of the incident.
  - Procurement of items/services
  - Maintenance of contracts
  - Tracking of incident expenditures and personnel time

The modular organization of PHIMS allows responders to scale their efforts and apply the parts of the PHIMS structure that best meet the demands of the incident. For example, many incidents will never require the activation of Planning, Logistics, or Finance/Administration Sections, while others, such as influenza pandemic, will require some or all of them to be established.

Communications occurs across groups, but also comes directly to one's supervisor and subsequently to the Section Chiefs and Command Staff. The Section Chiefs and Command Staff meet as needed to use information to make decisions. Information from these meetings and regular updates are incorporated into Situation Reports that are disseminated by e-mail to the entire response network to keep everyone up to date and anticipate future issues.



**Sample PHIMS Chart**  
**Public Health Emergency**



## APPENDIX D

### Legal Authorities

STATUTORY AUTHORITY		
STATUTE	AGENCY	AUTHORITY
U.S. Public Law 93-288	Federal Government	<ul style="list-style-type: none"> <li>Provides authority to respond to emergencies and provide assistance to protect public health; implemented by Federal Emergency Management Act</li> </ul>
USC Title 42-264	Federal Government	<ul style="list-style-type: none"> <li>Provides the U.S. Surgeon General the authority to apprehend and examine any individual(s) reasonably believed to be infected with a communicable disease for purposes of preventing the introduction, transmission, or spread of such communicable disease only:               <ol style="list-style-type: none"> <li>if the person(s) is moving or about to move from state to state.</li> <li>if the person, upon examination, is found to be infected, he may be detained for such time and in such manner as may be reasonably necessary.</li> </ol> </li> </ul>
USC Title 42-139 Sec. 14503	Federal Government	<ul style="list-style-type: none"> <li>Liability protection for volunteers – No volunteer of a non-profit organization or governmental entity shall be liable for harm caused by an act of omission of the volunteer on behalf of the organization or entity.</li> </ul>
ARS § 36-782	Governor	<ul style="list-style-type: none"> <li>In consultation with the Director of ADHS, may issue an enhanced surveillance advisory.</li> </ul>
ARS § 35-192	Governor	<ul style="list-style-type: none"> <li>Allows Governor to declare a state of emergency.</li> </ul>
ARS § 26-303	Governor	<ul style="list-style-type: none"> <li>Gives Governor authority over state agencies and the right to exercise police power.</li> <li>Allows Governor to delegate authority to adjutant general.</li> </ul>
ARS § 23-901.06	Division of Emergency Management	<ul style="list-style-type: none"> <li>Volunteer workers of a county, city, town or other political subdivision of the state may be deemed to be employees and entitled to the benefits provided by this chapter upon passage of a resolution or ordinance by the political subdivision defining the nature and type of volunteer work and workers to be entitled to such benefits.</li> </ul>
ARS § 26-310	Division of Emergency Management	<ul style="list-style-type: none"> <li>Allows any person holding any license, certificate, or other permit issued by any other state to render aid to meet the emergency as fully as if such license had been issued in this state.</li> </ul>

STATUTE	AGENCY	AUTHORITY
ARS § 26-314	Division of Emergency Management	<ul style="list-style-type: none"> <li>Immunity of state, political subdivisions and officers, agents and emergency workers; limitation rules: ADHS or any other state agency, will not be liable for any claim based upon the exercise or performance, or the failure to exercise or perform, a discretionary function or duty by an emergency worker, engaging in emergency management activities or performing emergency functions. (Please refer to entire statute for complete definition).</li> </ul>
ARS § 36-136	Arizona Department of Health Services	<ul style="list-style-type: none"> <li>Powers and duties of the Director</li> </ul>
ARS § 36-782	Arizona Department of Health Services	<ul style="list-style-type: none"> <li>Defines an Enhanced Surveillance Advisory</li> </ul>
ARS § 36-787(A)(6)	Arizona Department of Health Services	<ul style="list-style-type: none"> <li>Establishes in conjunction with applicable licensing boards a process for temporary waiver of the professional licensure requirements to address the state of emergency or state of war emergency.</li> </ul>
ARS § 36-787(A) (7)	Arizona Department of Health Services	<ul style="list-style-type: none"> <li>Grants temporary waivers of health care institution licensure requirements to address the state of emergency or state of war emergency.</li> </ul>
ARS § 36-788	Arizona Department of Health Services/County Health Departments	<ul style="list-style-type: none"> <li>Describes the authorities for isolation and quarantine during a state of emergency or state of war emergency.</li> </ul>
ARS § 36-789	Arizona Department of Health Services/County Health Departments	<ul style="list-style-type: none"> <li>Describes due process procedures for isolation and quarantine.</li> </ul>
AAC R9-6-204	Arizona Department of Health Services	<ul style="list-style-type: none"> <li>Allows for collection of patient specific information for positive laboratory reports of influenza</li> </ul>
ARS § 36-624	County Health Departments	<ul style="list-style-type: none"> <li>Allows county health departments to adopt quarantine and sanitary measures to prevent the spread of the disease.</li> </ul>
ARS § 36-627	County Health Departments	<ul style="list-style-type: none"> <li>Allows county health departments to assume control of hospitals and other places where infectious or contagious disease exists.</li> <li>Allows county health department to provide temporary hospitals or places of reception for persons with infectious or contagious diseases.</li> </ul>
ARS § 36-628	County Health Departments	<ul style="list-style-type: none"> <li>Allows county health departments to employ physicians and others they deem necessary to provide care for persons afflicted with contagious or infectious diseases.</li> </ul>
ARS § 26-311	Local Governments	<ul style="list-style-type: none"> <li>Allows mayors or chairmen of the board of supervisors to declare a local emergency</li> </ul>

## **APPENDIX E**

### **DECLARATION OF EMERGENCY**

#### **Pandemic Influenza**

**WHEREAS**, a National Emergency with respect to the 2009 H1N1 pandemic influenza was declared by the President on October 24, 2009; and

**WHEREAS**, the 2009 novel H1N1 pandemic influenza is affecting greater numbers of Arizona's population than seasonal influenza because of the novel nature of the disease and the lack of immunity to the disease within the population; and

**WHEREAS**, the progression of the disease has the potential to strain limited health care resources putting the health and safety of all Arizonans in extreme peril; and

**WHEREAS**, it is likely that Arizonans affected by pandemic influenza and seasonal influenza will occur at the same time further compounding the demands for healthcare prevention and response measures; and

**WHEREAS**, the Governor is authorized to declare an emergency pursuant to A.R.S. § 26-303(D); and

**WHEREAS**, the Arizona Department of Health Services, during a state of emergency declared as a result of an occurrence or imminent threat of an illness caused by a pandemic disease, shall, pursuant to A.R.S. § 36-787(A), coordinate all matters pertaining to the public health emergency response of the state;

**NOW, THEREFORE I**, Janice K. Brewer, Governor of the State of Arizona, by virtue of the authority vested in me by the Constitution and Laws of the State, do hereby determine that pandemic influenza justifies the declaration of a State of Emergency, pursuant to A.R.S. § 26-303(D), and I do hereby:

- a. Declare that a State of Emergency exists within the State of Arizona due to pandemic influenza, effective \_\_\_\_\_ and
- b. Declare that the Arizona Department of Health Services shall, pursuant to A.R.S. § 36-787(A) coordinate all matters pertaining to the public health emergency response of this state.

IN WITNESS WHEREOF, I have hereunto set my hand this \_\_\_\_\_ day of \_\_\_\_\_.

Janice K. Brewer  
Governor

# Arizona Pandemic Influenza Response Plan

## *Supplement 1: Surveillance and Epidemiology*







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## I. Rationale

Pandemic influenza surveillance includes surveillance for influenza viruses (laboratory surveillance) and surveillance for influenza-associated illness, hospitalizations, and deaths (disease surveillance).

The goals of laboratory surveillance for pandemic influenza are to:

- Rapidly detect the introduction and early cases of a pandemic influenza virus in the United States, and the specific introduction into Arizona.
- Track the virus' introduction into local areas and monitor the spread of the virus within affected areas.
- Monitor genetic changes in the pandemic virus, including development of antiviral resistance.

The goals of disease surveillance are to:

- Serve as an early warning system to detect increases in influenza-like illness (ILI) in the community.
- Monitor the pandemic's impact on health (e.g., by tracking outpatient visits, hospitalizations, and deaths).
- Track trends in influenza disease activity and identify populations that are severely affected.

Surveillance data can help decision-makers identify effective control strategies and re-evaluate recommended priority groups for vaccination and antiviral therapy. Data from surveillance can also facilitate efforts to mathematically model disease spread during a pandemic. The existing methods of influenza surveillance provide a framework to detect and monitor pandemic influenza.

## II. Overview

This supplement provides a summary of influenza surveillance activities conducted during normal influenza seasons as well as proposed enhancements to surveillance that would be implemented in the event of a pandemic. While primary investigations of influenza are conducted by local health departments, the Arizona Department of Health Services' Office of Infectious Disease Services (OIDS) coordinates human influenza surveillance activities throughout the state.

Veterinary surveillance is conducted through the Arizona Veterinary Diagnostic Laboratory (AzVDL) in coordination with the Arizona Department of Agriculture and the U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) Program. These agencies work together to conduct influenza surveillance in domestic animals. USDA also monitors wild avian populations for highly pathogenic avian influenza (HPAI) and other diseases of concern through the APHIS Wildlife Services program.

## III. World Health Organization (WHO) Pandemic Phases

The World Health Organization (WHO) has developed a [global influenza preparedness plan](http://www.who.int/csr/disease/influenza/PIPGuidance09.pdf) (<http://www.who.int/csr/disease/influenza/PIPGuidance09.pdf>), which defines phases of a pandemic, outlines the role of the WHO, and makes recommendations for national measures before, during, and after a pandemic. The WHO phases are used in this document to divide the Arizona Department of Health Services' response actions by the defined phases of pandemic activity. The phases used in this document are:

### A. Limited Human Spread

*Phase 1:* No animal influenza virus circulating among animals has been reported to cause infection in humans.

*Phase 2:* An animal influenza virus circulating in domesticated or wild animals is known to have caused infection in humans and is, therefore, considered a specific potential pandemic threat.

*Phase 3:* An animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people, but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks.

B. Sustained Human-to-Human Spread

*Phase 4:* Human-to-human transmission of an animal or human-animal influenza reassortant virus able to sustain community-level outbreaks has been verified.

C. Widespread Human Infection or Pandemic

*Phase 5:* The same identified virus has caused community-level outbreaks in two or more countries in one WHO region.

*Phase 6:* In addition to the criteria defined in phase 5, the virus has caused sustained community-level outbreaks in at least one other country in another WHO region.

#### **IV. Surveillance for WHO Phases 1-3 (Limited Human Spread)**

ADHS maintains and coordinates a statewide influenza surveillance system that identifies circulating influenza viruses and monitors influenza activity. While influenza surveillance is generally most intensive in October through May each year, Arizona performs virologic testing and laboratory surveillance throughout the year and gathers influenza-like illness reporting from selected sites year round. The statewide influenza surveillance system is coordinated and maintained through the ADHS Office of Infectious Disease Services (OIDS) and is comprised of the following components:

- Virologic surveillance by subtyping selected influenza isolates or via real-time reverse transcriptase polymerase chain reaction (PCR) testing
- Outpatient influenza-like illness (ILI) surveillance via ILINet and other methods
- Laboratory surveillance through the reporting of positive laboratory tests for influenza from laboratories throughout the state
- Influenza and pneumonia mortality data from county/state vital records offices and identification of influenza-associated deaths through collaborations with the medical examiners offices
- Influenza-associated pediatric mortality
- Influenza-like illness outbreak investigation
- Syndromic surveillance data from schools and other sites
- Veterinary surveillance through collaborations with other agencies
- Communication of surveillance findings to the public and public health partners around the state

Components are described in greater detail in Appendix 1.1: Components of the Arizona Influenza Surveillance System and in the sections below. These components provide data that result each week in an overall state-level assessment of influenza activity, which is submitted to CDC and communicated to local partners. Activity is characterized as “widespread”, “regional”, “local”, “sporadic” or “no activity”. Definitions for these levels are included in Appendix 1.2: Definitions of the Geographic Spread of Influenza. These assessments are used to compare the extent of influenza activity from state to state. The state influenza activity assessments are used to generate the influenza activity map (see [www.cdc.gov/flu/weekly/usmap.htm](http://www.cdc.gov/flu/weekly/usmap.htm)). During a pandemic, CDC may recommend that these assessments be made year-round, rather than only October through May.

National surveillance for influenza involves several components, including: virologic surveillance [state public health laboratories and other global sites], outpatient surveillance [sentinel provider surveillance via ILINet], hospital surveillance [Influenza Hospitalization Network (FluSurv-NET)], mortality surveillance [122 Cities Mortality Reporting System and Influenza-Associated Pediatric Mortality Surveillance System], and weekly state-level assessments of influenza activity. These are described in more detail on the CDC website at <http://www.cdc.gov/flu/weekly/overview.htm> and in Appendix 1.3: Overview of Influenza Surveillance in the United States.

The components of Arizona’s influenza surveillance system are described here:

## A. Laboratory surveillance for influenza

Public health goals for surveillance of influenza viruses are twofold: to identify and characterize circulating strains to inform annual vaccine formulation, and to identify and characterize strains with pandemic potential.

The Arizona State Public Health Laboratory (ASPHL) provides testing of influenza specimens submitted by providers and laboratories throughout the state year-round, via culture and hemagglutination inhibition or real-time reverse transcriptase polymerase chase reaction (PCR) testing. The ASPHL performs preliminary typing, forwards isolates or specimens with unusual results to CDC for identification of novel viruses, and provides specimens routinely to CDC for antigenic characterization. The ASPHL has the capacity for identification of influenza A H1, H3, H5, and H7 and influenza B.

In preparation for a pandemic, the ASPHL will be responsible for coordinating the detection of the pandemic strain by testing and forwarding specimens to the CDC laboratory, as appropriate. Recommendations for testing patients during a pandemic will likely come from the CDC, and patients for whom testing is recommended would likely be a subset of all patients with suspected influenza. ADHS will issue additional guidelines for testing of suspected influenza patients, as needed, based on available laboratory resources and surveillance needs within Arizona.

The ASPHL provides influenza specimen collection kits to county health departments and tests specimens that are submitted. Upon request, the county health department may provide collection kits to health care providers and facilitate transport of the specimens to ASPHL for testing and subtyping. Clinical and reference laboratories may also send a select number of isolates for subtyping.



OIDS receives ASPHL information through the state laboratory's electronic laboratory information system (StarLIMS). Positive influenza test results are then entered into the statewide, web-based surveillance system, the Medical Electronic Disease Surveillance Intelligence System (MEDSIS). County health departments are able to view and edit information in MEDSIS for persons that reside in their jurisdiction. Any high-priority laboratory results (e.g., identification of a novel strain or the first influenza case of the season) will be relayed to the county health department via telephone to ensure rapid follow-up. The information sharing procedures between OIDS, ASPHL, county health departments and clinical laboratories will continue to change with implementation of new systems allowing submitters to view the status of their samples at ASPHL.

The ASPHL is part of a national system of U.S.-based collaborating laboratories of the WHO Global Influenza Surveillance Network and the National Respiratory and Enteric Virus Surveillance System (NREVSS) (see Supplement 2 – Laboratory). The objective of this system is to detect trends and compare seasonal differences, rather than to record all influenza tests performed in the United States. These laboratories provide information weekly to describe influenza surveillance on a national level. The ASPHL and one other Arizona clinical laboratory report regularly to the NREVSS. In 2010, CDC and ASPHL worked together to implement the Public Health Laboratory Interoperability Project (PHLIP), which allows for daily transmission of influenza results from ASPHL to CDC and reduces the workload on the user sending the results. CDC also maintains and disseminates national data regarding the antigenic characterization and antiviral resistance of viruses submitted from state public health laboratories and other NREVSS sites.

All positive influenza tests have been reportable to ADHS by laboratories since October 2004, including influenza cultures, direct fluorescent antibody test, PCR, and rapid influenza diagnostic tests. This component of the state surveillance system provides useful information on the burden of confirmed influenza each week (disease surveillance) and also helps to determine the type of influenza circulating. This system is discussed in more detail in the Disease Surveillance section below.

Please refer to Supplement 2 – Laboratory Diagnostics, for a full description of laboratory activities.

## **B. Disease surveillance for influenza**

Disease surveillance provides valuable information on the burden of disease in a community and seasonal trends. Data on outpatient visits for ILI, laboratory-confirmed influenza, hospitalizations, and deaths allow public health to monitor regional disease trends. As mentioned previously, influenza surveillance has traditionally been conducted from October through May, though in recent years various components of influenza surveillance have been expanded to year-round. This enhancement is an important part of surveillance for novel strains of influenza.

Disease surveillance activities in Arizona incorporate local components of several of the national surveillance types and can be divided into the following categories: Outpatient (ILI) Surveillance, Laboratory Surveillance, Hospitalization Surveillance, Mortality Surveillance, Syndromic Surveillance, Veterinary Surveillance and Surveillance Communications. Below are influenza activities, by category, conducted during a routine influenza season:

### **Outpatient (ILI) Surveillance**

- Recruiting ILI sentinel reporting sites (county health departments or the providers report online to the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet); ADHS accesses this information online)
  - At least one regularly reporting surveillance site per 250,000 persons population is recommended, or at least one site for smaller counties.
  - Approximately 60 sites are enrolled each season, from 12-13 counties.
  - All sites are encouraged to continue reporting through the summer months. County health departments are responsible for helping to recruit sites and follow-up with non-reporting sites. ADHS works with the county health department to ensure geographic representation among sites.
- Ensuring ILI sentinel reporting sites are reporting to the state surveillance system on a regular basis
- Collecting county health department-level influenza surveillance information (cases and/or ILI outbreaks) from schools, long-term care facilities, or other institutions. Some counties also monitor school absenteeism regularly throughout the influenza season.

### **Laboratory Surveillance**

- Tracking reports of laboratory-confirmed influenza cases from clinical/commercial laboratories around the state. The reporting mechanism for laboratories for influenza is the same as for all other laboratory-reportable morbidities; lab reporting continues year-round. Entering and analyzing laboratory data on a routine basis.
- Continuing development and implementation of electronic laboratory reporting (ELR). Laboratories using ELR can provide more timely data through automatic data transmissions from their systems to ADHS. This also reduces data entry time at ADHS and may reduce data transcription errors. Two commercial laboratories have implemented ELR with ADHS and work continues to add more laboratories, including ASPHL. More information about MEDSIS and ELR can be found in Supplement 12 – Influenza Pandemic Information Management.
- Working with clinical/diagnostic laboratories around the state to ensure appropriate numbers of reference specimens are sent to ASPHL for subtyping or PCR.
  - The appropriate number is a balance between available resources, competing laboratory priorities, and the need for sufficient specimens to obtain quality data about circulating strains. Submission requests to laboratories may change throughout the season or pandemic phases as influenza activities and informational needs change.
- Promoting testing of suspect influenza patients from ILINet sites
  - Sentinel providers may send selected specimens for testing at no charge for shipping or testing.
  - Additional kits are sent to providers upon specimen receipt.
- Contacting local health departments on a monthly basis to assess influenza specimen collection kit needs; ensuring that kits are sent in a timely manner.



- Ensuring that ASPHL is producing adequate influenza testing media and preparing sufficient influenza testing kits for the influenza season.

### **Hospitalization Surveillance**

- Conducting hospital surveillance for severe acute respiratory illness in selected border counties, including characterizing the etiologies of respiratory illnesses within participating hospitals (conducted by ADHS Office of Border Health)
- Working with local health departments to monitor activity levels or unusual events from infection preventionists, infectious disease doctors, medical examiners or other relevant groups, as warranted by the influenza season.
- Monitoring BioSense for emergency department or inpatient anomalies: A CDC system that includes ICD-9-coded emergency department, inpatient and outpatient visits for influenza-like illnesses; eight Arizona hospitals are included in the national system. Data are available in real-time and statistical anomalies are flagged within the system.
- Collaborating with local health departments to respond to special situations and follow CDC requests (e.g., investigation of pediatric influenza-associated deaths, critically ill pregnant cases, or intensive care unit admissions).
- Investigating selected hospitalized cases. As a result of the 2009 H1N1 response, a form now exists in MEDSIS for entering information about hospitalized cases, including disease progression and underlying medical conditions. While it is anticipated that few individual hospitalized influenza cases will be investigated outside of a pandemic situation, the forms and data collection mechanism are now available.
- Conducting analysis of influenza-related hospitalizations from the Hospital Discharge Database, though this information is only available every six months. These data provide baseline information about usual trends among patients hospitalized with influenza and can serve as a comparison for current data.
- Nationally, the Influenza Hospitalization Network (FluSurv-NET) conducts surveillance for population-based, laboratory-confirmed influenza related hospitalizations in children (persons less than 18 years) and adults.

### **Mortality Surveillance**

The collection of mortality data can help health departments monitor the severity of seasonal influenza or a pandemic and determine the population and areas most affected. In Arizona, mortality surveillance is accomplished through death certificate data collected by state and county vital records offices, as well as reports of pediatric deaths due to laboratory-confirmed influenza. During a pandemic, state and local policy-makers and public health officials will likely ask health departments to provide mortality data to guide decision-making on control and response measures.

- Analyzing the number of deaths due to pneumonia and influenza recorded each week and comparing it to historical limits from the previous two years to identify unusual increases; analyzing demographic information for identified deaths to identify changes from expected patterns of mortality.
  - The ADHS Office of Vital Records deployed a web-based Electronic Death Registry System statewide, which expedites recording and reporting of deaths and allows for prompt access to the data. OIDS staff can access these data for analysis as soon as a cause of death is assigned.
  - The analysis is conducted at both the state level and for four regions within the state.
- Investigating reports of unexplained deaths with a history of fever, in collaboration with the county health departments and medical examiners' offices. The unexplained death investigation protocol was developed together between these three groups with the purpose of identifying deaths that might be of public health significance such as infectious diseases that are transmitted person-to-person, require a public health intervention, represent a new/emerging infection, or are an act of terrorism. The protocol is shown in Appendix 1.4: Investigation Protocol for Unexplained Deaths with a History of Fever. More information is located at <http://www.azdhs.gov/phs/oids/epi/unex/index.htm>.
  - During the 2009 H1N1 pandemic, many deaths associated with H1N1 were identified in this way. Investigations include submitting pre-mortem and post-mortem samples to ASPHL for testing, collecting clinical data available, and ensuring that any needed public health interventions are initiated.



- Working with county health departments to identify and investigate influenza-associated pediatric deaths and report this information to CDC.

### **Outbreak Investigation**

Investigation of outbreaks of influenza-like illness in certain settings can help identify particular populations that are more severely affected by the circulating influenza virus, confirm the etiology of the outbreak, and lead to the prevention of additional cases through education, infection control, vaccination, or antiviral chemoprophylaxis. Guidelines for the investigation and control of influenza-like illness in schools/child care centers, medical facilities, assisted living facilities, and long-term care facilities have been created.

- Work with local health departments to investigate reported ILI outbreaks, particularly those in high-priority settings involving populations at high risk of complications to influenza, or with many severely ill cases, or occurring outside the expected time period.
- Coordinate with local health departments and ASPHL to obtain and test specimens for respiratory viral illnesses to confirm outbreak etiology.
- Work with local health departments to recommend and implement control measures to prevent further morbidity.
- Track reported outbreaks to identify particular risk groups/settings for the circulating virus.

### **Syndromic Surveillance**

The sources listed below are monitored by ADHS and/or local health departments throughout the season and will continue to be assessed in the context of other information available. Validation of these methods continues to be needed to reduce false signals and increase sensitivity.

- School syndromic surveillance: ADHS contracts with the Arizona School Nurse Consortium to maintain access to syndromic surveillance data from more than 300 school nurse offices around the state. Visits to the school nurses' offices for any reason, including for influenza-like illness, are recorded, uploaded, and analyzed on a weekly basis to detect trends in influenza among school children. The school surveillance system was heavily used in Spring and Fall 2009 for the influenza A/H1N1 response to monitor trends in influenza-like illness at schools.
- BioSense: A CDC system that includes ICD-9-coded chief complaints or diagnoses at emergency department visits from selected hospitals, outpatient visits at Department of Defense ambulatory-care centers and Department of Veterans Affairs outpatient clinics. See <http://www.cdc.gov/biosense/> for more information. For influenza surveillance, influenza-like illness data are monitored. Data from eight Arizona emergency departments are included as of February 2011.
- Realtime Outbreak Detection System's National Retail Data Monitor (NRDM): A system coordinated by the University of Pittsburgh used to monitor sales of over-the-counter (OTC) health care products of enrolled pharmacies in order to identify disease outbreaks as early as possible. See <http://rods.health.pitt.edu/NRDM.htm> for more information.
- Some county health departments also work with their local hospitals to conduct syndromic surveillance within the emergency departments.

### **Veterinary Surveillance**

- Arizona Department of Agriculture (ADA) has primary responsibility for animal disease surveillance.
- Surveillance of avian influenza is routinely conducted at the two major poultry farms in Arizona. The University of Arizona Veterinary Diagnostic Lab (AzVDL) tests birds for avian influenza and forwards positives to the National Veterinary Services Laboratory (NVSL) in Ames, IA, for confirmation.
- Three methods of surveillance for wild birds are in place:



- USDA Animal and Plant Health Inspection Services, Wildlife Services samples waterfowl when rounding up unwanted birds from urban lake settings and when following up on unexplained events of morbidity and mortality in waterfowl. Cloacal swabs are normally collected.
- The Arizona Game & Fish Department sets up hunter stations during hunting season in Cibola National Wildlife Refuge, Havasu National Wildlife Refuge and Willcox Playa Wildlife Area to swab cloaca of certain target species of waterfowl and shorebirds.
- Arizona Game & Fish Department submits carcasses from die-offs of certain species of waterfowl and game birds for necropsy and/or tracheal swabs for avian influenza testing. Necropsy and avian influenza testing is performed at AzVDL.
- ADA reports positive test results to the Vector-Borne and Zoonotic Disease Program Manager within OIDS, where they are relayed to the appropriate county health department via phone, teleconferencing, email or fax.
- More details about Arizona Avian Influenza Surveillance are in Appendix 1.5.

### **Surveillance Communications**

- Monitoring of national and/or global influenza activity through CDC reports or conference calls.
- Conducting weekly conference calls (or as needed, depending on influenza activity) with all local health departments to discuss influenza activity and associated issues in their jurisdictions.
- Posting weekly influenza activity reports on the departmental website throughout the influenza season, at <http://www.azdhs.gov/phs/oids/epi/flu/index.htm>. The influenza activity report includes: laboratory-confirmed cases (including age and geographical distribution, and timing of disease report); subtyping information; ILI activity from sentinel sites; ILI from school surveillance; pneumonia and influenza mortality; and weekly state activity level (widespread, regional, local, sporadic, no activity).
- Distributing communications from ADHS, CDC and WHO to partners via HAN and EpiAZ (biweekly outbreak newsletter) to public health and health care practitioners across the state.
- Distributing other information to internal and external partners as needed.

### **C. Surveillance for WHO Phase 3**

In **Phase 3**, an animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people, but has not resulted in human-to-human transmission sufficient to sustain community-level outbreaks. The activities described above, appropriate for Phases 1 and 2 and ongoing, routine surveillance, will continue. However, additional activities or planning may be initiated in order to better detect the reassortant virus.

### **Outpatient (ILI) Surveillance**

- Consider requesting that providers screen patients with influenza or ILI for specific epidemiological factors related to the new subtype (e.g., travel to affected areas)
- Work with local health departments to ensure timely and comprehensive reporting of ILI from sentinel sites.
- Monitor surveillance reports and communications from CDC and WHO and enact recommendations.
- Utilize the “summer influenza case investigations” protocol if an influenza virus is detected out of season or if another unusual event occurs. This protocol focuses on clinical information, initial influenza testing, and epidemiological factors such as contact with poultry in a region with known avian influenza. The investigation protocols are specifically designed for three case reporting scenarios during the summer months (or outside of the usual influenza season): 1.) clinical reports without laboratory results, 2.) positive rapid diagnostic tests, and 3.) other positive laboratory results (culture, PCR, or DFA). Flow diagrams for each protocol are available and will serve as aids to the investigator. The protocol for culture or PCR is included as Appendix 1.6.
- Steps involved in investigating early cases or clusters include: collecting a specimen or confirming laboratory results by culture or PCR; obtaining clinical information including comorbidities and measures of severity; obtaining risk factor or exposure history; monitoring close contacts for ILI; and ensuring patient is isolated or

that the currently recommended infection control precautions have been implemented. This information will be collected through contact with the clinician, infection preventionist, and/or patient. Protocols and investigation forms used will likely depend on what is already known about the novel virus.

#### **Laboratory Surveillance**

- Ensure that representative and unusual viral isolates are sent to CDC for appropriate testing.
- Ensure that any influenza A viruses that cannot be subtyped are reported to CDC immediately and isolates are sent as appropriate.
- Ensure timely reporting of influenza from laboratories statewide.
- Ensure timely data entry and analysis of reports of influenza cases.

#### **Syndromic Surveillance**

- Monitor syndromic surveillance data sources or work with local health departments to assess data from schools, Biosense, RODS, or other sources of syndromic data to detect unusual patterns of ILI activity.

#### **Veterinary Surveillance**

- If the novel influenza strain is known to affect birds, Arizona Department of Agriculture (ADA) will heighten the monitoring of the two Arizona poultry farms and birds will be actively checked for symptoms.
- ADA will monitor the sentinel lake with increased frequency with possible capture and testing of wild birds.
- If during hunting season, additional check stations will be implemented by the Arizona Wildlife and Game Department and avian swabs taken.

#### **Surveillance Communications**

- Maintain regular internal communication between ASPHL and OIDS regarding epidemiological and laboratory surveillance.
- Distribute epidemiologic reports of influenza activity updates to surveillance partners and stakeholders and hold regular conference calls with county health department partners, as information is available.
- Obtain CDC guidelines/statements and distribute to partners.

### **V. Surveillance for WHO Phase 4 (Sustained Human-to-Human Spread)**

#### **A. Monitoring for novel strains of influenza**

Phase 4 is defined by the verification that human-to-human transmission of an animal or human-animal influenza reassortant virus is able to sustain community-level outbreaks. During this phase, ADHS will provide any guidance that CDC has made available, such as enhanced surveillance recommendations or testing guidelines for identification of patients at increased risk for infection with a novel virus, to providers, laboratories, county health departments, and other partners. Novel influenza strains include avian influenza viruses that can infect humans, other animal influenza viruses (such as swine influenza viruses) that can infect humans, or new or re-emergent human influenza strains that cause cases or clusters of human disease. The specific recommendations will depend on the epidemiology of the virus and the clinical characteristics of the human cases as they are known at the time, and will most likely focus on severely ill, hospitalized, or ambulatory patients who meet certain epidemiologic and clinical criteria. For example, CDC has issued guidance for laboratory testing of persons with suspected infection with highly pathogenic avian influenza A (H5N1) virus in the U.S. and follow-up of contacts of persons with suspected infections. The clinical guidelines are currently located at <http://www.cdc.gov/flu/avian/doh/> and are updated as needed. An excerpt from the suspect avian influenza laboratory testing guidelines is provided in Appendix 1.7: Interim Guidance for Laboratory Testing of Persons with Suspected Infection with Highly Pathogenic Avian Influenza A (H5N1). During the 2009 H1N1 pandemic, ADHS issued Arizona-specific guidelines and testing recommendations to clinicians soon after cases were identified in California and Texas, in order to enhance surveillance and rapid detection of the virus in Arizona. The initial clinician guidelines from April 2009 are included as Appendix 1.8: Clinician Fact Sheet: Swine Influenza, April 24, 2009.

Local health departments, in conjunction with ADHS, are responsible for investigating initial reports of potential human influenza infections due to a novel influenza strain in the state. Once a novel strain detected abroad exhibits sustained human-to-human transmission (WHO Phase 6), recommendations for further intensified laboratory and disease surveillance will likely be issued.

## **B. Reporting novel strains of influenza**

Local health departments should immediately inform ADHS of any suspected human infection with an avian/animal/novel human strain of influenza in order to obtain appropriate testing and coordinate any special investigations required.

In 2007, novel influenza A virus infections became nationally notifiable. The case definition includes a combination of clinical and epidemiological criteria, or laboratory confirmation of a novel virus. The most recent national case definition is included in Appendix 1.9: National Case Definition for Novel Influenza A Virus Infections.

ADHS would immediately report to CDC any influenza cases that meet the novel influenza A case definition or:

- Test positive for a novel influenza subtype, or
- Meet the enhanced surveillance case definition in effect at that time, and
- Cannot be subtyped in the state public health laboratory because appropriate reagents or biocontainment equipment is not available (see Supplement 2 – Laboratory Diagnostics).

ADHS would call the CDC 24-hour Emergency Response Hotline (770-488-7100) to report a suspected case of infection with avian influenza A (H5N1) or any other novel influenza virus. Following the initial telephone report, ADHS Epidemiology staff and/or county health department staff should conduct case interviews using a CDC case screening and report form and monitor contacts of all suspected cases. The case screening and report form provided to report suspected cases of human infection with influenza A (H5N1) is in Appendix 1.10: CDC Human Influenza A (H5) Case Screening and Report Form. The case report form provided to report early cases of 2009 H1N1 (swine influenza) is in Appendix 1.11: CDC Swine Influenza Case Report Form. If infection with a novel influenza virus is confirmed, ADHS may request CDC assistance with a case investigation to identify the source of infection and determine the course of illness.

Specific surveillance activities during Phase 4 include the following:

Surveillance operations listed for Phases 1 to 3 will continue, and the activities below will be implemented. During this phase, the objective is to identify any increases in influenza activity and also identify potential cases of the novel virus and obtain specimens rapidly for testing at ASPHL.

### **Outpatient (ILI) Surveillance**

- Request that any sentinel ILINet providers not already reporting start submitting data weekly.
- Screen travelers arriving from influenza-affected areas for ILI, if warranted and guidance for screening has been provided.
- Enhance surveillance, including obtaining demographic data on clusters, ill travelers, or unusual cases.
- Investigate any influenza cases, outbreaks, or increases in ILI suspected of being due to a novel virus.
- Consider instituting active surveillance including evaluating school and workforce absenteeism at selected sites.
- Analyze data from laboratory reporting, outbreaks, clusters, travelers, hospitals and other health care facilities to identify population groups at greatest risk and inform possible prioritization of vaccine or antivirals (see Supplement 6 – Vaccine Distribution and Supplement 7 – Antiviral Distribution)

### **Laboratory Surveillance**

- Request that surveillance partners (local health departments, sentinel providers, clinical laboratories) increase specimen collection; alert ASPHL to expect an increased number of specimens. Increase influenza laboratory testing for persons with compatible clinical syndromes at emergency departments or among hospitalized cases.

- Assess need to change types of laboratory testing performed to adhere to CDC guidance regarding safety concerns in working with the novel virus.
- Ensure that specimens for any suspected cases of novel influenza A virus infections, identified by clinical or epidemiological risk factors possibly in combination with preliminary influenza testing, be sent to ASPHL immediately.
- ADHS epidemiologists will coordinate between local health departments and ASPHL to ensure that testing is prioritized and that laboratory staff can identify suspicious cases so that they may take appropriate safety precautions.
- Send any specimens that test positive for influenza but cannot be subtyped to CDC immediately.
- Coordinate with CDC or the Translational Genomics Research Institute (TGen) North to send specimens from positive PCR or culture at ASPHL for antiviral resistance testing.
- Work with laboratory staff to identify thresholds for the number of specimens that can be tested in a day. Monitor the number of specimens received daily and develop a plan for how to limit the number of specimens received when the threshold is exceeded, while still maintain the ability to detect cases of novel virus infection.



### **Hospitalization Surveillance**

- Consider instituting active surveillance for increases in hospitalizations or emergency department visits for respiratory symptoms or influenza-like illness. Work with county health departments to contact hospitals or emergency departments or use BioSense for participating hospitals.
  - One example of hospital surveillance at the county level is the enhanced surveillance Maricopa County Department of Public Health has implemented numerous times when heightened health surveillance is desirable because of a large planned event. In those cases, the county health department will send out an email notice to hospital infection preventionists, emergency departments, urgent cares, and medical examiners, requesting that they be alert to unusual diseases or symptoms, including unusual numbers of cases presenting with similar symptoms or exposures or unusual presentation of symptoms. In some cases, providers are requested to report a daily status; in other cases they are asked to report only when something unusual is detected.
- Analyze the characteristics of any known hospitalized influenza cases to identify clinical characteristics or progression of illness.
- Depending upon frequency and location of influenza activity, ADHS may consider enacting an emergency measure to make influenza-associated hospitalizations reportable to the county health departments (Appendix 1.12: Arizona Draft Emergency Measure for Pandemic Influenza)

### **Mortality Surveillance**

- Consider instituting active surveillance (e.g., number of deaths due to respiratory illness among hospitalized patients).
- Increase frequency of communications with county medical examiners to ensure that protocols for unexplained death surveillance are in place, and provide any guidance or clarifications to medical examiners regarding notification or investigation of potential influenza-related deaths.
  - During the 2009 H1N1 pandemic, clarification of the protocols for medical examiners included notifying them that if they were notified of an unexplained death with an acute medical history of respiratory illness or preliminary autopsy findings showing an abnormal respiratory process, further assistance and potential supportive testing for the novel virus was available. Medical examiners could submit several specimen types (nasopharyngeal swab (preferred); lung swab; nasal aspirate; or nasal swab plus throat swab) to ASPHL for testing.



## **Surveillance Communications**

- Communicate changes to surveillance recommendations, testing guidelines, or other information.
  - Coordinate with the Logistics Section, if activated, or the Health Alert Network staff to ensure wide communications to all relevant parties.
  - Consider working with the medical professional societies to disseminate messages to their members.
- See also Supplement 10: Public Health Communications.

## **VI. Surveillance for WHO Phases 5-6 (Widespread Human Infection or Pandemic)**

Phases 5 and 6 are defined by widespread human infection. In Phase 5, the identified virus has caused community-level outbreaks in two or more countries in one WHO region. In Phase 6, the virus has caused sustained community-level outbreaks in at least one other country in another WHO region. Arizona's response will be greatly affected by which regions and countries are involved. Known novel influenza virus activity in North America at the level of Phases 5 or 6 or identification of the virus in Arizona will likely drive a more intensive surveillance response than if the virus has only been identified in other continents. Likewise, Arizona may perform activities listed under different phases than the WHO designation of the current status, depending on where the virus has been identified.

### **A. Surveillance for WHO Phase 5**

Surveillance operations listed under Phases 1 through 4 will continue, but will likely be coordinated under the Epidemiology and Disease Control Branch within the Operations Section in the ADHS PHIMS structure. Communications and analysis of surveillance data will likely occur with greater frequency.

### **B. Surveillance for WHO Phase 6**

If a pandemic is suspected, ADHS will closely monitor data from CDC regarding the first cases of a pandemic influenza virus in the United States as well as tracking disease spread. To be able to detect the first cases of the virus in Arizona, ADHS will notify local health departments and providers in addition to increasing laboratory surveillance. More intense testing will be necessary during the early stages of a pandemic, when detecting the introduction of the virus into a state or community is the primary goal. Once the virus has been identified throughout the state, testing levels may be decreased depending on resource availability.

#### ***Surveillance Activities for the early part of Phase 6***

Surveillance activities described above will continue to the extent possible, in addition to the activities below. The first activities listed may encompass many components.

ADHS will analyze morbidity and mortality data on a frequent basis to establish geographic or demographic populations most likely to be infected or to develop severe disease, to determine population- and geographic area-specific rates, or to identify risk factors, which may inform vaccine distribution or other control strategies. All surveillance activities described in earlier phases will continue until resources need to be diverted elsewhere or sufficient information has been gathered to inform the response.

MEDSIS or its platform (the Health Services Portal (HSP)) may contain the flexibility to quickly accommodate other electronic surveillance needs at various pandemic phases. During the 2009 H1N1 pandemic, the influenza screens within MEDSIS were adapted to include classification of the novel virus as well as information from the form described in Hospitalization Surveillance, below. This allowed for more rapid analysis of the data collected and improved ways to share case-specific data between county and state health departments. Line lists of cases under investigation or with testing results available were posted on a secure document library on the HSP to share information quickly and securely between local and state health departments.



### **Outpatient (ILI) Surveillance**

- Continue to monitor data received, and use data to establish or reassess vaccine and anti-viral priority groups.

### **Laboratory Surveillance**

- Focus laboratory surveillance on detecting antigenic drift variants or re-assortment viruses, or on testing severe cases.
  - During the 2009 H1N1 pandemic, ADHS issued guidelines for clinicians regarding which patients should be tested for H1N1 and which samples would be accepted at ASPHL. The last testing recommendation issued was to send specimens to the state public health laboratory for patients hospitalized for at least 24 hours with an influenza-like illness (defined as fever [ $\geq 100.4^{\circ}\text{F}$  ( $38^{\circ}\text{C}$ )] and cough and/or sore throat in the absence of a known cause) OR for unexplained deaths with febrile illness.
- Work with laboratory staff and Operations Section Chief to ensure that current ADHS testing guidelines reflect a good balance between resources available (staff and reagents) and type of information needed for the public health response. Testing guidelines may change throughout the pandemic and the period leading up to the pandemic as these factors vary with time.

### **Hospitalization Surveillance**

- Investigate identified, confirmed, hospitalized cases in order to determine risk factors for infection or severe illness, including demographic information or underlying medical conditions, and the medical progression or clinical presentation of cases. The one-page form used during the middle to end of the 2009 H1N1 pandemic is included as Appendix 1.13: Case Report Form for 2009 H1N1 for Hospitalizations and Deaths.
  - If laboratory submissions to ASPHL for influenza testing have been restricted to hospitalizations or severe cases, cases with positive tests may be one source of identifying priorities for investigation.
- Report aggregate hospitalizations to CDC, if requested, from laboratory-confirmed novel influenza or sentinel hospitals.
  - During the 2009 H1N1 pandemic, CDC requested aggregate reporting of all influenza lab-confirmed hospitalizations, or syndromic hospitalizations. ADHS collected information from BioSense inpatient reports in order to detect changes in the number of patients at those hospitals being admitted for influenza-like illness.

### **Mortality Surveillance**

- Continue to work with county medical examiners to identify influenza-related deaths.
- Report aggregate influenza and pneumonia deaths to CDC, if requested, from the vital records database.
  - During the 2009 H1N1 pandemic, CDC requested aggregate reporting of all lab-confirmed influenza-associated deaths, or pneumonia and influenza-related deaths. ADHS provided weekly the number of newly identified pneumonia or influenza deaths recorded since the previous report.
- Mortality data will be monitored in conjunction with existing surveillance data to evaluate the range and severity of the pandemic.
- Initially, laboratory confirmation of the novel virus will be required for counting deaths suspected to be related to the pandemic, reported through the medical examiners or other sources. Later in the pandemic, counting of deaths may change to an estimation based on the number of influenza deaths (whether or not laboratory testing has been conducted) as resources may not permit laboratory confirmation of all deaths.

### **Surveillance Communications**

- Disseminate surveillance information regularly to public health partners and the public, via Health Alerts, conference calls, or the ADHS website. Surveillance information and reports will be produced by the Epidemiology staff within PHIMS, but dissemination will likely be coordinated through another part of the PHIMS response.

Additional sources of surveillance data may be evaluated to determine the effectiveness of pandemic influenza interventions and resource allocation needs. These may include partnering with emergency preparedness staff to identify health care resource demands (e.g., number of patients on ventilators, emergency medical technician runs). In addition, surveillance programs may be asked to monitor vaccine and anti-viral effectiveness.

#### ***Surveillance Activities for later in Phase 6 or during the Post-Peak Period***

Surveillance will likely be overwhelmed during a pandemic, and personnel will need to be diverted to higher-priority activities. Continued testing for the novel virus and investigation of hospitalized or severe cases will be discontinued once enough information is gathered to make public health decisions and/or when resources no longer permit. Surveillance activities will scale back gradually, in order to provide as much situational awareness as necessary and in order to detect the introduction of a second wave, of viral changes, or of changes to severity or impact. While enhanced surveillance will be conducted during the introduction, initial spread, and first waves of a pandemic, over time, as more persons are exposed, the pandemic strain is likely to become a routinely circulating influenza A subtype. As that happens, the activities of both the ADHS and national influenza surveillance systems will revert to the frequency and intensity described under Phases 1 and 2. The changes will be communicated to all surveillance partners through the communication routes established for the pandemic.

### **VII. Surveillance for Post-Pandemic Period**

Surveillance activities that will be maintained in Arizona during the post-pandemic period include:

- Monitoring for unusual events, such as clusters of severe respiratory illness or death, through surveillance for unexplained deaths with a history of fever;
- Investigating severe or unusual cases, clusters, or outbreaks to facilitate rapid identification of important changes in the epidemiology or severity of influenza;
- Maintaining routine surveillance, including for influenza-like illness and cases of severe acute respiratory infections;
- Notifying CDC immediately if any of the following changes are detected:
  - Sustained transmission of antiviral-resistance to the pandemic strain
  - Human cases of infection with any influenza virus not currently circulating in human populations
  - Any notable changes in the severity or other epidemiological or clinical characteristics of the pandemic strain, including changes in the age distribution, the clinical appearance, proportion of cases requiring intensive management, or unexpected increases in numbers of cases.

## Appendix 1.1

### Components of the Arizona Influenza Surveillance System

Surveillance type	Source	Description
Laboratory surveillance	ADHS State Public Health Laboratory	The ADHS State Public Health Laboratory performs influenza culture and polymerase chain reaction (PCR) on respiratory submissions. Subtyping of isolates and PCR performed at ADHS can identify influenza A H1, H3, H5 and H7 subtypes, and influenza B. Unusual or untypable specimens are forwarded to CDC for further testing.
Laboratory surveillance	ADHS State Public Health Laboratory & Phoenix Children's Hospital	The State Laboratory and one other Arizona clinical laboratory are part of the National Respiratory and Enteric Virus Surveillance System (NREVSS) and report weekly to CDC the number of influenza tests performed and the number of positive results by type.
Laboratory surveillance	All laboratories	All positive laboratory tests for influenza are reportable to the state health department by law. Selected specimens are forwarded from clinical labs to the State Public Health Laboratory for typing.
Outpatient Surveillance	Influenza-like Illness (ILI) Sentinel Provider Network	Health care providers around the state monitor outpatient visits for ILI (fever >100°F AND sore throat and/or cough) and report weekly the number of ILI patients by age group and total visits to their facility. Approximately 60 sites are enrolled each year.
Hospitalization Surveillance	Selected hospitals in border counties	Participating hospitals identify hospitalized cases of severe acute respiratory illness for respiratory panel testing and collection of clinical information. A profile of circulating respiratory infections is one outcome of the surveillance.
Mortality surveillance	Electronic Death Registry System	All deaths in the state are registered in the Electronic Death Registry System and cause of death assigned for death certificates. The data are analyzed weekly for aberrations in influenza and pneumonia mortality.
Mortality surveillance	Medical Examiners Offices	Unexplained deaths with a history of fever identified by medical examiners or other sources are investigated to identify deaths of public health significance. The investigation involves medical record review and laboratory testing.

Mortality surveillance	122 Cities Mortality Reporting System	Phoenix and Tucson vital records offices transmit weekly data to CDC on the total number of death certificates filed and the number with pneumonia and/or influenza listed as a cause of death.
Mortality surveillance	Influenza-associated pediatric mortality	Reported laboratory-confirmed influenza-related deaths among children <18 years are investigated and reported to CDC.
Outbreak investigation	Local Health Departments; Institutions	Outbreaks of influenza-like illness in certain settings (e.g., long-term care facilities) are investigated to determine etiology and control disease spread.
Syndromic surveillance	School-based Syndromic Surveillance	School nurses in participating schools around the state record nursing diagnosis codes for all students visiting the nursing office. These data are analyzed for changes in influenza-like illness during the school year.
Veterinary surveillance	Arizona Department of Agriculture	The Department of Agriculture's state veterinarian reports cases of suspected avian influenza to the public health veterinarian. Avian influenza surveillance is discussed in greater detail in Appendix 1.5 of Supplement 1 of the Strategic Arizona Influenza Pandemic Response Plan.
Statewide summary report		ADHS reports to CDC on a weekly basis the overall level of influenza activity as none, sporadic, local, regional, or widespread.

## Appendix 1.2

### Definitions of the Geographic Spread of Influenza

- **No Activity:** No laboratory-confirmed cases of influenza and no reported increase in the number of cases of influenza-like illness (ILI).
- **Sporadic:** Small numbers of laboratory-confirmed influenza cases or a single laboratory-confirmed influenza outbreak has been reported, but there is no increase in cases of ILI.
- **Local:** Outbreaks of influenza or increases in ILI cases and recent laboratory-confirmed influenza in a single region of the state.
- **Regional:** Outbreaks of influenza or increases in ILI and recent laboratory confirmed influenza in at least two but less than half the regions of the state with recent laboratory evidence of influenza in those regions.
- **Widespread:** Outbreaks of influenza or increases in ILI cases and recent laboratory-confirmed influenza in at least half the regions of the state with recent laboratory evidence of influenza in the state.

#### Notes:

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.

Laboratory-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 predictive value positive may be low outside of peak influenza activity. Therefore, a state may wish to obtain laboratory confirmation of influenza by testing methods other than point-of-care tests for reporting the first laboratory-confirmed case of influenza of the season.

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 2 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 establish 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. In Arizona, four regions are defined (Northern, Southern, Western, and Central), and each county is assigned to one region.

## Appendix 1.3

### Overview of Influenza Surveillance in the United States

The Epidemiology and Prevention Branch in the Influenza Division at CDC collects, compiles and analyzes information on influenza activity year round in the United States and produces FluView, a weekly report from October through mid-May. The U.S. influenza surveillance system is a collaborative effort between CDC and its many partners in state, local, and territorial health departments, public health and clinical laboratories, vital statistics offices, healthcare providers, clinics and emergency departments. Information in five categories is collected from nine different data sources that allow CDC to:

- Find out when and where influenza activity is occurring
- Track influenza-related illness
- Determine what influenza viruses are circulating
- Detect changes in influenza viruses
- Measure the impact influenza is having on hospitalizations and deaths in the United States

#### Five Categories of Influenza Surveillance

1. **Viral Surveillance** — About 80 U.S. **World Health Organization (WHO) Collaborating Laboratories** and 60 **National Respiratory and Enteric Virus Surveillance System (NREVSS)** located throughout the United States participate in virologic surveillance for influenza. All state public health laboratories participate as WHO collaborating laboratories along with some county public health laboratories and some large tertiary care or academic medical centers. Most NREVSS laboratories participating in influenza surveillance are hospital laboratories. The U.S. WHO and NREVSS collaborating laboratories report the total number of respiratory specimens tested and the number positive for influenza types A and B each week to CDC. Most of the U.S. WHO collaborating laboratories also report the influenza A subtype (H1 or H3) of the viruses they have isolated and the ages of the persons from whom the specimens were collected. The majority of NREVSS laboratories do not report the influenza A subtype. Reports from both sources are combined and the weekly total number of positive influenza tests, by virus type/subtype, and the percent of specimens testing positive for influenza are presented in the weekly influenza update, FluView. A subset of the influenza viruses collected by U.S. WHO collaborating laboratories are sent to CDC for further characterization, including gene sequencing, antiviral resistance testing and antigenic determination. This information is presented in the antiviral resistance and antigenic characterization sections of the FluView report.

**Surveillance for Novel Influenza A Viruses-** In 2007, human infection with a novel influenza A virus became a nationally notifiable condition. Novel influenza A virus infections include all human infections with influenza A viruses that are different from currently circulating human influenza H1 and H3 viruses. These viruses include those that are subtyped as nonhuman in origin and those that are unsubtypable with standard methods and reagents. Rapid reporting of human infections with novel influenza A viruses will facilitate prompt detection and characterization of influenza A viruses and accelerate the implementation of effective public health responses.

2. **Outpatient Illness Surveillance** — Information on patient visits to health care providers for influenza-like illness is collected through the **U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet)**. ILINet consists of more than 3,000 healthcare providers in all 50 states, the District of Columbia and the U.S. Virgin Islands reporting over 25 million patient visits each year. Each week, approximately 1,800 outpatient care sites around the country report data to CDC on the total number of patients seen and the number of those patients with influenza-like illness (ILI) by age group. For this system, ILI is defined as fever (temperature of 100°F [37.8°C] or greater) and a cough and/or a sore throat in the absence of a KNOWN cause other than influenza. Sites with electronic records use an equivalent definition as determined by the state public health authorities.



**National and Regional Analysis:** The percentage of patient visits to healthcare providers for ILI reported each week is weighted on the basis of state population. This percentage is compared each week with the national baseline of 2.5%. The baseline is the mean percentage of patient visits for ILI during non-influenza weeks for the previous three seasons plus two standard deviations. Due to wide variability in regional level data, it is not appropriate to apply the national baseline to regional data; therefore, region specific baselines are calculated.

**ILI Activity Indicator Map:** Additionally, data reports collected in ILINet are used to produce a measure of ILI activity by state. Activity levels range from minimal to intense and are arranged on a scale of 1-10 with 1 being the least intense and 10 being the most intense. The activity levels correspond with the given proportion of visits to outpatient clinics due to ILI, and the number of standard deviations from the mean proportion during non-influenza weeks the given value is. An activity level of 1 corresponds to values that are below the mean and an activity level of 10 corresponds with values that are 8 or more standard deviations above the mean. Because data at the state or jurisdiction level are variable, baselines are adjusted on a weekly basis based on which sites within each state or jurisdiction provide data. To perform this adjustment, provider level baseline ratios are calculated for providers that have a sufficient reporting history, and for providers that do not have the required reporting history they are assigned the baseline ratio for their practice type. The state level baseline is then calculated using a weighted sum of the baseline ratios for each contributing provider.

**3. Mortality Surveillance** — Rapid tracking of influenza-associated deaths is done through two systems:

- **122 Cities Mortality Reporting System** — Each week, the vital statistics offices of 122 cities across the United States report the total number of death certificates received and the number of those for which pneumonia or influenza was listed as the underlying or contributing cause of death by age group. The percentage of deaths due to pneumonia and influenza (P&I) are compared with a seasonal baseline and epidemic threshold value calculated for each week. The seasonal baseline of P&I deaths is calculated using a periodic regression model that incorporates a robust regression procedure applied to data from the previous five years. An increase of 1.645 standard deviations above the seasonal baseline of P&I deaths is considered the “epidemic threshold,” i.e., the point at which the observed proportion of deaths attributed to pneumonia or influenza was significantly higher than would be expected at that time of the year in the absence of substantial influenza-related mortality.
- **Influenza-Associated Pediatric Mortality Surveillance System** — Influenza-associated deaths in children (persons less than 18 years) was added as nationally notifiable condition in 2004. Any laboratory-confirmed influenza-associated death in a child is reported through this system. Demographic and clinic information are collected on each case and are transmitted to CDC.

**4. Hospitalization Surveillance** — Laboratory confirmed influenza-associated hospitalizations in children and adults are monitored through the Influenza Hospitalization Network (FluSurv-NET) and Aggregate Hospitalization and Death Reporting Activity (AHDRA).

- **Influenza Hospitalization Network (FluSurv-NET)** – FluSurv-NET conducts surveillance for population-based, laboratory-confirmed influenza related hospitalizations in children (persons less than 18 years) and adults. The network covers over 80 counties in 10 Emerging Infections Program (EIP) states (CA, CO, CT, GA, MD, MN, NM, NY, OR, and TN) and six additional states (ID, MI, OH, OK, RI, and UT). Cases are identified by reviewing hospital laboratory and admission databases and infection control logs for children and adults with a documented positive influenza test (viral culture, direct/indirect fluorescent antibody assay (DFA/IFA), reverse transcription-polymerase chain reaction (RT-PCR), or a rapid influenza diagnostic test (RIDT)) conducted as part of routine patient care. FluSurv-NET estimated hospitalization rates are reported every two weeks during the influenza season.
- **Aggregate Hospitalization and Death Reporting Activity (AHDRA)** – States and territories collecting reports of laboratory-confirmed influenza-associated hospitalizations and deaths in their jurisdictions voluntarily share the reports with the Influenza Division at CDC. AHDRA reporting by state health departments allows tracking of detailed data and trends in severe disease with greater geographic

representativeness than is possible with existing systems alone and informed decision-making at the state and national levels. States report laboratory-confirmed hospitalizations and deaths as aggregate weekly counts to a secure website.

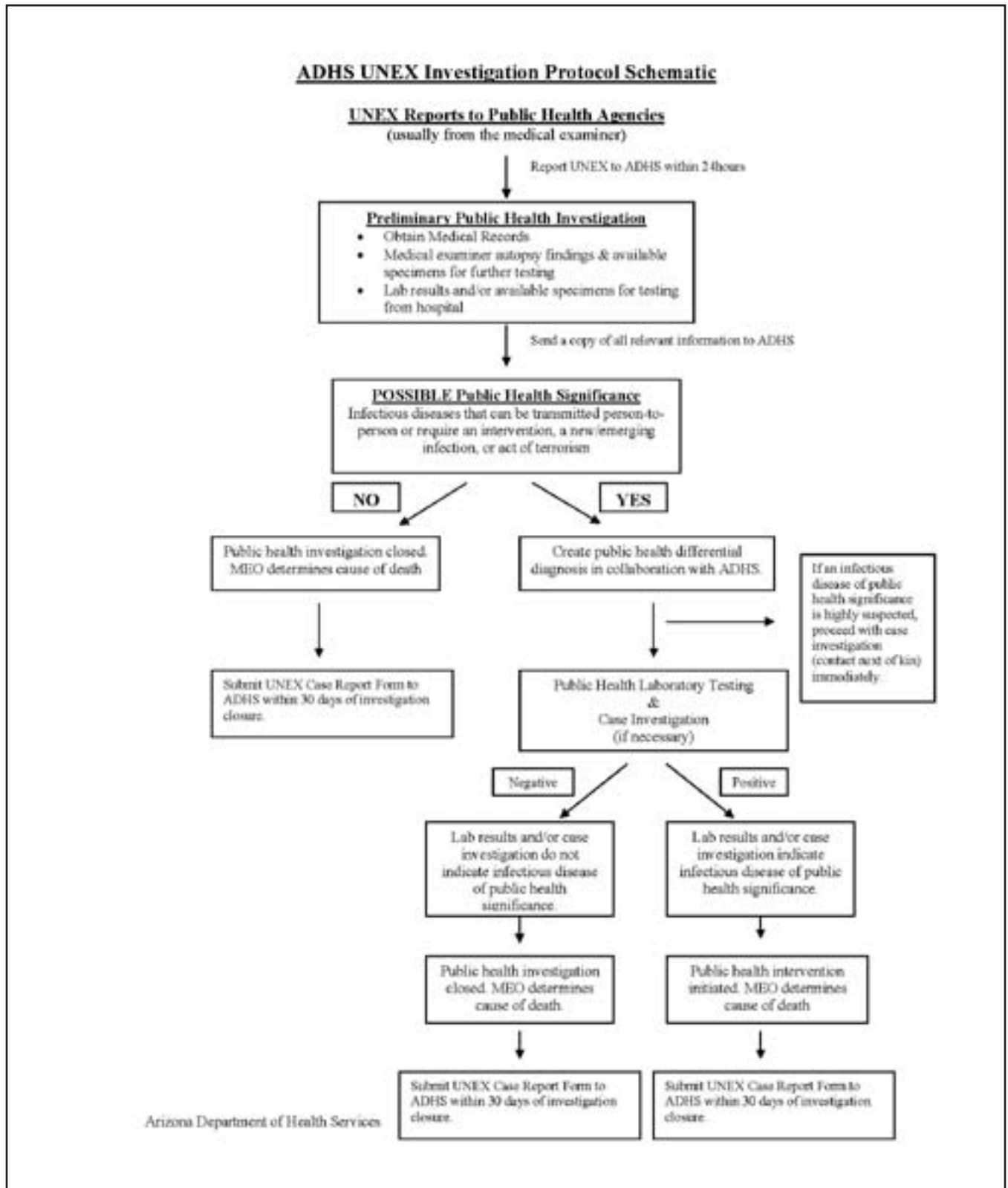
5. **Summary of the Geographic Spread of Influenza** — Health departments report the estimated level of geographic spread of influenza activity in their states each week through the **State and Territorial Epidemiologists Reports**. Jurisdictions report influenza activity as no activity, sporadic, local, regional, or widespread. These levels are defined as follows:

- **No Activity:** No laboratory-confirmed cases of influenza and no reported increase in the number of cases of ILI.
- **Sporadic:** Small numbers of laboratory-confirmed influenza cases or a single laboratory-confirmed influenza outbreak has been reported, but there is no increase in cases of ILI.
- **Local:** Outbreaks of influenza or increases in ILI cases and recent laboratory-confirmed influenza in a single region of the state.
- **Regional:** Outbreaks of influenza or increases in ILI and recent laboratory-confirmed influenza in at least two but less than half the regions of the state with recent laboratory evidence of influenza in those regions.
- **Widespread:** Outbreaks of influenza or increases in ILI cases and recent laboratory-confirmed influenza in at least half the regions of the state with recent laboratory evidence of influenza in the state.

Excerpt from <http://www.cdc.gov/flu/weekly/overview.htm> dated October 3, 2010.

## Appendix 1.4

### Investigation Protocol for Unexplained Deaths with a History of Fever



### Unexplained Death (UNEX) Investigation Protocol – Arizona Department of Health Services

**Purpose:** To identify deaths that might be of public health significance such as infectious diseases that are transmitted person-to-person, require a public health intervention, represent a new/emerging infection or are an act of terrorism.

**Guidelines:** (patient must meet at least one of the following criteria)

1. Hospital/facility-based death, no known cause AND history of fever ( $>38.0^{\circ}\text{C}/100.4^{\circ}\text{F}$ ) OR temp.  $<36^{\circ}\text{C}/96.8^{\circ}\text{F}$  within 48hrs of death
2. Patient-reported history of fever within 48hrs of death, without known cause
3. Clinical suspicion of infectious etiology by health care provider/medical examiner

**Investigation Protocol:** (conducted by the local health department unless otherwise specified)

\*\*\*\*Within 24hrs of case identification, the local health agency should be notified\*\*\*\*

1. Use the UNEX Death Report Form throughout the investigation.
2. Contact ADHS UNEX team within 1 working day of receipt.
3. Determine whether the case resided in your county and if it needs to be transferred to another county for investigation. The ADHS UNEX epidemiologist will take the lead on reservation cases.
4. Obtain and review the medical chart, if available.
  - a. Fax chart to ADHS UNEX team – ATTN: UNEX (fax number: 602-364-3199)
  - b. If no chart available, contact next of kin/other person (ME investigator) to obtain details for the investigation. Unless urgent, contacting the family through the ME investigator is preferable.
5. Determine whether an autopsy will be performed by contacting hospital/medical examiner.
  - a. If yes, obtain autopsy preliminary results from the medical examiner as well as any other information regarding the death (i.e. exposure information from next of kin).
  - b. Depending on ME findings, arrange for collection of appropriate specimens to be sent to the Arizona State Health Laboratory ASHL (see ASHL Services Guide for UNEX Investigations).
6. Obtain lab results identified through the medical chart/attending physician from the hospital/facility.
  - a. If lab results indicate an agent that is the likely cause of death (confirm with ADHS) then the investigation is closed and ruled out.
  - b. If no lab results are available from the hospital, the case did not visit a hospital immediately before death, or the laboratory results do not suggest an agent that is the likely cause of death then proceed with the investigation.
7. Determine what specimens are available for further testing from the hospital and medical examiner office.
8. If applicable, talk to the attending physician/infectious disease specialist for the case.
9. Send all above collected information to the ADHS UNEX team – ATTN: UNEX (fax number: 602-364-3199).
10. Based on all the information obtained, a public health differential diagnosis will be created in coordination with ADHS.
11. Specimens are sent to the ASHL for testing to identify or rule out infectious diseases of public health significance, if warranted.
  - a. If post-mortem specimens are submitted to ASHL, the MEI should submit the ME Findings Submission Form to the ADHS UNEX epidemiologist (fax number: 602-364-3199) and ADHS will forward to the appropriate local health agency.
12. High priority unclosed cases can be sent to the CDC for additional testing via the ADHS/ASHL team.
13. Laboratory Results:
  - a. If lab results from the ASHL or CDC indicate an infectious disease of public health significance, the local public health agency will initiate an intervention and/or control measures.
    - i. Contact next of kin to obtain necessary information to conduct intervention/control measures, if necessary.
  - b. If lab results from the ASHL or CDC do not indicate an infectious disease of public health significance, the UNEX death investigation will be closed.
14. Upon investigation completion, the UNEX Death Report Form is completed by the primary investigator and submitted to ADHS within 30 days of investigation closure.
15. Within 30 days of form submission, ADHS will complete and submit a written case report/summary to the involved local health agency(ies).
16. Communication of the ADHS UNEX report to family/authorized individuals is the local health department's responsibility.

**ADHS UNEX Investigation Protocol Schematic** – see next page.

**NOTE:** The investigation may be stopped if it is determined that the cause of death is not infectious or is not thought to be of public health significance. A UNEX Death Report Form must be submitted noting the case was considered and closed.

Arizona Department of Health Services

## **Appendix 1.5**

### **Arizona Avian Influenza Surveillance Information**

#### **A. USDA and Arizona Department of Agriculture (ADA) preparedness for Avian Influenza in Poultry.**

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS) has established an interagency working group to address highly pathogenic avian influenza (HPAI) preparedness and response issues. The group includes representatives from several federal agencies and international animal- and public-health organizations.

##### **1. Surveillance**

Currently, the Arizona Veterinary Diagnostic Laboratory (AzVDL) has the capability to conduct testing for both avian influenza (AI) and exotic Newcastle disease (END). The Arizona Department of Agriculture provides funding for necropsies on poultry at the AzVDL, when the owner cannot pay. This funding is through a cooperative agreement between ADA and USDA for surveillance for AI and END<sup>1</sup>. All fighting and exhibition birds that are confiscated are tested for AI and END.

If specimens from a chicken tested positive for either of these agents at the AzVDL, specimens are required to be forwarded to the National Veterinary Services Laboratory (NVSL) for confirmation.

##### **2. Response**

If an HPAI outbreak should occur in the United States, APHIS has the Foreign Animal Disease (FAD) management infrastructure required to conduct an emergency response program. The response would take place at the local level in accordance with the National Animal Health Emergency Management System's guidelines for highly contagious disease<sup>2</sup>. The Arizona Department of Agriculture (ADA) assisted in the development of the Foreign Animal Disease Incident Annex to the State Emergency Response and Recovery Plan<sup>3</sup>. ADA has the primary role of responsibility in the annex.

##### **3. Protection of Outbreak Response Workers**

APHIS has collaborated with CDC to draft recommendations to help prevent the transmission of HPAI to animal-disease outbreak-response workers<sup>4</sup>. APHIS' Veterinary Services (VS) program is developing a policy to ensure the protection of personnel involved in HPAI control and eradication activities. Upon detection of HPAI (such as H5N1) in poultry, APHIS would quickly notify the CDC to initiate their involvement, in coordination with State and local health departments, in efforts to minimize disease transmission from birds to humans. Upon detections of a low pathogenic AI outbreak in poultry in Arizona, the ADHS may have to contact USDA and the Arizona Department of Agriculture (AzDA) to initiate public health involvement in the same efforts to minimize disease transmission from birds to humans, in consultation with the CDC.

##### **4. Food Safety**

An outbreak in the United States could raise public health concerns about food safety. Without following proper food handling, hygiene, and normal cooking practices, HPAI (H5N1) virus can survive on contaminated raw poultry meat, on contaminated surfaces of eggs, and within the albumen and yolk of eggs. However, it is important to note that there is no evidence that people have been infected by HPAI (H5N1) through the consumption of eggs, egg products, or well-cooked poultry meat. The World Health Organization has developed a guidance document for concerns related to food safety and avian influenza<sup>5</sup>.

#### **B. Surveillance for HPAI in Wild Birds**

At this time, there is no enhanced surveillance for detection of avian influenza in wild birds in Arizona. Only poultry submitted to the AzVDL with symptoms and/or lesions associated with avian influenza are being tested for the disease. Examples of enhanced surveillance ongoing in Alaska include sampling of live-captured, apparently healthy wild birds to

detect the presence of HPAI or antibodies to the virus. In July 2005, President Bush's Homeland Security Council's Policy and Coordination Committee (PCC) requested the USDA and DOI to organize an interagency working group with the objective of developing a plan for early detection of highly pathogenic avian influenza (HPAI) introduction into North American wild birds. The interagency effort to detect HPAI in wild birds is being divided into two phases. The initial phase will address early detection activities in Alaska, and in particular, coastal areas that have the most potential for contact among Asian and North American birds. The second phase will address subsequent HPAI detection activities in the four major North American flyways.

The working group is currently evaluating five potential strategies for the detection of HPAI in wild birds. The working group is currently developing each of these strategies and comparing their respective advantages and disadvantages before providing their recommendation to the PCC.

#### References:

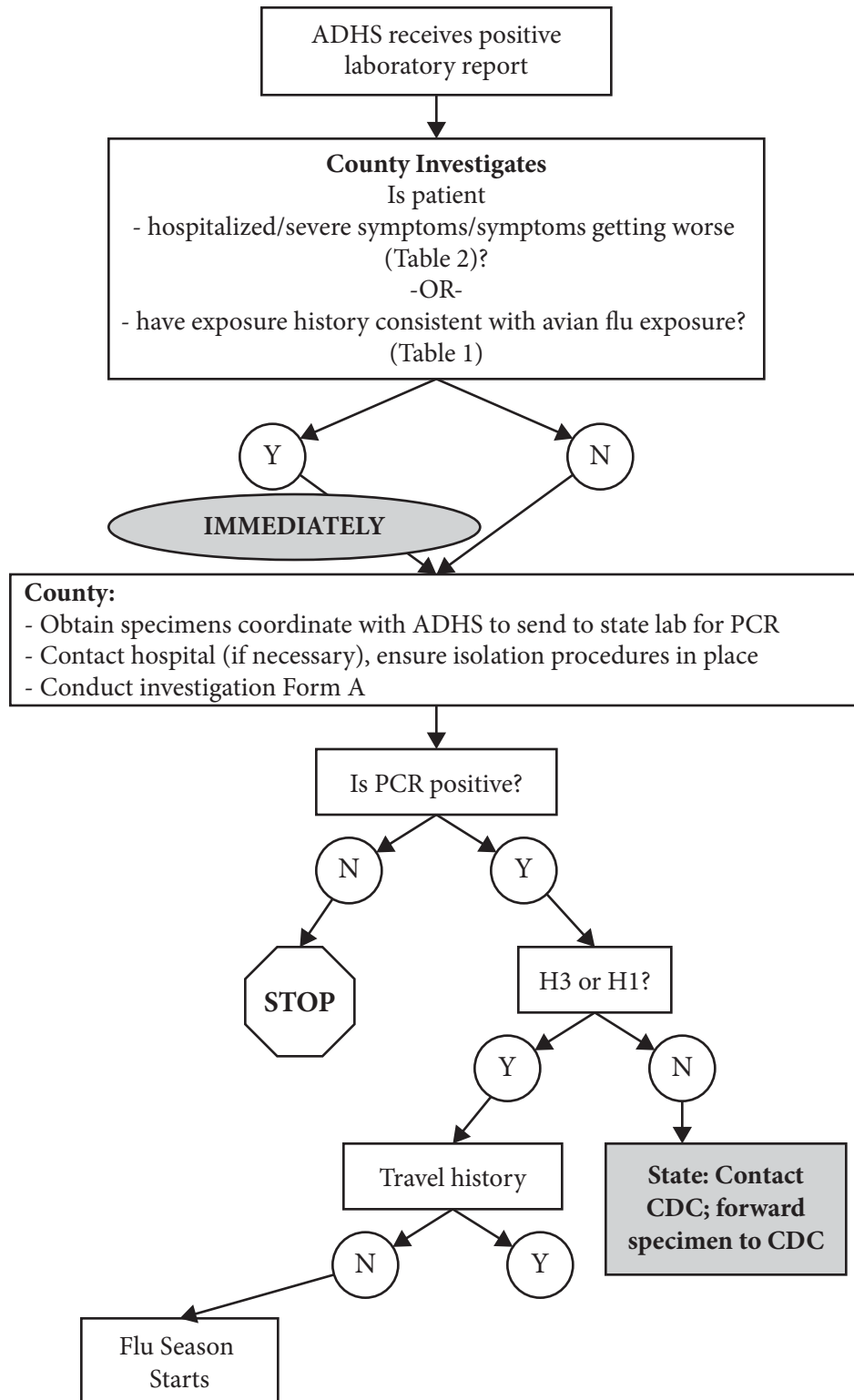
- 1) Per conversation with Dr. John Hunt, Director of Animal Services Division, Arizona Department of Agriculture: cooperative agreement with USDA for surveillance for avian influenza and exotic Newcastle disease in poultry
- 2) USDA Website, Wildlife Damage Management, National Wildlife Disease Program. Highly-Pathogenic Avian Influenza (HPAI) : [http://www.aphis.usda.gov/wildlife\\_damage/nwdp/AI.shtml](http://www.aphis.usda.gov/wildlife_damage/nwdp/AI.shtml).
- 3) Foreign Animal Disease Incident Annex, State Emergency Response and Recovery Plan Available on the HSP, Public Health Preparedness Portal, Response Plans, ADEM plans.
- 4) OSHANIOSH Issues Exchange Group document, Avian Influenza, Protecting Poultry Workers at Risk, posted on the OSHA Web site as a Safety and Health Information Bulletin on December 13, 2004. [www.osha.gov/dts/shib/shib121304.pdf](http://www.osha.gov/dts/shib/shib121304.pdf)
- 5) Highly pathogenic H5N1 avian influenza outbreaks in poultry and in humans: Food safety implications, Department of Food Safety, Zoonoses, and Foodborne Diseases, World Health Organization [www.who.int/foodsafety/micro/avian/en/index.html](http://www.who.int/foodsafety/micro/avian/en/index.html)

#### Other guidelines:

The U.S. Geological Survey also has provided "Interim Guidelines for the Protection of Persons Handling Wild Birds with Reference to Highly Pathogenic Avian Influenza" at: [www.nwhc.usgs.gov/publications/wildlife\\_health\\_bulletins/WHB\\_05\\_03.jsp](http://www.nwhc.usgs.gov/publications/wildlife_health_bulletins/WHB_05_03.jsp)



**Appendix 1.6**  
**Summer Investigations Protocol:**  
**Protocol for Positive Influenza Test**  
**(Culture, PCR, or DFA, not rapid diagnostic tests)**



**Appendix 1.7**  
**Excerpt From: Interim Guidance for Laboratory Testing of Persons with Suspected Infection with Highly Pathogenic Avian Influenza A (H5N1)**

Testing for H5N1 virus infection is recommended for a patient who has an illness that:

1. Requires hospitalization or is fatal; AND
2. Has or had a documented temperature of  $\geq 38^{\circ}\text{C}$  ( $\geq 100.4^{\circ}\text{F}$ ) in the past 24 hours OR has a history of feverishness in the past 24 hours; AND
3. Has radiographically-confirmed pneumonia, acute respiratory distress syndrome (ARDS), or other severe respiratory illness; AND
4. Has at least one of the following potential exposures within 7 days of symptom onset:
  - a. History of travel to a country where highly pathogenic avian influenza H5N1 has been documented in poultry, wild birds, and/or humans,<sup>†</sup> AND had at least one of the following potential exposures during travel:
    - i. Direct contact with (e.g. handling, slaughtering, defeathering, butchering, preparation for consumption) well-appearing, sick or dead poultry or wild birds;
    - ii. Direct contact with surfaces contaminated with poultry feces or poultry parts (carcasses, internal organs, etc.) that might contain H5N1 virus);
    - iii. Consumption of raw or incompletely cooked poultry or poultry products;
    - iv. Close contact (approach within about 6 feet) with a confirmed H5N1-infected animal other than poultry or wild birds (e.g. cat or dog);
    - v. Close contact (approach within about 6 feet) with a person who was hospitalized or died due to a severe unexplained respiratory illness;
    - vi. Visiting a market where live poultry are sold or slaughtered;
    - vii. Handling samples (animal or human) suspected of containing H5N1 virus in a laboratory or other setting. Close contact (approach within about 6 feet)\* with an ill person with confirmed H5N1 virus infection;
  - b. Close contact (approach within about 6 feet)\* with an ill person who was under investigation for possible H5N1 virus infection;
  - c. Working with live highly pathogenic avian influenza A (H5N1) virus in a laboratory.

In addition, testing for H5N1 virus infection can be considered on a case by case basis, in consultation with local and state health departments, for:

1. A patient with mild or atypical disease<sup>‡</sup> (hospitalized or ambulatory) who has one of the exposures listed above (criteria 4.a, b, c or d); OR
2. A patient with severe or fatal respiratory disease whose epidemiological information is uncertain, unavailable, or otherwise suspicious but does not meet the criteria above. An example would include an ill returned traveler that visited a country where highly pathogenic avian influenza A (H5N1) virus has been documented or is highly suspected in birds.

From <http://www.cdc.gov/flu/avian/professional/guidance-labtesting.htm>, referenced 6/18/2010, page last updated 2/20/2009

## Appendix 1.8

### Clinician Fact Sheet: Swine Influenza, April 24, 2009

Fifteen confirmed cases of swine influenza (H1N1) have been identified in California and Texas and Mexico. Arizona has not identified any cases of swine influenza but continues to see seasonal influenza cases. The following is an interim update and guidance for clinicians.

#### Clinical Presentation of Initial Eight U.S. Swine Flu Cases

- Symptoms alone cannot distinguish swine flu from seasonal flu. The eight US patients have all recovered and their illness was not more severe than seasonal influenza

#### Laboratory

- Collect **two** nasopharyngeal swabs for influenza on a person with an influenza-like illness and at least one of the following criteria:
  - Travel within the 7 days before onset to Mexico, California (San Diego or Imperial Counties only), or Texas (San Antonio area only); OR
  - Contact within the 7 days before onset with a person with respiratory illness and travel to one of the locations above; OR
  - Hospitalization for lower respiratory tract disease.
- If a patient meeting these criteria tests positive for influenza A, contact your local public health department to facilitate submitting specimens to the Arizona State Health Laboratory

#### Infection Control for Health Care Workers (HCWs)

- HCWs should always use droplet and standard precautions (surgical mask and eye protection) for influenza like illnesses with good hand washing before & after patient contact
- HCWs caring for patients with **laboratory-confirmed** swine influenza or ill contacts of lab-confirmed cases, should use N95 masks, eye protection (face shield or goggles), disposable gloves and gown, and place the patient in an airborne infection isolation room (AIIR)
- Swine flu patients and ill contacts of known swine flu patients should wear a surgical mask and be placed in AIIR (where possible) or a private room

#### Treatment & Prophylaxis

- The US swine flu isolates are sensitive to oseltamivir and zanamivir and resistant to amantadine and rimantadine, so use current influenza antiviral treatment recommendations for empiric therapy of patients with influenza-like illnesses
  - Use of zanamivir for treatment and chemoprophylaxis, or
  - Use dual therapy with both oseltamivir and rimantadine (or amantadine)

#### Resources

- CDC Swine Influenza Site: <http://www.cdc.gov/flu/swine/>
- ADHS Influenza Clinician Fact Sheet and Antiviral Fact Sheet: <http://www.azdhs.gov/flu/Info4HP.htm>

## Appendix 1.9

### National Case Definition for Novel Influenza A Virus Infection

#### Novel influenza A virus infections

##### 2010 Case Definition

CSTE Position Statement Number: 09-ID-43

##### *Clinical Description*

An illness compatible with influenza virus infection (fever >100 degrees Fahrenheit with cough or sore throat).

##### *Laboratory criteria for diagnosis*

A human case of infection with an influenza A virus subtype that is different from currently circulating human influenza H1 and H3 viruses. Novel subtypes include, but are not limited to, H2, H5, H7, and H9 subtypes. Influenza H1 and H3 subtypes originating from a non-human species or from genetic reassortment between animal and human viruses are also novel subtypes. Novel subtypes will be detected with methods available for detection of currently circulating human influenza viruses at state public health laboratories (e.g., real-time reverse transcriptase polymerase chain reaction [RT-PCR]). Confirmation that an influenza A virus represents a novel virus will be performed by CDC's influenza laboratory

##### *Exposure*

Criteria for epidemiologic linkage:

- The patient has had contact with one or more persons who either have or had the disease, AND
- Transmission of the agent by the usual modes of transmission is plausible

OR

- A case may be considered epidemiologically linked to a laboratory confirmed case if at least one case in the chain of transmission is laboratory confirmed

##### *Case Classification*

*Suspected:* A case meeting the clinical criteria, pending laboratory confirmation. Any case of human infection with an influenza A virus that is different from currently circulating human influenza H1 and H3 viruses is classified as a suspected case until the confirmation process is complete.

*Probable:* A case meeting the clinical criteria and epidemiologically linked to a confirmed case, but for which no confirmatory laboratory testing for novel influenza virus infection has been performed.

*Confirmed:* A case of human infection with a novel influenza A virus confirmed by CDC's influenza laboratory. Once a novel virus has been identified by CDC, confirmation may be made by public health laboratories following CDC-approved protocols for that specific strain, or by laboratories using an FDA-authorized test specific for detection of that novel influenza strain.

##### *Comment*

Once a novel virus is identified by CDC, it will be nationally notifiable until CSTE in consultation with CDC determines that it is no longer necessary to report each case.

On December 13, 2006, the United States formally accepted the revision of the International Health Regulations, referred to as IHR (2005) (<http://www.hhs.gov/news/press/2006pres/20061213.html>). The IHR (2005) are an international legal instrument that governs the roles of the WHO and its member countries in identifying and responding to and sharing information about public health emergencies of international concern ([http://www.who.int/csr/ihr/IHRWHA58\\_3-en.pdf](http://www.who.int/csr/ihr/IHRWHA58_3-en.pdf)). The updated rules are designed to prevent and protect against the international spread of diseases, while minimizing interference with world travel and trade. The revised regulations add human infections with new influenza strains to the

list of conditions that Member States must immediately report to WHO. An outbreak of infections with a new influenza A virus that demonstrates human-to-human transmission could signal the beginning of the next pandemic. Robust epidemiologic and laboratory surveillance systems are required for a coordinated public health response to infections with a novel influenza virus subtype. Early detection of an influenza virus with pandemic potential will permit identification of viral characteristics (e.g., genetic sequence, antiviral susceptibility, and virulence) that will affect clinical management and public health response measures. It should also facilitate development of a virus-specific vaccine and testing strategies.

All state public health laboratories have the capacity to test respiratory specimens for influenza viruses with sensitive and specific assays that can detect human and non-human influenza A viruses. They also have the capacity to subtype currently circulating human influenza A H1, H3, and avian H5 (Asian lineage) viruses. The detection or confirmation by a state public health laboratory of an influenza A virus that is unsubtypable with standard methods (e.g., real-time RT-PCR assays for human influenza A(H3) or (H1) viruses), or a non-human influenza virus (e.g., H5) from a human specimen, could be the initial identification of a virus with pandemic potential. Prompt notification of CDC by a state epidemiologist in conjunction with the public health laboratory will permit rapid confirmation of results and reporting to WHO. In addition, it will aid prompt viral characterization, and the development of virus-specific diagnostic tests.

From [http://www.cdc.gov/ncphi/disss/nndss/casedef/novel\\_influenzaA.htm](http://www.cdc.gov/ncphi/disss/nndss/casedef/novel_influenzaA.htm), referenced 6/19/2010, page last updated 1/12/2010

# **Appendix 1.10** **CDC Human Influenza A (H5) Case Screening and Report Form**



## **Human Influenza A (H5)**

### **Human Influenza A (H5) Domestic Case Screening Form**

CDC Case ID: \_\_\_\_\_

<b>1. Reported By</b>			
Date reported to state or local health department: ____/____/____ m m d d y y y y		State / Local Assigned Case ID: _____	
Last Name: _____		First Name: _____	
State: _____	Affiliation: _____	Email: _____	
Phone 1: _____	Phone 2: _____	Fax: _____	
<b>2. Patient Information</b>			
City of Residence: _____		County: _____	State: _____
Age at onset: _____ <input type="checkbox"/> Year(s) <input type="checkbox"/> Month(s)		Race: <i>(Choose One)</i> <input type="checkbox"/> American Indian/Alaska Native <input type="checkbox"/> Asian <input type="checkbox"/> Black <input type="checkbox"/> Native Hawaiian/Other Pacific Islander <input type="checkbox"/> White <input type="checkbox"/> Unknown	
Sex: <input type="checkbox"/> Male <input type="checkbox"/> Female		Ethnicity: <input type="checkbox"/> Non Hispanic <input type="checkbox"/> Hispanic	
<b>3. Optional Patient Information</b>			
Last Name: _____		First Name: _____	
<b>4. Signs and Symptoms</b>			
A. Date of symptom onset: ____/____/____ m m d d y y y y			
B. What symptoms and signs did the patient have during the course of illness? (check all that apply)			
<input type="checkbox"/> Fever > 38° C (100.4° F)	<input type="checkbox"/> Feverish (temperature not taken)	<input type="checkbox"/> Conjunctivitis	
<input type="checkbox"/> Cough	<input type="checkbox"/> Headache	<input type="checkbox"/> Shortness of breath	
<input type="checkbox"/> Sore throat	<input type="checkbox"/> Other (specify): _____		
C. Was a chest X-ray or chest CAT scan performed? <input type="checkbox"/> Yes* <input type="checkbox"/> No <input type="checkbox"/> Unknown			
If yes*, did the patient have radiographic evidence of pneumonia or respiratory distress syndrome (RDS)? <input type="checkbox"/> Yes* <input type="checkbox"/> No <input type="checkbox"/> Unknown			

February 19, 2004

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**DEPARTMENT OF HEALTH AND HUMAN SERVICES**  
**CENTERS FOR DISEASE CONTROL AND PREVENTION**  
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Epidemiologic Risk Factors

CDC Case ID:

5. Travel/Exposures					
A. In the 10 days prior to illness onset, did the patient travel to any of the countries listed in the table below? If yes*, please fill in arrival and departure dates for all countries that apply.			<input type="checkbox"/> Yes* <input type="checkbox"/> No** <input type="checkbox"/> Unknown <small>**If patient did not travel outside U.S., skip to question 6.</small>		
Country	Arrival Date	Departure Date	Country	Arrival Date	Departure Date
<input type="checkbox"/> Afghanistan			<input type="checkbox"/> Myanmar (Burma)		
<input type="checkbox"/> Bangladesh			<input type="checkbox"/> Nepal		
<input type="checkbox"/> Brunei			<input type="checkbox"/> North Korea		
<input type="checkbox"/> Cambodia			<input type="checkbox"/> Oman		
<input type="checkbox"/> China			<input type="checkbox"/> Pakistan		
<input type="checkbox"/> Hong Kong			<input type="checkbox"/> Papua New Guinea		
<input type="checkbox"/> India			<input type="checkbox"/> Philippines		
<input type="checkbox"/> Indonesia			<input type="checkbox"/> Saudi Arabia		
<input type="checkbox"/> Iran			<input type="checkbox"/> Singapore		
<input type="checkbox"/> Iraq			<input type="checkbox"/> South Korea		
<input type="checkbox"/> Israel			<input type="checkbox"/> Syria		
<input type="checkbox"/> Japan			<input type="checkbox"/> Taiwan		
<input type="checkbox"/> Jordan			<input type="checkbox"/> Thailand		
<input type="checkbox"/> Laos			<input type="checkbox"/> Turkey		
<input type="checkbox"/> Lebanon			<input type="checkbox"/> Viet Nam		
<input type="checkbox"/> Macao			<input type="checkbox"/> Yemen		
<input type="checkbox"/> Malaysia					

For the questions 5B to 5E,  
In the 10 days prior to illness onset, while in the countries listed above . . .

B. Did the patient come within 1 meter (3 feet) of any live poultry or domesticated birds (e.g. visited a poultry farm, a household raising poultry, or a bird market)? ☐ Yes\*    ☐ No    ☐ Unknown

If Yes\*

C. Did patient touch any recently butchered poultry? ☐ Yes    ☐ No    ☐ Unknown

D. Did the patient visit or stay in the same household with anyone with pneumonia or severe flu-like illness? ☐ Yes    ☐ No    ☐ Unknown

E. Did the patient visit or stay in the same household with a suspected human influenza A(H5) case? ☐ Yes    ☐ No    ☐ Unknown

F. Did the patient visit or stay in the same household with a known human influenza A(H5) case? ☐ Yes    ☐ No    ☐ Unknown

\* SEE Influenza A (H5) Interim U.S. Case Definitions

CDC ID:

### 6. Exposure for Non Travelers

For patients whom did not travel outside the U.S.,  
in the 10 days prior to illness onset, did the patient visit or stay  
in the same household with a traveler returning from one of  
the countries listed above who developed pneumonia or severe  
flu-like illness?

☐ Yes\* ☐ No ☐ Unknown

If yes\*, was the contact a confirmed or suspected H5 case  
patient?

☐ Yes\* ☐ No ☐ Unknown

If yes\*: CDC ID: \_\_\_\_\_ STATE ID: \_\_\_\_\_

### Laboratory Evaluation

#### 7. State and local level influenza test results

##### Specimen 1

☐ NP swab ☐ Bronchoalveolar lavage specimen (BAL)  
☐ NP aspirate ☐ OP swab ☐ Other \_\_\_\_\_

Date Collected:  
\_\_\_\_ / \_\_\_\_ / \_\_\_\_  
m m d d y y y y

Test Type:  
☐ RT-PCR ☐ Direct fluorescent antibody (DFA)  
☐ Viral Culture ☐ Rapid Antigen Test\*

Result:  
☐ Influenza A ☐ Influenza B  
☐ Influenza (type unk)  
☐ Negative ☐ Pending

\*Name of Rapid Test:

##### Specimen 2

☐ NP swab ☐ Bronchoalveolar lavage specimen (BAL)  
☐ NP aspirate ☐ OP swab ☐ Other \_\_\_\_\_

Date Collected:  
\_\_\_\_ / \_\_\_\_ / \_\_\_\_  
m m d d y y y y

Test Type:  
☐ RT-PCR ☐ Direct fluorescent antibody (DFA)  
☐ Viral Culture ☐ Rapid Antigen Test\*

Result:  
☐ Influenza A ☐ Influenza B  
☐ Influenza (type unk)  
☐ Negative ☐ Pending

\*Name of Rapid Test:

##### Specimen 3

☐ NP swab ☐ Bronchoalveolar lavage specimen (BAL)  
☐ NP aspirate ☐ OP swab ☐ Other \_\_\_\_\_

Date Collected:  
\_\_\_\_ / \_\_\_\_ / \_\_\_\_  
m m d d y y y y

Test Type:  
☐ RT-PCR ☐ Direct fluorescent antibody (DFA)  
☐ Viral Culture ☐ Rapid Antigen Test\*

Result:  
☐ Influenza A ☐ Influenza B  
☐ Influenza (type unk)  
☐ Negative ☐ Pending

\*Name of Rapid Test:

CDC ID:

### 8. List specimens sent to the CDC

Select a SOURCE\* from the following list for each specimen: Serum (acute), serum (convalescent), NP swab, NP aspirate, bronchoalveolar lavage specimen (BAL), OP swab, tracheal aspirate, or tissue

Specimen 1: <input type="checkbox"/> Clinical Material <input type="checkbox"/> Extracted RNA <input type="checkbox"/> Virus Isolate	Source*: _____	Collected : ____ / ____ / ____ m m d d y y y y Date Sent: ____ / ____ / ____ m m d d y y y y
Specimen 2: <input type="checkbox"/> Clinical Material <input type="checkbox"/> Extracted RNA <input type="checkbox"/> Virus Isolate	Source*: _____	Collected : ____ / ____ / ____ m m d d y y y y Date Sent: ____ / ____ / ____ m m d d y y y y
Specimen 3: <input type="checkbox"/> Clinical Material <input type="checkbox"/> Extracted RNA <input type="checkbox"/> Virus Isolate	Source*: _____	Collected : ____ / ____ / ____ m m d d y y y y Date Sent: ____ / ____ / ____ m m d d y y y y
Specimen 4: <input type="checkbox"/> Clinical Material <input type="checkbox"/> Extracted RNA <input type="checkbox"/> Virus Isolate	Source*: _____	Collected : ____ / ____ / ____ m m d d y y y y Date Sent: ____ / ____ / ____ m m d d y y y y
Specimen 5: <input type="checkbox"/> Clinical Material <input type="checkbox"/> Extracted RNA <input type="checkbox"/> Virus Isolate	Source*: _____	Collected : ____ / ____ / ____ m m d d y y y y Date Sent: ____ / ____ / ____ m m d d y y y y
Carrier: _____		Tracking #: _____

### 9. Case Notes:

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# **Appendix 1.11** **CDC Swine Influenza Case Report Form**

**Swine Influenza Case Report Form**  
(FAX to: 404-248-4094 or email to [casereportforms@cdc.gov](mailto:casereportforms@cdc.gov))

---

State EPI ID # (epidemiology ID) \_\_\_\_\_ CDC EPI ID # \_\_\_\_\_

State lab specimen ID #1 \_\_\_\_\_ CDC lab specimen ID #1 \_\_\_\_\_

State lab specimen ID #2 \_\_\_\_\_ CDC lab specimen ID #2 \_\_\_\_\_

\_\_\_\_\_ CDC (lab) unique ID # \_\_\_\_\_

---

Reported by: \_\_\_\_\_

State: \_\_\_\_\_ County: \_\_\_\_\_

Date reported to state/local health department  
\_\_\_\_/\_\_\_\_/\_\_\_\_

Name of Person Reporting to CDC: Last Name: \_\_\_\_\_ First Name: \_\_\_\_\_

Phone Number :( ) \_\_\_\_\_ - \_\_\_\_\_ Fax Number :( ) \_\_\_\_\_ - \_\_\_\_\_ E-Mail: \_\_\_\_\_

At the time of this report, is the case:  
☐ Probable      ☐ Confirmed  
 (please see: [www.cdc.gov/swineflu](http://www.cdc.gov/swineflu) for case definitions)

**Patient Demographic Data:**  
 Date of Birth (mm/dd/yy): \_\_\_\_/\_\_\_\_/\_\_\_\_

Race: ☐ American Indian/Alaska Native      ☐ White  
☐ Asian      ☐ Black  
☐ Native Hawaiian/Other Pacific Islander      ☐ Multiracial

Ethnicity: ☐ Hispanic      ☐ Non-Hispanic

Sex: ☐ Male    ☐ Female

*If Female, is the patient pregnant?* ☐ Yes (weeks pregnant) \_\_\_\_\_ ☐ No ☐ Unknown

**Clinical Data:**  
 Date of symptom onset (mm/dd/yy): \_\_\_\_/\_\_\_\_/\_\_\_\_

Signs and symptoms: (check all that apply)

<input type="checkbox"/> Fever >37.8 C (100 F) _____ T max	<input type="checkbox"/> Sore throat
<input type="checkbox"/> Feverish but temperature not taken	<input type="checkbox"/> Conjunctivitis
<input type="checkbox"/> Cough	<input type="checkbox"/> Shortness of breath
<input type="checkbox"/> Headache	<input type="checkbox"/> Diarrhea
<input type="checkbox"/> Seizures	<input type="checkbox"/> Vomiting
<input type="checkbox"/> Rhinorrhea	<input type="checkbox"/> Other, specify _____

Was the patient hospitalized? ☐ Yes      ☐ No      ☐ Unknown

Was the patient admitted to the intensive case unit? ☐ Yes      ☐ No      ☐ Unknown

Did the patient require mechanical ventilation? ☐ Yes      ☐ No      ☐ Unknown

Did the patient die as a result of this illness? ☐ Yes      ☐ No      ☐ Unknown

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**Medical History:**

Did the case-patient receive influenza vaccine between September 2008 and March 2009?

☐ Yes ☐ No ☐ Don't Know

If yes: Number of doses: ☐ 1 Date (mm/dd/yy) \_\_\_\_/\_\_\_\_/\_\_\_\_ [If day unknown use "15"]

Type of vaccine: ☐ Inactivated (injectable) ☐ Live Attenuated (spray) ☐ Unknown

☐ 2 Date (mm/dd/yy) \_\_\_\_/\_\_\_\_/\_\_\_\_ [If day unknown use "15"]

Type of vaccine: ☐ Inactivated (injectable) ☐ Live Attenuated (spray) ☐ Unknown

Does the case-patient have any of the following?

- a. Asthma ☐ yes ☐ no ☐ unknown
- b. Other chronic lung disease ☐ yes ☐ no ☐ unknown
- c. Chronic heart or circulatory disease ☐ yes ☐ no ☐ unknown
- d. Metabolic disease (incl diabetes mellitus) ☐ yes ☐ no ☐ unknown
- e. Kidney disease ☐ yes ☐ no ☐ unknown
- f. Cancer in the last 12 months ☐ yes ☐ no ☐ unknown
- g. Immunosuppressive condition (HIV infection, chronic corticosteroid therapy, or organ transplant recipient)  
☐ yes ☐ no ☐ unknown
- h. Other chronic diseases ☐ yes ☐ no ☐ unknown
- i. Neurological disease ☐ yes ☐ no ☐ unknown

**Diagnostic Findings:****General tests**

Leukopenia (white blood cell count <5,000 leukocytes/mm<sup>3</sup>)

☐ Yes ☐ No ☐ Unknown

Lymphopenia (total lymphocytes <800/mm<sup>3</sup> or lymphocytes <15% of total WBC)

☐ Yes ☐ No ☐ Unknown

Thrombocytopenia (total platelets <150,000/mm<sup>3</sup>)

☐ Yes ☐ No ☐ Unknown

Did the patient have any of the following tests?

☐ Chest X-ray If yes, ☐ Normal ☐ Abnormal ☐ Unknown

☐ Chest CT scan If yes, ☐ Normal ☐ Abnormal ☐ Unknown

If chest x-ray or chest CT scan result abnormal:

Was there evidence of pneumonia?

☐ Yes ☐ No ☐ Unknown

Did the patient have acute respiratory distress syndrome (ARDS)?

☐ Yes ☐ No ☐ Unknown

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**Treatment:**

Did the patient receive antiviral medications?

☐ Yes      ☐ No      ☐ Unknown

If yes, complete table below

Drug	Date Initiated	Date Discontinued	Dosage (if known)
Oseltamivir (Tamiflu®)			
Zanamivir (Relenza®)			
Rimantidine			
Amantadine			
Other			

**Epidemiologic Risk Factors**

The following questions concern the 7 days prior to illness onset:

Did the patient travel to Mexico?

☐ Yes      ☐ No      ☐ Unknown

Did the patient have close contact (within 2 meter (6 feet)) with a person (e.g. caring for, speaking with, or touching) who is a suspected, probable or confirmed swine influenza case\*?

☐ Yes      ☐ No      ☐ Unknown

Did the patient handle samples (animal or human) suspected of containing influenza virus in a laboratory or other setting?

☐ Yes      ☐ No      ☐ Unknown

Does the patient work in a health care facility or setting?

☐ Yes      ☐ No      ☐ Unknown

Has the patient had family members or close contacts with pneumonia or influenza-like illness?

☐ Yes      ☐ No      ☐ Unknown

**Household Transmission** (A household member is anyone including the case-patient with at least one overnight stay +/-7days from illness onset)

How many people live in the household (include patient in this number)? \_\_\_\_\_

For each person in the household, besides the patient, record age, check applicable symptoms if present anytime from 7 days before to 7 days after the patient's onset date, and record initial symptom onset date

Person #	Code*	Age (years)	No symptoms	Feverish	Max temp >37.8C or >100 F	Cough	Sore throat	Runny nose	Diarrhea	Onset date
1			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____/____/2009
2			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____/____/2009
3			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____/____/2009
4			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____/____/2009
5			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____/____/2009
6			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____/____/2009
7			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____/____/2009
8			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____/____/2009
9			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____/____/2009
10			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	____/____/2009

\*Use to complete the relationship of the household member to the patient. 1=spouse, 2=mother, 3=father, 4=child, 5=sister, 6=brother, 7=cousin, 8=aunt, 9=uncle, 10=grandmother, 11=grandfather, 12=not related, 19=other

**If any of the patient's household members been tested for influenza, please complete contact tracing form for each household member.**

\* Please refer to [www.cdc.gov/swineflu](http://www.cdc.gov/swineflu) for case definition.

## Influenza testing

**Test 1** Date collected (mm/dd/yy):     /     /

State Lab Specimen1 ID: \_\_\_\_\_

Specimen Type	Test Type	Results	Influenza Type/Subtype
Enter specimen code	<input type="checkbox"/> RT-PCR/PCR <input type="checkbox"/> DFA/IFA <input type="checkbox"/> Viral culture <input type="checkbox"/> HI <input type="checkbox"/> Rapid test <input type="checkbox"/> Immunohistochemistry <input type="checkbox"/> Other	<input type="checkbox"/> positive  <input type="checkbox"/> negative  <input type="checkbox"/> indeterminate	<input type="checkbox"/> flu A <input type="checkbox"/> flu B <input type="checkbox"/> flu A/H1 <input type="checkbox"/> flu A/H3 <input type="checkbox"/> flu A unsubtypeable <input type="checkbox"/> flu A swine H1

Specimen code and type:

- |                              |  |                       |
|------------------------------|--|-----------------------|
| 1. Nasopharyngeal swab       | 7. Bronchoalveolar lavage specimen (BAL) | 13. Pleural fluid     |
| 2. Nasopharyngeal aspirate   | 8. Sputum                                | 14. Peritoneal fluid  |
| 3. Oropharyngeal/throat swab | 9. Cerebrospinal fluid (CSF)             | 15. Pericardial fluid |
| 4. Nasal aspirate/swab       | 10. Tissue                               | 16. Chest fluid       |
| 5. Endotracheal aspirate     | 11. Stool                                | 17. Other             |
| 6. Serum                     | 12. Urine                                |                       |

**Test 2** Date collected (mm/dd/yy):     /     /

State Lab Specimen2 ID: \_\_\_\_\_

Specimen Type	Test Type	Results	Influenza Type/Subtype
Enter specimen code	<input type="checkbox"/> RT-PCR/PCR <input type="checkbox"/> DFA/IFA <input type="checkbox"/> Viral culture <input type="checkbox"/> HI <input type="checkbox"/> Rapid test <input type="checkbox"/> Immunohistochemistry <input type="checkbox"/> Other	<input type="checkbox"/> positive  <input type="checkbox"/> negative  <input type="checkbox"/> indeterminate	<input type="checkbox"/> flu A <input type="checkbox"/> flu B <input type="checkbox"/> flu A/H1 <input type="checkbox"/> flu A/H3 <input type="checkbox"/> flu A unsubtypeable <input type="checkbox"/> flu A swine H1

Specimen code and type:

- |                              |  |                       |
|------------------------------|--|-----------------------|
| 1. Nasopharyngeal swab       | 7. Bronchoalveolar lavage specimen (BAL) | 13. Pleural fluid     |
| 2. Nasopharyngeal aspirate   | 8. Sputum                                | 14. Peritoneal fluid  |
| 3. Oropharyngeal/throat swab | 9. Cerebrospinal fluid (CSF)             | 15. Pericardial fluid |
| 4. Nasal aspirate/swab       | 10. Tissue                               | 16. Chest fluid       |
| 5. Endotracheal aspirate     | 11. Stool                                | 17. Other             |
| 6. Serum                     | 12. Urine                                |                       |

## Specimens sent to CDC

Indicate when and what type of specimens (including sera) were sent to CDC and specimen ID

- Date:     /     /2009     Specimen type (enter specimen code)     , State Lab Specimen ID A: \_\_\_\_\_
- Date:     /     /2009     Specimen type (enter specimen code)     , State Lab Specimen ID B: \_\_\_\_\_
- Date:     /     /2009     Specimen type (enter specimen code)     , State Lab Specimen ID C: \_\_\_\_\_

Specimen code and type:

- |                              |  |                       |
|------------------------------|--|-----------------------|
| 1. Nasopharyngeal swab       | 7. Bronchoalveolar lavage specimen (BAL) | 13. Pleural fluid     |
| 2. Nasopharyngeal aspirate   | 8. Sputum                                | 14. Peritoneal fluid  |
| 3. Oropharyngeal/throat swab | 9. Cerebrospinal fluid (CSF)             | 15. Pericardial fluid |
| 4. Nasal aspirate/swab       | 10. Tissue                               | 16. Chest fluid       |
| 5. Endotracheal aspirate     | 11. Stool                                | 17. Other             |
| 6. Serum                     | 12. Urine                                |                       |

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## **Appendix 1.12**

### **Arizona Draft Pandemic Emergency Measure**

#### **ARIZONA DEPARTMENT OF HEALTH SERVICES**

#### **ADMINISTRATIVE ORDER 20XX-XX** **(Emergency Measures for Pandemic Influenza)**

**WHEREAS**, the Director of the Department of Health Services, pursuant to Arizona Revised Statutes (ARS) §36-136(G), may define and prescribe emergency measures for detecting, reporting, preventing, and controlling communicable or infectious diseases or conditions if the Director has reasonable cause to believe that a serious threat to public health and welfare exists; and

**WHEREAS**, there is a need to adopt control measures for pandemic influenza as an emergency measure under the authority of ARS §36-136(G), as established by the following:

1. Pandemic influenza represents a serious threat to public health. Pandemic influenza is a recently recognized, contagious febrile respiratory illness associated with infection by a novel influenza virus. Pandemic influenza manifestations are often severe, including death, and severe illnesses often occur in previously healthy persons, including health care workers.
2. While Pandemic influenza can be highly contagious, its overall rate of spread can be slowed with early recognition and aggressive implementation of control measures. The key to controlling pandemic influenza is prompt detection of cases, followed by rapid implementation of control measures.
3. Effective surveillance for pandemic influenza is challenging because the early signs and symptoms are not specific enough to reliably distinguish pandemic influenza from seasonal influenzas and other common respiratory illnesses. Thus, risk of exposure is key to considering the likelihood of a pandemic influenza diagnosis, and pandemic influenza surveillance efforts need to be determined by the presence of known novel influenza virus transmission in the world.
4. The World Health Organization has developed guidelines for pandemic influenza. These emergency measures are needed to implement the WHO guidelines for the detection and control of pandemic influenza.
5. The current rules for communicable diseases, in 9 A.A.C. 6 do not include provisions related to suspect cases of pandemic influenza. These emergency measures are needed to ensure the sharing of patient confidential information related to this non-reportable disease by healthcare providers, clinical laboratories, and healthcare institutions and to ensure that they implement appropriate control measures for pandemic influenza.

**NOW, THEREFORE**, I, Will Humble, by virtue of the authority vested in me as the Director of the Arizona Department of Health Services, do hereby Order the following emergency measures to be adopted for detecting, reporting, preventing, and controlling pandemic influenza in Arizona:

#### **A. Reporting Requirements and Control Measures in the Absence of Known Person-to-Person Transmission of Pandemic Influenza Worldwide**

1. A healthcare provider<sup>1</sup> or administrator of a healthcare institution<sup>2</sup> shall:
  - a. Ensure that each patient hospitalized for influenza like illness is screened for the following that might indicate a higher index of suspicion of a novel influenza virus infection:
    - i. In the 10 days before illness onset, travel to or close contact<sup>3</sup> with another ill individual who recently traveled to a geographical area with known novel influenza virus activity.
  - b. Immediately report to the local health agency by telephone or equally expeditious means each suspected or positive novel influenza virus test result; and
  - c. Include the following information in each report made under subsection (A)(1)(b):

- i. The patient's name, address, telephone number, date of birth, race or ethnicity, gender, and occupation;
- ii. The disease, date of onset, date of diagnosis, date of laboratory confirmation (if applicable) and test results; and
- iii. The name, address, and telephone number of the person or agency making the report.

<sup>1</sup> "Health Care provider" means a physician, physician assistant, registered nurse practitioner, or dentist.

<sup>2</sup> "Health Care institution" has the same meaning as in ARS §36-401.

2. A local health agency shall:

- a. Conduct an epidemiologic investigation of each patient reported under subsection (A)(1)(b); and
- b. Forward each report received under subsection (A)(1)(b) to the Department along with the communicable disease reports forwarded each week under R9-6-203 (B), including for each report a description of what action was initiated by the local health agency.
- c. In conjunction with the Department and other local health agencies or in alignment with the incident command structure, implement as available:
  - i. Appropriate community notification
  - ii. Community education
  - iii. Community mitigation
  - iv. Antiviral distribution
  - v. Vaccine strategy based upon the current information

**B. Reporting Requirements and Control Measures in the Presence of Person to Person Transmission of Pandemic Influenza**

- 1. In addition to complying with the reporting requirements and control measures described in subsection (A), a health care provider or administrator of a health care institution shall:
  - a. Ensure that each patient presenting to an outpatient clinic with influenza like illness is screened for the following pandemic influenza risk factors:
    - i. Travel within 10 days of illness onset to a foreign or domestic location with documented or suspected recent local transmission of Influenza A (H5N1) infection, or
    - ii. Close contact with 10 days of illness onset with an individual with known or suspected pandemic influenza;

I have executed this Order on this day

\_\_\_\_\_, 20XX  
 having authority to do so under Arizona Law

**DIRECTOR**

ON this \_\_\_\_\_ day of \_\_\_\_\_, 20XX,  
 Will Humble, Director of the Arizona Department of  
 Health Services, signed and acknowledged this document  
 in my presence.

**Appendix 1.13**  
**Case Report Form for 2009 H1N1 for Hospitalizations and Deaths**

**Novel H1N1 Short Form for Hospitalizations or Deaths**

ID #	Name	Date of Birth <small>mm / dd / yyyy</small>
------	------	--

**Hospitalization / Death**

Was the patient hospitalized?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Did the patient die as a result of this illness?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
If patient died, Date of death: <small>mm / dd / yyyy</small>	Cause of Death:		

**Hospitalization**

If the patient was hospitalized, please fill out the following information:			
Name of the hospital:			
Date of admission:			
Date of release / discharge:			
Duration of symptoms before hospitalization (in days):			
Did patient have pneumonia at time of admission?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Did patient develop ARDS prior to or in hospital?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Was the patient admitted to the intensive care unit?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Did the patient require mechanical ventilation?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown

**Current Status**

<input type="checkbox"/> Transferred to another hospital	<input type="checkbox"/> Discharged to home	<input type="checkbox"/> Other
<input type="checkbox"/> Currently hospitalized on ward	<input type="checkbox"/> Currently hospitalized in ICU	<input type="checkbox"/> Died
<input type="checkbox"/> Discharged to hospice		

**Pregnancy**

Was the patient pregnant?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown	<input type="checkbox"/> Male
If the patient was pregnant at admission, at the time of hospital discharge provide information about the pregnancy outcome	<input type="checkbox"/> Still pregnant	<input type="checkbox"/> Delivered: week of pregnancy at birth		

**Medical History - Did the case-patient have any of the following medical conditions?**

Asthma	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Other chronic lung disease	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Chronic heart or circulatory disease	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Metabolic disease (including diabetes mellitus)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Kidney disease	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Cancer in the last 12 months	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Immunosuppressive condition (HIV infection, chronic corticosteroid therapy, or organ transplant recipient)	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Other chronic diseases	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown
Neurological disease	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unknown

Revised: 6/2/2009



# Arizona Pandemic Influenza Response Plan

## *Supplement 2: Laboratory Diagnostics*





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## I. Rationale

The goals of diagnostic testing during a pandemic are to:

- Identify the earliest U.S. cases of pandemic influenza (whether the pandemic begins in the United States or elsewhere).
- Support disease surveillance to monitor the pandemic's geographic spread and impact of interventions.
- Facilitate clinical treatment by distinguishing patients with influenza from those with other respiratory illnesses.
- Monitor circulating viruses for antiviral resistance.

During the pandemic phase of an epidemic, public health, hospital, and clinical laboratories might receive a large and potentially overwhelming volume of clinical specimens. Pre-pandemic planning is therefore essential to ensure timeliness of diagnostic testing and the availability of diagnostic supplies and reagents, address staffing issues, and disseminate protocols for safe handling and shipping of specimens. Once a pandemic is underway, the need for laboratory confirmation of clinical diagnoses may decrease as the virus becomes widespread.

Diagnostic testing for pandemic influenza virus may involve a range of laboratory assays (see Box 2.1 and Appendix 2.1)

## II. Overview

The public health laboratory is a critical component of the overall public health response to pandemic influenza. The capability of differentiating seasonal influenza from pandemic influenza depends upon the rapid detection and characterization that is available at the Arizona State Public Health Laboratory (ASPHL) and the Centers for Disease Control and Prevention (CDC).

- The ASPHL contributes to national laboratory-based surveillance efforts.
- Only through laboratory testing can the signs and symptoms of influenza-like illness be attributed to a definitive pathogen.
- Only by identifying the pathogen can appropriate treatment and control measures be taken to limit/prevent the spread of the disease.
- Once the ASPHL detects and characterizes a newly emerging influenza strain, for example, the highly pathogenic avian influenza (H5) in the U.S., a sound epidemiologic approach to monitor and respond to the infectious agent can begin.



The ASPHL plays a key role in laboratory preparedness and response efforts. Federal funding has been used by the ASPHL not only to enhance biological /chemical terrorism preparedness and response activities but also to improve diagnostic capabilities and capacities for emergency preparedness and planning for emerging and re-emerging infectious diseases including pandemic influenza. Specifically the ASPHL:

- Provides accurate and rapid state-of-the-art testing for detection and identification of newly emergent subtypes of influenza such as H5N1.
- Leads laboratory-based surveillance efforts within each state and contribute to national surveillance efforts as members of a network of World Health Organization collaborating laboratories.
- Provides viral samples to the CDC for further characterization and emerging resistance throughout the pandemic period and contribute to the selection of future vaccine strains.

The ASPHL not only contributes to the detection and identification of influenza, but must also work closely with a network of clinical, research, and veterinary laboratories to support and coordinate diagnostic testing for influenza by:

- Providing education, training, and guidance on use and interpretation of rapid hand-held influenza tests.

- Assisting the clinical laboratories in the validation and implementation of in-house and commercial assays
- Providing representative samples of novel virus types to collaborative research facilities for the research and development of assays to assist in the monitoring of a novel influenza pandemic.
- Maintaining a close working relationship with veterinary diagnostic labs to monitor influenza activity within animal populations that may impact human populations.
- Assisting in the development of pandemic preparedness and response plans within states.

### **III. WHO Phases 1-3 (Limited Human Spread)**

#### **Global and US surveillance**

The World Health Organization (WHO) has a worldwide network of surveillance laboratories providing information on Influenza. In the United States they work in cooperation with the CDC. The ASPHL is a participant in the WHO surveillance network (see Box 2.2)

#### **Routine Surveillance Activities**

- On a weekly basis, information regarding the number of influenza isolates detected, their sub-types, patient ages, and geographical location are sent to the CDC.
- A random sample of influenza isolates are selected and submitted to the CDC during each influenza season as directed. These samples are selected to represent early, middle, and late season isolates.

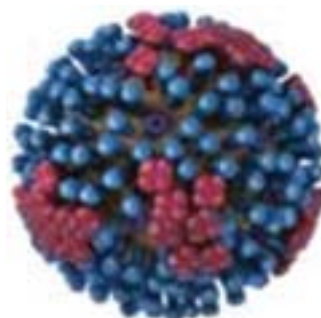
#### **A. Roles and responsibilities**

##### **Clinical and Hospital Laboratories**

- Develop a pandemic response plan and work with the ASPHL to address laboratory surge capacity issues.
- Train personnel in the management of respiratory specimens during an influenza pandemic.
- Perform diagnostic testing on clinical and reference specimens for the detection of influenza viruses
- Refer specimens from patients with suspected novel influenza to the ASPHL.
- Institute surveillance for influenza-like illness among laboratory personnel working with influenza virus.

##### **Arizona State Public Health Laboratory**

- Perform diagnostic testing on clinical and reference specimens for the detection of influenza viruses.
- Support surveillance activities on a year-round basis for seasonal and novel strains of the influenza virus
- Participate in pandemic influenza planning and exercises.
- Institute surveillance for influenza-like illness among laboratory personnel.
- Develop and review pandemic response plans and checklists.
- Educate clinical laboratorians on the safety and handling of specimens suspected to contain novel influenza viruses (see Appendices 2.3 and 2.4).



(3D graphical representation of a generic influenza virion's ultrastructure, photo courtesy of the CDC Public Health Image Library)

#### **B. Laboratory testing**

##### **Clinical Laboratories**

- Perform diagnostic testing on clinical samples using commercial or in-house assays including rapid test kits and viral culture.
- Forward specimens containing suspect novel viruses to the ASPHL (see page S2-8 for contact information).



### **Arizona State Public Health Laboratory (ASPL)**

- Test all influenza specimens received by the ASPHL by real-time reverse transcription polymerase chain reaction (RT-PCR) for seasonal and novel strains of the influenza virus following CDC-recommended testing algorithms.
- Inoculate PCR positive specimens into cell culture for virus isolation, unless an avian strain of influenza is suspected
- Perform hemagglutination inhibition (HAI) testing to determine influenza A subtype or influenza B subtype using CDC/WHO reagents and protocols.
- Refer specimens to the CDC if a patient meets the requirements for infection with a novel influenza virus and tests positive for influenza A virus.



### **C. Laboratory safety - Biocontainment**

During the period of Limited Human Spread, specimens from suspected cases of human infection with novel influenza viruses should be sent to the ASPHL for testing. The following guidelines should be used for handling and testing of samples suspected to contain a novel influenza virus.

- Commercial antigen detection testing – conduct all assays in a Bio-Safety cabinet under BSL-II conditions.
- RT-PCR – conduct all assays in a Bio-Safety cabinet under BSL-II conditions.
- Virus Isolation - all assays must be conducted under BSL-III with enhancements.
- (see Appendix 2.4 for additional laboratory BioSafety Guidelines).



### **D. Surge capacity planning**

#### **1. Staffing and Training**

- Cross-train personnel in the use of testing protocols and reporting through existing surveillance systems.
- Establish back-up plans for hiring temporary laboratory and receiving staff to handle surges in testing and demographic entry.
- Develop and maintain plans for multiple shifts, including after-hours and seven day per week testing capacity.



## 2. Supplies and Equipment

- Establish inventory system to determine current level of diagnostic supplies, including personal protective equipment.
- Assess anticipated equipment needs and maintain a redundancy in test equipment
- Determine mechanism to monitor consumption of supplies during the pandemic.
- Maintain an adequate supply of testing reagents to conduct surveillance activities.



## E. Partnerships

The ASPHL should build partnerships with the private clinical laboratories and provide them with updated information and training in influenza diagnostics.

## IV. WHO Phases 4-6 (Sustained Human-to-Human Spread and Widespread Human Infection)

### A. Roles and responsibilities

Public health, hospital and clinical laboratories will continue to support surveillance for pandemic influenza through the same mechanisms that support laboratory-based surveillance for seasonal influenza.

#### Clinical Laboratories

- Perform diagnostic testing for influenza.
- Enhance testing capacity to manage increased numbers of requests for influenza testing.
- Support surveillance activities – refer selected specimens from possible pandemic influenza patients to the ASL.
- Maintain other diagnostic services.

#### Arizona State Public Health Laboratory (ASPHL)

- Maintain laboratory capacity to conduct surveillance activities and report results in a timely fashion year-round.
- Expand and sustain laboratory capacity to manage a surge of testing, reporting, and client services anticipated during an influenza pandemic following plans developed for surge capacity testing.
- Work with federal partners and APHL to supply health care providers and clinical laboratories with guidelines on all aspects of specimen management and diagnostic testing.
- Collaborate with the clinical laboratory community to facilitate timely and appropriate use of influenza diagnostics.
- Collaborate with the clinical laboratory community to implement testing algorithms to assure efficient use of laboratory resources during periods of surge of testing demand.
- Work with federal partners to monitor the pandemic virus and conduct special studies with CDC related to vaccine development, antibiotic resistance testing, and other aspects of emergency response.
- Maintain reference testing for seasonal and novel strains of the influenza virus.
- Continue education of clinicians & laboratorians.
- Share data/information in “real-time”.
- Maintain other diagnostic services.

### B. Laboratory support for health care providers

#### Arizona State Public Health Laboratory (ASPHL)

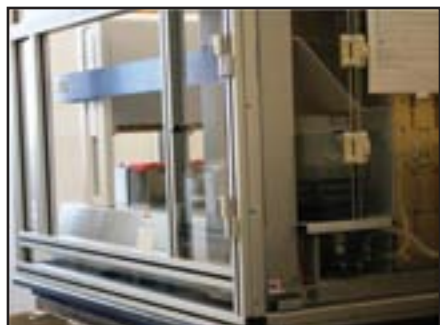
- Provide clinical laboratories with guidelines for safe handling, processing, and rapid diagnostic testing of clinical

specimens from patients who meet the case definition for pandemic influenza (see Appendices 2.4 and 2.5).

- Provide rapid communication of test results.
- Provide guidance on the use of commercially available diagnostic tests, including rapid test kits, for the detection of influenza A (see Appendix 2.6).
- Provide guidance on the specimens to refer to the State Public Health Laboratory.

### C. Laboratory safety - biocontainment

- Commercial antigen detection testing – conduct all assays in a Bio-Safety cabinet under BSL-II conditions.
- RT-PCR – conduct all assays in a Bio-Safety cabinet under BSL-II conditions.



- Virus Isolation - all assays must be conducted under Bio-Safety Level III with enhancements. (see Appendix 2.4).

### D. Occupational health issues for laboratory workers

To protect the health of laboratory workers during a pandemic, laboratories should maintain the safety practices used during the Periods of Limited Human Spread and Widespread Human Infection.

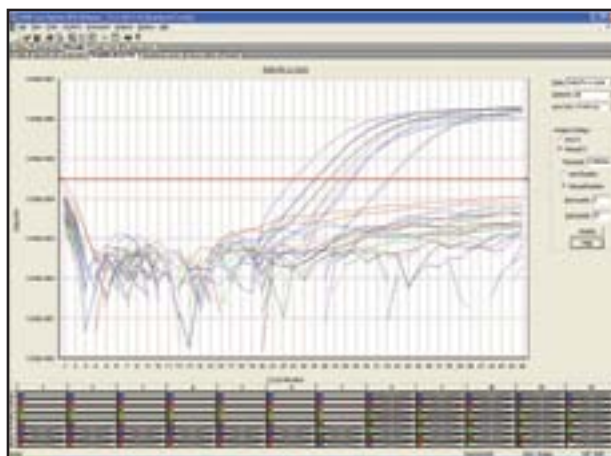
- Conduct laboratory procedures under appropriate biocontainment conditions.
- Encourage routine vaccination of laboratory employees exposed to specimens with respiratory infections. (See Appendix 2.7).

### E. Use of diagnostic assays during an influenza pandemic

#### 1. Rapid Diagnostic Tests

Rapid diagnostic tests based on antigen detection are commercially available for influenza. Laboratories in outpatient settings and hospitals can use these tests to detect viruses within 15 minutes. Some tests can detect influenza A viruses, including avian strains. Testing is not capable of distinguishing between the subtypes of influenza. (See Appendix 2.6).

#### 2. RT-PCR Subtyping



Influenza specimens may be typed and subtyped using RT-PCR. This method does not require the growth or isolation of virus.

### 3. Virus Isolation

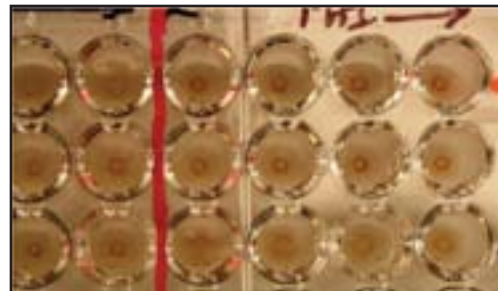
This method requires growth of virus in cell culture. Identification of the virus is usually confirmed through the use of immunofluorescence antibody (IFA) staining or hemagglutination inhibition (HAI), or RT-PCR to monitor circulating seasonal strains. If clinical or epidemiological data suggests that the human case of influenza might be due to infection with avian influenza, the virus should not be cultured except under BSL-3 conditions with enhancements. Laboratories that lack BSL-3 enhanced facilities should contact their State Public Health Laboratory and arrange to forward the specimen to the CDC for isolation and characterization.

#### *Immunofluorescence Antibody Staining*

IFA staining following virus isolation may be used by some laboratories to identify influenza types (A & B) and influenza A subtypes using a panel of specific antisera.

### 4. Serologic Tests

Tests based on the detection of antibodies in the patient's sera can be used retrospectively to confirm influenza detection. Acute and convalescent (paired) sera are used to detect rising antibody titers in patient's sera. This method is of limited value in the monitoring of an ongoing influenza pandemic.



## V. Post-Peak and Post-Pandemic Periods

### A. Roles and responsibilities

#### Clinical Laboratories

- Continue to perform diagnostic testing to look for new cases of influenza.
- Continue to support surveillance activities – refer selected specimens from possible pandemic influenza patients to the ASPHL.
- Maintain other diagnostic services.

#### Arizona State Public Health Laboratory (ASPHL)

- Maintain laboratory capacity to conduct surveillance activities and report results in a timely fashion year-round. Continue to submit original clinical material and isolates for national virologic surveillance in the U.S. WHO collaborating laboratories influenza virus surveillance program.
- Maintain reference testing for seasonal and novel strains of the influenza virus.
- Maintain other diagnostic services.

## VI. Appendices

### Reference Testing Guidelines

The ASPHL and other local laboratories may conduct initial testing on patient specimens for influenza A or potential highly pathogenic strains, if laboratory capacity is available. Due to the spread of avian influenza A (H5N1) in poultry in Asia, laboratories should be on the alert for avian and human H5 viruses. Procedures for diagnosis of human cases of influenza A (H5N1) are provided in Appendix 2.2. Influenza A viruses other than currently circulating H1 and H3 subtypes should also be considered as potentially pandemic if detected in humans. (See Appendix 2.3).

### **Box 2.1. Use of diagnostic assays during an influenza pandemic**

Public health and clinical laboratories will use different types of diagnostic tests for influenza at different stages of a pandemic. Each of the tests discussed below is described in detail in Appendix 2.1.

#### **Virus Isolation**

Virus isolation—growing the viral strain in cell culture—is considered the “gold standard” for influenza diagnostics. During a pandemic, virus isolation followed by antigenic and genetic (sequencing) analysis will be used to characterize the earliest pandemic isolates, as well as to monitor their evolution during the pandemic. Laboratories that participate in the WHO Global Influenza Surveillance Network, such as the ASPHL, typically use virus isolation followed by hemagglutination inhibition (HAI), IFA staining, or RT-PCR to monitor circulating seasonal strains of influenza. If clinical and epidemiologic data suggest that a human case of influenza might be due to infection with avian influenza A (H5N1) or another highly pathogenic avian influenza strain (see Box 2.3), the virus should not be cultured except under BSL-3 conditions with enhancements. Laboratories that lack BSL-3 enhanced facilities may either perform RT-PCR subtyping using BSL-2 containment procedures or send the specimen to CDC for isolation and viral characterization.

#### **Immunofluorescence Antibody Staining**

IFA staining following virus isolation can be used to identify influenza types (A and B) and influenza A subtypes using a panel of specific antisera. In some cases, IFA can be used for direct testing of cells pelleted from original clinical samples. CDC’s Influenza Branch produces and distributes a reagent kit to WHO collaborating laboratories that includes monoclonal antibodies for the typing and subtyping of currently circulating influenza viruses by IFA. Many laboratories use commercially available reagents to type influenza viruses by direct immunofluorescence tests (DFA).

#### **RT-PCR Subtyping**

Influenza specimens may also be typed and subtyped using RT-PCR, which does not require in vitro growth or isolation of virus. ASPHL scientists have received training from CDC on using RT-PCR subtyping to identify human and avian HA subtypes of public health concern. APhL members can access protocols and sequences of primers and probes that can be used for typing and subtyping on the APhL website.

#### **Serologic Tests**

Tests based on detection of antibodies in patient sera—e.g., enzyme-linked immunosorbent assay (ELISA), HAI, and microneutralization assay—can be used to retrospectively confirm influenza infection. Although microneutralization assay is the most comprehensive test for the detection of antibodies to avian influenza viruses in humans, it is currently unavailable at ASPHL.

#### **Rapid Diagnostic Tests**

Several rapid diagnostic test kits based on antigen detection are commercially available for influenza. Laboratories in outpatient settings and hospitals can use these tests to detect influenza viruses within 15 minutes. Some tests can detect influenza A viruses (including avian strains); others can detect influenza A and B viruses without distinguishing between them and some can distinguish between influenza A and B viruses. The type of specimens used in these tests (i.e., nasal wash/aspirate, nasopharyngeal swabs, or nasal swab or throat swab) may also vary. Like RT-PCR, rapid diagnostic tests do not require in vitro growth or isolation of virus. During a pandemic, rapid diagnostic tests will be widely used to distinguish influenza A from other respiratory illnesses. See Appendix 2.6 for additional information.

## **Box 2.2. Laboratory support for seasonal influenza surveillance**

### **U.S. Collaborating Laboratories of the WHO Global Influenza Surveillance Network**

All state public health laboratories, including ASPHL, as well as about 25 tertiary-care hospital and academic center laboratories, participate as U.S. collaborating laboratories in the WHO Global Influenza Surveillance Network, which collects worldwide data on circulating strains of influenza viruses. These data are used to develop recommendations for the formulation of each year's influenza vaccines, as well as to detect new human influenza viruses that might have pandemic potential. CDC's Influenza Laboratory serves as the WHO Collaborating Center for Surveillance, Epidemiology, and Control of Influenza, along with the WHO Collaborating Centers for Reference and Research on Influenza in Australia, Japan, and the United Kingdom. The U.S.-based WHO collaborating laboratories provide CDC with weekly reports of laboratory-confirmed cases of influenza A and B viruses by age group. These laboratories typically use virus isolation followed by antigenic testing with IFA staining or HAI—or by molecular testing with RT-PCR—to identify known subtypes of human influenza viruses. If unusual subtypes are detected, or if the specimens cannot be subtyped using available techniques, the specimens are sent to CDC for further testing.

### **NREVSS Collaborating Laboratories**

The National Respiratory and Enteric Virus Surveillance System (NREVSS; <http://www.cdc.gov/surveillance/nrevss/>) is a laboratory-based system to monitor selected respiratory and enteric viruses. More than 600 laboratories throughout the country, including hospital laboratories, state public health laboratories, and private commercial laboratories, participate in NREVSS surveillance. Some NREVSS laboratories are also WHO collaborating laboratories. Like the WHO collaborating laboratories, NREVSS laboratories provide CDC with weekly reports of laboratory confirmed cases of influenza A and B viruses. These laboratories typically test respiratory specimens with commercially available rapid diagnostic tests. Several NREVSS laboratories also perform virus isolation followed by rapid diagnostic tests or antigenic typing by IFA. If untypable viruses or unusual subtypes are detected, the specimens are sent to the state public health laboratory or to CDC for further testing.



### **Box 2.3. Avian influenza strains with high and low pathogenicity**

The U.S. Department of Agriculture (USDA) classifies avian influenza viruses as low pathogenic avian influenza (LPAI) viruses or highly pathogenic avian influenza (HPAI) viruses, based on characteristics of a virus' hemagglutinin cleavage site or its virulence in birds, as determined by laboratory testing. LPAI strains are endemic in wild birds worldwide and are responsible for most avian influenza outbreaks in poultry. LPAI strains with H5 and H7 subtypes sometimes evolve into highly pathogenic forms. HPAI strains are extremely contagious and cause severe illness and high mortality rates in poultry.

LPAI strains include:

- H5N2, the cause of poultry outbreaks in New York, Maine, and California in 2002
- H7N2, the cause of poultry outbreaks in Delaware, Maryland, and New Jersey in 2004

HPAI strains include:

- H5N1, the cause of major poultry outbreaks in Southeast Asia
- H7N7, the cause of a 2003 outbreak in the Netherlands
- H7N3, the cause of a 2004 outbreak in British Columbia
- H5N2, the cause of a 2004 outbreak in poultry in Texas

The 2004 outbreak in Texas was the first HPAI outbreak in the United States since a previous outbreak of H5N2 in 1983-84 in the northeastern United States. The 1983-84 disease control effort involved the destruction of approximately 17 million birds and cost more than \$70 million.

Although avian influenza A viruses don't usually infect humans, several instances of human infections of avian influenza have been reported since 1997. Cases of avian influenza infection in humans are apparently caused by contact with infected poultry or with surfaces contaminated with avian influenza viruses.

LPAI strains associated with human infection include:

- H9N2, which caused three cases of influenza-like illness in Hong Kong between 1999 and 2003, and other cases in China in 1998 and 1999
- H7N2, which was detected by serology in one person involved in the culling of sick chickens during the response to a poultry outbreak in Virginia in 2002, and was isolated from a New York resident in 2003 (unknown source of the infection)

HPAI viruses associated with human infection include:

- H5N1, which caused 51 deaths in Southeast Asia between January 2004 and April 2005
- H7N7, which caused the death of a veterinarian as well as 83 cases of mild human disease (including conjunctivitis) during the 2003 poultry outbreak in the Netherlands.
- H7N3, which caused 2 cases of very mild human disease (conjunctivitis, headache) in persons culling sick poultry in British Columbia in 2004



## Appendix 2.1

### Influenza diagnostic assays

Among the several types of assays used to detect influenza, rapid antigen tests, reverse transcription polymerase chain reaction (RT-PCR), viral isolation, immunofluorescence assays (IFA), and serology are the most commonly used. The sensitivity and specificity of any test for influenza will vary by the laboratory that performs the test, the type of test used, and the type of specimen tested. A chart that lists influenza diagnostic procedures and commercially available rapid diagnostic tests follows more detailed descriptions provided below.

#### Virus Isolation

**Biocontainment level: *periods of Sustained Human Infection and Widespread Human Infection*– BSL-3 with enhancements; *Pandemic Period* –BSL-2**

Virus isolation is a highly sensitive and very useful technique when the clinical specimens are of good quality and have been collected in a timely manner (optimally within 3 days of the start of illness). Isolation of a virus in cell culture along with the subsequent identification of the virus by immunologic or genetic techniques are standard methods for virus diagnosis. Virus isolation amplifies the amount of virus from the original specimen, making a sufficient quantity of virus available for further antigenic and genetic characterization and for drug-susceptibility testing if required. Virus isolation is considered the “gold standard” for diagnosis of influenza virus infections.

Highly pathogenic avian influenza (HPAI) viruses are BSL-3 agents. During the ***periods of Sustained Human Infection and Widespread Human Infection***, laboratories should attempt to culture HPAI viruses—as well as other influenza viruses with pandemic potential—only under BSL-3 conditions with enhancements in order to optimally reduce the risk of a novel influenza virus subtype spreading to persons or animals. During the Pandemic Period, biocontainment of BSL-2 is appropriate to prevent laboratory-acquired infection and the virus will already be widespread.

In recent years, the use of cell lines has surpassed the use of embryonated eggs for culturing of influenza viruses, although only viruses grown in embryonated eggs are used as seed viruses for vaccine production. Because standard isolation procedures require several days to yield results, they should be used in combination with the spin-amplification shell-vial method. The results of these assays can be obtained in 24–72 hours, compared to an average of 4–5 days using standard culture techniques. Spin-amplification should not be performed using 24-well plates because of increased risk of cross-contamination. The most effective combination of cell lines recommended for public health laboratories is primary rhesus monkey for standard culture, along with Madin Darby Canine Kidney (MDCK) in shell vial.<sup>1</sup> The use of these two cell lines in combination has demonstrated maximum sensitivity over time for recovery of evolving influenza strains. Some clinical laboratories have recently reported good isolation rates using commercially available cell-line mixed-cell combinations; however, data are lacking on the performance of these mixed cells with new subtypes of Influenza A viruses.

<sup>1</sup> *The shell-vial technique is described in: Manual of Clinical Virology, 3rd edition. Steven Specter, Richard Hodinka, and Stephen Young, eds. ASM Press, 2000.*

Appropriate clinical specimens for virus isolation include nasal washes, nasopharyngeal aspirates, nasopharyngeal and throat swabs, tracheal aspirates, and bronchoalveolar lavage. Ideally, specimens should be collected within 72 hours of the onset of illness. Viral culture isolates are used to provide specific information regarding circulating influenza subtypes and strains. This information is needed to compare current circulating influenza strains with vaccine strains, to guide decisions on influenza treatment and chemoprophylaxis, and to select vaccine strains for the coming year. Virus isolates also are needed to monitor the emergence of antiviral resistance and of novel influenza A subtypes that might pose a pandemic threat. During outbreaks of influenza-like illness, viral culture may help identify other causes of illness when influenza is not the etiology (except when using the MDCK shell-vial technique).

#### Immunofluorescence Assays

**Biocontainment level: BSL-2 when performed directly on clinical specimens; if used on cultures for earlier detection of virus, biocontainment recommendations for viral culture apply**

Direct (DFA) or indirect (IFA) immunofluorescence antibody staining of virus-infected cells is a rapid and sensitive method for diagnosis of influenza and other viral infections. DFA and IFA can also be used to type and subtype influenza viruses using commercially available monoclonal antibodies specific for the influenza virus HA. The sensitivity of these methods is greatly influenced by the quality of the isolate, the specificity of the reagents used, and the experience of the person(s) performing, reading, and interpreting the test.

Although IFA can be used to stain smears of clinical specimens directly, when rapid diagnosis is needed it is preferable to first increase the amount of virus through growth in cell culture. For HPAI isolates, attempts to culture the virus should be made only under BSL-3 conditions with enhancements.

## **Real Time Reverse-Transcription Polymerase Chain Reaction (rRT-PCR)**

**Biocontainment level: BSL-2**

PCR can be used for rapid detection and subtyping of influenza viruses in respiratory specimens. Because the influenza genome consists of single-stranded RNA, a complementary DNA (cDNA) copy of the viral RNA must be synthesized using the reverse-transcriptase (RT) enzyme prior to the PCR reaction.

APHL member laboratories can obtain CDC protocols and sequences of primers and probes for rapid rRT-PCR detection of human and avian HA subtypes of current concern at the APHL website (ASPHL is an APHL member laboratory and has these capabilities). These protocols use rRT-PCR methods with fluorescent-labeled probes that allow automatic, semi-quantitative estimation of the input template. The rRT-PCR results are analyzed and archived electronically, without the need for gel electrophoresis and photographic recording. A large number of samples may be analyzed at the same time, reducing the risk of carry-over contamination. As with all PCR assays, interpretation of rRT-PCR tests must account for the possibility of false-negative and false-positive results. False-negative results can arise from poor sample collection or degradation of the viral RNA during shipping or storage. Application of appropriate assay controls that identify poor-quality samples (e.g., an extraction control and, if possible, an inhibition control) can help avoid most false-negative results.<sup>2</sup>

The most common cause of false-positive results is contamination with previously amplified DNA. The use of rRT-PCR helps mitigate this problem by operating as a contained system. A more difficult problem is the cross-contamination that can occur between specimens during collection, shipping, and aliquoting in the laboratory. Use of multiple negative control samples in each assay and a well-designed plan for confirmatory testing can help ensure that laboratory contamination is detected and that negative specimens are not inappropriately identified as influenza-positive.

Specimens that test positive for a novel subtype of influenza virus should be forwarded to CDC for confirmatory testing. The original clinical material and its corresponding isolate (if available) should be forwarded to the CDC. All laboratory results should be interpreted in the context of the clinical and epidemiologic information available on the patient.

## **Rapid Diagnostic Tests**

**Biocontainment level: BSL-2**

Commercial rapid diagnostic tests can be used in outpatient settings to detect influenza viruses within 15 minutes. These rapid tests differ in the types of influenza viruses they can detect and in their ability to distinguish among influenza types. Different tests can 1) detect influenza A viruses only (including avian strains); 2) detect both influenza A and B viruses, without distinguishing between them; or 3) detect both influenza A and B viruses and distinguish between them.

The types of specimens acceptable for use (i.e., nasal wash/aspirate, nasopharyngeal swab, or nasal swab and throat swab) also vary by test. The specificity and, in particular, the sensitivity of rapid tests are lower than for viral culture and vary by test and specimen tested. The majority of rapid tests are 50-70% sensitive and 90-95% specific. Thus, as many as 30-50% of samples that would be positive for influenza by viral culture may give a negative rapid test result with these assays. When interpreting results of a rapid influenza test, physicians should consider the level of influenza activity in the community. When influenza prevalence is low, positive rapid test results should be independently confirmed by culture or RT-PCR. When influenza is known to be circulating, clinicians should consider confirming negative tests with viral culture or other means because of the lower sensitivity of the rapid tests. Package inserts and the laboratory performing the test should be

consulted for more details regarding use of rapid diagnostic tests. Additional information on diagnostic testing is provided at: <http://www.cdc.gov/flu/professionals/diagnosis/>. Detailed information on the use of rapid diagnostics tests is provided in Appendix 2.6.

<sup>2</sup> CDC is working with the private sector to provide inactivated RNA virus for use as RT-PCR controls for influenza A (H5) testing in LRN laboratories. CDC is working with USDA to resolve any permit issues that might affect the ability of LRN members to use these controls.

## **Serologic Tests<sup>3</sup>**

### **Hemagglutination Inhibition (HAI)**

**Biocontainment level: BSL-2**

Serologic testing can be used to identify recent infections with influenza viruses. It can be used when the direct identification of influenza viruses is not feasible or possible (e.g., because clinical specimens for virus isolation cannot be obtained, cases are identified after shedding of virus has stopped, or the laboratory does not have the resources or staff to perform virus isolation).

Since most human sera contain antibodies to influenza viruses, serologic diagnosis requires demonstration of a four-fold or greater rise in antibody titer using paired acute and convalescent serum samples. HAI is the preferred diagnostic test for determining antibody rises. In general, acute-phase sera should be collected within one week of illness onset, and convalescent sera should be collected 2–3 weeks later.

There are two exceptions in which the collection of single serum samples can be helpful in the diagnosis of influenza. In investigations of outbreaks due to novel viruses, testing of single serum samples has been used to identify antibody to the novel virus. In other outbreak investigations, antibody test results from single specimens collected from persons in the convalescent phase of illness have been compared with results either from age-matched persons in the acute phase of illness or from non-ill controls. In such situations, the geometric mean titers between the two groups to a single influenza virus type or subtype can be compared. In general, these approaches are not optimal, and paired sera should be collected whenever possible.

Because HAI titers of antibodies in humans infected with avian influenza viruses are usually very low or even undetectable, more sensitive serologic tests, such as microneutralization, may be needed.

### **Microneutralization Assay**

**Biocontainment level: periods of Sustained Human Infection and Widespread Human Infection – BSL-3 with enhancements; Pandemic Period –BSL-2**

The virus neutralization test is a highly sensitive and specific assay for detecting virus-specific antibody in animals and humans. The neutralization test is performed in two steps: 1) a virus-antibody reaction step, in which the virus is mixed with antibody reagents, and 2) an inoculation step, in which the mixture is inoculated into a host system (e.g. cell cultures, embryonated eggs, or animals). The absence of infectivity constitutes a positive neutralization reaction and indicates the presence of virus-specific antibodies in human or animal sera. The virus neutralization test gives the most precise answer to the question of whether or not a person has antibodies that can neutralize the infectivity of a given virus strain. The neutralization test has several additional advantages for detecting antibody to influenza virus. First, the assay primarily detects antibodies to the influenza virus HA and thus can identify functional, strain-specific antibodies in animal and human serum. Second, since infectious virus is used, the assay can be developed quickly upon recognition of a novel virus and before suitable purified viral proteins become available for use in other assays.

<sup>3</sup> Enzyme-linked immunoassay (EIA) is not included on this list because of non-specificity issues. Complement fixation is not included because it is currently out of use.

The microneutralization test is a sensitive and specific assay for detecting virus-specific antibody to avian influenza A (H5N1) in human serum and potentially for detecting antibody to other avian subtypes. Microneutralization can detect H5-specific antibody in human serum at titers that cannot be detected by HAI. Because antibody to avian influenza

subtypes is presumably low or absent in most human populations, single serum samples can be used to screen for the prevalence of antibody to avian viruses. However, if infection of humans with avian viruses is suspected, the testing of paired acute and convalescent sera in the microneutralization test would provide a more definitive answer regarding the occurrence of infection. Conventional neutralization tests for influenza viruses based on the inhibition of cytopathogenic effect (CPE)-formation in MDCK cell cultures are laborious and rather slow, but in combination with rapid culture assay principles the neutralization test can yield results within 2 days. For HPAI viruses, neutralization tests should be performed at BSL-3 enhanced conditions.

<b>Procedure</b>	<b>Influenza Types Detected</b>	<b>Acceptable Specimens</b>	<b>Time for Results</b>	<b>Rapid result available</b>
<b>Viral culture</b>	A and B	NP swab <sup>2</sup> , throat swab, nasal wash, bronchial wash, nasal aspirate, sputum	3-10 days <sup>3</sup>	No
<b>Immunofluorescence [Direct Fluorescent Antibody (DFA) or Indirect Fluorescent Antibody (IFA) Staining]</b>	A and B	NP <sup>2</sup> swab, nasal wash, bronchial wash, nasal aspirate, sputum	2-4 hours	No
<b>RT-PCR<sup>5</sup></b>	A and B	NP <sup>2</sup> swab, throat swab, nasal wash, bronchial wash, nasal aspirate, sputum	2-4 hours	No
<b>Serology<sup>*</sup></b>	A and B	paired acute and convalescent serum samples <sup>6</sup>	2 weeks or more	No
<b>Enzyme Immuno Assay (EIA)</b>	A and B	NP <sup>2</sup> swab , throat swab, nasal wash, bronchial wash	2 hours	No
<b>Rapid Diagnostic Tests</b>				
<b>3M™ Rapid Detection Flu A+B Test<sup>7,9</sup>(3M)</b>	A and B	NP <sup>2</sup> swab/aspirate; Nasal wash/aspirate	15 minutes	Yes
<b>Directigen EZ Flu A+B<sup>7,9</sup> (Becton-Dickinson)</b>	A and B	NP <sup>2</sup> wash/aspirate/ swab; throat swab;	15 minutes	Yes
<b>BinaxNOW Influenza A&amp;B<sup>7,8,9</sup> (Inverness)</b>	A and B	NP <sup>2</sup> swab/Nasal swab/ wash/ aspirate	15 minutes	Yes
<b>OSOM® Influenza A&amp;B<sup>7,9</sup> (Genzyme)</b>	A and B	Nasal swab	less than 15 minutes	Yes

<b>QuickVue Influenza Test<sup>4,7,8</sup></b> (Quidel)	A and B	Nasal swab/ wash/ aspirate	less than 15 minutes	Yes
<b>QuickVue Influenza A+B Test<sup>7,8,9</sup></b> (Quidel)	A and B	NP <sup>2</sup> swab, nasal swab/ wash/aspirate	less than 15 minutes	Yes
<b>SAS FluAlert<sup>7,9</sup></b> (SA Scientific)	A and B	Nasal wash/aspirate	15 minutes	Yes
<b>SAS Influenza A Test,<sup>8</sup>(SA Scientific)</b>	A	NP <sup>2</sup> /aspirate	15 minutes	Yes
<b>SAS Influenza B Test,<sup>8</sup>(SA Scientific)</b>	B	NP <sup>2</sup> /aspirate	15 minutes	Yes
<b>TRU FLU<sup>7,9</sup></b> (Meridian Bioscience)	A and B	NP <sup>2</sup> aspirate/swab Nasal wash/swab	15 minutes	Yes
<b>XPECT Flu A&amp;B<sup>7,9</sup></b> (Remel)	A and B	Nasal wash/swab, throat swab	15 minutes	Yes

\*Serology is not recommended for routine diagnostic testing, only for research purposes or sero-epidemiological investigations

1. List may not include all test kits cleared by the U.S. Food and Drug Administration.
2. NP = nasopharyngeal.
3. Shell vial culture, if available, may reduce time for results to 2 days.
4. Does not distinguish between influenza A and B virus infections.
5. RT-PCR = reverse transcription polymerase chain reaction.
6. A fourfold or greater rise in antibody titer from the acute– (collected within the 1st week of illness) to the convalescent-phase (collected 2-4 weeks after the acute sample) sample is indicative of recent infection.
7. Moderately complex test – requires specific laboratory certification.
8. CLIA–waived test. Can be used in any office setting. Requires a certificate of waiver or higher laboratory certification.
9. Distinguishes between influenza A and B virus infections.

## Appendix 2.2

### Interim CDC recommendations: enhanced U.S. surveillance and diagnostic evaluation to identify cases of human infection with avian influenza a (H5N1)

NOTE: This guidance pertains to the avian influenza A (H5N1) situation in October 2005. The CDC and the Association of Public Health Laboratories (APHL) will provide updated guidance for avian influenza A (H5N1) and for new situations, as needed, through the Health Alert Network (HAN).

Enhanced surveillance efforts by state and local health departments, hospitals, and clinicians are needed to identify patients at increased risk for influenza A (H5N1). Interim recommendations include the following:

Testing for avian influenza A (H5N1) is indicated for hospitalized patients with:

- Radiographically confirmed pneumonia, acute respiratory distress syndrome (ARDS), or other severe respiratory illness for which an alternative diagnosis has not been established, *and*
- History of travel within 10 days of symptom onset to a country with documented avian influenza A (H5N1) infections in poultry and/or humans. (For a regularly updated listing of H5N1-affected countries, see the OIE website at [http://www.oie.int/eng/en\\_index.htm](http://www.oie.int/eng/en_index.htm) and the WHO website at <http://www.who.int/en/> ).

*or*

Testing for avian influenza A (H5N1) should be considered on a case-by-case basis in consultation with state and local health departments for hospitalized or ambulatory patients with:

- Documented temperature of  $>100.4^{\circ}\text{F}$  ( $>38^{\circ}\text{C}$ ), *and*
- One or more of the following: cough, sore throat, or shortness of breath, *and*
- History of close contact either with poultry (e.g., visited a poultry farm, a household raising poultry, or a bird market) in an H5N1-affected country, or with a known or suspected human case of influenza A (H5N1) within 10 days prior to onset of symptoms.



## Appendix 2.3

### Reference testing guidelines for potential pandemic strains of influenza

State and local laboratories may conduct initial testing on patient specimens for influenza A or potential highly pathogenic strains, if laboratory capacity is available. Due to the spread of avian influenza A (H5N1) in poultry in Asia, laboratories should be on the alert for avian and human H5 viruses. Procedures for diagnosis of human cases of influenza A (H5N1) are provided in Appendix 2.2. Influenza A viruses other than currently circulating seasonal H1 and H3 subtypes, such as the 2009 Novel H1N1 Influenza Virus, should also be considered as potentially pandemic if detected in humans.

- ASPHL should send specimens to CDC if a sample tested by ASPHL is positive for H5 or another novel subtype;

**Note:** *A laboratory should test for influenza A (H5) only if it is able to do so by PCR or has a BSL-3-enhanced facility for influenza A (H5) viral culture.*

*or*

- A sample from a patient who meets the clinical and epidemiologic criteria for possible infection with a potentially pandemic virus is positive for influenza A by RT-PCR or rapid antigen detection,\* is negative for influenza A(H1) and A(H3), and the referring jurisdiction is not equipped to test for specific strains;

*or*

- The referring jurisdiction is not equipped to test samples for novel influenza viruses by RT-PCR and is requesting testing at CDC.

Shipping procedures for potential pandemic strains of influenza are provided in Appendix 2.5.

\*Because the sensitivity of commercially available rapid diagnostic tests for influenza may not always be optimal, CDC will also accept specimens taken from persons who meet the clinical and epidemiological criteria even if they test negative by influenza rapid diagnostic testing—if PCR assays are not available at the state laboratory.

## **Appendix 2.4**

### **Laboratory biosafety guidelines for handling and processing specimens or isolates of novel influenza strains**

#### **Key Messages**

- Commercial antigen detection testing for influenza may be conducted under BSL-2 containment conditions if a Class II biological safety cabinet is used.
- Clinical specimens from suspected novel influenza cases may be tested by RT-PCR using standard BSL-2 work practices in a Class II biological safety cabinet for initial processing of patient specimens.
- If a specimen is confirmed positive for influenza A (H5N1) by RT-PCR, additional testing should be performed only under BSL-3 conditions with enhancements. CDC's Influenza Branch should be informed immediately by contacting the CDC Director's Emergency Operations Center (DEOC) at 770-488-7100.
- A detailed description of recommended facilities, practices, and protective equipment for the various laboratory biosafety levels can be found in the CDC/NIH Biosafety in Microbiological and Biomedical Laboratories (BMBL) manual at [www.cdc.gov/od/ohs/biosfty/bmbl5/bmbl\\_5th\\_edition.pdf](http://www.cdc.gov/od/ohs/biosfty/bmbl5/bmbl_5th_edition.pdf)
- BSL-3 with enhancements and Animal Biosafety Level 3 include: all BSL-3 practices, procedures, and facilities, plus the use of negative-pressure, HEPA-filtered respirators or positive air-purifying respirators, and clothing change and personal showering protocols. Additional practices and/or restrictions may be added as conditions of USDA-APHIS permits. Registration of personnel and facilities with the Select Agent Program is required for work with highly pathogenic avian influenza (HPAI) viruses, which are classified as agricultural select agents.
- ASL will test clinical specimens from suspected novel influenza cases by RT-PCR using standard BSL-2 work practices in a Class II biological safety cabinet. Commercial rapid antigen detection testing may also be conducted under BSL-2 biocontainment conditions.
- Highly pathogenic avian influenza A (H5) and A (H7) viruses are classified as select agents. USDA regulations require that these viruses (as well as exotic low pathogenic avian influenza viruses) be handled under BSL-3 laboratory containment conditions, with enhancements (i.e., controlled-access double-door entry with change room and shower, use of respirators, decontamination of all wastes, and showering of all personnel). Laboratories that work with these viruses must be certified by USDA.
- Laboratories should not perform virus isolation on respiratory specimens from patients who may be infected with an avian influenza virus unless stringent BSL-3 enhanced containment conditions can be met and diagnostic work can be kept separate from studies with other human influenza A viruses (i.e., H1 or H3). Therefore, respiratory virus cultures should not be performed in most clinical laboratories. Cultures for patients suspected of having influenza A (H5N1) infection should be sent only to state laboratories with appropriate BSL-3 with enhancement containment facilities or to CDC.

## **Appendix 2.5**

### **1/4/06 Guidelines for collecting and shipping specimens for influenza diagnostics**

#### **Key Messages**

- Appropriate specimens for influenza testing vary by type of test.
- Before collecting specimens, review the infection control precautions are described in Supplement 3.

#### **I. Respiratory specimens<sup>4</sup>**

Eight types of respiratory specimens may be collected for viral and/or bacterial diagnostics:

1) nasopharyngeal wash/aspirates, 2) nasopharyngeal swabs, 3) oropharyngeal swabs, 4) bronchoalveolar lavage, 5) tracheal aspirate, 6) pleural fluid tap, 7) sputum, and 8) autopsy specimens. Nasopharyngeal wash/aspirates are the specimen of choice for detection of most respiratory viruses and are the preferred specimen type for children aged < 2 years. For suspected avian flu, oropharyngeal swabs and, if available, lower respiratory tract specimens (e.g., bronchoalveolar lavage or tracheal aspirate) are preferred.

Respiratory specimens for detection of most respiratory pathogens, and influenza in particular, are optimally collected within the first 3 days of the onset of illness. Before collecting specimens, review the infection control precautions in Supplement 4.

#### **A. Collecting specimens from the upper respiratory tract**

##### **1. Nasopharyngeal wash/aspirate**

- Have the patient sit with head tilted slightly backward.
- Instill 1 ml–1.5 ml of nonbacteriostatic saline (pH 7.0) into one nostril. Flush a plastic catheter or tubing with 2 ml–3ml of saline. Insert the tubing into the nostril parallel to the palate. Aspirate nasopharyngeal secretions. Repeat this procedure for the other nostril.
- Collect the specimens in sterile vials. Label each specimen container with the patient's ID number and the date collected.
- If shipping domestically, use cold packs to keep the sample at 4°C. If shipping internationally, pack in dry ice (see shipping instructions below).
- 2.Nasopharyngeal or oropharyngeal swabs
- Use only sterile dacron or rayon swabs with plastic shafts. Do not use calcium alginate swabs or swabs with wooden sticks, as they may contain substances that inactivate some viruses and inhibit PCR testing.
- To obtain a nasopharyngeal swab, insert a swab into the nostril parallel to the palate. Leave the swab in place for a few seconds to absorb secretions. Swab both nostrils.
- To obtain an oropharyngeal swab, swab the posterior pharynx and tonsillar areas, avoiding the tongue.
- Place the swabs immediately into sterile vials containing 2 ml of viral transport media. Break the applicator sticks off near the tip to permit tightening of the cap. Label each specimen container with the patient's ID number and the date the sample was collected.
- If shipping domestically, use cold packs to keep the sample at 4°C. If shipping internationally, pack in dry ice (see shipping instructions below).

<sup>4</sup> All types of respiratory specimens may used in RT-PCR tests. Fresh-frozen unfixed tissue specimens may also be submitted for RT-PCR.

## **B. Collecting specimens from the lower respiratory tract**

### **1. Bronchoalveolar lavage, tracheal aspirate, or pleural fluid tap**

- During bronchoalveolar lavage or tracheal aspirate, use a double-tube system to maximum shielding from oropharyngeal secretions.
- Centrifuge half of the specimen, and fix the cell pellet in formalin. Place the remaining unspun fluid in sterile vials with external caps and internal O-ring seals. If there is no internal O-ring seal, then seal tightly with the available cap and secure with Parafilm®. Label each specimen container with the patient's ID number and the date the sample was collected.
- If shipping domestically, use cold packs to keep the sample at 4°C. If shipping internationally, ship fixed cells at room temperature and unfixed cells frozen (see shipping instructions below).

### **2. Sputum**

- Educate the patient about the difference between sputum and oral secretions.
- Have the patient rinse the mouth with water and then expectorate deep cough sputum directly into a sterile screw-cap sputum collection cup or sterile dry container.
- If shipping domestically, use cold packs to keep the sample at 4°C. If shipping internationally, pack in dry ice (see shipping instructions below).

## **II. Blood components**

Both acute and convalescent serum specimens should be collected for antibody testing. Collect convalescent serum specimens 2–4 weeks after the onset of illness. To collect serum for antibody testing:

- Collect 5 ml–10 ml of whole blood in a serum separator tube. Allow the blood to clot, centrifuge briefly, and collect all resulting sera in vials with external caps and internal O-ring seals. If there is no internal O-ring seal, then seal tightly with the available cap and secure with Parafilm®.
- The minimum amount of serum preferred for each test is 200 microliters, which can easily be obtained from 5 ml of whole blood. A minimum of 1 cc of whole blood is needed for testing of pediatric patients. If possible, collect 1 cc in an EDTA tube and in a clotting tube. If only 1cc can be obtained, use a clotting tube.
- Label each specimen container with the patient's ID number and the date the specimen was collected.
- If unfrozen and transported domestically, ship with cold packs to keep the sample at 4°C. If frozen or transported internationally, ship on dry ice.

## **III. Autopsy specimens**

CDC can perform immunohistochemical (IHC) staining for influenza A (H5) viruses on autopsy specimens. Viral antigens may be focal and sparsely distributed in patients with influenza, and are most frequently detected in respiratory epithelium of large airways. Larger airways (particularly primary and segmental bronchi) have the highest yield for detection of influenza viruses by IHC staining. Collection of the appropriate tissues ensures the best chance of detecting the virus by (IHC) stains.

- If influenza is suspected, a minimum total of 8 blocks or fixed-tissue specimens representing samples from each of the following sites should be obtained and submitted for evaluation:
- Central (hilar) lung with segmental bronchi
- Right and left primary bronchi
- Trachea (proximal and distal)
- Representative pulmonary parenchyma from right and left lung

In addition, representative tissues from major organs should be submitted for evaluation. In particular, for patients with suspected myocarditis or encephalitis, specimens should include myocardium (right and left ventricle) and CNS (cerebral cortex, basal ganglia, pons, medulla, and cerebellum). Specimens should be included from any other organ showing significant gross or microscopic pathology. Specimens may be submitted as:

- Fixed, unprocessed tissue in 10% neutral buffered formalin, or
- Tissue blocks containing formalin-fixed, paraffin-embedded specimens, or
- Unstained sections cut at 3 microns placed on charged glass slides (10 slides per specimen)
- Specimens should be sent at room temperature (NOT FROZEN).
- Fresh-frozen unfixed tissue specimens may be submitted for RT-PCR.
- Include a copy of the autopsy report (preliminary, or final if available), and a cover letter outlining a brief clinical history and the submitter's full name, title, complete mailing address, phone, and fax numbers, in the event that CDC pathologists require further information. Referring pathologists may direct specific questions to CDC pathologists. The contact number for the Infectious Disease Pathology Activity is 404-639-3133, or the pathologists can be contacted 24hours a day, 7 days a week through the CDC Emergency Response Hotline at 770-488-7100.

#### **IV. Shipping instructions**

Local health departments, pathologists, or medical examiners should call ASPHL before sending specimens for influenza A reference testing. ASPHL will contact the CDC Influenza Branch to coordinate the shipment of the sample to the CDC for testing. In some cases, the ASPHL may arrange for a clinical laboratory to send samples directly to CDC.

Specimens should be sent by Priority Overnight Shipping for receipt within 24 hours. Specimens can be stored and shipped at 4°C. If specimens will not be shipped for more than two days, the specimens should be frozen at or below -70°C and shipped on dry ice. Avoid repeated freeze/thaw cycles.

ASPHL will provide the necessary paperwork to be included in the shipment. Protocols for standard interstate shipment of etiologic agents should be followed, and are available at <http://www.cdc.gov/od/ohs/biosfty/shipregs.htm> . All shipments must comply with current DOT/IATA shipping regulations.

## **Appendix 2.6**

### **Rapid diagnostic testing for influenza**

The following information in this appendix is designed to assist clinicians and clinical laboratory directors in the use of rapid diagnostic tests the period of Limited Human Spread. During an influenza pandemic, one or more of these tests may be sensitive and specific enough to be used by clinicians to supplement clinical diagnoses of pandemic influenza. However, clinicians should be reminded that a negative test result might not rule out pandemic influenza and should not affect patient management or infection control decisions.

#### **I. Information for clinicians**

##### **A. Background**

Rapid diagnostic tests for influenza can help in the diagnosis and management of patients who present with signs and symptoms compatible with influenza. They also are useful for helping to determine whether institutional outbreaks of respiratory disease might be due to influenza. In general, rapid diagnostic testing for influenza should be done when the results will affect a clinical decision. Rapid diagnostic testing can provide results within 15 minutes.

##### **B. Reliability and interpretation of rapid test results**

The reliability of rapid diagnostic tests depends largely on the conditions under which they are used. Understanding some basic considerations can minimize being misled by false-positive or false-negative results.

Sensitivities of rapid diagnostic tests are generally ~50-70% when compared with viral culture, but specificities of rapid diagnostic tests for influenza are approximately 90%–95%. False-positive (and true negative) results are more likely to occur when disease prevalence in the community is low, which is generally at the beginning and end of the influenza season. False-negative (and true positive) results are more likely to occur when disease prevalence is high in the community, which is typically at the height of the influenza season.

##### **C. Minimizing the occurrence of false results**

- Use rapid diagnostic tests that have high sensitivity and specificity.
- Collect specimens as early in the illness as possible (within 4–5 days of symptom onset).
- Follow the manufacturer's instructions, including those for handling of specimens.
- Consider sending specimens for viral culture when:
  - Community prevalence of influenza is low and the rapid diagnostic test result is positive, or
  - Disease prevalence is high but the rapid diagnostic test result is negative.
- Contact your ADHS or your county health department for information about influenza activity.

##### **D. For further information**

Information about influenza is available at [www.azdhs.gov/flu](http://www.azdhs.gov/flu) or the CDC influenza website ([www.cdc.gov/flu](http://www.cdc.gov/flu)) or from the CDC FluInformation Line (800-CDC-INFO [English and Spanish]; 800-243-7889 [TTY]).

For more information about influenza diagnostics, contact:

Arizona State Public Health Laboratory:  
250 North 17th Avenue  
Phoenix, AZ 85007  
Attn: Virology  
(602) 542-6134



Additional resources:

- Association of Public Health Laboratories: [http://www.aphl.org/Public\\_Health\\_Labs/index.cfm](http://www.aphl.org/Public_Health_Labs/index.cfm)
- Weekly U.S. influenza activity reports: <http://www.cdc.gov/flu/weekly/fluactivity.htm>
- CDC Clinician Outreach and Communication Activity: <http://www.bt.cdc.gov/coca/index.asp>
- CDC website: <http://www.cdc.gov/flu/professionals/labdiagnosis.htm>

## II. Information for clinical laboratory directors

### A. Background

Rapid diagnostic tests for influenza are screening tests for influenza virus infection; they can provide results within 30 minutes. The use of commercial influenza rapid diagnostic tests by laboratories and clinics has increased substantially in recent years. At least ten rapid influenza tests have been approved by the U.S. Food and Drug Administration (FDA) (see Appendix 2.1).

Rapid tests differ in some important respects. Some can identify influenza A and B viruses and distinguish between them; some can identify influenza A and B viruses but cannot distinguish between them. Some tests are waived from requirements under the Clinical Laboratory Improvement Amendments of 1988 (CLIA). Most tests can be used with a variety of specimen types, but sensitivity and specificity can vary with specimen type. FDA approval is based upon specific specimen types. Rapid tests vary in terms of sensitivity and specificity when compared with viral culture. Product insert information and research publications indicate that sensitivities are approximately 50%–70% and specificities are approximately 90%–95%.

Specimens to be used with rapid tests generally should be collected as close as possible to the start of symptoms and usually no more than 4–5 days later in adults. In very young children, influenza viruses can be shed for longer periods; therefore, in some instances, testing for a few days after this period may still be useful. Test sensitivity will be greatest in children, who generally have higher viral titers, if the specimen is obtained during the first 2 days of illness, and if the clinician or laboratory has more experience performing the test. The quality of the specimen tested also is critical for test sensitivity.

### B. Accuracy depends on disease prevalence

The positive and negative predictive values of rapid tests vary considerably depending on the prevalence of influenza in the community. False-positive (and true negative) influenza test results are more likely to occur when disease prevalence is low, which is generally at the beginning and end of the influenza season. False-negative (and true positive) influenza test results are more likely to occur when disease prevalence is high, which is typically at the height of the influenza season.

#### 1. Clinical considerations when influenza prevalence is low

When disease prevalence is low, the positive-predictive value (PPV) is low and false-positive test results are more likely. By contrast, the negative-predictive value (NPV) is high when disease prevalence is low, and negative results are more likely to be truly negative (see Graphs 1 and 2).

If flu prevalence is...	and specificity is...	then PPV is...	false-positive rate is...
VERY LOW (2.5%)	POOR (80%)	VERY POOR (6%–12%)	VERY HIGH (88%–94%)
VERY LOW (2.5%)	GOOD (98%)	POOR (39%–56%)	HIGH (44%–61%)
MODERATE (20%)	POOR (80%)	POOR (38%–56%)	HIGH (44%–62%)
MODERATE (20%)	GOOD (98%)	GOOD (86%–93%)	LOW (7%–14%)

Interpretation of positive results should take into account the clinical characteristics of the case-patient. If an important clinical decision is affected by the test result, the rapid test result should be confirmed by another test, such as viral culture or PCR.

#### 2. Clinical considerations when influenza prevalence is high

When disease prevalence is relatively high, the NPV is low and false-negative test results are more likely. By contrast, when

disease prevalence is high, the PPV is high and positive results are more likely to be true (see Graph 2).

<b>If flu prevalence is...</b>	<b>and sensitivity is...</b>	<b>then NPV is...</b>	<b>false-negative rate is.</b>
MODERATE (20%)	POOR (50%)	MODERATE (86%–89%)	MODERATE (11%–14%)
MODERATE (20%)	HIGH (90%)	V. GOOD (97%–99%)	V. LOW (2%–3%)
HIGH (40%)	POOR (50%)	MODERATE (70%–75%)	MODERATE (25%–30%)
HIGH (40%)	HIGH (90%)	V. GOOD (93%–94%)	LOW (6%–7%)

Interpretation of negative results should take into account the clinical characteristics of the case-patient. If an important clinical decision is affected by the test result, the rapid test result should be confirmed by another test, such as viral culture or PCR.

### **C. Selecting tests**

Selection of a test should take into consideration several factors, such as the types of specimens that are considered optimal for that test. Also, tests with high sensitivity and specificity will provide better positive and negative predictive values. Information about test characteristics is provided in product inserts and scientific articles and by the manufacturer.

### **D. Changes in recommended procedures can affect test results**

Modification by the user can affect test performances and increase false-positive and/or false-negative rates. Such modifications include using specimens for which the test is not optimized or using swabs that did not come with the rapid test kit (unless recommended).

### **E. When are rapid diagnostic tests beneficial?**

Use of rapid diagnostic tests are beneficial in these situations:

- To test cases during an outbreak of acute respiratory disease to determine if influenza is the cause, or
- To test selected patients during the influenza season, *or*
- In the fall or winter, to test selected patients presenting with respiratory illnesses compatible with influenza to help establish whether influenza is present in a specific population and to guide health care providers in diagnosing and treating respiratory illnesses.

In general, the exclusive use of rapid tests does not address the public health need for obtaining viral isolates so that influenza virus strain subtyping and characterization can be conducted to monitor antigenic and genetic changes.

During an influenza pandemic, some rapid diagnostic tests may be able to detect the pandemic strain with adequate sensitivity and specificity. Rapid tests can be used by physicians to supplement clinical diagnoses of pandemic influenza.

Physicians should be reminded that a negative test result might not rule out influenza and should not affect patient management or infection control decisions.

### **F. For further information**

Information on influenza diagnostics is provided on the CDC website at: <http://www.cdc.gov/flu/professionals/labdiagnosis.htm>.

**TABLE 2.1. Comparison of the number of positive influenza A test results from three RIDTs\* with the number of positive results from rRT-PCR† assay, by influenza A type and cycle threshold (Ct) interval --- United States, 2009**

RIDT	Influenza A virus type	No. of specimens positive by RIDT/ No. positive by rRT-PCR				Total no. of specimens positive by RIDT/	(%)
		Ct interval§				Total no. positive by rRT-PCR	
		(<20)	(20 to <25)	(25--30)	(>30)		
BinaxNOW Influenza A&B	Novel H1N1	8/9	7/17	2/13	1/6	18/45	(40)
	Seasonal H1N1	---	2/3	1/2	---	3/5	(60)
	Seasonal H3N2	---	10/10	2/4	0/1	12/15	(80)
Directigen EZ Flu A+B	Novel H1N1	8/9	10/16	2/12	1/6	21/43**	(49)
	Seasonal H1N1	---	2/2	1/2	---	3/4**	(75)
	Seasonal H3N2	---	8/8	2/3	0/1	10/12**	(83)
QuickVue A+B	Novel H1N1	9/9	13/17	6/13	3/6	31/45	(69)
	Seasonal H1N1	---	2/3	2/2	---	4/5	(80)
	Seasonal H3N2	---	10/10	2/4	0/1	12/15	(80)

\* Rapid influenza A diagnostic tests.

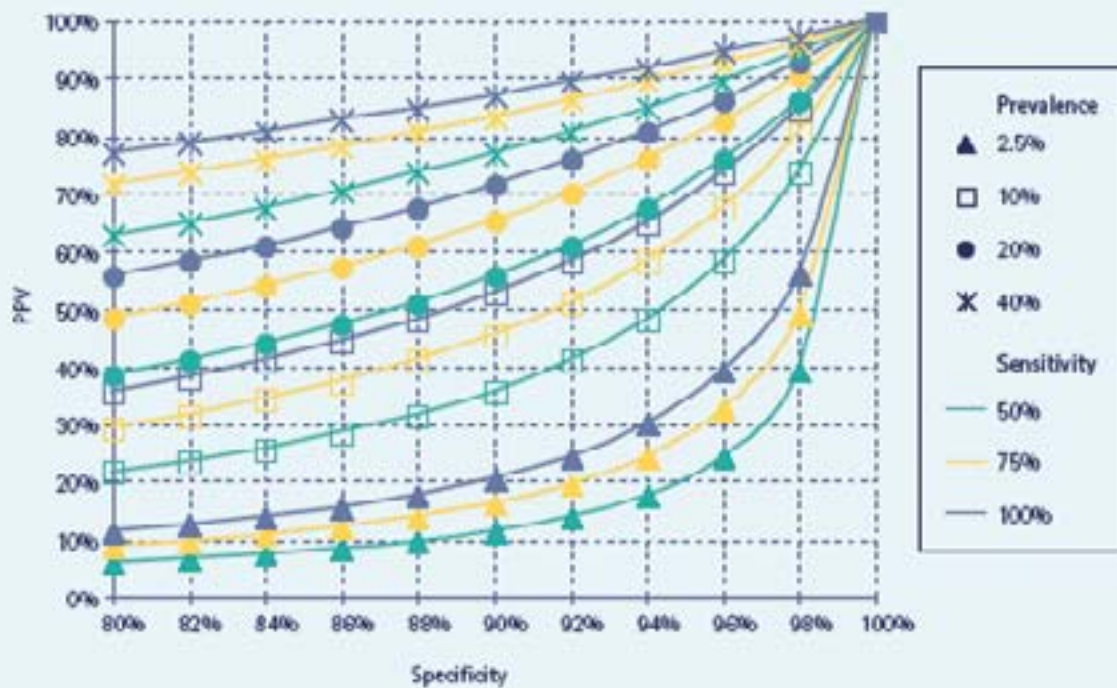
† Real-time reverse transcription--polymerase chain reaction.

§ A Ct value of 37 or lower is considered a positive rRT-PCR result.

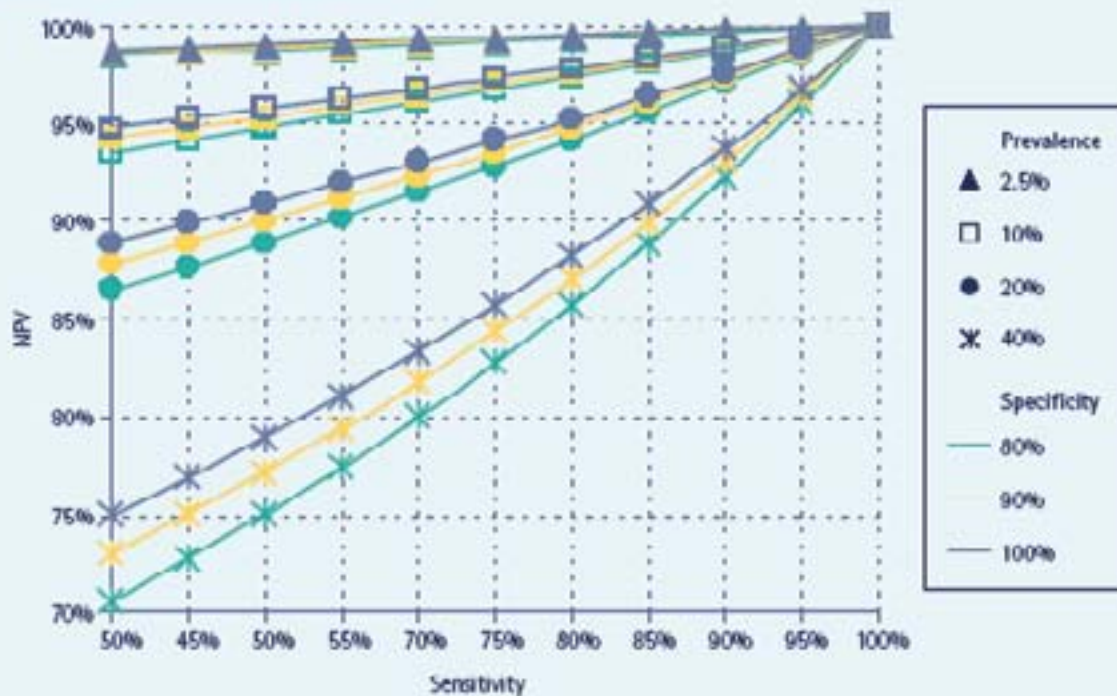
¶ No data available.

\*\* For this RIDT, insufficient material was available to test two specimens that were rRT-PCR positive for novel H1N1, one for seasonal H1N1, and three for seasonal H3N2

**GRAPH 1: IMPACT OF PREVALENCE, SENSITIVITY AND SPECIFICITY ON POSITIVE PREDICTIVE VALUE**



**GRAPH 2: IMPACT OF PREVALENCE, SENSITIVITY AND SPECIFICITY ON NEGATIVE PREDICTIVE VALUE**



## **Appendix 2.7**

### **Guidelines for Medical Surveillance of Laboratory Research Personnel**

**(those working with novel strains of influenza, including avian strains and other strains with pandemic potential)**

#### **Key Messages**

- Laboratory workers should receive training on the appropriate biosafety level for the type of work being performed.
- Before working with avian influenza A viruses, including highly pathogenic strains, laboratory workers should have a baseline serum sample obtained and stored for future reference.
- Workers in laboratories that contain avian influenza A viruses should report any fever or lower respiratory symptoms to their supervisors. Workers should be evaluated for possible exposures, and the clinical features and course of the illness should be closely monitored.
- Laboratory workers who are believed to have had a laboratory exposure to an avian influenza A virus or other highly pathogenic strain should be evaluated, counseled about the risk of transmission to others, and monitored for fever or lower respiratory symptoms as well as for any of the following: sore throat, rhinorrhea, chills, rigors, myalgia, headache, diarrhea.
- ADHS and/or county health departments should be notified promptly of laboratory exposures and illnesses in exposed laboratory workers. Medical surveillance of laboratory personnel can help to ensure that workers who are at risk of occupational exposure to avian influenza viruses or other novel animal or human influenza strains and who develop symptoms of illness receive appropriate medical evaluation and treatment, both for the benefit of their health and to prevent further transmission.

#### **I. Prerequisites for working with novel avian or human influenza viruses**

##### **A. Baseline serum samples**

Before working with novel avian or human influenza viruses, laboratory workers should have a baseline serum sample obtained and stored for future reference.

##### **B. Influenza vaccine**

Laboratories should offer the current inactivated influenza vaccine to laboratory personnel. Its use is especially encouraged for personnel working with avian viruses in BSL-3 enhanced laboratory conditions and for those who may be exposed to these viruses in the field. Immunization might reduce the chance of illness from exposure to human influenza viruses currently circulating in the community that could lead to confusion in monitoring for avian influenza A infection. Vaccines against novel influenza A viruses (e.g., H5N1) are undergoing clinical trials and might be available in the future.

##### **C. Oseltamivir prophylaxis**

- It is not necessary to require oseltamivir for laboratory research personnel working with highly pathogenic influenza strains, but encourage it for those doing animal experiments only for the time they are working with animals and especially while working with ferrets.
- When considering oseltamivir prophylaxis, be sure to evaluate appropriate candidates for contraindications, answer their questions, review adverse effects, and explain the benefits.
- Maintain a log of persons on oseltamivir, persons evaluated and not on oseltamivir, doses dispensed, and adverse effects.
- Periodically evaluate and update oseltamivir policies and procedures.

##### **D. Post-exposure prophylaxis**

Conditions for use of oseltamivir for post-exposure prophylaxis include a known or suspected laboratory exposure to live avian influenza virus, including highly pathogenic strains, for a person not on oseltamivir. Appropriate health care personnel should be available to evaluate immediately and dispense oseltamivir if the exposure occurs during working hours. If exposure occurs after working hours, an exposed laboratory person should present to the Emergency Department and, after evaluation, communicate with ADHS or CDC for recommendations.



## **II. Management of influenza-like illness in personnel with possible exposure to novel avian or human influenza viruses**

### **A. General procedures**

- Maintain a daily sign-in/out sheet to record name, date, time in/out, use of oseltamivir, and brief description of job tasks. This record will facilitate retrospective documentation if an illness occurs.
- Workers should report any influenza-like illness and any potential laboratory exposures to the supervisor (see also Supplement 4).

### **B. Evaluation and treatment**

#### **1. During regular working hours**

- The affected employee should notify the supervisor. The supervisor should immediately contact the appropriate health care personnel and facility contacts (e.g., occupational health, infection control, or designee).
- Upon arrival at the designated clinic, the employee should be placed in a private room for isolation where a health care provider can provide consultation and evaluation.
- The health care provider should obtain a respiratory specimen (e.g. nasopharyngeal swab or aspirate) for viral culture. A rapid antigen test<sup>5</sup> with the ability to differentiate between influenza A and B should be used for initial diagnosis, followed by virus isolation.

\*If laboratory capacity is available; RT-PCR should be used to rule out the suspected pathogen.

- Based on: 1) the rapid test result (if influenza A positive), 2) the status of oseltamivir prophylaxis, and 3) the clinical evaluation, the health care provider should determine whether the patient will return to work, be sent home, or be sent to an infectious disease consultant.

#### **2. During working hours when the employee calls from home**

- The employee should notify the supervisor. The supervisor should discuss the situation with the appropriate health care personnel and determine where and by whom the employee will be evaluated and specimens for viral culture will be obtained.
- The employee may come to an on-site clinic for evaluation or may elect to see a personal physician. If the employee chooses to see a personal physician, the on-site clinician should discuss with the personal physician the likelihood of a laboratory-acquired infection. The personal physician should be asked to collect specimens for antigen detection and viral culture.
- An employee who is not sick enough to be admitted to a hospital should remain at home under the care of a personal physician, pending results from the viral culture. If influenza A (H3N2) or A (H1N1) is identified, the employee should be advised and can resume normal activities as soon as symptoms subside.
- If avian influenza A (e.g., H5, H7, H9) is identified, the family and other contacts should be monitored for illness.<sup>6</sup>
- Local public health officials should be notified about any confirmed avian influenza infections.

#### **3. After working hours**

- The employee should notify the supervisor. The supervisor should inform other persons as the situation dictates.
- If the employee is acutely ill with symptoms consistent with influenza, the employee and/or supervisor should contact the appropriate health care provider for instructions. The health care provider should conduct the initial evaluation and patient management.
- The supervisor should immediately ask the health care provider to collect specimens for rapid testing and viral culture.
- The employee should follow the advice of the health care provider with regard to further evaluation/treatment.



## Appendix 2.8

### Contact Information and Resources

#### Contact Information

Arizona State Public Health Laboratory  
250 North 17th Avenue  
Phoenix, AZ 85007  
Attn: Virology  
(602) 542-6134

After-hours emergency contact:  
Laboratory Manager's cell – (602) 283-6277

#### Influenza: Resources

ADHS homepage for influenza  
<http://www.azdhs.gov/flu>

ADHS homepage for influenza pandemic preparedness  
<http://www.azdhs.gov/pandemicflu>

CDC home page for influenza  
<http://www.cdc.gov/flu>  
[www.cdc.gov/flu/pandemic](http://www.cdc.gov/flu/pandemic)

U.S. web site for pandemic flu & U.S. Pandemic Flu Plan and Preparedness Planning  
<http://pandemicflu.gov/>

W.H.O. home page for influenza (including avian influenza)  
<http://www.who.int/csr/disease/influenza/en/>

Promed (Program for Monitoring Emerging Diseases, International Society for Infectious)  
<http://www.promedmail.org>

Biosafety in Microbiological and Biomedical Laboratories (BMBL), 5th ed  
[http://www.cdc.gov/od/ohs/biosfty/bmbl5/bmbl\\_5th\\_edition.pdf](http://www.cdc.gov/od/ohs/biosfty/bmbl5/bmbl_5th_edition.pdf)



# Arizona Pandemic Influenza Response Plan

## *Supplement 3: Health Care Coordination and Surge Capacity*





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## **I. Rationale**

Arizona Department of Health Services (ADHS), county and tribal health departments, hospitals, other healthcare facilities, healthcare providers, emergency responders, law enforcement and many others in the community must prepare and respond closely together if a local epidemic is to be detected and managed in a timely and effective manner. Planning is a key factor in preparation for the State's response to a pandemic. Lessons learned from past influenza pandemics demonstrate that planning must take into account staffing, hospital surge capacities and capabilities, mass prophylaxis and/or vaccination, and disposition of remains.

During a pandemic, there will be an increased burden affecting the entire healthcare system. Facilities must be able to respond to day-to-day emergencies and care of their patients. Additional planning is therefore needed to increase the ability of healthcare professionals and first responders to function during a greater demand of their services related to a pandemic with fewer essential personnel.

## **II. Overview**

Several key public health and healthcare strategies will be utilized to respond to an influenza pandemic. The aim of these strategies is to minimize the morbidity and mortality associated with the event. One strategy is containment which refers to preventing transmission and spread of the disease by implementing social distancing measures, isolation of the sick, quarantine of contacts (see Supplement 8). Other strategies include the judicious use of antiviral medications (see Supplement 7) and maintenance of essential public health services. If there is rapid spread within the general population, containment may not be possible. The strategy will then shift to an emphasis on the maintenance of essential public health and healthcare services.

The objectives of this supplement are to identify planning and response elements for:

1. Ensuring adequate surveillance is in place to detect a novel influenza virus
2. Limit the spread of influenza through early containment measures to increase the amount of time available to implement preparedness measures.
3. Limit morbidity and mortality during an influenza pandemic.
4. Provide the public, health care workers, the media and other public health service providers with timely, factual and readily available information at all pandemic stages
5. Address the stress on the healthcare system through early identification and use of additional resources.

## **III. Actions for WHO Phases 1-4 (Limited Human Spread to Sustained Human Spread)**

### **A. Planning for Provisional Care in Hospitals**

#### **1. Planning Process**

The planning process for WHO Phases 1-4 is a complicated process that involves all available public health and health care assets. Arizona healthcare facilities must be capable of rapidly expanding services (surge capacities and capabilities) to meet pandemic influenza patient and public health needs. ADHS/PHEP is charged with developing a state healthcare coordination plan and assisting in the development of regional and county plans, additional response plans in place that contain relevant information should be used whenever possible. Arizona Regional Public Health Preparedness Coordinating Committees should assist in the development of pandemic response plans within their jurisdiction. The planning process should include:

- Pre-existing plans and papers from technical experts, procedures from WHO, HHS, and CDC, other State and local guidance should all be included in healthcare pandemic response plans.
- In accordance with the National Response Framework (NRF), all agencies should be using the National Incident Management System (NIMS) and should have plans to establish an Emergency Operations Center (EOC) using the Incident Command System (ICS) structure.



- Hospital planning is vital to the success of combating an influenza pandemic. Surge capacity and capability should be planned for and should consider other hospital, region, county, state and other community based organizations.

## **2. Partnership/Coalition**

ADHS developed partnerships for healthcare emergency response with local jurisdictions, hospitals and healthcare associations. The main objective is to provide a forum for the healthcare community to interact with one another, along with other response agencies at the county, regional and state levels. These efforts promote emergency preparedness, and improvement to the delivery of healthcare emergency response services when needed.

ADHS utilizes the existing infrastructure of Arizona's Public Health Preparedness Regional Committees as entry points for this partnership and coalition development.

Currently, there are two operational Arizona Coalitions for Healthcare Emergency Response (AzCHER): (1) AzCHER-Central in Central Region includes Maricopa, Pinal & Gila Counties; and (2) AzCHER-SE in Southeast Region includes Pima, Santa Cruz, Cochise, Graham and Greenlee counties. Each coalition includes participation from the following organizations:

- Local jurisdictions such as county public health and emergency management
- Healthcare systems including specialty hospitals (pediatric, trauma centers, burn care centers) and the community health centers
- Metropolitan Medical Response Systems (MMRS)
- Arizona Healthcare and Hospital Association (AzHHA)
- Arizona Association of Community Health Centers

Each coalition has a memorandum of understanding (MOU) which focuses on sharing and coordination of information, resources and personnel during emergencies. Both coalitions played an important role during 2009 H1N1 response by collaborating with local, state and federal partners.

## **3. Planning Elements**

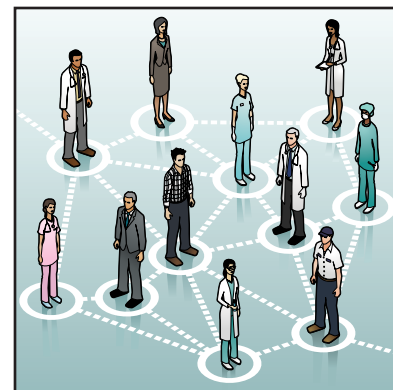
### **a. Hospital Surveillance**

Expanding influenza surveillance and epidemiological capacity at the local level is an important component of pandemic preparedness. Local disease surveillance and on-site laboratory testing are an essential first step in preparedness and are important in helping ADHS to react quickly. Hospital surveillance procedures are outlined in Supplement 1. Laboratory procedures are located in Supplement 2.

### **b. Hospital Communications**

The role of the news media will be critical during a pandemic. Healthcare information released by hospitals, regions, and counties must be carefully coordinated with ADHS to ensure the most accurate and consistent messages are provided to prevent conflicting information. The communication procedures for all levels of public health response during a pandemic are summarized in Supplement 10.

1. Communications must be coordinated during pandemic operations so all elements of the public health response network operate as a single entity.
2. Hospital, regional and county internal communications are an integral component to keep Administration and Public Information Officers informed as to the entity's ability to meet the demands of the pandemic and still provide critical health care services to the community.



### **c. Education and Training**

Each hospital should update their education and training plan and ensure that it addresses the needs of staff, patients, family members and visitors.

#### Staff Education:

- Provide opportunity for educational resources for clinicians, including federally sponsored teleconferences, state and local health department programs, web-based training materials, and locally prepared presentations.
- Educate staff on sick leave policies related to the current influenza pandemic.
- Ensure staff is familiar with the facility's emergency response plan.
- General topics for staff education should include:
  - Prevention and control of influenza
  - Implications of pandemic influenza
  - Benefits of annual influenza vaccination and importance in the prevention of disease.
  - Role of antivirals
  - Infection control strategies
  - Education of patients, family members, and visitors
  - Identify language-specific and reading-level appropriate materials
  - Distribute information to all persons who enter the hospital. Identify staff to answer questions about procedures for preventing influenza transmission

#### **d. Triage, Clinical Evaluation and Admission Procedures**

During the peak of a pandemic, hospital emergency departments, outpatient clinics and healthcare provider offices might be overwhelmed with patients seeking care. Triage should be conducted to: 1) identify persons who might have pandemic influenza, 2) separate them from others to reduce the risk of disease transmission, and 3) identify the type of care they require (i.e., home care or hospitalization). These procedures are outlined in Supplement 5, Clinical Guidelines.

#### **e. Facility Access**

Uncertainty, anxiety and ongoing stress will affect all segments of the population. This may place additional burdens on the health care system as well as individual and community recovery. Service demand will be heavy as treatment facilities seek to triage and treat those affected, those who believe they are infected and routine non-influenza patient loads.

The following should be considered while controlling access to the facility:

1. Visitors should be limited to reduce the likelihood of pandemic influenza transmission among visitors, patients, and healthcare workers.
2. Visitors should receive infection control training from hospital infection control departments (e.g., brochures or videos) and comply with infection control measures.
3. Symptomatic persons exposed to pandemic influenza patients should be excluded from visiting patients.
4. Transportation of patients within the facility needs to be controlled. Patient transportation requirements are listed in Supplement 4, Infection Control. Disinfecting the transportation equipment as well as other potentially exposed surfaces and equipment must take place.
5. Transportation outside of the facility may also be considered. Additional precautions and disinfection will be necessary if the person is undergoing mechanical ventilation.
6. Review security risk assessments and make changes as necessary to enhance the facility's perimeter control and the ability to secure and limit access to the facility.

#### **f. Occupational Health**

Employee health programs should institute a strategy to monitor the health of staff and patients who are potentially exposed to the pandemic influenza strain. Comprehensive occupational health programs can reduce transmission from ill

employees and allow them to go back into the field where their services are needed. Employee health programs should:

1. Develop an active education of all staff in hygiene precautions. This includes proper hand washing procedures and techniques for donning gloves, N95 mask, gown and eyewear.
2. Develop a plan to identify staff that may have acquired immunity to the pandemic influenza virus and might be deployed to high exposure areas.
3. Keep a register of all staff who have recovered from pandemic influenza.
4. Prepare for dislocation of hospital workforce due to illness, death and absenteeism. The hospital will be affected at all levels from, key administrative positions to essential service providers, including clerical and support staff. Collateral organizational structures, backups and workarounds must be in place prior to the pandemic.
5. Encourage staff to self-report influenza-like illness and have a surveillance system in place to capture data.
6. Educate staff regarding the impact of a pandemic on the hospital and how it could influence their decision to continue to work in a potentially high risk environment.
7. Ensure time off policies and procedures and consider staffing needs during periods of clinical crisis.
8. Have mental health and faith-based resources identified as part of the hospital team to assist caregivers in the high stress environment during a pandemic.
9. Anticipate the potential need to isolate staff working in high exposure areas such as the emergency department between shifts.
10. Ensure hospital workers and their immediate families receive prophylaxis and/or vaccination as appropriate.



**g. Use and Administration of Vaccines and Antiviral Drugs.**

Vaccines and antiviral drugs will be in short supply early in a pandemic. Public Health officials and key decision makers will need to carefully consider and balance medical needs with resource allocation issues. Information on vaccines is located in Supplement 6. Procedures for antiviral medications can be found in Supplement 7.

**h. Surge Capacity**

ADHS has the responsibility for projecting health resource needs in the event of a major health-related emergency and for allocating scarce resources to meet those needs. The four Regional Public Health Preparedness Coordinating Committees are designed to assist ADHS in managing resource allocations within their area. This arrangement establishes a more effective span of control for Arizona, with only a few regions rather than multiple individual facilities, reporting data and resource needs. It also allows for plans to consolidate inventories of supplies, epidemiological data, medical response, communications, and command and control. These intrastate regional coalitions will be incorporated into regional multi-agency coordination planning and response.

ADHS is using a six-tier system for medical surge capacity and capability consistent with the Health and Human Services (HHS) model. Medical surge capacity also includes fatality management planning for hospitals in the event the mortuary affairs system is overloaded and hospitals must retain remains of patients for several days before transportation agencies can pick them up.

**i. Security**

Healthcare facilities should plan for additional security. This may be required given the increased demand for services coupled with long wait times for care, and because triage or treatment decisions may lead to people not receiving the level of care they think they require.

Healthcare facility administrators should consider the following when planning for additional security measures:

1. Emphasize to staff the importance of maintaining the facility's access control, security, revised visitor policies, limited access plans and procedures, and how to report security breaches.
2. Review security risk assessments and make changes as necessary to enhance the facility's perimeter control, and ability to secure and limit access to the facility.
3. Establish/review plans to protect scarce resources, and protection of staff handling them.
4. Confirm that security equipment is functioning properly and that security vendors have backup capability and redundancy and staffing plans.
5. Determine signage needs inside and outside the facility with consideration for the diversity of your population and changes in location of service or hours of operations.
6. Identify potential additional waiting area space and implement its usage before existing space is overflowing. Adequate seating, drinking water, waste disposal containers, and alcohol based sanitizer should be provided.
7. Determine if your visitation policy adequately protects your patients, staff, visitors, and others coming to the hospital campus. Make necessary modifications and communicate changes to the public to reduce the chance of negative encounters.
8. Remind staff to be aware of potential crimes within the facility that may be committed during times of overcrowded conditions and staff distractions.

#### **j. Mortuary Issues**

During a pandemic, hospitals have to be prepared to manage additional deaths far above the number of fatalities normally experienced. The ability to quickly secure refrigerated storage will enable the hospital to "hold" remains until they can be retrieved by a funeral home or the Office of the Medical Examiner (OME). To prepare for the possibility of increased patient deaths during an influenza pandemic, hospitals should:

- Develop a plan for setting up a temporary morgue in the hospital or in close proximity to handle the increased patient fatality rate.
- Coordinate a mass fatality management plan and a temporary morgue plan with the County Public Health Department, local Funeral Homes and the OME.
- Determine the scope and volume of supplies (e.g. human remains pouches) equipment (shelving or storage area for patient remains) and refrigeration unit(s) needed to handle an increased number of patient fatalities.
- Hospitals should train staff in human remains handling.

In-hospital post-mortem care is another issue that must be addressed and planned for during a pandemic.

- Health care workers must follow standard precautions and contact precautions when caring for decedent influenza patients or as directed by the County Health Department.
- Hospital temporary holding morgues require temperature and biohazard control, adequate water, lighting and should be in communication with the hospital emergency operations center as a minimum.
- Infection control and housekeeping should be involved in setting up and maintaining the hospital temporary morgue:
  - Proper cleaning and infection control methods must be employed
  - Temporary morgue temperature checking procedures and schedules should be established and maintained by Infection Control.
- Transfer to a Central Mortuary Affairs Collection Point, OME, or funeral home should occur as soon as possible.

#### **k. Vulnerable Populations**

Pandemic influenza may adversely impact persons who have special needs or live in institutions such as, assisted –living

facilities, group homes, and correctional facilities. Additional planning efforts by healthcare facilities will be necessary. The characteristics of the influenza outbreak may also require additional preparedness and response actions for certain segments of the population. These issues will be considered as the epidemiology of the influenza pandemic is clarified.

#### **IV. Actions for the WHO Phases 5-6 (Widespread Human Infection or Pandemic)**

##### **A. Activating the facility's pandemic influenza response plan**

Following the initial detection of pandemic influenza anywhere in the world, ADHS will communicate the level of pandemic influenza response plan activation. See Table 1 for hospital actions based upon pandemic influenza phases.

###### **1. Pandemic Influenza Reported Outside the United States**

If cases of pandemic influenza have been reported outside the United States, the main steps will be to:

- Establish contact with key public health, healthcare, and community partners.
- Implement hospital surveillance for pandemic influenza (Supplement 1), including detection of patients admitted for other reasons who might be infected with the pandemic strain of influenza virus.
- Implement a system for early detection and antiviral treatment of healthcare workers who might be infected with the pandemic strain of influenza virus.
- Reinforce infection control measures to prevent the spread of influenza (see Supplement 4).
- Accelerate the training of staff, in accordance with the facility's pandemic influenza education and training plan.

###### **2. Pandemic Influenza Reported in the United States**

If cases of pandemic influenza have been reported in the United States, additional steps for healthcare facilities will be to:

- Identify when pandemic influenza cases begin in the community. (Supplement 1)
- Identify, isolate, and treat all patients with potential pandemic influenza, when possible. See also Supplements 4, 5, and 8.
- Implement activities to increase capacity, supplement staff shortages, and provide supplies and equipment.
- Maintain close communication within and among healthcare facilities and with ADHS and local health departments.

##### **B. Planning for Provision of Care in Non-Hospital Settings**

Demand for healthcare services will be high at hospital emergency departments as other primary healthcare facilities such as private providers begin to surge. This may disrupt normal patient services, leave some primary healthcare assets with limited service and create great pressures on hospital emergency departments. Understaffed skilled nursing facilities may face influenza outbreaks among fragile patients. Home healthcare services may be critically challenged, leaving many vulnerable clients without services. Some of these clients will manage with the help of family, friends, or neighbors, but others who require skilled nursing services may be at higher risk of severe illness or infection. State and local public health departments and healthcare facilities will need to develop call centers, hotlines, and website information repositories to help ease the burden on emergency departments.

The intent is to reduce the transmission of influenza within facilities and to conserve critical healthcare resources and personnel for more severe influenza patients. Also, hospitals may become overwhelmed with the additional demands brought on by a pandemic while patients are seeking the appropriate level of care. Community health centers and urgent care centers will be a critical resource for many patients. In addition, separate sites for those presenting with symptoms or signs of influenza may be established away from primary care, emergency departments and hospitals. These alternate care sites could be schools, gymnasiums, or other sites identified by ADHS and local health departments for use during the pandemic.

Table 3.1 Hospital Pandemic Influenza WHO Phases			
Pandemic Influenza Phase	Description		Suggested Actions
PHASE 1	No animal influenza virus circulating among animals have been reported to cause infection in humans.		<ul style="list-style-type: none"><li>• Develop, exercise, and periodically revise influenza pandemic preparedness and response plans.</li><li>• Develop robust surveillance systems in collaboration with relevant sectors.</li><li>• Complete communications planning and initiate communications activities to communicate real and potential risks.</li><li>• Promote beneficial behaviors in individuals for self protection. Plan for use of pharmaceuticals and vaccines.</li><li>• Prepare the health system to scale up.</li><li>• Increase surveillance in selected animal &amp; human populations.</li></ul>
PHASE 2	An animal influenza virus circulating in domesticated or wild animals is known to have caused infection in humans.	Some human cases with limited spread among humans or limited human to human transmission.	
PHASE 3	An animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people.		
PHASE 4	Human-to-Human transmission of an animal or human-animal influenza reassortant virus able to sustain community-level outbreaks has been verified.	Sustained Human-to-Human Spread	<ul style="list-style-type: none"><li>• Direct and coordinate rapid pandemic containment activities to limit or delay the spread of infection.</li><li>• Increase surveillance. Monitor containment operations. Share findings with community.</li><li>• Promote and communicate recommended interventions to prevent and reduce population and individual risk.</li><li>• Implement rapid pandemic containment operations and other activities; collaborate community as necessary.</li><li>• Activate contingency plans.</li><li>• Post signs for respiratory hygiene/cough etiquette.</li></ul>
PHASE 5 & 6 are grouped together and begin on the following page.			



Table 3.1 Hospital Pandemic Influenza WHO Phases		
<b>PHASE 5</b>	Same identified virus has caused sustained community level outbreaks.	Widespread Human-to-Human Spread
<b>PHASE 6</b>	Same virus has caused sustained community level outbreaks in at least one other country.	<ul style="list-style-type: none"> <li>• Provide leadership and coordination to mitigate the societal and economic impacts.</li> <li>• Actively monitor and assess the evolving pandemic and its impacts and mitigation measures.</li> <li>• Continue providing updates to general public and all stakeholders on the state of pandemic and measures to mitigate risk.</li> <li>• Implement individual, societal, and pharmaceutical measures.</li> <li>• Implement contingency plans for health systems at all levels.</li> <li>• Establish contact with key public health, healthcare, and community partners.</li> <li>• Implement hospital surveillance for pandemic influenza (Supplement 1) in incoming patients and previously admitted patients.</li> <li>• Implement a system for early detection and treatment of healthcare personnel who might be infected with the pandemic strain of influenza.</li> <li>• Reinforce infection control procedures to prevent the spread of influenza (Supplement 4).</li> <li>• Accelerate staff training in accordance with the facility's pandemic influenza education and training plan.</li> <li>• Implement activities to increase capacity, supplement staff, and provide supplies and equipment.</li> <li>• Maintain close contact with and among healthcare facilities and with state and local health departments.</li> <li>• Maintain high index of suspicion that patients presenting with influenza like illness could be infected with pandemic strain.</li> <li>• If pandemic strain is detected in local patient, community transmission can be assumed and hospital would move to next level of response.</li> </ul>

Table 3.1 Hospital Pandemic Influenza WHO Phases	
<p><b>PHASES 5 &amp; 6 cont'd</b></p>	<p><u>Emergency Department (ED)</u></p> <ul style="list-style-type: none"> <li>• Establish segregated waiting areas for persons with symptoms of influenza.</li> <li>• Implement phone triage to discourage unnecessary ED/outpatient department visits.</li> <li>• Enforce respiratory hygiene/cough etiquette.</li> </ul> <p><u>Access controls</u></p> <ul style="list-style-type: none"> <li>• Limit number of visitors to those essential for patient support.</li> <li>• Screen all visitors at point of entry to facility for signs and symptoms of influenza.</li> <li>• Limit points of entry to facility; assign clinical staff to entry screening.</li> </ul> <p><u>Hospital admissions</u></p> <ul style="list-style-type: none"> <li>• Defer elective admissions and procedures until local epidemic wanes.</li> <li>• Discharge patients as soon as possible.</li> <li>• Cohort patients admitted with influenza.</li> <li>• Monitor for nosocomial transmission.</li> </ul> <p><u>Staffing practices</u></p> <ul style="list-style-type: none"> <li>• Consider furlough or reassignment of pregnant staff and other staff at high risk for complications of influenza.</li> <li>• Consider re-assigning non-essential staff to support critical hospital services or placing them on administrative leave; cohort staff caring for influenza patients.</li> <li>• Consider assigning staff recovering from influenza to care for influenza patients.</li> <li>• Implement system for detecting and reporting signs and symptoms of influenza in staff reporting for duty.</li> <li>• Provide staff with antiviral prophylaxis, according to HHS recommendations.</li> </ul>

**Table 3.1 Hospital Pandemic Influenza WHO Phases**

<b>POST PEAK PERIOD</b>	Levels of pandemic influenza in most countries with adequate surveillance have dropped below peak levels.		<ul style="list-style-type: none"> <li>• Plan and coordinate for additional resources and capacities during possible future waves.</li> <li>• Continue surveillance to detect subsequent waves.</li> <li>• Regularly update the public and other stakeholders on any changes to the status of the pandemic.</li> <li>• Evaluate the effectiveness of the measures used to update guidelines, protocols, and algorithms.</li> <li>• Rest, restock resources, revise plans, and rebuild essential services.</li> </ul>
<b>POST PANDEMIC PERIOD</b>	Levels of influenza activity have returned to the levels seen for seasonal influenza in most countries with adequate surveillance.		<ul style="list-style-type: none"> <li>• Review lessons learned and share experience with the international community. Replenish resources.</li> <li>• Evaluate the pandemic characteristics and situation monitoring and assessment tools for the next pandemic and other public health emergencies.</li> <li>• Publicly acknowledge contribution of all communities and sectors and communicate the lessons learned; incorporate lessons learned into communications activities and planning for the next major public health crisis.</li> <li>• Conduct a thorough evaluation of all interventions implemented.</li> <li>• Evaluate the response of the health system to the pandemic and share the lessons learned.</li> </ul>



# Arizona Pandemic Influenza Response Plan

## *Supplement 4: Infection Control*







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## I. Rationale

The primary strategies for preventing pandemic influenza are the same as those for seasonal influenza: vaccination, early detection and treatment with antiviral medications (as discussed elsewhere in this plan), and the use of infection control measures to prevent transmission during patient care. However, when a pandemic begins, a vaccine may not yet be widely available, and the supply of antiviral drugs may be limited. The ability to limit transmission in health care settings will, therefore, rely heavily on the appropriate and thorough application of infection control measures. While it is commonly accepted that influenza transmission requires close contact—via exposure to large droplets (droplet transmission), direct contact (contact transmission), or near-range exposure to aerosols (airborne transmission)—current literature supports droplet transmission as the more common mode. These precautions apply for any respiratory infection, including seasonal or pandemic influenza.

## II. Overview

Supplement 4 provides guidance to health care and public health partners on basic principles of infection control for limiting the spread of influenza. These principles (summarized in Box 4.1) are common to the prevention of other infectious agents spread by respiratory droplets. Supplement 4 also includes guidance on the selection and use of personal protective equipment (PPE); hand hygiene and safe work practices; cleaning and disinfection of environmental surfaces; handling of laboratory specimens; and post-mortem care. The guidance also covers infection control practices related to the management of infectious patients, the protection of persons at high-risk for severe influenza or its complications, and issues concerning occupational health.

Supplement 4 also provides guidance on how to adapt infection control practices in specific health care settings, including hospitals, nursing homes and other long-term care facilities, pre-hospital care (emergency medical services [EMS]), medical offices and other ambulatory care settings, and during the provision of professional home health care services. The section on hospital care covers detection of entering patients who may be infected with influenza; implementation of source-control measures to limit virus dissemination from respiratory secretions; hospitalization of influenza patients; and detection and control of nosocomial transmission.

In addition, Supplement 4 includes guidance on infection control procedures for influenza patients in the home or in alternative care sites that may be established if local hospital capacity is overwhelmed by a pandemic. Finally, it includes recommendations on infection control in schools, workplaces, and community settings.

Supplement 4 does not address the use of vaccines and antivirals in the control of influenza transmission in health care settings and the community. These issues are addressed in Supplements 6 and 7, respectively.

## III. Recommendations for Infection Control in Health Care Settings

*The recommendations for infection control described below are applicable throughout each pandemic phase. In some cases, as indicated, recommendations may be modified as the situation progresses from limited cases to widespread community illness.*

### A. Basic infection control principles for preventing the spread of pandemic influenza in health care settings

The following infection control principles apply in any setting where persons suspected with pandemic influenza might seek and receive health care services (e.g. hospitals, emergency departments, out-patient facilities, residential care facilities, homes). Details of how these principles may be applied in various health care setting follow (see also Appendix 4.1).

#### 1. Limit contact between infected and non-infected persons<sup>1</sup>

- Isolate infected persons (i.e., confine patients to a defined area as appropriate for the health care setting).
- Limit contact between nonessential personnel and other persons (e.g., social visitors) and patients who are suspected to have influenza or an unknown respiratory infection.
- Promote spatial separation in common areas (i.e., sit or stand as far away as possible—at least 3 feet—from potentially infectious persons) to limit contact between symptomatic and non-symptomatic persons.

## **2. Protect persons caring for influenza patients in health care settings from contact with the pandemic influenza virus**

- Wear a surgical or procedure mask<sup>2</sup> for close contact with infectious patients.
- Use contact, and when appropriate, airborne precautions, including the use of N95 respirators, (e.g., during aerosol generating procedures).
- Wear gloves (gown if necessary) for contact with respiratory secretions.
- Perform hand hygiene after contact with infectious patients.



## **3. Contain infectious respiratory secretions**

- Instruct persons who have “flu-like” symptoms (see below) to use respiratory hygiene/cough etiquette (See Box 4.2).
- Promote use of masks<sup>3</sup> by symptomatic persons in common areas (e.g., waiting rooms in physician offices or emergency departments) or when being transported (e.g., in emergency vehicles).

Symptoms of influenza include fever, headache, myalgia, prostration, coryza, sore throat, and cough. Otitis media, nausea, and vomiting are also commonly reported among children. Typical influenza (or “flu-like”) symptoms, such as fever, may not always be present in elderly patients, young children, patients in long-term care facilities, or persons with underlying chronic illnesses

<sup>1</sup> During WHO Phases 1-3, recommendations on laboratory-confirmation of influenza infection will be issued by public health.

<sup>2</sup> Surgical masks come in two basic types: one type is affixed to the head with two ties, conforms to the face with the aid of a flexible adjustment for the nose bridge, and may be flat/pleated or duck-billed in shape; the second type of surgical mask is pre-molded, adheres to the head with a single elastic and has a flexible adjustment for the nose bridge. Procedure masks are flat/pleated and affix to the head with ear loops. All masks have some degree of fluid resistance but those approved as surgical masks must meet specified standards for protection from penetration of blood and body fluids.

<sup>3</sup> Coughing persons may wear either a surgical or procedure mask. However, only procedure masks come in both adult and pediatric sizes.

## **B. Management of infectious patients**

### **1. Respiratory Hygiene/Cough Etiquette**

Respiratory hygiene/cough etiquette has been promoted as a strategy to contain respiratory viruses at the source and to limit their spread in areas where infectious patients might be awaiting medical care (e.g., physician offices, emergency departments).

The impact of covering sneezes and coughs and/or placing a mask on a coughing patient on the containment of respiratory secretions or on the transmission of respiratory infections has not been systematically studied. In theory, however, any measure that limits the dispersal of respiratory droplets should reduce the opportunity for transmission. Masking may be difficult in some settings, e.g., pediatrics, in which case the emphasis will be on cough hygiene.

The elements of respiratory hygiene/cough etiquette include:

- Education of health care facility staff, patients, and visitors on the importance of containing respiratory secretions to help prevent the transmission of influenza and other respiratory viruses
- Posted signs in languages appropriate to the populations served with instructions to patients and accompanying family members or friends to immediately report symptoms of a respiratory infection as directed
- Source control measures (e.g., covering the mouth/nose with a tissue when coughing and disposing of used tissues; using masks on the coughing person when they can be tolerated and are appropriate)

- Hand hygiene after contact with respiratory secretions, and
- Spatial separation, ideally >3 feet, of persons with respiratory infections in common waiting areas when possible.

## **2. Droplet Precautions**

Patients with known or suspected pandemic influenza should be placed on droplet precautions for a minimum of five days from the onset of symptoms. Because children and immunocompromised patients may shed virus for longer periods, they may be placed on droplet precautions for the duration of their illness. Health care personnel should wear appropriate PPE. If the pandemic virus is associated with diarrhea, contact precautions (i.e., gowns and gloves for all patient contact) should be added. CDC will update these recommendations if changes occur in the anticipated pattern of transmission (see [www.cdc.gov/flu](http://www.cdc.gov/flu) for more information).

## **C. Infection Control Practices for Health Care Personnel**

Infection control practices for influenza are the same as for other human influenza viruses and primarily involve the application of standard and droplet precautions (Box 4.1) during patient care in health care settings (e.g., hospitals, nursing homes, outpatient offices, emergency transport vehicles) as well as for health care personnel providing home health care. During a pandemic, conditions that could affect infection control may include shortages of antiviral drugs, decreased efficacy of the vaccine, increased virulence of the influenza strain, shortages of single-patient rooms, and shortages of personal protective equipment. These issues may necessitate changes in the standard recommended infection control practices for influenza. CDC will provide updated infection control guidance as circumstances dictate. Additional guidance is provided for family members providing home care and for use in public settings (e.g., schools) where people with influenza may be encountered. See also Appendix 4.1 for more detailed information on infection control in the healthcare setting.



### **1. Personal Protective Equipment**

#### **a) PPE for standard and droplet precautions**

PPE is used to prevent direct contact with the influenza virus. PPE that may be used to provide care includes surgical or procedure masks, as recommended for droplet precautions, and gloves and gowns, as recommended for standard precautions (Box 4.1). Additional precautions may be indicated during the performance of aerosol-generating procedures (see below). Information on the selection and use of PPE is provided at <http://www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html>

#### *Masks (surgical or procedure)*

- Wear a mask when entering a patient's room. A mask should be worn once and then discarded. If influenza patients are cohorted in a common area or in several rooms on a nursing unit, and multiple patients must be visited over a short time, it may be practical to wear one mask for the duration of the activity; however, other PPE (e.g., gloves, gown) must be removed between patients followed by hand hygiene.
- Change masks when they become moist.
- Do not leave masks dangling around the neck.
- Upon touching or discarding a used mask, perform hand hygiene.

#### *Gloves*

- A single pair of patient care gloves should be worn for contact with blood and body fluids, including during hand contact with respiratory secretions (e.g., providing oral care, handling soiled tissues). Gloves made of latex, vinyl, nitrile, or other synthetic materials are appropriate for this purpose; if possible, latex-free gloves should be available for health care workers or patients who have latex allergy.
- Gloves should fit comfortably on the wearer's hands.
- Remove and dispose of gloves after use on a patient; do not wash gloves for subsequent reuse.

- Perform hand hygiene after glove removal.
- If gloves are in short supply (i.e., the demand during a pandemic could exceed the supply), priorities for glove use might need to be established. In this circumstance, reserve gloves for situations where there is a likelihood of extensive patient or environmental contact with blood or body fluids, including during suctioning.
- Use other barriers (e.g., disposable paper towels, paper napkins) when there is only limited contact with a patient's respiratory secretions (e.g., to handle used tissues). Hand hygiene should be strongly reinforced in this situation.

#### *Gowns*

- Wear an isolation gown, if soiling of personal clothes or uniform with a patient's blood or body fluids, including respiratory secretions, is anticipated. Most patient interactions do not necessitate the use of gowns. However, procedures such as intubation and activities that involve holding the patient close (e.g., in pediatric settings) are examples of when a gown may be needed when caring for influenza patients.
- A disposable gown made of synthetic fiber or a washable cloth gown may be used.
- Ensure that gowns are of the appropriate size to fully cover the area to be protected.
- Gowns should be worn only once and then placed in a waste or laundry receptacle, as appropriate, and hand hygiene performed. If gowns are in short supply (i.e., the demand during a pandemic could exceed the supply) priorities for their use may need to be established. In this circumstance, reinforcing the situations in which they are needed can reduce the volume used. Alternatively, other coverings (e.g., patient gowns) could be used. It is doubtful that disposable aprons would provide the desired protection in the circumstances where gowns are needed to prevent contact with influenza virus, therefore should be avoided. There are no data upon which to base a recommendation for reusing an isolation gown on the same patient. To avoid possible contamination, it is prudent to limit this practice.

#### *Goggles or face shield*

In general, wearing goggles or a face shield for routine contact with patients with influenza is not necessary. If sprays or splatter of infectious material is likely, goggles or a face shield should be worn as recommended for standard precautions. See <http://www.cdc.gov/niosh/topics/eye/eye-infectious.html> for additional information related to the use of eye protection for infection control.

### **b) PPE for special circumstances (See also Appendix 4.1)**

#### *PPE for aerosol-generating procedures*

During procedures that may generate increased small-particle aerosols of respiratory secretions (e.g., endotracheal intubation, nebulizer treatment, bronchoscopy, suctioning), health care personnel should wear gloves, gown, face/eye protection, and a N95 respirator or other appropriate particulate respirator. Respirators should be used within the context of a respiratory protection program that includes fit-testing, medical clearance, and training. If possible and when practical, use of an airborne isolation room may be considered when conducting aerosol-generating procedures.

#### *PPE for managing influenza with increased transmissibility*

The addition of airborne precautions, including respiratory protection (an N95 filtering face piece respirator or other appropriate particulate respirator), may be considered for strains of influenza exhibiting increased transmissibility, during initial stages of an outbreak of an emerging or novel strain of influenza, and as determined by other factors such as vaccination/immune status of personnel and availability of antivirals. As the epidemiologic characteristics of the pandemic virus are more clearly defined, CDC will provide updated infection control guidance, as needed.

### **c) Health care personnel should avoid when caring for influenza patients**

Touching their eyes, nose or mouth with contaminated hands (gloved or ungloved). Careful placement of PPE before patient contact will help avoid the need to make PPE adjustments and risk self-contamination during use. Careful removal of PPE is also important.

Contaminating environmental surfaces that are not directly related to patient care (e.g., door knobs, light switches, etc.)



## **2. Hand hygiene**

Hand hygiene is the single most important practice to reduce the transmission of infectious agents in health care settings and is an essential element of standard precautions. The term “hand hygiene” includes both hand washing with either plain or antimicrobial soap and water and use of alcohol-based products (gels, rinses, foams) containing an emollient that do not require the use of water.



- If hands are visibly soiled or contaminated with respiratory secretions, wash hands with soap (either non-antimicrobial or antimicrobial) and water.
- In the absence of visible soiling of hands, approved alcohol-based products for hand disinfection are preferred over antimicrobial or plain soap and water because of their superior microbiocidal activity, reduced drying of the skin, and convenience.
- Always perform hand hygiene between patient contacts and after removing PPE.
- Ensure that resources to facilitate handwashing (i.e., sinks with warm and cold running water, plain or antimicrobial soap, disposable paper towels) and hand disinfection (i.e., alcohol-based products) are readily accessible in areas in which patient care is provided. For additional guidance on hand hygiene, see <http://www.cdc.gov/handhygiene/> for more information.

## **3. Disposal of solid waste**

Standard precautions are recommended for disposal of solid waste (medical and non-medical) that might be contaminated with an influenza virus:

- Contain and dispose of contaminated medical waste in accordance with facility-specific procedures and/or local or state regulations for handling and disposal of medical waste, including used needles and other sharps, and non-medical waste. (See [http://www.azsos.gov/public\\_services/Title\\_18/18-13.htm](http://www.azsos.gov/public_services/Title_18/18-13.htm) for Arizona’s solid waste rules, including biohazardous medical waste disposal)
- Discard as routine waste used patient-care supplies that are not likely to be contaminated (e.g., paper wrappers).
- Wear disposable gloves when handling waste. Perform hand hygiene after removal of gloves.

## **4. Linen and laundry**

Standard precautions are recommended for linen and laundry that might be contaminated with respiratory secretions from patients with influenza:

- Place soiled linen directly into a laundry bag in the patient’s room. Contain linen in a manner that prevents the linen bag from opening or bursting during transport and while in the soiled linen holding area.
- Wear gloves and gown when directly handling soiled linen and laundry (e.g., bedding, towels, personal clothing) as per standard precautions. Do not shake or otherwise handle soiled linen and laundry in a manner that might create an opportunity for disease transmission or contamination of the environment.
- Wear gloves for transporting bagged linen and laundry.
- Perform hand hygiene after removing gloves that have been in contact with soiled linen and laundry.
- Wash and dry linen according to routine standards and procedures. (See [http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Enviro\\_guide\\_03.pdf](http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Enviro_guide_03.pdf) for more information.)

## **5. Dishes and eating utensils**

Standard precautions are recommended for handling dishes and eating utensils used by a patient with known or possible influenza:

- Wash reusable dishes and utensils in a dishwasher with recommended water temperature [http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Enviro\\_guide\\_03.pdf](http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Enviro_guide_03.pdf)



- Disposable dishes and utensils should be discarded with other general waste.
- Wear gloves when handling patient trays, dishes, and utensils.

## **6. Patient-care equipment**

Follow standard practices for handling and reprocessing used patient-care equipment, including medical devices:

- Follow current recommendations for cleaning and disinfection or sterilization of reusable patient-care equipment.
- Wipe external surfaces of portable equipment for performing x-rays and other procedures in the patient's room with an EPA-approved hospital disinfectant upon removal from the patient's room.

## **7. Environmental cleaning and disinfection**

Cleaning and disinfection of environmental surfaces are important components of routine infection control in health care facilities. Environmental cleaning and disinfection for influenza follow the same general principles used in health care settings. (See: [http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Enviro\\_guide\\_03.pdf](http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Enviro_guide_03.pdf))

### **a) Cleaning and disinfection of patient-occupied rooms**

- Wear gloves in accordance with facility policies for environmental cleaning and wear a surgical or procedure mask in accordance with droplet precautions. Gowns are not necessary for routine cleaning of an influenza patient's room.
- Keep areas around the patient free of unnecessary supplies and equipment to facilitate daily cleaning.
- Use an EPA-registered hospital detergent-disinfectant. Follow manufacturer's recommendations for-use dilution (i.e., concentration), contact time, and care in handling.
- Follow facility procedures for regular cleaning of patient-occupied rooms. Give special attention to frequently touched surfaces (e.g., bedrails, bedside and over-bed tables, TV controls, call buttons, telephones, lavatory surfaces including safety/pull-up bars, doorknobs, commodes, ventilator surfaces) in addition to floors and other horizontal surfaces.
- Clean and disinfect spills of blood and body fluids in accordance with current recommendations for Isolation Precautions (<http://www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html>).

### **b) Follow standard facility procedures for post-discharge cleaning of an isolation room.**

## **8. Postmortem care**

Follow standard facility practices for care of the deceased.

## **9. Laboratory specimens and practices**

Follow standard facility and laboratory practices for the collection, handling, and processing of laboratory specimens.

## **D. Occupational health issues**

Health care personnel are at risk for influenza through community and health care-related exposures. Once influenza has reached a community, health care facilities must implement systems to monitor for illness in the facility workforce and manage those who are symptomatic or ill. These facilities should consider:

- Implementing a system to educate personnel about occupational health issues related to influenza.
- Screening all personnel for influenza-like symptoms before they come on duty. Symptomatic personnel should be excluded from providing patient care.
- Informing personnel at high risk for complications of influenza (e.g., pregnant women, immunocompromised persons) about their medical risk.

## **E. Reducing exposure of persons at high risk for complications of influenza**

Persons who are well, but at high risk for influenza or its complications (e.g., persons with underlying diseases), should

be instructed to avoid health care facilities caring for influenza patients (i.e., do not visit patients, postpone nonessential medical care).

## **F. Health care setting-specific guidance**

All health care facilities should follow the infection control guidance above. The following guidance is intended to address setting-specific infection control issues that should also be considered.

### **1. Hospitals**

#### **a) Persons entering the facility who may have influenza**

- Post visual alerts (in appropriate languages) at the entrance of the hospital and/or its outpatient facilities (e.g., emergency departments, outpatient clinics) instructing persons with respiratory symptoms (e.g., patients, persons who accompany them) to:
  - Inform reception and health care personnel when they first register for care, and
  - Practice respiratory hygiene/cough etiquette. Sample visual alerts are available at: <http://www.cdc.gov/germstopper/materials.htm> and <http://www.cdc.gov/flu/protect/covercough.htm>
- Triage patients calling for medical appointments for influenza symptoms:
  - Discourage unnecessary visits to medical facilities.
  - Instruct symptomatic patients on infection control measures to limit transmission in the home and when traveling to necessary medical appointments.
- As the scope of the pandemic escalates locally, consider setting up a separate triage area for persons presenting with symptoms of respiratory infection. Because seasonal influenza may be circulating during a pandemic, infection control measures will be important in preventing further spread.
- During the peak of a pandemic, emergency departments and outpatient offices may be overwhelmed with patients seeking care. A “triage officer” may be useful for managing patient flow, including deferral of patients who do not require emergency care.
- Designate separate waiting areas for patients with influenza-like symptoms. If this is not feasible, the waiting area should be set up to enable patients with respiratory symptoms to sit as far away as possible (at least 3 feet) from other patients. Healthcare facilities may want to also provide surgical masks to these patients.

#### **b) “Source control” measures to limit dissemination of influenza virus from respiratory secretions**

- Post signs that promote respiratory hygiene/cough etiquette in common areas (e.g., elevators, waiting areas, cafeterias, lavatories) where they can serve as reminders to all persons in the health care facility. Signs should instruct persons to:
  - Cover the nose/mouth when coughing or sneezing.
  - Use tissues to contain respiratory secretions.
  - Dispose of tissues in the nearest waste receptacle after use.
  - Perform hand hygiene after contact with respiratory secretions. Samples of visual alerts are available at: <http://www.cdc.gov/flu/protect/covercough.htm>
- Facilitate adherence to respiratory hygiene/cough etiquette by ensuring the availability of materials in waiting areas for patients and visitors.
  - Provide tissues and no-touch receptacles (e.g., waste containers with pedal-operated lid or uncovered waste container) for used tissue disposal.
  - Provide conveniently located dispensers of alcohol-based hand rub.
  - Provide soap and disposable towels for hand washing where sinks are available.
- Promote the use of masks and spatial separation by persons with symptoms of influenza.

- Offer and encourage the use of either procedure masks (i.e., with ear loops) or surgical masks (i.e., with ties or elastic) by symptomatic persons to limit dispersal of respiratory droplets.
- Encourage coughing persons to sit as far away as possible (at least 3 feet) from other persons in common waiting areas.

#### c) Hospitalization of pandemic influenza patients

##### *Patient placement*

- Most patients with mild to moderate influenza symptoms will not require hospitalization, and can be discharged home with instructions for at home care.
- If hospitals are reaching capacity, facilities may need to triage patients with severe complications of influenza who cannot be cared for at home.
- Cohorting
  - Designated units or areas of a facility should be used for cohorting patients with influenza. During the early stages of a pandemic, laboratory confirmation of influenza infection is recommended when possible before cohorting patients. During a pandemic, other respiratory viruses (e.g., seasonal influenza, respiratory syncytial virus, parainfluenza virus) may be circulating concurrently in a community. Therefore, to prevent cross-transmission of respiratory viruses, whenever possible assign only patients with confirmed pandemic influenza to the same room. At the height of a pandemic, laboratory testing to confirm pandemic influenza is likely to be limited, in which case cohorting should be based on having symptoms consistent with pandemic influenza.
  - Personnel (clinical and non-clinical) assigned to cohorted patient care units for pandemic influenza patients should not “float” or otherwise be assigned to other patient care areas. The number of personnel entering the cohorted area should be limited to those necessary for patient care and support.
  - Personnel assigned to cohorted patient care units should be aware that patients with influenza may be concurrently infected or colonized with other pathogenic organisms (e.g., *Staphylococcus aureus*, *Clostridium difficile*) and should adhere to infection control practices (e.g., hand hygiene, changing gloves between patient contact) used routinely, and as part of standard precautions, to prevent nosocomial transmission
  - Because of the high patient volume anticipated during a pandemic, cohorting should be implemented early in the course of a local outbreak.



##### *Patient transport*

- Limit patient movement and transport outside the isolation area to medically necessary purposes.
- Consider having portable x-ray equipment available in areas designated for cohorting influenza patients.
- If transport or movement is necessary, ensure that the patient wears a surgical or procedure mask. If a mask cannot be tolerated (e.g., due to the patient’s age or deteriorating respiratory status), apply the most practical measures to contain respiratory secretions. Patients should perform hand hygiene before leaving the room.

##### *Visitors*

- Screen visitors for signs and symptoms of influenza before entry into the facility and exclude persons who are symptomatic.
- Family members of patients with influenza-like illness are assumed to have been exposed to influenza and should wear masks.
- Limit visitors to persons who are necessary for the patient’s emotional well-being and care.
- Instruct visitors to wear surgical or procedure masks while in the patient’s room.
- Instruct visitors on hand-hygiene practices.

## *Pediatrics*

- Place pediatric patients in droplet precautions for the duration of illness
- Consider gowns for health care workers caring for infants in their arms. Aprons would not provide sufficient protection

### d) Control of nosocomial pandemic influenza transmission

- Once patients with pandemic influenza are admitted to the hospital, nosocomial surveillance should be heightened for evidence of transmission to other patients and health care personnel. (Once pandemic influenza is firmly established in a community, this may not be feasible or necessary.)
- If limited nosocomial transmission is detected (e.g., has occurred on one or two patient care units), appropriate control measures should be implemented. These may include:
  - Cohorting of patients and staff on affected units
  - Restriction of new admissions to the affected unit(s) (except for other pandemic influenza patients)
  - Restriction of visitors to the affected unit(s) to those who are essential for patient care and support
- If widespread nosocomial transmission occurs, control measures may need to be implemented hospital-wide and might include:
  - Restricting all nonessential persons
  - Stopping admissions not related to pandemic influenza and stopping elective surgeries

## **2. Nursing homes and other residential facilities**

Residents of nursing homes and other residential facilities will be at particular risk for transmission of influenza and disease complications. Influenza can be introduced through facility personnel and visitors; once a pandemic influenza virus enters such facilities, controlling its spread is problematic. Therefore, as soon as pandemic influenza has been detected in the region, nursing homes and other residential facilities should implement aggressive measures to prevent introduction of the virus.

### a) Prevention or delay of pandemic influenza virus entry into the facility

#### *Control of visitors*

- Post visual alerts (in appropriate languages) at the entrance to the facility restricting entry by persons who have been exposed to or have symptoms of pandemic influenza.
- Enforce visitor restrictions by assigning personnel to verbally and visually screen visitors for respiratory symptoms at points of entry to the facility.
- Provide a telephone number where persons can call for information on measures used to prevent the introduction of pandemic influenza.

#### *Control of personnel*

- Implement a system to screen all personnel for influenza-like symptoms before they come on duty.
- Symptomatic personnel should be offered a mask or should be sent home until they are physically able to return to duty.

### b) Monitoring patients for pandemic influenza and instituting appropriate control measures

Despite aggressive efforts to prevent the introduction of pandemic influenza virus, persons in the early stages of pandemic influenza could introduce it to the facility. Residents returning from a hospital stay, outpatient visit, or family visit could also introduce the virus. Early detection of the presence of influenza in a facility is critical for ensuring timely implementation of infection control measures.



- Early in the progress of a pandemic in the region, increase resident surveillance for influenza-like symptoms. Notify state or local health department officials if a case(s) is suspected.
- If influenza symptoms are apparent, implement droplet precautions for the resident and roommates, pending confirmation of pandemic influenza virus infection. Patients and roommates should not be separated or moved out of their rooms unless medically necessary. Once a patient has been diagnosed with influenza, roommates should be treated as exposed cohorts.
- Cohort residents and staff on units with known or suspected cases of pandemic influenza.
- Limit movement within the facility (e.g., temporarily close the dining room and serve meals on nursing units, cancel social and recreational activities).

### **3. Pre-hospital care including Emergency Medical Services (EMS)**

Patients with severe influenza or disease complications are likely to require emergency transport to the hospital. The following information is designed to protect EMS personnel during transport.

- Screen patients requiring emergency transport for symptoms of influenza.
- Follow standard and droplet precautions when transporting symptomatic patients.
- Consider routine use of surgical or procedure masks for all patient transport when pandemic influenza is in the community.
- If possible, place a procedure or surgical mask on the patient to contain droplets expelled during coughing. If this is not possible (i.e., would further compromise respiratory status, difficult for the patient to wear), have the patient cover the mouth/nose with tissue when coughing, or use the most practical alternative to contain respiratory secretions.
- Oxygen delivery with a non-rebreather face mask can be used to provide oxygen support during transport. If needed, positive-pressure ventilation should be performed using a resuscitation bag-valve mask.
- Unless medically necessary to support life, aerosol-generating procedures (e.g., mechanical ventilation) should be avoided during prehospital care.
- Optimize the vehicle's ventilation to increase the volume of air exchange during transport. When possible, use vehicles that have separate driver and patient compartments that can provide separate ventilation to each area.
- Notify the receiving facility that a patient with possible pandemic influenza is being transported.
- Follow standard operating procedures for routine cleaning of the emergency vehicle and reusable patient care equipment.

### **4. Home health care services**

Home health care includes health and rehabilitative services performed in the home by providers including home health agencies, hospices, durable medical equipment providers, home infusion therapy services, and personal care and support services staff. The scope of services ranges from assistance with activities of daily living and physical and occupational therapy to wound care, infusion therapy, and chronic ambulatory peritoneal dialysis (CAPD). Communication between home health care providers and patients or their family members is essential for ensuring that these personnel are appropriately protected.

When pandemic influenza is in the community, home health agencies should consider contacting patients before the home visit to determine whether persons in the household have an influenza-like illness.

If patients with pandemic influenza are in the home, consider:

- Postponing nonessential services
- Assigning providers who are not at increased risk for complications of pandemic influenza to care for these patients
- Home health care providers who enter homes where there is a person with an influenza-like illness should follow



the recommendations for standard and droplet precautions described above. Professional judgment should be used in determining whether to don a surgical or procedure mask upon entry into the home or only for patient interactions. Factors to consider include the possibility that others in the household may be infectious and the extent to which the patient is ambulating within the home.

## **5. Outpatient medical offices**

Patients with non-emergency symptoms of an influenza-like illness may seek care from their medical provider. Implementation of infection control measures when these patients present for care will help prevent exposure among other patients and clinical and non-clinical office staff.

### **a) Detection of patients with possible pandemic influenza**

- Post visual alerts (in appropriate languages) at the entrance to outpatient offices instructing persons with respiratory symptoms (e.g., patients, persons who accompany them) to:
  - Inform reception and health care personnel when they first register for care
  - Practice respiratory hygiene/cough etiquette (see [www.cdc.gov/flu/professionals/infectioncontrol/resphgiene.htm](http://www.cdc.gov/flu/professionals/infectioncontrol/resphgiene.htm)). Sample visual alerts may be found on CDC's flu website: <http://www.cdc.gov/flu/protect/covercough.htm>
- Triage patients calling for medical appointments for influenza symptoms:
  - Reschedule unnecessary visits to medical facilities.
  - Instruct symptomatic patients on infection control measures to limit transmission in the home and when traveling to necessary medical appointments.

### **b) "Source control" measures**

- Post signs that promote cough etiquette in common areas (e.g., elevators, waiting areas, cafeterias, lavatories) where they can serve as reminders to all persons in the health care facility. Signs should instruct persons to:
  - Cover the nose/mouth when coughing or sneezing.
  - Use tissues to contain respiratory secretions.
  - Dispose of tissues in the nearest waste receptacle after use.
  - Perform hand hygiene after contact with respiratory secretions.
- Facilitate adherence to respiratory hygiene/cough etiquette. Ensure the availability of materials in waiting areas for patients and visitors.
  - Provide tissues and no-touch receptacles (e.g., waste containers with pedal-operated lid or uncovered waste container) for used tissue disposal.
  - Provide conveniently located dispensers of alcohol-based hand rub.
  - Provide soap and disposable towels for hand washing where sinks are available.
- Promote the use of procedure or surgical masks and spatial separation by persons with symptoms of influenza.
  - Offer and encourage the use of either procedure masks (i.e., with ear loops) or surgical masks (i.e., with ties or elastic) by symptomatic persons to limit dispersal of respiratory droplets.
  - Encourage coughing persons to sit at least 3 feet away from other persons in common waiting areas.

### **c) Patient placement**

- Where possible, designate separate waiting areas for patients with symptoms of influenza. Place signs indicating the separate waiting areas.
- Place symptomatic patients in an evaluation room as soon as possible to limit their time in common waiting areas.

## **6. Other ambulatory settings**

A wide variety of ambulatory settings provide chronic (e.g., hemodialysis units) and episodic (e.g., freestanding surgery



centers, dental offices) health care services. When influenza is in the region, these facilities should implement control measures similar to those recommended for outpatient physician offices. Other infection control strategies that may be utilized include:

- Screening patients for influenza-like illness by phone or before coming into the facility and rescheduling appointments for those whose care is non-emergency
- Canceling all non-emergency services when there is pandemic influenza in the community

## **G. Care of influenza patients in the home**

Most patients with influenza will be able to remain at home during the course of their illness and can be cared for by other family members or others who live in the household. Anyone residing in a household with an influenza patient during the incubation period and illness is at risk for developing influenza. A key objective in this setting is to limit transmission of influenza within and outside the home. When care is provided by a household member, basic infection control precautions should be emphasized (e.g., segregating the ill patient, hand hygiene). Infection within the household may be minimized if a primary caregiver is designated; ideally someone who does not have an underlying condition that places them at increased risk of severe influenza disease. Although no studies have assessed the use of masks at home to decrease the spread of infection, use of surgical or procedure masks by the patient and/or caregiver during interactions may be of benefit.



### **1. Management of influenza patients**

- Physically separate the patient with influenza from non-ill persons living in the home as much as possible.
- Patients should not leave the home during the period when they are most likely to be infectious to others (i.e., 5 days after onset of symptoms). When movement outside the home is necessary (e.g., for medical care), the patient should follow cough etiquette (i.e., cover the mouth and nose when coughing and sneezing) and wear procedure or surgical masks if available.

### **2. Management of other persons in the home**

- Persons who have not been exposed to influenza and who are not essential for patient care or support should not enter the home while persons are actively ill with influenza.
- If unexposed persons must enter the home, they should avoid close contact with the patient.
- Persons living in the home with the influenza patient should limit contact with the patient to the extent possible; consider designating one person as the primary care provider.
- Household members should monitor closely for the development of influenza symptoms and contact a telephone hotline or medical care provider if symptoms occur.

### **3. Infection control measures in the home**

- All persons in the household should carefully follow recommendations for hand hygiene (i.e., handwashing with soap and water or use of an alcohol-based hand rub) after contact with an influenza patient or the environment in which care is provided.
- Although no studies have assessed the use of masks at home to decrease the spread of infection, use of surgical or procedure masks by the patient and/or caregiver during interactions may be of benefit. The wearing of gloves and gowns is not recommended for household members providing care in the home.
- Soiled dishes and eating utensils should be washed either in a dishwasher or by hand with warm water and soap. Separation of eating utensils for use by a patient with influenza is not necessary.

- Laundry can be washed in a standard washing machine with warm or cold water and detergent. It is not necessary to separate soiled linen and laundry used by a patient with influenza from other household laundry. Care should be used when handling soiled laundry (i.e., avoid “hugging” the laundry) to avoid contamination. Hand hygiene should be performed after handling soiled laundry.
- Tissues used by the ill patient should be placed in a bag and disposed with other household waste. Consider placing a bag for this purpose at the bedside.
- Normal cleaning of environmental surfaces in the home should be followed.

## **H. Care of pandemic influenza patients at alternative sites**

If an influenza pandemic results in severe illness that overwhelms the capacity of existing health care resources, it may become necessary to provide care at alternative sites. Existing “all-hazard” plans have likely identified designated sites for this purpose. The same principles of infection control apply in these settings as in other health care settings. Careful planning is necessary to ensure that resources are available and procedures are in place to adhere to the key principles of infection control.

## **IV. Recommendations for Infection Control in Schools**

- In schools, infection control for influenza should focus on:
  - Keeping sick students, faculty, and workers away while they are infectious.
  - Promoting respiratory hygiene/cough etiquette and hand hygiene as for any respiratory infection.
- The benefit of wearing masks in these settings has not been established.
- School administrators should promote proper hygiene with students and staff, including frequent and thorough hand washing; covering coughs and sneezes with tissue or the elbow; and refraining from touching the eyes, nose, and mouth. If soap and water are not readily available, the use of alcohol-based hand sanitizers is recommended. Educational messages and infection control guidance for pandemic influenza are available for distribution.
- Schools should be on alert for students and staff exhibiting flu-like symptoms. Students and staff who have flu-like symptoms should be separated from others (preferably in a separate room) until they can be sent home.
- It is recommended for students and staff with flu-like illness to stay home until fever resolves or upon specific recommendations by the state and local health departments at the time of the pandemic.

## **V. Recommendations for Infection Control in Community Settings**

Infection control in the community should focus on “social distancing” and promoting respiratory hygiene/cough etiquette and hand hygiene to decrease exposure to others. This could include the use of masks by persons with respiratory symptoms, if feasible. Although the use of masks in community settings has not been demonstrated to be a public health measure to decrease infections during a community outbreak, persons may choose to wear a mask as part of individual protection strategies that include cough etiquette, hand hygiene, and avoiding public gatherings. Masks use may also be important for persons who are at high risk for complications of influenza. Public education should be provided on how to use masks appropriately. Persons at high risk for complications of influenza should try to avoid public gatherings (e.g., movies, religious services, public meetings) when influenza is prevalent in the community. They should also avoid going to other public areas (e.g., food stores, pharmacies); the use of other persons for shopping or home delivery service is encouraged.

**Box 4.1. Summary of infection control recommendations for care of patients with pandemic influenza**

COMPONENT	RECOMMENDATIONS
<b>Standard Precautions</b>	See <a href="http://www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html">http://www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html</a>
<b>Droplet Precautions</b>	See <a href="http://www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html">http://www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html</a>
Hand Hygiene	Perform hand hygiene after touching blood, body fluids, secretions, excretions, and contaminated items; after removing gloves; and between patient contacts. Hand hygiene includes both handwashing with either plain or antimicrobial soap and water or use of alcohol-based products (gels, rinse, foams) that contain an emollient and do not require the use of water. If hands are visibly soiled or contaminated with respiratory secretions, they should be washed with soap (either non-antimicrobial or antimicrobial) and water. In the absence of visible soiling of hands, approved alcohol-based products for hand disinfection are preferred over antimicrobial or plain soap and water because of their superior microbicidal activity, reduced drying of the skin, and convenience.
Personal Protective Equipment (PPE) <ul style="list-style-type: none"> <li>Gloves</li> <li>Gown</li> <li>Face/eye protection (e.g., surgical or procedure mask and goggles or a face shield)</li> </ul>	<ul style="list-style-type: none"> <li>For touching blood, body fluids, secretions, excretions, and contaminated items; for touching mucous membranes and nonintact skin</li> <li>During procedures and patient-care activities when contact of clothing/exposed skin with blood/body fluids, secretions, and excretions is anticipated</li> <li>During procedures and patient care activities likely to generate splash or spray of blood, body fluids, secretions, excretions</li> </ul>
Safe Work Practices	Avoid touching eyes, nose, mouth, or exposed skin with contaminated hands (gloved or ungloved), avoid touching surfaces with contaminated gloves and other PPE that are not directly related to patient care (e.g., door knobs, keys, light switches).
Patient Resuscitation	Avoid unnecessary mouth-to-mouth contact, use mouthpiece, resuscitation bag, or other ventilation devices to prevent contact with mouth and oral secretions.
Soiled Patient Care Equipment	Handle in a manner that prevents transfer of microorganisms to oneself, other and environmental surfaces, wear gloves if visibly contaminated; perform hand hygiene after handling equipment.
Soiled Linen and Laundry	Handle in a manner that prevents transfer of microorganisms to oneself, others, and to environmental surfaces; wear gloves (gown if necessary) when handling and transporting soiled linen and laundry; and perform hand hygiene.
Needles and other Sharps	Use devices with safety features when available; do not recap, bend, break or hand-manipulate used needles; if recapping is necessary, use a one-handed scoop technique, place used sharps in a puncture-resistant container.

**Box 4.1. Summary of infection control recommendations for care of patients with pandemic influenza (cont.)**

COMPONENT	RECOMMENDATIONS
Environmental Cleaning & Disinfection	Use EPA-registered hospital detergent-disinfectant; follow standard facility procedures for cleaning and disinfection of environmental surfaces, emphasize cleaning/disinfection of frequently touched surfaces (e.g., bed rail, phones, lavatory surfaces).
Disposal of Solid Waste	Contain and dispose of solid waste (medical and non-medical) in accordance with facility procedures and/or local or state regulations, wear gloves when handling waste, wear gloves when handling containers, perform hand hygiene.
Respiratory hygiene/cough etiquette <i>Source control measures for persons with symptoms of a respiratory infection; implement at first point of encounter (e.g., triage/reception areas) within a health care setting</i>	Cover the mouth/nose when sneezing/coughing; use tissues and dispose in no-touch receptacles; perform hand hygiene after contact with respiratory secretions; wear a mask (procedure or surgical) if tolerated; sit or stand as far away as possible (more than 3 feet) from persons who are not ill.
Patient Placement	Place patients with influenza in a private room or cohort with other patients with influenza.* Keep door closed or slightly ajar; maintain room assignments of patients in nursing homes and other residential settings; and apply droplet precautions to all persons in the room.  *During the early stages of a pandemic, infection with influenza should be laboratory-confirmed, if possible.
Personal Protective Equipment	Wear a surgical or procedure mask for entry into patient room, wear other PPE as recommended for standard precautions.
Patient Transport	Limit patient movement outside of room to medically necessary purposes, have patient wear a procedure or surgical mask when outside the room.
Other	Follow standard precautions and facility procedures for handling linen, laundry, dishes and eating utensils, and for cleaning/disinfection of environmental surfaces and patient care equipment, disposal of solid waste, and postmortem care.
Aerosol-Generating Procedures	During procedures that may generate small particles of respiratory secretions (e.g., endotracheal intubation, bronchoscopy, nebulizer treatment, suctioning), health care personnel should wear gloves, gown, face/eye protection, and a fit-tested N95 respirator or other appropriate particulate respirator.

## **Box 4.2. Respiratory hygiene/cough etiquette**

To contain respiratory secretions, all persons with signs and symptoms of a respiratory infection, regardless of presumed cause, should be instructed to:

- Cover the nose/mouth when coughing or sneezing.
- Use tissues to contain respiratory secretions.
- Dispose of tissues in the nearest waste receptacle after use.
- Perform hand hygiene after contact with respiratory secretions and contaminated objects/materials.

Health care facilities should ensure the availability of materials for adhering to respiratory hygiene/cough etiquette in waiting areas for patients and visitors:

- Provide tissues and no-touch receptacles for used tissue disposal.
- Provide conveniently located dispensers of alcohol-based hand rub.
- Provide soap and disposable towels for handwashing where sinks are available.

### **Masking and separation of persons with symptoms of respiratory infection**

During periods of increased respiratory infection in the community, persons who are coughing should be offered either a procedure mask (i.e., with ear loops) or a surgical mask (i.e., with ties) to contain respiratory secretions. Coughing persons should be encouraged to sit as far away as possible (at least 3 feet) from others in common waiting areas. Some facilities may wish to institute this recommendation year-round.



## Appendix 4.1

### Guidance on Infection Control Measures for Influenza in Healthcare Settings, Including Protection of Healthcare Personnel

#### Definition of healthcare personnel

For the purposes of this guidance, healthcare personnel are defined as all persons whose occupational activities involve contact with patients or contaminated material in a healthcare, home healthcare, or clinical laboratory setting. Healthcare personnel are engaged in a range of occupations, many of which include patient contact even though they do not involve direct provision of patient care, such as dietary and housekeeping services.

#### Definition of suspect influenza

A febrile respiratory illness (fever defined as 38 degrees Celsius, 100.4 degrees Fahrenheit) plus a sore throat and/or cough and/or other respiratory symptoms.

### GENERAL RECOMMENDATIONS

#### Review Pandemic Plans for the 2009-2010 Fall/Winter Influenza Season

Facilities should review and, if not already in place, develop written pandemic influenza plans.

#### Use a Hierarchy of Controls to Prevent Influenza Transmission in Healthcare Settings

Facilities should use a hierarchy of controls approach to prevent exposure of healthcare personnel and patients and prevent influenza transmission within healthcare settings. The hierarchy of controls to protect workers from occupational injury or illness places preventive interventions in groups that are ranked according to their likely effectiveness in reducing or removing the source of exposure. To apply the hierarchy of controls to prevention of influenza transmission, facilities should take the following steps, in order of preference:

- 1) *Elimination of potential exposures:* Eliminating the potential source of exposure ranks highest in the hierarchy of controls. Examples of interventions in this category include: taking steps to minimize outpatient visits for patients with mild influenza-like illness who do not have risk factors for complications, postponing elective visits by patients with suspected or confirmed influenza until they are no longer infectious, and denying entry to visitors who are sick.
- 2) *Engineering controls:* Engineering controls rank second in the hierarchy of controls. These controls can protect patients as well as personnel. Administrative controls: Administrative controls are required work practices and policies that prevent exposures. As a group, they rank third in the hierarchy of controls because their effectiveness is dependent on consistent implementation by management and employees. Examples of administrative controls include promoting and providing vaccination; enforcing exclusion of ill healthcare personnel, implementing respiratory hygiene/cough etiquette strategies; and setting up triage stations and separate areas for patients who visit emergency departments with influenza-like illness, managing patient flow, and assigning dedicated staff to minimize the number of healthcare personnel exposed to those with suspected or confirmed influenza. Of note, although it is ranked lower on the list as an administrative control, vaccination is one of the most important interventions for preventing transmission of influenza to healthcare personnel.
- 3) *Personal protective equipment (PPE):* PPE ranks lowest in the hierarchy of controls. It is a last line of defense for individuals against hazards that cannot otherwise be eliminated or controlled. While providing personnel with appropriate PPE and education in its use is important, effectiveness of PPE is dependent on a number of factors. PPE is effective only if used throughout potential exposure periods. PPE will not be effective if adherence is incomplete or when exposures to infectious patients or ill co-workers are unrecognized. In addition, PPE must be used and maintained properly, and must function properly, to be effective.

Careful attention to elimination of potential exposures, engineering controls, and administrative controls will reduce the need to rely on PPE, including respirators.



## **SPECIFIC RECOMMENDATIONS**

### **Promote and administer and seasonal influenza vaccines**

Facilities and organizations providing healthcare services are strongly encouraged to provide vaccine to healthcare personnel and to promote their use aggressively. Healthcare and emergency medical services personnel are among the priority groups recommended to receive influenza vaccine. To improve adherence, vaccination should be offered to healthcare personnel free of charge and during working hours. Vaccination campaigns with incentives such as lotteries with prizes should be considered. Healthcare facilities should require personnel who refuse vaccination to complete a declination form.

### **Enforce respiratory hygiene and cough etiquette**

This form of source control should be implemented by everyone in healthcare settings - patients, visitors, and staff alike. Respiratory hygiene and cough etiquette procedures should continue to be followed for the entire duration of stay.

### **Establish facility access control measures and triage procedures**

- Establish non-punitive policies that encourage or require ill health care personnel workers to stay home. Post signage at entry points instructing patients and visitors about hospital policies.
- Establish mechanisms to identify patients with symptoms of respiratory illness at any point of entry to the facility. Provisions should be made for symptomatic patients to cover their nose and mouth with tissues when coughing or sneezing, or put on facemasks for source control, if tolerated, and for their prompt isolation and assessment.
- Establish triage procedures and engineering controls (e.g., partitions) that separate ill and well patients and limit the need for PPE use by staff.
- Consider limiting points of entry to the facility.

### **Manage visitor access and movement within the facility**

Establish procedures for managing visitors to include:

- Limiting visitors for patients in isolation for influenza to persons who are necessary for the patient's emotional well-being and care. Scheduling and controlling visits to allow for:
  - Screening for symptoms of acute respiratory illness before entering the hospital.
  - Instruction, before entering the patient's room, on hand hygiene, limiting surfaces touched, and use of PPE according to current facility policy while in the patient's room.

### **Establish policies and procedures for patient placement and transport**

Any patient with respiratory illness consistent with influenza should promptly be asked to wear a facemask for source control, if tolerated, or cover their nose and mouth with tissues when coughing or sneezing, and placed directly in an individual room with the door kept closed, where medically appropriate. The precautions required for entry into patient rooms should be posted on the door. Follow current facility procedures for transport and movement of patients under isolation precautions, including:

- Communicating information about patients with suspected, probable or confirmed influenza to appropriate personnel before transferring them to other departments in the facility (e.g., radiology, laboratory) and to other facilities.
- Limiting patient transport and movement of patients outside of the room to medically necessary purposes and minimizing waiting times and delays associated with transport and procedures conducted outside the patient's room.
- Providing influenza patients with facemasks to wear for source control, as tolerated, and tissues to contain secretions when outside of their room.

### **Limit the number of healthcare personnel entering the isolation room**

- Healthcare personnel entering the room of a patient in isolation should be limited to those truly necessary for performing patient care activities.

## Apply isolation precautions

The following isolation precautions are recommended for healthcare personnel who are in close contact with patients with suspected or confirmed influenza. For the purposes of this document, close contact is defined as working within 6 feet of the patient or entering into a small enclosed airspace shared with the patient (e.g., average patient room):

- Standard Precautions - For all patient care, use nonsterile gloves for any contact with potentially infectious material, followed by hand hygiene immediately after glove removal; use gowns along with eye protection for any activity that might generate splashes.
- Respiratory Protection – Recommendation: ADHS recommends the use of a surgical mask for health care personnel who are in close contact with patients with suspected or confirmed influenza or other febrile respiratory illness. ADHS will continue to revisit its guidance as new information becomes available, within this season if necessary.
- Healthcare facilities should provide fit tested N95 respirators (or better) to any healthcare worker who requests them when resources are available to do so.

**Special care should be taken to ensure that respirators are available for situations where respiratory protection is most important, such as performance of aerosol-generating procedures on patients with suspected or confirmed influenza or provision of care to patients with other infections for which respiratory protection is strongly indicated (e.g., tuberculosis).**

Prioritized respirator use: Where a shortage of respirators exists despite reasonable efforts to obtain and maintain a sufficient supply for anticipated needs, in particular for very high exposure risk situations such as some aerosol-generating procedures (listed below), a facility should consider shifting to a prioritized respirator use mode. In this mode, respirator use is prioritized to ensure availability for healthcare personnel at most risk from influenza exposure. Even under conditions of prioritized use, personnel attending aerosol-generating procedures on patients with suspected or confirmed influenza should always use respiratory protection at least as protective as fitted N95 respirators. Prioritization should be adapted to local conditions and should consider intensity and duration of exposure, personal health risk factors for complications of infection, and vaccination status.

Facemasks for healthcare personnel who are not provided a respirator due to the implementation of prioritized respirator use: If a facility is in prioritized respirator use mode and unable to provide respirators to healthcare personnel who provide care to suspected and confirmed influenza cases, the facility should provide those personnel with facemasks.

## Aerosol-generating procedures

Some procedures performed on patients are more likely to generate higher concentrations of respiratory aerosols than coughing, sneezing, talking, or breathing, presenting healthcare personnel with an increased risk of exposure to infectious agents present in the aerosol. ADHS views the following procedures as being very high exposure risk aerosol-generating procedures for which special precautions should be used:

- Bronchoscopy
- Sputum induction
- Endotracheal intubation and extubation
- Open suctioning of airways
- Cardiopulmonary resuscitation
- Autopsies

Although some have suggested that administration of nebulized medications (due to risk of inducing cough), acquisition of nasopharyngeal swabs/samples, and use of high-flow oxygen might create infectious aerosols of concern, less is known about the magnitude or potential for exposure. Clinical judgment should be used to determine the need for fit tested N95 respirators as PPE for health care personnel performing nebulized medication treatments. The availability of N95 respirators should be taken into account in this decision.

A combination of measures should be used to reduce exposures from high-risk aerosol-generating procedures, including:

- Only perform these procedures on patients with suspected or confirmed influenza if they are medically necessary and cannot be postponed.
- Limit the number of healthcare personnel present during the procedure to only those essential for patient care and support.
- Conduct the procedures in an airborne infection isolation room (AIIR) when feasible.
- Portable HEPA filtration units may be used to further reduce the concentration of contaminants in the air. Some of these units can connect to local exhaust ventilation systems (e.g. hoods, booths, tents) or have inlet designs that allow close placement to the patient in order to assist with source control; however, these units do not eliminate the need for respiratory protection for individuals entering the room because they may not entrain all of the room air. Information on air flow/air entrainment performance should be evaluated for such devices.
- Healthcare personnel should adhere to standard precautions <http://www.cdc.gov/hicpac/2007IP/2007isolationPrecautions.html> and wear respiratory protection equivalent to a fitted N95 filtering facepiece respirator or higher level of protection during aerosol-generating procedures.
- Unprotected healthcare personnel should not be allowed in a room where an aerosol-generating procedure has been conducted until sufficient time has elapsed to remove potentially infectious particles. Environmental surface cleaning also is necessary to ensure that environmental contamination does not lead to infection transmission.

## **Hand Hygiene**

Healthcare personnel should perform hand hygiene frequently, including before and after all patient contact, contact with respiratory secretions, and before putting on and upon removal of PPE. Soap and water or alcohol-based hand sanitizers should be used.

## **Duration of Isolation Precautions for Patients**

Isolation precautions for patients who have influenza symptoms should be continued for the 7 days after illness onset or until 24 hours after the resolution of fever and respiratory symptoms, whichever is longer, while a patient is in a healthcare facility. Shedding of influenza viruses generally diminishes over the course of 7 days, with transmission apparently correlating with fever. Patients should be discharged from medical care when clinically appropriate, not based on the period of isolation.

In some cases, facilities may choose to continue isolation precautions for longer periods such as in the case of young children or severely immunocompromised patients, who may shed influenza virus for longer periods of time and who might be shedding antiviral resistant virus. Clinical judgment should be used to determine the need for continued isolation precautions for such patients. Communications regarding the patient's diagnosis with post hospital care providers (e.g. Home-healthcare agencies, long-term care facilities) as well as transporting agencies is essential.

## **Monitor and Manage Ill Healthcare Personnel**

In most cases, decisions about work restrictions and assignments for personnel with respiratory illness should be guided by clinical signs and symptoms rather than by laboratory testing for influenza. Personnel should be provided with information about risk factors for complications of influenza, so those at higher risk know to promptly seek medical attention and be evaluated for early treatment if they develop symptoms of influenza. All personnel should be provided with specific instructions to follow in the event of respiratory illness with rapid progression, particularly when experiencing shortness of breath. Anyone with the following emergency warning signs needs urgent medical attention and should seek medical care promptly:

- Difficulty breathing or shortness of breath
- Pain or pressure in the chest or abdomen
- Sudden dizziness
- Confusion
- Severe or persistent vomiting

- Flu-like symptoms improve but then return with fever and worse cough

Healthcare personnel who develop a fever and respiratory symptoms should be:

- Instructed not to report to work, or if at work, to promptly notify their supervisor and infection control personnel/ occupational health.
- Excluded from work for at least 24 hours after they no longer have a fever, without the use of fever-reducing medicines such as acetaminophen and ibuprofen.
- If returning to work in areas where severely immunocompromised patients are provided care, considered for temporary reassignment or exclusion from work for 7 days from symptom onset or until the resolution of symptoms, whichever is longer. Clinical judgment should be used for personnel with only cough as a symptom, since cough after influenza infection may be prolonged and may not be an indicator of viral shedding. Healthcare personnel recovering from a respiratory illness may return to work with immunocompromised patients sooner if absence of 2009 H1N1 viral RNA in respiratory secretions is documented by real-time reverse transcriptase-polymerase chain reaction (rRT-PCR).
- Reminded of the importance of practicing frequent hand hygiene (especially before and after each patient contact) and respiratory hygiene and cough etiquette after returning to work following an acute respiratory illness.

Healthcare personnel who develop acute respiratory symptoms without fever should be:

- Allowed to continue or return to work unless assigned in areas where severely immunocompromised patients are provided care. In this case they should be considered for temporary reassignment or exclusion from work for 7 days from symptom onset or until the resolution of symptoms, whichever is longer. Clinical judgment should be used for personnel with only cough as a symptom, since cough after influenza infection may be prolonged and may not be an indicator of viral shedding. Healthcare personnel recovering from a respiratory illness may return to work with immunocompromised patients sooner if absence of 2009 H1N1 viral RNA in respiratory secretions is documented by rRT-PCR. Additional information on diagnostic testing for 2009 H1N1 influenza infection can be found at <http://www.cdc.gov/h1n1flu>
- Reminded of the importance of practicing frequent hand hygiene (especially before and after each patient contact) and respiratory hygiene and cough etiquette after returning to work following an acute respiratory illness.

Facilities and organizations providing healthcare services should:

- Ensure that sick leave policies for healthcare personnel (e.g., staff and contract personnel) are flexible and consistent with public health guidance and that employees are aware of the policies.
- Ensure that sick employees are able to stay home without fear of losing their jobs.
- Consider offering alternative work environments as an accommodation for employees at higher risk for complications of 2009 H1N1 influenza during periods of increased influenza activity or if influenza severity increases.
- Not require a doctor's note for workers with influenza to validate their illness or return to work.

### **Antiviral Treatment and Chemoprophylaxis of Healthcare Personnel**

Please refer to the ADHS web site for the most current recommendations on the use of antiviral agents for treatment and chemoprophylaxis: <http://www.azdhs.gov/flu/h1n1/providers.htm>. All healthcare personnel concerned about symptoms of influenza should seek advice from their medical provider promptly.

### **Training and education of healthcare personnel**

All healthcare personnel should receive training on influenza prevention and risks for complications of influenza. The training should include information on risk assessment; isolation precautions; vaccination protocols; use of engineering and administrative controls and personal protective equipment; protection during high-risk aerosol-generating procedures; signs, symptoms, and complications of influenza; and to promptly seek medical attention for any concerns about symptoms of influenza.

## Healthcare Personnel at Higher Risk for Complications of Influenza

Personnel at higher risk for complications from influenza infection include pregnant women, persons 65 years old and older, and persons with chronic diseases such as asthma, heart disease, diabetes, diseases that suppress the immune system, and certain other chronic medical conditions.

Vaccination and early treatment with antiviral medications are very important for healthcare personnel at higher risk for influenza complications because they can prevent hospitalizations and deaths. Healthcare personnel at higher risk for complications should check with their healthcare provider if they become ill so that they can receive early treatment.

## Environmental Infection Control

Routine cleaning and disinfection strategies used during influenza seasons can be applied to the environmental management of influenza. Management of laundry, utensils and medical waste should also be performed in accordance with procedures followed for seasonal influenza. More information can be found at: <http://www.cdc.gov/hicpac/pubs.html>.

**Table 1. Prioritization of Respiratory Protection During Respirator Shortages for Healthcare Personnel Not Participating in Aerosol-Generating Procedures<sup>a</sup>**

(Numbers 1 through 4 indicate relative priorities for respiratory protection, with 1 the highest priority and 4 the lowest priority)

<b>Exposure Scenario</b>	<b>Not Vaccinated<sup>b</sup></b>	<b>Vaccinated<sup>c</sup></b>
<i>Personnel Without Risk Factors for Influenza-Related Complications<sup>d</sup></i>		
Routine care – frequent close exposure <sup>e</sup>	2	4
Routine care – infrequent close exposure <sup>f</sup>	3	4
<i>Personnel With Risk Factors for Influenza-Related Complications<sup>g</sup></i>		
Routine care – frequent close exposure	1	3
Routine care – infrequent close exposure	2	4

<sup>a</sup> This table is provided as an example of prioritization that considers intensity and duration of exposure, personal health risk factors for complications of infection, and vaccination status. Advance planning is critical to efficient implementation of prioritized use during supply shortages.

<sup>b</sup> Not vaccinated: not vaccinated or less than 14 days after vaccination. Consider including those with immunosuppressive conditions or treatment with immunosuppressive therapies anticipated to impair vaccine response in this group.

<sup>c</sup> Vaccinated: 14 or more days after vaccination.

<sup>d</sup> See section on “Healthcare Personnel at Higher Risk for Complications of Influenza” for list of personal risk factors for influenza-related complications.

<sup>e</sup> Personnel frequently in close contact with patients with suspected or confirmed 2009 H1N1 influenza. For the purposes of this document, close contact is defined as working within 6 feet of the patient or entering into a small enclosed airspace shared with the patient (e.g., average patient room). This generally includes personnel working in settings where cases of suspected or confirmed 2009 H1N1 influenza are routinely seen (e.g. emergency departments and primary care in environments such as clinics in outpatient settings, employee healthcare facilities, and correctional facilities).

<sup>f</sup> Personnel infrequently in close contact with patients with suspected or confirmed 2009 H1N1 influenza. This generally includes personnel working in settings where cases of suspected or confirmed 2009 H1N1 influenza are not routinely seen and/or having job duties not involving close contact.

<sup>g</sup> Gathering of personal information for the purposes of pandemic planning and response must be done in a fashion that is compliant with all applicable rules and regulations, including the Americans with Disabilities Act (ADA).





# Arizona Pandemic Influenza Response Plan

## *Supplement 5: Clinical Guidelines*





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## **I. Summary of Public Health Roles and Responsibilities for Clinical Guidelines**

### **WHO Phases 1-4 (Limited Human Spread to Sustained Human-to-Human Spread)**

#### *Health care providers:*

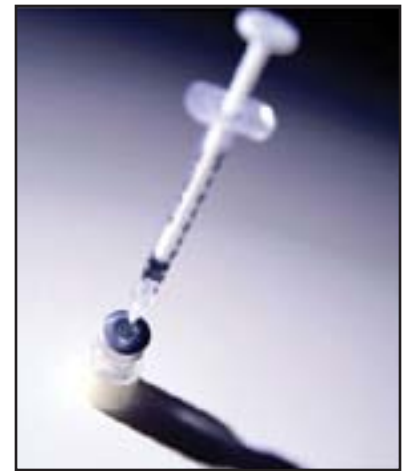
- Follow public health clinical guidance and recommendations
- Know the appropriate tests for influenza
- Know appropriate infection control measures and recommendations
- Know appropriate antiviral regimens for seasonal and/or novel influenza viruses
- Notify health departments about suspected or confirmed novel influenza cases and fatalities
- When requested, forward specimens to designated state and federal laboratories for the diagnosis of novel influenza strains

#### *ADHS and local health departments:*

- Help educate health care providers about seasonal and pandemic influenza
- Provide or facilitate testing and investigation of suspected novel influenza cases
- Conduct follow-up of suspected novel influenza cases

#### *U.S. Department of Health and Human Services (HHS):*

- Develop and disseminate recommendations on the use of influenza diagnostic tests, antiviral drugs, and vaccines during an influenza pandemic
- Develop a national stockpile of antiviral drugs for use during a pandemic
- Work with state and local health departments to investigate and manage suspected cases of human infection with seasonal and/or novel strains of influenza
- Establish case definition and reporting mechanisms.



### **WHO Phases 5-6 (Widespread Human Infection or Pandemic)**

#### *Health care providers:*

- Follow updates on diagnosis/clinical management, laboratory testing, and treatment algorithms for pandemic influenza
- Follow recommendations on antiviral use from federal, state, and local health agencies
- Choose antiviral treatment appropriate for circulating influenza strains
- When antiviral supplies are limited, prescribe antivirals for persons in priority groups where the need and benefit are the greatest
- Report pandemic influenza cases or fatalities as requested by health departments
- Collect and forward specimens for ongoing pandemic influenza surveillance as requested to designated state and federal laboratories
- Report atypical cases, breakthrough infections while on prophylaxis, adverse reactions to treatment or vaccine, vaccine failure, or any other abnormal cases throughout the duration of the pandemic to public health agencies

#### *ADHS and local health departments:*

- Update providers regularly as the influenza pandemic unfolds as to clinical management and treatment issues or changes in recommendations for prevention, diagnosis, or treatment
- Provide or facilitate testing and investigation of pandemic influenza cases
- Accelerate training on the appropriate use of antivirals among public health staff and health care partners

- Work with health care partners to activate state-based plans for distributing and administering antivirals to persons in priority groups
- Review and modify as needed recommendations for prioritization of antiviral treatment and prophylaxis
- Work with CDC to investigate and report special pandemic situations
- Collaborate with CDC and private research laboratories to monitor anti-viral drug resistance
- Work with other governmental agencies and non-governmental organizations to ensure effective public health communications

*HHS:*

- Update and disseminate national guidelines on influenza diagnostic testing and use of antiviral drugs and vaccines during the pandemic
- Develop a pandemic influenza vaccine
- Work with health care partners to refine clinical management guidelines and issue regular updates on treatment issues
- Conduct studies to investigate pandemic influenza pathogenesis
- Monitor pandemic influenza cases for antiviral resistance
- Monitor antiviral drug use and inventories
- Collect information on clinical features, outcomes, and treatments

## **II. Rationale**

Health care providers play an essential role in the detection of an initial case of novel or pandemic influenza in a community. Early identification and isolation of cases may help slow the spread of influenza. Clinical awareness of novel or pandemic influenza disease can also benefit the individual patient, as rapid initiation of treatment can avert potentially severe complications.

Currently there is a lack of specific clinical findings and commercially available laboratory tests to rapidly distinguish novel or pandemic influenza from seasonal influenza. In addition, it is difficult ahead of time to fully predict the clinical characteristics of a novel or pandemic influenza virus strain or the groups at highest risk for complications.

However, clinical management of patients during pandemic influenza will follow many of the same principles of patient care in cases of seasonal strains of influenza. Health care workers will need to know

- the symptoms of an influenza-like illness
- the strains that are circulating in the community
- the appropriate tests to diagnose influenza
- the appropriate infection control precautions
- how to select the correct antiviral medicine
- the side effects of the antiviral medicines
- how to prescribe antivirals for prophylaxis (see Supplement 7)

Additional difficulties in managing pandemic influenza include: differentiating seasonal strains of influenza from pandemic strains; deciding which antiviral medicine would be most appropriate to use; and selecting the populations that would benefit most from antivirals in the face of great demands for a limited supply of antivirals.

The management of influenza is based primarily on sound clinical judgment regarding the individual patient as well as the availability of local resources, such as rapid diagnostic tests, antiviral drugs, and hospital beds. Health care providers who are well trained in managing seasonal influenza will be better able to effectively diagnose and care for patients with pandemic influenza.

### III. Overview

Supplement 5 focuses on the initial screening, assessment, and management of patients who present from the community with fever and/or respiratory symptoms during WHO Phases 1-4. (Box 5.1 defines these phases). Boxes, figures, tables, and appendices have been revised from similar information located in the November 2005 HHS Pandemic Influenza Plan (<http://www.hhs.gov/pandemicflu/plan/pdf/HHSPandemicInfluenzaPlan.pdf>).

The Appendices add additional information on the clinical presentation and complications of influenza; the clinical features of human infection with novel influenza; management of secondary bacterial pneumonia during a pandemic; and respiratory etiquette posters.

During the WHO Phases 1-4, early recognition of illness caused by a novel influenza virus will rely on a combination of clinical and epidemiologic features.

During periods in which no human infections with a novel influenza A virus strain have occurred anywhere in the world (WHO Phase 1), or when sporadic cases of animal-to-human transmission or rare instances of limited human-to-human transmission of a novel influenza virus have occurred in the world (WHO Phases 2 or 3), the risk to travelers is low.

Once local person-to-person transmission of a novel influenza virus has been confirmed (WHO Phase 4), the potential for novel influenza A virus infection will be higher in an ill person who has a strong epidemiologic link to the affected area.

During the WHO Phases 5-6 (in a setting of high community prevalence), diagnosis will be more clinically-oriented because the likelihood will be high that any severe febrile respiratory illness is pandemic influenza.

This Supplement is subject to change as experience is gained. Updates will be provided, as needed, on the Arizona Department of Health Services website ([www.azdhs.gov](http://www.azdhs.gov)), the CDC website ([www.cdc.gov/flu/](http://www.cdc.gov/flu/)), and the HHS-sponsored website ([www.flu.gov/](http://www.flu.gov/)).

Other supplements in the pandemic plan that cover topics of potential interest to clinicians are:

Supplement 1: Surveillance and Epidemiology

Supplement 2: Laboratory Diagnostics

Supplement 3: Health Care Coordination and Surge Capacity

Supplement 4: Infection Control

Supplement 6: Vaccine Distribution and Use

Supplement 7: Antiviral Drug Distribution and Use

### IV. Clinical Guidelines for WHO Phases 1-4 (Limited Human Spread to Sustained Human-to-Human Spread)

During WHO Phases 1-4, the primary goal is to quickly identify and contain cases of novel influenza. To limit evaluating an overwhelming number of patients, screening criteria should rely on a combination of clinical and epidemiologic features.

Febrile respiratory illnesses are one of the most common reasons for medical evaluation during the winter. Therefore, during WHO Phases 1-3, febrile illnesses caused by novel influenza strains are expected to be rare. Laboratory testing should be done for those with severe respiratory illness, such as pneumonia. The main features of case detection and clinical management during the WHO Phases 1-4 are outlined in Figure 5.1.

#### A. Criteria for evaluation of patients with possible novel influenza

During WHO Phases 1-3, human infections with novel influenza viruses will be uncommon. Therefore, both clinical and epidemiologic criteria should be met. The criteria will be updated as needed and posted at [www.cdc.gov/flu/](http://www.cdc.gov/flu/) and/or [www.flu.gov/](http://www.flu.gov/).



## 1. Clinical criteria

Any suspected cases of human infection with a novel influenza virus must meet the criteria for influenza-like illness (ILI): temperature of  $\geq 38^{\circ}\text{C}$  plus one of the following: sore throat, cough, or dyspnea.

Because of the large number of influenza-like illnesses during a typical influenza season, during WHO Phases 1-4, laboratory evaluation for novel influenza viruses is recommended only for:

- a) Hospitalized patients with severe ILI, including pneumonia, who meet the epidemiologic criteria (see below), or
- b) Non-hospitalized patients with ILI and with strong epidemiologic suspicion of novel influenza virus exposure (e.g., direct contact with ill animals in an affected area, or close contact with a known or suspected human case of novel influenza).



Recommendations for the evaluation of patients with respiratory illnesses are provided in Box 5.2.

Exceptions to the current clinical criteria are:

- For persons with a high risk of exposure to a novel influenza virus (e.g., poultry worker from an affected area, caregiver of a patient with laboratory-confirmed novel influenza, employee in a laboratory that works with live novel influenza viruses), epidemiologic evidence might be enough to initiate further measures, even if clinical criteria are not fully met. In these persons, early signs and symptoms—such as rhinorrhea, conjunctivitis, chills, rigors, myalgia, headache, and diarrhea—in addition to cough or sore throat, may be used to fulfill the clinical criteria for evaluation.
- High-risk groups with atypical symptoms (i.e., young children, elderly patients, patients in long-term care facilities, and persons with underlying chronic illnesses) might not have typical influenza-like symptoms, such as fever. When such patients have a strong epidemiologic risk factor, novel influenza should be considered with almost any change in health status, even in the absence of typical clinical features. Conjunctivitis has been reported in patients with influenza A (H7N7) and (H7N3) infections. In young children, gastrointestinal manifestations such as vomiting and diarrhea might be present. Infants may present with fever or apnea alone, without other respiratory symptoms, and should be evaluated if there is an otherwise increased suspicion of novel influenza.

Updated lists of affected areas are provided at the websites of the OIE ([http://www.oie.int/eng/en\\_index.htm](http://www.oie.int/eng/en_index.htm)), WHO ([www.who.int/en/](http://www.who.int/en/)), and CDC ([www.cdc.gov/flu/](http://www.cdc.gov/flu/)).

## 2. Epidemiologic criteria

Epidemiologic criteria for evaluation of patients with possible novel influenza focus on the risk of exposure to a novel influenza virus with pandemic potential. Although the incubation period for seasonal influenza ranges from one to four days, the incubation periods for novel types of influenza are currently unknown and might be longer. Therefore, the maximum interval between potential exposure and symptom onset is set conservatively at 10 days.

During WHO Phases 1 and 2, the majority of human cases of novel influenza will result from animal-to-human transmission (see Box 5.1). Therefore, a history of direct contact with animals associated with influenza (well-appearing, sick, or dead), consumption of uncooked animals associated with influenza, or direct exposure to environmental contamination with animal feces in an affected area will be important to ascertain.

During WHO Phases 3 and 4, a history of close contact with an ill person suspected or confirmed to have novel influenza in an affected area will be even more important.

Exposure risks fall into three categories: travel; direct contact with animal-associated influenza; and occupational.

- a) **Travel risks:** Persons have a travel risk if they have:

- recently visited or lived in an area affected by highly pathogenic animal-associated influenza outbreaks in domestic poultry or where a human case of novel influenza has been confirmed, and
- had close contact with a person with confirmed or suspected novel influenza. Updated listings of areas affected by avian influenza A (H5N1) and other current/recent novel strains are provided on the websites of the OIE ([http://www.oie.int/eng/en\\_index.htm](http://www.oie.int/eng/en_index.htm)), WHO ([www.who.int/en/](http://www.who.int/en/)), CDC ([www.cdc.gov/flu/](http://www.cdc.gov/flu/)), and HHS ([www.flu.gov/](http://www.flu.gov/)). Close contact with a person from an infected area with confirmed or suspected novel influenza is defined as being within 3 feet (1 meter) of that person during their illness.

b) **Direct contact with animal-associated influenza** is defined as:

- touching the animals (well-appearing, sick, or dead), or
- touching animal feces or surfaces contaminated with feces, or
- consuming uncooked animal products (including blood) in an affected area.
- Because specific testing for human infection with animal-associated influenza might not be locally available in an affected area, persons reporting close contact in an affected area with a person suffering from a severe, yet unexplained, respiratory illness should also be evaluated.

Human influenza viruses circulate worldwide and year-round, including in countries with outbreaks of avian influenza A (H5N1) among poultry. Therefore, during WHO Phases 1-4, human influenza virus infection can be a cause of ILI among returned travelers at any time of the year, including during the summer in the United States. This includes travelers returning from areas affected by poultry outbreaks of highly pathogenic avian influenza A (H5N1) in Asia. As of December 2005, such persons are currently more likely to have infection with human influenza viruses than with avian influenza A (H5N1) viruses.

c) **Occupational risks**

Persons at occupational risk for infection with a novel strain of influenza include:

- persons who work on farms or live poultry markets
- persons who process or handle animals infected with known or suspected influenza viruses
- workers in laboratories that contain live animal or novel influenza viruses
- healthcare workers in direct contact with a suspected or confirmed novel influenza case.

Information on limiting occupational risk is provided on the Occupational Health and Safety Administration (OSHA) website at: <http://www.osha.gov/dsg/topics/pandemicflu/index.html>.

## **B. Initial management of patients who meet the criteria for novel influenza**

When a patient meets both the clinical and epidemiologic criteria for a suspected case of novel influenza, health care personnel should initiate the following activities:

### **1. Implement infection control precautions for novel influenza, including respiratory hygiene/cough etiquette**

Patients should be placed on Droplet Precautions for a minimum of 14 days, unless there is full resolution of illness or another etiology has been identified before that period has elapsed. Health care personnel should wear surgical or procedure masks on entering a patient's room, as per Droplet Precautions. They should also wear gloves and gowns when indicated for Standard Precautions. Patients should be admitted to a single-patient room, and patient movement and transport within the hospital should be limited to medically necessary purposes (see also Supplement 4, Infection Control).

### **2. Notify the local health department or ADHS**

Report each patient who meets the clinical and epidemiologic criteria for a suspected case of novel influenza to the state or local health department as quickly as possible to facilitate initiation of public health measures (see Supplement 1, Surveillance and Epidemiology). Designate one person as a point of contact to update public health authorities on the patient's clinical status.

### **3. Obtain clinical specimens and notify the local and state health departments to arrange testing**

Testing of suspected novel or pandemic influenza will be directed by public health authorities (see Supplement 2, Laboratory Diagnostics, for more detailed guidelines).

- a) Where feasible, collect the following respiratory specimens for novel influenza virus testing: nasopharyngeal swab; throat swab; oropharyngeal swab; tracheal aspirate (for intubated patients); and nasal swab, aspirate or wash. Store specimens at 4°C in viral transport media until transported or shipped for testing.
- b) Immediately notify their local health departments of their intention to ship clinical specimens from suspected cases of human infection with novel influenza, to ensure that the specimens are handled under proper biocontainment conditions.
- c) Novel influenza can be confirmed by RT-PCR or virus isolation with subtyping at the Arizona State Laboratory. RT-PCR testing of novel influenza viruses may also be available at clinical laboratories. Viral culture of specimens from suspected novel influenza cases should be attempted only in laboratories that meet the biocontainment conditions for BSL-3 with enhancements or higher.
- d) Rapid influenza diagnostic tests and immunofluorescence (indirect fluorescent antibody [IFA] staining or direct fluorescent antibody [DFA] staining) may be used to detect seasonal influenza, but should not be used to confirm or exclude novel influenza. Rapid influenza tests have relatively low sensitivity for detecting seasonal influenza, and their ability to detect novel influenza subtypes is unknown. Such tests can identify influenza viruses but cannot distinguish between human infection with seasonal and novel influenza viruses. A negative rapid influenza test result does not necessarily exclude human infection with either seasonal or novel influenza viruses. A positive rapid influenza test result could be a false positive or represent infection with either seasonal or novel influenza viruses. Therefore, both negative and positive rapid influenza test and immunofluorescence results should be interpreted with caution, and RT-PCR testing for influenza viruses should be performed. (See Supplement 2, Laboratory Diagnostics, for further information on rapid diagnostic testing).
- e) Serological testing for novel influenza virus infection can be performed only at CDC with approval.
  - i) If requested, collect acute (within seven days of illness onset) and convalescent serum specimens (two to three weeks after the acute specimen and at least three weeks after illness onset) should be obtained and refrigerated at 4°C or frozen at minus 20–80°C. Refrigerated specimens should be shipped on ice; frozen samples should be shipped with dry ice to prevent thawing.
  - ii) If collected, acute and convalescent serum samples and other available clinical specimens (respiratory, blood, and stool) should be saved and refrigerated or frozen for additional testing until a specific diagnosis is made.

### **4. Evaluate alternative diagnoses**

An alternative diagnosis should be based only on laboratory tests with high positive-predictive value (e.g., blood culture, viral culture, PCR, Legionella urinary antigen, pleural fluid culture, transthoracic aspirate culture, coccidioidomycosis serology or culture). If an alternate etiology is identified, the possibility of co-infection with a novel influenza virus may still be considered if there is a strong epidemiologic link to exposure to novel influenza.

### **5. Decide on inpatient or outpatient management**

The decision to hospitalize a suspected novel influenza case will be based on the physician's clinical assessment and assessment of risk and whether adequate precautions can be taken at home to prevent the potential spread of infection.

- Patients cared for at home should be separated from other household members as much as possible.
- All household members should carefully follow recommendations for hand hygiene, and tissues used by the ill patient should be placed in a bag and disposed with other household waste (Box 5.4).
- Use of surgical or procedure masks by the patient and/or caregiver during interactions may be of benefit if the patient is cared for at home.

- Separation of eating utensils for use by a patient with influenza is not necessary, as long as they are washed with warm water and soap (Box 5.4).

#### **6. Initiate antiviral treatment as soon as possible, even if laboratory results are not yet available**

Clinical trials have shown that these drugs can decrease the illness due to seasonal influenza duration by several days when they are initiated within 48 hours of illness onset. The clinical effectiveness of antiviral drugs for treatment of novel influenza is unknown, but it is likely that the earlier treatment is initiated, the greater the likelihood of benefit. During WHO Phase 4, available isolates of novel influenza will be tested for resistance to the currently licensed antiviral medications. (See Supplement 7 for antiviral information).



#### **7. Assist public health officials with identifying exposed contacts**

After consulting with ADHS or local public health officials, clinicians might be asked to help identify persons exposed to the suspected novel influenza case-patient (particularly health care workers). In general, persons in close contact with the case-patient at any time beginning one day before the onset of illness are considered at risk. Close contacts might include household and social contacts, family members, workplace or school contacts, fellow travelers, and/or health care providers (see Supplement 8 and Supplement 9).

### **C. Management of patients who test negative for novel influenza**

The sensitivity of the currently available tests for detecting novel influenza viruses in clinical specimens has not been thoroughly evaluated, so false-negative test results may occur. Therefore, if test results are negative but the clinical and epidemiologic suspicion for a novel influenza virus remains high, continue antiviral treatment and isolation procedures. Test results could be negative for influenza viruses for several reasons:

- Some patients may have an alternate etiology to explain their illness. The general work-up for febrile respiratory illnesses described below should evaluate the most common alternate causes.
- A certain number of truly infected cases might also test falsely negative, due to specimen collection conditions, to viral shedding that is not detectable, or to sensitivity of the test.

Interpretation of negative testing results should be tailored to the individual patient in consultation with hospital infection control and infectious disease specialists, as well as the state or local health department and CDC. In hospitalized patients who test negative for novel influenza but have no alternate diagnosis established, novel-influenza-directed management should be continued if clinical suspicion is high and there is a strong epidemiologic link to exposure to novel influenza.

When influenza tests are negative and an alternative diagnosis is established, isolation precautions and antiviral drug therapy for novel influenza may be discontinued based on clinician's assessment if:

- There is no strong epidemiologic link
- An alternative diagnosis is made using a test with a high positive-predictive value
- The clinical manifestations are explained by the alternative diagnosis.

## **V. Clinical Guidelines for WHO Phases 5-6 (Widespread Human Infection or Pandemic)**

During WHO Phases 5-6, the primary goal of rapid detection is to appropriately identify and triage cases of pandemic influenza. Outpatient clinics and emergency departments may be overwhelmed with suspected cases, restricting the time and laboratory resources available for evaluation. In addition, if the pandemic influenza virus exhibits transmission characteristics similar to those of seasonal influenza viruses, illnesses will likely spread throughout the community too rapidly to allow the identification of obvious exposures or contacts.

Evaluation will therefore focus predominantly on clinical and basic laboratory findings, with less emphasis on laboratory diagnostic testing for influenza (which may be in short supply). Clinicians in communities without pandemic influenza activity might consider asking patients about recent travel from a community with pandemic influenza activity or close contact with a suspected or confirmed pandemic influenza case. The main features of clinical management during these phases are outlined in Figure 5.2.

## **A. Criteria for evaluation of patients with possible pandemic influenza**

### **1. Clinical criteria**

Suspected cases of pandemic influenza virus infection should meet the criteria for an influenza-like illness (ILI): temperature of  $\geq 38^{\circ}\text{C}$  plus one of the following: sore throat, cough, or dyspnea. Although past influenza pandemics have most frequently resulted in respiratory illness, the next pandemic influenza virus strain might present with a different clinical syndrome (see Appendix 5.1 and Appendix 5.2). During a pandemic, updates on other clinical presentations will be provided at: [www.pandemicflu.gov](http://www.pandemicflu.gov); [www.cdc.gov/flu/](http://www.cdc.gov/flu/); and [www.flu.gov/](http://www.flu.gov/).

Recommendations for general evaluation of patients with ILI are provided in Box 5.2.

Exceptions to the current clinical criteria are:

- For persons with a high risk of exposure to a novel influenza virus (e.g., poultry worker from an affected area, caregiver of a patient with laboratory-confirmed novel influenza, employee in a laboratory that works with live novel influenza viruses), epidemiologic evidence might be enough to initiate further measures, even if clinical criteria are not fully met. In these persons, early signs and symptoms—such as rhinorrhea, conjunctivitis, chills, rigors, myalgia, headache, and diarrhea—in addition to cough or sore throat, may be used to fulfill the clinical criteria for evaluation.
- High-risk groups with atypical symptoms (i.e., young children, elderly patients, patients in long-term care facilities, and persons with underlying chronic illnesses) might not have typical influenza-like symptoms, such as fever. When such patients have a strong epidemiologic risk factor, novel influenza should be considered with almost any change in health status, even in the absence of typical clinical features. Conjunctivitis has been reported in patients with influenza A (H7N7) and (H7N3) infections. In young children, gastrointestinal manifestations such as vomiting and diarrhea might be present. Infants may present with fever or apnea alone, without other respiratory symptoms, and should be evaluated if there is an otherwise increased suspicion of novel influenza.

Updated lists of affected areas are provided at the websites of the OIE ([http://www.oie.int/eng/en\\_index.htm](http://www.oie.int/eng/en_index.htm)), WHO ([www.who.int/en/](http://www.who.int/en/)), and CDC ([www.cdc.gov/flu/](http://www.cdc.gov/flu/)).

### **2. Epidemiologic criteria**

During WHO Phases 5-6, an exposure history will be marginally useful for clinical management when disease is widespread in a community. In addition, there will be a relatively high likelihood that any case of ILI during that time period will be pandemic influenza. Once pandemic influenza has arrived in a particular locality, clinical criteria will be sufficient for classifying the patient as a suspected pandemic influenza case.

## **B. Initial management of patients who meet the criteria for pandemic influenza**

When a patient meets the criteria for a suspected case of pandemic influenza, health care personnel should initiate the following activities:

1. Report according to local and state health department recommendations for patients who meet the criteria for pandemic influenza. See Supplement 1 for guidance on case reporting.
2. If the patient is hospitalized, implement infection control precautions for pandemic influenza, including Respiratory Hygiene/Cough Etiquette.



- Place the patient on Droplet Precautions for a minimum of 7 days from the onset of symptoms or 24 hours after resolution of fever, whichever is longer.
  - Health care personnel should wear surgical or procedure masks on entering a patient's room, as per Droplet Precautions
  - Health care personnel should wear gloves and gowns along with eye protection for any activity that might generate splashes of respiratory secretions or other infectious material, as per Standard Precautions (see Supplement 4, Infection Control).
  - Patients should be admitted to either a single-patient room or an area designated for cohorting of patients with influenza.
  - Patient movement and transport outside the isolation area should be limited to medically necessary purposes (see Supplement 4, Infection Control).
3. Hospital admission of patients should be limited to those with severe complications who cannot be cared for outside the hospital setting, especially once a pandemic is underway.
  4. Obtain clinical specimens, as clinically indicated (see Box 5.2).
    - Once pandemic influenza has arrived in a community, influenza testing will likely not be needed for most patients.
    - Work in conjunction with health departments to perform laboratory testing in a subset of pandemic influenza cases, as part of ongoing virologic surveillance (see Supplements 1 and 2).
    - As with seasonal influenza, RT-PCR and virus isolation from tissue culture will be the most accurate methods for diagnosing pandemic influenza.
    - Specimens should generally include combined nasopharyngeal aspirates or nasal swabs, and throat swabs, stored at 4°C in viral transport media.
  5. Know how to properly use rapid diagnostic tests for influenza
    - Rapid tests and immunofluorescence may be helpful for initial clinical management, including cohorting and treatment, but have relatively low sensitivity for detecting seasonal influenza, and their ability to detect pandemic influenza viruses is unknown.
    - The sensitivity of rapid diagnostic tests will likely be higher in specimens collected within two days of illness onset, in children, and when tested at clinical laboratories that perform a high volume of testing.
    - During a pandemic a negative rapid test may be a false negative. Therefore test results need to be interpreted within the overall clinical context. For example, it may not be optimal to withhold antiviral treatment from a seriously ill high-risk patient on the basis of a negative test.
    - The risk of a false-negative test also must be taken into account in making cohorting decisions.
    - Rapid diagnostic testing should not preclude more reliable testing, if available.
    - See Supplement 2, Laboratory Diagnostics for further information on rapid diagnostic testing.
  6. Decide on inpatient or outpatient management

The decision to hospitalize a suspected pandemic influenza case will be based on the physician's clinical assessment of the patient as well as the availability of hospital beds and personnel. Guidelines on cohorting and infection control for admitted patients can be found in Supplement 3, Healthcare Coordination and Surge Capacity, and Supplement 4, Infection Control.

- High priority for admission is an unstable patient. Patients with high-risk conditions (see Appendix 5.1) might also warrant special attention, such as observation or close follow-up, even if disease is mild.
- Appropriate for home management with follow up is a well-appearing young children with fever alone.



## 7. Infection control for home care

- Patients cared for at home should be separated from other household members as much as possible.
- All household members should carefully follow recommendations for hand hygiene, and tissues used by the ill patient should be placed in a bag and disposed with other household waste (Supplement 4, Infection Control).
- Infection within the household may be minimized if a primary caregiver is designated. The primary caregiver would ideally be someone who does not have an underlying condition that places them at increased risk of severe influenza disease.
- Using a surgical or procedure mask by the patient or caregiver during interactions may be of benefit.
- Separation of eating utensils for use by a patient with influenza is not necessary, as long as they are washed with warm water and soap (Supplement 4, Infection Control).



## C. Clinical management of pandemic influenza patients

See Supplement 7, Antiviral Drug Distribution and Use for current antiviral information and treatment strategies. In addition to the use of antivirals, clinical management of severe influenza should address supportive care and the rapid identification and treatment of secondary complications.\*

1. Provide ADHS with virus isolates from persons who fail treatment or antiviral prophylaxis for testing at CDC, as these strains may more likely be drug resistant.
2. Do not give aspirin or other salicylate-containing product to children aged < 18 years with suspected or confirmed pandemic influenza because of an increased risk of Reye syndrome in this age group (characterized by acute encephalopathy and liver failure).
3. Monitor for complications. Complications related to seasonal human influenza occur more commonly in persons with certain underlying medical conditions, such as chronic respiratory or cardiovascular disease, extremes of age, pregnancy, and neuromuscular disease are described in Appendix 5.1. Limited data are available on risk factors and complications related to infection with novel influenza viruses, and these may change as individual strains evolve.
4. Review the summary of the clinical presentations and complications associated with recent influenza A (H5N1) viruses in Appendix 5.2.
5. Be aware that post-influenza community-acquired pneumonia will likely be a commonly encountered complication, and be aware of recommended methods for diagnosis and treatment. Guidance on the management of influenza-related pneumonia is in Appendix 5.3.

*Ribavirin and immunomodulatory therapies, such as steroids, are not approved by the FDA for treatment of severe influenza of any type and are purely investigational at this time. These agents frequently have severe adverse effects, such as bone marrow and hepatic toxicity, while the benefits of these therapies are unknown.*

**Box 5.1. Risk of Novel Influenza in Persons with Severe Respiratory Disease or Influenza-like Illness during WHO Phases 1 through 3 (Limited Human Spread) and Phase 4 (Sustained Human-to-Human Spread)**

Clinicians should recognize that human influenza A and B viruses and other respiratory viruses circulate year-round among people throughout the world, including in countries affected by outbreaks of avian influenza A viruses in poultry. Seasonal human influenza A and B community outbreaks occur in temperate climates of the northern and southern hemisphere, and human influenza activity may occur year-round in subtropical and tropical regions. Outbreaks of human influenza can occur among travelers during any time of the year, including periods of low influenza activity in the United States (e.g., summer).

**Phases 1 through 3 (Limited Human Spread)**

Phases 1 through 3 range from no infection in humans to small clusters or limited human transmission. During these phases, the risk of human infection with a novel influenza virus is extremely low. The risk of human infection with human influenza viruses or other viruses is much higher in persons living in or traveling to affected areas.

**Phase 4 (Sustained Human-to-Human Spread)**

Human-to-human transmission of an animal or human-animal influenza reassortant virus is able to sustain community-level outbreaks and has been verified. During these phases, the risk of human infection with a novel influenza virus is elevated. The risk of human infection with human influenza viruses or other viruses is much higher in persons living in or traveling to affected areas.

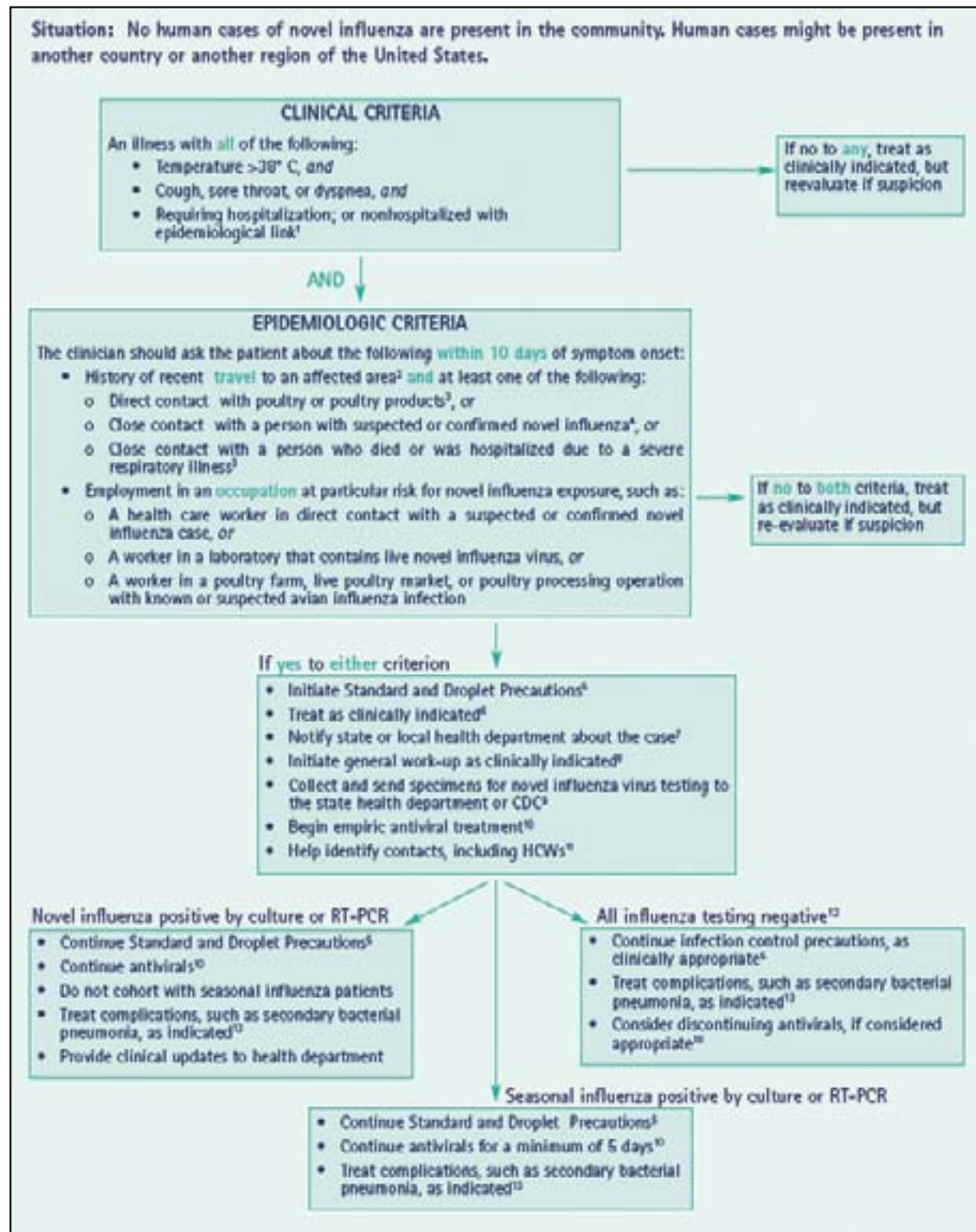
### Box 5.2. Clinical Evaluation of Patients with Influenza-like Illness during WHO Phases 1 through 4

- Patients who require hospitalization for an influenza-like illness for which a definitive alternative diagnosis is not immediately apparent\* should be questioned about:
  - travel to an area affected by influenza virus outbreaks in animals
  - direct contact with poultry
  - close contact with persons with suspected or confirmed novel influenza; or
  - occupational exposure to novel influenza viruses (such as through agricultural, health care, or laboratory activities).
- Patients may be screened on admission for recent seasonal influenza vaccination and pneumococcal vaccination. Those without a history of immunization should receive these vaccines before discharge, if indicated.
- Patients meeting the epidemiologic criteria for possible infection with a novel strain of influenza should undergo a routine diagnostic work-up, guided by clinical indications. Appropriate personal protective equipment should be used when evaluating patients with suspected novel influenza, including during collection of specimens.\*\*
- Diagnostic testing for a novel influenza virus should be initiated as follows:
  - Collect the following specimens as needed: nasopharyngeal swab, nasal swab, wash, or aspirate, throat swab, and tracheal aspirate (if intubated), and place into viral transport media and refrigerate at 4°C until specimens can be transported for testing.
  - Immediately contact the local and state health departments to report the suspected case and to arrange novel influenza testing by RT-PCR. RT-PCR testing is not available in all hospital laboratories and may be performed at a qualified laboratory such as the Arizona State Laboratory or the CDC Influenza Laboratory. Viral culture should be performed only at biosafety level 3 [BSL-3] with enhancements (see Supplement 2).
- Depending on the clinical presentation and the patient's underlying health status, other initial diagnostic testing might include:
  - Pulse oximetry
  - Chest radiograph
  - Coccidioidomycosis serology or culture
  - Complete blood count (CBC) with differential
  - Blood cultures
  - Sputum (in adults), tracheal aspirate, and pleural effusion aspirate (if an effusion is present) Gram stain and culture
  - Antibiotic susceptibility testing (encouraged for all bacterial isolates)
  - Multivalent immunofluorescent antibody testing or PCR of nasopharyngeal aspirates or swabs for common viral respiratory pathogens, such as influenza A and B, adenovirus, parainfluenza viruses, and respiratory syncytial virus, particularly in children
  - In adults with radiographic evidence of pneumonia, *Legionella* and pneumococcal urinary antigen testing
  - If clinicians have access to rapid and reliable testing (e.g., PCR) for *M. pneumoniae* and *C. pneumoniae*, adults and children <5 yrs with radiographic pneumonia should be tested.
  - Comprehensive serum chemistry panel, if metabolic derangement or other end-organ involvement such as liver or renal failure is suspected.

\*Further evaluation and diagnostic testing should also be considered for outpatients with strong epidemiologic risk factors and mild or moderate illness.

\*\*Health care personnel should wear surgical or procedure masks on entering a patient's room (Droplet Precautions), as well as gloves and gowns, when indicated (Standard Precautions) (see Supplement 4).

Figure 5.1. Case Detection and Clinical Management during WHO Phases 1 through 4

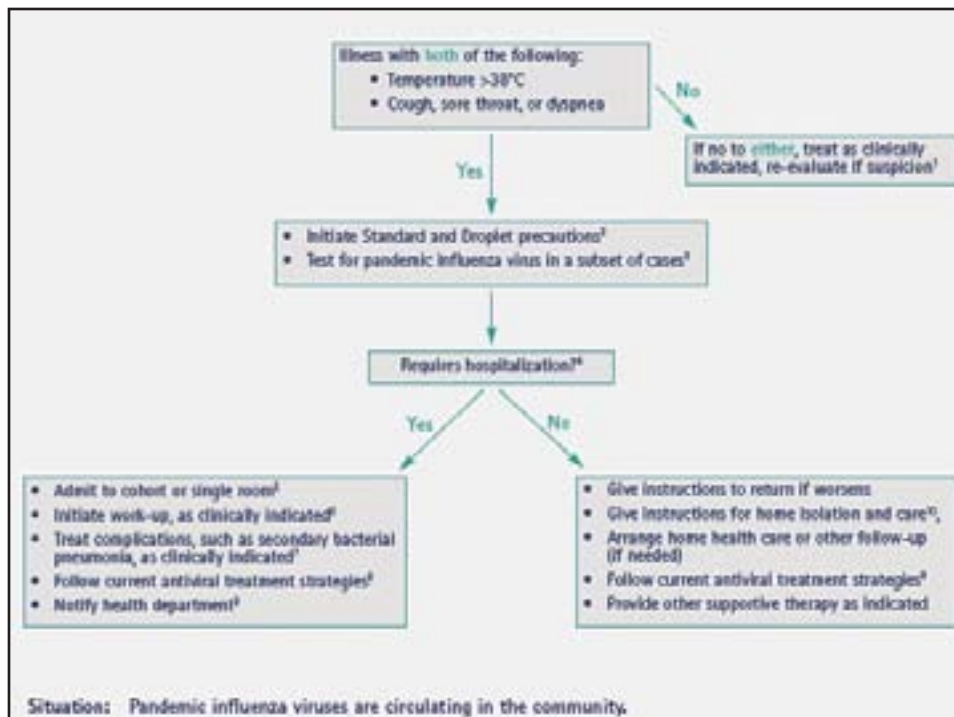


#### Footnotes to Figure 5.1:

1. Further evaluation and diagnostic testing should also be considered for outpatients with strong epidemiologic risk factors and mild or moderate illness. (See Box 5.2).
2. Updated information on areas where novel influenza virus transmission is suspected or documented is available on the CDC website at <http://wwwnc.cdc.gov/travel> and on the WHO website at [www.who.int/en/](http://www.who.int/en/).
3. For persons who live in or visit affected areas, close contact includes touching live poultry (well-appearing, sick or dead) or touching or consuming uncooked poultry products, including blood. For animal or market workers, it includes touching surfaces contaminated with bird feces. In recent years, most instances of human infection with a novel influenza A virus having pandemic potential, including influenza A (H5N1), are thought to have occurred through direct transmission from domestic poultry. A small number of cases are also thought to have occurred through limited person-to-person transmission or consumption of uncooked poultry products. Transmission of novel influenza viruses from other infected animal populations or by contact with fecally contaminated surfaces remains a possibility. These guidelines will be updated as needed if alternate sources of novel influenza viruses are suspected or confirmed.
4. Close contact includes direct physical contact, or approach within 3 feet (1 meter) of a person with suspected or confirmed novel influenza.
5. Standard and Droplet Precautions should be used when caring for patients with novel influenza or seasonal influenza (Table and Supplement 4). Information on infection precautions that should be implemented for all respiratory illnesses (i.e., Respiratory Hygiene/Cough Etiquette) is provided at: [www.cdc.gov/flu/professionals/infectioncontrol/resphgiene.htm](http://www.cdc.gov/flu/professionals/infectioncontrol/resphgiene.htm)
6. Hospitalization should be based on all clinical factors, including the potential for infectiousness and the ability to practice adequate infection control. If hospitalization is not clinically warranted, and treatment and infection control is feasible in the home, the patient may be managed as an outpatient. The patient and his or her household should be provided with information on infection control procedures to follow at home (Supplement 4). The patient and close contacts should be monitored for illness by local public health department staff.
7. Guidance on how to report suspected cases of novel influenza is provided in Supplement 1.
8. The general work-up should be guided by clinical indications. Depending on the clinical presentation and the patient's underlying health status, initial diagnostic testing might include:
  - Pulse oximetry
  - Chest radiograph
  - Coccidioidomycosis serology or culture
  - Complete blood count (CBC) with differential
  - Blood cultures
  - Sputum (in adults), tracheal aspirate, pleural effusion aspirate (if pleural effusion is present) Gram stain and culture
  - Antibiotic susceptibility testing (encouraged for all bacterial isolates)
  - Multivalent immunofluorescent antibody testing or PCR of nasopharyngeal aspirates or swabs for common viral respiratory pathogens, such as influenza A and B, adenovirus, parainfluenza viruses, and respiratory syncytial virus, particularly in children
  - In adults with radiographic evidence of pneumonia, Legionella and pneumococcal urinary antigen testing
  - If clinicians have access to rapid and reliable testing (e.g., PCR) for *M. pneumoniae* and *C. pneumoniae*, adults and children <5 yrs with radiographic pneumonia should be tested.
  - Comprehensive serum chemistry panel, if metabolic derangement or other end-organ involvement, such as liver or renal failure, is suspected See Box 5.2 for additional details.
9. Guidelines for novel influenza virus testing can be found in Supplement 2. All of the following respiratory specimens should be collected for novel influenza A virus testing: nasopharyngeal swab; nasal swab, wash, or aspirate; throat swab; and tracheal aspirate (for intubated patients), stored at 4° C in viral transport media; and acute and convalescent serum samples.
10. Strategies for the use of antiviral drugs are provided in Supplement 7.
11. Guidelines for the management of contacts in a health care setting are provided in Supplement 3.
12. Given the unknown sensitivity of tests for novel influenza viruses, interpretation of negative results should be tailored to the individual patient in consultation with the local health department. Novel influenza directed management may need to be continued, depending on the strength of clinical and epidemiologic suspicion. Antiviral therapy and isolation precautions for novel influenza may be discontinued on the basis of an alternative diagnosis. The following criteria may be considered for this evaluation:
  - Absence of strong epidemiologic link to known cases of novel influenza
  - Alternative diagnosis confirmed using a test with a high positive-predictive value
  - Clinical manifestations explained by the alternative diagnosis
13. Guidance on the evaluation and treatment of suspected post-influenza community-associated pneumonia is provided in Appendix 5.3.



**Figure 5.2. Case Detection and Clinical Management during WHO Phases 5 and 6**



**Footnotes to Figure 5.2:**

1. Antiviral therapy and isolation precautions for pandemic influenza should be discontinued on the basis of an alternative diagnosis only when both the following criteria are met:
  - Alternative diagnosis confirmed using a test with a high positive-predictive value, and
  - Clinical manifestations entirely explained by the alternative diagnosis
2. Standard and Droplet Precautions should be used when caring for patients with novel influenza or seasonal influenza (Table and Supplement 4). Information on infection precautions that should be implemented for all respiratory illnesses (i.e., Respiratory Hygiene/Cough Etiquette) is provided at: [www.cdc.gov/flu/professionals/infectioncontrol/resphgiene.htm](http://www.cdc.gov/flu/professionals/infectioncontrol/resphgiene.htm)
3. Guidance on laboratory testing during the Pandemic Period can be found in Supplement 2. Generally, specimens should include respiratory samples (e.g., nasopharyngeal wash/aspirate; nasopharyngeal, nasal or oropharyngeal swabs, or tracheal aspirates) stored at 4°C in viral transport media. Routine laboratory confirmation of clinical diagnoses will be unnecessary as pandemic activity becomes widespread in a community. CDC will continue to work with state health laboratories to conduct virologic surveillance to monitor antigenic changes and antiviral resistance in the pandemic virus strains throughout the Pandemic Period.
4. The decision to hospitalize should be based on a clinical assessment of the patient and the availability of hospital beds and personnel.
5. Guidelines on cohorting can be found in Supplement 4. Laboratory confirmation of influenza infection is recommended when possible before cohorting patients.
6. The general work-up should be guided by clinical indications. Depending on the clinical presentation and the patient's underlying health status, initial diagnostic testing might include:
  - Pulse oximetry
  - Chest radiograph
  - Coccidioidomycosis serology or culture
  - Complete blood count (CBC) with differential
  - Blood cultures
  - Sputum (in adults) or tracheal aspirate Gram stain and culture
  - Antibiotic susceptibility testing (encouraged for all bacterial isolates)
  - Multivalent immunofluorescent antibody testing of nasopharyngeal aspirates or swabs for common viral respiratory pathogens, such as influenza A and B, adenovirus, parainfluenza viruses, and respiratory syncytial virus, particularly in children



- In adults with radiographic evidence of pneumonia, Legionella and pneumococcal urinary antigen testing
  - If clinicians have access to rapid and reliable testing (e.g., PCR) for *M. pneumoniae* and *C. pneumoniae*, adults and children <5 yrs with radiographic pneumonia should be tested.
  - Comprehensive serum chemistry panel, if metabolic derangement or other end-organ involvement, such as liver or renal failure, is suspected See Box 5.2 for additional details.
7. Guidance on the evaluation and treatment of community acquired pneumonia and suspected post-influenza community-acquired bacterial pneumonia are provided in Appendix 5.3.
  8. Strategies for the use of antiviral drugs are provided in Supplement 7.
  9. Guidance on the reporting of pandemic influenza cases is found in Supplement 1.
  10. Patients with mild disease should be provided with standardized instructions on home management of fever and dehydration, pain relief, and recognition of deterioration in status. Patients should also receive information on infection control measures to follow at home (Supplement 4, Infection Control). Patients cared for at home should be separated from other household members as much as possible. All household members should carefully follow recommendations for hand hygiene, and tissues used by the ill patient should be placed in a bag and disposed of with other household waste. Infection within the household may be minimized if a primary caregiver is designated; ideally, someone who does not have an underlying condition that places them at increased risk of severe influenza disease. Although no studies have assessed the use of masks at home to decrease the spread of infection, using a surgical or procedure mask by the patient or caregiver during interactions may be beneficial. Separation of eating utensils for use by a patient with influenza is not necessary, as long as they are washed with warm water and soap. Additional information on measures to limit the spread of pandemic influenza in the home and community can be found in Supplement 4 and Supplement 8.

Figure 5.3. Management of Community-Acquired Pneumonia during an Influenza Pandemic: Adults

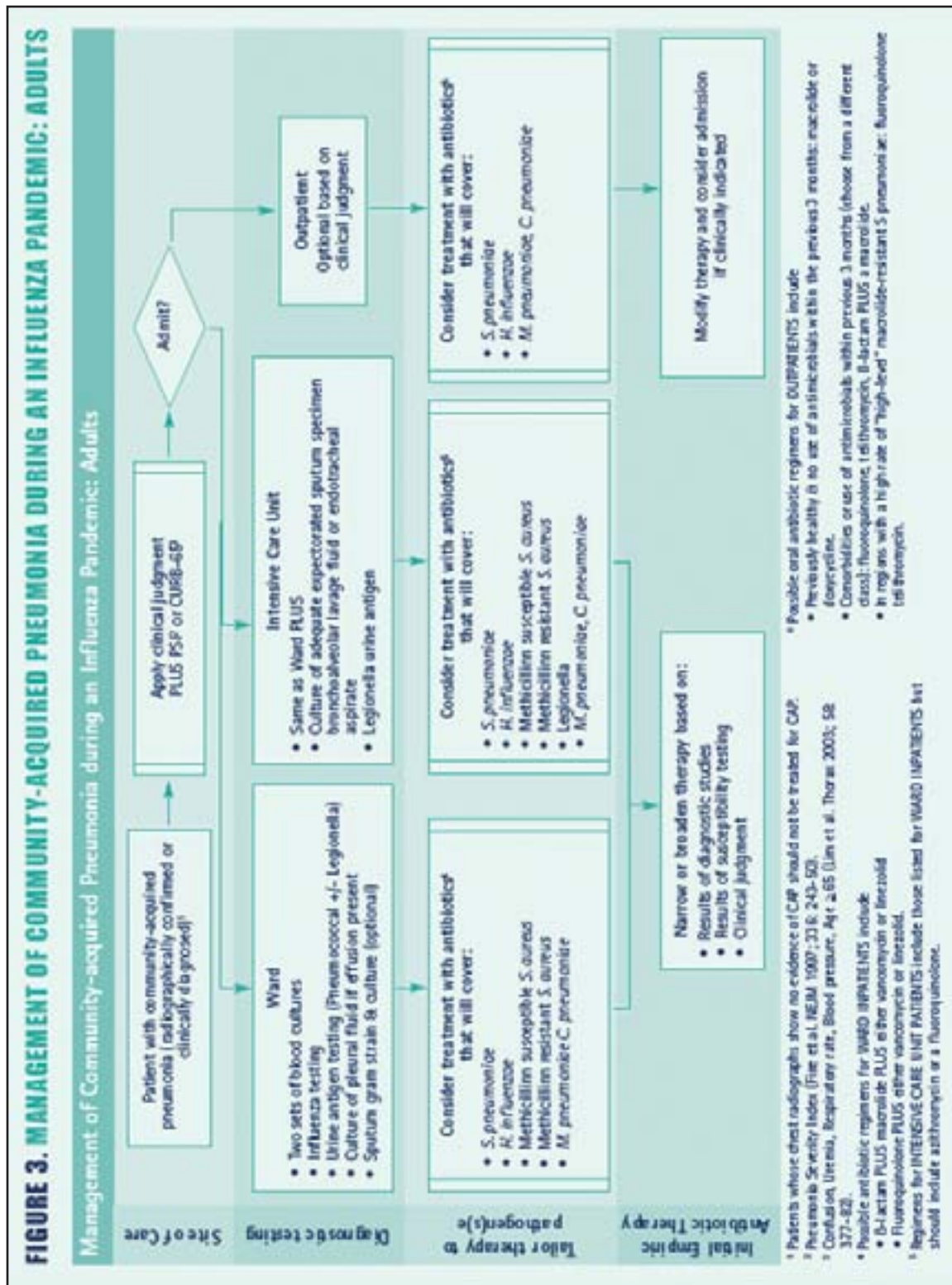
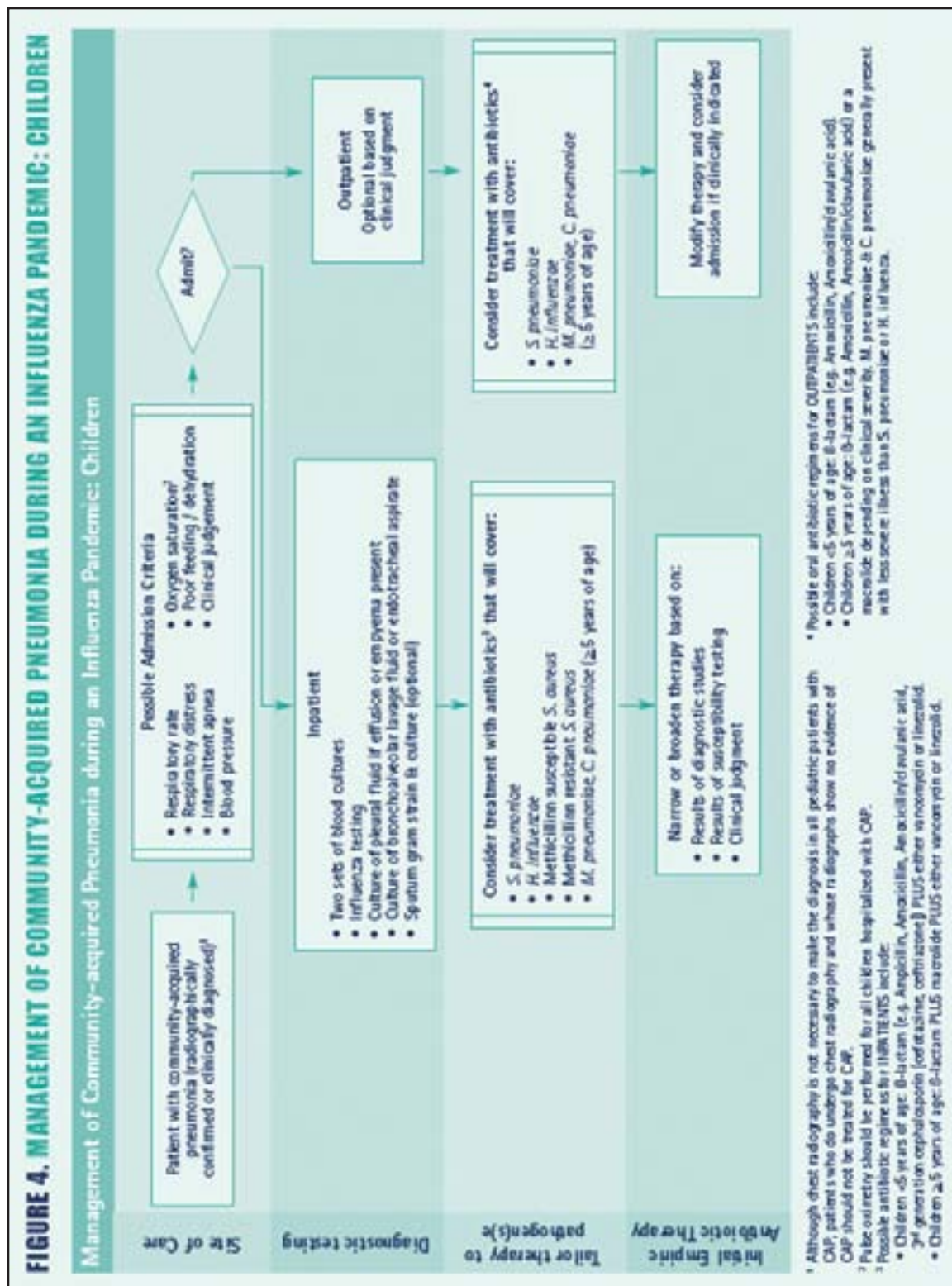


Figure 5.4: Management of Community Acquired Pneumonia during an Influenza Pandemic: Children



## **Appendix 5.1**

### **Clinical Presentation and Complications of Seasonal Influenza**

Although often quite characteristic, the clinical picture of seasonal influenza can be indistinguishable from illness caused by other respiratory infections. The frequent use of non-specific terms such as “flu” and “influenza-like illness” makes the clinical diagnosis of influenza even more indefinite. Even when the diagnosis of influenza is confirmed, management can be challenging, as influenza virus infection can result in subclinical infection, mild illness, uncomplicated influenza, or exacerbation of underlying chronic conditions to fulminant deterioration, and can result in a wide variety of complications.

This appendix provides a brief description of the common presentations and complications of seasonal human influenza. Novel and pandemic influenza viruses might, however, cause quite different clinical syndromes than seasonal influenza. For instance, seasonal influenza-related complications more commonly affect those at the extremes of age, whereas previous pandemics resulted in disproportionate morbidity and mortality in young and previously healthy adults. It will be essential to describe and disseminate the clinical features of novel or pandemic influenza cases as soon as they are identified.

#### **Presentation of Seasonal Influenza**

- A typical case of uncomplicated seasonal influenza begins abruptly and is manifested by systemic symptoms such as fever, chills, myalgias, anorexia, headache, and extreme fatigue. Fever typically lasts 2–3 days and usually reaches 38–40°C, but can be higher (particularly in children).
- Respiratory tract symptoms such as nonproductive cough, sore throat, and upper respiratory congestion occur at the same time, although these may be overshadowed by systemic complaints.
- Physical examination typically reveals fever, weakness, mild inflammation of the upper respiratory tract, and rare crackles on lung examination, but none of these findings is specific for influenza.
- In uncomplicated illness, major symptoms typically resolve after a limited number of days, but cough, weakness, and malaise can persist for up to 2 weeks.
- In the elderly and in infants, the presenting signs can include respiratory symptoms with or without fever, fever only, anorexia only, lassitude, or altered mental status. In children, fevers are often higher than in adults and can lead to febrile seizures. Gastrointestinal manifestations (e.g., vomiting, abdominal pain, diarrhea) occur more frequently in children. Fever or apnea without other respiratory symptoms might be the only manifestations in young children, particularly in neonates.

At times, influenza can be difficult to distinguish from illnesses caused by other respiratory pathogens on the basis of symptoms alone. Fever and cough, particularly in combination, are modestly predictive of influenza in unvaccinated adults, as is the combination of fever, cough, headache, and pharyngitis in children.

Other constitutional signs and symptoms, such as chills, rigors, diaphoresis, and myalgias, are also suggestive. The positive predictive value of any clinical definition is strongly dependent on the level of influenza activity and the presence of other respiratory pathogens in the community.

#### **Routine laboratory findings for seasonal influenza**

No routine laboratory test results are specific for influenza. Leukocyte counts are variable. Severe leukopenia and thrombocytopenia have been described in fulminant cases. Leukocytosis of >15,000 cells/ml should raise suspicion for a secondary bacterial process. Comprehensive laboratory testing might reveal other influenza-related complications (see Complications below).

#### **Differential diagnosis**

The fever and respiratory manifestations of seasonal influenza are not specific and can occur with several other pathogens, such as respiratory syncytial virus (RSV), parainfluenza viruses, adenoviruses, human metapneumovirus, rhinoviruses, coronaviruses, and *Mycoplasma pneumoniae*.



In contrast to influenza, most of these pathogens do not usually cause severe disease, particularly in previously healthy adults. However, RSV and parainfluenza viruses can lead to severe respiratory illness in young children and the elderly and should be considered in the differential diagnosis if circulating in the community. Even if an alternate etiology is determined, viral or bacterial co-infections can still be a possibility.

Often the clinician can diagnose seasonal influenza with reasonable certainty in the absence of laboratory testing due to the tendency for influenza to occur in community epidemics and to affect persons of all ages. Nevertheless, a definitive diagnosis requires laboratory testing.

Rapid influenza diagnostic tests and immunofluorescence testing using a panel of respiratory pathogens aid in the clinical management of patients with suspected influenza. Further information on diagnostic testing for influenza can be found at <http://www.cdc.gov/flu/professionals/diagnosis/>.

## Complications

### Groups recommended for vaccination

Each year, the Advisory Committee on Immunization Practices (ACIP) publishes recommendations for prevention and control of seasonal influenza (see Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP). Please reference the current seasonal ACIP guidelines when making decisions regarding groups recommended for vaccination. The 2010 guidelines: MMWR, Early Release, 2010; 59: 1-62 <http://www.cdc.gov/vaccines/pubs/ACIP-list.htm#flu>).

### Types of influenza complications

1. Respiratory exacerbations. Worsening of underlying chronic diseases are the most common serious complications of influenza. Complications are frequently related to underlying respiratory disease, such as chronic obstructive pulmonary disease (COPD). In some cases, typical influenza symptoms might be brief or minimal compared to the exacerbation of the underlying disease, particularly in the elderly.
2. Secondary bacterial pneumonia. This common complication is characterized by an initial improvement in influenza symptoms over the first few days followed by a return of fever, along with a productive cough and pleuritic chest pain. Findings include lobar consolidation on chest x-ray and, in adults, sputum smears positive for leukocytes and bacteria. The most commonly isolated pathogens are *Streptococcus pneumoniae*, *Staphylococcus aureus*, group A *Streptococcus*, and *Haemophilus influenzae*.
3. Primary influenza viral pneumonia. A prominent feature of previous influenza pandemics, primary influenza viral pneumonia is currently a relatively rare outcome of seasonal influenza in adults. In contrast, children with pneumonia are more likely to have a viral etiology, including influenza than a bacterial cause. Primary influenza pneumonia usually begins abruptly, with rapid progression to severe pulmonary disease within 1–4 days. Physical and radiologic findings are consistent with diffuse interstitial and/or alveolar disease, including bilateral inspiratory crackles on auscultation and diffuse pulmonary infiltrates on chest radiographs. Hypoxia and hemoptysis indicate a poor prognosis, and recovery can take up to 1–2 weeks.
4. Mixed viral-bacterial pneumonia. This is slightly more common than primary viral pneumonia, and, although mixed pneumonia may have a slower progression, the two are often indistinguishable. Bacterial pathogens in mixed infections are similar to those found in secondary bacterial pneumonias.
5. Bronchiolitis due to influenza. This occurs more commonly in children, with a clinical picture similar to that of RSV or parainfluenza virus infections.
6. Croup. Influenza can cause croup (laryngotracheobronchitis) in children, and, although influenza viruses are a less common etiology than other respiratory viruses, the illness can be more severe.
7. Otitis media & sinusitis. Children with influenza can also develop otitis media, due to either direct viral infection or secondary bacterial involvement. Similarly, bacterial sinusitis can develop in older children and adults with influenza.

8. Cardiovascular complications. A range of cardiovascular problems can occur, most commonly as an exacerbation of an underlying condition such as congestive heart failure. Pregnant women and children with congenital heart defects can also experience worsening cardiac function during an influenza illness. Cardiac inflammation, such as myocarditis and pericarditis, can be found occasionally, although clinical manifestations are rare. Available reports suggest that myocarditis might have occurred more frequently during pandemic years. Influenza virus is not typically identified in heart tissue, suggesting that the host inflammatory response might play a role. Although influenza has been associated in rare instances with sudden death possibly due to cardiac arrhythmia, this outcome has been difficult to investigate.
9. Gastrointestinal symptoms. Gastrointestinal involvement is uncommon with seasonal influenza, although more commonly reported in children. Manifestations can include vomiting and diarrhea, sometimes leading to significant dehydration. Transient hepatic inflammation can occur in rare circumstances.
10. Myositis related to influenza. This is another complication more commonly found in children. It is also more frequently associated with influenza B than with influenza A. Involvement may be limited to pain and weakness of the lower extremities but sometimes can progress to rhabdomyolysis and renal failure.
11. Encephalopathy. Influenza-associated encephalopathy, characterized by an acute alteration in mental status within the first few days of fever onset, is a recently recognized complication of influenza in children. Most reports of influenza-associated encephalopathy have been in Japanese children, but the condition has been reported sporadically in other countries, including the United States. The syndrome can include seizures, neurologic deficits, obtundation, and coma. While most children recover completely, some cases can result in permanent sequelae or death. This condition might be due to an abnormal host inflammatory response without viral infection of the central nervous system.
12. Other neurologic complications. Uncomplicated self-limited febrile seizures can occur with high fever, usually occurring in younger children. Guillain-Barré syndrome and transverse myelitis have been reported to occur in very rare instances after influenza, but no definite etiologic relationship has been established.
13. Reye syndrome. This is characterized by an acute encephalopathy combined with hepatic failure in the absence of inflammation in either the brain or the liver. Hepatic involvement includes fatty infiltration, hypoglycemia, and hyperammonemia, whereas neurologic manifestations include cerebral edema, delirium, coma, and respiratory arrest. Reye syndrome was found to be associated with the use of aspirin in children; its incidence has decreased dramatically since the 1980s after aspirin use was discouraged in children.
14. Systemic complications. Seasonal influenza can be associated with systemic symptoms, such as sepsis and shock. Sepsis caused by invasive co-infection with *Staphylococcus aureus*, including methicillin-resistant *S. aureus* (MRSA), or other bacteria, such as *Neisseria meningitidis*. Toxic shock syndrome without bacterial co-infection has also been reported.



## **Appendix 5.2**

### **Clinical Presentation and Complications of Illnesses Associated With Avian Influenza A (H5N1) and Previous Pandemic Influenza Viruses**

Human infections with different avian influenza A viruses have emerged and caused mild to severe illness in recent years, including H9N2, H7N7, H7N3, and H7N2. One novel subtype, influenza A (H5N1), has repeatedly caused limited outbreaks of severe and fatal human disease in recent years and therefore has been of particular concern.

#### **Human infection with avian influenza A (H5N1)**

The H5N1 subtype first came to widespread public attention in 1997, when a poultry outbreak of highly pathogenic avian influenza A (H5N1) in Hong Kong caused illness in 18 humans. These cases were the first identified instances of direct avian-to-human transmission of an avian influenza A virus that led to severe disease.

Clinical features ranged from asymptomatic infection or mild upper respiratory symptoms to severe pneumonia and death. Most cases presented with fever, headache, malaise, myalgia, sore throat, cough, and rhinorrhea; a few persons also had conjunctivitis or gastrointestinal distress. Seven persons, mostly children, developed only mild upper respiratory infections, whereas 11 developed severe primary viral pneumonia with rapid deterioration. Most patients in this latter group developed lymphopenia; six developed acute respiratory distress syndrome (ARDS), and five developed multi-organ system failure. Other abnormalities included pulmonary hemorrhage, renal dysfunction, liver failure, pancytopenia, hemophagocytosis, and Reye syndrome (with aspirin ingestion). Notably, none of the patients had secondary bacterial pneumonia. Six of the 18 infected persons eventually died.

Avian influenza A (H5N1) resurfaced in Hong Kong in February 2003, in a father and son returning from Fujian Province, China. Both presented with influenza-like symptoms, chest radiograph abnormalities, and lymphopenia. The father's status rapidly deteriorated, and he developed severe lung involvement and hemophagocytosis; the 8-year-old son recovered. Of note, the father's 7-year-old daughter had also died of a pneumonia-like illness while in China, but the cause of her illness was not determined. The boy reported close contact with live chickens during his visit to China, but no definite source for H5N1 was found.

The most recent human outbreak of avian influenza A (H5N1) has been ongoing since December 2003. This outbreak has been associated with an extensive H5N1 epizootic among poultry in Asia. Transmission continues to be predominantly from birds to humans, although a few instances of limited human-to-human transmission have been suspected.

Reports published from Vietnam and Thailand describe the early confirmed H5N1 cases from this outbreak. These reports characterize human illness with avian influenza A (H5N1) virus infection as a primarily respiratory febrile illness that progresses to severe disease in a high proportion of cases. Among 10 Vietnamese patients,<sup>1</sup> all were previously healthy children or young adults (mean age, 13.7 years) who presented to medical attention with fever, cough, and dyspnea. None of the patients had other respiratory symptoms, such as sore throat or rhinorrhea, but seven developed diarrhea. Significant lymphopenia was observed in all 10 cases, and moderate thrombocytopenia occurred. All 10 had marked abnormalities on chest radiograph, and eight patients—all of whom eventually died—required mechanical ventilation for respiratory failure. Respiratory cultures suggested bacterial pneumonia in two patients.

Of 12 cases described from Thailand,<sup>2</sup> seven were aged <14 years, and all but one were previously healthy. All of the patients developed fever, cough, and dyspnea, and six patients were reported with myalgia and diarrhea. Decreased leukocyte counts were reported in seven cases, thrombocytopenia occurred in four cases, and increased serum liver enzymes were found in eight. All patients had negative blood cultures. They all had abnormal chest radiographs; nine developed respiratory failure with ARDS, whereas five developed cardiac failure, four had renal failure, and eight ultimately died. In the Vietnamese and Thai cases, respiratory deterioration occurred a median of 5 days after symptom onset, but the range was quite wide.

<sup>1</sup> Tran TH, Nguyen TL, Nguyen TD, Luong TS, Pham PM, Nguyen VC, et al. Avian influenza A (H5N1) in 10 patients in Vietnam. *N Engl J Med*. 2004;350:1179-88.

<sup>2</sup> Chotpitayasunondh T, Ungchusak K, Hanshaoworakul W, Chunsuthiwat S, Sawanpanyalert P, Kijphati R, et al. Human disease from influenza A (H5N1), Thailand, 2004. *Emerg Infect Dis*. 2005;11:201-9.

Whereas all patients described above presented with pulmonary symptoms, subsequently published case reports suggest that other clinical syndromes can occur with H5N1 infection.<sup>3,4,5</sup> In one report, a 39-year-old female with confirmed H5N1 from Thailand was initially admitted with symptoms of fever, vomiting, and diarrhea, and was found to have significant lymphopenia. She developed shortness of breath approximately 12 days after illness onset and soon progressed to ARDS and death.

A 4-year-old male from Vietnam presented for medical attention with severe diarrhea, developed acute encephalitis with coma, and died soon thereafter. Although avian influenza A (H5N1) was later detected in throat, stool, serum, and cerebrospinal fluid specimens, the patient had no respiratory symptoms at presentation. This patient's 9-year-old sister died of a similar illness a few days before his illness began, but no H5N1 testing was performed. Asymptomatic H5N1 infection, detected by seroconversion, has been reported. Updated information on avian influenza can be found at [http://www.who.int/csr/disease/avian\\_influenza/en/](http://www.who.int/csr/disease/avian_influenza/en/).

### **Illnesses associated with previous pandemic viruses**

Since most people do not have previous immunity to novel influenza A viruses, an influenza pandemic results in an increased rate of severe disease in a majority of age groups. Nevertheless, the three pandemics of the past century demonstrated significant variability in terms of morbidity.

The 1918–19 pandemic was particularly notable in affecting young, healthy adults with severe illness. A significant proportion of patients developed fulminant disease, accompanied by a striking perioral cyanosis, leading to death within a few days. Postmortem examinations in these patients frequently revealed denuding tracheobronchitis, pulmonary hemorrhage, or pulmonary edema. Others survived the initial illness, only to die of a secondary bacterial pneumonia, usually due to *Streptococcus pneumoniae*, *Staphylococcus aureus*, group A *Streptococcus*, or *Haemophilus influenzae*.

The clinical features of the subsequent pandemics of 1957–58 and 1968–69 were also typical of influenza-like illness, including fever, chills, headache, sore throat, malaise, cough, and coryza, but were milder compared to the 1918–19 pandemic. On a population level, the impact of influenza in 1957–58 was only one-tenth that observed in 1918–19, and the excess death rate in 1968–69 was only half that observed during 1957–58. However, death rates were elevated among the chronically ill and the elderly, and the occurrence of severe complications, such as primary viral pneumonia, was notably increased in healthy young adults during the 1957–58 pandemic, particularly in pregnant women.

### **Implications for the next pandemic**

The characteristic clinical features of the next influenza pandemic cannot be predicted. It is reasonable to assume that most affected persons will have the typical features of influenza (e.g., fever, respiratory symptoms, myalgia, malaise). However, past pandemics have varied considerably with regard to severity and associated complications.

Illnesses caused by novel influenza viruses such as avian influenza A (H5N1) might predict the potential characteristics of pandemic influenza, but H5N1 has not adapted to spread easily among humans, and its presentation and severity might change as the virus evolves. Even as the next pandemic begins and spreads, the characteristic features might change, particularly if successive waves occur over several months.

Given this potential for a dynamic clinical picture, it will be important for clinicians and public health partners to work together to disseminate updated and authoritative information to the health care community on a regular basis.

<sup>3,4,5</sup> de Jong MD, Bach VC, Phan TQ, Vo MH, Tran TT, Nguyen BH, et al. Fatal avian influenza A (H5N1) in a child presenting with diarrhea followed by coma. *N Engl J Med*. 2005;352:686-91.  
Apisarnthanarak A, Kitphati R, Thongphubeth K, Patoomanunt P, Anthanont P, Auwanit W, et al. Atypical avian influenza (H5N1). *Emerg Infect Dis* 2004;10:1321-4  
Beigel JH, Farrar J, Hayden FG, Hyer R, de Jong MD, Lochindrat S, et al. Avian influenza A (H5N1) infection in humans. *N Engl J Med*. 2005 Sep 29;353(13):1374-85.

## Appendix 5.3

### Guidelines for Management of Community-Acquired Pneumonia, Including Post-Influenza Community-Acquired Pneumonia

#### Rationale

Post-influenza bacterial community-acquired pneumonia will likely be a common complication during the next pandemic and might affect approximately 10% of persons with pandemic influenza, based on data from previous influenza pandemics. Assuming that pandemic influenza will affect about 15%–35% of the U.S. population, approximately 4.4 to 10.2 million cases of post-influenza bacterial community-acquired pneumonia could occur.

Post-influenza bacterial community-acquired pneumonia often presents as a return of fever, along with a productive cough and pleuritic chest pain, after an initial improvement in influenza symptoms over the first few days. Findings include lobar consolidation on chest x-ray and, in adults, sputum smear positive for leukocytes and bacteria. As with other bacterial infections, leukocytosis with increased immature forms may be present, but this finding is neither sensitive nor specific.

The most common etiologies of post-influenza bacterial pneumonia are *Streptococcus pneumoniae*, *Staphylococcus aureus* (including *Methicillin Resistant Staphylococcus Aureus* (MRSA)), group A *Streptococcus*, and *Haemophilus influenzae*.

Primary viral pneumonia, with abrupt onset and rapid progression, is more common than bacterial pneumonia in children, yet rare in adults. Physical and radiologic findings in viral pneumonia are consistent with interstitial and/or alveolar disease and include bilateral inspiratory crackles and diffuse infiltrates.

Mixed viral-bacterial pneumonia is slightly more common than primary viral pneumonia, but they are often indistinguishable. Bacterial pathogens in mixed infections are similar to those found in secondary bacterial pneumonias.

Droplet and Standard Precautions are currently recommended for community-acquired pneumonia of bacterial etiology.<sup>1</sup>

Treatment of community-acquired pneumonia, including post-influenza bacterial community-acquired pneumonia will pose challenges for clinicians during a pandemic. Secondary bacterial pneumonia following influenza virus infection will be difficult to distinguish from community-acquired pneumonia that is not preceded by influenza.

Current guidelines for the treatment of adult community-acquired pneumonia (CAP) during WHO Phases 1-4 de-emphasize the use of diagnostic testing for pathogen-directed treatment and favor empiric therapy with safe and effective broad-spectrum antibacterials, especially extended-spectrum macrolides and fluoroquinolones. However, these antibacterials will likely be in short supply during a pandemic.

The guidelines in this appendix are therefore designed to assist clinicians in managing patients with community-acquired pneumonia, including post-influenza bacterial community-acquired pneumonia, in a setting of high patient volume and limited clinical resources, where the pressure to treat empirically will likely be even greater.

These recommendations have been updated from the November 2005 HHS Pandemic Influenza Plan (<http://www.hhs.gov/pandemicflu/plan/pdf/HHSPandemicInfluenzaPlan.pdf>). For adults, the guidance draws heavily from the current draft guidelines for the management of CAP developed jointly by the Infectious Diseases Society of America (IDSA)<sup>2</sup> and the American Thoracic Society (ATS).<sup>3</sup> For children, the guidance incorporates recommendations from the British Thoracic Society (BTS),<sup>4</sup> a published review<sup>5</sup> and expert opinions.

<sup>1</sup> Centers for Disease Control and Prevention. Guidelines for preventing health-care-associated pneumonia, 2003 recommendations of CDC and the Health care Infection Control Practices Advisory Committee. *Respir Care*. 2004;49(8):926-39.

<sup>2</sup> Mandell LA, Bartlett JG, Dowell SF, File TM Jr, Musher DM, Whitney C; Infectious Diseases Society of America. Update of practice guidelines for the management of community-acquired pneumonia in immunocompetent adults. *Clin Infect Dis*. 2003; 37(11):1405-33.

<sup>3</sup> Niederman MS, Mandell LA, Anzueto A, Bass JB, Broughton WA, Campbell GD, et al. American Thoracic Society. Guidelines for the management of adults with community-acquired pneumonia. Diagnosis, assessment of severity, antimicrobial therapy, and prevention. *Am J Respir Crit Care Med*. 2001;163(7):1730-54.

<sup>4</sup> British Thoracic Society Standards of Care Committee. British Thoracic Society guidelines for the management of community acquired pneumonia in childhood. *Thorax*. 2002;57(suppl 1):i1-24.

<sup>5</sup> McIntosh, K. Community-acquired pneumonia in children. *N Engl J Med*. 2002;346:429-37.

## Prevention

Efforts to maximize vaccination coverage against *Streptococcus pneumoniae* are an important component of post-influenza bacterial community-acquired pneumonia prevention. Current guidelines on the use of the 23-valent pneumococcal polysaccharide vaccine among adults<sup>6</sup> and the 7-valent and 13-valent pneumococcal conjugate vaccine among children<sup>7</sup> are available.

## Site of care: inpatient versus outpatient

### Adults

IDSA-ATS draft guidelines recommend the use of severity scores, such as the Pneumonia PORT Severity Index (PSI) and the CURB-65 system, to determine which patients can be safely treated as outpatients (Tables 2–5). The use of these or other similar systems could be extremely important during the next pandemic, as hospital beds will be in short supply. However, these systems should be used to supplement rather than replace the judgment of the individual clinician.

### Children

Current guidelines provide indicators for hospitalization of children with CAP. For infants, the indications include temperature >38.5 C, respiratory rate (RR) >70 breaths per minute, chest retractions (indrawing), nasal flaring, hypoxia, cyanosis, intermittent apnea, grunting, and poor feeding. Indications for hospitalization among older children include temperature >38.5 C, RR >50, chest retractions, nasal flaring, hypoxia, cyanosis, grunting, and signs of dehydration.

As with pandemic influenza, the decision to hospitalize for post-influenza bacterial community-acquired pneumonia during WHO Phases 5 and 6 will rely on the physician's clinical assessment of the patient as well as availability of personnel and hospital resources. Although an unstable patient will be considered a high priority for admission, patients with certain high-risk conditions (see Appendix 5.1) might also warrant special attention. Home management with follow-up might be appropriate for well-appearing young children with fever alone.

## Diagnostic testing

### Adults

Generally, the etiologies associated with CAP will continue to occur during a pandemic. Familiarity with the appropriate use of available diagnostic tests is therefore a key feature of clinical preparedness.

1. Look for *S. pneumoniae* and *S. aureus* (MRSA). Draft IDSA-ATS guidelines recommend obtaining appropriate specimens for etiologic diagnosis whenever such an etiology would alter clinical care. Since the most common etiologies of post-influenza bacterial pneumonia are *Streptococcus pneumoniae*, *Staphylococcus aureus* (including *Methicillin Resistant Staphylococcus Aureus* (MRSA)), group A *Streptococcus*, and *Haemophilus influenzae* and are treated differently, diagnostic testing should be performed to the extent feasible to distinguish among these pathogens.
2. Do additional tests for hospitalized patients.
  - a. Blood cultures, pneumococcal urine antigen testing, and pleural fluid aspiration with Gram stain and culture should be considered.
  - b. Since sputum Gram stain and culture are highly dependent on patient and technical conditions, these are considered optional for hospitalized but non-severe patients.
  - c. For patients admitted to an ICU, consider aspiration of endotracheal secretions for Gram stain and bacterial culture.

<sup>6</sup> CDC. Prevention of pneumococcal disease: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Morb Mortal Wkly Rep. 1997;46(RR-8).

<sup>7</sup> Prevention of pneumococcal disease among infants and young children: recommendations of the Advisory Committee on Immunization Practices. MMWR Morb Mortal Wkly Rep. 2000;49(RR-9).

## **Children**

Diagnostic studies for identifying bacterial pneumonia in young children are severely limited.

1. Blood cultures should be obtained from all children suspected of having post-influenza bacterial community-acquired pneumonia.
2. Sputum samples are rarely useful in children. However, if tracheal or pleural fluid aspirates are available, they should be submitted for Gram stain and bacterial culture.
3. If pleural effusions are present, they should be aspirated and submitted for Gram stain and culture.
4. Test antibiotic susceptibility testing of any bacterial isolates to direct treatment, where feasible.

## **Antibiotic treatment**

### **Adults and children**

Antibiotics may be in short supply during the pandemic, particularly those needed to treat CAP. Therefore, use of empiric therapy for all persons with post-influenza bacterial community-acquired pneumonia may not be feasible.

1. Antimicrobial therapy is best managed by culture and susceptibility testing of appropriate clinical specimens, and by awareness of local antibiotic susceptibility patterns. (See Figures 1 and 2 for additional clinical management algorithms and information.)
2. A history of a preceding influenza-like illness, especially when pandemic influenza is circulating in the community, might help to select those patients more likely to have viral rather than bacterial respiratory infection.
3. Empiric therapy should be directed toward the most likely etiologies of post-influenza bacterial community-acquired pneumonia.
4. Concurrent antiviral treatment should also be considered, depending on the timing and presentation of illness, the clinical status of the patient, and the availability of antivirals (see Supplement 7, Antiviral Drug Distribution and Use).

**Appendix 5.3. Table 2.  
Pneumonia PORT Severity Index (PSI) Calculation**

Patient Characteristic	Points Assigned
Demographic Factor	
Age	Number of years
Male      Female	Number of years–10
Nursing home resident	+10
Comorbid illnesses	
Neoplastic disease	+30
Liver disease	+20
Congestive heart failure	+10
Cerebrovascular disease	+10
Renal disease	+10
Physical examination finding	
Altered mental status	+20
Respiratory rate >30 breaths/minute	+20
Systolic blood pressure <90 mm Hg	+20
Temperature <35 C or >40 C	+15
Pulse >125 beats/minute	+10
Laboratory and /or radiographic finding	
Arterial pH <7.35	+30
Blood urea nitrogen >30 mg/dl	+20
Sodium <130mmol/l	+20
Glucose >250 mg/dl	+10
Hematocrit <30%	+10
Hypoxemia: <90% by pulse oximetry OR <60mm Hg by arterial blood gas	+10
Pleural effusion on baseline radiograph	+10



**Appendix 5.3. Table 3.  
Pneumonia Severity Index Risk Classification**

PSI Risk Class	Characteristics and Points	Recommended Site of Care
I	Age >50 years + no comorbid conditions, normal range vital signs, normal mental status	Outpatient
II	<70	Outpatient
III	71–90	Outpatient / Brief inpatient
IV	91–130	Inpatient
V	130	Inpatient

**Appendix 5.3. Table 4.  
CURB-65 Scoring System**

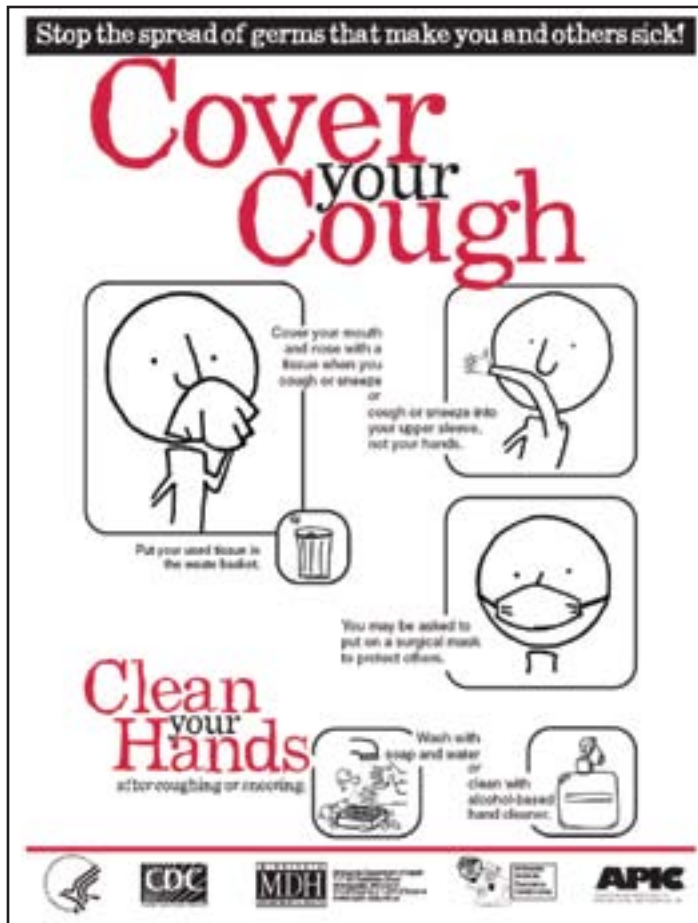
Characteristic	Points
Confusion <sup>1</sup>	+1
Urea >7mmol/l (20mg/dl)	+1
Respiratory rate >30 breaths per minute	+1
Blood pressure (Systolic <90 or diastolic <60 mm Hg)	+1
Age >65 years	+1

<sup>1</sup> Based on a specific mental test or disorientation to person, place, or time.

**Appendix 5.3. Table 5.  
Recommended site of care based on CURB-65 system**

Number of Points	Recommended Site of Care
0–1	Outpatient
2	Admit to medical ward
3–5	Admit to medical ward or ICU

**Appendix 5.4:  
Respiratory Etiquette Posters**



# Arizona Pandemic Influenza Response Plan

## *Supplement 6: Vaccine Distribution and Use*





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## **I. Rationale**

The initial response to an influenza pandemic will include medical care, community containment, personal protective measures, and targeted use of antiviral drugs. Before a vaccine containing the circulating pandemic virus strain becomes available, pre-pandemic vaccine from stockpiles (if available for the pandemic subtype or partially cross-protective to the circulating virus) may be considered for persons in designated priority groups. Once a vaccine against the circulating pandemic virus strain becomes available, its distribution and delivery will be a major focus of pandemic response efforts. Public health goals for vaccination during an influenza pandemic include:

- Developing pre-pandemic strategies for vaccine manufacturing and stockpiling that will maximize manufacturing capability
- Stockpiling influenza vaccine for strains and subtypes with pandemic potential
- Expediting development of a pandemic virus reference strain and distribution of the strain to vaccine manufacturers
- Accelerating production of a pandemic vaccine
- Maximizing the immune response to the vaccine
- Ensuring efficient and equitable distribution of pandemic vaccine, according to identified priority populations
- Rapidly determining vaccine effectiveness
- Providing ongoing and timely monitoring of vaccine coverage
- Providing ongoing and timely monitoring of vaccine safety
- Licensing the vaccine and/or establishing alternate use policies (Emergency Use Authorizations and Investigational New Drug protocols).

ADHS goals for vaccination are:

- Communicating the benefits of vaccine for priority groups
- Securing sufficient quantities of vaccine for priority groups
- Ensuring equitable distribution of vaccine to providers serving priority groups
- Communicating vaccine ordering status, storage and handling requirements, and policy and administrative solutions regarding insurance, vaccine licensing, and administration fees to the provider community
- Coordinating, brokering, distributing and delivering vaccine to identified public and private providers, retail pharmacies local health departments and community vaccinators based on need
- Facilitating special immunization clinics for easy access by the priority groups, the vulnerable, and hard-to-reach population
- Developing and implementing a reporting system for data collection and vaccine usage and effectiveness according to set protocols
- Collecting data and reporting any adverse events following vaccination
- Ensuring the safe return and disposal of unused or expired vaccines

## **II. Overview**

Supplement 6 provides recommendations to state and local partners and other stakeholders on planning for the various elements of a pandemic influenza vaccination program. The recommendations for the WHO Phases 1-4 focus on planning for vaccine distribution, vaccination of priority groups, monitoring of adverse events, tracking of vaccine supply and administration, vaccine coverage and effectiveness, communications, legal preparedness, and training. The recommendations for the WHO Phases 5 and 6 focus on working with healthcare partners to implement plans for vaccination against pandemic influenza and initiate monitoring activities. Additional issues that might be of interest to healthcare partners that administer vaccine are addressed in Supplement 3.



### **III. Actions for WHO Phases 1-4 (Limited Human Spread to Sustained Human-to-Human Spread)**

#### **A. Summary of public health roles and responsibilities**

##### **HHS agencies**

- Work with manufacturers to expedite public-sector vaccine purchasing contracts during a pandemic and establish mechanisms for vaccine procurement and distribution.
- Develop guidance on priority groups for vaccination.
- Develop and stockpile vaccine for influenza strains with pandemic potential.
- Expedite the rapid development, licensure, and production of new influenza vaccines, as well as evaluate dose optimization strategies to maximize use of limited vaccine stocks.
- Estimate rates of reports of mild and severe adverse events following immunization (AEFIs).
- Identify mechanisms and define protocols for conducting vaccine-effectiveness studies.
- Develop reporting specifications for tracking data on vaccine administration.
- Develop and distribute communication and education materials for use by state and other stakeholders.
- Work with industry partners to ensure influenza vaccine can be produced on an emergency basis at any time throughout the year.

##### **ADHS**

- Work with local health departments, healthcare providers, retail pharmacies, medical associations, state licensing boards, healthcare coalitions, and other stakeholders to develop state-based plans and reporting mechanisms for monitoring vaccine effectiveness and safety, and coordinating vaccine distribution and use.
- Work with local health departments and healthcare providers to develop plans and systems to receive, distribute, and administer pre-pandemic stockpiled vaccines to designated groups.
- Develop and distribute communication and education materials for use statewide.
- Assemble the Vaccine and Antiviral Prioritization Advisory Committee (VAPAC) to discuss federal recommendations for priority populations.

##### **Local health departments**

- Develop and implement plans, systems and capacities to receive, distribute, and administer the vaccine to the jurisdiction's population.

#### **B. Vaccination against seasonal influenza virus strains**

During WHO Phases 1-3, the Arizona Department of Health Services (ADHS) and local health departments will continue to work with tribes, Indian Health Service (IHS), community partners, mass immunizers, healthcare partners, targeted populations, and immunization coalitions to:

- 1) Promote Universal and seasonal recommendations for vaccination
- 2) Focus on persons at risk for medical complications from influenza
  - a. all children aged 6 months-4 years (59 months)
  - b. all persons aged  $\geq 50$  years



- c. adults and children who have chronic pulmonary (including asthma) or cardiovascular (except isolated hypertension), renal, hepatic, neurological, hematologic, or metabolic disorders (including diabetes mellitus)
- d. persons who have immunosuppression (including immunosuppression caused by medications or by HIV)
- e. women who are or will be pregnant during the influenza season
- f. children and adolescents (aged 6 months-18 years) who are receiving long-term aspirin therapy and who might be at risk for experiencing Reye syndrome after influenza virus infection
- g. residents of nursing homes and other long-term care facilities
- h. American Indians/Alaska Natives
- i. persons who are morbidly obese (BMI  $\geq 40$ )
- j. healthcare
- k. household contacts and caregivers of children aged  $<5$  years and adults aged  $\geq 50$  years, with particular emphasis on vaccinating contacts of children aged  $<6$  months
- l. household contacts and caregivers of persons with medical conditions that put them at higher risk for severe complications from influenza
- m. other priority groups recommended by the Advisory Committee on Immunization Practices (ACIP) as new seasonal strains are identified

Each year, the Advisory Committee on Immunization Practices (ACIP) publishes recommendations for prevention and control of seasonal influenza (see Prevention and control of seasonal influenza with vaccines: recommendations of the Advisory Committee on Immunization Practices (ACIP). Please reference the current seasonal ACIP guidelines when making decisions regarding groups recommended for vaccination. The 2010 guidelines: MMWR, Early Release, 2010; 59: 1-62 <http://www.cdc.gov/vaccines/pubs/ACIP-list.htm#flu>).

3) Pneumococcal polysaccharide vaccination (PPSV23) among those for whom it is recommended:

- a. Adults  $\geq 65$  years
- b. Cigarette smokers aged 19-64 years
- c. Adults with asthma aged 19-64 years
- d. Persons aged 2-64 years with alcoholism, chronic liver disease, or cerebrospinal fluid leaks
- e. Persons aged 2-64 with functional or anatomic asplenia
- f. Immunocompromised persons aged  $\geq 2$  years
- g. Patients with cochlear implants

References include: MMWR April 4, 1997 (<http://www.cdc.gov/mmwr/PDF/rr/rr4608.pdf> (comprehensive)); MMWR August 8, 2003 (<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5231a5.htm> (cochlear implants)); and ACIP Provisional Recommendations (October 2008) (<http://www.cdc.gov/vaccines/recs/provisional/downloads/pneumo-Oct-2008-508.pdf> (asthma and smoking)).

4) Pneumococcal conjugate vaccination (PCV13) among those for whom it is recommended:

- a. All children 2-59 months
- b. Children 60-71 months with underlying medical conditions that increase their risk for pneumococcal disease or complications:
  - Chronic heart disease

- Chronic lung disease
- Diabetes mellitus
- Cerebrospinal leaks
- Cochlear implant
- Functional or anatomic asplenia
- Immunocompromising conditions

Reference: MMWR March 12, 2010 (<http://www.cdc.gov/mmwr/PDF/wk/mm5909.pdf>)

Increased use of pneumococcal polysaccharide vaccine may decrease rates of secondary bacterial infections during a pandemic. Because large-scale pneumococcal vaccination might not be feasible once a pandemic occurs, the WHO Phases 1-4 is the ideal time to deliver this preventive measure. Specific guidelines on the prevention of pneumococcal disease can be found at <http://www.cdc.gov/mmwr/pdf/rr/rr4608.pdf>, Recommendations of the Advisory Committee on Immunization Practices (ACIP).

### C. Preparedness for vaccination against a pandemic influenza virus

A monovalent vaccine directed against the circulating pandemic virus strain of influenza should begin to be available within four to six months after identification of the new pandemic virus strain. HHS works with industry partners to ensure that influenza vaccine can be produced on an emergency basis at any time throughout the year and to facilitate the development of cell- and recombinant-based pandemic influenza vaccines towards FDA licensure in U.S.-based manufacturing facilities. Activities in support of these goals include:

- Stimulating expanded manufacturing capacity by increasing annual demand for influenza vaccines by the Centers for Medicare & Medicaid Service (CMS) and CDC
- Securing a year-round egg supply for production of inactivated egg-based influenza vaccines
- Promoting the development of new technologies that:
  - Shorten the time required to develop a vaccine against a new strain of influenza.
  - Facilitate rapid expansion of vaccine production during a pandemic.
  - Optimize the use of limited vaccine supplies (e.g., antigen-sparing strategies).



HHS also spearheads the development of human vaccines against novel influenza viruses with pandemic potential. This includes the development of the 2009 H1N1 vaccine and continuing to prepare vaccine for a potential H5N1 pandemic. HHS provides funding to develop and manufacture pilot investigational lots of these vaccines at licensed influenza vaccine manufacturers and to evaluate their safety and immunogenicity in National Institute of Health (NIH)-sponsored clinical trials in healthy adult, elderly, and pediatric populations.

The number of persons who may be protected by vaccination depends on the manufacturing capacity, the amount of antigen per dose needed for a protective immune response, and the number of doses required. Although annual influenza vaccine is immunogenic in older children and adults with a single 15 microgram ( $\mu\text{g}$ ) dose, a higher antigen concentration and/or two doses may be needed for pandemic vaccine where persons have no previous exposure to the influenza subtype and lack immunity. Additional clinical trials are ongoing to evaluate possible ways to improve the immune response to lower the amounts of vaccine antigen needed for protection.

Initial pandemic vaccine stocks will be used to vaccinate designated priority groups (see Tables 1 and 2 for examples).

After vaccination of these priority groups, vaccination of all those who desire it will be phased in depending on available supplies. For several years, ADHS, local health departments, and healthcare partners have been planning for the distribution of vaccine and antivirals for pandemic influenza. These plans tie closely with existing state and local emergency response plans such as emergency mass distribution of medical supplies and other public health emergency plans.

In conjunction with local health departments, healthcare providers, and other stakeholders, ADHS will conduct the following steps to prepare for the pandemic and protect Arizona's population:

- Review CDC's and ACIP's priority group and recommendations; accept or modify groups for Arizona.
- Update vaccine allocation and planning worksheets with the numbers of individuals in targeted priority groups established by CDC.
- Prompt local health departments to compile lists of potential clinic sites for vaccine administration.
- Compile lists of qualified ADHS staff who can assist or administer vaccine in the clinics and/or provide support functions (e.g., set-up, crowd control, data entry, etc.).
- Compile lists of volunteers from other agencies/organizations who can assist such as private partners, mass immunizers, etc.
- Utilize the Arizona Emergency System for the Advanced Registration of Volunteer Health Professionals (ESAR-VHP) to verify and credential needed health volunteers.
- Pre-register physicians and private providers who are or would likely be administering vaccine and ensure they are complying with federal requirements and integrating with federal systems.
- Conduct inventory of vaccine distribution-related supplies (e.g., Styrofoam coolers, ice packs, etc.) and establish written procedures/names of vendors to order additional supplies.
- Identify additional storage facilities for the vaccine such as refrigerators.
- Review written standard operating procedures (SOPs) for mass vaccination clinics and updated if needed.
- Review written SOPs for setting up and operating the ADHS Health Emergency Operations Center and Public Health Incident Management System (PHIMS) if activated.
- Educate and train clinic staff on importance of proper storage and handling protocols.
- Establish financial/logistical mechanisms for obtaining and distributing necessary vaccine and distribution supplies.
- Recommend appropriate security measures during vaccine storage and transportation.
- Review Strategic National Stockpile (SNS) protocol in the event state supplies are exhausted or assets are pre-deployed to states.
- Anticipate adverse reactions to vaccine, possible vaccine failures, vaccine lot recalls, and potential liability issues.
- Develop protocols to address vaccine handling and administration and licensing issues.
- Develop data reporting and other communication systems for healthcare providers.
- Begin planning for vaccine recovery programs for unused or expired vaccines.
- Establish a continuity of operations plan in the event of increased workload, staff absenteeism, or staff losses.

### **1. Vaccination of priority groups**

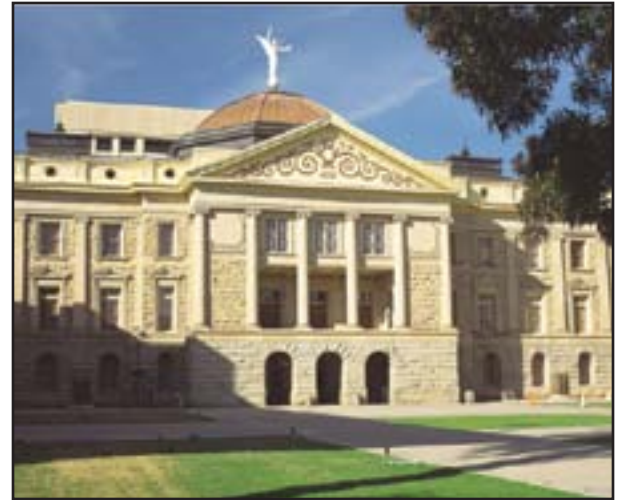
During a pandemic, changes to priority groups may be made based on the characteristics of the causative virus (e.g., drug susceptibilities, fatality rate, transmissibility, virulence, initial geographic distribution, age-specific morbidity and mortality rates, complication rates, etc.) and on vaccine effectiveness. During WHO Phase 4, ADHS will establish a Vaccine and Antiviral Prioritization Advisory Committee (VAPAC).

The VAPAC will make recommendations on how these priority groups can apply on a state and local level and modify these recommendations as needed based on the availability of antiviral medicines and vaccine, the characteristics of the

causative virus and the effectiveness of implemented strategies. With guidance from the CDC and ACIP recommendations and led by the ADHS Director, the VAPAC will develop key strategies to target the highest priority groups for vaccination in the most efficient and effective manner. With integration from statewide partners, the VAPAC will provide the rationale for recommending the priority groups so that the reasons for prioritization can be communicated to the community. Each local health officer or tribal health authority may utilize the recommendations or modify them to fit local needs.

The VAPAC will be comprised of:

- Representative(s) from the Governor’s office
- State Epidemiologist
- State physician(s)
- ADHS influenza epidemiologist
- ADHS Bureau of Epidemiology and Disease Control representative(s)
- ADHS Bureau of Public Health Emergency Preparedness representative(s)
- ADHS Division of Licensing representative(s)
- ADHS administrator(s)
- Arizona Immunization Program Office (AIPO) representative
- ADHS Office of Infectious Disease Services Chief
- Arizona Local Health Officers Association representative
- Arizona Medical Association representative
- Hospital Association representative
- Arizona Emergency Medical Service representative
- Arizona Pharmacy Alliance representative
- Arizona Chapter of American Academy of Pediatrics
- Long-term care representative
- Indian Health Services
- Other stakeholders as needed



The following tables are example tools for state and local health departments to estimate the jurisdiction’s population in priority groups. While priority groups will be specific to that pandemic, these tables may assist in estimating groups and reinforcing key planning elements. Please note that proper use of estimation tables will require updated population and census statistics and ensuring priority groups listed are still identified as such. Please note that some groups in Table 6.2 will require further discussion (i.e., key government leaders, telecommunications, utility service workers, etc.) for better estimation of numbers.



**Table 6.1. Arizona's Influenza Vaccine Estimate Worksheet**

Resource: All population estimates are based on [Guidance on Allocating and Targeting Pandemic Influenza Vaccine](#), released in 2008, unless otherwise specified.

Assumptions: Arizona population is 2% of US total based on 2008 census population estimates

Priority Level	Priority Groups	U.S. Pop.	Arizona Pop.	Arizona Winter Pop./ Seasonal Workers
1	Pregnant Women	3.1 million	113,756 <sup>1</sup>	
1	Household contacts and caregivers of children < 6 months	4.3 million	86,000	
1	Healthcare and emergency medical service personnel	10.7 million <sup>2</sup>	214,000	
1	People 6 months through 24 years of age	103.7 million <sup>3</sup>	2.1 million	
	6 months through 35 months	10.3 million	257,955	
	3 years through 4 years	10.3 million <sup>4</sup>	257,955	
	5 years through 9 years	19.7 million <sup>5</sup>	471,857 <sup>6</sup>	
	10 years through 14 years	20.6 million <sup>5</sup>	445,791 <sup>6</sup>	
	15 years through 19 years	21.5 million <sup>5</sup>	444,319 <sup>6</sup>	
	20 years through 24 years	20.9 million <sup>5</sup>	431,287 <sup>6</sup>	
1	Persons 25 to 64 years of age with high risk conditions	36 million <sup>7</sup>	720,000	
2	Healthy persons 25 through 64 years	107.4 million <sup>3,8</sup>	2.2 million	90,000 <sup>9</sup>
2	Persons 65 years and older	39 million	780,000	300,000 <sup>10</sup>



<sup>1</sup> Estimate from [ADHS pregnancy data, all races/ethnicities, 2007](#):

<sup>2</sup> Includes public health personnel, inpatient health care providers, outpatient and home health providers, health care providers in LTCFs, community support and emergency management, pharmacists, and emergency services sector personnel.

<sup>3</sup> Data from [2008 census population estimates](#)

<sup>4</sup> Estimated by subtracting total of 6 months to 35 months found in [Guidance on Allocating and Targeting Pandemic Influenza Vaccine](#) from total under 5 years found in [2005-2007 American Community Survey estimates](#)

<sup>5</sup> Data from 2005-2007 [American Community Survey estimates](#)

<sup>6</sup> Data from [2008 Arizona population estimates](#)

<sup>7</sup> Estimated from age 19-64 – possible overestimate for 25-64 years group

<sup>8</sup> Excludes individuals from priority level 1 (pregnant women, household contacts, healthcare personnel, persons 25-64 years with high risk conditions).

<sup>9</sup> Estimate of Yuma County only, taken from: Torres, E. (2007). Futuro Claro: A culturally competent Promotora program serving migrant and seasonal farmworkers and the Latino population in the rural and border communities of Yuma County Arizona. Available at [http://www.tobaccofreeaz.org/ctfa/docs/2007%20conference/10%20Emma%20Torres\\_futuro%20claro%20Need%20to%20confirm%20permission.pdf](http://www.tobaccofreeaz.org/ctfa/docs/2007%20conference/10%20Emma%20Torres_futuro%20claro%20Need%20to%20confirm%20permission.pdf).

<sup>10</sup> Estimate from: Hogan, T, Happel, SK, Walls, KS. (2003). State's 'snowbird' count estimated at 300,000 or more. Arizona Business. Available at [http://wpcarey.asu.edu/seidman/ccpr/AZBpdfs/AZB\\_0306.pdf](http://wpcarey.asu.edu/seidman/ccpr/AZBpdfs/AZB_0306.pdf).

**Table 6.2. Arizona's Influenza Vaccine Estimate Worksheet**

Resource: 2005 National Strategy for Pandemic Influenza Appendix D: Table D-1

Assumptions: 2004 Census data and AZ/US ratio ~2%

Estimates include Federal health care providers to Indian Nations and Tribes

Tiers	Pandemic Priority Groups	Estimated Population			County	# of doses (2 doses per person)
		U.S.	Arizona Pop.	Arizona Winter Pop and migrant seasonal workers		
ALL	Total Population	312,000,000	5,832,150	600,000		11,664,300
1A	Vaccine & antiviral manufacturers	~ 40,000	~ 800			
1A	Medical workers and public health workers w/direct patient care	~ 8 – 9 million	~160,000 – 180,000			
1B	Persons ≥ 65 years w/ 1 or more high-risk conditions	~ 18.2 million	~364,000	250,000		
1B	Persons 6 months to 64 w/ 2 or more high-risk conditions	~ 6.9 million	~138,000			
1B	Persons 6 months or older w/ history of hospitalization for pneumonia or influenza in past year	~ 740,000	~14,800			
1C	Pregnant women	~ 30 million	~ 600,000			
1C	Household contacts of severely immunocompromised persons who could not receive vaccine	~ 2.7 million	~ 54,000			
1C	Household contact of children < 6 months olds	~ 5.0 million	~100,000			

1D	Public health emergency response workers critical to pandemic response	~ 150,000	~ 3,000			
1D	Key government leaders	TBD	TBD			
2A	Healthy persons 65 years and older	~ 17.7 million	~ 354,000	300,000		
2A	Persons 6 months to 64 years of age w/1 high-risk condition	~ 35.8 million	~716,000	50,000		
2A	Healthy children 6 – 23 months olds	~ 5.6 million	~112,000			
2B	Other public health emergency responders	~ 300,000	~6,000			
2B	Public safety workers including police, fire, 911 dispatchers, and correctional facility staff	2.99 million	59,800			
2B	Utility workers essential for maintenance of power, water, and sewage	364,000	7,280			
2B	Transportation workers transporting fuel, water, food, and medical supplies	3.8 million	72,000			
2B	Telecommunications/IT for essential network operations and maintenance	1.08 million	21,600			
3	Other key government health decision-makers	TBD	TBD			
3	Funeral directors/embalmers	62,000	1,240			
4	Healthy persons 2-64 years not included in other categories	~179.3 million	~3,026,630			

## **2. Vaccine production and procurement**

HHS is working to expand pandemic influenza vaccine production capacity and will signal to manufacturers when to shift from seasonal to pandemic vaccine production. This will help to ensure that pandemic vaccine is produced at full capacity.

At the onset of an influenza pandemic, HHS, in concert with the Congress and in collaboration with the states, will work with the pharmaceutical industry to acquire vaccine directed against the pandemic strain. Distribution of pandemic vaccine to ADHS and providers may occur via private-sector vaccine distributors or directly via the manufacturer.

Arizona will receive available vaccine in proportion to the size of its population in defined priority groups. The following concepts are used to formulate the event-specific vaccination response plan, specific to the amount of vaccine that is available to the state:

- Use of the Vaccine and Antiviral Prioritization Advisory Committee (VAPAC) to determine and estimate the size of the priority groups that will be vaccinated
- Identify organizations that will administer vaccines to priority groups
- Identify locations for vaccination clinics or alternative means of vaccinating priority populations
- Determine whether vaccine will be shipped from the manufacturer to ADHS for further distribution or directly to vaccine providers
- Ensure event-specific plan includes strategies for vaccinating medically underserved, hard-to-reach populations, seasonal visitors, and migrant populations to improve equity in access within priority groups and, later, the general population.
- If vaccinations are provided by private-sector organizations or providers at offices, clinics, or other sites, ADHS and local health departments will:
  - Allocate vaccine based on projected need.
  - Manage unused vaccine (if any) from health care providers who have met their priority vaccination goals and re-distribute the vaccine to those who have not.
  - Monitor that vaccine administration follows existing plans on priority groups.



ADHS, in conjunction with local health departments, will identify the vaccine providers pre-authorized to receive influenza vaccine. ADHS will procure the influenza vaccine through CDC and/or the vaccine manufacturers. It is anticipated the CDC will determine the number of doses each state is allotted.

## **3. Arizona Influenza Vaccine Distribution**

Arizona public health and healthcare partners may receive the vaccine in one of several ways:

- ADHS orders and receives the vaccine shipments. ADHS then utilizes its own resources and/or a third party storage/transportation company to deliver the vaccine to local health departments and/or healthcare providers. If vaccine is shipped directly to ADHS, the vaccine will be transported from ADHS to predetermined locations on a weekly basis to control distribution and adjustments to geographical areas and to minimize storage problems at the vaccine providers.
- ADHS orders the vaccine from the manufacturer, and the vaccine is then shipped directly to pre-identified ship-to sites.
- ADHS orders the vaccine from a centralized distributor as local health departments decide on partner allocations within their jurisdictions. The vaccine is then distributed to healthcare partners statewide from the centralized distributor.

In order to prepare for vaccine distribution, ADHS will:

- Develop a system to interface with the federal ordering system to track vaccine distribution statewide.
- Assess the refrigerator capacity of ADHS and county health departments. Current vaccine storage capacity at ADHS is 100,000 doses at any time. ADHS will utilize an existing third party distributor to handle the storage and distribution of this vaccine if ADHS storage capacity is exceeded.
- Review the adequacy of the current security measures at ADHS and local health department offices and enhance, if needed. ADHS may request assistance from law enforcement agencies. The ADHS Immunization Program Office would remain responsible for management of vaccine, including coordination of distribution. Enhanced security for vaccine at the local distribution sites will be the responsibility of the local authorities.

**a) Second-dose vaccination**

A vaccine against pandemic influenza may require two doses to provide a level of immunity comparable to that obtained with seasonal influenza vaccines, especially in children. Recommendations on the number of required doses and the timing of the second dose will be issued once immunogenicity trials have been completed. If two doses are required to achieve immunity, it will be necessary to ensure that vaccinated persons return for the second dose. Second dose reminders should be built into data reporting systems.

**b) Contingency planning for Investigational New Drug use**

ADHS and local health departments need to be prepared to distribute unlicensed vaccines (if needed) under FDA's Investigational New Drug (IND) provisions. Unlicensed vaccines might be needed, for example, if pandemic spread is rapid and standard vaccine efficacy and safety tests are not completed in time to play a role in the response.

IND provisions require strict inventory control and record-keeping, completion of a signed consent form from each vaccinee, and mandatory reporting of specified types of adverse events.

IND provisions also require approval from Institutional Review Boards (IRBs) in hospitals, health departments, and other vaccine-distribution venues. The FDA regulations permit the use of a national or "central" IRB. A treatment IND is one IND mechanism that FDA has available for use and is especially suited for large scale use of investigational products.

As an alternative to IND, use of an unapproved antiviral drug may be authorized under Emergency Use Authorization procedures as described in the FDA Guidance "Emergency Use Authorization of Medical Products" (<http://www.fda.gov/RegulatoryInformation/Guidances/ucm125127.htm>).

**4. Vaccine monitoring and data collection**

To ensure optimal use of a new pandemic influenza vaccine, state and local health departments and participating immunization providers should be prepared to collect data on vaccine utilization, vaccine coverage and evaluation, and vaccine safety. The following data collection systems and resulting data will be utilized to evaluate coverage, target priority groups for vaccination, and identify ways to improve vaccination activities.

**a) Vaccine utilization**

**i. Vaccine allocation**

ADHS is responsible for tracking that a sufficient and appropriate amount of vaccine is being allocated to participating providers and priority groups and that all areas of the state are being served. Vaccine allocation tracking is accomplished through vaccine maintenance systems managed by ADHS in coordination with local health departments.

**ii. Vaccine doses administered**

ADHS will track who has received the vaccine through the Arizona State Immunization Information System (ASIIS) and other mechanisms. ADHS has the capability and capacity to collect data and store vaccine/immunization data in ASIIS, the state immunization registry. Vaccine supply can be tracked and data collected on coverage. ASIIS is continually upgraded and enhanced to collect additional information and expand data collection on all ages. ASIIS is a

web-based system which will allow any health care professional licensed under Arizona Revised Statutes (A.R.S.) Title 32 to provide immunizations to enroll and submit immunization data on any age person to ASIIS.

#### **b) Vaccine coverage and evaluation**

ADHS will be able to utilize the state immunization registry, ASIIS, to track coverage with pandemic influenza vaccine. Health professionals administering vaccines to individuals birth to 18 years of age have been required (ARS §36-135) to report those immunizations to ASIIS since 1998. ASIIS is a web-based system and can be expanded to allow any health professional administering pandemic flu vaccine to any age person to report those doses and other needed information. Data currently collected includes name, address, social security number if known, gender, and date of birth. Fields can be added to collect, at a minimum, tracking data such as:

- Number of doses administered by date and age, priority group, and state or county (or zip code)
- ASIIS includes a reminder/recall program that could be utilized to recall patients for a second dose, if necessary.
- ADHS and local health departments may consider additional data requirements for their own needs.

Vaccine tracking and coverage information may be used by federal, state, and local decision-makers to estimate adverse event rates based on the number of doses administered and to determine if vaccine is being administered according to established priority groups for pandemic vaccine (especially in the early phases of vaccination). Data will be collected from individual providers, collated at the local and state levels, and reported to federal authorities on a scheduled routine basis.

CDC will work with ADHS to develop a system for monitoring vaccination rates at regular intervals, using newly-developed or pre-existing population-based survey tool (e.g., Behavioral Risk Factor Surveillance System) that provides national and state-level estimates and complements the vaccine tracking systems described above.

#### **c) Vaccine safety**

ADHS and local health departments will use the Vaccine Adverse Event Reporting System (VAERS) to report and monitor Arizona adverse events following immunization with a pandemic influenza vaccine. Adverse events will be decreased by excluding people who have contraindications to receiving the vaccine (such as those who have allergy to eggs).

In a pandemic, the ADHS Immunizations Program Medical Officer will be the ADHS primary point of contact (POC) for local and federal entities for vaccine safety concerns and adverse events following immunization. The Arizona VAERS Coordinator will be the secondary ADHS point of contact. These Vaccine Safety Coordinators will maintain frequent contact with CDC vaccine safety staff to ensure adequate exchange of information, prompt response to vaccine safety emergencies, and optimal risk communication activities. Additionally, the POCs will maintain logon access to SiteScape, a secure CDC website for vaccine safety monitoring, to obtain the most current communications, alerts, and reports regarding vaccine adverse event activity for Arizona. Vaccine safety updates will be disseminated to provider and partner organizations as necessary, using the current Health Alert Notice communication network.

The Arizona Immunization Program Office has a designated Vaccine Adverse Event Reporting System (VAERS) Coordinator for the state. This person is responsible for submitting vaccine adverse events to VAERS that have been reported to ADHS. Information on VAERS (how to report online or print out a report form that can be completed and mailed to VAERS) can be found at <http://vaers.hhs.gov>.

Following CDC guidance, all providers should report clinically significant adverse events following influenza vaccination directly to VAERS by completing the online form or by printing out the VAERS form, completing all relevant fields and faxing the form to VAERS. If a provider is unable to report directly to VAERS, a completed report form may be faxed to the ADHS VAERS Coordinator who will transmit the information to VAERS.

VAERS is the federal front-line monitoring system for collecting and analyzing voluntary reports of adverse events following influenza vaccination, both from health care providers and from individuals. VAERS is one of the vaccine safety surveillance systems for the United States, and is co-managed by CDC and the Food and Drug Administration (FDA). VAERS helps to watch for unusual or severe adverse events that need to be further investigated. However, VAERS data cannot be used to show a cause-and-effect relationship between a vaccine and the subsequent adverse event.



CDC also monitors adverse events following receipt of vaccines using the [Vaccine Safety Datalink \(VSD\)](#). VSD is a collaborative effort between CDC and eight large managed care organizations (MCOs) representing approximately 3% of the U.S. population. The Arizona Immunization Program Office participates in data collection for VSD at the request of CDC.

An additional national vaccine safety surveillance system is the Vaccine Analytic Unit (VAU) which is a collaboration among the Department of Defense, CDC, and the FDA. It utilizes the Defense Medical Surveillance System (DMSS), which has data on ~1.5 million active US military personnel.

## **5. Public health communications**

Vaccine information will be an important component of ongoing public health communication during a pandemic (see Supplement 10 for full details regarding public health communications). Some key points for public health communications include:

- ADHS and local health departments will work with federal partners to disseminate accurate, useful, and consistent public health messages and will tailor information to local needs.
- ADHS will disseminate information on vaccine use to health care providers who purchase private stocks of pandemic influenza vaccine. In addition, all vaccine providers will need vaccine information sheets that describe the benefits, risks, including contraindications, of the vaccine.
- ADHS and local health departments will provide information to health care providers, state and local government officials, and the news media on:
  - Rationale for prioritization and list of priority groups
  - Phasing in of broader vaccination coverage after priority groups have been vaccinated
  - When and where vaccination is available
  - Importance of vaccination given likelihood of subsequent pandemic waves, particularly if public interest in vaccination has decreased

## **6. Coordination with bordering jurisdictions**

ADHS and local health departments will coordinate vaccine distribution plans with health authorities in bordering jurisdictions, including neighboring states, Sonora, Mexico, and other unique populations.

## **7. Legal preparedness**

ADHS and local health departments need to ensure that appropriate legal authorities are in place to facilitate implementation of plans for distributing and administering pandemic influenza vaccines. Some legal preparedness key points for vaccine administration include:

- A.R.S. §36-787 provides authority to ADHS to coordinate a mass immunization campaign during a public health emergency
- The Arizona Revised Statutes allow for licensed volunteers or health care workers from other jurisdictions to administer influenza vaccines.
- During a declared public health emergency under A.R.S. §36-787, licensing requirements can be suspended to allow others to perform these tasks.
- A.R.S. §36-788 provides for mandatory vaccination during a public health emergency, except for those who refuse on religious grounds and who can be quarantined during the period of risk for exposure. However, these legal allowances have not been exercised and may not be an appropriate action for a pandemic response in Arizona.



Presently in Arizona, physicians, registered nurses and registered nurse practitioners have authority to administer vaccines in accordance with their respective “scopes of practice.” Additionally, physician’s assistants may do so under protocols established with a supervisory physician. Medical assistants and personal care assistants may administer vaccinations under appropriate physician supervision. Certain military personnel may have training as well to administer vaccinations.

The potential emergency need for additional non-professional personnel to administer vaccinations will be assessed and necessary mechanisms (e.g., emergency orders from the Governor), appropriate training, supervisory guidelines, etc. of such staff will be developed.

In October 2009, A.R.S. §32-1974 allows certified pharmacists to administer vaccines without a prescription except as specified by ADHS. The pharmacists administering the vaccines are overseen by the Arizona Board of Pharmacy. The Arizona Administrative Code (A.A.C.) regarding pharmacists administering adult immunizations can be found at [http://www.azsos.gov/public\\_services/Title\\_04/4-23.htm](http://www.azsos.gov/public_services/Title_04/4-23.htm).

As per ADHS rules, only travel vaccines require pharmacists to have a prescription (i.e., yellow fever, rabies, Japanese encephalitis, and typhoid vaccines). The influenza vaccine is one of the vaccines that pharmacists can administer without requiring a prescription. Having certified pharmacists authorized to administer influenza vaccines increases the capacity for adult influenza vaccination during a pandemic.

Trained and certified Emergency Medical Technicians (EMT)-Intermediate (EMT-I) and EMT Paramedic (EMT-P) can administer immunizations under the authorization and direction of a medical director as long as there is compliance with 9 A.A.C. 6, Article 7.

## **8. Training**

ADHS and local health departments will assist health care partners in conducting training exercises to facilitate rapid and effective delivery and use of vaccines. Exercises and drills are essential to ensure that emergency procedures are in place and roles and responsibilities are well understood. Exercises conducted at the state and local level have included:

- Practice in receiving large quantities of vaccine
- Storing and handling vaccine from the distributor and from the Strategic National Stockpile
- Setting up and staffing clinics
- Administering vaccine
- Testing information management systems
- Educating the public, media, and medical providers
- Targeting specific priority groups



## **IV. Actions for the WHO Phases 5 to 6 (Widespread Human Infection or Pandemic)**

In addition to the actions described below, federal, state, and local public health agencies will begin to implement the preparedness planning and actions described in the previous WHO Phases above and throughout this Supplement.

### **A. After the first reports of pandemic influenza are confirmed and before a vaccine is available**

#### **HHS agencies**

- Facilitate vaccine procurement, distribution, and tracking working with private partners.
- Revise recommendations on vaccination of priority groups guided by epidemiologic information about the pandemic virus.
- Provide guidance on reporting specifications for tracking administration of vaccine.
- Provide guidance on Investigational New Drug (IND) and Emergency Use Authorization (EUA)
- Provide guidance on which adverse event reports are highest priority for investigation.
- Provide regulatory guidance to vaccine manufacturers.

## **ADHS**

- If stockpiled vaccine of the pandemic subtype is available, ensure delivery to county and tribal health departments and health care partners, as determined by priority status.
- Keep the health care and public health workforce up-to-date on projected timelines for availability of vaccines against pandemic influenza.
- Provide updated information to the public on vaccine status and prioritization (see Supplement 10).

## **Local health departments**

- Mobilize response partners and prepare to activate plans for receiving, distributing, and administering vaccines.
- Activate plans and systems to receive, distribute, and administer pre-pandemic stockpiled vaccines to designated groups.
- Review modifications, if any, to recommendations on vaccinating priority groups.
- Accelerate training in vaccine administration and vaccine monitoring for public health staff and for partners responsible for vaccinating priority groups.
- Be prepared to administer unlicensed vaccines (if needed) under FDA's Investigational New Drug (IND) provisions.
- Work with other governmental agencies and non-governmental organizations to ensure effective public health communications.

## **B. After a vaccine becomes available**

### **HHS agencies**

- Provide forecasts of pandemic vaccine availability from the manufacturers
- Continue to provide input into appropriate strain selection for seasonal influenza vaccine.
- Distribute public stocks of vaccines to state and local health departments and to federal agencies with direct patient care responsibility, as needed.
- Implement protocols for assessing vaccine effectiveness.
- Monitor vaccine coverage rates.

## **ADHS**

- Submit requests to HHS for appropriate number of vaccine doses.
- Work with emergency management to ensure the safe delivery of pandemic vaccines to county and tribal health departments and to health care facilities for priority populations.
- Monitor vaccine supplies, distribution, and use.
- Monitor and investigate adverse events.
- Provide updated information to the public via the news media.
- Ensure that vaccine requests to HHS and distribution to clinics and other facilities account for the need for second doses.
- Work with HHS to evaluate vaccine-related response activities when the pandemic is over.

## **Local health departments**

- Activate plans and systems to receive, distribute and administer vaccines to designated groups.
- Phase in vaccination of the balance of the population after priority groups have been vaccinated, based on age or other criteria that will ensure fair, equitable, and orderly distribution.
- After the pandemic has ended, ADHS and local health departments will evaluate all response activities, including vaccine tracking and delivery, adverse event monitoring, and communications. After action reports and other written documentation, including an assessment of lessons learned and best practices, will be made available to HHS, CDC, local health departments, and other key stakeholders.

## Appendix 6.1

### Time Table of Immunizations to Various Priority Groups

Time table of immunizations to various priority groups			
	Dose 1		Dose 2 ( if needed)
Vaccine Priority Groups	Total doses per group	Estimated doses in Weeks 1-4	Weeks 5-8
1A	180,800	135,600	
1B	514,800	463,320	
1C	754,000	377,000	
1D	3,100	2,790	
Subtotal	1,452,700	978,710	
<p>1A = 180,800 doses    Assumption: 75% coverage rate = 135,600</p> <p>1B = 514,800 doses    Assumption: 90% coverage rate = 463,320</p> <p>1C = 754,000 doses    Assumption: 50% coverage rate = 377,000</p> <p>1D = 3,100 doses    Assumption: 90% coverage rate = 2,790</p>			

# Arizona Pandemic Influenza Response Plan

## *Supplement 7: Antiviral Drug Distribution and Use*







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## I. Rationale



Appropriate use of antiviral agents during an influenza pandemic may reduce morbidity and mortality and diminish the overwhelming demands that will be placed on the health care system. Antivirals might also be used during the early phases of the pandemic in limited attempts to contain small disease clusters and potentially slow the spread of novel influenza viruses. Drugs with activity against influenza viruses (“antivirals”) include the M2 ion channel inhibitors or amantadanes [amantadine (Symmetrel®) and rimantadine (Flumadine®)] and the neuraminidase inhibitors [oseltamivir (Tamiflu®) and zanamivir (Relenza®)]. These drugs have been useful for the management of seasonal influenza.

However, a large and uncoordinated demand for antivirals early in a pandemic could rapidly deplete national and local supplies. Planning for optimal use of antiviral stocks is therefore essential. During an influenza pandemic, the Arizona Department of Health Services (ADHS) will need to play a central role in insuring that limited supplies of antivirals will be distributed efficiently to where there is the greatest need and benefit.

## II. Overview

Supplement 7 provides recommendations to state and local partners and to health care providers in Arizona on the distribution and use of antiviral drugs for treatment and prophylaxis during an influenza pandemic. These recommendations are up to date as of July 2010, and will be revised as new information is available.

In this document the term “novel strains of influenza” refers to avian or animal influenza strains that can infect humans (like avian influenza virus or swine influenza virus), or new or re-emergent human influenza viruses that cause cases or clusters of human disease. A pandemic occurs when a novel influenza virus emerges that can infect humans and be efficiently transmitted from person to person.

The Phases 1-3 (Limited Human Spread) and Phase 4 (Sustained Human-to-Human Spread) recommendations focus on; 1) preparedness planning for the rapid distribution and use of antiviral drugs, 2) the use of antiviral drugs in the management and containment of cases and clusters of infection with novel or pandemic strains of influenza, and 3) the education of health care providers about antiviral use in the management of both seasonal and pandemic influenza.

Phases 5-6 (Widespread Human Infection or Pandemic) recommendations focus on the local use of antiviral drugs in three situations: 1) when pandemic influenza is sporadically reported in the United States (without evidence of spread in the United States), 2) when there is limited transmission of pandemic influenza in the United States, and 3) when there is widespread transmission in the United States.

Throughout Phases 5-6 (Widespread Human Infection or Pandemic), education of health care providers will continue. ADHS recommendations for optimal use of limited stocks of antivirals will be updated throughout the course of an influenza pandemic to reflect new epidemiologic data, laboratory results, and the availability of an effective pandemic influenza vaccine.

## III. Summary of Public Health Roles and Responsibilities for Antiviral Distribution and Use

### Phases 1-3 (Limited Human Spread) and Phase 4 (Sustained Human-to-Human Spread)

#### 1. Health care providers

- a. Learn how to identify influenza-like illnesses
- b. Know procedures for influenza screening and laboratory testing
- c. Know appropriate infection control measures for influenza
- d. Know appropriate antiviral regimens for influenza A and B

## **2. ADHS and County and Tribal Health Departments**

- a. Develop state-based plans for the distribution and use of antivirals during a pandemic (ADHS)
- b. Work with stakeholders to develop a system by which ADHS will assist in brokering antivirals during a pandemic where there is limited supply
- c. Develop state-based plans for requesting antivirals from the Strategic National Stockpile (SNS)
- d. Work with stakeholders to develop a system to monitor use of antivirals throughout the state (ADHS and county and tribal health)
- e. Procure a supply of antivirals under the control of ADHS for to use for special populations (ADHS)
- f. Help educate health care providers about clinical presentation and control of novel and pandemic influenza (ADHS and county and tribal health)
- g. Give guidance to health care providers about using antivirals in the medical management of cases of novel strains of influenza (ADHS and county and tribal health)
- h. Provide or facilitate testing and investigation of suspected novel influenza cases (ADHS and county and tribal health)
- i. Conduct follow-up of suspected novel influenza cases (County health departments)

## **3. Department of Health and Human Services (HHS)**

- a. Develop national guidance on the use of antivirals during all phases of a pandemic (Phases 1-6)
- b. Develop a national stockpile of antiviral drugs for use during a pandemic
- c. Identify priority groups for antiviral drug treatment and prophylaxis
- d. Procure and maintain national supplies of antivirals in the Strategic National Stockpile (SNS)
- e. Maintain a program to test and extend dating of stockpiled antivirals
- f. Develop protocols for monitoring antiviral effectiveness, safety, and resistance during a pandemic
- g. Develop and distribute communication and education materials about antivirals for use by states and other stakeholders

## **Phases 5-6 (Widespread Human Infection or Pandemic)**

1. Choose antivirals appropriate for circulating influenza strains
2. Follow recommendations on antiviral use from federal, state, and local health agencies
3. When antiviral supplies are limited, prescribe antivirals for persons in priority groups where the need and benefit are the greatest

## **ADHS and County and Tribal Health Departments**

1. Work with health care partners to activate plans for distributing and administering antivirals to persons in priority groups (county health departments)
2. Review and modify as needed recommendations for prioritization of antiviral treatment and prophylaxis (ADHS)
3. Accelerate training on the appropriate use of antivirals among public health staff and health care partners (ADHS and county and tribal health)
4. Work with CDC to monitor antiviral drug use and effectiveness, to monitor antiviral drug resistance, and to monitor and investigate adverse events associated with antivirals (ADHS)

5. Work with other governmental agencies and non-governmental organizations to ensure effective public health communications (ADHS and county and tribal health)

#### **HHS responsibilities**

1. Revise recommendations for treatment and prophylaxis with antivirals for priority groups, if necessary
2. Provide state, territorial and local health departments and health care partners with guidance on reporting specifications for tracking distribution, effectiveness, and safety of antivirals.
3. Work with WHO and global partners to determine and monitor the drug susceptibilities of the pandemic strain
4. Provide state, territorial and local health departments and health care partners with guidance on reporting specifications for tracking distribution, effectiveness, and safety of antivirals
5. Provide information to health professionals and the public on issues related to availability and use of antiviral drugs during an influenza pandemic

#### **Federal responsibilities**

1. Maintain stockpiles of influenza antiviral drugs in the SNS
2. Distribute antiviral drugs from the SNS to states, cities, and federal agencies as appropriate
3. Work with states to monitor antiviral drug use and effectiveness, to monitor antiviral drug resistance, and to monitor and investigate adverse events associated with antivirals
4. Monitor the emergence of antiviral resistance
5. Issue updated national guidelines for appropriate use of antivirals as the pandemic continues
6. Continue to provide pertinent information to health professionals and the public on drug availability, distribution, administration, side effects, and the rationale for targeted drug use



### **IV. Recommendations for antiviral use in Phases 1-3 (Limited Human Spread) and Phase 4 (Sustained Human to Human Spread)**

#### **A. Use of antivirals in management of seasonal strains of influenza**

Influenza epidemics occur every winter in Arizona. Antiviral medicines are a useful adjunct to influenza vaccine for controlling, treating, and preventing influenza. Current human influenza illness in the United States can be treated and prevented with antivirals.

The M2 ion channel inhibitors (also known as amantadanes) are amantadine (Symmetrel®) and rimantadine (Flumadine®). They have historically been effective for most influenza A strains. The neuraminidase inhibitors oseltamivir (Tamiflu®) or zanamivir (Relenza®) are effective for both influenza A and B. Although many influenza A strains are sensitive to amantadine or rimantadine, the avian influenza A (H5N1) isolates are resistant. At the present time, avian influenza A (H5N1) is usually sensitive to both oseltamivir and zanamivir.

As long as pandemic influenza is not being reported abroad or in the United States, and there is no epidemiologic link to cases of avian influenza, seasonal influenza is unlikely to be caused by a novel influenza virus. Epidemiologic links that should suggest the risk of a novel influenza virus would include:

- A history of travel to areas where there are avian/animal influenza outbreaks
- A history of contact with a person with an unexplained respiratory disease in an area with avian or animal influenza outbreaks

- Contact with patients ill with a known or suspected novel virus
- Contact with sick poultry or animals

See Clinical Guidelines (Supplement 5) for more detailed information about epidemiologic criteria for suspecting a novel influenza virus.

Physicians can use antiviral medicines to treat and give prophylaxis against seasonal influenza. Treatment is most effective in reducing the length of illness when given within the first 48 hours of symptoms. Physicians should choose which antiviral medicine to use based on a variety of factors:

- What strain is currently circulating in the community (influenza A or B or both)
- The known sensitivities to antivirals of these circulating strains
- Rapid influenza testing results
- The age of the patient
- Whether the antiviral medicine will be used for treatment or prophylaxis

(See Appendix 7.3: ADHS Clinician Fact Sheet: Antivirals for Influenza 2008-2009; Appendix 7.4: ADHS Clinician Fact Sheet: Influenza 2008-2009.

The educational components about antivirals of the ADHS' Pandemic Influenza Plan will assist health care providers in the appropriate use of antivirals during seasonal influenza. This will allow health care providers to be better prepared to use antivirals during pandemic influenza.

## **B. Use of antivirals in management of cases of novel influenza**

In this document the term “novel strains of influenza” is used to refer to avian or animal influenza strains that can infect humans (like avian influenza A [H5N1]) and new or re-emergent human influenza viruses that cause cases or clusters of human disease. Criteria for early detection and identification of novel strains of influenza are discussed in Supplement 1.

Sentinel laboratories throughout Arizona send influenza isolates to the Arizona Public Health Laboratory. Influenza A viral isolates are tested to detect hemagglutinins H1, H3, H5, or H7. Recent circulating influenza strains have been H1 and H3. If the isolate were H5 or H7, or if could not be identified, the isolate would be immediately sent to the Centers for Disease Control and Prevention (CDC) for further characterization to exclude a novel influenza virus.



### **1. Use of antivirals for TREATMENT of suspected avian influenza A (H5N1) or another novel strain of influenza.**

A patient with a suspected case of avian influenza A (H5N1) or another novel strain of influenza should be isolated as described in Supplement 4 and treated in accordance with the clinical algorithm for Phases 1-3 (Limited Human Spread) and Phase 4 (Sustained Human-to-Human Spread) provided in Supplement 5.

As of July 2010, a patient with a suspected case of avian influenza A (H5N1) or another novel strain of influenza should be treated with oseltamivir or zanamivir. The antiviral should be administered as early as possible and ideally **within 48 hours after onset of symptoms**.

Neuraminidase inhibitors are preferred because the majority of avian influenza A (H5N1) viruses currently affecting humans are resistant to amantadine and rimantadine. Cross-resistance between zanamivir- and oseltamivir-resistant viruses is variable. Current recommended doses for antiviral treatment are provided in Table 7.2 and in ADHS' Clinician Fact Sheet on Antivirals for Influenza in Appendix 7.3. This information will be updated as circumstances warrant.

### **2. Use of antivirals for PROPHYLAXIS of contacts suspected avian influenza A (H5N1) or another novel strain of influenza.**

ADHS and local health departments, in consultation with CDC, will consider whether it is necessary and feasible to trace a patient's close contacts and provide them with post-exposure antiviral prophylaxis. Close contacts may include family, schoolmates, workmates, health care providers, and fellow passengers if the patient has been traveling. If deemed necessary by public health authorities, these persons may receive post-exposure prophylaxis with oseltamivir, as zanamivir is not currently indicated for prophylaxis.

If the exposure to the novel influenza virus strain occurs during the regular influenza season, the patient's health care contacts (who may also care for persons with seasonal influenza) should be **vaccinated against seasonal influenza** to reduce the possible risk of co-infection and reassortment of seasonal and novel strains.

### **3. Use of antivirals for containment of disease clusters caused by suspected avian influenza A (H5N1) or another novel strain of influenza.**

In special circumstances, ADHS could recommend "targeted antiviral prophylaxis" as a community-based measure for containing small clusters of infection with novel strains of influenza (see Supplement 8). This measure would be implemented in small, well-defined settings such as the initial introduction of a virus with pandemic potential into a small community or a military base, however, once a pandemic is underway, such a strategy would not represent an efficient use of limited antiviral supplies.

Because targeted antiviral prophylaxis would require rapid delivery and administration of substantial stocks of antiviral drugs, the feasibility to use antivirals to contain disease clusters caused by a novel strain of influenza will be evaluated at the time based on available antiviral supply and interim updated recommendations on antiviral drug use. These decisions will involve the Vaccine and Antiviral Prioritization Advisory Committee (VAPAC) as described below in C-2-b: "Establishing priority groups."

Targeted antiviral prophylaxis would involve investigation of disease clusters, administration of antiviral treatment to persons with confirmed or suspected cases of pandemic influenza, and provision of drug prophylaxis to all persons in the affected community. Targeted antiviral prophylaxis would also require intensive case finding in the affected area as well as effective communication with the affected community.

## **C. Preparedness planning for use of antivirals during a pandemic**

### **1. National recommendations on use of antivirals during a pandemic**

During an influenza pandemic, demand is likely to far outstrip supplies available in stockpiles or through usual channels of distribution. The U.S. Department of Health and Human Services' HHS Pandemic Influenza Plan, November 2005 Part 1, Appendix D, table D-2, page D-21 provides a list of priority groups for receiving antiviral treatment or prophylaxis and the rationale for prioritization

During an actual pandemic, these recommendations will be modified, based on the characteristics of the causative virus (e.g., drug susceptibilities, initial geographic distribution, fatality rate, age-specific morbidity and mortality rates) and the effectiveness of implemented strategies.

### **2. Arizona planning**

ADHS is working with the federal government, local health departments, tribal governments, bordering states, and the government of Sonora, Mexico to develop and integrate state-based plans for antiviral needs assessment, procurement, distribution, and targeted use. ADHS will use:

- Interim recommendations developed by the National Vaccine Advisory Committee on priority groups for prophylaxis and treatment to assist in calculations for Arizona priority groups
- Strategies outlined in Box 7.1 for optimizing antiviral use in treatment and prophylaxis.
- Clinical treatment algorithms provided in Clinical Guidance Supplement 5
- Existing ADHS plans for emergency distribution of medical supplies

ADHS has, as part of its Influenza Pandemic Response Plan, procedures for procuring antiviral medication for state



and local entities; distributing antivirals to priority groups through health care providers and public health dispensing sites; data collection to monitor drug use, drug-related adverse events, and drug resistance; coordination with bordering jurisdictions; legal preparedness; training; and dissemination of public health information.

This requires coordination and collaboration with health care providers who will administer antivirals during a pandemic.

- ADHS will convene state-wide pandemic influenza strategy meetings on the use of antivirals to facilitate local planning and define public- and private-sector roles (e.g., related to rapid administration to priority groups and medical surge capacity)
- ADHS will maintain communication with the medical community statewide regarding national guidelines for treatment, prophylaxis and the appropriate use of antivirals
- ADHS maintains contact information for appropriate federal agencies, county health departments, tribal governments, bordering states, and the government of Sonora, Mexico for coordinating distribution of antivirals.

#### **a. Procurement**

The needs in Arizona for antiviral treatment and prophylaxis during an influenza pandemic may not be met by federally supplied antivirals from the SNS stockpile. Therefore, state and local governments, and private institutions need to consider additional ways to obtain antivirals.

Typically, human influenza outbreaks can be prevented and treated with four different antivirals. Influenza A usually can be treated with amantadine (Symmetrel®) or rimantadine (Flumadine®) or the neuraminidase inhibitors oseltamivir (Tamiflu®) or zanamivir (Relenza®). Influenza B is only sensitive to neuraminidase inhibitors. Of note, avian influenza strain H5N1 is not sensitive to amantadine or rimantadine. Zanamivir has only been approved for treatment of influenza. Therefore, oseltamivir is the only antiviral drug that would be available for *both prophylaxis and treatment*.



ADHS has estimated the quantity of antiviral drugs that would be needed in Arizona (see Appendix 7.1) based on the U.S. Department of Health and Human Services' Pandemic Influenza Plan, November 2005. The cumulative amount to provide oseltamivir for all 11 of these priority groups would require 2,615,500 treatment courses, or 26,155,000 doses of oseltamivir.

#### **Procurement of State Stockpile**

Due to space constraints, management logistics, and challenges with rotating stock, ADHS will not be able to maintain a stockpile of antiviral medicines.

#### **State Guidance for Stockpiling Antiviral Medication**

Arizona will encourage stockpiling antiviral medication for pandemic influenza in Arizona by 1) encouraging health care facilities to consider their own institutional stockpiles or vendor-managed inventories, 2) facilitating/maintaining arrangements with local private-sector distributors for emergency purchase of antiviral drugs, and 3) when needed, requesting antivirals from the Strategic National Stockpile (SNS).

#### **b. Establishing priority groups**

During a pandemic, changes to priority groups may be made based on the characteristics of the causative virus (e.g., drug susceptibilities, fatality rate, transmissibility, virulence, initial geographic distribution, age-specific morbidity and mortality rates, complication rates, etc.) and on vaccine effectiveness. During WHO Phase 4, ADHS will establish a Vaccine and Antiviral Prioritization Advisory Committee (VAPAC).

The VAPAC will make recommendations on how these priority groups can apply on a state and local level and modify these recommendations as needed based on the availability of antiviral medicines and vaccine, the characteristics of the causative virus and the effectiveness of implemented strategies. With guidance from the CDC and ACIP recommendations and led by the ADHS Director, the VAPAC will develop key strategies to target the highest priority groups for vaccination in the most efficient and effective manner. With integration from statewide partners, the VAPAC will provide the rationale

for recommending the priority groups so that the reasons for prioritization can be communicated to the community. Each local health officer or tribal health authority may utilize the recommendations or modify them to fit local needs.

The VAPAC will be comprised of:

- Representative(s) from the Governor's office
- State Epidemiologist
- State physician(s)
- ADHS influenza epidemiologist
- ADHS Bureau of Epidemiology and Disease Control representative(s)
- ADHS Bureau of Public Health Emergency Preparedness representative(s)
- ADHS Division of Licensing representative(s)
- ADHS administrator(s)
- Arizona Immunization Program Office (AIPO) representative
- ADHS Office of Infectious Disease Services Chief
- Arizona Local Health Officers Association representative
- Arizona Medical Association representative
- Hospital Association representative
- Arizona Emergency Medical Service representative
- Arizona Pharmacy Alliance representative
- Arizona Chapter of American Academy of Pediatrics
- Long-term care representative
- Indian Health Services
- Other stakeholders as needed



The highest priority should be **treatment** of **high-risk individuals** who are **hospitalized** due to influenza illness.

The next priorities could be 1) **prophylaxis** of health care workers (HCW) with direct patient contact and emergency medical service (EMS) providers, and/or 2) **treatment** of health responders (public health, vaccinators, vaccine and antiviral manufacturers), public safety (police, fire, corrections), and government decision-makers.

Only when there is adequate antiviral medicine should there be able to be **treatment** of low-risk outpatients and **prophylaxis** of high-risk outpatients and other high-risk health care workers.

Appendix 7.1 provides estimates for treatment and prophylaxis of priority groups based on the 11 priority groups in the HHS Pandemic Influenza Plan, November 2005 table D-2, page D-21. One underlying assumption is that 25% of the U.S. population would become ill with influenza. The cumulative amount to provide oseltamivir for all 11 of these priority groups in Arizona would require 2,615,500 treatment courses, or 26,155,000 doses of oseltamivir. These initial calculations can help the VAPAC to estimate the size of the various priority groups in Arizona.

### c. Distributing and dispensing antivirals to priority groups

#### Deciding how, where, and when to distribute

Distribution of antivirals will depend on the amounts of antivirals available in the state, the priority groups that are to be targeted (as per the VAPAC), and the locations of greatest need. In order to equitably and effectively distribute antivirals to priority groups during an influenza pandemic, ADHS will need to know the location and amount of antivirals throughout the state, and be able to rapidly direct their flow to the appropriate priority groups.

During Phases 1-3 (Limited Human Spread) and Phase 4 (Sustained Human-to-Human Spread), ADHS will:

- Work with stakeholders to develop a system to assess and track antiviral stocks at the state and local level (both in inpatient and outpatient settings) to allow for tracking during a pandemic.



- Constitute and exercise the VAPAC
- Work with local health departments to plan for and to exercise the distribution of antiviral medicines based on priorities and needs.
- Establish the legal authority to have standing orders for antivirals both at the state and local health department level
- Explore how to implement standing orders if they are needed for treatment of certain priority groups (e.g. hospitalized patients and health care workers)
- Review and update pre-existing plans for the transport, receipt, storage, security, tracking, and delivery of:
  - Antiviral stocks for use in treatment to hospitals, clinics, nursing homes, alternate care facilities, and other health care institutions.
  - Antiviral stocks for use in post-exposure prophylaxis (e.g., for direct contacts of infected patients)
  - Antiviral stocks for use in prophylaxis even when there is no known direct pandemic influenza exposure (e.g. pandemic health responders, public safety workers, government decision-makers, and pandemic societal responders)
- Explore how to implement standing orders for antivirals for high priority groups (e.g. hospitalized patients, health care workers, etc.)
- Develop a system to obtain antivirals for treatment of pandemic influenza, or prophylaxis of a close contact of someone with pandemic influenza, where lack of financial resources prevents the individual from purchasing available antivirals.

During an influenza pandemic, ADHS will:

- Handle requests for antivirals through an incident command system (ICS).
  - The providers would request antivirals through their local health department [or county Emergency Operating Center (EOC)] and these requests would be sent on to ADHS [or the Arizona state EOC].
- Be guided by the VAPAC's recommendations about priority groups
- Request and handle SNS antiviral supplies according to the ADHS Operational SNS Plan for Receipt, Store, and Stage (RSS)

### **ADHS Brokering of Antiviral Supply**

According to Arizona Revised Statutes §36-787: [<http://www.azleg.state.az.us/FormatDocument.asp?inDoc=/ars/36/00787.htm&Title=36&DocType=ARS>], during a state of emergency in which there is a pandemic disease that poses a substantial risk of a significant number of human fatalities, the Governor, in consultation with the director of the Department of Health Services, may issue orders that ration medicine and vaccines, and provide for procurement of medicines and vaccines. Under these circumstances, ADHS will take the lead to direct the prioritization of limited antiviral supplies during an influenza pandemic.

ADHS does not have the capacity to purchase, store, rotate, and distribute the estimated 2,615,500 treatment doses of oseltamivir that would be needed in Arizona if all 11 priority groups were to receive medication (see Appendix 7.1). Therefore, ADHS would need to use the current system of antiviral distribution in order to get antiviral medicines to patients during an influenza pandemic. In Phases 1-3 (Limited Human Spread) and Phase 4 (Sustained Human-to-Human Spread), ADHS will assist providers in overcoming antiviral shortages by informing them of ways to obtain antivirals. Hospitals will be encouraged and to prepare and maintain their own antiviral stockpile.

During Phases 5-6 (Widespread Human Infection or Pandemic), if there are inadequate supplies of antivirals, ADHS will work directly with the manufacturer and the pharmaceutical distributors, in order to direct and broker the flow of medicines. Priority distribution will go to the sites of greatest need that service the highest priority groups according to the priorities outlined in C-2-b.

When the supply of antivirals in Arizona during an influenza outbreak is insufficient to provide for the needs of the

citizens, the Director of Arizona Department of Health Services will help facilitate an emergency request for federal assets from the SNS. HHS and CDC officials will make the decision whether to deploy federal assets to Arizona. Federal supplies of antivirals will be delivered to Arizona's Receipt, Storage and Staging (RSS) site. ADHS SNS Coordinator will provide logistical guidance on the receipt and distribution of federal assets to priority groups.

Topics for discussion with stakeholders will include 1) coordination between manufacturer, distributors, pharmacies, health care providers and ADHS; 2) proposed situations where ADHS would begin actual brokering and prioritization of antivirals; 3) plans on how and when to institute prioritization; 4) restrictions on when physicians can write prescriptions for oseltamivir;

#### **Distribution based on electronic monitoring of supply**

ADHS does not have information on the amount and type of antivirals currently used in Arizona. Such information is regarded as proprietary. Since Arizona's population is approximately 2% of the United States, a proportional number of oseltamivir treatments would be 30,500.

In order for ADHS to effectively and equitably distribute a limited amount of antivirals, it will be essential to know where, when, by whom, and how much antiviral medicine is needed and/or is being used.



#### **d. Monitoring and data collection**

To ensure optimal use of antiviral drugs during an influenza pandemic, ADHS will work with federal officials and health care partners to collect data on 1) distribution of state or federal supplies of antiviral drugs, 2) occurrence of adverse events following administration of antiviral drugs, 3) effectiveness of treatment and prophylaxis, and 4) development of drug resistance.

- 1) influenza specimens are sent to CDC on a periodic basis, usually after testing them by RT-PCR, viral culture, or rapid diagnostic testing to confirm the presence of strains of influenza A. CDC will test the drug susceptibilities of viruses isolated from different age groups and geographic groups over the course of the pandemic (see Antiviral Effectiveness above). Changes in antiviral resistance patterns will influence changes in recommendations for treatment and prophylaxis.

#### **e. Coordination with bordering jurisdictions**

ADHS will review and coordinate antiviral drug distribution plans with health authorities in bordering jurisdictions, including:

- Arizona Counties
- Tribal governments
- Mexico, specifically the state of Sonora
- Surrounding states

During an influenza pandemic, ADHS will share details regarding their distribution of antivirals with these jurisdictions to monitor antiviral needs and optimize targeting of antiviral use.

Due to Arizona's international border, additional planning will be needed with Mexico, since pandemic influenza will not stop at the border in Mexico. If Sonora, Mexico does not have adequate amounts of vaccines and antivirals, people will be coming to the United States for further evaluation and treatment. ADHS will meet with representatives of Sonora, Mexico to share information about pandemic influenza planning as it regards such things as diagnostic supplies, antiviral supplies, provider education, and coordination of pandemic planning. In addition, ADHS will prepare Spanish versions of ADHS messages for the Spanish-speaking public.



#### **f. Legal preparedness**

According to Arizona Revised Statutes §36-787, during a state of emergency in which there is a pandemic disease that poses a substantial risk of a significant number of human fatalities, the Governor, in consultation with the director of the Department of Health Services, may issue orders that ration medicine and vaccines, and provide for procurement of medicines and vaccines. Under these circumstances, ADHS will take the lead to direct the prioritization of limited antiviral supplies during an influenza pandemic.

During pandemic influenza, there may be a need for the ADHS chief medical officer or local health departments to issue a blanket prescription for dispensing of antivirals. The state medical director would need the authority to do so in a way that is consistent with Arizona's prescription laws.

However, close contacts of patients with confirmed or suspected pandemic influenza should be able to receive appropriate prophylaxis without undue waiting. Currently, in nonemergency situations, hospitals and treating physicians usually refer patients to local health departments or primary care physicians for prophylactic medications. In a pandemic situation, this would cause undue delay in light of the short incubation period of influenza (1-3 days).

Hospitals and physicians need to have the resources, the authority, and legal protection in order to rapidly provide antiviral prophylaxis to close contacts of confirmed or suspected cases of pandemic influenza.

In addition, there needs to be clarification as to whether adverse side effects of antivirals when taken for prophylaxis by essential workers would be covered by worker's compensation insurance.

ADHS will investigate:

- Ways to give health departments and physicians the authority to issue a blanket prescription for dispensing antivirals to contacts as a public health measure in a way that is consistent with state prescription laws.
- How worker's compensation laws apply to health care workers and other essential workers who take antivirals for prophylaxis.
- Whether a state or county employee would be covered for malpractice or tort claims coverage under state law if they administer an antiviral medication in the course of his/her official duties.
- What legal authority is in place, or needs to be put in place, to facilitate implementation of plans for the ADHS medical director or local health departments to issue a blanket prescription for dispensing of antivirals in a way that is consistent with Arizona's prescription laws.



#### **g. Training**

ADHS will work with local health departments, tribal governments, bordering states, and the government of Sonora, Mexico to enhance training and education efforts related to use of antiviral drugs during a pandemic.

ADHS has developed concise information sheets for health care providers called Clinician Fact Sheets that give clinically pertinent information about use of antiviral medicines and influenza. (See Appendices 7.3 & 7.4). These Clinician Fact Sheets are available on ADHS' influenza website. ADHS has also developed Clinician Fact Sheets for health care providers for identifying, diagnosing, and managing pandemic influenza, and posted it on the ADHS website.

ADHS physicians, nurses, and epidemiologists will participate in statewide lectures to inform health care providers about pandemic influenza and appropriate antiviral use.

It is essential that those who will be involved in prioritizing and distributing antivirals understand their roles and responsibilities. ADHS will conduct exercises with county and tribal health departments to plan for and to exercise the distribution of antiviral medicines based on priorities and needs. ADHS will involve its Vaccine and Antiviral Prioritization Advisory Committee (VAPAC) in these exercises.

## **h. Public health information**

ADHS will work with county health departments, tribal governments, bordering states, and the government of Sonora, Mexico to develop and implement plans to educate the public, the medical community, and other stakeholders about:

- Role of antivirals in responding to pandemic influenza
- Need to prioritize use of limited antiviral supplies for treatment and prophylaxis
- Rationale for the priority groups identified in the interim recommendations
- Importance of appropriate use (i.e., using the drugs as prescribed and for the full number of days recommended) to minimize the development of drug resistance

Pandemic influenza information will also be provided in Spanish.

## **i. Contingency planning for Investigational New Drug (IND) use**

Unlicensed antiviral drugs may be available under FDA's Investigational New Drug (IND) provisions during an influenza pandemic. IND provisions require strict inventory control and record keeping, completion of a signed consent form from each person who receives the medication, and mandatory reporting of specified types of adverse events. IND provisions also require approval of the protocol and consent form by an Institutional Review Board (IRB). These requirements are extremely time consuming.

FDA regulations permit the use of a national or "central" IRB for IND medications, and would likely be used in such a situation. A treatment IND is one IND mechanism that FDA has available for use and is especially suited for large-scale use of investigational products.

As an alternative to IND use of an unapproved antiviral drug, HHS may utilize the drug product under Emergency Use Authorization procedures as described in the FDA draft Guidance "Emergency Use Authorization of Medical Products" <http://www.fda.gov/RegulatoryInformation/Guidances/ucm125127.htm>

In order for state and local health departments to be able to help to distribute antiviral drugs under IND provisions, there needs to be funding for nurses, physicians, and pharmacists to provide the necessary services. ADHS will investigate available funding sources and will decide on the feasibility of providing antivirals under IND provisions based on the availability of funding sources and personnel.



## **V. Recommendations for Antiviral Use in Phases 5-6 (Widespread Human Infection or Pandemic)**

ADHS will update interim recommendations for use of antivirals throughout the course of an influenza pandemic to reflect current epidemiologic and laboratory data. Interim recommendations may also be updated as an effective influenza vaccine becomes available.

### **A. When pandemic influenza is reported abroad, or sporadic pandemic influenza cases are reported in the United States, without evidence of spread**

If an influenza pandemic has begun in other countries, ADHS will work with the federal government, county health departments, tribal governments, bordering states, and the government of Sonora, Mexico to:

- Use antiviral drugs in the management of persons infected with novel strains of influenza and their contacts.
- Work with health care partners to provide antiviral prophylaxis to persons at highest risk for influenza. Examples of such persons could include:
  - Public health workers who investigate suspected cases of pandemic influenza



- Health care workers in emergency departments, intensive care units, and, dialysis centers
- Paramedics and Emergency Medical Technicians
- Meet with local partners and stakeholders to review the state-based antiviral drug distribution plan. As part of this effort, state and local partners will:
  - Modify the distribution plan to take into account
    - Updated federal recommendations on target groups
    - Updated information on projected supplies of antiviral drugs.
  - Notify the medical community about the status of the plan and the availability of antiviral drugs.
  - Disseminate public health guidelines that encourage drug-use practices to minimize the development of drug resistance.
  - Provide the public with information on interim recommendations and their rationale
  - Work with federal partners to monitor the safety and effectiveness of drugs and ensure that available antivirals are used in accordance with federal and local recommendations.

## **B. When there is limited transmission of pandemic influenza in the United States**

When there is limited transmission of pandemic influenza in the United States, ADHS will work with county health departments, tribal governments, bordering states, and the government of Sonora, Mexico to:

- Activate state-based plans for targeting antiviral drugs to priority groups for prophylaxis and treatment.
- Request antiviral drugs, as needed, from previously identified sources including the SNS.
- Continue to educate health care partners to ensure appropriate use of antivirals in the medical management of early cases and contacts.
- Assist hospitals in implementing procedures for early detection and treatment of influenza in health care workers (see Supplement 3).
- Work with federal partners to begin monitoring the safety and effectiveness of drugs and ensure that available antivirals are used in accordance with federal and local recommendations.



## **C. When there is widespread transmission of pandemic influenza in the United States**

- When influenza has become widespread, the goals of antiviral use will be to 1) treat those at highest risk of severe illness and death, and 2) to preserve the delivery of health care and other essential critical services through early treatment and limited prophylaxis.
- After a vaccine becomes available, antiviral drugs will continue to be used to protect persons who have an inadequate vaccine response (e.g., the elderly and those with underlying immunosuppressive disease) as well as persons with contraindications to vaccination, such as anaphylactic hypersensitivity to eggs or other vaccine components.
- Until the pandemic has waned, ADHS will continue to work with federal and health care partners to monitor the safety and effectiveness of antivirals and to encourage appropriate drug use practices that help minimize the development of drug resistance.

### Box 7.1. Strategies for Antiviral Use in Pandemic Influenza Treatment and Prophylaxis

The goals of vaccine and antiviral use during an influenza pandemic are to limit mortality and morbidity, minimize social disruption, and reduce economic impact. Because a pandemic vaccine is unlikely to be available during the first 4 to 6 months of the pandemic, appropriate use of antivirals may play an important role in achieving these goals.

#### A. Treatment

##### 1. Planning considerations

- The effectiveness of antivirals against a new pandemic influenza virus cannot be predicted.
- Early treatment may reduce the risk of hospitalization by ~50%, although there are no data on the effectiveness of neuraminidase inhibitors in preventing either serious morbidity or mortality. (MMWR July 13, 2007 <http://www.cdc.gov/mmwr/PDF/rr/rr5606.pdf>)
- Antiviral agents used against seasonal influenza show efficacy in clinical trials when treatment is started within 48 hours of the onset of symptoms. Assuming that antivirals have a similar level of effectiveness against pandemic influenza, it will be essential to have rapid diagnosis, distribution, and administration of antivirals during a pandemic.
- Early treatment is a more efficient use of antivirals than widespread prophylaxis. Because prophylaxis for approximately 6 weeks would require at least four times the number of doses as a 5-day treatment course per individual, huge antiviral stockpiles would be required to permit prophylaxis of more than a small proportion of the U.S. population.
- Most influenza A (H5N1) viruses currently in circulation in southeast Asia are resistant to the M2 ion channel inhibitors (amantadine and rimantadine). Strains that may evolve from these viruses are likely to be resistant to this class of antivirals.
- The emergence of drug resistant strains is less likely during treatment with neuraminidase inhibitors (oseltamivir and zanamivir) than with M2 ion channel inhibitors (amantadine and rimantadine). Neuraminidase inhibitors may also have a lower incidence of severe side. (MMWR July 13, 2007 <http://www.cdc.gov/mmwr/PDF/rr/rr5606.pdf>)

**Reserve oseltamivir and zanamivir for treatment** whenever possible. Because supplies of oseltamivir and zanamivir are expected to be limited, early depletion of oseltamivir and widespread use of M2 ion channel inhibitors could lead to increased rates of side effects and drug resistance.

##### 2. Treatment Strategies

Optimal use of limited stocks of antiviral drugs will vary depending on the phase of the pandemic. The following is interim guidance that will be updated as more information becomes available.

*At all stages of a pandemic:*

- Target antiviral therapy to influenza patients admitted to a hospital who present within 48 hours of symptom onset.
- Test to detect the emergence of drug-resistant variants of a pandemic influenza strain (e.g., obtaining specimens from persons who develop influenza while on prophylaxis or who progress to severe disease despite treatment).
- Modify priority groups for treatment based on up-to-date information (e.g. drug supplies, drug susceptibilities, geographic distribution, fatality rate, age-specific morbidity and mortality rates, and the effectiveness of implemented strategies).
- Monitor availability of antivirals. When appropriate, recommend changes in priority groups for receiving antivirals
- Purchase antivirals as needed as they become available if not provided by the federal government.
- Distribute antivirals as they become available
- Use an electronic management system for antiviral inventory tracking. ADHS and the Division of Strategic National Stockpile are both working to develop such a management system.

*During the earliest stages of a pandemic in the United States:*

- Antiviral treatment decisions should be made on laboratory results. A positive rapid antigen test for influenza A would be sufficient grounds for initiating treatment, with a confirmatory, definitive laboratory test required for continuation of treatment (e.g. viral isolate or RT-PCR).
- Negative results of influenza testing would permit stopping antiviral treatment, given the overall low rate of infection in a particular community.
- Target use of antivirals to contain small, well-defined pandemic disease clusters, to possibly delay or reduce the spread to other communities (see Supplement 8).

*When there is increasing disease activity in the United States:*

- Treatment decisions will be based on:
  - Laboratory-confirmed identification of the pandemic subtype (e.g. by viral isolation and subtyping, or RT-PCR), or
  - Detection of influenza A by rapid antigen test, or
  - Epidemiologic and clinical characteristics.
- Initiation of antiviral treatment should be on a clinical basis (i.e. before results from viral isolation, IFA, RT-PCR assays, or rapid antigen tests become available) since early treatment is more likely to be effective.

Once infection becomes more common, negative rapid antigen test results are more likely to represent false negatives; therefore, treatment should continue while awaiting results from confirmatory testing.

*When the pandemic is widespread in the United States:*

- Antiviral treatment decisions will be made on clinical features and epidemiologic risk factors, taking into account updated knowledge of the epidemiology of the influenza virus.

As the pandemic progresses, recommendations for antiviral treatment will be revised as new information is obtained about the circulating influenza strains.

## **B. Prophylaxis**

### **1. Planning considerations for prophylaxis**

- Primary constraints on the use of antivirals for prophylaxis will be:
  - Limited supplies
  - Increasing risk of side effects with prolonged use
  - Potential emergence of drug-resistant variants of the pandemic strain.
- The need for antiviral prophylaxis may decrease once an effective pandemic influenza vaccine becomes available for use among healthcare workers and other groups.
- Post-exposure prophylaxis might be useful in attempts to control small, well-defined disease clusters (institutional outbreaks or household introductions). The potential use of targeted prophylaxis to contain disease clusters is discussed in **Supplement 8**.
- The number of persons who receive **prophylaxis** with oseltamivir should be **minimized**, primarily to extend supplies available to treat persons at highest risk of serious morbidity and mortality. If sufficient antiviral supplies are available, prophylaxis should be used only during peak periods of viral circulation to protect small groups of front-line healthcare workers and other providers of essential community services prior to availability of vaccine.
- If a pandemic virus is susceptible to M2 ion channel inhibitors, amantadine and rimantadine can be used for prophylaxis, although drug resistance may emerge quickly.
- Where supplies allow, rimantadine is preferred over amantadine, because it is associated with a lower incidence of serious side effects. Strains that are resistant to amantadine are likely resistant to rimantadine.

- Prophylaxis with amantadine or rimantadine decreased the risk of influenza illness during the 1968 pandemic and the 1977 reappearance of H1N1 viruses.\*
- A study of post-exposure prophylaxis using amantadine—conducted during the 1968 pandemic—demonstrated little effectiveness, possibly due to rapid development of resistance.\*
- Oseltamivir has >70% efficacy as prophylaxis against laboratory-confirmed febrile influenza illness during pandemic periods in unimmunized adults.\*

\*See MMWR, July 13, 2007 <http://www.cdc.gov/mmwr/PDF/rr/rr5606.pdf>

## 2. Strategies for prophylaxis

Strategies for effective use of antiviral prophylaxis during a pandemic include:

- **Targeting prophylaxis to priority groups throughout the first wave of the pandemic.** . (See **Appendix 1**, and U.S. Department of Health and Human Services' HHS Pandemic Influenza Plan, November 2005, Appendix D: NVAC/ACIP recommendations for prioritization of pandemic influenza vaccine and NVAC recommendations on pandemic antiviral drug use, table D-2, page D-21 <http://www.hhs.gov/pandemicflu/plan/pdf/AppD.pdf> . Data from 20th century influenza pandemics suggest that the first wave of these pandemics lasted approximately 4 to 8 weeks in a community
- **Using post-exposure prophylaxis** (generally for 10 days) to:
  - Control small, well-defined disease clusters, such as outbreaks in nursing homes or other institutions, to delay or reduce transmission to other communities.
  - Protect individuals with a known recent exposure to a pandemic virus (e.g., household contacts of pandemic influenza patients).
- **Modify priority groups for prophylaxis based on up-to-date information** (e.g. drug supplies, drug susceptibilities, geographic distribution, fatality rate, age-specific morbidity and mortality rates, the effectiveness of implemented strategies, and when a vaccine becomes available).
- **Consider post-exposure prophylaxis to protect key personnel** (when a vaccine becomes available) during the period between vaccination and the development of immunity.

## C. Strategies for Combined Treatment and Prophylaxis

During Phases 1-3 (Limited Human Spread) and Phase 4 (Sustained Human to Human Spread), combined antiviral treatment for ill persons and targeted post-exposure prophylaxis of contacts would be considered in attempts to contain small disease clusters (e.g., institutional outbreaks or household introductions as described in **Supplement 8**.

The administration of oseltamivir does not interfere with the development of antibodies to influenza viruses after administration of trivalent inactivated influenza vaccine. Therefore, persons receiving prophylaxis can continue to receive oseltamivir during the period between vaccination and the development of immunity. Whether oseltamivir can interfere with the immune response elicited by a live-attenuated pandemic vaccine is unknown.

## D. Pediatric Use

None of the available influenza antivirals are currently FDA approved for use among children aged <1 year. In particular, the safety and efficacy of oseltamivir have not been studied in children aged <1 year for either treatment or prophylaxis of influenza (see oseltamivir package insert). The decision by an individual physician to treat children aged <1 year in an emergency setting on an off-label basis with an antiviral must be made on a case-by-case basis with full consideration of the potential risks and benefits.

Oseltamivir is available as an oral suspension for use in children. However, this formulation of oseltamivir may not be available in sufficient supply during a pandemic to treat all pediatric patients. If physicians use 75 mg oseltamivir capsules to deliver a partial, pediatric dose to children, they should know that there are insufficient data on palatability, stability, and dosing consistency to predict the safety or effectiveness of such a use.

### Box 7.2. Federal Supplies of Antiviral Drugs in the Strategic National Stockpile

During an influenza pandemic, a decision to deploy federal assets from the Strategic National Stockpile (SNS) will be made by HHS and CDC. The SNS contains a wide range of treatment regimens including oseltamivir (capsules and suspension), rimantadine (tablets and syrup), and zanamivir. The specific amounts present in the stockpile change regularly.

The details of the HHS approach for allocation and distribution of SNS assets during an influenza pandemic are flexible and depend on the severity of the situation. ADHS will work with the federal government, local health departments, tribal governments, bordering states, and Sonora, Mexico to:

- Develop plans to allot antivirals to health care facilities, assuming that distribution of limited supplies of antivirals will initially be targeted to patients hospitalized with pandemic influenza and for treatment or prophylaxis of essential health care workers.
- Develop a system that would allow for standing orders for the prescription of antivirals, particularly for use in health care workers.
- Work with occupational health clinics in hospitals and other health care organizations on plans for delivery of antivirals to health care workers.
- Instruct health care providers **not** to prescribe oseltamivir to individuals for prophylaxis against pandemic influenza, and counsel individuals **not** to stockpile oseltamivir in homes. At the present time, antivirals are needed to treat and give prophylaxis to the highest priority groups for the current seasonal influenza. Inappropriate use and stockpiling of oseltamivir will take away necessary resources from those who have the highest priority.

**Table 7.1. Characteristics of Anti-Influenza Antiviral Drugs**

	Inhibits	Acts on	Administration	Common Side Effects
<b>Amantadine</b>	M2 ion channel	Influenza A	Oral	CNS, GI
<b>Rimantadine</b>	M2 ion channel	Influenza A	Oral	CNS, GI (less often than amantadine)
<b>Oseltamivir</b>	Neuraminidase	Influenza A and B	Oral	GI
<b>Zanamivir</b>	Neuraminidase	Influenza A and B	Inhaler	Bronchospasm

These agents differ in mechanisms of action, pharmacokinetics, FDA-approved indications, dosages, cost, and potential for emergence of drug resistance, see MMWR July 13, 2007 <http://www.cdc.gov/mmwr/PDF/rr/rr5606.pdf>.

The neuraminidase inhibitors and rimantadine are superior to amantadine with regard to the frequency of serious side effects. The use of M2 ion channel inhibitor, particularly for treatment, is likely to lead to the emergence and spread of drug-resistant influenza viruses.

Source of Table 1: <http://www.hhs.gov/pandemicflu/plan/10>

**Table 7.2. Recommended Daily Dosage of Antivirals for Treatment and Prophylaxis**

(From *Prevention and Control of Influenza, Recommendations of the Advisory Committee on Immunization Practices [ACIP], MMWR July 13, 2007*)

Antiviral Agent	Age Groups (years)				
	1–6	7–9	10–12	13–64	≥65
<b>Amantadine<sup>a</sup></b>					
Treatment, influenza A	5mg/kg body weight/day up to 150 mg in two divided doses <sup>b</sup>	5mg/kg body weight /day up to 150 mg in two divided doses <sup>b</sup>	100 mg twice daily <sup>c</sup>	100 mg twice daily <sup>c</sup>	≤100 mg/day
Prophylaxis, influenza A	5mg/kg body weight /day up to 150 mg in two divided doses <sup>b</sup>	5mg/kg body weight /day up to 150 mg in two divided doses <sup>b</sup>	100 mg twice daily <sup>c</sup>	100 mg twice daily <sup>c</sup>	≤100 mg/day
<b>Rimantadine <sup>d</sup></b>					
Treatment, <sup>e</sup> influenza A	NA <sup>f</sup>	NA	NA	100 mg twice daily <sup>c,g</sup>	100 mg/day
Prophylaxis, influenza A	5m/kg body weight /day up to 150 mg in two divided doses <sup>b</sup>	5mg/kg body weight /day up to 150 mg in two divided doses <sup>b</sup>	100 mg twice daily <sup>c</sup>	100 mg twice daily <sup>c</sup>	100 mg/day <sup>h</sup>
<b>Zanamivir<sup>i,j</sup></b>					
Treatment, influenza A and B	NA	10 mg twice daily	10 mg twice daily	10 mg twice daily	10 mg twice daily
<b>Oseltamivir</b>					
Treatment, <sup>k</sup> influenza A and B	dose varies by child's weight <sup>l</sup>	dose varies by child's weight <sup>l</sup>	dose varies by child's weight <sup>l</sup>	75 mg twice daily	75 mg twice daily
Prophylaxis, influenza A and B	dose varies by child's weight <sup>l</sup>	dose varies by child's weight <sup>l</sup>	dose varies by child's weight <sup>l</sup>	75 mg/day	75 mg/day

a The drug package insert should be consulted for dosage recommendations for administering amantadine to persons with creatinine clearance <50 ml/min/1.73m<sup>2</sup>.

b 5 mg/kg body weight of amantadine or rimantadine syrup = 1 tsp/2.2 lbs.

c Children aged >10 years who weigh <40 kg should be administered amantadine or rimantadine at a dosage of 5 mg/kg body weight /day.

d A reduction in dosage to 100 mg/day of rimantadine is recommended for persons who have severe hepatic dysfunction or those with creatinine clearance <10 mL/min. Other persons with less severe hepatic or renal dysfunction taking 100 mg/day of rimantadine should be observed closely, and the dosage should be reduced or the drug discontinued, if necessary.

e Approved by FDA only for treatment among adults.

f Not applicable.

g Rimantadine is approved by FDA for treatment among adults. However, certain experts in the management of influenza consider it appropriate for treatment among children. (See American Academy of Pediatrics, 2003 Red Book.)

h Older nursing-home residents should be administered only 100 mg/day of rimantadine. A reduction in dosage to 100 mg/day should be considered for all persons aged >65 years if they experience possible side effects when taking 200 mg/day.

i Zanamivir administered via inhalation using a plastic device included in the medication package. Patients will benefit from instruction and demonstration of the correct use of the device.

j Zanamivir is not approved for prophylaxis.

k A reduction in the dose of oseltamivir is recommended for persons with creatinine clearance <30 ml/min.

l The dose recommendation for children who weigh <15 kg is 30 mg twice a day. For children who weigh >15 to 23 kg, the dose is 45 mg twice a day. For children who weigh >23 to 40 kg, the dose is 60 mg twice a day. And for children who weigh >40 kg, the dose is 75 mg twice a day.

Source of table 2: <http://www.hhs.gov/pandemicflu/plan/10> and <http://www.cdc.gov/mmwr/PDF/rr/rr5606.pdf>



## Appendix 7.1

### Arizona's Priority Groups for Antiviral Use during an Influenza Pandemic Estimation of the Number of Treatment Courses Required in Arizona for Select Priority Groups

	Priority Group	Strategy	Estimated Population		C.F.	Number of Treatment Courses (10 pills/course)		Rationale
			US (millions)	AZ		Target group	Cumulative courses	
1	Patients admitted to hospital	Treat	10.0	200,000	75%	150,000	150,000	Treat those seriously ill and most likely to die
2	HCWs with direct patient care and EMS	Treat	9.2	184,000	25%	46,000	196,000	HCWs needed for medical care
3	Highest risk outpatients: Pregnant women; immuno-compromised	Treat	2.5	50,000	25%	12,500	208,500	Highest risk of hospitalization and death; hard to protect immuno-compromised by vaccine
4	Pandemic health responders, Public Safety, Government decision-makers	Treat	3.3	66,000	25%	16,500	225,000	Critical for effective public health response
5	Increased risk patients: Ages 12-23 mos., ≥65 yrs.; underlying medical conditions	Treat	85.5	1,710,000	25%	427,500	652,500	High risk for hospitalization and death
6	Outbreak response	Post Exposure Proph.	~ 2 million	~ 40,000	2%	40,000	692,500	Treatment & prophylaxis to contacts stop outbreaks
7	HCWs in emergency departments, ICU, EMS, dialysis centers	Prophy.	1.2	240,000	x4	960,000	1,652,500	Most critical to prevent absenteeism and surge capacity response
8	Pandemic societal responders & HCWs without direct patient contact	Treat	10.2	204,000	25%	51,000	1,703,500	Impact on maintaining health, implementing pandemic response, maintaining societal functions
9	Other outpatients	Treat	180	3,600,000	25%	72,000	1,775,500	Those who develop influenza and do not fit in about groups
10	Highest risk outpatients	Prophy.	2.5	50,000	x4	200,000	1,975,500	Prevents illness in highest risk groups
11	Other HCWs with direct patient contact	Prophy.	8.0	160,000	x4	640,000	2,615,500	Reduce absenteeism and preserve optimal health care response

Note: This does not include calculations for family members of high priority or high-risk individuals

## **Appendix 7.1 (cont'd)**

### **Assumptions, Definitions, and Abbreviations**

#### Assumptions:

- US population as per estimated population in table = 314.4 million
- AZ population in 2009 = 6,595,778 (July 2009)
- Therefore, AZ/US Ratio ~ 2%

C.F.=Conversion Factors: Mirroring assumptions in HHS PIP 11-05 document for US

- 75% of hospitalized patients would get treated.
- 25% of select priority groups would get infected and need treatment.
- Two million people in the US may need Post Exposure Prophylaxis (PEP); 2% of that = 40,000.
- x4 derives from the average need for prophylaxis for select priority groups would be the equivalent of 4 treatment courses (20 days or forty 75 mg pills)

HCWs=Health Care Workers

EMS=Emergency Medical Service providers

ICU= Intensive care units

Prophy.=Prophylaxis

NA=Not applicable

Treatment Courses: 10 pills (i.e. Five days of 75 mg pills twice a day)

Public Health Responders (PHR): Public health, vaccinators, vaccine and antiviral manufacturers

Public safety: Police, fire, corrections

Outbreak response: (Nursing homes and residential settings)

Source of US population and suggested priority groups: U.S. Department of Health and Human Services' HHS Pandemic Influenza Plan, November 2005. Appendix D: NVAC/ACIP recommendations for prioritization of pandemic influenza vaccine and NVAC recommendations on pandemic antiviral drug use, table D-2, page D-21.

<http://www.hhs.gov/pandemicflu/plan/pdf/AppD.pdf>

## Appendix 7.2

### Projected use of Antivirals in Arizona during an Influenza Pandemic

Arizonans who would receive Antivirals Based on Appendix 1's priority Groups and Estimates:	#	% of population
<b>Treatment</b>	775,500	13.2%
<b>Prophylaxis</b>	490,000	8.5%
<b>Treatment or Prophylaxis</b>	1,265,500	21.7%

#### **Supporting documents:**

1. HHS Pandemic Influenza Plan, November 2005. U.S. Department of Health and Human Services.  
<http://www.hhs.gov/pandemicflu/plan>
2. HHS Pandemic Influenza Plan, Part 1--HHS Strategic Plan, Appendix D: NVAC/ACIP Recommendations on Use of Vaccines and NVAC Recommendations on Pandemic Antiviral Drug Use.  
<http://www.hhs.gov/pandemicflu/plan/pdf/AppD.pdf>
3. HHS Pandemic Influenza Plan, Part 2—Public Health Guidance for State and Local Partners, Supplement 7: Antiviral Distribution and Use.  
<http://www.hhs.gov/pandemicflu/plan/pdf/S07.pdf>



**ADHS Interim Recommendations for 2008-2009 Influenza Season: Consider use of Zanamivir for treatment and chemoprophylaxis.**

- Antivirals shorten the course of illness when given within the first 1-2 days of influenza symptoms
- Avoid antivirals in pregnant women unless benefit outweighs risk
- This season the antiviral medicines amantadine and rimantadine are not recommended as monotherapy in the U.S. due to influenza resistance.
- For empiric therapy or prophylaxis when unable to use zanamivir, consider combining oseltamivir and amantadine (or rimantadine).

**Consider for treatment with antiviral medicines**

- Any person with a potentially life-threatening influenza-related illness
- Persons with laboratory-confirmed influenza who are hospitalized, who have influenza pneumonia, who have bacterial co-infection, or who are at higher risk for influenza complications.
- Persons presenting to medical care within 48 hours of influenza illness who want to decrease the duration or severity of their symptoms and reduce transmission of influenza to others

**Consider antiviral chemoprophylaxis during influenza season for those at high risk of complications while influenza is circulating in the community**

- Persons at high risk of serious complications from influenza for whom influenza vaccine is contraindicated
- Persons at high risk of serious complications, their family members, close contacts, and health-care workers when circulating strains of influenza virus in the community are not well-matched with vaccine strains
- Persons with immunosuppressive conditions who are not expected to mount an adequate antibody response to influenza vaccine.
- Health-care workers with direct patient care responsibilities who have not been vaccinated
- Unvaccinated staff and residents during an institutional influenza outbreak
- High risk children under 9 years old after receiving influenza vaccine for the first time until 2 weeks after the second vaccine dose
- For 2 weeks after influenza vaccination in persons at high risk of complications from influenza

**Length of Antiviral Treatment and Chemoprophylaxis**

	Treatment Length	Chemoprophylaxis Length		
		After exposure	Institutional outbreak	After vaccine*
<b>Amantadine**</b> (Symmetrel®)	5 days	7-10 days	Minimum of 2 weeks or 7-10 days after onset of last case	2 weeks
<b>Oseltamivir</b> (Tamiflu®)		7-10 days	Minimum of 2 weeks or 7-10 days after onset of last case	2 weeks
<b>Zanamivir</b> (Relenza®)		10 days	Not proven effective for nursing home residents	2 weeks

\* If antiviral prophylaxis is desired for high-risk individuals during the time immunity is developing.

\*\* Only use concurrently with oseltamivir. CDC does not recommend the use of the antiviral medicines amantadine and rimantadine as single use agents this season due to high levels of influenza resistance.

## Pediatric Points

Children 6 months-8 years old who have never had an influenza vaccine need 2 doses of influenza vaccine, > 1 month apart to be optimally protected. So, if a high-risk child is vaccinated when there is influenza in the community, antiviral prophylaxis may need to be continued for 6 weeks for optimal protection.

For pediatric antiviral use where no liquid formulation is available, open the capsule or crush the tablet, and give the appropriate dose in cherry syrup.

## ANTIVIRAL MEDICINES FOR INFLUENZA

	<b>Amantadine</b> (Symmetrel®)	<b>Oseltamivir</b> (Tamiflu®)	<b>Zanamivir</b> (Relenza®)
<b>Treatment Recommendations</b>	<b>Only A (H1N1)</b> ≥ 1 y.o.	<b>A (H3N2) &amp; B</b> ≥ 1 y.o.	<b>Both A &amp; B</b> ≥ 7 y.o.
<b>Adult</b>	<b>100 mg BID (maximum of 5 days)</b>	<b>75 mg BID x5 days</b>	<b>Two inhalations (10 mg) twice daily x5 days</b>
<b>Pediatric</b>	<b>Maximum of 5 days:</b> <b>1-9 years:</b> 5 mg/kg/day in 2 divided doses with max of 150 mg; <b>≥10 years and &lt;40 kg:</b> 5 mg/kg/day in 2 divided doses; <b>≥10 years and &gt;40 kg:</b> adult dosing	<b>Based on weight:</b> Length-5 days <b>≤ 15 kg:</b> 30 mg BID; <b>&gt;15-23 kg:</b> 45 mg BID; <b>&gt;23-40 kg:</b> 60 mg BID; <b>&gt;40 kg:</b> 75 mg PO BID	<b>Two inhalations (10 mg) twice daily x5 days</b>
<b>Prophylaxis</b>	≥ 1 y.o.	≥ 1 y.o.	≥ 5 y.o.
<b>Adult</b>	<b>100 mg BID</b>	<b>75 mg daily</b>	<b>Two inhalations (10 mg) once daily</b>
<b>Pediatric</b>	<b>Same total daily dose as treatment</b>	<b>Based on weight:</b> <b>≤ 15 kg:</b> 30 mg QD; <b>&gt;15-23 kg:</b> 45 mg QD; <b>&gt;23-40 kg:</b> 60 mg QD; <b>&gt;40 kg:</b> 75 mg PO QD	<b>Two inhalations (10 mg) once daily</b>
<b>Dosage Forms</b>	<b>100 mg tablet 100 mg capsule 50 mg/5 ml susp.</b>	<b>75 mg tablet 60 mg/5ml susp.</b>	<b>Inhaler</b>
<b>Side Effects</b>	<b>CNS: Insomnia, seizures, anti-cholinergic</b>	<b>Nausea, vomiting, delirium, abnormal behavior</b>	<b>Bronchospasm</b>
<b>Contraindications</b>			<b>Underlying airway disease</b>
<b>Renal impairment</b>	<b>Adjust dosing in renal insufficiency</b>	Adjust dosing in renal insufficiency	
<b>Note</b>	Use only in combination with Oseltamivir; CNS sx's may need dose reduction or stopping		

For more detailed information about each antiviral medication, see: [www.cdc.gov/flu/professionals/treatment](http://www.cdc.gov/flu/professionals/treatment)

**Arizona Department of Health Services  
Division of Public Health Services**





### Epidemiology

- Human disease is caused by influenza A or influenza B
- Ongoing minor antigenic changes require yearly vaccination in the fall
- Knowing the currently circulating strain aids in decisions regarding antiviral treatment and prophylaxis

### Clinical Presentation

- High fever, chills, prostration, muscle aches, sore throat, coryza, cough; at times, also vomiting and diarrhea

### Differential Diagnosis

- Febrile respiratory illnesses such as bacterial pneumonia, mycoplasma, adenovirus, avian influenza (e.g. influenza A H5N1), and SARS

### Laboratory

- Rapid testing of nasopharyngeal swabs for influenza
- Consider NP swab for respiratory viral culture (if it is positive, it allows for further typing of isolate)
- Do not order routine viral **culture** if avian influenza is suspected

### Infection control

- Droplet precautions (mask within 3-6 feet)
- Routine standard precautions and good hand washing before & after patient contact

### Treatment & Prophylaxis

- Antivirals shorten the course of illness when given within the first 1-2 days of influenza symptoms
- CDC recommends against the use of amantadine & rimantadine as single line agents for the 2008-2009 season
- ADHS interim recommendations for 2008-2009 season: Use Zanamivir preferentially for treatment or prophylaxis unless contraindicated.
  - For empiric therapy or prophylaxis when unable to use zanamivir, consider combining oseltamivir and rimantadine (or amantadine).

	Rimantadine (Flumadine ®)	Oseltamivir (Tamiflu®)	Zanamivir (Relenza®)
<b>Influenza type sensitivity</b>	<b>Only A (H1N1)</b>	<b>A (H3N2) and B</b>	<b>Both A and B</b>
<b>Mode</b>	<b>Oral</b>	<b>Oral</b>	<b>Inhaled</b>
<b>Treatment</b>	<b>≥ 1 y.o.</b>	<b>≥ 1 y.o.</b>	<b>≥ 7 y.o.</b>
<b>Prophylaxis</b>	<b>≥ 1 y.o.</b>	<b>≥ 1 y.o.</b>	<b>≥ 5 y.o.</b>

### Follow CDC's vaccine recommendations for ages & contraindications

- Don't use smaller vaccine doses than recommended
- Use Live Attenuated Influenza Vaccine (LAIV; Flumist™) only in healthy people ages 2 years-49 years
- Persons receiving LAIV should avoid close contact with severely immunosuppressed people for 7 days
- Contraindications to inactivated influenza vaccine or LAIV
  - Anaphylactic allergy to eggs
  - Guillain-Barré syndrome during the 6 weeks following a previous influenza vaccine
- Don't prescribe influenza antivirals for 2 weeks after LAIV
- Stop influenza antivirals for at least 2 days before giving LAIV

## Influenza Vaccine Recommendations for 2008-2009 season

### Inactivated intramuscular shot [Multiple manufacturers]:

- 1) Ages > 50 y.o.
- 2) All children ages 6 months-18 years old
- 3) Household contacts and caregivers of children 0-59 months as well as persons at high risk of complications from influenza
- 4) All persons with chronic medical conditions (e.g. heart disease, lung disease, asthma, diabetes, kidney disease, HIV, immunosuppression).
- 5) Pregnant in any trimester during influenza season.
- 6) Children age 6 months-18 years old on chronic aspirin therapy.
- 7) All health care workers
- 8) Residents of any age in a nursing home or chronic care facility.
- 9) Patients with any condition that can compromise respiratory function, handling of respiratory secretions, or can increase risk of aspiration.
- 10) **Anyone** wishing to reduce their risk of influenza.

### Live attenuated influenza vaccine (LAIV) [Flumist™]:

- Healthy, nonpregnant people ages 2 y.o. through 49 y.o., including close contacts of infants and most health care workers

### **Pediatric pointers**

- Children ages 6 months-8 years old receiving any influenza vaccine for the first time need two doses of vaccine.
  - The two doses should be spaced  $\geq 4$  weeks apart
- Notify local or county health department for pediatric influenza deaths.

### **Staphylococcal and MRSA disease associated with influenza**

- MRSA is becoming a community-acquired infection and has been associated with severe disease following influenza
- Influenza increases risk of *Staphylococcus aureus* respiratory infection
- Physicians caring for patients who have influenza and worsening respiratory status requiring IV antibiotics should consider adding **vancomycin** for staphylococcal coverage until culture results are available and/or clinical improvement occurs
- Many oral antibiotics do not cover MRSA
- Oral antibiotics that may be effective against MRSA
  - Clindamycin (Also good against *Streptococcus pneumoniae*)
  - Trimethoprim-sulfamethoxazole
    - Poor for *S. pneumoniae* which also complicates influenza
    - Avoid in pregnancy

### **For More Information**

- ADHS website at [www.azdhs.gov/phs/immun/providersflu.htm](http://www.azdhs.gov/phs/immun/providersflu.htm)
- Centers for Disease Control and Prevention website at [www.cdc.gov/flu](http://www.cdc.gov/flu)
- MMWR August 8, 2008. "Prevention and Control of Influenza" at [www.cdc.gov/mmwr/PDF/rr/rr5707.pdf](http://www.cdc.gov/mmwr/PDF/rr/rr5707.pdf)
- ADHS Hotline for the Public (Recorded message):  
Metro Phoenix 602-364-4500; Statewide 1-800-314-9243
- Clinics giving influenza vaccines can be found at [www.cir.org](http://www.cir.org),  
(602) 263-8856, or (800) 352-3792 (for area codes 520 & 928)

**Arizona Department of Health Services  
Division of Public Health Services**

# Arizona Pandemic Influenza Response Plan

## *Supplement 8: Community Disease Control and Prevention*





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## I. Overview

The initial response to the emergence of a novel influenza subtype that spreads between people will focus on containing the virus at its source, if feasible, and preventing a pandemic. Once spread beyond this coupled with the introduction of the virus into the United States, the foci of containment activities will be public health and individual measures that attempt to slow and limit viral transmission. Containment measures refer to measures that attempt to fully limit transmission as well as those that attempt to slow transmission (Box 8.1). Containment strategies aimed at controlling and slowing the spread of the virus might include measures that affect individuals (e.g., isolation of patients and monitoring their contacts) as well as measures that affect groups or entire communities (e.g., cancellation of public gatherings; implementation of community-wide “Stay Home Days”) (Appendix 8.1). Guided by epidemiologic data, the Arizona Department of Health Services (ADHS) and local health agencies will implement the most appropriate of these measures in efforts to maximize impact on disease transmission and minimize impact on individual freedom of movement.



Although states and localities have primary responsibility for public health matters within their borders, including isolation and quarantine, under the authority of Section 361 of the Public Health Service Act (42 U.S.C. §264), the U.S. Department of Health and Human Services (HHS) Secretary may make and enforce regulations necessary to prevent the introduction, transmission, or spread of communicable diseases from foreign countries into the United States or from one state or possession into another.

Containment measures applied to individuals (e.g., isolation and quarantine) may have limited impact in preventing the transmission of pandemic influenza due to the short incubation period of the illness; the ability of persons with asymptomatic infection to transmit virus; and the possibility that early symptoms among persons infected with a novel influenza strain may be non-specific, delaying recognition and implementation of containment. Nevertheless, during the early stages of the pandemic with a less efficiently transmitted virus, these measures may have great effectiveness, slowing disease spread and allowing time for targeted use of medical interventions. In addition, implementing these measures early in a pandemic when disease is first introduced into the U.S. and when the scope of the outbreak is focal and limited may slow geographical spread and increase time for vaccine production and implementation of other pandemic response activities.

Later, when disease transmission is occurring in communities around the U.S., individual quarantine is much less likely to have an impact and likely would not be feasible to implement. Thus, community-based containment interventions (e.g., closing schools or restricting public gatherings) and emphasizing what individuals can do to reduce their risk of infection (e.g., hand hygiene and cough etiquette) may be more effective disease control tools.

## II. Planning for the Pandemic

### A. Planning for disease control and containment

Both individual and community-based containment measures raise legal, logistical, and social challenges that should be addressed prior to the pandemic. This section provides information on planning for disease control and containment, legal preparedness, planning for potential use of influenza hotlines and the role of communications in preparing the public to accept the possible need for restrictive measures to reduce the spread of pandemic influenza.

Although individual quarantine as a control measure is likely only to be used during the initial phases of the pandemic—for example, among communities where initial cases are introduced into the U.S.—all state and local health departments and tribal authorities should prepare for the challenges of effectively implementing this measure by working with community partners to review the steps involved in establishing and maintaining quarantine facilities and procedures.



Key activities include (see also Appendix 8.2):

- Identifying and engaging traditional partners (e.g., public health and health care workers) and non-traditional community partners (e.g., transportation workers) and inviting them to participate in preparedness planning and in exercises and drills
- Identifying potential isolation and quarantine facilities
- Establishing procedures for medical evaluation and isolation of quarantined persons who exhibit signs of influenza-like illness (ILI)
- Developing tools and mechanisms to prevent stigmatization and provide mental health services to persons in isolation or quarantine, as well as to family members of affected persons and other community members
- Establishing procedures for delivering medical care, food, and services to persons in isolation or quarantine. These efforts should take into account the special needs of children and persons with disabilities.
- Developing protocols for monitoring and enforcing quarantine measures
- Ensuring legal authorities and procedures exist for various levels of movement restrictions
- Establishing procedures for issues related to employment compensation and job security

Planning checklists for businesses, individuals and families, and faith-based and community organizations are in Appendix 8.3.

### **1. Legal preparedness: Isolation and Quarantine**

ADHS, county health departments, and tribes (including Indian Health Services, as appropriate) have primary responsibility for public health matters within their borders, including isolation and quarantine. Specific statutory authorities for government agencies are listed below.

For purposes of this response plan, “Isolation” refers to the separation of an individual with influenza from non-infected individuals. “Quarantine” refers to the separation of an individual, or individuals, exposed to influenza from non-infected and non-exposed individuals. There are three sources of legal authority and direction for Isolation and Quarantine in Arizona:

#### **a) A.R.S. § 36-624**

Gives the counties the authority to conduct isolation and quarantine measures. Must be consistent with the due process and other requirements that are specified under A.R.S. §§ 36-788 and 36-789 (see below). Some counties may have established their own procedures for isolation and quarantine under this authority, however many counties may not be prepared in this area.

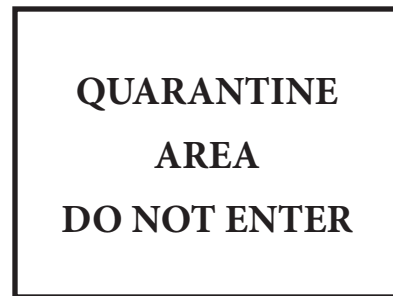
#### **b) A.R.S. §§ 36-787 through 36-789**

Provides isolation and quarantine authority to the state during a state of emergency or state of war emergency. Quarantine and Isolation orders at the state level can only be given by the Governor, in consultation with the director of the Arizona Department of Health Services, and are implemented by ADHS and local health departments through written directives.

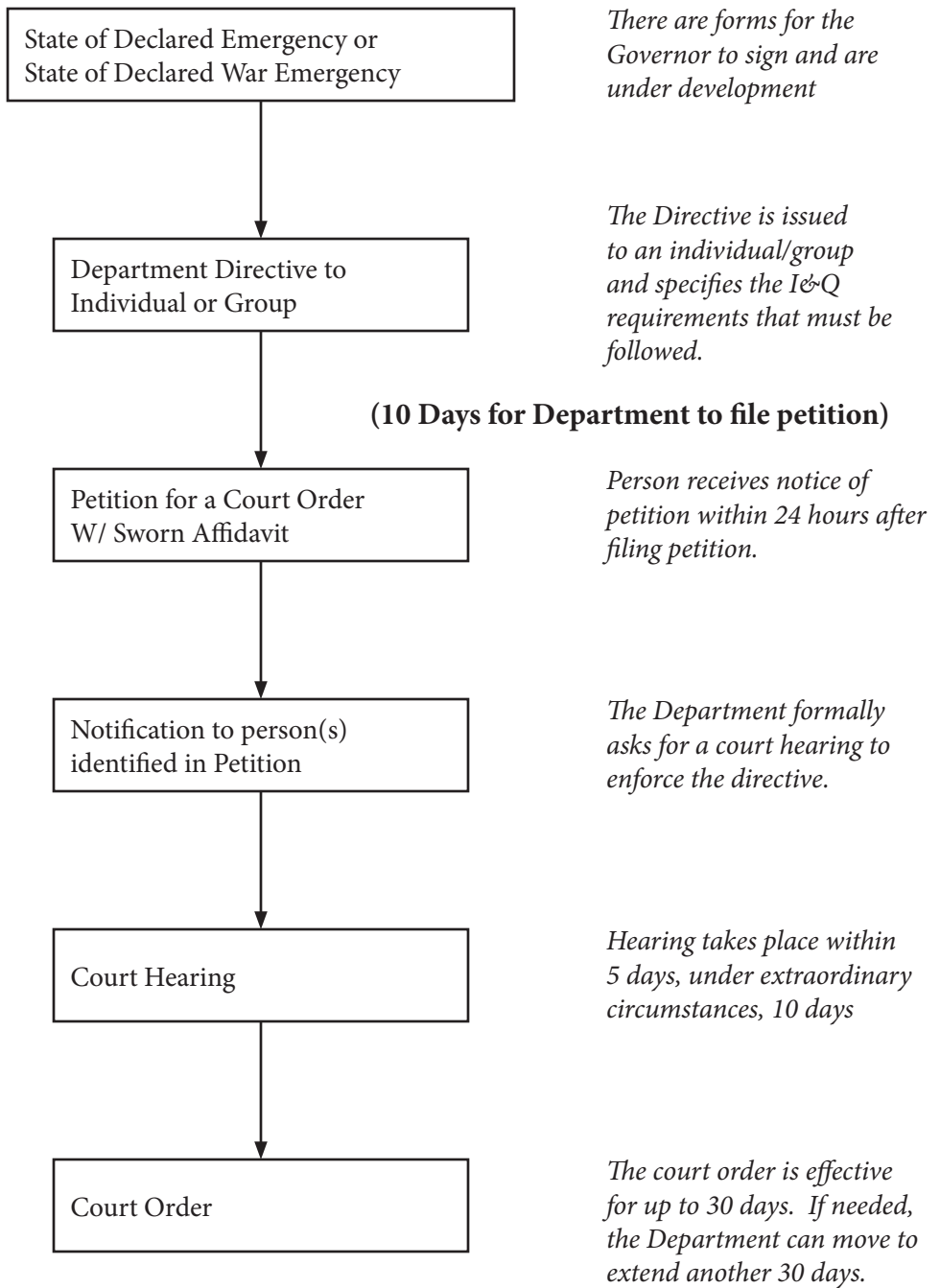
#### **c) A.A.C. R9-6-303**

This rule provides the local health agency a process from which to issue isolation and/or quarantine orders that are congruent with A.R.S. § 36-624, A.R.S. § 36-788 and A.R.S. § 36-789 (see Figures 8.1 and 8.2).

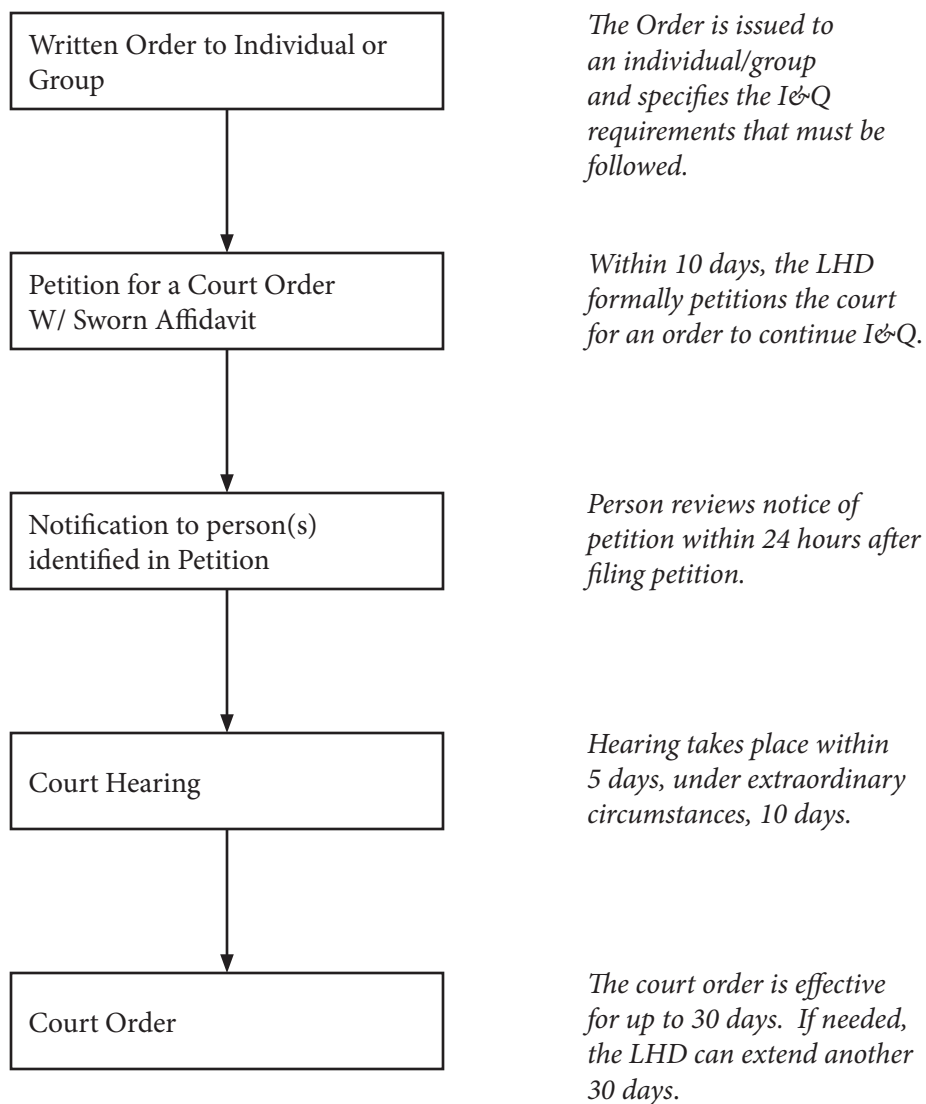
Templates for documents supporting the request for isolation and quarantine orders are in Appendix 8.4.



**Figure 8.1 During a Governor-declared state of war emergency or state of emergency, the Department (ADHS) must follow the process below to issue an order for isolation or quarantine (A.R.S. §§ 36-787 through 36-789):**



**Figure 8.2 The local health department (LHD) must follow the process below to issue an order for isolation or quarantine (A.R.S. § 36-624):**



## **2. Planning for influenza clinics and hotlines**

An influenza pandemic is likely to put great stress on Arizona's health care delivery system, particularly emergency departments. Hospital and health care surge capacity plans are designed to address the overwhelming demand on hospital emergency departments and the overall health care system. (see Supplement 3).

Using hotlines as a method of "community triage" efforts may help prevent hospitals from being overwhelmed with patients who do not require hospital-level care. Moreover, community triage efforts may also reduce the number of uninfected persons who mingle with infected persons at clinics and hospitals. If a hotline is available, ill persons will be encouraged to call to receive advice on whether to stay home or to seek medical care. ADHS and many county health departments have hotline capacities that can act as triage and information systems to support this need. Activated influenza hotline systems will include:

- Communication systems with influenza clinics or alternative treatment facilities, if they are established
- Telephone hotline numbers that people can call to report specific symptoms (e.g., fever)
- Protocols for hotline staff members that include training components and triage decision trees or algorithms

## **3. Public understanding of disease containment measures**

Community preparedness for implementation of both individual and community control measures needs to be enhanced prior to the pandemic. Improving public understanding of the dangers of pandemic influenza and the benefits of community-wide disease control practices, including social-distancing measures, may increase compliance with public health prevention measures and may prevent illness and death. Strategies for disease control will be facilitated by clear communication of the rationale and duration of containment measures.

Public health education campaigns that involve community partners will be designed to build public confidence in the ability to cope with an influenza pandemic. Partners will include schools, faith-based organizations, community-based organizations, businesses and local government institutions that can help educate the public and provide support to families and persons who are incapacitated by illness.

Local public health campaigns will explain how individual action (e.g., strict compliance with respiratory hygiene, staying home when ill) combined with community efforts (e.g., implementation of "Stay Home Days" and self-isolation, as described below) can help reduce disease transmission. Education campaigns will describe the criteria, justification, role, methodology, and duration of quarantine and the social, medical, and psychological ways in which persons will be supported during the quarantine period. Although quarantining temporarily restricts personal movement, they can also explain that it is a collective action implemented for the common good. In addition, they can alleviate public concerns about privacy issues related to the provision of medical information to health care workers and public health officials. These key messages will be translated and modified as required to address the cultural and linguistic needs of local neighborhoods.

## **4. Enforcement and support of community containment measures**

Experience from the 2003 SARS outbreak suggests that quarantine applied on a voluntary basis can be sufficient to reduce disease. Nevertheless, ADHS and the county health departments are prepared to enact and enforce individual and community-based containment measures, if needed.

### **B. Management of patients infected with novel strains of influenza and their contacts**

In this document, the term "novel strains of influenza" is used to refer to animal influenza strains that can infect humans and new or reemergent human viruses that cause cases or clusters of human disease. The choice of measures to contain the spread of novel strains of influenza will vary depending on the assessment of risk.

#### **1. Patient isolation**

Infection control precautions and procedures for isolating influenza patients in various settings are described in Supplement 4. The patient will be admitted to a hospital if clinically indicated, if public health needs require it, or if

isolation at home or in a community facility cannot be achieved safely and effectively. Information for evaluating the suitability of homes and facilities for patient isolation is provided in Appendix 8.6.

ADHS or county health department personnel will advise the health care provider and health care facility on additional steps that may be taken before and after laboratory test results become available from the Arizona State Public Health Laboratory or CDC.

## **2. Management of close contacts**

In most situations and even at the earliest stages of a pandemic, it will not likely be possible to trace and quarantine close contacts of suspected or confirmed cases within 48 hours (the average incubation period for human influenza). However, in certain situations, efforts to identify exposed individuals or groups might be recommended. Examples might include:

- Suspected or confirmed cases of novel influenza. For example, a suspected or confirmed case of avian influenza A (H5N1) in persons who have traveled to an H5N1-affected country and have been exposed to sick poultry (either through handling or eating poultry products) or a laboratory-confirmed human case of H5N1 influenza
- Suspected or confirmed cases of a novel strain of influenza in travelers on internationally-originating airplanes about to arrive in Arizona (see Supplement 9)
- Suspected or confirmed cases of avian influenza of any type in persons with known exposure to sick poultry or birds in the United States
- Clusters of avian influenza A (H5N1) or another novel strain of influenza in small, well defined settings, such as a military base
- Cases of laboratory exposure to avian influenza A (H5N1) or influenza viruses with the potential to cause a pandemic (e.g., influenza A [H2N2])

Decisions on whether to trace a patient's contacts and how to manage them will be made on a case-by-case basis by county health officers and/or ADHS officials, taking into consideration the:

- Likelihood that the suspected case is due to a novel influenza strain (based on symptoms and travel history, if laboratory results are not yet available)
- Likelihood that the causative virus is transmitted from person-to-person with a moderate or high efficiency.
- Feasibility of conducting contact tracing given the short incubation period for influenza

A patient's close contacts may include family, friends, work colleagues, classmates, fellow passengers, and/or health care providers. Management of contacts might include passive or active monitoring without activity restrictions and/or quarantine at home or in a designated facility. Quarantine of contacts should be implemented early in the pandemic and only when there is a high probability that the ill patient is infected with a novel influenza strain that may be transmitted to others.

Health department officials will monitor contacts by phone or in person who are quarantined at least once a day to assess symptoms and address any needs. Frequent monitoring (e.g., twice a day) will facilitate early detection, reducing the interval between the onset of symptoms and the isolation of the sick person, but may not be feasible, depending on resource availability. Early signs of influenza include fever, respiratory symptoms, and chills, rigors, myalgia, headache, or diarrhea. Quarantine may be lifted as soon as the exposed contact has remained without signs or symptoms of disease for a complete incubation period for influenza. (Experience with seasonal influenza suggests the incubation period is one to four days, with an average length of two days. However, the clinical behavior of a novel influenza virus may be different and could potentially be as long as 10 days. Pandemic influenza preparedness activities should plan for containment measures that may last between one to 10 days. For the purposes of this document, 10 days is referred to as the incubation period, following the HHS planning model; however, this time frame may be adjusted as more is known about the virus.)

## **C. Containment of small clusters of infection with novel strains of influenza**

When cases are first introduced into the U.S., community-based control measures that public health officials might use to contain small clusters of infection with novel strains of influenza include targeted chemoprophylaxis and early detection of

new cases by use of influenza hotlines and clinics. These approaches may be implemented in small, well-defined settings. They are not likely to be useful once a pandemic is underway.

### **1. Targeted chemoprophylaxis of disease clusters**

This intervention includes investigation of disease clusters, administration of antiviral treatment to persons with confirmed or suspected pandemic influenza, and provision of drug prophylaxis to all likely exposed persons in the affected community. CDC will assist ADHS and county health departments in these efforts, as needed. Targeted chemoprophylaxis also requires intensive disease surveillance to ensure coverage of the entire affected area, effective communication with the affected community, and rapid distribution and administration of antivirals. This is important because antivirals are most effective when provided within 48 hours of symptom onset or when used as post-exposure prophylaxis before onset of illness. This intervention may only be useful upon the recognition of the first cases or introduction in Arizona, especially in a closed community, such as an assisted living facility.

### **2. Influenza hotlines and infectious disease referral centers**

In a community experiencing a disease cluster, a combination of self-assessment and establishment of influenza hotlines may be effective in detecting potential influenza disease and conducting “community triage” to direct persons with symptoms to the appropriate site and level of care. This intervention includes asking all members of the affected community to monitor their symptoms in accordance with public health directives. For example, all members of the community might be asked to take their temperature (and the temperature of their household members) once or twice daily. Persons with temperatures above a certain level may be asked to either stay home and phone a designated influenza hotline for a medical consult, or proceed to a designated infectious disease referral center, established by regional public health and health care authorities.



## **III. Actions for WHO Phases 5 through 6 (Widespread Human Infection or Pandemic)**

During WHO Phases 5 through 6 (Widespread Human Infection or Pandemic), control measures such as contact tracing and quarantine applied to individuals may have limited impact in decreasing influenza transmission. In addition, individual-level measures may no longer be feasible. During this stage, ADHS and local health departments will consider measures that decrease social contact within groups or whole communities (e.g., self-isolation, cancellation of public events, “Stay Home Days”) and measures that individuals can take personally to decrease their risk of infection.

Table 8.1 outlines measures that may be employed at different stages of a pandemic, as the disease becomes more widespread. These begin with containment activities for individuals and progress, as needed, to community-based measures.

### **A. Containment measures for individuals**

#### **1. Patient isolation**

As noted above, a patient with a suspected or confirmed case of pandemic influenza may need to be separated from persons who are well, using infection control measures described in Supplement 4. If a surge in patients overwhelms the health care capacity or if home isolation is not feasible, health departments may need to use alternate facilities for isolation of influenza patients. Guidance on use of alternative facilities for isolation of influenza patients is provided in Appendix 8.7 and in Supplement 3.

#### **2. Management of contacts**

Contact tracing, contact monitoring, and quarantine of close contacts may be effective only in special situations during the earliest stages of a pandemic. Because the usefulness and feasibility of these measures will be limited once the pandemic has started to spread, community-based measures that reduce disease transmission by increasing social distances will likely be the primary public health intervention.



## **B. Community-based containment measures**

If disease transmission in the community is significant and sustained, public health authorities may implement community-based containment measures. Community-based containment measures can be grouped into two broad categories: measures that affect groups of exposed or at-risk persons and measures that affect entire communities. Table 8.2 lists quantifiable factors that may influence decisions on where and when to impose community-based containment measures. Social considerations, including levels of community cooperation and mobility, will also inform decision-making.

### **1. Measures that affect groups of exposed or at-risk persons**

Measures that affect groups of exposed or at-risk persons include:

- Quarantine of groups of exposed persons
- Containment measures that apply to use of specific sites or buildings

These measures should be considered when:

- There is limited disease transmission in the area.
- Most cases can be traced to contact with an earlier case or exposure to a known transmission setting (e.g., a school or workplace where a person became ill).
- The intervention is likely to either significantly slow the spread of infection or to decrease the overall magnitude of an outbreak in the community.

#### **a) Quarantine of groups of exposed persons**

The purpose of quarantine is to reduce influenza transmission by separating exposed persons from others, monitoring exposed persons for symptoms, and providing medical care and infection control precautions as soon as symptoms are detected. Groups that might be quarantined include:

- Persons who might have been exposed to an influenza case
  - Via family members
  - At a public gathering
  - On an airplane or other closed conveyance (see also Supplement 9), or
  - At their school or workplace
- Health care providers who work at a facility where influenza cases receive care

Group quarantine (like patient isolation) is optimally performed on a voluntary basis, in accordance with instructions of health care providers and health officials. However, the Governor, ADHS, and the local health officer have the basic legal authority (A.R.S. §§36-624, 36-787 through 36-789) to compel mandatory isolation and quarantine of individuals and groups when necessary to protect the public's health. Recommendations for quarantine and monitoring of quarantined persons in different situations (home quarantine, quarantine in a designated facility, working quarantine) are provided in Appendix 8.6.

#### **b) Measures that apply to use of specific sites or buildings**

Two ways of increasing social distance activity restrictions are to cancel events and close buildings or to restrict access to certain sites or buildings. These measures are sometimes called "focused measures to increase social distance." Depending on the situation, examples of cancellations and building closures might include:

- Cancellation of public events (concerts, sports events, movies, plays)
- Closure of recreational facilities (community swimming pools, youth clubs, gymnasiums) or other public or private facilities

## **2. Measures that affect communities**

Measures that affect entire communities (including both exposed and non-exposed persons), include:

- Promotion of community-wide infection control measures (e.g., respiratory hygiene/cough etiquette)
- “Stay Home Days” and self-isolation
- Closure of office buildings, shopping malls, schools, and public transportation (e.g., buses; see Supplement 9)

Measures that affect whole communities will be considered when:

- There is moderate to extensive disease transmission in the area
- Many cases cannot be traced to contact with an earlier case or known exposure
- Cases are increasing among contacts of influenza patients
- There is a significant delay between the onset of symptoms and the isolation of cases because of the large number of ill persons

As community outbreaks of pandemic influenza occur, community-wide infection control measures may decrease the overall magnitude of the outbreak (see Table 8.1). Community-based measures may also include school closures, “Stay Home Days”, and self-isolation.

### **a) Community-wide infection control measures**

Throughout a pandemic, public health authorities will encourage all persons with signs and symptoms of a respiratory infection, regardless of presumed cause, to:

- Cover the nose/mouth when coughing or sneezing
- Use tissues to contain respiratory secretions
- Dispose of tissues in the nearest waste receptacle after use
- Perform hand hygiene after contact with respiratory secretions and contaminated objects or materials

Persons at high risk for complications of influenza will be advised to avoid public gatherings (e.g., movies, public meetings) when influenza is in the community. They should also avoid going to other public areas (e.g., food stores, pharmacies); the use of other persons for shopping or home delivery service is encouraged.



Disposable surgical-type masks are used by health care workers taking care of ill patients to prevent splashes and droplets of potentially infectious material (e.g., from coughs and sneezes) from reaching the mucous membranes of the health care workers' nose or mouth. The benefit of wearing masks by well persons in public settings has not been established and is not recommended as a public health control measure at this time. In contrast to health care workers who unavoidably have close contact with ill patients, the general public should try to avoid close contact with ill individuals.

Nevertheless, persons may choose to wear masks as part of individual protection strategies that include cough etiquette, hand hygiene, and avoiding public gatherings. Mask use may be most important for persons who:

- Are at high risk for complications of influenza
- Are unable to avoid close contact with others
- Must travel for essential reasons such as seeking medical care or attending religious services

Public education should be provided on how to use and dispose of masks appropriately. In addition, this education should emphasize that mask use is not a substitute for social distance or other personal protection measures (see also Supplement 4). Supply issues should be considered so that mask use in communities does not limit availability for health care settings where the importance and effectiveness of this use has been documented.

## **b) “Stay Home Days” and Self-isolation**

“Stay Home Days” asks everyone to stay home (note: “Stay Home Days” is similar to “Snow Days” in Health and Human Services (HHS) and other state plans). This involves the entire community in a positive way, is acceptable to most people, and is relatively easy to implement. “Stay Home Days” may be declared at a state or local level by the respective health officer for an initial set period, with final decisions on duration based on an epidemiologic and social assessment of the situation. Such a declaration would be an official public health recommendation, but would not be legally enforceable. States and local authorities need to consider recommendations to the public for acquiring and storing the necessary provisions including type and quantity of supplies needed during “Stay Home Days”. “Stay Home Days” can effectively reduce transmission without explicit activity restrictions (i.e., quarantine). Consideration will be given to personnel who maintain primary functions in the community (e.g., law enforcement personnel, transportation workers, utility workers). Compliance with “Stay Home Days” may be enhanced by “self-isolation” behavior (i.e., many people may stay home even in the absence of an official “Stay Home Days” Declaration).

## **c) Closure of office buildings, shopping malls, schools, and public transportation**

Closure of office buildings, stores, schools, and public transportation systems may be feasible community containment measures during a pandemic. However, this would have significant impact on the community and workforce. Public health officials and others will need to carefully consider the potential effectiveness, how it can most efficiently be implemented, and how to maintain critical supplies and infrastructure while limiting community interaction. For example, when public transportation is cancelled, other modes of transportation must be provided for emergency medical services and medical evaluation.



Although data are limited, school closures may be effective in decreasing spread of influenza and reducing the overall magnitude of disease in a community. In addition, the risk of infection and illness among children is likely to be decreased, which would be particularly important if the pandemic strain causes significant morbidity and mortality among children. Children are known to be efficient transmitters of seasonal influenza and other respiratory illnesses. Anecdotal reports suggest that community influenza outbreaks may be limited by closing schools. Results of mathematical modeling also suggest a reduction of overall disease, especially when schools are

closed early in the outbreak. During Who Phases 5 through 6 (Widespread Human Infection or Pandemic), parents will be encouraged to consider child care arrangements that do not result in re-aggregating the children outside the school setting.

## **d) Widespread community quarantine (cordon sanitaire)**

In extreme circumstances, state and local officials may implement widespread or community-wide quarantine, which is the most stringent and restrictive containment measure. It differs from “Stay Home Days” in two respects: 1) It may involve a legally enforceable action, and 2) it restricts travel into or out of an area circumscribed by a real or virtual “sanitary barrier” or “cordon sanitaire”, except to authorized persons such as public health or health care workers. While HHS includes this containment intervention in federal guidance documents, it is not a viable option for Arizona. This is due to a lack of legal authority in Arizona to enforce such an intervention and the low-likelihood of success of physically maintaining it.

## **3. Scaling back community containment measures**

The decision to discontinue community-level measures will balance the need to lift individual movement restrictions against community health and safety. Premature removal of containment strategies can increase the risk of additional transmission. General recommendations are to withdraw the most stringent or disruptive measures first. Decisions will be based on evidence of improving local/regional control, such as:

- Consistent decrease in the number of confirmed cases
- Reduction in the number of probable and known cases
- Effective protective countermeasures are in place (e.g., high coverage with a pandemic influenza vaccine)

### Box 8.1. Containment Measures: Terms and Definitions

**Isolation** is the separation and restriction of movement or activities of ill infected persons (patients) who have a contagious disease for the purpose of preventing transmission to others.

**Quarantine** is the separation and restriction of movement or activities of persons who are not ill but who are believed to have been exposed to infection for the purpose of preventing transmission of disease. Individuals may be quarantined at home or in designated facilities; health care providers and other response workers may be subject to quarantine when they are off duty.

**Quarantine of close contacts** refers to the quarantine of individuals exposed to patients with communicable diseases (e.g., family members, work or school mates, health care workers).

**Quarantine of groups of exposed persons** refers to quarantine of people who have been exposed to the same source of illness (e.g., a case of influenza at a public gathering, on an airline, train, or cruise ship, at a school or workplace or apartment complex, or at a recently visited store or office).

**Widespread or community-wide quarantine** refers to closing community borders or creating real or virtual barriers around a geographic area (a *cordon sanitaire*) and prohibiting travel into or out of the area.

**Self-isolation or Self-shielding** refers to self-imposed exclusion from infected persons or those perceived to be infected (e.g., by staying home from work or school during an epidemic).

**Stay Home Days or Snow days** are days on which offices, schools, transportation systems are closed or cancelled, as if there were a major snowstorm.

**Influenza clinics** are special facilities that may be established during a pandemic to provide rapid medical assessment of potentially infected persons. Ill persons would be encouraged to call influenza hotlines that provide advice on whether to stay home or seek help at an influenza clinic. Persons who come to an influenza clinic will be advised on whether they may be best served by hospital care or home care.

**Individual-level containment measures** include isolation of patients and management of their close contacts.

**Focused measures to increase social distance (or decrease social contact)** includes measures applied to groups rather than individuals or whole communities (e.g., quarantine of groups of exposed persons and measures that apply to the use of specific sites or buildings).

**Containment measures that apply to use of specific sites or buildings** include cancellation of public events (e.g., concerts, sports events, movies and plays), closure of office buildings, apartment complexes, or schools; and closure of subways or bus lines. These measures may also involve restricting entrance to buildings or other sites (e.g., requiring fever screening or use of face masks before entry to schools, worksites, or airplanes).

**Community-based measures to increase social distance** include measures applied to whole neighborhoods, towns, or cities (e.g., “Stay Home Days”, establishment of fever clinics, and community-wide quarantine).

**Table 8.1. Graded Implementation of Community Containment Measures**

<b>Level of Influenza Activity</b>	<b>Response</b>
No novel influenza strains of public health concern in global circulation	Preparedness Planning
Limited novel influenza virus <sup>1</sup> transmission abroad; all local cases are either imported or have clear epidemiologic links to other cases	Quarantine of close contacts
Limited novel influenza virus transmission in the area, with either a small number of cases without clear epidemiologic links to other cases or with increased occurrence of influenza among their close contacts	Quarantine of close contacts
Sustained novel influenza virus transmission in the area, with a large number of cases without clear epidemiologic links to other cases; control measures aimed at individuals and groups appear to be effective	Focused measures to increase social distance <sup>2</sup> , consider community-based measures
Sustained novel influenza activity in the area, with a large number of cases in persons without an identifiable epidemiologic link at the time of initial evaluation; control measures are believed to be ineffective	Community-level measures to increase social distance; consider snow days and community-wide quarantine
Decreases in the number of new cases, unlinked (or “unexpected”) cases, and generations of transmission	Quarantine of contacts
Transmission has been controlled or eliminated; no new cases reported	Active monitoring in high-risk populations; continue for two to three incubation periods after control or elimination of transmission

1 “Novel influenza viruses” include avian or animal influenza strains that can infect humans and new or reemergent human viruses that cause cases or clusters of human disease.

2 “Focus measures to increase social distance” include measures applied to groups rather than individuals or whole communities (e.g., quarantine of groups of exposed persons and measures that apply to the use of specific sites or buildings).

**Table 8.2. Threshold Determinants for the Use of Community Containment Measures**

Data on cases and contacts – as well as on depletion of healthcare and public health resources over the course of a pandemic – can help state and local health authorities decide when to implement community-level containment measures. As part of preparedness planning, state and local health agencies and healthcare partners may estimate at what point in the pandemic – in terms of such variables as numbers of cases and numbers of unoccupied hospital beds – that more extensive measures may be imposed. During an actual pandemic, states and local departments may also evaluate social considerations, such as levels of community cooperation and mobility.

Potential Parameters	Variable
Cases and contacts	<ul style="list-style-type: none"><li>• Number of cases (absolute or estimated)</li><li>• Rate of incident cases</li><li>• Number of hospitalized cases</li><li>• Number and percentage of cases with no identified epidemiologic link</li><li>• Morbidity (including disease severity) and mortality</li><li>• Number of contacts under surveillance and/or quarantine</li></ul>
Healthcare resources	<ul style="list-style-type: none"><li>• Hospital/facility bed capacity</li><li>• Staff resources</li><li>• Patient/staff ratio</li><li>• Number of ill or absent staff members</li><li>• Availability of specifically trained specialists and ancillary staff members</li><li>• Availability of ventilators</li><li>• Availability of other respiratory equipment</li><li>• Availability of personal protective equipment and other measures</li><li>• Availability of therapeutic medications (influenza and non-influenza specific)</li></ul>
Public health resources	<ul style="list-style-type: none"><li>• Investigator to case and contact ratios</li><li>• Number of contacts under active surveillance</li><li>• Number of contacts under quarantine</li><li>• Ability to rapidly trace contacts (number of untraced/interviewed contacts)</li><li>• Ability to implement and monitor quarantine (staff ratio to contact ratio)</li><li>• Ability to provide essential services (food, water, etc.)</li></ul>
Community cooperation, mobility, and compliance	<ul style="list-style-type: none"><li>• Degree of compliance with voluntary individual isolation</li><li>• Degree of compliance with active surveillance and voluntary individual quarantine</li><li>• Degree of movement out of the community</li><li>• Degree of compliance with community-containment measures</li></ul>



## Appendix 8.1

### Interventions for Community Containment

Contacts of pandemic influenza patients can be managed by use of a range of interventions, all of which are designed to facilitate early recognition of illness in persons at greatest risk of becoming infected and thereby prevent transmission to others. Whereas many of these interventions are applied individually to persons identified as contacts of a person with possible or known influenza disease, others are applied to larger groups of persons, or communities that share a similar risk of exposure. Measures applied to individuals may not be feasible during the actual pandemic, when quarantining individuals and tracing close contacts may not be possible. The range of interventions includes the following:

<b>Passive Monitoring</b>	
<i>Definition</i>	The contact is asked to perform self-assessment at least twice daily and to contact authorities immediately if respiratory symptoms and/or fever occur.
<i>Application</i>	Situations in which 1) the risk of exposure and subsequent development of disease is low, and 2) the risk to others if recognition of disease is delayed is also low
<i>Benefits</i>	<ul style="list-style-type: none"> <li>• Requires minimal resources</li> <li>• Places few constraints on individual movement</li> </ul>
<i>Challenges</i>	<ul style="list-style-type: none"> <li>• Relies on self-reporting</li> <li>• Affected persons may not perform an adequate self-assessment</li> </ul>
<i>Resources Required</i>	<ul style="list-style-type: none"> <li>• Supplies (thermometer, symptom log, written instructions)</li> <li>• Hotline to notify authorities about symptoms or needs</li> <li>• Staff to receive telephone reports and provide in-person evaluation and care</li> <li>• Plans and procedures for rapid isolation of persons who develop symptoms</li> </ul>
<i>Partners</i>	Household members
<i>Forms/Templates</i>	<ul style="list-style-type: none"> <li>• Symptom logs</li> <li>• Instructions for patients and health care workers</li> </ul>
<b>Active Monitoring without Explicit Activity Restrictions</b>	
<i>Definition</i>	A health care or public health worker evaluates the contact on a regular (at least daily) basis by phone and/or in person for signs and symptoms suggestive of influenza
<i>Application</i>	Situations in which 1) the risk of exposure to and subsequent development of disease is moderate to high, 2) resources permit close observation of individuals, and 3) the risk of delayed recognition of symptoms is low to moderate
<i>Benefits</i>	Places few constraints on individual liberties
<i>Challenges</i>	Requires adequate staffing to track information and to verify monitoring and appropriate actions based on findings
<i>Resources Required</i>	Trained staff to provide in-person and/or telephone evaluations Plans and procedures for rapid isolation of persons who develop symptoms Contingency plans for managing noncompliant persons Hotline to notify authorities about symptoms or needs

<i>Partners</i>	<ul style="list-style-type: none"> <li>Professional and lay health care workers to perform evaluations on behalf of the health department</li> <li>Possible need for law enforcement to assist with management of noncompliant persons</li> </ul>
<i>Forms/Templates</i>	<ul style="list-style-type: none"> <li>Checklist for assessment of active monitoring</li> <li>Template for recording results of clinical evaluation</li> </ul>
<b>Working Quarantine</b>	
<i>Definition</i>	Employees are permitted to work but must observe activity restrictions while off duty. Monitoring for influenza-like illness is usually required. This may change based on the clinical presentation of the pandemic strain. Use of appropriate PPE while at work is required
<i>Application</i>	Persons for whom activity restrictions (home or facility quarantine) are indicated but who provide essential services (e.g., health care workers).
<i>Benefits</i>	<ul style="list-style-type: none"> <li>Reduces risk of community spread from high-risk contacts while minimizing adverse impact of activity restrictions on provision of essential services.</li> <li>Clinical monitoring at work reduces the staff required for active monitoring at the quarantine site.</li> </ul>
<i>Challenges</i>	<ul style="list-style-type: none"> <li>Need for close and consistent pre-shift monitoring at the work site to prevent inadvertent exposures</li> <li>May require means of transporting persons to and from work site to minimize interactions; persons in working quarantine should wear appropriate PPE during transport.</li> <li>Must maintain close cooperation and communication between work site and local health authorities.</li> <li>Need to provide mental health services to address concerns about isolation from family and friends.</li> </ul>
<i>Resources Required</i>	<ul style="list-style-type: none"> <li>Appropriate facility for off-duty quarantine if home is unavailable or inadequate</li> <li>Staff, funding, and goods for provision of essential services</li> <li>Personal protective equipment</li> <li>Hotline for notification of symptoms and personal needs</li> <li>System to track results of work-site monitoring and location(s) of off-duty quarantine</li> <li>Mental health, psychological, and behavioral support services, especially if work includes care of influenza patients</li> </ul>
<i>Partners</i>	<ul style="list-style-type: none"> <li>Work-site administrators and infection control personnel</li> <li>Community volunteers/workers</li> <li>Staff/volunteers to assist with transportation to and from work</li> <li>Mental health professionals</li> <li>Potential need for law enforcement to assist with noncompliant person</li> </ul>

<i>Forms/Templates</i>	<ul style="list-style-type: none"> <li>• Guidelines and instructions for persons in working quarantine</li> <li>• Instructions for supervisors of persons in working quarantine</li> <li>• Checklist to evaluate homes for quarantine</li> <li>• Guidelines for monitoring compliance</li> <li>• Checklist for active monitoring at work site</li> <li>• Template for recording results of clinical evaluation</li> <li>• Forms for recording compliance</li> </ul>
<b>Active Monitoring with Activity Restrictions (Quarantine)</b>	
<i>Definition</i>	<p>The contact remains separated from others for a specific period (up to 10 days after potential exposure), during which he is assessed on a regular basis (in person at least once daily) for signs and symptoms of influenza disease. Persons with fever, respiratory, or other early influenza symptoms require immediate evaluation by a trained health care provider. Restrictions may be voluntary or legally-mandated; confinement may be at home or in an appropriate facility.</p> <p>No specific precautions are required for those sharing the household with a person in quarantine as long as the person remains asymptomatic. Because onset of symptoms may be insidious, it may be prudent to minimize interactions with household members during the period of quarantine, if feasible.</p>
<i>Application</i>	Situations in which the risk of exposure and subsequent development of disease is high and the risk of delayed recognition of symptoms is moderate
<i>Benefits</i>	Reduces risk of spread from persons with subacute or subclinical presentations or from delayed recognition of symptoms
<i>Challenges</i>	<ul style="list-style-type: none"> <li>• May infringe on personal movement</li> <li>• May lead to a feeling of isolation from family and friends</li> <li>• May lead to a loss of income or employment</li> <li>• Requires plans/protocols for provision of essential services</li> <li>• Requires plan for provision of mental health support</li> <li>• Risk of noncompliance, particularly as duration increases</li> <li>• May require enforcement for noncompliance</li> </ul>
<i>Resources Required</i>	<ul style="list-style-type: none"> <li>• Staff for monitoring and evaluation</li> <li>• Appropriate facility if home setting is unavailable or inadequate</li> <li>• Staff, funding, and goods for provision of essential services</li> <li>• Hotline for notification of symptoms or personal needs</li> <li>• Mechanisms to communicate with family members outside the household or facility</li> <li>• Mental health and social support services</li> <li>• Delivery system for food and other essential supplies</li> </ul>

<i>Partners</i>	<ul style="list-style-type: none"> <li>Professional and lay health care workers to perform assessment on behalf of the health department</li> <li>Community volunteers/workers to assist with provision of essential services</li> <li>Potential need for law enforcement to assist with noncompliant persons</li> </ul>
<b>Focused Measures to Increase Social Distance</b>	
<i>Definition</i>	Intervention applied to specific groups designed to reduce interactions and thereby transmission risk within the group. When focused, the intervention is applied to groups or persons identified in specific sites or buildings, most but not necessarily all of whom are at risk of exposure to influenza.
<i>Examples</i>	<ul style="list-style-type: none"> <li>Quarantine of groups of exposed persons</li> <li>Cancellation of public events</li> <li>Closure of office buildings, schools, and/or shopping malls</li> <li>Closure of public transportation such as subways or bus lines</li> </ul>
<i>Application</i>	Groups or settings where transmission is believed to have occurred, where the linkages between cases is unclear at the time of evaluation, and where restrictions placed only on persons known to have been exposed is considered insufficient to prevent further transmission.
<i>Benefits</i>	<ul style="list-style-type: none"> <li>When applied broadly, it reduces the requirement for urgent evaluation of large numbers of potential contacts to determine indications for activity restrictions</li> <li>May enable reductions in transmission among groups of persons without explicit activity restrictions (quarantine)</li> </ul>
<i>Challenges</i>	<ul style="list-style-type: none"> <li>May be difficult to solicit cooperation, particularly if popular buildings are closed or popular events are canceled</li> <li>Requires excellent communication mechanisms to notify affected persons of details and rationale</li> <li>May need to provide replacement for affected activities</li> <li>Generally relies on passive monitoring</li> </ul>
<i>Resources Required</i>	<ul style="list-style-type: none"> <li>Systems to communicate relevant messages</li> <li>May require enforcement, particularly if closure of buildings or gathering places is necessary</li> <li>Requires resources for passive monitoring</li> <li>Hotlines to report symptoms and obtain follow-up instructions</li> <li>Transportation for medical evaluation, with appropriate infection control precautions</li> </ul>
<i>Partners</i>	<ul style="list-style-type: none"> <li>News media and communication outlets</li> <li>Law enforcement</li> <li>Community groups</li> </ul>
<i>Forms/Templates</i>	<ul style="list-style-type: none"> <li>Messages for affected persons</li> <li>Messages for employers of affected persons</li> <li>Messages for persons supplying essential services</li> </ul>

<b>Community-Wide Measures to Increase Social Distance</b>	
<i>Definition</i>	Intervention applied to an entire community or region, designed to reduce personal interactions and thereby transmission risk. The prototypical example is implementation of a “Stay Home Days” or “snow days” declaration, in which offices, schools, and transportation systems are cancelled as for a major snowstorm.
<i>Application</i>	All members of a community in which 1) extensive transmission of influenza is occurring, 2) a significant number of cases lack clearly identifiable epidemiologic links at the time of evaluation, and 3) restrictions on persons known to have been exposed are considered insufficient to prevent further spread.
<i>Benefits</i>	<ul style="list-style-type: none"> <li>• Reduces the need for urgent evaluation of large numbers of potential contacts to determine indications for activity restrictions</li> <li>• May enable reductions in transmission among groups without explicit activity restrictions or quarantine</li> <li>• “Snow days” may be familiar concepts and thus may be easy to implement on short notice</li> </ul>
<i>Challenges</i>	<ul style="list-style-type: none"> <li>• May be difficult to solicit cooperation</li> <li>• Requires excellent communication mechanisms to notify affected persons of details and rationale</li> <li>• May need to provide replacement for affected activities</li> <li>• May need to address mental health and financial support issues</li> <li>• When an entire community is involved, requires cooperation with neighboring jurisdiction that may not be using a similar intervention, particularly in situations where persons live in one city and work in another.</li> <li>• Generally relies on passive monitoring</li> <li>• Social and economic impact of public transportation closures</li> </ul>
<i>Resources Required</i>	<ul style="list-style-type: none"> <li>• Communication outlets</li> <li>• Enforcement</li> <li>• Resources for passive monitoring</li> <li>• Hotlines and other communication system to report symptoms and obtain follow-up instructions</li> </ul>
<i>Partners</i>	<ul style="list-style-type: none"> <li>• News media and other communication outlets</li> <li>• Law enforcement and transportation officials to enforce restrictions (e.g., closure of bridges, roads, or mass transit systems) and plan for provision of critical supplies and infrastructure</li> </ul>
<i>Forms/Templates</i>	<ul style="list-style-type: none"> <li>• Messages for affected persons</li> <li>• Messages for employers of affected persons</li> <li>• Messages for persons supplying essential services</li> </ul>

## **Appendix 8.2**

### **Preparedness Checklist for Community Containment Measures**

#### **General**

- ☐ Establish an incident command structure that can be used for influenza response.
- ☐ Establish a legal preparedness plan.
- ☐ Establish relationships with partners, such as law enforcement, first responders, health care facilities, mental health professionals, local businesses, and the legal community.
- ☐ Plan to monitor and assess factors that will determine the types and levels of response, including the epidemiologic profile of the outbreak, available local resources, and level of public acceptance and participation.
- ☐ Develop communication strategies for the public, government decision-makers, health care and emergency response workers, mental health professionals, and the law enforcement community.
- ☐ Invite key partners to participate in pandemic influenza containment exercises and drills.

#### **Management of cases and contacts (including quarantine)**

- ☐ Develop protocols, tools, and databases for:
  - Case surveillance
  - Clinical evaluation and management
  - Contact tracing, monitoring, and management
  - Reporting criteria
- ☐ Develop standards and tools for home and non-hospital isolation and quarantine.
- ☐ Establish supplies for non-hospital management of cases and contacts.
- ☐ Establish a telecommunications plan for “hotlines” or other services for:
  - Case and contact monitoring and response
  - Fever triage
  - Public information
  - Provider information
- ☐ Plan to ensure provision of essential services and supplies to persons in isolation and quarantine, keeping in mind the special needs of children. Services and supplies include:
  - Food and water
  - Shelter
  - Medicines and medical consultations
  - Mental health and psychological support services
  - Other supportive services (e.g., day care or elder care)
  - Transportation to medical treatment, if required
- ☐ Plan to address issues of financial support, job security, and prevention of stigmatization.
- ☐ Establish procedures for medical evaluation and isolation of quarantined persons who exhibit signs of illness.
- ☐ Develop protocols for monitoring and enforcing quarantine measures, such as:
  - Protocols for follow-up of persons who cannot be reached by telephone.



These may include a threshold period for non-responsiveness that should trigger a home visit or other means to locate the person. Partnerships with law enforcement and other community-based resources will be helpful in tracing the whereabouts of persons who have violated restrictions.

- ☐ Protocols for monitoring persons who cannot or will not comply with voluntary home quarantine. These may include:
  - Issuing official, legally binding quarantine orders
  - Posting a guard outside the home
  - Using electronic forms of monitoring
  - Using guarded facilities
  - Protocols for using checkpoints to restrict travel between neighborhoods.

Temporary emergency facilities for patient isolation, quarantine, and assessment of patients with fever (see Appendix 8.7 for a list of facility characteristics)

- ☐ Identify appropriate community-based facilities for isolation of patients who have no substantial health care requirements.
- ☐ Develop policies related to use of these facilities.
- ☐ Identify facilities for persons for whom home isolation is indicated but who do not have access to an appropriate home setting, such as travelers and homeless populations.
- ☐ Ensure that required procedures for assessment of potential isolation or quarantine sites are available and up to date.
- ☐ Identify potential quarantine facilities and prepare contingency plans for staffing and equipping them.
- ☐ Identify potential sites for fever clinics and prepare contingency plans for staffing and equipping them, including the ability to dispense antiviral drugs to identified cases in the priority groups

### **Community containment measures**

- ☐ Ensure that legal authorities and procedures are in place to implement the various levels of movement restrictions as necessary.
- ☐ Establish procedures for medical evaluation and isolation of quarantined persons who exhibit signs of illness. (Additional information on medical evaluation is provided in Supplement 5.)
- ☐ Develop tools and mechanisms to prevent stigmatization and provide mental health services to persons in isolation or quarantine.
- ☐ Identify key partners and personnel for the implementation of movement restrictions, including quarantine, and the provision of essential services and supplies:
  - Law enforcement
  - First responders
  - Other government service workers
  - Utilities
  - Transportation industry
  - Local businesses
  - Schools and school boards

Establish procedures for delivering medical care, food, and services to persons in isolation or quarantine. Examples of services that will require the help of non-traditional partners include:

- ☐ Training for responders and health care workers, as necessary, in use of personal protective equipment

- ☐ Plans for the mobilization and deployment of public health and other community-service personnel

### **General**

- ☐ Establish an incident command structure that can be used for influenza response.
- ☐ Establish a legal preparedness plan.
- ☐ Establish relationships with partners, such as law enforcement, first responders, health care facilities, mental health professionals, and the legal community.
- ☐ Plan to monitor and assess factors that will determine the types and levels of response, including the epidemiologic profile of the outbreak, available local resources, and level of public acceptance and participation.
- ☐ Develop communication strategies for the public government decision-makers, health care and emergency response workers, mental health professionals, and the law enforcement community. These strategies should consider privacy concerns.
- ☐ Invite key partners to participate in pandemic influenza containment exercises and drills.

### **Management of cases and contacts (including quarantine)**

- ☐ Develop protocols, tools, and databases for management of cases and contacts, considering account security and privacy concerns. These may include protocols for:
  - Case surveillance
  - Clinical evaluation and management
  - Contact tracing, monitoring, and management
  - Reporting criteria
- ☐ Develop standards and tools for home and non-hospital isolation and quarantine.
- ☐ Establish supplies for non-hospital management of cases and contacts.
- ☐ Establish a telecommunications plan for “hotlines” or other services for case and contact monitoring and response
  - Fever triage
  - Public information
  - Provider information
- ☐ Plan to ensure provision of essential services and supplies to persons in isolation and quarantine, including:
  - Food and water
  - Shelter
  - Medicines and medical consultations
  - Mental health and psychological support services
  - Other supportive services (e.g., day care or elder care).
  - Transportation to medical treatment, if required
- ☐ Plan to address issues of financial support, job security, privacy concerns and prevention of stigmatization.

## Appendix 8.3

### Planning Checklists and Resources

The U.S. Department of Health and Human Services (HHS)-managed website [www.flu.gov/](http://www.flu.gov/) provides many useful checklists and planning resources for businesses, individuals and families, faith-based and community organizations, and several others. As stated on the website, it “provides comprehensive government-wide information on seasonal, H1N1 (swine), H5N1 (bird) and pandemic influenza for the general public, health and emergency preparedness professionals, policy makers, government and business leaders, school systems, and local communities”.

Planning Checklists available (<http://www.flu.gov/professional/checklists.html>)

#### *State & Local Government*

- CDC 2009 H1N1 Vaccination Campaign Planning Checklist
- State and Local Pandemic Influenza Planning Checklist

#### *Workplace*

- Law Enforcement Pandemic Influenza Planning Checklist
- Correctional Facilities Pandemic Influenza Planning Checklist
- Business Pandemic Influenza Planning Checklist
- Long-Term Care and Other Residential Facilities Pandemic Influenza Planning Checklist
- Health Insurer Pandemic Influenza Planning Checklist
- Travel Industry Pandemic Influenza Planning Checklist

#### *Individuals & Families*

- Pandemic Flu Planning Checklist for Individuals and Families

#### *Schools*

- Childcare and Preschool Pandemic Influenza Planning Checklist
- School District (K-12) Pandemic Influenza Planning Checklist
- Colleges and Universities Pandemic Influenza Planning Checklist

#### *Healthcare*

- CDC 2009 H1N1 Vaccination Campaign Planning Checklist
- Home Health Care Services Pandemic Influenza Planning Checklist
- Medical Offices and Clinics Checklist
- Emergency Medical Services and Medical Transport Checklist
- Hospital Pandemic Influenza Planning Checklist
- Long-Term Care and Other Residential Facilities Pandemic Influenza Planning Checklist

## **Appendix 8.4**

### **Legal Preparedness: Isolation and Quarantine Templates**

- 8.4.1 Quarantine Directive for Public Health Emergencies: A.R.S. §§ 36-788 and -789
- 8.4.2 Isolation Directive for Public Health Emergencies: A.R.S. §§ 36-788 and -789
- 8.4.3 Petition for Compulsory Isolation or Quarantine: A.R.S. § 36-789(B)
- 8.4.4 Affidavit in Support of Compulsory Isolation or Quarantine: A.R.S. § 36-789(C)
- 8.4.5 Order for Isolation or Quarantine: A.R.S. § 36-789(B), (F), (G)

**Appendix 8.4.1**  
**Quarantine Directive for Public Health Emergencies**  
**A.R.S. §§ 36-788 and -789**

**QUARANTINE DIRECTIVE FOR PUBLIC HEALTH EMERGENCIES**  
**(INDIVIDUAL OR MULTIPLE PERSONS/GROUPS)**

To: \_\_\_\_\_ Address: \_\_\_\_\_

The Governor of the State of Arizona has declared a State of Emergency or State of War Emergency that includes an occurrence or imminent threat of smallpox, plague, viral hemorrhagic fevers or a highly contagious and highly fatal disease with transmission characteristics similar to small pox.

The Arizona Department of Health Services ("the Department") has reason to suspect that you have come in contact with a person who has one of the designated diseases and you may have or develop this disease. Specifically, you are suspected of having come into contact with a person who has \_\_\_\_\_. If you were to have this disease you would pose a substantial threat to the health of other persons. Because any delay in implementing your quarantine will pose an immediate and serious threat to the public health, the Department, in order to prevent transmission of this contagious disease, directs you to be placed in quarantine in accordance with A.R.S. § 36-789(A). The time and location of the premises for your quarantine are:

Time: \_\_\_\_\_

Location: \_\_\_\_\_

The Department considers this the least restrictive clinically appropriate place of quarantine given the nature of the disease with which you may have come into contact. Within ten days after issuing this Directive, the Department shall file a petition for a court order authorizing the continued quarantine of the person or persons named in this Directive. A court hearing will be set following the filing of the petition.

During this period you may be required to undergo a medical exam and may be ordered to receive medical treatment and/or vaccination. A person subject to quarantine shall comply with the Department's rules and orders, shall not go beyond the quarantine premises, and shall not come in contact with any person not subject to quarantine other than a health care provider, the Department or local health authority, or other person authorized by the Department or local health authority.

This directive will be in effect until you are deemed non-contagious by the Department and therefore do not pose a substantial threat to the health of the public, or upon the expiration of the Directive or by court order. It is anticipated that you will need to be quarantined for at least \_\_\_\_\_ to verify whether or not you have a contagious disease.

If you leave the place of quarantine designated above without the prior consent of the Department, action will be taken as authorized under A.R.S. § 36-787 to have you taken into custody by law enforcement officials and returned to the place of quarantine.

If you object to this order of quarantine or to the conditions of your quarantine, you may request a hearing in the superior court in accordance with A.R.S. §§ 36-789 (I) and (J). The court will then schedule a hearing. The request for a hearing does not suspend the effect of the Quarantine Directive.

Any questions regarding this order may be directed to \_\_\_\_\_ at (602) \_\_\_\_\_.

Notice was provided to the person or persons subject to this directive as follows:

☐ This directive was served in-hand to the above-named individual on \_\_\_\_\_ at \_\_\_\_\_ a.m./p.m.

**Appendix 8.4.2**  
**Isolation Directive for Public Health Emergencies**  
**A.R.S. §§ 36-788 and -789**

**ISOLATION DIRECTIVE FOR PUBLIC HEALTH EMERGENCIES**  
**(INDIVIDUAL OR MULTIPLE PERSONS/GROUPS)**

To: \_\_\_\_\_ Address: \_\_\_\_\_

The Governor of the State of Arizona has declared a State of Emergency or State of War Emergency that includes an occurrence or imminent threat of smallpox, plague, viral hemorrhagic fevers or a highly contagious and highly fatal disease with transmission characteristics similar to small pox.

The Arizona Department of Health Services ("the Department") has reason to suspect that you are infected with the contagious disease \_\_\_\_\_. If you are in fact infected with this disease you pose a substantial threat to the health of other persons. Because any delay in implementing your isolation will pose an immediate and serious threat to the public health, the Department, in order to prevent transmission of this contagious disease, directs you to be placed in isolation in accordance with A.R.S. § 36-789(A). The time and location of the premises for your isolation are:

Time: \_\_\_\_\_

Location: \_\_\_\_\_

The Department considers this the least restrictive clinically appropriate place of isolation given the nature of the disease you are suspected of having. Within ten days after issuing this Directive, the Department shall file a petition for a court order authorizing the continued isolation of the person or persons named in this Directive. A court hearing will be set following the filing of the petition.

During this period you will be required to undergo a medical exam and may be ordered to receive medical treatment. A person subject to isolation shall comply with the Department's rules and orders, shall not go beyond the isolation premises, and shall not come in contact with any person not subject to isolation other than a health care provider, the Department or local health authority, or other person authorized by the Department or local health authority.

This directive will be in effect until you are deemed non-contagious by the Department and no longer pose a substantial threat to the health of the public, or upon expiration of this Directive or by court order. It is anticipated that you will need to be isolated for at least \_\_\_\_\_ to verify a diagnosis and render you non-contagious.

If you leave the place of isolation designated above without the prior consent of the Department, action will be taken as authorized under A.R.S. § 36-787 to have you taken into custody by law enforcement officials and returned to the place of isolation.

If you object to this isolation directive or to the conditions of your isolation, you may request a hearing in the superior court in accordance with A.R.S. § 36-789 (I) and (J). The court will then schedule a hearing. The request for a hearing does not suspend the effect of this Isolation Directive.

Any questions regarding this directive may be directed to \_\_\_\_\_ at (602) \_\_\_\_\_.

Notice was provided to the person or persons subject to this directive as follows:

↳ This directive was served in-hand to the above-named individual on \_\_\_\_\_ at \_\_\_\_\_ a.m./p.m.

↳ This directive applies to a group of persons for whom it is impractical to provide individual copies. A copy of this directive has been posted in a conspicuous place at: \_\_\_\_\_

\_\_\_\_\_  
Arizona Department of Health Services, Director

\_\_\_\_\_  
Date

# 412047



**Appendix 8.4.3**  
**Petition for Compulsory Isolation or Quarantine**  
**A.R.S. § 36-789(B)**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">-----Name-----</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Attorney General/County Attorney</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Firm State Bar No. -----</div></div> <div style="border: 1px solid black; padding: 5px;"><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">-----Name-----</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">-----Title-----</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">-----Address-----</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">-----Address-----</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">-----Telephone-----</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">-----Fax-----</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">-----E-mail-----</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">State Bar No. -----</div></div>	<p style="text-align: center; margin: 0;"><b>IN THE SUPERIOR COURT OF THE STATE OF ARIZONA</b></p> <p style="text-align: center; margin: 0;"><b>IN AND FOR THE COUNTY OF -----</b></p> <table border="0" style="width: 100%; margin-top: 20px;"><tr><td style="width: 40%; vertical-align: top;">STATE OF ARIZONA</td><td style="width: 10%; text-align: center; vertical-align: middle;">}</td><td style="width: 50%; vertical-align: top;">Case No.:</td></tr><tr><td style="vertical-align: top; padding-top: 10px;">Petitioner,</td><td></td><td></td></tr><tr><td style="text-align: center; vertical-align: middle;">vs.</td><td></td><td><b>PETITION FOR COMPULSORY</b></td></tr><tr><td style="border-bottom: 1px dashed black; height: 1.2em; width: 150px; margin: 0 auto;"></td><td></td><td><b>ISOLATION/QUARANTINE</b></td></tr><tr><td></td><td></td><td><b>PURSUANT TO A.R.S. § 36-789</b></td></tr><tr><td></td><td></td><td>(Oral Argument Requested)</td></tr><tr><td style="vertical-align: top; padding-top: 10px;">Respondent(s).</td><td></td><td></td></tr></table>	STATE OF ARIZONA	}	Case No.:	Petitioner,			vs.		<b>PETITION FOR COMPULSORY</b>			<b>ISOLATION/QUARANTINE</b>			<b>PURSUANT TO A.R.S. § 36-789</b>			(Oral Argument Requested)	Respondent(s).		
STATE OF ARIZONA	}	Case No.:																					
Petitioner,																							
vs.		<b>PETITION FOR COMPULSORY</b>																					
		<b>ISOLATION/QUARANTINE</b>																					
		<b>PURSUANT TO A.R.S. § 36-789</b>																					
		(Oral Argument Requested)																					
Respondent(s).																							
<p>The Arizona Department of Health Services/County Department of Public Health ("Department") petitions the Court for an Order authorizing the initial/continued isolation/quarantine of Respondent(s), pursuant to A.R.S. § 36-789(B).</p> <p>The Governor of the State of Arizona has declared a State of Emergency or State of War Emergency that includes an occurrence or imminent threat of smallpox, plague, viral hemorrhagic fevers or a highly contagious and highly fatal disease with transmission characteristics similar to small pox. See A.R.S. § 36-787(C). A copy of the Governor's State of Emergency or State of War Emergency is attached and incorporated herein as</p>																							
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1 Exhibit A. Under A.R.S. § 36-788(B), the Department may: (1) establish and maintain  
2 places of isolation and quarantine; and (2) require the isolation and quarantine of any  
3 person or group of persons, by the least restrictive measures available, to protect the  
4 public health.

5 The Department has reasonable cause to believe that a highly contagious and fatal  
6 disease exists within its jurisdiction and isolation/quarantine of the Respondent(s) is the  
7 least restrictive means by which the public can be protected from transmission of the  
8 disease. See A.R.S. § 36-788(A). Therefore, the Department seeks a court order  
9 authorizing the isolation/quarantine of Respondent(s) OR has isolated/quarantined  
10 Respondent(s) through a written directive and now seeks a court order to continue  
11 isolation/quarantine. A copy of the Department's written directive is attached and  
12 incorporated herein as Exhibit B. A.R.S. § 36-789.  
13

14 The following information is provided pursuant to A.R.S. § 36-789(B):  
15

- 16 1. The identity of the person/group of persons subject to isolation/quarantine:  
17

18 \_\_\_\_\_;  
19

- 20 2. The premises subject to isolation/quarantine:  
21

22 \_\_\_\_\_;  
23

- 24 3. The date and time at which isolation/quarantine commences:  
25

\_\_\_\_\_;  
\_\_\_\_\_;

1 4. The suspected contagious disease, if known:

2 \_\_\_\_\_  
3 \_\_\_\_\_;

4 5. (ADHS ONLY): A statement of compliance with the conditions and  
5 principles for isolation/quarantine:

6 The Department is in compliance with the conditions and principals for  
7 isolation/quarantine set forth in A.R.S. §§ 36-787 through 36-789:

9 (LOCAL HEALTH DEPARTMENT ONLY): The isolation or quarantine  
10 and other control measure requirements being imposed, including, if  
11 applicable, requirements for physical examinations and medical testing to  
12 ascertain and monitor an individual's health status:

13 \_\_\_\_\_  
14 \_\_\_\_\_;

15 6. A statement of the basis on which isolation/quarantine is justified:

16 \_\_\_\_\_  
17 \_\_\_\_\_;

18 **INFORMATION TO BE INCLUDE FOR STATEMENT #6:**

19 **FOR ISOLATION:** the following information must be provided in  
20 this section:

21 What is the reasonable basis for the Department's conclusion  
22 that the Respondent(s) have contracted one of the enumerated  
23 highly contagious diseases, why the disease poses a serious  
24 threat to public health, why isolation and the conditions of  
25 this isolation are the least restrictive means by which the  
public can be protected from transmission of the disease, and  
any details of the refusal of the Respondent(s) to accept less  
restrictive measures.

1 **FOR QUARANTINE:** the following information must be provided  
in this section:

2 What is the reasonable basis for the Department's conclusion  
3 as to how the Respondent(s) have been exposed to this highly  
4 contagious disease, why the disease poses a serious threat to  
5 public health, why quarantine and the conditions of the  
6 quarantine are the least restrictive means by which the public  
can be protected from transmission of the disease, and any  
details of the refusal of the Respondent(s) to accept less  
restrictive measures.

7 -----Name-----, -----Title----- of the Department attests to the facts asserted in this  
8 petition. ---Name---'s sworn Affidavit is attached and incorporated herein as Exhibit  
9 B/C.

10 Conclusion.

11 The Department requests this Court to issue an order authorizing the  
12 isolation/quarantine of the Respondent(s) to prevent the transmission of a highly  
13 contagious and deadly disease.

14  
15 DATED this \_\_\_\_ day of \_\_\_\_\_.

16  
17 -----Name-----  
18 Attorney General/County Attorney

19  
20 -----Name-----  
-----Title-----  
21 Attorney for the State

22 Original filed this \_\_\_\_ day of \_\_\_\_\_ with:  
23 \_\_\_\_\_

24 Clerk of the Superior Court  
----- County Superior Court  
25 -----Address-----  
-----Address-----

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Copy of the foregoing hand delivered this  
\_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ to:

Honorable \_\_\_\_\_  
\_\_\_\_\_ County Superior Court  
\_\_\_\_\_ Address \_\_\_\_\_  
\_\_\_\_\_ Address \_\_\_\_\_

Copy of the foregoing personally served this  
\_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_ on:

\_\_\_\_\_ Name \_\_\_\_\_  
\_\_\_\_\_ Title \_\_\_\_\_  
\_\_\_\_\_ Address \_\_\_\_\_  
\_\_\_\_\_ Address \_\_\_\_\_

Copy of the foregoing mailed this \_\_\_\_\_  
day of \_\_\_\_\_, \_\_\_\_\_ to:

\_\_\_\_\_ Name \_\_\_\_\_  
\_\_\_\_\_ Title \_\_\_\_\_  
\_\_\_\_\_ Address \_\_\_\_\_  
\_\_\_\_\_ Address \_\_\_\_\_

By: \_\_\_\_\_  
\_\_\_\_\_ Name, Title \_\_\_\_\_

DOC: PHX # 862438



**Appendix 8.4.4**  
**Affidavit in Support of Compulsory Isolation or Quarantine**  
**A.R.S. § 36-789(C)**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	<p style="text-align: center;"><u>AFFIDAVIT</u></p> <p>STATE OF ARIZONA     )   ) ss. County of _____ )</p> <p>_____, being first duly sworn upon his/her oath, deposes, and says:</p> <p>1. I am the _____ of the Arizona Department of Health Services/County Department of Public Health ("Department") and I am authorized to execute this affidavit in support of the Petition for Compulsory Isolation/Quarantine on behalf of the Department.</p> <p>2. I have read the Petition for Compulsory Isolation/Quarantine Pursuant to A.R.S. § 36-789 and know the contents thereof.</p> <p>3. The facts asserted in the Petition are true to the best of my knowledge, specifically:</p> <ul style="list-style-type: none"><li>a. The identity of the person or group of persons subject to isolation/quarantine;</li><li>b. The premises subject to isolation/quarantine;</li><li>c. The date and time at which isolation/quarantine commences;</li><li>d. The suspected contagious disease;</li><li>e. The compliance of the Department with the conditions and principles for isolation/quarantine; and</li><li>f. The basis on which isolation/quarantine is justified pursuant to A.R.S. Title 36, Chapter 6, Article 9.</li></ul> <p>4. OPTIONAL PARAGRAPHS: Include additional factual information that is relevant to the court's consideration.</p> <p style="text-align: center;">1</p>
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DATED this [redacted] day of [redacted], [redacted]

\_\_\_\_\_  
-----Name-----  
-----Title-----

SUBSCRIBED AND SWORN to before me this [redacted] day of [redacted], [redacted]

\_\_\_\_\_  
NOTARY PUBLIC

My Commission Expires:

\_\_\_\_\_

DOC: PHX # 862439

**Appendix 8.4.5**  
**Order for Isolation or Quarantine**  
**A.R.S. § 36-789(B),(F),(G)**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Name</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Attorney General/County Attorney</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Firm State Bar No.</div></div> <div style="border: 1px solid black; padding: 5px;"><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Name</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Title</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Address</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Address</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Telephone</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Fax</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">E-mail</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">State Bar No.</div></div>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Name</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Attorney General/County Attorney</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Firm State Bar No.</div></div> <div style="border: 1px solid black; padding: 5px;"><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Name</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Title</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Address</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Address</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Telephone</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">Fax</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">E-mail</div><div style="border-bottom: 1px dashed black; margin-bottom: 2px;">State Bar No.</div></div>									
<b>IN THE SUPERIOR COURT OF THE STATE OF ARIZONA</b>											
<b>IN AND FOR THE COUNTY OF</b> <span style="border: 1px solid black; padding: 0 20px;"> </span>											
<table border="0" style="width: 100%;"><tr><td style="width: 40%; vertical-align: top;">STATE OF ARIZONA</td><td style="width: 10%; text-align: center; vertical-align: middle;">}</td><td style="width: 50%; vertical-align: top;">Case No.:  <b>ORDER FOR ISOLATION/QUARANTINE PURSUANT TO A.R.S. § 36-789</b></td></tr><tr><td style="text-align: center; vertical-align: middle;">vs.</td><td style="text-align: center; vertical-align: middle;">}</td><td></td></tr><tr><td style="vertical-align: top;">Petitioner,  <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div></td><td style="text-align: center; vertical-align: middle;">}</td><td style="vertical-align: top;">Respondent(s),  <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div></td></tr></table>			STATE OF ARIZONA	}	Case No.:  <b>ORDER FOR ISOLATION/QUARANTINE PURSUANT TO A.R.S. § 36-789</b>	vs.	}		Petitioner,  <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	}	Respondent(s),  <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>
STATE OF ARIZONA	}	Case No.:  <b>ORDER FOR ISOLATION/QUARANTINE PURSUANT TO A.R.S. § 36-789</b>									
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Petitioner,  <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	}	Respondent(s),  <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>									
<p>Having reviewed the Arizona Department of Health Services'/County Department of Public Health's ("Department") Petition for Compulsory Isolation/Quarantine Pursuant to A.R.S. § 36-789 and attached exhibits, Respondent's -----documents filed, if any-----, and the testimony of the parties and witnesses, THE COURT FINDS that:</p> <p>1. The Governor of the State of Arizona has declared a State of Emergency or State of War Emergency that includes an occurrence or imminent threat of smallpox, plague, viral hemorrhagic fevers or a highly contagious and highly fatal disease with transmission characteristics similar to smallpox.</p>											
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1           2. The Department has reasonable cause to believe that a highly contagious and  
2 fatal disease exists within its jurisdiction.

3           3. Isolation/Quarantine of the Respondent(s) is the least restrictive means by  
4 which the public can be protected from transmission of the disease.

5           4. The Department is in compliance with the conditions and principals for  
6 isolation/quarantine set forth in A.R.S. §§ 36-787 through 36-789.

7           5. (Include paragraphs stating the basis on which isolation/quarantine is  
8 justified.)

9           The Department having shown by a preponderance of the evidence that  
10 isolation/quarantine is reasonably necessary to protect the public health, IT IS HEREBY  
11 ORDERED THAT:  
12

13           1. The following person or group of persons shall be isolated/quarantined  
14 beginning at (date and time), at (location):

15           (Identify the isolated or quarantined person or group of persons by name or  
16 shared or similar characteristics or circumstances)

17           2. (Optional paragraph: The isolation/quarantine shall be effected with the  
18 following conditions necessary to ensure that the isolation/quarantine is carried out  
19 within the stated purposes and restrictions of A.R.S. Title 36, Chapter 6, Article 9:  
20 )

21           3. This Order shall be served on the above-named person or group of persons in  
22 accordance with the Arizona Rules of Civil Procedure.

23           IT IS FURTHER ORDERED THAT this Order shall expire 30 (can be less than,  
24 but no more than 30) days from the date of its issuance unless the Department is granted  
25 continuance of this Order under A.R.S. §36-789(H).

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SIGNED this \_\_\_\_ day of \_\_\_\_\_.

Honorable -----Name-----

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## **Appendix 8.5**

### **Frequently Asked Questions About Quarantine**

#### **If an influenza pandemic occurs, will my community be quarantined?**

Community-wide quarantine is only one of a spectrum of actions that may be considered during an influenza pandemic in the United States. Although rapid control is likely to require bold and swift action, measures that are less drastic than legally enforced quarantine may suffice, depending on the epidemiologic characteristics of the pandemic. For example, active monitoring without activity restrictions may be adequate when most cases are either imported or have clear epidemiologic linkages at the time of initial evaluation. When the epidemiology of the outbreak indicates a need for stronger measures, jurisdictions can adopt a voluntary quarantine approach and reserve compulsory measures for only extreme situations. When an outbreak progresses to include large numbers of cases for which no epidemiologic linkages can be identified, community-level interventions may become necessary. Even at this stage, however, measures designed to increase social distance, such as “Stay Home Days”, may be preferred alternatives to quarantine. Wider use of quarantine is generally reserved for situations in which all other control measures are believed to be ineffective.

The choice of containment measures requires frequent and ongoing assessment of an outbreak and evaluation of the effectiveness of existing control measures. Officials must be prepared to make decisions based on limited information and then modify those decisions as additional information becomes available.

#### **Does the effectiveness of containment measures require 100% compliance?**

No. Containment measures, including quarantine, are effective even if compliance is less than 100%. Although health officials should strive for high compliance, even partial or “leaky” quarantine can reduce transmission. Therefore, strict enforcement is not always needed; in most cases, jurisdictions can rely on voluntary cooperation. The incremental benefit of quarantine approaches a maximum at a compliance rate of approximately 90%, with little additional benefit from higher rates of compliance. Therefore, containment measures can be important components of the response to a communicable disease outbreak even when compliance is not 100%.

#### **Does “quarantine” always mean using a legal order to restrict someone’s activity?**

No. The term “quarantine” is often defined narrowly to refer to the legally mandated separation of well persons who have been exposed to a communicable disease from those who have not been exposed. Although the precise legal definition of quarantine may differ from jurisdiction to jurisdiction, when used clinically or programmatically, quarantine may be defined more broadly to include all interventions, both mandatory and voluntary, that restrict the activities of persons exposed to a communicable disease. Therefore, whenever an exposed person is placed under a regimen of monitoring that includes an activity restriction, even when those restrictions are voluntary, the person is said to be under quarantine.

#### **Must quarantine be mandatory to be effective?**

Although the federal government and nearly all states have the basic legal authority to place persons exposed to certain communicable diseases under quarantine and enforce the required restrictions on activity, use of this authority may not always be necessary or practical. Previous experiences with the use of quarantine, including those during the 2003 SARS outbreak, suggest that the majority of persons comply voluntarily with requests from health authorities to remain in quarantine and observe the recommended activity restrictions. In the event voluntary measures are not successful, it may be necessary to implement mandatory containment measures.

#### **Does being placed in quarantine increase a person’s risk for acquiring disease?**

One of the fundamental principles of modern quarantine is that persons in quarantine are to be closely monitored so that those who become ill are efficiently separated from those who are well. A second principle is that persons in quarantine should be among the very first to receive any available disease-prevention interventions. Adherence to these two principles of modern quarantine should prevent an increase in risk for acquiring disease while in quarantine.

### **Is quarantine really necessary if everyone who develops symptoms is rapidly placed in isolation?**

Although theoretically true, it would be unrealistic to believe that even the most efficient system for initiation of isolation will minimize delays to the extent required to prevent transmission. Among the factors contributing to delays in recognition of symptoms are the insidious nature of disease onset and denial that symptoms have developed.

Quarantine helps to reduce transmission associated with delays in isolation in two ways. First, quarantine enables health officials to quickly locate symptomatic persons who should be placed in isolation. Second, although quarantine locations may not be as efficient as isolation facilities in preventing transmission, quarantine reduces the number of persons who might be exposed while awaiting transfer to an isolation facility. If quarantine was not used, symptomatic and infectious persons could move about freely in public places, potentially exposing large numbers of additional persons and thereby fueling the outbreak.

### **Is quarantine useful only for diseases that are spread by the airborne route?**

No. Quarantine simply refers to the separation and restriction of activity of persons exposed to a communicable disease who are not ill. It is designed to minimize interactions between those exposed to a disease and those not yet exposed. As such, quarantine can be used for any disease that is spread from person to person. In practice, however, because of the activity restrictions associated with quarantine, the intervention is generally reserved for diseases like SARS or pandemic influenza that are easily and rapidly spread from person to person. However, this tool can also be useful where transmission can occur through close personal contact with secretions or objects contaminated by an ill person. Smallpox is an excellent example of a disease where quarantine can be effective in controlling spread although transmission may occur by means other than the airborne route.

### **Will the public accept the use of quarantine?**

Yes. The negative connotations associated with quarantine likely stem from its misuse or abuse in the past. Although inappropriate use of quarantine, either voluntary or mandatory, would not and should not be accepted by the public, efforts should be made to gain public acceptance when use of this measure is indicated. Experiences with the use of quarantine during the SARS outbreaks of 2003 suggest that public acceptance of quarantine may be greater than previously thought. For example, during the 2003 SARS outbreak in Canada, almost all persons asked to observe quarantine restrictions did so willingly, with only a small number requiring a legal order to gain cooperation. In all cases, cooperation and acceptance was achieved through clear and comprehensive communication with the public about the rationale for use of quarantine.



## **Appendix 8.6**

### **Recommendations for Quarantine**

#### **General considerations**

- Monitor each quarantined person daily, or more frequently if feasible, for fever, respiratory symptoms, and other symptoms of early influenza disease.
- Monitor compliance with quarantine through daily visits or telephone calls.
- Provide a hotline number for quarantined persons to call if they develop symptoms or have other immediate needs.
- If a quarantined person develops symptoms suggestive of influenza, arrangements should be in place for separating that person from others in quarantine and ensuring immediate medical evaluation.
- Provide persons in quarantine with all needed support services, including 1) psychological support, 2) food and water, 3) household and medical supplies, and 4) care for family members who are not in quarantine. Financial issues, such as medical leave, may also need to be considered.
- Collect data related to quarantine activities to guide ongoing decision-making including information on each person quarantined:
  - Relationship to the case-patient
  - Nature and time of exposure
  - Whether the contact was vaccinated, on antiviral prophylaxis or using PPE
  - Underlying medical conditions
  - Number of days in quarantine
  - Symptom log
  - Basic demographics
  - Compliance with quarantine

Based on current available data, the recommended duration of quarantine for influenza is generally 10 days from the time of exposure. (This period may be adjusted based on available information during a pandemic.) At the end of the designated quarantine period, contacts should have a final assessment for fever and respiratory symptoms. Persons without fever or respiratory symptoms may return to normal activities.

#### **Home quarantine**

Whenever possible, contacts should be quarantined at home. Home quarantine requires the fewest additional resources, although arrangements must still be made for monitoring patients, reporting symptoms, transporting patients for medical evaluation if necessary, and providing essential supplies and services. Home quarantine is most suitable for contacts with a home environment that can meet their basic needs and in which unexposed household members can be protected from exposure. Other considerations include:

- Persons in home quarantine must be able to monitor their own symptoms (or have them monitored by a caregiver).
- The person's home should be evaluated for suitability before being used for quarantine, using a questionnaire administered to the quarantined person or the caregiver. Additional guidance on use of a residence for quarantine is provided in Appendix 8.7.
- Quarantined persons should minimize interactions with other household members to prevent exposure during the interval between the development and recognition of symptoms. Precautions may include 1) sleeping and eating in a separate room, 2) using a separate bathroom, and 3) appropriate use of personal protective equipment (see Supplement 4).

- Persons in quarantine may be assessed for symptoms by either active or passive monitoring. Active monitoring of contacts in quarantine may overcome delays resulting from the insidious onset of symptoms or denial among those in quarantine.
- Household members may go to school, work, etc., without restrictions unless the quarantined person develops symptoms. If the quarantined person develops symptoms, household members should remain at home in a room separate from the symptomatic person and await additional instructions from health authorities.
- Household members can provide valuable support to quarantined persons by helping them feel less isolated and ensuring that essential needs are met.
- Immediate and ongoing psychological support services should be provided to minimize psychological distress.
- Quarantined persons should be able to maintain regular communication with their loved ones and health care providers.

### **Quarantine in designated facilities**

In some cases, affected persons may not have access to an appropriate home environment for quarantine. Examples include travelers; persons living in dormitories, homeless shelters, or other group facilities; and persons whose homes do not meet the minimum requirements for quarantine. In other instances, contacts may have an appropriate home environment but may not wish to put family members at risk. In these situations, health officials should identify an appropriate community-based quarantine facility. Monitoring of quarantined persons may be either passive or active, although active monitoring may be more appropriate in a facility setting. Facilities designated for quarantine of persons who cannot or choose not to be quarantined at home should meet the same criteria listed for home quarantine. Evaluation of potential sites for facility-based quarantine is an important part of preparedness planning (see Appendix 8.7).

### **Working quarantine**

This type of quarantine applies to health care workers or other essential personnel who are at occupational risk of influenza infection. These groups may be subject to quarantine either at home or in a designated facility during off-duty hours. When off duty, contacts on working quarantine should be managed in the same way as persons in quarantine at home or in a designated facility. Local officials should:

- Monitor persons in working quarantine for symptoms during work shifts
- Promptly evaluate anyone who develops symptoms
- Provide transportation to and from work, if needed
- Develop mechanisms for immediate and ongoing psychological support

At the end of the designated quarantine period, contacts should receive physical (fever and respiratory symptoms) and psychological health assessments. Persons without fever or respiratory symptoms may return to normal activities. Persons who exhibit psychological distress should be referred to mental health professionals for additional support services.

## **Appendix 8.7**

### **Evaluation of Homes and Facilities for Isolation and Quarantine Isolation Facilities**

#### **Home isolation**

Ideally, persons who meet the criteria for a case of pandemic influenza and who do not require hospitalization for medical reasons should be isolated in their homes. The home environment is less disruptive to the patient's routine than isolation in a hospital or other community setting.

If feasible—especially during the earliest stages of a pandemic—a home being considered as an isolation setting should be evaluated by an appropriate authority, which could be the patient's physician, health department official, or other appropriate person to verify its suitability. The assessment should center on the following minimum standards for home isolation of an influenza patient:

##### **Infrastructure**

- Functioning telephone
- Electricity
- Heating, ventilation, and air conditioning (HVAC)
- Potable water
- Bathroom with commode and sink
- Waste and sewage disposal (septic tank, community sewage line)

##### **Accommodations**

- Ability to provide a separate bedroom for the influenza patient
- Accessible bathroom in the residence; if multiple bathrooms are available, one bathroom designated for use by the influenza patient

##### **Resources for patient care and support**

- Primary caregiver who will remain in the residence and who is not at high risk for complications from influenza disease
- Meal preparation
- Laundry
- Banking
- Essential shopping
- Social diversion (e.g., television, radio, Internet access, reading materials)
- Masks, tissues, hand hygiene products, and information on infection control procedures
- Educational material on proper waste disposal

#### **Isolation in a community-based facility**

When persons requiring isolation cannot be accommodated either at home or in a health care facility, a community-based isolation facility will be required. The availability of a community-based facility will be particularly important during a large outbreak (See also <http://www.ahrq.gov/research/altsites.htm>).

Much of the work in identifying and evaluating potential sites for isolation should be conducted in advance of an outbreak as part of preparedness planning. Each jurisdiction should assemble a team (including infection control specialists, public health authorities, engineers, sanitation experts, and mental health specialists) to identify appropriate locations and resources for community influenza isolation facilities, establish procedures for activating them, and coordinate activities related to patient management. The team should consider the use of both existing and temporary structures. Options for existing structures include community health centers, nursing homes, apartments, schools, dormitories, and hotels. Options for temporary structures include trailers, barracks, and tents.

**Considerations include:**

## Basic infrastructure requirements

- Meets all local code requirements for a public facility
- Functioning telephone system
- Electricity
- Heating, ventilating, and air conditioning (HVAC)
- Potable water
- Bathroom with commode and sink
- Waste and sewage disposal (septic tank, community sewage line)
- Multiple rooms for housing ill patients (individual rooms are preferred)

## Access considerations

- Proximity to hospital
- Parking space
- Ease of access for delivery of food and medical and other supplies
- Handicap accessibility
- Basic security

## Space requirements

- Administrative offices
- Offices/areas for clinical staff
- Holding area for contaminated waste and laundry
- Laundry facilities (on- or off-site)
- Meal preparation (on- or off-site)

## Social support resources

- Television and radio
- Reading materials

## To determine priorities among available facilities, consider these features:

- Separate rooms for patients or areas amenable to isolation of patients with minimal construction
- Feasibility of controlling access to the facility and to each room
- Availability of potable water, bathroom, and shower facilities
- Facilities for patient evaluation, treatment, and monitoring
- Capacity for providing basic needs to patients
- Rooms and corridors that are amenable to disinfection
- Facilities for accommodating staff
- Facilities for collecting, disinfecting, and disposing of infectious waste
- Facilities for collecting and laundering infectious linens and clothing
- Ease of access for delivery of patients and supplies
- Legal/property considerations

## Additional considerations include:

- Staffing and administrative support
- Training
- Ventilation and other engineering controls
- Ability to support appropriate infection control measures
- Availability of food services and supplies
- Ability to provide an environment that supports the social and psychological well-being of patients
- Security and access control
- Ability to support appropriate medical care, including emergency procedures
- Access to communication systems that allow for dependable communication within and outside the facility
- Ability to adequately monitor the health status of facility staff

## QUARANTINE FACILITIES

### Home quarantine

A person's residence is generally the preferred setting for quarantine. As with isolation, home quarantine is often least disruptive to a person's routine. Because persons who have been exposed to influenza may need to stay in quarantine for as long as 10 days (may be modified based on information about the virus), it is important to ensure that the home environment meets the individual's ongoing physical, mental, and medical needs. An evaluation of the home for its suitability for quarantine should be performed, ideally before the person is placed in quarantine. This evaluation may be performed on site by a health official or designee. However, from a practical standpoint, it may be more convenient to evaluate the residence through the administration of a questionnaire to the individual and/or the caregiver. Factors to be considered in the evaluation include:

- Basic utilities (water, electricity, garbage collection, and heating or air-conditioning as appropriate)
- Basic supplies (clothing, food, hand-hygiene supplies, laundry services)
- Mechanism for addressing special needs (e.g., filling prescriptions)
- Mechanism for communication, including telephone (for monitoring by health staff, reporting of symptoms, gaining access to support services, and communicating with family)
- Accessibility to health care workers or ambulance personnel
- Access to food and food preparation
- Access to supplies such as thermometers, fever logs, phone numbers for reporting symptoms or accessing services, and emergency numbers (these can be supplied by health authorities if necessary)
- Access to mental health and other psychological support services.

### Quarantine in a community-based facility

Although the home is generally the preferred setting for quarantine, alternative sites for quarantine may be necessary in certain situations. For example, persons who do not have a home situation suitable for this purpose or those who require quarantine away from home (e.g., during travel) will need to be housed in an alternative location. Because persons who have been exposed to influenza may require quarantine for as long as 10 days, it is important to ensure that the environment is conducive to meeting the individual's ongoing physical, mental, and medical needs. Ideally, one or more community-based facilities that could be used for quarantine should be identified and evaluated as part of influenza preparedness planning. The evaluation should be performed on site by a public health official or designee. Additional considerations, beyond those listed above for home quarantine, include:

- Adequate rooms and bathrooms for each contact
- Delivery systems for food and other needs
- Staff to monitor contacts at least daily for fever and respiratory symptoms
- Transportation for medical evaluation for persons who develop symptoms
- Mechanisms for communication, including telephone (for monitoring by health staff, reporting symptoms, gaining access to support services, and communicating with family)
- Adequate security for those in the facility

Services for removal of waste. No special precautions for removal of waste are required as long as persons remain asymptomatic.





# Arizona Pandemic Influenza Response Plan

## *Supplement 9: Managing Travel-Related Risk of Disease Transmission*





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## I. Rationale

The 2003 pandemic of severe acute respiratory syndrome (SARS) demonstrated how quickly human respiratory viruses can spread, especially in a world of modern air travel. Disease spread will likely be even faster during an influenza pandemic because a typical influenza virus has a shorter average incubation period (typically two days versus seven to 10 days for SARS-associated coronavirus [SARS-CoV]) and is more efficiently transmitted from person to person. If an influenza pandemic begins outside the United States, public health authorities might screen inbound travelers from affected areas to decrease disease importation into the United States. If a pandemic begins in or spreads to the United States, health authorities might screen outbound passengers to decrease exportation of disease or implement domestic travel-related measures to slow disease spread within the United States.

Because some persons infected with influenza will still be in the incubation period, be shedding virus asymptomatically, or have mild symptoms, it will not be possible to identify and isolate all arriving infected or ill passengers and quarantine their fellow passengers. Moreover, if an ill passenger is identified after leaving the airport, it might not be possible to identify all travel contacts within the incubation period. However, depending on the situation, these activities might slow the spread early in a pandemic, allowing additional time for implementation of other response measures such as vaccination.



Over the course of an influenza pandemic, ADHS and local health authorities may consider a range of travel-related control measures to decrease the spread of disease into or within Arizona. Depending on the severity, the following factors will be considered in developing policy:

- The relative magnitude, duration and stage of indigenous transmission versus the risk associated with further introduced cases. When the disease is widespread in the U.S., the additional contribution of introduced cases to the magnitude or spread of the pandemic will be minimal depending on the state of epidemic in the specific location of introduction.
- The value of compulsory restrictions in a setting of voluntary changes in travel patterns. Voluntary changes in travel will occur during a pandemic as persons may choose to cancel nonessential travel to decrease their potential exposure and risk of infection. In this context, the added value of compulsory restrictions should be considered relative to the societal disruptions that limitations on movement would cause.

## II. Overview

Supplement 9 details travel-related containment strategies that can be used during different phases of an influenza pandemic. These strategies range from distribution of travel health alert notices, to isolation and quarantine of new arrivals, to restriction or cancellation of nonessential travel. ADHS and county health departments will implement these strategies in coordination with CDC quarantine stations. Currently, U.S. Quarantine Stations are located at 20 ports of entry and land-border crossings where international travelers arrive. These stations are staffed with quarantine medical and public health officers from the CDC. Although no CDC quarantine stations exist in Arizona, state and local public health officials work closely with the nearest station in San Diego, California on these issues.

The actions for WHO Phases 1 through 4 (Limited Human Spread to Sustained Human-to-Human Spread) focus on preparedness planning and on management of arriving ill passengers on international flights, primarily at Sky Harbor International Airport, in Phoenix, and on cross-border travel associated with the Arizona-Sonora border. The actions for WHO Phases 5 through 6 (Widespread Human Infection or Pandemic) focus on travel-related measures to decrease disease spread into, out of, and within the United States.

## **A. Primary response agencies and responsibilities**

### **1. Arizona Department of Health Services Responsibilities**

- Coordinate with HHS and CDC on activities related to travel-related risk
- Provide guidance to local health departments on implementing travel-related containment measures
- Provide public health information to residents that may travel to countries of concern
- Coordinate with the Arizona Department of Homeland Security and the Arizona Division of Emergency Management on response activities and policy decisions regarding travel-related containment measures

### **2. County Health Department and Tribal Agency Responsibilities**

- Ensure readiness to implement travel-related disease containment measures
- Provide public health information to travelers who visit countries where avian or animal influenza strains or human strains with pandemic potential have been reported
- Evaluate and manage arriving ill passengers who might be infected with avian or animal influenza strains or human strains with pandemic potential
- Evaluate and implement quarantine, as necessary, on exposed passengers or other individuals related to travel
- Evaluate the need to implement or cease travel-related containment measures as the pandemic evolves

### **3. Municipal Police and Fire Department Responsibilities**

- Provide Incident Command and security related to travel disease control and risk containment strategies

### **4. Federal Responsibilities (including HHS, CDC, and U.S. Customs and Border Protection)**

- Work with local points of entry to prevent the importation of influenza-infected birds and animals into the United States
- Provide state and local health departments with legal preparedness templates for use in implementing quarantine and patient isolation measures
- Work with travel industry partners to ensure that airplane captains and crew are familiar with procedures for identifying and managing arriving ill passengers
- Coordinate with other countries and WHO to prevent the spread of novel influenza via international travel
- Work with state and local health departments and CDC quarantine stations to prevent the importation and exportation of cases of pandemic influenza
- Develop and maintain procedures for isolating sick and quarantining exposed border crossers on the Arizona-Sonora international border
- Coordinate with other countries and WHO to prevent the spread of pandemic influenza via international travel

## **III. WHO Phases 1 through 4 (Limited Human Spread to Sustained Human-to-Human Spread)**

### **A. Preparedness for implementation of travel-related containment measures**

If a pandemic begins outside the United States, early application of travel-related control measures (i.e., identification and isolation of ill travelers, quarantine of close contacts) might slow the introduction of the virus into Arizona, allowing more time for healthcare preparedness efforts.

The effectiveness of these measures might be limited because asymptomatic travelers can transmit disease, travelers in the incubation



phase might not become symptomatic until after arrival at their destinations, and it might not be possible to trace contacts within the incubation period for influenza. The ability to detect some cases early in the pandemic may slow disease spread even for a short time.

### **1. Travel-related measures at early stages of a pandemic**

When there is limited transmission in other countries and potential for importation of cases into the United States, specifically Arizona, ADHS and county health departments, in conjunction with federal partners, may conduct the following actions, depending on status of statewide disease spread, and the established epidemiology of the pandemic:

- Initiate enhanced disease surveillance at ports of entry.
- Provide guidance on infection control procedures that can be implemented, if needed, on airplanes (e.g., separate the ill passenger from other passengers; provide the ill passenger with a mask or tissues to prevent viral spread via coughing).
- Isolate arriving ill passengers or border crossers, and quarantine their contacts as necessary.
- Collect information on all arriving passengers if notification is warranted (e.g., for antiviral administration, vaccination, or health monitoring).
- Ensure appropriate containment of exposed border-crossers, as feasible

### **2. Engaging community partners**

While primary planning and response activities occur at the local level, ADHS works closely with these jurisdictions to assist in engaging appropriate community partners and to develop and exercise plans. Community partners include:

- Municipal emergency responders (firefighters, police officers)
- Members of the legal community
- Emergency medical services and other emergency responders
- Referral hospital personnel
- Representatives of Sky Harbor International and Tucson International Airports
- CDC Quarantine officers
- U.S. Customs and Border Protection
- Political leaders and key elected officials
- American Red Cross and other non-governmental organizations
- Businesses and private sector



### **3. Protocols for managing ill travelers at ports of entry**

Local public health officials are responsible, in conjunction with ADHS, for developing protocols for managing ill travelers at airports. These protocols include provisions for:

- Meeting flights with a reported ill passenger
- Establishing notification procedures and communication links among organizations involved in the response
- Reporting potential cases to ADHS (ADHS will ensure reporting to CDC)
- Providing a medical assessment of the ill traveler and referral for evaluation and care
- Separating the ill traveler from other passengers during the initial medical assessment
- Transporting the ill traveler to a designated healthcare facility, if necessary (see also Supplement 3)
- Identifying other ill passengers and separating them from passengers who are not sick
- Transporting and quarantining contacts, if necessary



- Enforcing isolation and quarantine, if necessary, when ill travelers or their contacts are uncooperative

The U. S. Customs and Border Protection (CBP) is the primary agency responsible for identifying potential cases of pandemic influenza crossing the international border into Arizona. A workgroup was established between ADHS, county health departments, airport officials, the Transportation Security Administration Authority, the CDC Quarantine Stations, and U.S. Customs and Border Protection personnel at the Phoenix Sky Harbor Airport. In coordination with other agencies, the CDC has developed emergency response plans detailing procedures such as:

- Reporting
- Planeside Response
- Passenger Screening
- Decontamination
- Media Response
- International Communications
- Agency Roles and Responsibilities
- Communications and Notification Procedures

#### **4. Quarantine preparedness at ports of entry**

County health officials, in collaboration with the ADHS, need to be prepared to identify quarantine facilities and house passengers, crew, and emergency workers who may have been exposed to an ill traveler. Plans should account for:

- Temporary quarantine (a few hours to a few days)
- Longer-term quarantine (up to 10 days)
- The provision of goods and services to persons in quarantine (see Supplement 8)

#### **5. Legal preparedness**

The primary legal remedies for preventing the introduction, transmission, and spread of communicable diseases related to travel are the state and local legal authorities prescribed in the Arizona Revised Statutes (§§36-264 and 787-9) (see Supplement 8 for more detail). The Federal government has primary responsibility for preventing international importation of diseases. The U.S. Public Health Service authority for quarantine relates to international travel, as well as travel between states, to help prevent domestic disease spread. These authorities are used at the state and local level when such authorities do not exist at the local level or when there is no capacity to implement the authority. State and local jurisdictions are primarily responsible for restricting travel within their borders; however, there is no statutory authority in Arizona for large scale travel restrictions, especially related to *cordon sanitaire*.

#### **6. Reporting**

During the early stages of the pandemic, if a border traveler using a commercial conveyance has been identified with suspected pandemic influenza either by laboratory report or local health department notification, the ADHS Office of Border Health will immediately notify the CDC Division of Global Migration and Quarantine. If the traveler came from another country, ADHS will also immediately notify the CDC Emergency Operations Center (EOC) following the “Guidelines for Cooperation of Epidemiologic Events of Mutual Interest” ([http://www2a.cdc.gov/PHLP/docs/US\\_Mexico\\_Epi\\_Info\\_Sharing.pdf](http://www2a.cdc.gov/PHLP/docs/US_Mexico_Epi_Info_Sharing.pdf)) and the International Health Regulations (<http://www.who.int/ihr/en/>). Notification of other jurisdictions will follow the Council for State and Territorial Epidemiologists (CSTE) guidelines for determining residency. During the pandemic phase, notifications will occur only if residency is known and notification regarding travel status will not be of interest due to the spread of the pandemic.

### **B. Travel health precautions and warnings**

As the pandemic spreads from country to country, CDC will update country-specific travel notices and post them on the CDC Travelers’ Health website (<http://www.cdc.gov/travel/>). ADHS and the Arizona Division of Emergency Management (ADEM) will provide links to this website for international travelers to traveling to countries affected by novel influenza

viruses during the pandemic. These notices are issued depending on the scope, risk for travelers, and recommended preventive measures.

### **C. Evaluation of travel-related cases of infection with novel strains of influenza**

During the early stages of the pandemic, travel-related cases of infection might be detected after entry into the United States, specifically Arizona, or reported during transit by airline personnel before arrival of an ill passenger. Information on the detection and identification of novel strains of influenza is provided in Supplement 1. Guidance on the clinical management of suspected cases of novel influenza is provided in Supplement 5.

Local health departments are required to ensure the completion and implementation of protocols for the management of arriving ill passengers in their county who meet the clinical and epidemiological criteria for infection with a novel strain of influenza and for the management of contacts of such passengers. ADHS is responsible for assisting in the development and implementation of these protocols. Additionally, ADHS is responsible for ensuring these are coordinated with federal protocols and systems.

#### **1. Travel into Arizona**

Early, during an influenza pandemic that begins outside the United States, affected county health departments will heighten disease surveillance at airports and maintain close communication with ADHS. ADHS will coordinate with the U.S. Customs and Border Protection and CDC regarding disease surveillance and containment at the Arizona-Sonora border. Travel-related disease control measures will include management of ill travelers arriving at ports of entry and provision of travel health alert notices to incoming travelers.



Identification and management of incoming ill travelers may delay and decrease the introduction of novel influenza strains into the United States during the early stages of the pandemic. These efforts may continue at the beginning of the pandemic phase, especially if a novel influenza strain emerges in another country but has not yet entered the United States.

Once the pandemic has spread outside and within the United States, screening for arriving ill passengers will become less useful and feasible. Although exit-screening of travelers from affected areas is likely to be a more effective disease control measure, its effectiveness too will be limited.

To manage arriving ill passengers, public health authorities or quarantine officers will need to do the following:

- If a suspected case of pandemic influenza is reported aboard an arriving airplane during the early stages of a pandemic, obtain preliminary information about the ill passenger, and advise the captain and crew on patient isolation and infection control.
- If the likelihood of pandemic influenza infection appears high, establish airline quarantine response plans. The major objective activities of these plans are to :
  - Notify the airport to mobilize its first responders and arrange for patient transport and preparation of quarantine facilities
  - Meet the airplane, perform a medical evaluation of the ill traveler, and assess the risk to public health
  - Inform the passengers and crew of the situation and manage disembarkation until the evaluation is complete.

### **D. Preventing the importation of infected birds and animals**

While there are no legal authorities for ADHS to impose interventions to prevent the importation of infected birds or animals into the state, ADHS works closely with the Arizona Department of Agriculture and the Arizona Game and Fish Department on all animal issues that relate to human health. For more information on surveillance related to infected birds and animals, see Supplement 1.

## **IV. WHO Phases 5 through 6 (Widespread Human Infection or Pandemic)**

### **A. Travel-related measures at later stages of a pandemic**

If the situation worsens overseas and there is extensive and sustained transmission in other countries, the CDC, ADHS and local health departments may conduct these actions:

- Distribute travel health alert notices to passengers arriving from affected countries (i.e., countries for which health warnings have been issued)
- Post travel health alert notices in airports (e.g., on posters)
- Recommend canceling or limiting nonessential travel to affected countries

Further collection of information on all arriving passengers will likely not be feasible due to lack of resources.

### **B. Travel out of the United States**

If the level of influenza transmission in the United States presents a high risk for exportation of disease, CDC and state and local public health authorities will likely conduct the following actions:

- Distribute travel health warnings to outbound passengers who live in or have visited affected parts of the United States
- Recommend the cancellation of nonessential travel to other countries from ports of entry in affected parts of the United States
- Recommend the implementation of pre-departure screening (e.g., temperature screening or visual screening) of outbound travelers

### **C. Travel within the United States and Arizona**

If the level of influenza transmission in a U.S. area is high and if most other areas have not yet been affected, CDC and state authorities will consider recommending the limiting or canceling of nonessential travel to that area or to implement increased disease surveillance measures. If the area of high disease transmission includes Arizona, community infection control measures will likely be used to slow the spread of illness within the state (see Supplement 8).

### **D. De-escalation of travel-related control measures**

Decisions to de-escalate control measures related to international travel will be made in consultation with CDC.



# Arizona Pandemic Influenza Response Plan

## *Supplement 10: Public Health Communications*







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## **I. Rationale**

As a keystone of comprehensive pandemic influenza preparedness and response, effective communication pilots the public, the media, response agencies, healthcare providers and stakeholders through a coordinated response to pandemic outbreaks in compliance with public health measures.

The goal of communications before and during a pandemic is to provide and exchange relevant information with the public, partners, and stakeholders to allow them to make well informed decisions and take appropriate actions to protect health and safety. Effective communication about the risks related to pandemic influenza is critical at every stage of preparedness and response and is a fundamental part of effective risk management. Given the complex risks and perceptions associated with an influenza pandemic, communication strategies that simply disseminate outbreak information and recommendations will be insufficient. The scope and complexity of the task demands frequent, transparent, and proactive communication and information exchange with the public, partners, and other stakeholders about decision making, health recommendations, and related information.

Influenza pandemics are pervasive and long-lasting and will strain national, state, county and local resources. Consequentially, strategic communications planning is integral to a pandemic response.

The goals of this plan are to:

- Describe the integral role of communications in preparing for, implementing, and evaluating public health actions to protect health and prevent pandemic influenza-associated morbidity and mortality.
- Provide state health officials, community health care professionals and communications specialists with guidance to assist them in developing and implementing communication plans that support an effective public health response and help minimize anxiety, fear, and stigmatization.
- Provide the basis for a well-coordinated and consistent communications strategy across jurisdictions, based on a common adherence to established risk communication principles.

This plan emphasizes the following strategies to help state and local communications professionals collaborate with each other, CDC, and other organizations to accomplish these goals:

- Provide timely, accurate, consistent, and appropriate information about pandemic influenza public health interventions.
- Emphasize the rationale and importance of adherence to public health measures that some people may consider intrusive (e.g., quarantine).
- Help set realistic expectations of public health and health care systems.
- Promptly address rumors, inaccuracies, and misperceptions.
- Minimize stigmatization that may occur during a pandemic.
- Adapt materials, for special needs and at-risk populations (e.g., non-English speaking populations, difficult-to-reach communities, and persons living in institutional settings) receive appropriate information.
- Acknowledge the anxiety, distress, and grief that people experience during long-term, major public health events such as pandemics.

## **II. Overview**

Communications preparedness for an influenza pandemic, as outlined in this plan, follows seven key risk communications concepts.

- When health risks are uncertain, as likely will be the case during an influenza pandemic, people need information about what is known and unknown, as well as interim guidance to formulate decisions to help protect their health and the health of others.
- Coordination of message development and release of information among federal, state, and local health officials

is critical to help avoid confusion that can undermine public trust, raise fear and anxiety, and impede response measures.

- Guidance to community members about how to protect themselves and their family members and colleagues is an essential component of crisis management.
- Information provided to the public should be technically correct and succinct without seeming patronizing.
- Information presented during an influenza pandemic should minimize speculation and avoid over-interpretation of data, overly confident assessments of investigations and control measures.
- An influenza pandemic will generate immediate, intense, and sustained demand for information from the public, health care providers, policy makers, and news media. Health care workers and public health staff are likely to be involved in media relations and public health communications.
- Timely and transparent dissemination of accurate, science-based information about pandemic influenza and the progress of the response can build public trust and confidence.

#### External Planning Assumptions

- There will be a persistent demand for timely and new information from the public, healthcare providers, elected officials and the media.
- Government and public health officials will stay in constant communication.
- A pandemic is a global event; consequently, the public will pull information from various sources, which could result in conflicting messages.
- Hearsay, rumor and speculation should be expected.
- The availability and/or operability of dissemination channels will depend on the severity of the pandemic and its scope.
- A pandemic will strain the healthcare system, vaccine and antiviral supplies.
- Upon the exhaustion of antiviral prophylaxis supplies, there is no further defense against the virus (assuming a two week protection period between doses).
- Upwards of 40 percent of the workforce will be absent for two or more weeks at the peak of a pandemic wave.
- Calls for assistance, including requests for ambulatory transport, will saturate Emergency call centers and 9-1-1 switchboards.

#### Internal Planning Assumptions

- CDC (Centers for Disease Control and Prevention) and HHS (U.S. Department of Health and Human Services) will inform ADHS as to:
  - Pandemic phases/stages;
  - Virus characteristics;
  - Vaccine availability;
  - National response coordination;
  - Suggestions for vaccine and antiviral/antibiotic prioritization; and
  - Recommendations for detection, control and response.
- ADHS has formulated a Strategic National Stockpile (SNS) distribution plan and apportioning procedures.
- The Department Director, Deputy Director and Assistant Director of Public Health or their designee will approve all information for public use, or, in a crisis, through the Public Health Incident Management System (PHIMS) Command Structure.
- Federal, state and local partners will establish a Joint Information Center (JIC) in support of response operations; stakeholders will share information and collaborate in the creation of materials and strategies to ensure consistent messaging.

- Public health organizations will determine the content of communication campaigns for effective health education, promotion of health behaviors, and to maintain public trust.
- ADHS, under the direction of the Public Information Officer, will establish a Speaker's Bureau of identified Subject-Matter Experts (SMEs) and agency spokespersons.
- Despite best efforts, crisis demands and unforeseen complications may disrupt interoperable communications between ADHS and its partners. Coordinated activity during an outbreak will require planned regular communication mechanisms, in addition to ad hoc communications.
- ADHS will encourage proper healthcare practices, define appropriate use of medical services, provide information on alternate care sites, outline self-monitoring and reporting of symptoms, and speak to coping strategies and mental health needs.

ADHS will employ a risk communication strategy contingent upon World Health Organization (WHO) pandemic phases and corresponding U.S. federal pandemic response stages. Department priorities, messages, and methods will evolve with the progression of pandemic periods and spread of the influenza. As the pandemic progresses, ADHS will establish a precedent of transparent, swift, empathetic, candid, and inclusive communication. ADHS will collaborate with public health response partners at the local, state and federal levels to develop communication strategies and tactics and messages that comply with risk communication concepts.

### **III. Actions for the WHO Phases 1-3 (Limited Human Spread)**

During Phases 1-3, health communications professionals will work together to develop and maintain communications preparedness and to keep the public and other target groups updated about risks as the threat of a pandemic evolves. Actions fall into four major categories:

- Assessing communications capacity and needs statewide
- Conducting collaborative planning
- Developing and testing standard procedures for disseminating information
- Developing, testing, and disseminating messages and materials tailored to Arizona audiences.

#### **A. Assessing communications capacity and needs**

A first step in effective risk communications preparedness is to conduct an assessment of communications strengths and challenges.

##### **1. Capacity**

- As part of overall pandemic influenza preparedness planning, ADHS has developed this supplement that incorporates pandemic public health risk communications plan information.
- Ensure adequate human and fiscal resources will be available for all phases of a pandemic.
- Prepare for resource contingencies (e.g., surge capacity) by developing and regularly updating backup plans and procedures, identifying community resources, and training extra staff for emergency communications responsibilities.
- Ensure ongoing communications proficiency among all staff engaged in pandemic influenza response, especially given personnel changes, reorganization, or other variables.

##### **2. Needs**

- Review and update public health communications plans at least annually to ensure that they remain practical and evidence-based. Plans have been shared in advance with stakeholders.
- ADHS has identified communications professionals and media spokespersons. ADHS will, as needed, provide media training and instruction in crisis and risk communication. Encourage familiarity with professional counterparts from local/regional jurisdictions or communities to facilitate collaboration.



- Familiarize key officials with available communications resources and gaps; notify policy and key decision-makers of plans to deploy staff and resources during an influenza pandemic.
- ADHS is preparing basic communications resources in advance, and is planning to update them during a pandemic, utilizing fact sheets, and other communications tools and those available through the [www.pandemicflu.gov](http://www.pandemicflu.gov) and [www.cdc.gov](http://www.cdc.gov) websites, as well other resources.
- ADHS will identify common communications opportunities and challenges with neighboring states, particularly with regard to reaching people in high-priority risk groups; this plan will consider novel opportunities to pool communications resources.
- ADHS will continuously monitor the effectiveness of risk communication activities, adjusting as necessary to achieve public health communications objectives.
- ADHS will continuously maintain communications with Governor's office and all state agencies, providing updated preparedness information.

## **B. Conducting collaborative planning**

Communications professionals in the public and private sectors need to ensure strong and well-integrated working relationships that will help sustain communications resources as a pandemic evolves. Interaction with all partners is vital to surveillance and other essential information exchange and to building collaborative and consistent messaging strategy. The following are critical elements of Arizona's response:

- Where and when appropriate, ADHS will coordinate training and other preparedness activities that include options for backing up key communications personnel in the event of their personal illness or emergency.
- ADHS will coordinate with partner agencies to prepare for appropriate public, health care provider, policy, and media responses to outbreaks of pandemic influenza. ADHS is prepared to address the following topics as a pandemic draws near:
  - Basic health protection information the public and other target audiences will need
  - Responsiveness, capabilities, and limitations of the public health system
  - Roles and responsibilities of diverse pandemic response stakeholders
  - Resources to help people cope with escalating fear, anxiety, grief, and other emotions (see Supplement 11).
  - How public health procedures and actions may change during different pandemic phases and why unusual steps may be needed to protect public health.
- ADHS and other response agencies will consider when and how to use federal assistance when available. For instance, background information and frequent updates for communications and other health care professionals will be available on the [www.pandemicflu.gov](http://www.pandemicflu.gov) website and through other official mechanisms.
- Response agencies need to identify and engage credible local resources as partners. For example, local chapters of nonprofit health organizations may assist with urgent communications to community groups.
- Affirm mechanisms with news media representatives to optimize effective working relationships during pandemic phases.
- ADHS will ensure that communications professionals have opportunities to participate with other public health and emergency staff in tabletop exercises and drills to help identify and resolve potential problems during the WHO phases 1-3.





### **C. Developing and testing standard state and local procedures for disseminating information**

Although there will be much that is unpredictable about an influenza pandemic, communication processes can and should be formalized. Standard, yet flexible procedures for disseminating information support consistency, efficiency, and coordination, and improve prospects for effective feedback in both internal and external communications.

State and local communication plans will identify dissemination procedures and channels for forwarding communications from partner agencies to ensure that partners and stakeholders at all levels remain informed but protected from unnecessary messaging. As an influenza pandemic unfolds, ADHS will then relate essential information to response agencies and partners through the Health Services Portal (HSP) and the Health Alert Network (see supplement 12) and to the public through [www.azdhs.gov](http://www.azdhs.gov), as well as through county/local agencies and media communications. The following activities will be used to ensure effective state and local information dissemination during an influenza pandemic:

- Establishing expedited procedures for reviewing and approving pandemic influenza-related messages and materials.
- Establishing protocols for frequently updated information, including daily disease activity reports. These may include morbidity and mortality figures, geographic location of cases, demographics of infected populations, and the number of persons hospitalized. This is done on a weekly basis every influenza season in Arizona, as well as during declared outbreaks (e.g., West Nile and pertussis).
- Establish and maintain a website with current information through [www.azdhs.gov](http://www.azdhs.gov)
- Arizona will utilize established local, state and federal hotlines, such as the CDC-INFO telephone line (1-800-CDC-INFO; 1-800-232-4636) for the dissemination of public information. However, during an influenza pandemic, ADHS will also tailor additional information for Arizona through [www.azdhs.gov](http://www.azdhs.gov).
- Prepare contingency plans to manage increased media demands. Arizona's media relations specialists from all state agencies will form a Joint Emergency News Center (JENC) or Joint Information Center (JIC), through the Arizona Division of Emergency Management (ADEM); this will ensure the coordination of messages with the Governor's office to prepare for media requests and facilitate media needs. A schedule for regularly scheduled press briefings will be determined by the Governor's office and the ADEM JIC.
- Develop ongoing coordination procedures with state agencies and organizations to conserve resources and avoid duplication in such areas as developing and pre-testing messages, and in training media spokespersons.

### **D. Developing, testing, and disseminating locally tailored messages and materials for WHO Phases 1-3 (Limited Human Spread)**

The WHO Pandemic Phases 1-3 are an ideal time to identify and learn about target audiences and raise awareness and knowledge of pandemic influenza, doing so, however, may prove challenging. For instance, in the absence of pandemic influenza, it may be difficult to generate media and public interest, in addition, the need to inform and educate the public, health care professionals, policy-makers, and others about the threat of a pandemic must be balanced against the possibility that a pandemic may not occur for many years and may or may not be severe. Risk communication strategies such as dilemma-sharing and acknowledging uncertainty can help establish appropriate and balanced messages.

It is also appropriate during Phases 1-3 to prepare communications materials for use during Phase 4 and Phases 5-6. Advance message development helps to ensure that the target audience's questions and concerns are addressed and that messages are credible and understandable. Answers to the most likely questions can be provided by way of press releases and fact sheets, using "place-holders" for specific details to be inserted later. Reviewing and clearing these materials with the Governor's office, ADEM and state agency PIOs that will participate in the JIC, in advance can help identify potential areas of disagreement and allow time to work through controversies outside the stressful environment of an emergency response. Formative research can help inform development of appropriately tailored messages. (See Appendices 10.1 and 10.2 for additional information about message development.)

Communications efforts should also take into account knowledge, attitudes, and beliefs (KABs) that suggest how audiences understand and react to certain messages. Concerns will vary by group or subgroup but will likely include personal safety,



family and pet safety, and interruption of routine life activities. State and local communications professionals will identify methods to assess the unique KABs of target audiences in their populations and communities. Such activities can help identify potential barriers to compliance with response measures, and inform message development to build support and trust.

Stigmatization and discrimination (e.g., being shunned as a perceived source of contagion) can be especially difficult and potentially dangerous during an infectious disease outbreak. Identify possible scenarios when stigmatization may occur. Plan steps to address and resolve such problems quickly and repeatedly if needed. Consider messages for general audiences, high-risk groups, and difficult-to-reach populations. (For additional information, see Supplement 11, which includes information on psychosocial factors and issues.)

Basic human needs for self-protection and protection of loved ones can have both positive and negative impacts on public health efforts. Stress, worry, and fear will be present to varying degrees throughout a pandemic. Communications professionals will work ahead of time with others—including mental health experts from Arizona’s Behavioral Health community—to assess the effect of message content on public anxiety, anticipate other possible stressful situations, and plan appropriate countermeasures.

Additional considerations for developing and disseminating messages and materials about pandemic influenza include the following:

- Assess existing organizational resources for communications, including materials and messages to meet concerns and information needs of target audiences and identify current and potential information gaps.
- Maintain current, accessible, and secure communications contact lists and databases. Maintain lists electronically and updated hard copy monthly in case of electricity interruption.
- Develop a portfolio of communications information sources, including material on topics such as clinical and laboratory diagnostics, infection control practices, isolation and quarantine procedures, stigmatization management, travel control authority, and legal issues related to the pandemic. The state will utilize information at [www.pandemicflu.gov](http://www.pandemicflu.gov) and other resources during a pandemic and adapt these materials for Arizona use.
- Work with local subject-matter experts to adapt key national messages about topics such as basic medical treatments, prioritization recommendations for high-risk groups, use of antiviral medications, and access to care. HHS will provide communications materials (e.g., fact sheets, question-and-answer documents, and message maps) for states and localities to use and adapt.
- Work with local subject-matter experts to adapt communications components of education courses and materials in multiple formats for professional audiences. Consult the [www.pandemicflu.gov](http://www.pandemicflu.gov) and [www.cdc.gov/flu/](http://www.cdc.gov/flu/) websites for information about specific materials and training opportunities.
- Develop a specific, consistent plan to identify and address rumors and misinformation promptly. Test the plan before a pandemic occurs and modify as needed to ensure it works.
- Utilize the Arizona Special Populations Study and other resources to identify preferred channels for target audiences.
- Ensure the availability of communications products in multiple languages, based on the demographics of the jurisdiction. State will provide all materials in Spanish via its Spanish version of its website and for other languages will adapt materials available via the [www.pandemicflu.gov](http://www.pandemicflu.gov) and [www.cdc.gov/flu/](http://www.cdc.gov/flu/) websites.
- Begin disseminating messages and materials to increase the knowledge and understanding of the public, health care professionals, policy-makers, media, and others about unique aspects of pandemic influenza that distinguish it from seasonal influenza, and generally what to expect during different phases of an influenza pandemic.
- Provide coordinated information on ways to access help (e.g., [www.azdhs.gov](http://www.azdhs.gov), local/county hotlines, helplines) and self-help (e.g., psychological resources, and stress and anxiety management).

#### IV. Actions for WHO Phase 4 (Sustained Human-to-Human Spread)

Communication and public information activities are substantially elevated during Phase 4. Communication and outreach efforts will focus on hygiene, social distancing, preparedness, and vaccine as available

Pandemic alert messages will discuss due diligence and incorporate topics of self-protective practices, containment measures and the responsible utilization of medical services. Boilerplate and novel materials will be tailored to conventional and “at-risk” populations. At this point in the pandemic, ADHS would work with state and local partners develop a Joint Information System (JIS) and/or request activation of the Joint Information Center (JIC). The exact level of activation would be based on factors specific to the pandemic.



ADHS will appraise communications plans and capabilities in coordination with stakeholders.

##### Communication Actions:

- Writes and/or compiles pandemic influenza collateral materials (e.g., boilerplates, backgrounders, speaking points, fact sheets, etc.) for stakeholders, the media and the public. (Stakeholders include: healthcare providers, first responders, ESAR-VHP volunteers, large businesses, state healthcare agencies, non-profit agencies).
- Adapts materials from HHS, CDC, WHO and other agencies for distribution through media, hotline, Web site, list servers, local health departments and others.
- Develops collateral materials for all Arizona audiences.
- Collaborates with stakeholders to exercise plans and abilities, pinpoint gaps, isolate weaknesses and apply improvements.
- Promotes AzEIN and Just in Case Arizona as repositories for emergency (e.g., pandemic influenza) updates and preparedness information.
- A representative(s) from ADHS will be assigned to the State JIC (when activated) to coordinate the development and dissemination of messages.

#### V. Actions for WHO Phases 5-6 (Widespread Human Infection or Pandemic)

Communications professionals from response agencies in Arizona will focus on providing timely, accurate information in especially challenging conditions, coordinating communications leadership across all tiers of jurisdiction (e.g., local, state, regional, and national), and promptly addressing rumors, misperceptions, stigmatization, and any unrealistic expectations about public and private health provider response capacity.

##### A. Activating emergency communications plans

According to A.R.S. §36-787, ADHS is the lead agency for crafting public information strategies and messages during a declared public health emergency. Once a public health emergency is declared and state PHIMS (see Primary Plan - Appendix A) is activated, communications demands will increase. This will raise the need to communicate health risk to local populations (for example, if a human case of avian influenza is reported in Arizona). As communications demands escalate, state and local health departments will activate emergency communications plans and systems, including local and state hotlines and messaging on [www.azdhs.gov](http://www.azdhs.gov).



## **B. Refining and delivering messages**

Arizona will follow these steps ensuring the delivery of proper messages:

- Provide regular updates and offer opportunities to address questions (e.g., in partnership with news media, in public forums, and in printed or electronic messages).
- Distribute practical information, such as travelers' advisories, infection control measures, and information about potential priority distribution of antiviral medications and first-generation vaccines. Be prepared to immediately address questions related to initial case(s) and to provide guidance to the public about disease susceptibility, diagnosis, and management, as well as other topics.
- Reinforce and verify ways to help people protect themselves, their families, and others, including self-care information for psychological well-being.
- Address rumors and misinformation promptly and persistently.
- Take steps to minimize stigmatization.

## **C. Providing timely, accurate information**

Depending on health, economic, and overall societal effects, such as the extent of influenza-related illness and death, communications professionals will reassess and adjust as necessary to emerging needs and expectations of public and professional audiences. Areas meriting particular attention include:

- Community subject-matter experts and spokespersons. It may be important to consider additional recruitment and training.
- Effectiveness of procedures for keeping communications lists, materials, and databases current and accurate. Plans for having these lists available in alternate formats if electricity fails.
- Open and accessible channels for advice to the public, including ongoing functioning of hotlines in collaboration with the CDC-INFO telephone line. In addition to providing ready access to inquiries and concerns, state and local hotlines can help communications professionals assess community awareness and behaviors and adapt communications strategies.



## **D. Providing coordinated communications leadership across jurisdictional tiers (e.g., local, regional, state, and national)**

Communications officials at ADHS will work with communications officials from state agencies, county, tribal, city, and federal agencies as well as from other response partners, including health care and volunteer organizations, as necessary. This coordination will occur through the ADEM Joint Information Center.

## **E. Promptly addressing rumors, misperceptions, stigmatization, and unrealistic expectations about the capacity of public and private health providers**

After the initial stages of a pandemic, news media coverage may become more mixed, with both positive and critical coverage. Hero stories may emerge, while “what ifs” and negative images may start to compete for the public attention. As the media proceeds into in-depth analysis of what happened and why, these elements become important to an effective response:

- Monitor news media reports and public inquiries to identify emerging issues, rumors, and misperceptions and respond accordingly.

- Conduct “desk-side briefings” and editorial roundtables with news media decision-makers.
- Proactively address groups that voice overly critical, unrealistic expectations.
- Establish trust with marginalized groups subject to or experiencing stigmatization and cite specific media outlets for inaccurate, misleading, or misguided reporting that may serve to encourage stigmatization.
- Maintain scheduled access to pandemic subject-matter experts to balance the media’s needs with other subject-matter expert priorities.

## **VI. Actions for Post Peak Period**

Communication efforts during the Post Peak Period will focus on local, state, federal and global recovery efforts, psychosocial needs and a return to normalcy. ADHS and its partner agencies will adopt a condition of readiness and review its response. In the wake of an influenza pandemic, there will be a residual need for recovery messages and information.

### **ADHS Communication Actions:**

- Updates automated menu and messages on Public Health Information Line (PHIL);
- Confers with the Division of Behavioral Health Services and other mental health partners (e.g., Regional Behavioral Health Authorities (RBHA)) to compose recovery messages;
- Advertises available public services;
- Emphasizes the successes of community support services;
- Expresses empathy;
- Champions family preparedness and self-protection measures;
- Briefs the public on the status of the pandemic, and local, state and federal recovery efforts;
- Speaks to areas requiring improvement;
- Underscores the implementation of mitigating actions ;
- Promotes the revival of everyday activities.

The ADHS communication staff will review and discuss operations (i.e., risk communication plans, campaigns, ideologies and strategies) implemented in the pandemic phases to produce an After Action Report (AAR) and subsequent Improvement Plan (IP).

### **ADHS:**

- Considers critiques solicited from ADHS employees and officials, the public via the ADHS Web site, health care providers, emergency response personnel county and tribal health offices;
- Dissects media interviews given by ADHS personnel, SMEs, etc. for content and observance of risk communication principals;
- Analyzes success of releases, boilerplates and education campaigns to reach audiences and affect behaviors;
- Evaluates procedures/systems employed in the development, approval and dissemination of information; and
- Catalogs “lessons learned,” and
- Implements corrective actions.

Additionally, ADHS will persist in its public education and outreach activities, having measured the potency of previous approaches and methods.

### **ADHS:**

- Directs audiences to AzeIN, Just in Case Arizona and the ADHS/Bureau Of Public Health Emergency Preparedness (BPHEP) Web site for preparedness information on ...

- family preparedness,
- self-protection practices,
- non-pharmaceutical containment measures, and
- the appropriate use of medical services;
- Implements changes to the education/outreach programs based on IP recommendations;
- Consults “best practices” and “lessons learned” reports for applicable materials;
- Devises strategies to better reach conventional and “at-risk” populations.

## **VII. Actions for Post Pandemic Period**

As Arizona enters the Post Pandemic Period, actions will revolve around recovery and evaluation of actions during the pandemic. After-action reporting and improvement plans will contribute to improving the overall response in preparation for future influenza pandemics.

### **ADHS:**

- Publicly acknowledge contributions of all communities and sectors and communicate the lessons learned; incorporate lessons learned into communications activities and planning for the next major public health crisis
- Evaluate communications response during previous phases; review lessons learned
- Ensure lessons learned are incorporated into revised and improved communication plans of all stakeholders, ready for use in the next pandemic/major public health event.
- Continue to work with Member States to increase the effectiveness of national communication activities



## Appendix 10.1

### Background Information for Developing Communications Messages about Pandemic Influenza

The language, timing, and detail of key messages will depend on a number of factors, including demographics and group psychological profiles of intended audiences, available or preferred media, and urgency. However, the following points may help communications professionals adapt appropriate health messages related to an influenza pandemic:

By definition, pandemic influenza will result from a new influenza A subtype against which humans have limited or no natural immunity. Pandemic influenza virus infection therefore is likely to cause serious, possibly life-threatening disease in greater numbers, even among previously healthy persons, than occurs during seasonal influenza outbreaks.

- Global influenza pandemics are unpredictable events, presenting challenges for communication.
- Global and domestic surveillance, coupled with laboratory testing, are vital to identifying new influenza A subtypes virus strains with pandemic potential.
- The threat of a pandemic may be heightened when a highly pathogenic avian influenza A virus spreads widely among birds and infects other animals, including humans. The strains can mutate or adapt and give rise to a strain that spreads easily from person to person in a sustained manner, causing a pandemic.
- Illness and death may be much higher during a pandemic than during annual seasonal community influenza outbreaks; pandemics can also occur in waves over several months.
- It could take many months to develop an effective pandemic influenza vaccine and immunize substantial numbers of people. Antiviral medications for treatment or prevention of pandemic influenza could have an important interim role, but may also be in short supply. Consequently, practical and common sense measures, such as frequent hand washing, covering your mouth and nose while sneezing or coughing, and staying home from work or school if you are ill with influenza-like illness, may be important to help prevent the spread of pandemic influenza.
- Although travel restrictions and isolation and quarantine procedures may limit or slow the spread of pandemic influenza in its earliest stages, these measures are likely to be much less effective once the pandemic is widespread. Alternative population containment measures (e.g., cancellation of public events) may be necessary.
- Arizona is preparing for pandemic influenza by:
  - Developing a coordinated state strategy to prepare for and respond to an influenza pandemic in conjunction with federal and local partners
  - Participating in a pandemic influenza table-top exercise within the first six months of 2006
  - Already embarking on a campaign to immunize elderly adults for pneumonia, often a secondary infection to influenza that can cause fatalities in the high risk elderly population
  - Educating health care workers about pandemic influenza diagnosis, case management, and infection control practices
  - Refining pandemic influenza surveillance systems
  - Developing guidelines for minimizing transmission opportunities in different settings
  - Working with federal agencies as they are expanding supplies of antiviral medications in the Strategic National Stockpile and establishing guidelines for their use
  - Developing candidate vaccines and establishing plans for the rapid development, testing, production, and distribution of vaccines that may target specific pandemic influenza strains
  - Developing materials that county and local agencies can adapt as guidance for use during an influenza pandemic.



## **Appendix 10.2 Sample Materials**

ADHS will utilize materials provided and adapted from HHS which will provide communications materials for states and localities throughout all pandemic phases. Many of these resources will be made available at appropriate times on the [www.azdhs.gov/pandemic](http://www.azdhs.gov/pandemic) flu and [www.pandemicflu.gov](http://www.pandemicflu.gov) websites. Others will be disseminated by using the Health Alert Network (HAN), Epidemic Information Exchange (Epi-X), and other resources for health professionals. Current links to available materials:

Avian Influenza Fact Sheet

<http://www.cdc.gov/flu/avian/gen-info/facts.htm>

\*Note, this website also has links to Novel H1N1; Seasonal Flu; Swine Flu and Pandemic Flu information (see right side of website)

Guidance to Travelers

[http://www.cdc.gov/travel/other/avian\\_flu\\_ah5n1\\_031605.htm](http://www.cdc.gov/travel/other/avian_flu_ah5n1_031605.htm)

Managing Anxiety in Times of Crisis

<http://mentalhealth.samhsa.gov/cmhs/managinganxiety/default.asp>

## **Appendix 10.3**

### **Additional Resources**

HHS and its agencies will make resources available to state and local health professionals to assist with their communications responsibilities during all phases of a pandemic event. Because information may change frequently, check the [www.flu.gov](http://www.flu.gov) and [www.cdc.gov/flu/](http://www.cdc.gov/flu/) websites for up-to-date materials. Communications professionals in states and local areas will be able to localize and download most resources, including posters, brochures, fact sheets, media kits, webcasts, and archived satellite broadcasts. Much of the material will also be available through e-mail or mail orders. Material will include color and black and white versions for health care and public health professionals and for public audiences, as well as specific versions for low-literacy populations. As appropriate and feasible, materials will be provided in a variety of languages.

#### **Other resources**

National Vaccine Program Office Website

<http://www.HHS.gov/nvpo/>

WHO Pandemic Influenza Website

<http://www.who.int/csr/disease/influenza/pandemic/en/>

CDC Morbidity and Mortality Weekly Report

<http://www.cdc.gov/mmwr/>

Epidemic Information Exchange (Epi-X)

<http://www.cdc.gov/mmwr/epix/epix.html>

Health Alert Network (HAN)

<http://www.bt.cdc.gov/documentsapp/HAN/han.asp>

Centers for Public Health Preparedness

<http://www.bt.cdc.gov/cdcpreparedness/cphp/index.asp>

This website provides locating information and links to the 40 centers involved in this network. The centers form a unique partnership that includes accredited schools of public health, dentistry schools, medical schools, veterinary schools, and state and local health departments. Together, the partners provide a nationwide defense system through the preparation of front-line public health workers and first responders.

The WHO European Influenza Network Website

<http://www.euroflu.org/index.php>

#### **Vaccine-Specific Sites and Resources**

The Vaccine Adverse Events Reporting System (VAERS)

<http://vaers.hhs.gov/> or call 1-800-822-7967

#### **Surveillance Sites**

CDC Influenza Surveillance Data

<http://www.cdc.gov/flu/weekly/fluactivitysurv.htm>

EISN: European Influenza Surveillance Network

<http://www.ecdc.europa.eu/en/activities/surveillance/EISN/Pages/home.aspx/>

## **Outbreak Sites**

[Animal and Plant Health Inspection Service \(APHIS\), Veterinary Services, U.S. Department of Agriculture \(USDA\)](http://www.aphis.usda.gov/)  
<http://www.aphis.usda.gov/>

APHIS coordinates efforts to prepare for and respond to outbreaks of exotic animal diseases, including highly pathogenic avian influenza. Results of surveillance for influenza A viruses in avian species in the United States are reported each year by the National Veterinary Services Laboratories in the Proceedings of the U.S. Animal Health Association Annual Meeting.

World Health Organization Disease Outbreak Site

[The World Health Organization \(WHO\): disease outbreaks](http://www.who.int/csr/don/en/)  
<http://www.who.int/csr/don/en/>

## **Research Sites**

National Institute of Allergy and Infectious Diseases (NIAID)

<http://www.niaid.nih.gov/topics/flu/Pages/default.aspx>

USDA Agricultural Research Service

<http://www.ars.usda.gov>

## **Manufacture and Licensing of Influenza Vaccine**

[Center for Biologics Evaluation and Research \(CBER\), FDA](http://www.fda.gov/BiologicsBloodVaccines/default.htm)

<http://www.fda.gov/BiologicsBloodVaccines/default.htm>

CBER plays a critical role in the manufacture and licensing of influenza vaccine.

WHO Global Influenza Preparedness Plan (April 2009)

<http://www.who.int/csr/disease/influenza/pipguidance2009/en/index.html>

## **Appendix 10.4**

### **Joint Information Center**

The Joint Information Center (JIC) provides the mechanism to organize, integrate, and coordinate information collection and dissemination to ensure timely, accurate, and consistent messaging across multiple jurisdictions and/or disciplines including the private sector and nongovernmental agencies.

The State of Arizona has a designated JIC at the Arizona Division of Emergency Management State Emergency Operations Center. This facility contains a staging area for the media and a working site for the public information officers (PIO). The primary task of PIO is to clearly and rapidly communicate key facts, explain response activities, and inform the public of any protective measures. During a pandemic response, the JIC will be the primary physical location for the development, coordination, and dissemination of all pandemic information. Once the JIC is established, the JIC becomes the recognized source for the news media and stakeholders to get official information on the incident.

#### **Roles and Responsibilities**

The Lead Public Information Officer (PIO), in coordination with other state and federal officials, will:

1. Use the media, outreach and other communication systems to provide risk communication to inform and instruct individuals, families, businesses, and industries about health and medical factors related to a pandemic.
  - Maintain fact sheets and draft news releases
  - Oversee the coordination and activation of the ADHS 24 hour hotline
  - Ensure the ADHS website is updated with all current news releases, fact sheets and other pertinent health information
  - Coordinate with local public health agencies, and other state and federal agencies to ensure consistent messages are being delivered
2. Ensure accuracy, timeliness, and appropriateness of all health and medical public information before its release to the media.
3. Respond to media requests for health and medical information, or assign approved spokesperson to media requests.
4. Maintain a list of spokespersons and subject matter experts from ADHS and other stakeholders.
  - Director
  - Deputy Director
  - Communications Director
  - Assistant Director, Public Health
  - Public Information Officer, Public Health
  - Deputy Assistant Director, Public Health
  - State Epidemiologist
  - Chief Medical Officer
  - Chief, Bureau of Emergency Preparedness and Response
  - Infectious Disease Specialist

#### **Standard Operating Procedures**

1. Public Information Distribution
2. Media Request Form
3. News Release Approval Process
4. News Conferences
5. Website
6. Translations
7. Hotline Activation

8. Health Alerts
9. Draft Messages/Templates
10. Media Lists

## **Information Approval Process**

During a pandemic response in which the HEOC and JIC are activated, the approval process for messaging will follow the Public Health Incident Management System (PHIMS) command structure. JIC staff will work with HEOC command staff and their subject matter experts to develop incident specific messaging. The ADHS Director, Deputy Director and Assistant Director of Public Health or their designees will approve information for public use. After approval is obtained, the HEOC Logistics Section and/or JIC staff will be responsible for distributing the information to stakeholders and/or the media.

Staff involved in the approval process must recognize the need for timely and responsive public information. Messages should be evaluated and approved based on the STARCC (Simple, Timely, Accurate, Relevant, Credible and Consistent) criteria.

Information that is posted to the ADHS Website or distributed via social media sites must also be approved by the HEOC Manager and Lead PIO. It is important to note that all individuals responsible for approving information must be well versed in confidentiality guidelines. This is especially important when releasing information related to case fatalities.

## **Staffing**

The staffing of the JIC will be determined by the scope of the event, the number of response agencies and the needs of the public and the media. In accordance with NIMS principles, JIC organizational charts are scalable and flexible. PIOs from a variety of agencies may be called on to serve in the JIC. Although these individuals will be reporting to the Lead PIO, and by default the HEOC Manager, PIOs may still serve as the main point of contact for their respective agencies.

### **A. Communication Stakeholders**

#### **Federal**

- U.S. Department of Health and Human Services
  - Centers for Disease Control (CDC) and Prevention
- Indian Health Services (HIS)
- Food and Drug Administration (FDA)

#### **State**

- Primary:
  - Arizona Division of Emergency Management
- Support:
  - Department of Agriculture (ADA)
  - Department of Economic Security (ADES)
  - Department of Emergency & Military Affairs (DEMA)
    - Arizona Division of Emergency Management (ADEM)
    - National Guard (AZNG)
  - Department of Education (ADE)
  - Department of Environmental Quality (ADEQ)
  - Department of Public Safety (ADPS)
  - Department of Transportation (ADOT)
  - Office of the Attorney General
  - Office of the Governor
  - State Board of Funeral Directors and Embalmers
  - State Pharmacy Board

#### County

- County Emergency Management (CM)
- County Health Departments (CPH)
- County Sheriff Departments (CSO)

#### Local

- Metropolitan Medical Response System (MMRS) cities

#### Voluntary

- American Red Cross (ARC)
- Arizona Statewide Independent Living Council (AZSILC)
- The Salvation Army (TSA)
- Arizona Volunteer Organizations Active in Disasters (AZVOAD)

#### Private Sector

- Arizona Funeral Directors Association (AFDA)
- Arizona Hospital and Health Care Association (AHHCA)
- Arizona Pharmaceutical Association (APA)
- Local medical facilities
- Local businesses

#### Public Sector

- Utility companies
- Schools; private and public

### **B. At-risk Populations**

Messages must also reach unconventional audiences. Such “at risk” populations are identified by the Centers for Disease Control and Prevention (CDC) and the Hospital Preparedness Program (HPP).

CDC defines “at risk” as ...

- geographically isolated,
- pregnant,
- mobility impairments,
- lack of transportation,
- inability to read,
- chronic disease, and
- social isolation

HPP defines “at risk” as ...

- geographically isolated,
- pregnant,
- non-English speakers,
- homeless,
- elderly, and
- children

### **Message Categories**

Messages can be classified into the following categories by the severity of the public health message and risk. It is suggested that local public health departments and partners follow these guidelines:

- **News Advisory:** Announces an event such as a news conference, photo or video opportunity



- **News Release:** Announces new data, issues, reports, etc.
- **Health Update:** Provides an update to an issue or problem already discussed. It doesn't carry the expectation of an action.
- **Health Advisory:** Indicates importance to the public's health but no immediate actions. Proactive and preventative information.
- **Health Alert:** Information about a specific health issue where immediate action is required to protect health.

## **Modes of Message Distribution**

The following vehicles are identified as suitable modes of information distribution to the media, stakeholders, and the public.

### **Media**

- Telephone calls
- E-mails based on the noted preference of the outlet
- Faxes based on noted preference of the outlet
- Tours
- Regular media briefings and interviews

### **ADHS Partners and Stakeholders**

- Telephone calls
- Satellite phones
- E-mail
- Fax
- Health Services Portal (HSP) system
- Health Alert Network (HAN)
- Interpersonal dealings

### **Public**

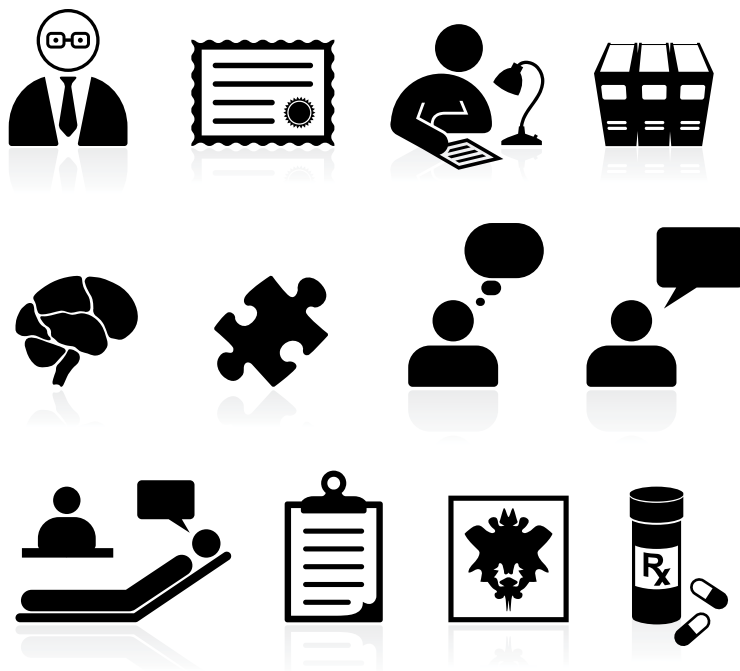
- Print, broadcast and electronic media
- News conferences and scheduled "town halls"
- Collateral materials (e.g., press releases, fact sheets and brochures) available online and in hard copy
- Call centers to field public inquiries, communicate key messages, identify messaging needs and gaps, and corral rumors
- AzEIN, ADHS and partner Web sites; media Web pages

Upon notification of a significant event requiring a state response, ADHS staff will alert identified personnel to be prepared to meet requirements for representing the Health and Medical Services Emergency Support Function (ESF 8).



# Arizona Pandemic Influenza Response Plan

## *Supplement 11: Workforce Support – Psychosocial Considerations and Information Needs*





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## **I. Rationale**

The response to an influenza pandemic will pose substantial physical, personal, social, and emotional challenges to health care providers, public health officials, and other emergency responders and essential service workers. Critical stress levels may reach varying degrees of severity among health care providers and emergency responders through the duration of the response as well as the recovery phases of a pandemic. These critical stress levels may persist for more than a year. Experience with disaster relief efforts suggests that enhanced workforce support activities can help responders remain effective and proactive during emergencies.

Medical and public health responders and their families will be at personal risk for as long as the pandemic continues in their community. Special planning is therefore needed to ensure that hospitals, public health agencies, first-responder organizations, and employers of essential service workers are prepared to help employees maximize personal resilience and professional performance. An essential part of this planning effort involves the creation of alliances with governmental, community-based organizations and nongovernmental organizations with expertise in and resources for psychosocial support services or training.

## **II. Overview**

The objective of Supplement 11 is to ensure health care providers, public health officials, and other emergency responders and essential service workers reside in the safest and healthiest environment possible by addressing the psychological and social (“psychosocial”) needs of the occupational groups that will participate in the response to an influenza pandemic in Arizona.

## **III. Concept of Operations**

During regular business operations, the Arizona Department of Health Services, Division of Behavioral Health Services (ADHS/DBHS) is a publicly funded behavioral health system that serves children, families and adults who are at or below the federal poverty level.

However, as stated in the Arizona State Emergency Response and Recovery Plan (SERRP), during natural or human caused incidents that require state assistance, guidance and/or recovery funding ADHS/DBHS is the lead agency for the development and coordination of state behavioral health emergency/disaster response plans and services. In addition, ADHS/DBHS will ensure coordination with other state, county, private and volunteer response agencies to prepare intra-agency emergency response plans that include checklists as well as procedural guides.

ADHS/DBHS will assist the Arizona Division of Emergency Management (ADEM) in preparing a Presidential Major Disaster Declaration request to ensure that behavioral health services support is requested.

The ADHS/DBHS will also manage and perform the following operational support functions during an emergency such as an influenza pandemic:

- Assist in the preparation of an application for and attainment of federal grants (Federal Emergency Management Agency (FEMA), etc.) to fund immediate crisis counseling needs of the population and work force suffering from the pandemic emergency as well as grants to fund ongoing behavioral health and substance abuse service needs during the response and recovery phases.
- Managing contracts with behavioral health service providers including reporting emergency behavioral health service provision, funding expenditure and reimbursement, and the outcome of service provision.
- Managing emergency pandemic grants and funds including reporting emergency behavioral health service provision, funding acquisition and expenditure, and the outcome of service provision.
- Overseeing the quality of care provided by behavioral health service providers directly, or through contracted regional behavioral health authorities.
- Maintaining surveillance of behavioral health needs and efforts undertaken in order to adjust behavioral health service provision to meet the workforces demand
- Provide guidance on development of appropriate behavioral health information messages to the ADHS communications team (see Supplement 10).



#### **IV. WHO Phases 1-3 (Limited Human Spread) and Phase 4 (Sustained Human-To-Human Spread)**

Planning activities for these phases focus on the establishment of statewide psychosocial support services that will help workers manage emotional stress during the response to an influenza pandemic and resolve related personal, professional, and family issues.

##### **A. Institutionalizing Statewide Psychosocial Support Systems**

ADHS will assist local health departments, hospitals and health care organizations in planning for the provision of psychosocial support services that include the following activities:

- Sharing of information and available tools and systems.
- Encouraging the use of tools and techniques for supporting staff and their families during times of crisis.
- As grant funding is available, offering Basic and Advanced Critical Incident Stress Management (CISM) training for State and local public health and behavioral health staff. This training focuses on behavioral interventions to help employees cope with grief, stress, exhaustion, anger, and fear during an emergency.
- Encouraging the local health departments to establish partnerships and participate in any RBHA outreach activities to the emergency responder community. This purpose of this outreach is to inform these individuals on how to use as well as receive suggestions on how to improve the crisis response system.



##### **B. Preparing Workforce Support Materials**

ADHS/DBHS is in the process of developing communication materials to assist Department employees and serve as a resource for the local health departments and other employers of health care providers, response workers and providers of essential services. These materials will be prepared utilizing in-house knowledge as well as resources developed by other agencies and entities such as the Centers for Disease Control and Prevention, American Psychological Association, Substance Abuse and Mental Health Services Administration and other behavioral health organizations for distribution during a pandemic. These materials shall be designed to do the following:

- Educate and inform employees about emotional responses they might experience or observe in their colleagues and families (including children) during an influenza pandemic and techniques for coping with these emotions.
- Educate employees about the importance of developing “family communication plans” so that family members can maintain contact during an emergency.
- Describe workforce support services that will be available during an emergency, including confidential behavioral health services and employee assistance programs.
- Answer questions about infection control practices to prevent the spread of influenza in the workplace (see Supplement 4)



##### **C. Developing Workforce Resilience Programs**

ADHS and local health departments need to establish their own workforce resilience programs that will help deployed workers to prepare for, cope with, and recover from the social and psychological challenges of emergency work. To prepare for

implementation of workforce resilience programs to cope with the special challenges posed by an influenza pandemic, state and local response agencies should include the following components:

- Plan for a long response (i.e., more than 1 year).
- Identify pre-deployment briefing materials.
- Augment employee assistance programs (EAP) with social support services for the families of deployed workers.
- Provide program administrators and counselors with information on:
  - Cognitive, physiological, behavioral, and emotional symptoms that might be exhibited by patients and their families (especially children), including symptoms that might indicate severe mental disturbance.
  - Self-care in the field (i.e., actions to safeguard physical and emotional health and maintain a sense of control and self efficacy).
  - Cultural (e.g., professional, educational, geographic, ethnic) differences that can affect communication.
  - Potential impact of a pandemic on special populations (e.g., children, ethnic or cultural groups, the elderly).

## **V. WHO Phase 5-6 (Widespread Human Infection Or Pandemic)**

Actions for these phases focus on the delivery of statewide psychosocial support services to response workers, provision of occupational health information to health care providers, and implementation of workforce resilience programs.

### **A. Delivering Psychosocial Support Services**

Health care facilities, ADHS and local health departments - as well as companies and local governments that employ essential service providers need to make full use of self-care and behavioral health interventions that can help response workers manage emotional stress, family issues and build coping skills and resilience. These approaches and tools can include:

- Stress control/resilience teams in hospitals should observe recommended infection control precautions as well as assist and support employees and foster cohesion and morale by:
  - Monitoring employee health and well-being (in collaboration with occupational health clinics, if possible).
  - Staffing “rest and recuperation sites”.
  - Distributing informational materials.
- Rest and recuperation sites. Sites can be stocked with healthy snacks and relaxation materials (e.g., music, relaxation tapes, movies), as well as pamphlets or notices about workforce support services.
- Confidential telephone support lines staffed by behavioral health professionals.
- Services for families. Services to families of employees who work in the field, work long hours, and/or remain in hospitals or other workplaces overnight might include:
  - Assistance with elder care and child care.
  - Help with other issues related to the care or well-being of children.
  - Provision of cell phone or wireless communication devices to allow regular communication among family members.
  - Provision of information via websites or hotlines.
  - Access to expert advice and answers to questions about disease control measures and self care.
- Information for commuters. Workers might need alternative transportation and scheduling (e.g., carpooling, employer provided private transportation, alternate work schedules during off-peak hours) to avoid exposure to large groups of potentially infected persons.
- Services provided by community- and faith-based organizations. Activities of these organizations can provide relaxation and comfort during trying and stressful times.

## B. Providing Information to Responders

Health care providers, especially those who work in hospitals, are likely to be under extreme stress during a pandemic. They will have special needs for open lines of communication with employers and access to up-to-date information. Health care facilities should ensure that employees have ongoing access to information on the following:

- International, national, and local progress of the pandemic.
- Work policies related to illness, sick pay, staff rotation, shift coverage, overtime pay, use of benefit time, transportation, and use of cell phones.
- Family issues, especially the availability of child care.
- Health care issues such as the availability of vaccines, antiviral drugs, and personal protective equipment (PPE).
- Actions to address understaffing or depletion of PPE and medical supplies.
- Infection control practices as conditions change.
- Approaches to ensure patients' adherence to medical and public health measures without causing undue anxiety or alarm.
- Management of agitated or desperate persons.
- Guidance on distinguishing between psychiatric disorders and common reactions to stress and trauma.
- Management of those who fear they may be infected, but are not (so-called "worried well").
- Guidance and psychosocial support for persons exposed to large numbers of influenza cases and deaths and to persons with unusual or disturbing disease symptoms.
- Because health care workers might be called upon to fill in for sick colleagues and perform unfamiliar tasks, health care facilities and state and local public health agencies shall provide written instructions for "just-in-time" cross training on essential tasks.

Other occupational groups that might participate in the response to pandemic influenza (including police, firefighters, and community outreach workers) shall have access to information and written materials available on the Department's website and other appropriate Health Alerts that will help them anticipate behavioral reactions to public health measures such as movement restrictions (e.g., quarantine, isolation, closure of public events), especially if such actions are compounded by an economic crisis or abrupt loss of essential supplies and services.

Health care workers and other emergency responders shall be provided with information on what to do if they or their children or other family members experience stigmatization or discrimination because of their role in the pandemic influenza response. Hospital public affairs offices should be prepared to address these issues as well.

## C. Implementing Workforce Resilience Programs

During an influenza pandemic, state and local response agencies need to implement workforce resilience programs that meet the special needs of emergency workers, including those who continue to report to the same job location but whose assignments shift to respond to the pandemic. Other personnel maintaining essential operations will also need attention. First-responder or nongovernmental organizations that send employees or volunteers to assist patients in hospitals, non-hospital settings and at home should also establish similar programs.

State and local workforce resilience programs need to provide the following services:

### 1. Pre-deployment/assignment

- Conduct briefings and training on behavioral health, resilience, stress management issues, and coping skills.
- Train supervisors in strategies for recognizing signs of stress and maintaining a supportive work environment.



## **2. During deployment/assignment**

- To support responders in the field:
  - Deploy several persons as a team and/or assign “buddies” to maintain frequent contact and provide mutual help in coping with daily stresses.
  - Frequently monitor the occupational safety, health, and psychological well-being of deployed staff.
  - Provide access to activities that help reduce stress (e.g., rest, hot showers, nutritious snacks, light exercise).
  - Provide behavioral health services, as requested.
- For essential operations personnel:
  - Enlist stress control or resilience teams to monitor employees’ occupational safety, health, and psychological well being.
  - Establish rest and recuperation sites and encourage their use.
  - Provide behavioral health services, as requested.
- For families of responders:
  - Provide a checklist of necessary personal affairs documents that need to be assembled prior to departure. (e.g. benefits information, personal will, power of attorney)
  - Enlist employee assistance programs to provide family members with psychosocial support (e.g., family support groups, bereavement counseling, and courses on resilience, coping skills, and stress management).
  - Provide a suggestion box for input via e-mail or anonymous voice-mail with a toll-free number.
  - Continue to provide outreach to employees’ families to address ongoing psychological and social issues.
- Throughout the response, policies on personnel health and safety should be reviewed and revised, as needed.

## **3. Post-deployment/assignment**

- Interview employees and family members (including children) to assess lessons learned that might be applied to future emergency response efforts.
- Provide ongoing access to post-emergency psychosocial support services for employees and their families (on-site or through partner organizations).
- Conduct an ongoing evaluation of the after-effects of the pandemic on employees’ health, morale, and productivity.

# Arizona Pandemic Influenza Response Plan

## *Supplement 12: Pandemic Influenza Information Management*







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## I. Rationale

Public Health Informatics refers to the use of technology for improving access to and utilization of public health information. Public Health Informatics is also the management of information in the public health system—how it is captured, retrieved, and used in making decisions. In the area of public health emergency response, information management takes on new characteristics associated with real-time analysis instead of research driven analysis. Similarly, public health emergency response informatics focuses on systems that support response related interventions and resource tracking.

As part of the pandemic influenza response activities, information is needed to address decision support for all phases of the event. To this end, the need for near real-time communication flow will grow as the event progresses from Pandemic Phase 1 to Phase 6.

### Areas of Information Need During All Phases

- Status of the Disease Event – this includes the ability to collect, compile, and analyze information from varied sources to determine the extent of the outbreak within geographic regions and variances over time. This effort begins with disease monitoring to support early identification, and includes support for patient follow-up, and analysis of outbreak mitigation efforts including vaccine efficacy and adverse event reporting.
- Status of Vaccination Progress – this includes the availability of pre-event vaccine and pre-event vaccination progress (dependent upon vaccine availability), and continued vaccine availability and vaccination progress monitoring throughout the event. These efforts include the need to identify the status, location, and resources of vaccination facilities; the amount, location, and delivery status of vaccine inventories; and the number of vaccinations having been given by risk or response group.
- Status of Isolation and Quarantine Systems – this includes the collection and tracking of individuals and locations that have been established for isolation and quarantine. Similarly, the tracking will include information on medical conditions and treatment associated with the outbreak. Aggregate numbers will be needed to understand outbreak mitigation, while detailed information will support individual patient treatment.
- Status of Equipment and Resources – this includes identification and tracking of existing and recently acquired resources. Resources may include: durable equipment, vaccine, prophylaxis, supplies (medical and other), and human resources (volunteers and staff at a variety of locations).
- Status of Community Resources – this includes the tracking of health care and community resources. Also included in community resources is the availability of hospital beds and ambulances, as well as the operational status and location of the Medical Reserve Corp, the Red Cross, and other community response agencies.

### Areas of Communications Needs

- Direct Communications  
This type of communications involves direct person to person communication that can be performed through synchronous and asynchronous methods. The need for redundancy of direct communications is imperative for maintenance of communications between response partners.
- Collaborative Communications  
Collaborative communications are systems that support the group interchange of information. These types of communications can be handled through synchronous and asynchronous methods.
- Mass Distribution Communications  
This type of communications is usually associated with communications to the media, the public or special populations. The mechanisms can vary, and are utilized to take strain off of response groups and systems.
- Stakeholder and Responder Distribution Communications  
This type of communications is the utilization of direct communications for one-way distribution of information. This communication need is usually associated with directed response or emergency information that is associated

with activation or emergency updates. Communications of this type are usually directed to specific public health and emergency response roles.

- Data Collaboration Messaging

This communication need is associated with establishing data and systems integration and interoperability. This communication mechanism is usually established as part of planning efforts, but flexible implementation can allow for tailoring for specific emergency response efforts.

## II. Overview

Addressing the needs of an Influenza Pandemic response will require the use of all Departmental systems. Each of these systems will meet a critical information need, while together the information from many systems can be synthesized to provide stronger decision support. Specifically, systems will be in place to support surveillance, vaccine and pharmaceutical delivery, emergency response, and communications needs. Systems that will be utilized in these efforts are listed below:

### Surveillance (also see Supplement 1)

- MEDSIS (Medical Electronic Disease Surveillance Intelligence System) – MEDSIS is a web-based application to electronically capture and analyze reportable disease information from Arizona hospitals, health care providers, and clinical laboratories. MEDSIS is a statewide system hosted and supported by the ADHS for use by ADHS, local health departments, and institutions responsible for reporting communicable diseases. Participating hospitals and laboratories enter or electronically transmit disease information to MEDSIS. Case data can then be accessed simultaneously by local and state health departments, which can also add information gathered from investigations or other reports. During the 2009 H1N1 pandemic, the fields from the investigation form used for collecting information on H1N1-associated hospitalizations and deaths were added to a “disease-specific observation” tab so that all information could be shared, extracted, and analyzed easily across public health jurisdictions in Arizona.
- ELR (Electronic Laboratory Reporting) – ELR is a system for the electronic collection of reportable laboratory results used for disease surveillance. For influenza, data reported through ELR feeds into MEDSIS and laboratory reports can be easily appended to previously-reported cases or used to create new cases. This web-based system utilizes national data messaging standards.
- EWIDS (Early Warning Infectious Disease Surveillance) – Additional functionality has been added to MEDSIS and the Health Services Portal (HSP) to address surveillance needs along the Arizona-Mexico border. Counterparts from the Sonora, Mexico, health department have been trained on and given access to MEDSIS and HSP. When those users access MEDSIS, they view a Spanish-language version of the system. Cases marked as having binational interest in MEDSIS, due to travel to Mexico during the infectious period, possible acquisition in Mexico, or residency in Mexico, are shared with the Sonoran officials through MEDSIS. This allows for more collaboration on binational investigations. Additionally, Sonoran health officials can access the secure email system on HSP as a means to securely share confidential data with health officials in Arizona. Binational alerting functions are still under development.
- LIMS (Laboratory Information Management System) – This is the State Laboratory Information Management System. All information about specimen receipt and influenza testing results at the state laboratory is recorded here. LIMS can also be accessed by epidemiologists at ADHS for tracking results of specific cases or downloading data for incorporation into the surveillance system. The system also allows for integration with other State Laboratories and transmission of laboratory data via ELR to MEDSIS.



- CDC BioSense – BioSense provides visualization of syndromic surveillance data using ICD-9-coded chief complaints or diagnoses at emergency department visits and admissions from selected hospitals, and outpatient visits at Department of Defense ambulatory-care centers and Department of Veterans Affairs outpatient clinics. County health departments are able to access this system to identify sentinel alerts and unexpected data aberrations for follow up investigations. For influenza surveillance, influenza-like illness data are monitored. Data from eight Arizona hospital emergency departments are included as of June 2010.
- NRDMS (National Retail Data Monitoring System) – The University of Pittsburgh’s Real time Outbreak Detection System (RODS) Laboratory provides visualization of daily aggregate sales of over-the-counter medication from large national retailers in Arizona. Several states have used this system to identify early influenza activity based upon increasing sales of OTC cold and cough remedies. County health departments can access this system to monitor their own areas.

## Emergency Response

- ASIIS (Arizona State Immunization Information System) – ASIIS is a web-based application that represents the ADHS immunization registry. The focus on the system is childhood vaccinations, based on reporting requirements, however, the system can collect and manage immunization information for all ages.
- EMCredential - EMCredential is a component of the EMSystems suite of products. It is a web based application that follows the federal ESAR-VHP (Emergency System for the Advanced Registration of Volunteer Health Professionals) guidelines. EMCredential is fully operational in Arizona and is capable of credentialing and verifying local health professionals and integrating with local volunteer management systems.
- Outbreak Management – There is currently no established system at the Department of Health Services, although case and suspect case information can be recorded in MEDSIS. The Centers for Disease Control and Prevention have a personal computer based application, OMS, which can be used for outbreak management.
- Isolation and Quarantine Tracking – While there is currently no system in place to track patients, and their locations, related to isolation and quarantine needs, basic tracking can be performed using elements of the HSP Environment. This feature will need to be developed, and collection of the system needs may require the development of another web-application.
- EMSystems – The EMSystems suite of web-based applications are used by Hospitals, Urgent Care Centers, Emergency Medical Services, and Public Health. The EMSystems suite is composed of three applications: EMResource, EMTrack, and EMCredential. EMResource is used to share information about hospital diversion status, public health events, and mass causality incidents. The system is also used as a mechanism to query the hospitals about bed availability, surge capacity, and response needs and fulfills the Health and Human Services (HHS) requirement to report to the Hospital Available Beds for Emergencies and Disasters (HAvBED) system. EMTrack is used to track patients from scene to facility through the use of hardware scanners and barcoded triage tags. EMCredential is used to credential and register volunteer health professionals and fulfills the ESAR-VHP (Emergency System for the Advanced Registration of Volunteer Health Professionals) requirements as stated above



## Vaccine and Pharmaceutical Administration (see also Supplements 6 & 7)

- Inventory and Resource Management System (IRMS) – IRMS is a web-based application used to track and monitor inventory to adhere to guidance for countermeasures and response administration. The application has the ability to maintain multiple warehouses from a single database instance. This will give the department flexibility to manage assets statewide. IRMS will be used to accurately dispense inventory to partners within Arizona during an actual event or exercise. The system can be customized to include Strategic National Stockpile

(SNS) data and security can be customized to provide specific users access only to designated SNS areas. With the ability to expand to wireless hardware scanners, label printers and RFID tags, IRMS will evolve as the needs of the Arizona Department of Health Services change.

- The Vaccine Ordering Management Systems (VOMS) is a web-based vaccine ordering system that can be used by Arizona providers to order Vaccine For Children (VFC), other vaccines, or immunization supplies provided by the CDC. The vaccines ordered through VOMS are imported into the CDC Vaccine Management System (VACMAN), once imported into VACMAN, the vaccine orders can be transmitted to CDC for distribution. VACMAN has the ability to track vaccine and supply shipments and monitor vaccine usage by providers. VACMAN will be replaced by the CDC application Vaccine Tracking System (VTrcks) in 2011. VTrcks will enhance the vaccine tracking and monitoring components of VACMAN.
- Flu-shot module – This web-based application is a proof-of-concept system for rapid collection of flu vaccination information. This system would integrate with ASIIS, but be streamlined to meet emergency needs. While the system was created for testing and exercising, it can be adapted to address a full-scale emergency.

## Communication

- HAN Messaging (Health Alert Network Messaging) – HAN messaging is a web-based system to initiate the distribution of alerts. The system can distribute information by email, phone, text-pager, or fax. In addition, the system utilizes text-to-speech to read typed information over the phone. This system is utilized for information dissemination to public health responders and stakeholders. The system is also utilized call internal staff to fill ICS rolls with the Health Emergency Operation Center (HEOC). In addition, this system supports teleconference-bridging capability for conference call meetings.
- HSP (Health Services Portal) – HSP is both a system's architecture to support web-based applications (like MEDSIS, HAN messaging, etc.) and also supports the Public Health Preparedness Portal. This portal supports secure areas for response tracking. These secure portal spaces represent a virtual emergency operations center. Similarly, the system supports a secure online collaborative portal for sharing of information between local health jurisdictions and across the Mexico border.
- AZEIN (Arizona Emergency Information Network) – AZEIN is a web-based data repository that includes information for the public about public services and other health and human services. In addition, the system has an emergency response area that is utilized to post public emergency bulletins (also see Supplement 10).

(Additional information on these systems and their contacts is located in Appendix 12.1)

## III. Actions for WHO Phases 1-3 (Limited Human Spread)

### Surveillance

- Respiratory specimens are submitted to the state laboratory for testing and subtyping via culture or PCR; a sample of reference isolates are also sent to the state laboratory by clinical laboratories for subtyping (see Supplement 1). The ADHS Infectious Disease Epidemiology Section (IDES) receives information through the state laboratory's electronic laboratory database (LIMS) or by communication with the laboratory.
- Reports of laboratory-confirmed influenza are recorded in MEDSIS and can be viewed and accessed by ADHS and the relevant local health department. Influenza reports transmitted via ELR are incorporated into MEDSIS.
- Schools, long-term care facilities, or other institutions report influenza or ILI outbreaks to state or local health departments (passive reporting).
- Enhancing influenza surveillance (works in progress):
  - Increase the number of laboratories submitting data via ELR.

### Vaccine and Pharmaceutical Delivery

- No activities



## Emergency Response

- Management of equipment and materials caches that are owned by the Department of Health Services
- Enhancing state-wide response and tracking (work in progress):
  - Improved systems for inventory and tracking of equipment and materials. This will include inventory, receiving and distributing of materials.
  - Develop a system for tracking of patients in isolation & quarantine
  - Purchase fixed and portable radio units for communication redundancy and clinic/warehousing coordination.



## Communications

- HAN messaging sends information from the Office of Infectious Disease Services via HSP to key partners and stakeholders

## IV. Actions for WHO Phase 4 (Sustained Human-to-Human Spread)

### Surveillance

- Investigate additional data sources including pharmaceutical data, hospital emergency department and community health center capacity (bed availability) and incorporate any of these new data sources into other surveillance activities.
- Explore other feeds of surveillance data including hospital admissions or discharge data.
- Utilize data messaging standards to receive other syndromic surveillance data.
- Consider instituting active surveillance (e.g., school absenteeism; number of patients on ventilators; number of deaths due to respiratory illness; contacting hospitals, emergency departments, clinics, labs that test for influenza; use of SARS self-screening tools).

### Vaccine and Pharmaceutical Delivery

- Conduct inventory of critical equipment, including, but not limited to, statewide availability of antiviral and antibiotic pharmaceuticals, refrigerated depots for vaccines, and transport for delivery of vaccines. This can utilize developed systems or paper inventory.
- Provide systems training update to ensure available trained staff on inventory and alerting systems.
- Configure inventory tracking systems to the established protocols for distribution of vaccine, antibiotics, and antivirals.

## Emergency Response

- Establish a plan for information sharing utilizing the Public Health Preparedness Portal. Establish the secure portal space with activation of PHIMS/HEOC.
- Establish activation groups and alerting protocols specific for the event.
- Prepare for EOC Activation
- Prepare volunteer job posting and review available volunteers for necessary skill-sets.

## Communications

- Disseminate surveillance data to local health departments and providers using the public health preparedness portal.
- Establish and maintain contacts with influenza and immunization coordinators in neighboring states.
- Maintain information posted online with accurate information on status of the event and State-wide readiness (see Supplement 10).
- Review message templates and ensure that audiences for messages have been established.



- Test alerting systems and communications equipment. Include testing of radio equipment.
- Place Information Technology Response Staff on 24-hour stand-by.
- Evaluate system maintenance and upgrade schedules to minimize planned downtime of systems.
- ADHS will continue use of HAN messaging for distribution of information via HSP.

## **V. Actions for WHO Phases 5-6 (Widespread Human Inflection or Pandemic)**

### **Surveillance**

- During Phase 5 and the early part of Phase 6, surveillance activities described above and in Supplement 1 will continue, likely with increased frequency. In the later part of Phase 6, surveillance systems will likely be overwhelmed; surveillance activities will continue to the extent possible while diverting personnel to the highest-priority activities.
- Analyze morbidity and mortality data to establish age- and geographic area-specific rates, as long as the relevant data are being collected.

### **Vaccine and Pharmaceutical Delivery**

- Provide tracking information on the number and types of individuals receiving vaccinations.
- Monitor VAERS data for evidence of adverse reactions to the influenza vaccine (see Supplement 6). Report findings routinely to the PHIMS Planning Section and to the CDC.

### **Emergency Response**

- Monitor availability of antivirals
- Distribute vaccine and/or antiviral agents as they become available; use Vaccine Management System (VACMAN) for inventory tracking or other developed systems (see Supplement 6).
- Assess antiviral/antibiotic/vaccine needs, conduct necessary activities as prescribed in SNS protocol.
- Activate identified volunteers. Deploy volunteers as necessary and maintain their deployment status.
- Request health care workers from other institutions.

### **Communications**

- HEOC to be in contact with SEOC
- Notify the Department Director, general counsel, legislative liaison, tribal liaison, local health liaison, border health liaison, Governor's Press Secretary, ADEM Public Affairs Director, Arizona Department of Homeland Security, county health department PIOs, and other stakeholders of Pandemic response.
- Continue information flow to local health departments and other stakeholders. Utilize the Joint Information Center (JIC) at the State Emergency Operations Center (SEOC) to organize all public and media messages.
- Maintain information posted online with accurate information on status of the event and State-wide readiness (see Supplement 10).
- Convey local information back to the CDC and other States through EPI-X.
- Change system maintenance and upgrade schedules to minimize planned downtime of systems. Move to a limited maintenance schedule with notification of all planned downtime.
- Increase system monitoring to 6 hour intervals.
- ADHS will continue use of HAN messaging for distribution of information via HSP.



## **VI. Actions for WHO Post Pandemic Period**

### **Surveillance**

- Surveillance will return to standard operating activities to the extent possible.
  - Vaccine and Pharmaceutical Delivery
- Provide finalized tracking information and inventory all equipment and remaining materials.
- Initiate recovery of distributed equipment. Perform equipment inventory with testing.

### **Emergency Response**

- Demobilize the Emergency Operation Center, and related information management systems.

### **Communications**

- Communicate to the media and public that the pandemic is over
- Notify the Department Director, general counsel, legislative liaison, tribal liaison, local health liaison, border health liaison, Governor's Press Secretary, ADEM Public Affairs Director, Arizona Department of Homeland Security, county health department PIOs, and other stakeholders that the pandemic is over.
- Maintain information posted online with accurate information on status of the event and State-wide readiness.
- Convey local information back to the CDC and other States through EPI-X.
- Return to normal system maintenance routines, and schedule any outstanding system upgrades.
- Return system monitoring to regular intervals.



## **VII. Appendix 12.1**

### **Information Management Systems: Access Information**

#### **Surveillance Systems**

- MEDSIS (Medical Electronic Disease Surveillance Intelligence System)  
Status: Operational  
Access: Secure Web-based System  
Users: State and Local Public Health, and reporting by health care providers  
System Contact: MEDSIS/ELR Program Manager
- ELR (Electronic Laboratory Reporting)  
Status: Operational, additional laboratories being connected  
Access: Secure Web-based System  
Users: State Public Health, and reporting by clinical laboratories; Local Public Health can view results in MEDSIS once imported  
System Contact: MEDSIS/ELR Program Manager
- EWIDS (Early Warning Infectious Disease Surveillance)  
Status: Operational, binational alerting still Proposed  
Access: Secure Web-based System  
Users: State and Local Public Health, and Border Partners  
System Contact: MEDSIS/ELR Program Manager
- LIMS (Laboratory Information Management System)  
Status: Operational  
Access: Secure Intranet Application  
Users: Arizona Department of Health Services' employees  
System Contact: Assistant Bureau Chief, Arizona State Public Health Laboratory
- CDC BioSense  
Status: Operational  
Access: Secure Web-based System  
Users: State and Local Public Health  
System Contact: Office Chief, Office of Infectious Disease Services
- NRDMS (National Retail Data Monitoring System)  
Status: Operational  
Access: Secure Web-based System  
Users: State and Local Public Health  
System Contact: Program Manager, Infectious Disease Epidemiology Section

## Emergency Response

- ASIIS (Arizona State Immunization Information System)  
Status: Operational  
Access: Secure Web-based System  
Users: State and Local Public Health and health care providers  
System Contact: ASIIS Project Leader
- EMCredential ESAR-VHP (Emergency System for the Advanced Registration of Volunteer Health Professionals)  
Status: Operational  
Access: Secure Web-based System  
Users: State Public Health  
System Contact: BPHEP Logistics Section Chief
- Outbreak Management  
Status: Deployable  
Access: Desktop Application  
Users: State and Local Public Health  
System Contact: Office Chief, Office of Infectious Disease Services
- Isolation and Quarantine Tracking  
Status: Proposed  
Access: Secure Web-Based System  
Users: State and Local Public Health  
System Contact: Logistics Section Chief
- EMSystems  
Status: Operational  
Access: Secure Web-Based System  
Users: State and Local Public Health and pre-hospital and hospital emergency departments  
System Contact: BPHEP Logistics Section Chief

## Vaccine and Pharmaceutical delivery (see also Supplements 6 & 7)

- Inventory and Resource Management System (IRMS)  
Status: Proposed  
Access: Secure Web-Based System  
Users: State and Local Public Health  
System Contact: Logistics Section Chief
- Vaccine Management System (VACMAN)  
Status: Deployable  
Access: Desktop Application with web-synchronization  
Users: Arizona Department of Health Services' employees  
System Contact: Office Chief for Arizona Immunization Program Office

## Communication

- HAN Messaging (Health Alert Network Messaging)  
Status: Operational  
Access: Secure Web-based System  
Users: State and Local Public Health  
System Contact: BPHEP Logistics Section Chief
- HSP (Health Services Portal)  
Status: Operational  
Access: Secure Web-based System  
Users: State and Local Public Health  
System Contact: BPHEP Logistics Section Chief
- AZEIN (Arizona Emergency Information Network)  
Status: Operational  
Access: Public Web-based System <http://www.azein.gov/azein/default.aspx>  
Users: Public





# Arizona Pandemic Influenza Response Plan

## *Supplement 13: Guidance for County and Tribal Health Departments*





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## **I. General Preparedness Guidance**

County and tribal health departments will be highly affected prior to and during an influenza pandemic. This guidance is designed to help spotlight important planning and response activities that are necessary at the local health department level. There is a wide variety of planning tools, outreach resources, and checklists produced by HHS that can be found at: ([www.pandemicflu.gov](http://www.pandemicflu.gov)). While HHS planning instruments are not reproduced here, the website contains broad concepts that are important and may help counties and tribes in the development of their respective plans.

All counties should have a jurisdiction-specific Pandemic Influenza Response Plan that is an extension of both their jurisdiction's overall Emergency Response Plan and the Arizona Pandemic Influenza Response plan. It is necessary for each county, and each tribe, as appropriate, to fit into the existing state plan to more effectively coordinate overall resources within the state.

Tribes in Arizona, and elsewhere in the Nation, have sovereign authority. In order to achieve optimal state-wide coordination during a pandemic response, tribal health departments and other tribal-related entities (e.g., U.S. Indian Health Services), will need to work closely with neighboring county health departments and the state health department. For purposes of this planning guide, tribal and county health departments are both considered local health departments, as these entities are responsible for providing public health services at the local level. There is no inference in this guide or elsewhere in the plan that equates counties with tribes.

Under a declared public health emergency Arizona Revised Statute (A.R.S. 36-787 states that the Arizona Department of Health Services (ADHS) becomes the primary coordinating agency in the state for all public health activities. This declaration will likely occur in Arizona during the late stages of Phases 1-3 (Limited Human Spread) or at the outset of a federally declared pandemic. Under such a declaration the counties will be responsible for carrying out the local public health duties necessary to respond, the goals and direction of these activities will be coordinated by ADHS; however, the operational plans to conduct these activities may vary from county to county, depending on the availability of local resources. The operational plans will need to function in the absence of a state declaration of emergency as seen in previous pandemics. This guidance should help both counties and tribes in Arizona identify the key local public health activities that will likely be necessary during the different phases of pandemic activity.

### **A. Incident Command**

As with other disasters and emergency plans, the response systems developed need to incorporate a National Incident Management System (NIMS) compliant incident command system (ICS). This requires training of management and staff in NIMS-compliant ICS courses. As ADHS will likely be playing a coordination role throughout the pandemic response, all partner agencies should be familiar with the ADHS ICS system – Public Health Incident Management System (PHIMS). PHIMS is described in detail in Appendix C of the Arizona Influenza Pandemic Response Plan (base plan). Local health agencies that have not adopted the ICS should use PHIMS as a structure, to ensure the ability of the local health agency and ADHS to appropriately coordinate during a pandemic response.

### **B. Community Preparedness**

Local health agencies should ensure community level planning and preparedness occurs within their jurisdictions. As with any disaster, a pandemic response will require the community and the government sectors working together. Community sectors include:

- businesses
- schools, day care
- long term care facilities
- churches
- volunteer organizations
- health care
- emergency responders
- community leaders
- private citizens and families
- local media outlets

Community preparedness activities include information sessions, training and education, resource assessments, community and individual planning (school, businesses, families, etc.), and community level exercises. Community level preparedness requires knowledge of the demographic, geographic and cultural make-up of the community, in order to ensure all populations in a community are involved, or are, at a minimum, accounted for in the response plan. See Supplement 8 for actual community preparedness planning guides (see also [www.pandemicflu.gov](http://www.pandemicflu.gov) for updated guides).

## **II. Specific Activity Preparedness**

The following portion of the guidance details specific local health agency activities extracted from Supplements 1-12 of the Arizona Pandemic Influenza Response Plan. These activities are listed, by category, as an outline of specific local actions that will likely need to be undertaken during the different phases of pandemic response, as part of an overall statewide response. Some actions will not pertain to all counties and tribes, and it is likely that each county and tribe will have additional activities that are not listed here. This model is typical of all public health emergency responses, where certain actions need to be coordinated at a state level, but the necessities of local implementation require innovative and sometimes alternative approaches.

### **A. Surveillance and Epidemiology**

Disease surveillance and epidemiological analysis are the key science-based components for all public health response activities. While ADHS will coordinate state-wide surveillance activities, the success of these actions will rely heavily upon the participation and implementation at the local level. County and tribal health departments are the primary agencies for conducting surveillance. The current surveillance systems during non-pandemic, seasonal influenza will be the basis for any surveillance activities during a pandemic (see Supplement 1)



#### **Actions for WHO Phases 1-3 (Limited Human Spread)**

1. Ensure participation is ongoing within the influenza surveillance systems
2. Continue to increase participation in sentinel surveillance for influenza-like illness
3. Explore opportunities to conduct syndrome surveillance with local reporting sources (i.e., clinics, ambulance companies, schools, etc.)
4. Maintain participation in the Arizona Health Alert Network, by receiving and re-distributing health alerts to appropriate community members
5. Ensure the full implementation of MEDSIS in respective jurisdiction, both at the health department and health care system level
6. Work with ADHS to develop and implement protocols for investigating institutional outbreaks
7. Ensure the ability to collect death certificates related to infectious causes, especially influenza, in a timely manner
8. Investigate initial reports of potential human influenza infections due to a novel influenza strain in respective jurisdiction utilizing local rapid response teams (RRT). These response activities include completing investigations forms, obtaining specimens for testing, and monitoring close contacts for influenza-like illness (ILI)
9. Immediately inform ADHS of any suspected human infection with an avian/animal/novel human strain of influenza
10. Ensure timely and comprehensive reporting of ILI from sentinel sites
11. Monitor syndromic surveillance data sources and evaluate increased activity, as appropriate
12. Assist ADHS with distribution of epidemiologic reports of influenza activity updates to surveillance partners and stakeholders and participate in regular surveillance conference calls with ADHS

### **Actions for WHO Phase 4 (Sustained Human-to-Human Spread)**

13. Request health care providers to screen travelers arriving from influenza-affected areas for ILI
14. Collect and analyze demographic data on clusters, ill travelers, or unusual cases
15. In accordance with ADHS recommendations, initiate active surveillance for hospitalized cases.
16. In accordance with ADHS recommendations, initiate active surveillance for influenza deaths

### **Actions for WHO Phases 5-6 (Widespread Human Infection or Pandemic)**

17. Continue with previous phase activities, likely at increased levels
18. Consider activating Public Health Incident Command System, to better coordinate activities within jurisdiction and with ADHS
19. Coordinate with ADHS to increase surveillance with health care providers at the early stages of a declared Pandemic, to detect introduction of virus into jurisdiction.
20. Analyze morbidity and mortality data to establish population- and geographic area-specific rates
21. Assist ADHS in ensuring medical examiner reporting of influenza-related deaths (see Supplement 1)
22. Additional sources of surveillance data may be evaluated to determine the effectiveness of pandemic influenza interventions and resource allocation needs.
23. Once the virus has been identified throughout the state, surveillance and testing levels may be decreased depending on resource availability
24. The pandemic strain is likely to become a routinely circulating influenza A subtype. When that happens, the activities of both the counties, tribes, ADHS and national influenza surveillance systems will revert to the frequency and intensity typically seen during pandemic influenza seasons

## **B. Health Care Response Coordination**

### **Actions for WHO Phases 1-3 (Limited Human Spread)**

While health care response during an emergency is primarily a partnership between private sector health care institutions, ADHS and county/tribal health departments need to work with these responding institutions to ensure overall coordination.

During Phases 1-3, ADHS and county/tribal health departments, along with emergency management and first responder agencies work together with all health care entities through the Arizona Regional Public Health Preparedness Coordinating Committees, to develop preparedness plans including infectious disease referral systems and patient surge capacity plans (see Supplement 3).



#### **Actions:**

1. County and tribal health departments need to maintain active participation in their respective Arizona Regional Public Health Preparedness Coordinating Committee.
2. Build close, habitual relationships with the hospital administrators within their jurisdiction, to ensure closer coordination during emergencies.
3. Identify multiple lines of redundancy for communication between local health department on health care institutions.



4. Ensure facilities have an influenza pandemic response plan as part of their overall facility emergency response plan.
5. Ensure health care partners receive latest guidance from ADHS or HHS during an emergency.
6. Work to identify needed health care resources, depending on impact of pandemic on health care system.

### **C. Vaccine and Antiviral Delivery and Administration**

Vaccines and antivirals are public health and medical tools to prevent and respond to influenza outbreaks. Their effectiveness during any given outbreak is not certain, especially during a pandemic due to a novel strain. While it is important for local plans to include the use of these tools as potential interventions, they should not be the only focus of an influenza pandemic response plan.

Vaccines are to be used as a preventative measure, while antivirals will primarily be used as a treatment by health care providers. Under specific guidance, antiviral medications may be used as a prophylactic measure for close contacts of known cases of pandemic influenza or potentially for response personnel with high risk of exposure (see Supplements 6 and 7)



#### **Actions for WHO Phases 1-3 (Limited Human Spread)**

1. Develop and implement plans, systems and capacities to receive, distribute, and administer vaccine to populations within each jurisdiction
2. Identify and train public health volunteer workforce to staff and administer mass vaccination clinics
3. Identify strategies to deliver vaccine doses to health care and immunization providers within jurisdiction, as part of the overall vaccine response plan
4. Develop a system to rapidly vaccinate staff within respective agencies, and their families.
5. Identify strategies to effectively distribute antiviral medications to potential priority groups, including hospitals and clinics for patient treatment, and frontline health care providers, first responders and other priority workers for potential prophylactic measures.

#### **Actions for Pre-Vaccine Availability**

6. Mobilize response partners, and prepare to activate plans for distributing and administering vaccines and antivirals, as necessary
7. Activate plans and systems to receive, distribute and administer pre-pandemic stockpiled vaccines and antivirals, to designated groups, upon receipt from ADHS
8. Review modifications, if any, to recommendations on vaccinating the priority groups.
9. Accelerate training in vaccination and vaccine monitoring for public health staff and for partners responsible for vaccinating priority groups.
10. Work with other governmental agencies, private institutions and non-profit organizations to ensure effective public health communications.

#### **Actions for Post-Vaccine Availability**

11. Activate plans and systems to distribute and administer vaccines to designated groups, upon receipt from ADHS.
12. Phase in vaccination of the rest of the population after priority groups have been vaccinated.

## D. Community Disease Control

Community Disease Control measures are those measures that are taken to limit or slow the spread of illness in a community. These can be enacted on an individual basis (i.e., quarantine of a contact of a case), on a large group of individuals (e.g., the quarantine of plane passengers that arrive with a person identified as having pandemic influenza), or at the community level (e.g., declaration of “Stay Home Days” to keep citizens at home and creating social distance between all members of the community). These measures will be best enacted at the local level, as they may only be necessary or effective in certain communities. County and tribal health departments shall consult with ADHS prior to taking such actions.

### Actions for WHO Phases 1-3 (Limited Human Spread)

1. Identify and engage traditional partners (e.g., public health and health care workers) and non-traditional community partners (e.g., transportation workers) and invite them to participate in preparedness planning and in pandemic influenza containment exercises and drills
2. Provide information to the public on the definitions of and the potential need for individual, small group, and community containment measures, to improve a wider understanding and acceptance during a pandemic
3. Identify potential isolation and quarantine facilities
4. Establish procedures, in conjunction with ADHS, for medical evaluation and isolation of quarantined persons who exhibit signs of influenza-like illness (ILI)
5. Develop tools and mechanisms to prevent stigmatization and provide mental health services to persons in isolation or quarantine, as well as to family members of affected persons and other community members
6. Establish procedures for delivering medical care, food, and services to persons in isolation or quarantine. These efforts should take into account the special needs of children and persons with functional and/or access needs
7. Develop protocols for monitoring and enforcing quarantine measures
8. Ensure legal authorities and procedures exist for various levels of movement restrictions

### Actions for WHO Phase 4 (Sustained Human-to-Human Spread)

9. When a case with a novel strain that has been identified that matches a strain with potential to cause a pandemic, use quarantine authority to separate known exposed contacts of cases, to help limit spread within community. Quarantine of contacts should be implemented only when there is a high probability that the ill patient is infected with a novel influenza strain that may be transmitted to others
10. Monitor contacts who are quarantined at least once a day—by phone or in person—to assess symptoms and address any needs



### Actions for WHO Phases 5-6 (Widespread Human Infection or Pandemic)

11. During the early stages of these phases, use quarantine authority to separate known exposed contacts of cases, to help limit spread within community. Quarantine of contacts should be implemented only when there is a high probability that the ill patient is infected with a novel influenza strain that may be transmitted to others
12. Monitor contacts who are quarantined at least once a day—by phone or in person—to assess symptoms and address any needs

Note: As disease progresses throughout the community, use of quarantine may become less valuable outside of closed settings. Local health authority should be ready to enact community-wide containment measures (as detailed in Supplement 8)

13. Promote community containment strategies, as appropriate, and in consultation with ADHS. These measures may include:
  - a. Promotion of community-wide infection control measures (e.g., respiratory hygiene/cough etiquette)
  - b. Declare voluntary “Stay Home Days”
  - c. Encourage “self-isolation”
  - d. Closure of office buildings, shopping malls, schools, public transportation and large community events
14. Identify strategies to determine impact of containment measures on both disease and society. Use this information to better focus containment measures.
15. Stand down measures as quickly as possible without risk of prolonging pandemic

## **E. Addressing Travel-Related Risk**

Travel-related risk in regards to pandemic planning primarily refers to health effects associated with air travel, or any international travel (e.g., border crossings). Measures used to address travel-related risks include many of the community disease control measures found in Supplement 8. As with community containment, travel-related containment is often best addressed at the local level, although many situations may also involve guidance from ADHS and the federal government, due to the nature of federal quarantine authority and international travel laws. Affected county and tribal health departments are encouraged to work with ADHS while preparing for and enacting containment measures that address travel-related risk.

### **Actions for WHO Phases 1-3 (Limited Human Spread)**

1. Ensure readiness to implement travel-related disease containment measures
2. Engage appropriate community partners (such as embassies and cultural groups) to develop and exercise appropriate plans
3. Assist ADHS in providing public health information to travelers who visit countries where influenza strains that can infect humans or human strains with pandemic potential have been reported.
4. Evaluate and manage arriving symptomatic passengers who might be infected with animal influenza strains or human strains with pandemic potential.

### **Actions for WHO Phase 4 (Sustained Human-to-Human Spread) and Phases 5-6 (Widespread Human Infection or Pandemic)**

5. Continue to provide public health information to travelers, in coordination with ADHS
6. In coordination with ADHS and CDC, initiate enhanced disease surveillance at ports of entry
7. Implement and evaluate quarantine, as necessary, on exposed passengers or other individuals related to travel
8. Evaluate the need to establish travel bans
9. Evaluate the need to implement or terminate travel-related containment measures as the pandemic evolves.



## **F. Public Information**

During the early phases of a pandemic, communications professionals from local health departments will need to work closely with ADHS communications team and other response agencies to focus on preparedness planning and on building flexible, sustainable communications networks and media relationships.

During Phases 5-6 (Widespread Human Infection or Pandemic), they will focus on coordinated health communications to support public health interventions designed to help limit influenza-associated morbidity and mortality. According to A.R.S. 36-787, ADHS is the lead agency for crafting public information strategies and messages during a declared public health emergency. While ADHS will take the coordination role, local health departments will ensure the unified messages reach Arizona residents at the community level (see Supplement 10).

#### **Actions for WHO Phases 1-3 (Limited Human Spread)**

1. Assess and monitor readiness to meet communications needs in preparation for an influenza pandemic, including regular review and update of communications plans.
2. Participate in regional and statewide emergency communication activities with ADHS, other response agencies, private industry, education, and nonprofit partners (e.g., American Red Cross chapters).
3. Identify and train lead subject-specific spokespersons.
4. Provide public health communications staff with training on risk communications for use during an influenza pandemic.
5. Develop and maintain up-to-date communications contacts.
6. Participate in exercises and other collaborative preparations to assess readiness by testing plans, training, equipment and staff specific to the response.
7. Confirm any contingency contracts needed for communications resources during a pandemic.
8. Begin disseminating messages and materials to increase the knowledge and understanding of the public, healthcare professionals, policy-makers, media, and others about unique aspects of pandemic influenza that distinguish it from seasonal influenza, and generally what to expect during different phases of an influenza pandemic.
9. Address concerns, rumors and false reports regarding pandemic influenza threats.



#### **Actions for WHO Phase 4 (Sustained Human-to-Human Spread) and Phases 5-6 (Widespread Human Infection or Pandemic)**

10. Contact key community partners and implement frequent update briefings.
11. As appropriate, implement and maintain community resources, such as hotlines, websites and social media to respond to local questions from the public and professional groups.
12. Tailor communications services and key messages to specific local audiences and additionally target specific, hard to reach populations.
13. In coordination with epidemiologic and medical personnel, obtain and track information daily on the numbers and location of newly hospitalized cases, newly quarantined persons, and hospitals with pandemic influenza cases. Use these reports to determine priorities among community outreach and education efforts, and to prepare for updates to media organizations in coordination with federal partners.
14. Coordinate all pandemic influenza media messages with ADHS to ensure consistency with statewide and national messages
15. Promptly respond to concerns, rumors and inaccurate information to minimize concern, social disruption, and stigmatization.

## G. Workforce Support – Psychosocial Needs

All response agencies, including county and tribal health departments need to ensure that their response personnel reside in the safest and healthiest environment possible by addressing the psychological and social (“psychosocial”) needs of these employees (see Supplement 11).

### Actions for WHO Phases 1-3 (Limited Human Spread)

1. Encouraging the use of tools and techniques for supporting staff and their families during times of crisis
2. Establish partnerships and participate in any Regional Behavioral Health Agency (RBHA)/Tribal Behavioral Health Agency (TRBHA) or outreach activities to the pandemic responder community. The purpose of this outreach is to inform these individuals on how to use, as well as receive, suggestions on how to improve the crisis response system
3. Provide psychosocial communication information developed by ADHS to employees. Such information will:
  - Educate and inform employees about emotional responses they might experience or observe in their colleagues and families (including children) during an influenza pandemic, and techniques for coping with these emotions.
  - Educate employees about the importance of developing “family communication plans” so that family members can maintain contact during an emergency.
  - Describe workforce support services that will be available during an emergency, including confidential behavioral health services and employee assistance programs.
4. Establish workforce resilience programs that will help deployed workers to prepare for, cope with, and recover from the social and psychological challenges of emergency work

### Actions for WHO Phase 4 (Sustained Human-to-Human Spread) and Phases 5-6 (Widespread Human Infection or Pandemic)

5. Make full use of self-care and behavioral health interventions that can help response workers manage emotional stress, family issues and build coping skills and resilience (including providing child and family care, use of stress-control teams, establishing rest and recuperation sites – see Supplement 11 for more information)
6. Ensure that employees have ongoing access to information, including the progression of the pandemic, business and personnel issues (e.g., overtime pay, work hours, etc.), and health care issues
7. Implement workforce resilience programs that meet the special needs of emergency workers - including those who continue to report to the same job location but whose assignments shift to respond to the pandemic (see Supplement 11 for more information).



## H. Information Management

For pandemic planning and response public health information management focuses on technology systems that support response related interventions and resource tracking. Like ADHS, county and tribal health departments have been developing and improving information management systems for emergency response for the past several years. Supplement 12 lists and describes all the statewide information management systems that will be used during a pandemic. County and tribal health departments should continue to participate in the development, testing, deployment, and use of these systems to ensure their overall effectiveness.











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