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SUMMARY OF ROLES AND RESPONSIBILITIES FOR HEALTHCARE AND PUBLIC
HEALTH PARTNERS

INTERPANDEMIC AND PANDEMIC ALERT PERIODS

Healthcare facility responsibilities:
• Develop planning and decision-making structures for responding to pandemic influenza.
• Develop written plans that address: disease surveillance, hospital communications, education and training, triage and clinical evaluation, facility access, occupational health, use and administration of vaccines and antiviral drugs, surge capacity, supply chain and access to critical inventory needs, and mortuary issues.
• Participate in pandemic influenza response exercises and drills, and incorporate lessons learned into response plans.

State and local responsibilities:
• Develop statewide and local or regional plans to manage an influenza pandemic.
• Assist healthcare facilities in conducting exercises and drills to test healthcare response issues and build partnerships among healthcare and public health officials, community leaders, and emergency response workers.
• Develop a communications infrastructure to facilitate and ensure the timely dissemination and transfer of information between the healthcare and public health sectors.
• Address legal issues that can affect staffing and patient care.

HHS responsibilities:
• Provide ongoing public health guidance on healthcare preparedness for an influenza pandemic.
• Provide healthcare facilities with model protocols for early detection and treatment of influenza among patients and staff; these protocols can be piloted during routine influenza seasons.

PANDEMIC PERIOD
If an influenza pandemic begins in another country:

Healthcare facility responsibilities:
• Heighten institutional surveillance for influenza and prepare to activate institutional pandemic influenza plans, as necessary.

State and local responsibilities:
• Work with HHS to provide local physicians and hospital administrators with updated information and guidance as the situation unfolds.
S3-1. RATIONALE

An influenza pandemic will place a huge burden on the U.S. healthcare system. Published estimates based on extrapolation of the 1957 and 1968 pandemics suggest that there could be 839,000 to 9,625,000 hospitalizations, 18–42 million outpatient visits, and 20–47 million additional illnesses, depending on the attack rate of infection during the pandemic.1 Estimates based on extrapolation from the more severe 1918 pandemic suggest that substantially more hospitalizations and deaths could occur. The demand for inpatient and intensive-care unit (ICU) beds and assisted ventilation services could increase by more than 25% under the less severe scenario. Pre-pandemic planning by healthcare facilities is therefore essential to provide quality, uninterrupted care to ill persons and to prevent further spread of infection. Effective planning and implementation will depend on close collaboration among state and local health departments,2 community partners, and neighboring and regional healthcare facilities. Despite planning and preparedness, however, in a severe pandemic it is possible that shortages, for example of mechanical ventilators, will occur and medical care standards may need to be adjusted to most effectively provide care and save as many lives as possible.

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2 Depending on the locality, health departments may also include territorial or tribal health departments.
S3-II. OVERVIEW

Supplement 3 provides healthcare partners with recommendations for developing plans to respond to an influenza pandemic. The focus is on planning during the Interpandemic Period for: pandemic influenza surveillance, decision-making structures for responding to a pandemic, hospital communications, education and training, patient triage, clinical evaluation and admission, facility access, occupational health, distribution of vaccines and antiviral drugs, surge capacity, and mortuary issues. Planning for the provision of care in non-hospital settings—including residential care facilities, physicians' offices, private home healthcare services, emergency medical services, federally qualified health centers (FQHCs), rural health clinics, and alternative care sites—is also addressed.

The recommendations for the Pandemic Period focus on activation of institutional pandemic influenza response plans. The ability to provide detailed guidance on this aspect of the pandemic is limited because of uncertainty about how the pandemic will evolve and variation and uncertainty of local factors that will influence decisions at various stages.

The activities suggested in Supplement 3 are intended to be synergistic with those of other pandemic influenza planning efforts, including state preparedness plans. Links to additional resources that provide the most up-to-date guidance on particular topics are included. A checklist to help facilities assess their current level of readiness to deal locally with an influenza pandemic is provided in Appendix 2.

S3-III. RECOMMENDATIONS FOR THE INTERPANDEMIC AND PANDEMIC ALERT PERIODS

A. Planning for provision of care in hospitals

U.S. healthcare facilities must be prepared for the rapid pace and dynamic characteristics of pandemic influenza. All hospitals should be equipped and ready to care for: 1) a limited number of patients infected with a pandemic influenza virus, or other novel strains of influenza, as part of normal operations; and 2) a large number of patients in the event of escalating transmission of pandemic influenza.

Hospital response plans for pandemic influenza should:

- Outline administrative measures for detecting the introduction of pandemic influenza, preventing its spread, and managing its impact on the facility and the staff.
- Build on existing preparedness and response plans for bioterrorism events, SARS, and other infectious disease emergencies.
- Incorporate planning suggestions from state and local health departments and other local and regional healthcare facilities and response partners.
- Identify criteria and methods for measuring compliance with response measures (e.g., infection control practices, case reporting, patient placement, healthcare worker illness surveillance).
- Review and update inventories of supplies that will be in high demand during an influenza pandemic.
- Review procedures for the receipt, storage, and distribution of assets received from federal stockpiles.
- Include mechanisms for periodic reviews and updates.

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3 A federally qualified health center (FQHC) is a type of provider defined by the Medicare and Medicaid statutes. FQHCs include health centers receiving grants under section 330 of the Public Health Service Act, certain tribal organizations, and clinics designated by HHS as FQHC Look-Alikes. More information may be found at: http://www.cms.hhs.gov/providers/fqhc/
Hospitals that intend to use an “all-hazards” incident command structure for responding to pandemic influenza will need to incorporate the relevant aspects of communicable disease control that are included in this supplement and in Supplement 4. Hospitals should consider using “table top” simulations or other exercises to test response capabilities (see Appendix 1).

1. Planning process
   - Groups and individuals involved in the hospital planning process should include:
     - An internal, multidisciplinary planning committee with responsibility for pandemic influenza preparedness and response. The committee should include technical experts, persons with decision-making authority, and representatives from a range of response partners (see Box 1). A pre-existing all-hazards preparedness team (e.g., established for bioterrorism or SARS response) might assume this role.
     - A response coordinator/incident commander to direct the facility’s planning and response efforts
     - A core group from the multidisciplinary planning committee to work with the response coordinator and assist with decision-making during the pandemic
     - The pandemic influenza response team should plan to remain active throughout the pandemic period, which could be several weeks or months.
     - Hospital planning for pandemic influenza should consider concurrent public health, community, and healthcare planning efforts at the local, state, and regional levels. Some possible mechanisms for collaboration and coordination are to:
       - Include a state or local health department representative as an ex officio member on the hospital planning committee (see Box 1).
       - Obtain copies of draft pandemic influenza plans from other local or regional hospitals to use as models.
       - Work with other local hospitals, community organizations (e.g., social service groups), and the state or local health department to coordinate healthcare activities in the community and define responsibilities for each entity during a pandemic.
       - Collaborate with HRSA hospital preparedness programs in the state or region.
       - Include a hospital representative in local or regional planning efforts.
       - Include representatives from safety-net providers4 in the local community (e.g., FQHCs and rural health clinics).

2. Planning elements
   The elements of a hospital influenza pandemic preparedness plan discussed below are listed in the Hospital Preparedness Checklist provided in Appendix 2.

   a) Hospital surveillance
      - Hospital surveillance for novel strains of influenza
        During the Interpandemic and Pandemic Alert Periods, healthcare providers and healthcare facilities play an essential role in surveillance for suspected cases of infection with novel strains of influenza and should be on the alert for such cases. Novel strains may include avian or animal influenza strains that can infect humans (like avian influenza A

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4 Health care safety net providers deliver care to low-income and other vulnerable populations, including the uninsured and those covered by Medicaid. Many of these providers have either a legal mandate or an explicit policy to provide services regardless of a patient’s ability to pay (http://www.ahcpr.gov/data/safetynet/faq.htm). Major safety net providers include public hospitals and community health centers as well as teaching and community hospitals, and private physicians.
[H5N1]) and new or re-emergent human viruses that cause cases or clusters of human disease. For detection of cases during the Interpandemic and Pandemic Alert Periods, hospitals should have:

- Procedures in place to facilitate laboratory testing on-site using proper biosafety levels and reporting of unusual influenza isolates through local and state health department channels (see Supplement 1). If appropriate methods or biosafety levels do not exist at the hospital, specimens should be shipped to the state health department.
- Predetermined thresholds for activating pandemic influenza surveillance plans (see S3-III.A and the Table).

**Hospital surveillance for pandemic influenza**

During the Pandemic Period, healthcare providers and healthcare facilities will play an essential role in pandemic influenza surveillance (see Supplement 1). For detection of cases during the Pandemic Period, hospitals should have:

- Mechanisms for conducting surveillance in emergency departments to detect any increases in influenza-like illness (see box below) during the early stages of the pandemic
- Mechanisms for monitoring employee absenteeism for increases that might indicate early cases of pandemic influenza
- Mechanisms for tracking emergency department visits and hospital admissions and discharge of suspected or laboratory-confirmed pandemic influenza patients. This information will be needed to: 1) support local public health personnel in monitoring the progress and impact of the pandemic, 2) assess bed capacity and staffing needs, and 3) detect a resurgence in pandemic influenza that might follow the first wave of cases.
- Updated information on the types of data that should be reported to state or local health departments (e.g., admissions; discharges/deaths; patient characteristics such as age, underlying disease, and secondary complications; illnesses in healthcare personnel) and plans for how these data will be collected during a pandemic. State and local health departments will provide guidance on the scope and mechanism of reporting (see Supplement 1).
- Criteria for distinguishing pandemic influenza from other respiratory diseases (see Supplement 5).

**Symptoms of influenza** include fever, headache, myalgia, prostration, coryza, sore throat, and cough. 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 (see Supplement 5, Box 2).

**b) Hospital communications**

Each hospital should work with public health officials, other government officials, neighboring healthcare facilities, the lay public, and the press to ensure rapid and ongoing information-sharing during an influenza pandemic.

- **External communications**
  - Assign responsibility for external communication about pandemic influenza; identify a person responsible for updating public health reporting (e.g., infection control), a clinical spokesperson (e.g., medical director), and a media spokesperson (e.g., public information officer).
  - Identify points of contact among local media (e.g., newspaper, radio, television) representatives and public officials and community leaders.
  - With guidance from state or local health departments, determine the methods, frequency, and scope of external communications.
  - Determine how communications between local and regional healthcare facilities will be handled.
• Consult with state or local health departments on plans for coordinating or facilitating communication among healthcare facilities. In the absence of such a plan, consider organizing a meeting of local health facilities to determine an optimal communications strategy.

• Identify key topics for ongoing communication (e.g., staffing needs, bed capacity, durable and consumable medical equipment and device needs, supplies of influenza vaccine and antiviral drugs).

• Assign responsibility within the hospital for communications with other healthcare facilities.

• Consult with local or state public health officials regarding the hospital’s role in communicating with the media and the public.

• Determine the type of hospital-specific communications (e.g., press releases, community bulletin board) that might be needed, and develop templates for these materials.

• Consult with local or state health departments on plans for a pandemic influenza hotline and/or website for public inquiries.

• Determine how public inquiries will be handled (e.g., refer callers to the health department; provide technical support for handling calls).

• Identify the types of information that will be provided by the hospital and the types of inquiries that will be referred to state or local health departments.

• **Internal communications**

• Determine how to keep administrators, personnel (including infection control staff and intake and triage staff), patients, and visitors informed of the ongoing impact of pandemic influenza on the facility and on the community.

**c) Education and training**

Each hospital should develop an education and training plan that addresses the needs of staff, patients, family members, and visitors. Hospitals should assign responsibility for coordination of the pandemic influenza education and training program and identify training materials—in different languages and at different reading levels, as needed—from HHS agencies, state and local health departments, and professional associations (see Appendix 1).

• **Staff Education**

• Identify educational resources for clinicians, including federally sponsored teleconferences, state and local health department programs, web-based training materials, and locally prepared presentations.

• General topics for staff education should include:

  • Prevention and control of influenza
  • Implications of pandemic influenza
  • Benefits of annual influenza vaccination
  • Role of antiviral drugs in preventing disease and reducing rates of severe influenza and its complications
  • Infection control strategies for the control of influenza, including respiratory hygiene/cough etiquette, hand hygiene, standard precautions, droplet precautions, and, as appropriate, airborne precautions (see Supplement 4).

• Hospital-specific topics for staff education should include:

  • Policies and procedures for the care of pandemic influenza patients, including how and where pandemic influenza patients will be cohorted
  • Pandemic staffing contingency plans, including how the facility will deal with illness in personnel
• Policies for restricting visitors and mechanisms for enforcing these policies
• Reporting to the health department suspected cases of infection caused by novel influenza strains during the Interpandemic and Pandemic Alert Periods
• Measures to protect family and other close contacts from secondary occupational exposure
• Establish a schedule for training/education of clinical staff and a mechanism for documenting participation. Consider using annual infection control updates/meetings, medical Grand Rounds, and other educational venues as opportunities for training on pandemic influenza.
• Cross-train clinical personnel, including outpatient healthcare providers, who can provide support for essential patient-care areas (e.g., emergency department, ICU, medical units).
• Train intake and triage staff to detect patients with influenza symptoms and to implement immediate containment measures to prevent transmission (see also Supplement 5).
• Supply social workers, psychologists, psychiatrists, and nurses with guidance for providing psychological support to patients and hospital personnel during an influenza pandemic (see Supplement 11). (HHS agencies will identify or develop educational materials on: signs of distress, traumatic grief, stress management and effective coping strategies, building and sustaining personal resilience, and behavioral and psychological support resources.) If feasible, hospitals should also provide psychological-support training to appropriate individuals who are not mental health professionals (e.g., primary-care clinicians, leaders of community and faith-based organizations).
• Develop a strategy for "just-in-time" training of non-clinical staff who might be asked to assist clinical personnel (e.g., help with triage, distribute food trays, transport patients), students, retired health professionals, and volunteers who might be asked to provide basic nursing care (e.g., bathing, monitoring of vital signs); and other potential in-hospital caregivers (e.g., family members of patients).

• **Education of patients, family members, and visitors**
  Patients and others should know what they can do to prevent disease transmission in the hospital, as well as at home and in community settings.
  - Identify language-specific and reading-level appropriate materials for educating patients, family members, and hospital visitors during an influenza pandemic. If language-specific materials are not available for the population(s) being served, arrange for translations.
  - Develop a plan for distributing 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 and outpatient offices might be overwhelmed with patients seeking care. Therefore, 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) (see Supplement 5).

• Develop a strategy for triage, diagnosis, and isolation of possible pandemic influenza patients. Consider the following triage mechanisms:
  - Using phone triage to identify patients who need emergency care and those who can be referred to a medical office or other non-urgent facility
  - Assigning separate waiting areas for persons with respiratory symptoms
  - Assigning a separate triage evaluation area for persons with respiratory symptoms
- Assigning a “triage coordinator” to manage patient flow, including deferring or referring patients who do not require emergency care (see Supplement 4 and Supplement 5).
- Review procedures for the clinical evaluation of patients in the emergency department and in outpatient medical offices to facilitate efficient and appropriate disposition of patients.
- Review admission procedures and streamline them as needed to limit the number of patient encounters in the hospital (e.g., direct admission to an inpatient bed).
- Identify a “trigger” point at which screening for signs and symptoms of pandemic influenza in all persons entering the hospital will escalate from passive (e.g., signs at the entrance) to active (e.g., direct questioning). In addition to visual alerts, potential screening measures might include priority triage of persons with respiratory symptoms and telephone screening of patients with appointments.

e) Facility access
Hospitals should determine in advance the criteria and procedures they will use to limit access to the facility if pandemic influenza spreads through the community.

- Define “essential” and “non-essential” visitors with regard to the hospital and the population served. Develop protocols for limiting non-essential visitors.
- Develop criteria or “triggers” for temporary closing of the hospital to new admissions and transfers. The criteria should consider staffing ratios, isolation capacity, and risks to non-influenza patients. As part of this effort, hospital administrators should: 1) determine who will make decisions about temporary closings and how and to whom these decisions will be communicated, and 2) consult with state and local health departments on their roles in determining policies for hospital admissions and transfers.
- Determine how to involve hospital security services in enforcing access controls. Consider meeting with local law enforcement officials in advance to determine what assistance, if any, they can provide. Note that local law enforcement might be overburdened during a pandemic and have limited ability to assist healthcare facilities with security services.

f) Occupational health
The ability to deliver quality health care is dependent on adequate staffing and optimum health and welfare of staff. During a pandemic, the healthcare workforce will be stressed physically and psychologically. Like others in the community, many healthcare workers will become ill. Healthcare facilities must be prepared to: 1) protect healthy workers from exposures in the healthcare setting through the use of recommended infection control measures; 2) evaluate and manage symptomatic and ill healthcare personnel; 3) distribute and administer antiviral drugs and/or vaccines to healthcare personnel, as recommended by HHS and state health departments; and 4) provide psychosocial services to health care workers and their families to help sustain the workforce.

- Managing ill workers
  - Establish a plan for detecting signs and symptoms of influenza in healthcare personnel before they report for duty.
  - Develop policies for managing healthcare workers with respiratory symptoms that take into account HHS recommendations for healthcare workers with influenza (see www.cdc.gov/ncidod/hip/GUIDE/infectcont98.htm
  - Consider assigning staff who are recovering from influenza to care for influenza patients.

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5 During the Pandemic Alert Period, healthcare personnel exposed to avian influenza A (H5N1) or other novel strains of influenza should be managed on a case-by-case basis (see Supplement 5).
• **Time-off policies**
  Ensure that time-off policies and procedures consider staffing needs during periods of clinical crisis.

• **Reassignment of high-risk personnel**
  Establish a plan to protect personnel at high risk for complications of influenza (e.g., pregnant women, immunocompromised persons) by reassigning them to low-risk duties (e.g., non-influenza patient care, administrative duties that do not involve patient care) or placing them on furlough.

• **Psychosocial health services (see also Supplement 11)**
  • Identify mental health and faith-based resources for counseling of healthcare personnel during a pandemic. Counseling should include measures to maximize professional performance and personal resilience by addressing management of grief, exhaustion, anger, and fear; physical and mental health care for oneself and one’s loved ones; and resolution of ethical dilemmas.
  • Determine a strategy for supporting healthcare workers’ needs for rest and recuperation.
  • Develop a strategy for housing and feeding healthcare personnel who might be needed on-site for prolonged periods.
  • Develop a strategy for accommodating and supporting staff who have child- or elder-care responsibilities.

• **Influenza vaccination and use of antiviral drugs**
  • Promote annual influenza vaccination among hospital employees. Increased vaccination coverage during the Interpandemic Period might help increase vaccine acceptance during a pandemic and will limit the spread of seasonal influenza.
  • Ensure that a system is in place for documenting influenza vaccination of healthcare personnel. The hospital might decide to enroll in the National Healthcare Safety Network (NHSEN; www.cdc.gov/ncidod/hip/NNIS/members/nhsn.htm) to help track employee vaccination and health status.
  • Establish a strategy for rapidly vaccinating or providing antiviral prophylaxis or treatment to healthcare personnel as recommended by HHS and state health departments. Preliminary recommendations on the use of antiviral drugs and vaccination have been established (see Part 1, Appendix E and Supplement 6 and Supplement 7) but will need to be tailored to fit the epidemiology of the pandemic.

**g) Use and administration of vaccines and antiviral drugs**

• **Pandemic influenza vaccine and “pre-pandemic” influenza vaccine**
  Once the characteristics of a new pandemic influenza virus are identified, the development of a pandemic vaccine will begin. Recognizing that there may be benefits to immunization with a vaccine prepared before the pandemic against an influenza virus of the same subtype, efforts are underway to stockpile vaccines for subtypes with pandemic potential. As supplies of these vaccines become available, it is possible that some healthcare personnel and others critical to a pandemic response will be recommended for vaccination to provide partial protection or immunological priming for a pandemic strain. Policies for the use of pre-pandemic vaccine have not been finalized.

• Interim recommendations on priority groups for vaccination and strategies for vaccine distribution are discussed in Supplement 6. During a pandemic, these recommendations will be updated, taking into account populations which are most at risk. In the interim, healthcare facilities should:
  • Monitor updated HHS information and recommendations on the development, distribution, and use of a pandemic influenza vaccine (http://www.pandemicflu.gov)
  • Work with local and state health departments on plans for distributing pandemic influenza vaccine.
  • Provide estimates of the quantities of vaccine needed for hospital staff and patients, as requested by the state health department.
• Develop a stratification scheme for prioritizing vaccination of healthcare personnel who are most critical for patient care and essential personnel to maintain the day-to-day operation of the healthcare facility.

• Develop a pandemic influenza vaccination plan in the hospital.

• Antiviral drugs

Antiviral drugs effective against the circulating pandemic strain can be used for treatment and possibly prophylaxis during an influenza pandemic. Because of the effectiveness of treatment with antiviral drugs such as oseltamivir and zanamivir, and the greater efficiency of treatment in a setting of limited supply, the use of prophylaxis will be restricted to maximize health benefits. Interim recommendations for the use of antiviral drugs are discussed in Supplement 7. Healthcare facilities should consider how antiviral drugs might be used in their patient and healthcare worker populations, taking into account state and national guidelines, and determine if a reserve supply should be stockpiled. (See also HRSA cooperative agreements www.hrsa.gov/grants/preview/guidancespecial/hrsa05001.htm.)

h) Surge capacity

Healthcare facilities should plan ahead to address emergency staffing needs and increased demand for isolation wards, ICUs, assisted ventilation services, and consumable and durable medical supplies (Box 2). Hospital planners can use FluSurge software (http://www.cdc.gov/flu/flusurge.htm) to estimate the potential impact of a pandemic on resources such as staffed beds (both overall and ICU) and ventilators (see also HRSA and AHRQ planning and surge capacity resources listed in Appendix 1.)

• Staffing

• Assign responsibility for the assessment and coordination of staffing during an emergency.

• Estimate the minimum number and categories of personnel needed to care for a single patient or a small group of patients with influenza complications on a given day.

• Determine how the hospital will meet staffing needs as the number of patients with pandemic influenza increases and/or healthcare and support personnel become ill or remain at home to care for ill family members. Consider the following options:
  • Assigning patient-care responsibilities to clinical administrators
  • Recruiting retired healthcare personnel
  • Using trainees (e.g., medical and nursing students)
  • Using patients’ family members in an ancillary healthcare capacity

• Collaborate with local and regional healthcare-planning groups in an attempt to achieve adequate staffing of the hospital during an influenza pandemic (e.g., decide whether and how staff will be shared with other healthcare facilities, determine how salary issues will be addressed for employees shared between facilities, and consider ways to increase the number of home healthcare staff to reduce hospital admissions during the emergency). State and local health departments can help assess the feasibility of recruiting staff from different hospitals and/or regions, working in coordination with federal facilities, including Veterans Administration and Department of Defense hospitals. Healthcare facilities may implement these arrangements through Mutual Aid Agreements (MAAs) or Memoranda of Understanding/Agreement (MOU/As).

• Increase cross-training of personnel to provide support for essential patient-care areas at times of severe staffing shortages (e.g., in emergency departments, ICUs, or medical units) (see also S3-III.A.2.c).

• Create a list of essential-support personnel titles (e.g., environmental and engineering services, nutrition and food services, administrative, clerical, medical records, information technology, laboratory) that are needed to maintain hospital operations.
- Create a list of non-essential positions that can be re-assigned to support critical hospital services or placed on administrative leave to limit the number of persons in the hospital.

- Consult with the state health department on plans for rapidly credentialing healthcare professionals during a pandemic. This might include defining when an “emergency staffing crisis” can be declared and identifying emergency laws that allow employment of healthcare personnel with out-of-state licenses.

- Identify insurance and liability issues related to the use of non-facility staff.

- Explore opportunities for recruiting healthcare personnel from other healthcare settings, (e.g., medical offices and day-surgery centers). Consult public health partners about existing state or local plans for recruitment and deployment of local personnel.

- **Bed capacity**
  - Review and revise admissions criteria for times when bed capacity is limited (see also S3-III.A.2.e).
  - Develop policies and procedures for expediting the discharge of patients who do not require ongoing inpatient care (e.g., develop plans and policies for transporting discharged patients home or to other facilities; create a patient discharge holding area or discharge lounge to free up bed space).
  - Work with home healthcare agencies to arrange at-home follow-up care for patients who have been discharged early and for those whose admission was deferred because of limited bed space.
  - Develop criteria or “triggers” for temporarily canceling elective surgical procedures and determining what and where emergency procedures will be performed during a pandemic. Determine which elective procedures will be temporarily postponed.
  - Determine whether patients who require emergency procedures will be transferred to another hospital.
  - Discuss with local and state health departments how bed availability, including available ICU beds and ventilators, will be tracked during a pandemic.
  - Consult with hospital licensing agencies on plans and processes to expand bed capacity during times of crisis. These efforts should take into account the need to provide staff and medical equipment and supplies to care for the occupant of each additional hospital bed.
  - Discuss with healthcare regulators whether, how, and when an "Altered Standards of Care in Mass Casualty Events" will be invoked and applied to pandemic influenza (See http://www.ahrq.gov/research/altstand/).
  - Develop policies and procedures for shifting patients between nursing units to free up bed space in critical-care areas and/or to cohort pandemic influenza patients.
  - Develop Mutual Aid Agreements (MAAs) or Memoranda of Understanding/Agreement (MOU/As) with other local facilities who can accept non-influenza patients who do not need critical care.
  - Identify areas of the facility that could be vacated for use in cohorting influenza patients. Consider developing criteria for shifting use of available space based on ability to support patient-care needs (e.g., access to bathroom and shower facilities). Consider developing cohorting protocols based on a patient’s stage of recovery and infectivity.

- **Consumable and durable supplies**
  - Evaluate the existing system for tracking available medical supplies in the hospital to determine whether it can detect rapid consumption, including items that provide personal protection (e.g., gloves, masks). Improve the system as

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6 The HRSA Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) is helping each state and territory establish a standardized volunteer registration system. Additional information is available at: www.hrsa.gov/bioterrorism/esarvhp/. Two new draft standards on emergency credentialing have been offered for public comment by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO; http://www.jcaho.org/).
needed to respond to growing demands for resources during an influenza pandemic (http://www.cdc.gov/flu/fiusurge.htm).

- Consider stockpiling enough consumable resources such as masks (see Box 2) for the duration of a pandemic wave (6-8 weeks).

- Assess anticipated needs for consumable and durable resources, and determine a trigger point for ordering extra resources. Estimate the need for respiratory care equipment (including mechanical ventilators), and develop a strategy for acquiring additional equipment if needed. Neighboring hospitals might consider developing inventories of equipment and determining whether and how that equipment might be shared during a pandemic.

- Anticipate needs for antibiotics to treat bacterial complications of influenza, and determine how supplies can be maintained during a pandemic (see Supplement 5).

- Establish contingency plans for situations in which primary sources of medical supplies become limited. Consult with the local and state health departments about access to the national stockpile during an emergency.

- **Continuation of essential medical services**
  - Address how essential medical services will be maintained for persons with chronic medical problems served by the hospital (e.g., hemodialysis patients).
  - Develop a strategy for ensuring uninterrupted provision of medicines to patients who might not be able to (or should not) travel to hospital pharmacies.

**i) Security**

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

**j) Mortuary issues**

To prepare for the possibility of mass fatalities during an influenza pandemic, hospitals should do the following:

- Assess current capacity for refrigeration of deceased persons.
- Discuss mass fatality plans with local and state health officials and medical examiners.
- Work with local health officials and medical examiners to identify temporary morgue sites.
- Determine the scope and volume of supplies (e.g., body bags) needed to handle an increased number of deceased persons.

Resources for addressing these issues are provided in Appendix 1.

**B. Planning for provision of care in non-hospital settings**

Planning and effective delivery of care in outpatient settings is critical. Appropriate management of outpatient influenza cases will reduce progression to severe disease and thereby reduce demand for inpatient care. A system of effective outpatient management will have several components. To decrease the burden on providers and to lessen exposure of the “worried well” to persons with influenza, telephone hotlines should be established to provide advice on whether to stay home or to seek care. Most persons who seek care can be managed appropriately by outpatient providers. Health care networks may designate specific providers, offices, or clinics for patients with influenza-like illness. Nevertheless, some persons with influenza will likely present to all medical offices and clinics so that planning and preparedness is important at every outpatient care site. In underserved areas, health departments may establish influenza clinics to facilitate access. Hospitals should develop a strategy for triage of potential influenza patients, which may include establishing a site outside of the Emergency Department.
where persons can be seen initially and identified as needing emergency care or may be referred to an outpatient care site for diagnosis and management. Finally, home health care providers and organizations can provide follow-up for those managed at home, decreasing potential exposure of the public to persons who are ill and may transmit infection.

Effective management of outpatient care in communities will require that health departments, health care organizations, and providers communicate and plan together. Issues to address include:

- Plan to establish and staff telephone hotlines.
- Develop training modules, protocols and algorithms for hotline staff.
- Within health care networks, develop plans on the organization of care for influenza patients and develop materials and strategies to inform patients on care-seeking during a pandemic.
- For clinics and offices, develop plans that include education, staffing, triage, infection control in waiting rooms and other areas, and communication with healthcare partners and public health authorities.

1. Non-hospital healthcare facilities

The hospital planning recommendations (see S3-III.A) can serve as a model for planning in other healthcare settings, including nursing homes and other residential care facilities, and primary care health centers. All healthcare facilities should do the following:

- Create a planning team and develop a written plan.
- Establish a decision-making and coordinating structure that can be tested during the Interpandemic Period and will be activated during an influenza pandemic.
- Determine how to conduct surveillance for pandemic influenza in healthcare personnel and, for residential facilities, in the population served.
- Develop policies and procedures for managing pandemic influenza in patients and staff.
- Educate and train healthcare personnel on pandemic influenza and the healthcare facility’s response plan.
- Determine how the facility will communicate and coordinate with healthcare partners and public health authorities during a pandemic.
- Determine how the facility will communicate with patients and help educate the public regarding prevention and control measures.
- Develop a plan for procuring the supplies (e.g., personal protective equipment [PPE]) needed to manage influenza patients.
- Determine how the facility will participate in the community plan for distributing either vaccine or antiviral drugs, including possibly serving as a point of distribution and providing staff for alternative community points of distribution.

Emergency medical services, private homecare services, FQHCs, and rural health clinics may adapt their planning activities from this model. In some parts of the country, FQHCs and rural health clinics may need to rely on volunteers to provide and administer pandemic influenza vaccines.

2. Alternative care sites

If an influenza pandemic causes severe illness in large numbers of people, hospital capacity might be overwhelmed. In that

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7 As mentioned in footnote #6, the HRSA Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) is helping each state and territory establish a standardized volunteer registration system. Additional information is available at: www.hrsa.gov/ bioterrorism/ esarvhp/.
case, communities will need to provide care in alternative sites (e.g., school gymnasiums, armories, convention centers). (Also see http://www.ahrq.gov/research/altsites.htm.) The selection of alternative care sites for pandemic influenza should specifically address the following infection control and patient care needs:

- Bed capacity and spatial separation of patients
- Facilities and supplies for hand hygiene
- Lavatory and shower capacity for large numbers of patients
- Food services (refrigeration, food handling, and preparation)
- Medical services
- Staffing for patient care and support services
- PPE supplies
- Cleaning/disinfection supplies
- Environmental services (linen, laundry, waste)
- Safety and Security

S3-IV. RECOMMENDATIONS FOR THE PANDEMIC PERIOD

A. Activating the facility's pandemic influenza response plan

Following initial detection of pandemic influenza anywhere in the world, the facility's pandemic influenza response plan should be activated in accordance with the level of pandemic activity (see Table).

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, 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 S5-IV.B and 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 will be to:

- Identify when pandemic influenza cases begin in the community. See also Supplement 1.
- Identify, isolate, and treat all patients with potential pandemic influenza. 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 state and local health departments.
BOX 1. HEALTHCARE FACILITY PANDEMIC INFLUENZA PLANNING COMMITTEE

Representatives for a hospital pandemic influenza planning committee may include:

- **Hospital staff**
  - Administration/senior management (including fiscal officer)
  - Legal counsel/risk management
  - Infection control/hospital epidemiology
  - Hospital disaster/emergency coordinator
  - Engineering/physical plant/industrial hygiene/institutional safety
  - Nursing administration
  - Medical staff (including outpatient areas)
  - Intensive-care unit
  - Emergency department
  - Laboratory services
  - Respiratory therapy
  - Nutrition and food services
  - Pharmacy
  - Environmental services (housekeeping, laundry)
  - Public relations
  - Security
  - Materials management
  - Education/training/staff development
  - Occupational health
  - Diagnostic imaging
  - Information technology

- **Adjunct staff members**
  - Infectious diseases
  - Mental health (psychiatry, psychology)
  - Union representatives
  - Human resources
  - Social work
  - Director of house staff/fellowship and other training programs
  - Critical care medicine
  - Pathology

- **State and local health departments**
  - Communicable disease division
  - Laboratory services
  - Medical examiners

- **Community partners**
  - Emergency medical technicians ("first responders")
  - Local law enforcement
  - Funeral service personnel
  - Community service agencies
  - Federally qualified health centers (FQHC)* and other healthcare safety net providers**

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*A federally qualified health center (FQHC) is a type of provider defined by the Medicare and Medicaid statutes. FQHCs include health centers receiving grants under section 330 of the Public Health Service Act, certain tribal organizations, and clinics designated by HHS as FQHC Look-Alikes. More information may be found at: http://www.cms.hhs.gov/providers/fqhc/

**Health care safety net providers deliver care to low income and other vulnerable populations, including the uninsured and those covered by Medicaid. Many of these providers have either a legal mandate or an explicit policy to provide services regardless of a patient’s ability to pay (http://www.ahcpr.gov/data/safetynet/faq.htm). Major safety net providers include public hospitals and community health centers as well as teaching and community hospitals, and private physicians.
BOX 2. EXAMPLES OF CONSUMABLE AND DURABLE SUPPLY NEEDS

- **Consumable resources**
  - Hand hygiene supplies (antimicrobial soap and alcohol-based, waterless hand hygiene products)
  - Disposable N95, surgical and procedure masks
  - Face shields (disposable or reusable)
  - Gowns
  - Gloves
  - Facial tissues
  - Central line kits
  - Morgue packs

- **Durable resources:**
  - Ventilators
  - Respiratory care equipment
  - Beds
  - IV pumps
### Table 1. Hospital Pandemic Influenza Triggers

<table>
<thead>
<tr>
<th>Pandemic Influenza Level</th>
<th>Suggested Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interpandemic Period</strong></td>
<td>• Conduct planning</td>
</tr>
<tr>
<td></td>
<td>• Conduct education/training</td>
</tr>
<tr>
<td></td>
<td>• Conduct hospital surveillance for influenza (Supplement 1)</td>
</tr>
<tr>
<td><strong>Pandemic Alert Period</strong></td>
<td>• Increase preparation; refine local plan</td>
</tr>
<tr>
<td></td>
<td>• Conduct hospital surveillance for influenza (Supplement 1)</td>
</tr>
<tr>
<td><strong>Pandemic Period</strong></td>
<td>• Establish contact with key public health, healthcare, and community partners.</td>
</tr>
<tr>
<td>- Pandemic influenza outside the United States</td>
<td>• Implement hospital surveillance for pandemic influenza (Supplement 1) in incoming patients and previously admitted patients.</td>
</tr>
<tr>
<td></td>
<td>• Implement a system for early detection and treatment of healthcare personnel who might be infected with the pandemic strain of influenza.</td>
</tr>
<tr>
<td></td>
<td>• Reinforce infection control procedures to prevent the spread of influenza (Supplement 4).</td>
</tr>
<tr>
<td></td>
<td>• Accelerate staff training in accordance with the facility's pandemic influenza education and training plan.</td>
</tr>
<tr>
<td>- Pandemic influenza in the United States</td>
<td>As above, plus:</td>
</tr>
<tr>
<td></td>
<td>• Implement activities to increase capacity, supplement staff, and provide supplies and equipment.</td>
</tr>
<tr>
<td></td>
<td>• Maintain close contact with and among healthcare facilities and with state and local health departments.</td>
</tr>
<tr>
<td></td>
<td>• Post signs for respiratory hygiene/cough etiquette.</td>
</tr>
<tr>
<td></td>
<td>• Maintain high index of suspicion that patients presenting with influenza-like illness could be infected with pandemic strain.</td>
</tr>
<tr>
<td></td>
<td>If pandemic strain is detected in local patient, community transmission can be assumed and hospital would move to next level of response.</td>
</tr>
<tr>
<td>Pandemic Influenza Level</td>
<td>Suggested Actions</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Pandemic Period (cont.)</td>
<td>As above, plus;</td>
</tr>
<tr>
<td>• Pandemic influenza in the local area</td>
<td>• Emergency department (ED)</td>
</tr>
<tr>
<td></td>
<td>• Establish segregated waiting areas for persons with symptoms of influenza.</td>
</tr>
<tr>
<td></td>
<td>• Implement phone triage to discourage unnecessary ED/outpatient department visits.</td>
</tr>
<tr>
<td></td>
<td>• Enforce respiratory hygiene/cough etiquette.</td>
</tr>
<tr>
<td></td>
<td>• Access controls</td>
</tr>
<tr>
<td></td>
<td>• Limit number of visitors to those essential for patient support.</td>
</tr>
<tr>
<td></td>
<td>• Screen all visitors at point of entry to facility for signs and symptoms of influenza.</td>
</tr>
<tr>
<td></td>
<td>• Limit points of entry to facility; assign clinical staff to entry screening.</td>
</tr>
<tr>
<td></td>
<td>• Hospital admissions</td>
</tr>
<tr>
<td></td>
<td>• Defer elective admissions and procedures until local epidemic wanes.</td>
</tr>
<tr>
<td></td>
<td>• Discharge patients as soon as possible.</td>
</tr>
<tr>
<td></td>
<td>• Cohort patients admitted with influenza.</td>
</tr>
<tr>
<td></td>
<td>• Monitor for nosocomial transmission.</td>
</tr>
<tr>
<td></td>
<td>• Staffing practices</td>
</tr>
<tr>
<td></td>
<td>• Consider furlough or reassignment of pregnant staff and other staff at high risk for complications of influenza.</td>
</tr>
<tr>
<td></td>
<td>• Consider re-assigning non-essential staff to support critical hospital services or placing them on administrative leave; cohort staff caring for influenza patients.</td>
</tr>
<tr>
<td></td>
<td>• Consider assigning staff recovering from influenza to care for influenza patients.</td>
</tr>
<tr>
<td></td>
<td>• Implement system for detecting and reporting signs and symptoms of influenza in staff reporting for duty.</td>
</tr>
<tr>
<td></td>
<td>• Provide staff with antiviral prophylaxis, according to HHS recommendations (See Supplement 7).</td>
</tr>
</tbody>
</table>
### TABLE 1. HOSPITAL PANDEMIC INFLUENZA TRIGGERS (CONT.)

<table>
<thead>
<tr>
<th>Pandemic Influenza Level</th>
<th>Suggested Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pandemic Period (cont.)</strong></td>
<td>As above, plus, if nosocomial transmission is limited to only a small number of units in the facility,</td>
</tr>
<tr>
<td>• Nosocomial transmission</td>
<td>• Close units where there has been nosocomial transmission.</td>
</tr>
<tr>
<td></td>
<td>• Cohort staff and patients.</td>
</tr>
<tr>
<td></td>
<td>• Restrict new admissions (except for other pandemic influenza patients) to affected units.</td>
</tr>
<tr>
<td></td>
<td>• Restrict visitors to the affected units to those who are essential for patient care and support.</td>
</tr>
<tr>
<td></td>
<td>See also Supplement 4.</td>
</tr>
<tr>
<td>• Widespread transmission in community and hospital; patient admissions at surge capacity</td>
<td>As above plus:</td>
</tr>
<tr>
<td></td>
<td>• Redirect personnel resources to support patient care (e.g., administrative clinical staff, clinical staff working in departments that have been closed [e.g., physical/occupational therapy, cardiac catheterization]).</td>
</tr>
<tr>
<td></td>
<td>• Recruit community volunteers (e.g., retired nurses and physicians, clinical staff working in outpatient settings).</td>
</tr>
<tr>
<td></td>
<td>• Consider placing on administrative leave all non-essential personnel who cannot be reassigned to support critical hospital services.</td>
</tr>
</tbody>
</table>
APPENDIX 1. RESOURCES LIST FOR HEALTHCARE PLANNING

PANDEMIC INFLUENZA PLANS

Currently available State Plans may be found on the following Council of State and Territorial Epidemiologists website: http://www.cste.org/specialprojects/Influenzaplans/StateMap.asp.

Currently available National Plans may be found on the following WHO website: http://www.who.int/csr/disease/influenza/nationalpandemic/en/index.html


Tools

FluAid (http://www2.cdc.gov/od/fluaid/default.htm) FluAid 2.0 provides estimates of the total deaths, hospitalizations, and outpatient visits that might occur during an influenza pandemic.

FluSurge (http://www.cdc.gov/flu/flusurge.htm) This specialized spreadsheet-based software estimates the potential surge in demand for hospital-based health care during a pandemic. For each week of a pandemic, FluSurge calculates the potential demand for hospital beds, intensive care unit beds, and mechanical ventilators. Demand for resources is compared with actual capacity. FluSurge is a companion to the previously released FluAid 2.0.

AHRQ’s Health Emergency Assistance Line and Triage Hub (HEALTH) Mode
The model is designed to minimize surges in patient demand on the health care delivery system during a bioterrorist event or other public health emergency.

1. Full Report—Health Emergency Assistance Line and Triage Hub (HEALTH) Model (AHRQ Publication No. 05-0040) (http://www.ahrq.gov/research/health/health.pdf) This report helps planners determine the requirements, specifications, and resources needed for developing an emergency contact center such as the HEALTH model.

2. Contact Center Assessment Tool Set (http://www.ahrq.gov/research/health/health.asp)

AHRQ Bioterrorism Planning and Response Resource Page http://www.ahrq.gov/browse/bioterbr.htm This resource includes a listing of a variety of tools and resources on issues from community prophylaxis to surge capacity in health facilities.

Emergency Preparedness Resource Inventory (EPRI): A Tool for Local, Regional, and State Planners (http://www.ahrq.gov/research/epri/) The Emergency Preparedness Resource Inventory (EPRI) is a tool allowing local or regional planners to assemble an inventory of critical resources that would be useful in responding to a bioterrorist attack. In addition to a Web-based software tool, EPRI includes an Implementation Report, a Technical Manual, and an Appendix.
Altered Standards of Care in Mass Casualty Events
(http://www.ahrq.gov/research/altstand/index.html)
This report discusses the potential of a mass casualty event to compromise the ability of health systems to deliver services meeting established standards of care.

Computer Staffing Model for Bioterrorism Response
(http://www.ahrq.gov/research/biomodel.htm)
This new resource is the Nation’s first computerized staffing model that is downloadable as a spreadsheet or accessible as a Web-based version. It can be used to calculate the specific needs of local health care systems based on the number of staff they have and the number of patients they would need to treat quickly in a bioterrorism event.

Rocky Mountain Regional Care Model for Bioterrorist Events: Locate Alternate Care Sites During an Emergency
(http://www.ahrq.gov/research/altsites.htm)
The alternate care site selection tool is designed to allow regional planners to locate and rank potential alternative sites—stadiums, schools, recreation centers, motels, and other venues—based on whether they have adequate ventilation, plumbing, food supply and kitchen facilities, and other factors.

HRSA Bioterrorism and Hospital Preparedness
(http://www.hrsa.gov/bioterrorism/preparationandplanning/healthcare&facilities.htm)
A comprehensive list of resources and documents

ASTHO "Preparedness Planning for State Health Officials – Nature’s Terrorist Attack – Pandemic Influenza"
(http://www.astho.org/pubs/PandemicInfluenza.pdf)
Provides checklists for state health officials to assist in preparedness planning. A brief summary of major issues to consider is also included.

Educational Materials samples
(http://www.health.state.ny.us/nysdoh/flu/resources.htm)

HHS healthcare surge capacity document
(http://www.os.hhs.gov/asphep/mscc_handbook.html)

OSHA—Best Practices for the Protection of Hospital-Based First Receivers

ASTM Standard Guide for Hospital Preparedness and Response
The purpose of the guide is to answer questions regarding the minimal levels of preparedness needed for hospitals to deal with a large-scale terrorist attack or other serious emergency and includes guidelines regarding the process for preparedness and mitigation; the process of organizing and planning a hospital response plan; the nature of supplies that hospitals need to make available; the application of existing regulations and guidelines; and an acceptable means to protect the facilities for usual operation, patients, and staff while continuing to provide an effective level of response. (This document is not free to the public, a document summary is available at http://www.astm.org/cgi-bin/SoftCart.exe/DATABASE.CART/REDLINE_PAGES/E2413.htm?L+mystore+vybd9920)

Information on Handling Human Remains During Mass-Casualty Events
- Interim Health Recommendations for Workers who Handle Human Remains
  www.bt.cdc.gov/disasters/tsunamis/handleremains.asp
- Disposing of Liquid Waste from Autopsies in Tsunami-Affected Areas
• Management of Dead Bodies in Disaster Situations
  www.paho.org/English/DD/PED/ManejoCadaveres.htm


Presentations

2004 AHRQ-sponsored series “Addressing Surge Capacity in a Mass Casualty Event”
(http://www.hsrnet.net/ahrq/surgecapacity/)

Presentations from First National Congress on Public Health Readiness
(http://www.ama-assn.org/ama/noindex/category/11053.html)
(http://www.bt.cdc.gov/training/ncphr/) -CDC Presentations only

These slideshows represent presentations from speakers at the 1st National Congress on Public Health Readiness held July 20-22, 2004.

“No Vacancy: Healthcare Surge Capacity in Disasters.”
(http://www.ama-assn.org/ama1/pub/upload/mm/415/hick.ppt)
Jonathan L. Hick, MD, Medical Director, Office of Emergency Preparedness, Hennepin County Medical Center, Minneapolis, Minnesota

Bioterrorism Preparedness: A Hospital Tabletop Exercise
SHEA 14th Annual Scientific Meeting, Philadelphia, PA
April 17, 2004
Prepared by Kelly Henning, MD
### APPENDIX 2. HOSPITAL PREPAREDNESS CHECKLIST

<table>
<thead>
<tr>
<th>Preparedness Subject</th>
<th>Actions Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Structure for planning and decision making</td>
<td></td>
</tr>
<tr>
<td>❑ An internal, multidisciplinary planning committee for influenza preparedness has been created.</td>
<td></td>
</tr>
<tr>
<td>❑ A person has been designated as the influenza preparedness coordinator.</td>
<td></td>
</tr>
</tbody>
</table>
(Insert name) ______________________________ |
<p>| ❑ Members of the planning committee include the following hospital staff members (insert names) | |
| ❑ Administration |
| ❑ Legal counsel |
| ❑ Infection control |
| ❑ Hospital disaster coordinator |
| ❑ Risk management |
| ❑ Facility engineering |
| ❑ Nursing administration |
| ❑ Medical staff |
| ❑ Intensive care |
| ❑ Emergency Department |
| ❑ Laboratory services |
| ❑ Respiratory therapy |
| ❑ Psychiatry |
| ❑ Environmental services |
| ❑ Public relations |
| ❑ Security |
| ❑ Materials management |
| ❑ Staff development |
| ❑ Occupational health |
| ❑ Diagnostic imaging |
| ❑ Pharmacy |
| ❑ Information technology |
| ❑ Other members |
| ❑ Other members |</p>
<table>
<thead>
<tr>
<th>Preparedness Subject</th>
<th>Actions Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>❑ A state or local health department person has been identified as a committee liaison.</td>
<td></td>
</tr>
<tr>
<td>(Insert name)</td>
<td></td>
</tr>
<tr>
<td>❑ A linkage with local or regional emergency preparedness groups has been established</td>
<td></td>
</tr>
<tr>
<td>(Planning organization)</td>
<td></td>
</tr>
<tr>
<td>2. Development of a written pandemic influenza plan</td>
<td></td>
</tr>
<tr>
<td>❑ A written plan has been completed or is in progress that includes the elements listed in #3 below.</td>
<td></td>
</tr>
<tr>
<td>❑ The plan specifies the circumstances under which the plan will be activated.</td>
<td></td>
</tr>
<tr>
<td>❑ The plan describes the organization structure that will be used to operationalize the plan.</td>
<td></td>
</tr>
<tr>
<td>❑ Responsibilities of key personnel related to executing the plan have been described.</td>
<td></td>
</tr>
<tr>
<td>❑ A simulation exercise has been developed to test the effectiveness of the plan.</td>
<td></td>
</tr>
<tr>
<td>❑ A simulation exercise has been performed. (Date performed _______________________)</td>
<td></td>
</tr>
<tr>
<td>3. Elements of an influenza pandemic plan</td>
<td></td>
</tr>
<tr>
<td>❑ A surveillance plan has been developed.</td>
<td></td>
</tr>
<tr>
<td>❑ Syndromic surveillance has been established in the emergency room.</td>
<td></td>
</tr>
<tr>
<td>❑ Criteria for distinguishing pandemic influenza is part of the syndromic surveillance plan.</td>
<td></td>
</tr>
<tr>
<td>❑ Responsibility has been assigned for reviewing global, national, regional, and local influenza activity trends and informing the pandemic influenza coordinator of evidence of an emerging problem. (Name ___________________________)</td>
<td></td>
</tr>
<tr>
<td>❑ Thresholds for heightened local surveillance for pandemic influenza have been established.</td>
<td></td>
</tr>
<tr>
<td>❑ A system has been created for internal review of pandemic influenza activity in patients presenting to the emergency department.</td>
<td></td>
</tr>
<tr>
<td>❑ A system for monitoring for nosocomial transmission of pandemic has been implemented and tested by monitoring for non-pandemic influenza.</td>
<td></td>
</tr>
<tr>
<td>Preparedness Subject</td>
<td>Actions Needed</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>❑ A communication plan has been developed.</td>
<td></td>
</tr>
<tr>
<td>❑ Responsibility for external communication has been assigned.</td>
<td></td>
</tr>
<tr>
<td>Person responsible for updating public health reporting</td>
<td></td>
</tr>
<tr>
<td>Clinical spokesperson for the facility</td>
<td></td>
</tr>
<tr>
<td>Media spokesperson for the facility</td>
<td></td>
</tr>
<tr>
<td>❑ Key points of contact outside the facility have been identified.</td>
<td></td>
</tr>
<tr>
<td>State health department contact</td>
<td></td>
</tr>
<tr>
<td>Local health department contact</td>
<td></td>
</tr>
<tr>
<td>Newspaper contact(s)</td>
<td></td>
</tr>
<tr>
<td>Radio contact(s)</td>
<td></td>
</tr>
<tr>
<td>Public official(s)</td>
<td></td>
</tr>
<tr>
<td>❑ A list of other healthcare facilities with whom it will be necessary to maintain communication has been established.</td>
<td></td>
</tr>
<tr>
<td>❑ A meeting with local healthcare facilities has been held to discuss a communication strategy.</td>
<td></td>
</tr>
<tr>
<td>❑ A plan for updating key facility personnel on a daily basis has been established.</td>
<td></td>
</tr>
<tr>
<td>The person(s) responsible for providing these updates are:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>❑ A system to track pandemic influenza admissions and discharges has been developed and tested by monitoring non-pandemic influenza admissions and discharges in the community.</td>
<td></td>
</tr>
<tr>
<td>❑ A strategy for regularly updating clinical, ED, and outpatient staff on the status of pandemic influenza, once detected, has been established. (Responsible person ______________________)</td>
<td></td>
</tr>
<tr>
<td>❑ A plan for informing patients and visitors about the level of pandemic influenza activity has been established.</td>
<td></td>
</tr>
<tr>
<td>❑ An education and training plan on pandemic influenza has been developed.</td>
<td></td>
</tr>
<tr>
<td>❑ Language and reading level-appropriate materials for educating all personnel about pandemic influenza and the facility's pandemic influenza plan, have been identified.</td>
<td></td>
</tr>
<tr>
<td>❑ Current and potential sites for long-distance and local education of clinicians on pandemic influenza have been identified.</td>
<td></td>
</tr>
<tr>
<td>❑ Means for accessing state and federal web-based influenza training programs have been identified.</td>
<td></td>
</tr>
<tr>
<td>❑ A system for tracking which personnel have completed pandemic influenza training is in place.</td>
<td></td>
</tr>
<tr>
<td>❑ A plan is in place for rapidly training non-facility staff brought in to provide patient care when the hospital reaches surge capacity.</td>
<td></td>
</tr>
<tr>
<td>Preparedness Subject</td>
<td>Actions Needed</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>The following groups of healthcare personnel have received training on the facility's influenza plan:</td>
<td></td>
</tr>
<tr>
<td>Attending physicians</td>
<td></td>
</tr>
<tr>
<td>House staff</td>
<td></td>
</tr>
<tr>
<td>Nursing staff</td>
<td></td>
</tr>
<tr>
<td>Laboratory staff</td>
<td></td>
</tr>
<tr>
<td>Emergency Department personnel</td>
<td></td>
</tr>
<tr>
<td>Outpatient personnel</td>
<td></td>
</tr>
<tr>
<td>Environmental Services personnel</td>
<td></td>
</tr>
<tr>
<td>Engineering and maintenance personnel</td>
<td></td>
</tr>
<tr>
<td>Security personnel</td>
<td></td>
</tr>
<tr>
<td>Nutrition personnel</td>
<td></td>
</tr>
<tr>
<td>A triage and admission plan has been developed.</td>
<td></td>
</tr>
<tr>
<td>A specific location has been identified for triage of patients with possible pandemic influenza.</td>
<td></td>
</tr>
<tr>
<td>The plan includes use of signage to direct and instruct patients with possible pandemic influenza on the triage process.</td>
<td></td>
</tr>
<tr>
<td>Patients with possible pandemic influenza will be physically separated from other patients seeking medical attention.</td>
<td></td>
</tr>
<tr>
<td>A system for phone triage of patients for purposes of prioritizing patients who require a medical evaluation has been developed.</td>
<td></td>
</tr>
<tr>
<td>Criteria for determining which patients need a medical evaluation are in place.</td>
<td></td>
</tr>
<tr>
<td>A method for tracking the admission and discharge of patients with pandemic influenza has been developed.</td>
<td></td>
</tr>
<tr>
<td>The tracking method has been tested with non-pandemic influenza patients.</td>
<td></td>
</tr>
<tr>
<td>A facility access plan has been developed.</td>
<td></td>
</tr>
<tr>
<td>Criteria and protocols for closing the facility to new admissions are in place.</td>
<td></td>
</tr>
<tr>
<td>Criteria and protocols for limiting visitors have been established.</td>
<td></td>
</tr>
<tr>
<td>Hospital Security has had input into procedures for enforcing facility access controls.</td>
<td></td>
</tr>
<tr>
<td>An occupational health plan has been developed.</td>
<td></td>
</tr>
<tr>
<td>A system for rapidly delivering vaccine or antiviral prophylaxis to healthcare personnel has been developed.</td>
<td></td>
</tr>
<tr>
<td>The system has been tested during a non-pandemic influenza season.</td>
<td></td>
</tr>
<tr>
<td>Preparedness Subject</td>
<td>Actions Needed</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>❑ A method for prioritizing healthcare personnel for receipt of vaccine or antiviral prophylaxis based on level of patient contact and personal risk for influenza complications has been established.</td>
<td></td>
</tr>
<tr>
<td>❑ A system for detecting symptomatic personnel before they report for duty has been developed.</td>
<td></td>
</tr>
<tr>
<td>❑ This system has been tested during a non-pandemic influenza period.</td>
<td></td>
</tr>
<tr>
<td>❑ A policy for managing healthcare personnel with symptoms of or documented pandemic influenza has been established. The policy considers:</td>
<td></td>
</tr>
<tr>
<td>❑ When personnel may return to work after having pandemic influenza</td>
<td></td>
</tr>
<tr>
<td>❑ When personnel who are symptomatic but well enough to work, will be permitted to continue working</td>
<td></td>
</tr>
<tr>
<td>❑ A method for furloughing or altering the work locations of personnel who are at high risk for influenza complications (e.g., pregnant women, immunocompromised healthcare workers) has been developed.</td>
<td></td>
</tr>
<tr>
<td>❑ Mental health and faith-based resources who will provide counseling to personnel during a pandemic have been identified.</td>
<td></td>
</tr>
<tr>
<td>❑ A strategy for housing healthcare personnel who may be needed on-site for prolonged periods of time is in place.</td>
<td></td>
</tr>
<tr>
<td>❑ A strategy for accommodating and supporting personnel who have child or elder care responsibilities has been developed.</td>
<td></td>
</tr>
<tr>
<td>❑ A vaccine and antiviral use plan has been developed.</td>
<td></td>
</tr>
<tr>
<td>❑ A contact for obtaining influenza vaccine has been identified.</td>
<td></td>
</tr>
<tr>
<td>(Name)________________________________________________________________________</td>
<td></td>
</tr>
<tr>
<td>❑ A contact for obtaining antiviral prophylaxis has been identified.</td>
<td></td>
</tr>
<tr>
<td>(Name)________________________________________________________________________</td>
<td></td>
</tr>
<tr>
<td>❑ A priority list (based on HHS guidance for use of vaccines and antivirals in a pandemic when in short supply) and estimated number of patients and healthcare personnel who would be targeted for influenza vaccination or antiviral prophylaxis has been developed.</td>
<td></td>
</tr>
<tr>
<td>❑ Number of first priority personnel ____________</td>
<td></td>
</tr>
<tr>
<td>❑ Number of second priority personnel ____________</td>
<td></td>
</tr>
<tr>
<td>❑ Number of remaining personnel ____________</td>
<td></td>
</tr>
<tr>
<td>❑ Number of first priority patients ____________</td>
<td></td>
</tr>
<tr>
<td>❑ Number of second priority patients ____________</td>
<td></td>
</tr>
<tr>
<td>❑ A system for rapidly distributing vaccine and antivirals to patients has been developed.</td>
<td></td>
</tr>
<tr>
<td>Preparedness Subject</td>
<td>Actions Needed</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>- Issues related to surge capacity have been addressed.</td>
<td>- A plan is in place to address unmet staffing needs in the hospital.</td>
</tr>
<tr>
<td>- A plan is in place to address unmet staffing needs in the hospital.</td>
<td>- The minimum number and categories of personnel needed to care for a group of patients with pandemic influenza has been determined.</td>
</tr>
<tr>
<td>- The minimum number and categories of personnel needed to care for a group of patients with pandemic influenza has been determined.</td>
<td>- Responsibility for assessing day-to-day clinical staffing needs during an influenza pandemic has been assigned.</td>
</tr>
<tr>
<td>- Responsibility for assessing day-to-day clinical staffing needs during an influenza pandemic has been assigned.</td>
<td>- Persons responsible are: (names and/or titles)</td>
</tr>
<tr>
<td>- Legal counsel has reviewed emergency laws for using healthcare personnel with out-of-state licenses.</td>
<td>- Legal counsel has made sure that any insurance and other liability concerns have been resolved.</td>
</tr>
<tr>
<td>- Legal counsel has made sure that any insurance and other liability concerns have been resolved.</td>
<td>- Criteria for declaring a &quot;staffing crisis&quot; that would enable the use of emergency staffing alternatives have been defined.</td>
</tr>
<tr>
<td>- Criteria for declaring a &quot;staffing crisis&quot; that would enable the use of emergency staffing alternatives have been defined.</td>
<td>- The plan includes linking to local and regional planning and response groups to collaborate on addressing widespread healthcare staffing shortages during a crisis.</td>
</tr>
<tr>
<td>- The plan includes linking to local and regional planning and response groups to collaborate on addressing widespread healthcare staffing shortages during a crisis.</td>
<td>- A priority list for reassignment and recruitment of personnel has been developed.</td>
</tr>
<tr>
<td>- A priority list for reassignment and recruitment of personnel has been developed.</td>
<td>- A method for rapidly credentialing newly recruited personnel has been developed.</td>
</tr>
<tr>
<td>- A method for rapidly credentialing newly recruited personnel has been developed.</td>
<td>- Mutual AID Agreements (MAAs) and Memoranda of Understanding/Agreement (MOU/As) have been signed with other facilities that have agreed to share their staff, as needed.</td>
</tr>
<tr>
<td>- Mutual AID Agreements (MAAs) and Memoranda of Understanding/Agreement (MOU/As) have been signed with other facilities that have agreed to share their staff, as needed.</td>
<td>- Strategies to increase bed capacity have been identified</td>
</tr>
<tr>
<td>- A threshold has been established for canceling elective admissions and surgeries</td>
<td>- MOAs have been signed with facilities that would accept non-influenza patients in order to free-up bed space</td>
</tr>
<tr>
<td>- MOAs have been signed with facilities that would accept non-influenza patients in order to free-up bed space</td>
<td>- Areas of the facility that could be utilized for expanded bed space have been identified</td>
</tr>
<tr>
<td>- Areas of the facility that could be utilized for expanded bed space have been identified</td>
<td>- The estimated patient capacity for this facility is ________</td>
</tr>
<tr>
<td>- The estimated patient capacity for this facility is ________</td>
<td>- Plans for expanded bed capacity have been discussed with local and regional planning groups</td>
</tr>
<tr>
<td>- Plans for expanded bed capacity have been discussed with local and regional planning groups</td>
<td>- Anticipated durable and consumable resource needs have been determined</td>
</tr>
<tr>
<td>- Anticipated durable and consumable resource needs have been determined</td>
<td>- A primary plan and contingency plan to address supply shortages has been developed</td>
</tr>
</tbody>
</table>
| - A primary plan and contingency plan to address supply shortages has been developed | - Plans for obtaining limited resources have been discussed with local and regional planning and response groups.
<table>
<thead>
<tr>
<th>Preparedness Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>❑ A strategy for handling increased numbers of deceased persons has been developed.</td>
</tr>
<tr>
<td>❑ Plans for expanding morgue capacity have been discussed with local and regional planning groups.</td>
</tr>
<tr>
<td>❑ Local morticians have been involved in planning discussions.</td>
</tr>
<tr>
<td>❑ Mortality estimates have been used to estimate the number of body bags and shrouds.</td>
</tr>
<tr>
<td>❑ Supply sources for postmortem materials have been identified.</td>
</tr>
</tbody>
</table>

<table>
<thead>
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S4-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 healthcare 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)—the relative clinical importance of
each of these modes of transmission is not known.

The infection control guidance provided in this supplement is based on our knowledge of routes of influenza transmission (S4-
II.A), the pathogenesis of influenza (S4-II.B), and the effects of influenza control measures used during past pandemics and
interpandemic periods (S4-II.C) (see also supporting references in the Appendix). Given some uncertainty about the
characteristics of a new pandemic strain, all aspects of preparedness planning for pandemic influenza must allow for flexibility
and real-time decision-making that take new information into account as the situation unfolds. The specific characteristics of
a new pandemic virus—virulence, transmissibility, initial geographic distribution, clinical manifestation, risk to different age
groups and subpopulations, and drug susceptibility—will remain unknown until the pandemic gets underway. If the new virus
is unusual in any of these respects, HHS and its partners will provide updated infection control guidance.

S4-II. INFLUENZA TRANSMISSION

A. Modes of transmission

Despite the prevalence of influenza year after year, most information on the modes of influenza transmission from person to
person is indirect and largely obtained through observations during outbreaks in healthcare facilities and other settings (e.g.,
cruise ships, airplanes, schools, and colleges); the amount of direct scientific information is very limited. However, the
epidemiologic pattern observed is generally consistent with spread through close contact (i.e., exposure to large respiratory
droplets, direct contact, or near-range exposure to aerosols). While some observational and animal studies support airborne
transmission through small particle aerosols, there is little evidence of airborne transmission over long distances or prolonged
periods of time (as is seen with M. tuberculosis). The relative contributions and clinical importance of the different modes of
influenza transmission are currently unknown.

1. Droplet transmission (www.cdc.gov/ncidod/hip/ISOLAT/std_prec_excerpt.htm)

Droplet transmission involves contact of the conjunctivae or the mucous membranes of the nose or mouth of a susceptible
person with large-particle droplets containing microorganisms generated from a person who has a clinical disease or who is
a carrier of the microorganism. Droplets are generated from the source person primarily during coughing, sneezing, or talking
and during the performance of certain procedures such as suctioning and bronchoscopy. Transmission via large-particle
droplets requires close contact between source and recipient persons, because droplets do not remain suspended in the air and
generally travel only short distances (about 3 feet) through the air. Because droplets do not remain suspended in the air, special
air handling and ventilation are not required to prevent droplet transmission.

Based on epidemiologic patterns of disease transmission, large droplet transmission has been considered a major route of
influenza transmission. However, data directly demonstrating large droplet transmission of influenza in human outbreaks is
indirect and limited.
2. Contact transmission (www.cdc.gov/ncidod/hip/ISOLAT/contact_prec_excerpt.htm)

Direct-contact transmission involves skin-to-skin contact and physical transfer of microorganisms to a susceptible host from an infected or colonized person, such as occurs when personnel turn patients, bathe patients, or perform other patient-care activities that require physical contact. Direct-contact transmission also can occur between two patients (e.g., by hand contact), with one serving as the source of infectious microorganisms and the other as a susceptible host. Indirect-contact transmission involves contact of a susceptible host with a contaminated intermediate object, usually inanimate, in the patient’s environment.

Contact transmission of influenza may occur through either direct skin-to-skin contact or through indirect contact with virus in the environment. Transmission via contaminated hands and fomites has been suggested as a contributing factor in some studies. However, there is insufficient data to determine the proportion of influenza transmission that is attributable to direct or indirect contact.

3. Airborne transmission (www.cdc.gov/ncidod/hip/ISOLAT/airborne_prec_excerpt.htm)

Airborne transmission occurs by dissemination of either airborne droplet nuclei or small particles in the respirable size range containing the infectious agent. Microorganisms carried in this manner—such as M. tuberculosis—may be dispersed over long distances by air currents and may be inhaled by susceptible individuals who have not had face-to-face contact with (or been in the same room with) the infectious individual. Organisms transmitted in this manner must be capable of sustaining infectivity, despite desiccation and environmental variation that generally limit survival in the airborne state. Preventing the spread of agents that are transmitted by the airborne route requires the use of special air handling and ventilation systems (e.g., negative pressure rooms).

The relative contribution of airborne transmission to influenza outbreaks is uncertain. Evidence is limited and is principally derived from laboratory studies in animals and some observational studies of influenza outbreaks in humans, particularly on cruise ships and airplanes, where other mechanisms of transmission were also present. Additional information suggesting airborne transmission was reported in a Veterans Administration Hospital study that found lower rates of influenza in wards exposed to ultraviolet radiation (which inactivates influenza viruses) than in wards without UV radiation. Another study indicated that humidity can play a role in the infectivity of aerosolized influenza, although the influence of humidity on the formation of droplet nuclei was not evaluated.

Small-particle aerosols. There is no evidence that influenza transmission can occur across long distances (e.g., through ventilation systems) or through prolonged residence in air, as seen with airborne diseases such as tuberculosis. However, transmission may occur at shorter distances through inhalation of small-particle aerosols (droplet nuclei), particularly in shared air spaces with poor air circulation. An experimental study involving human volunteers found that illness could be induced with substantially lower virus titers when influenza virus was administered as a small droplet aerosol rather than as nasal droplets, suggesting that infection is most efficiently induced when virus is deposited in the lower rather than the upper respiratory tract. While this study supports the possibility of droplet nuclei transmission of influenza, the proportion of infections acquired through droplet nuclei—as compared with large droplet or contact spread—is unknown.

It is likely that some aerosol-generating procedures (e.g., endotracheal intubation, suctioning, nebulizer treatment, bronchoscopy) could increase the potential for dissemination of droplet nuclei in the immediate vicinity of the patient. (Although transmission of SARS-CoV was reported in a Canadian hospital during an aerosol-generating procedure [intubation], it occurred in a situation involving environmental contamination with respiratory secretions.) Although this mode of transmission has not been evaluated for influenza, additional precautions for healthcare personnel who perform aerosol-generating procedures on influenza patients may be warranted.
B. Pathogenesis of influenza and implications for infection control

The cellular pathogenesis of human influenza indicates that infection principally takes place within the respiratory tract. While conjunctivitis is a common manifestation of systemic influenza infection, the ocular route of inoculation and infection has not been demonstrated for human influenza viruses. This may not be true with certain avian species of influenza (e.g., H7N7) that have been associated primarily with conjunctivitis in humans. This information suggests that preventing direct and indirect inoculation of the respiratory tract is of utmost importance for preventing person-to-person transmission when caring for infectious patients.

C. Control of transmission in healthcare facilities

Outbreaks of influenza have been prevented or controlled through a set of well established strategies that include vaccination of patients and healthcare personnel; early detection of influenza cases in a facility; use of antivirals to treat ill persons and, if recommended, as prophylaxis; isolation of infectious patients in private rooms or cohort units; use of appropriate barrier precautions during patient care, as recommended for Standard and Droplet Precautions (Box 1); and administrative measures, such as restricting visitors, educating patients and staff, and cohorting healthcare workers assigned to an outbreak unit.

These are the primary infection control measures recommended in this plan. They will be updated, as necessary, based on the observed characteristics of the pandemic influenza virus.

S4–III. OVERVIEW

Supplement 4 provides guidance to healthcare and public health partners on basic principles of infection control for limiting the spread of pandemic influenza. These principles (summarized in Box 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 healthcare 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 healthcare services. The section on hospital care covers detection of entering patients who may be infected with pandemic influenza; implementation of source-control measures to limit virus dissemination from respiratory secretions; hospitalization of pandemic influenza patients; and detection and control of nosocomial transmission.

In addition, Supplement 4 includes guidance on infection control procedures for pandemic 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 healthcare settings and the community. These issues are addressed in Supplements 6 and 7, respectively.

1 Eye protection is recommended when working with conjunctivitis-inducing avian influenza viruses
S4-IV. RECOMMENDATIONS FOR INFECTION CONTROL IN HEALTHCARE SETTINGS

The recommendations for infection control described below are generally applicable throughout the different pandemic phases. 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 healthcare settings

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

- Limit contact between infected and non-infected persons
- Isolate infected persons (i.e., confine patients to a defined area as appropriate for the healthcare setting).
- Limit contact between nonessential personnel and other persons (e.g., social visitors) and patients who are ill with pandemic influenza.
- 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.
- Protect persons caring for influenza patients in healthcare settings from contact with the pandemic influenza virus. Persons who must be in contact should:
  - Wear a surgical or procedure mask for close contact with infectious patients.
  - Use contact and airborne precautions, including the use of N95 respirators, when appropriate [S4-IV.C].
  - Wear gloves (gown if necessary) for contact with respiratory secretions.
  - Perform hand hygiene after contact with infectious patients.
- Contain infectious respiratory secretions:
  - Instruct persons who have “flu-like” symptoms (see below) to use respiratory hygiene/cough etiquette (See Box 2).
  - Promote use of masks 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 (see Supplement 5, Box 2).

2 During the early stages of a pandemic, laboratory-confirmation of influenza infection is recommended when possible.
3 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.
4 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) (see S4-IV.B.2).

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 healthcare 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 and patient placement

Patients with known or suspected pandemic influenza should be placed on droplet precautions for a minimum of 5 days from the onset of symptoms. Because immunocompromised patients may shed virus for longer periods, they may be placed on droplet precautions for the duration of their illness. Healthcare personnel should wear appropriate PPE (see S4-IV.C). The placement of patients will vary depending on the healthcare setting (see setting-specific guidance).

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 (www.cdc.gov/flu).

C. Infection control practices for healthcare personnel

Infection control practices for pandemic influenza are the same as for other human influenza viruses and primarily involve the application of standard and droplet precautions (Box 1) during patient care in healthcare settings (e.g., hospitals, nursing homes, outpatient offices, emergency transport vehicles). This guidance also applies to healthcare personnel going into the homes of patients. 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 (S4-IV.G) and for use in public settings (e.g., schools, workplace) where people with pandemic influenza may be encountered (S4-V and S4-VI).
1. Personal protective equipment

a) PPE for standard and droplet precautions

PPE is used to prevent direct contact with the pandemic 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 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 www.cdc.gov/ncidod/hip/isolat/isolat.htm/.

- **Masks (surgical or procedure)**
  - Wear a mask when entering a patient's room. A mask should be worn once and then discarded. If pandemic 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 and hand hygiene performed.
  - 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 healthcare workers 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 pandemic 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, and 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 pandemic 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. Additional information related to the use of eye protection for infection control can be found at http://www.cdc.gov/niosh/topics/eye/eye-infectious.html.

b) **PPE for special circumstances**

- **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), healthcare 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 pandemic 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.

- **Precautions for early stages of a pandemic**

  Early in a pandemic, it may not be clear that a patient with severe respiratory illness has pandemic influenza. Therefore precautions consistent with all possible etiologies, including a newly emerging infectious agent, should be implemented. This may involve the combined use of airborne and contact precautions, in addition to standard precautions, until a diagnosis is established.

c) **Caring for patients with pandemic influenza**

  Healthcare personnel should be particularly vigilant to avoid:

  - 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. (See also: http://www.cdc.gov/ncidod/hip/ppe/default.htm.)
  
  - Contaminating environmental surfaces that are not directly related to patient care (e.g., door knobs, light switches)

2. **Hand hygiene**

   Hand hygiene has frequently been cited as the single most important practice to reduce the transmission of infectious agents in healthcare settings (see http://www.cdc.gov/handhygiene/pressrelease.htm) and is an essential element of standard precautions. The term "hand hygiene" includes both handwashing 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/.

3. Disposal of solid waste
Standard precautions are recommended for disposal of solid waste (medical and non-medical) that might be contaminated with a pandemic 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.

• 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 pandemic 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.

• Wash and dry linen according to routine standards and procedures (www.cdc.gov/ncidod/hip/enviro/guide.htm).

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

• Wash reusable dishes and utensils in a dishwasher with recommended water temperature (www.cdc.gov/ncidod/hip/enviro/guide.htm).

• Disposable dishes and utensils (e.g., used in an alternative care site set-up for large numbers of patients) 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:

• Wear gloves when handling and transporting used patient-care equipment.
7. Environmental cleaning and disinfection

Cleaning and disinfection of environmental surfaces are important components of routine infection control in healthcare facilities. Environmental cleaning and disinfection for pandemic influenza follow the same general principles used in healthcare settings.

a) Cleaning and disinfection of patient-occupied rooms
(See: www.cdc.gov/ncidod/hip/enviro/Enviro_guide_03.pdf)

- 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 any 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 (www.cdc.gov/ncidod/hip/ISOLAT/Isolat.htm).

b) Cleaning and disinfection after patient discharge or transfer

- Follow standard facility procedures for post-discharge cleaning of an isolation room.
- Clean and disinfect all surfaces that were in contact with the patient or might have become contaminated during patient care. No special treatment is necessary for window curtains, ceilings, and walls unless there is evidence of visible soiling.
- Do not spray (i.e., fog) occupied or unoccupied rooms with disinfectant. This is a potentially dangerous practice that has no proven disease control benefit.

8. Postmortem care

Follow standard facility practices for care of the deceased. Practices should include standard precautions for contact with blood and body fluids.

9. Laboratory specimens and practices

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

D. Occupational health issues

Healthcare personnel are at risk for pandemic influenza through community and healthcare-related exposures. Once pandemic influenza has reached a community, healthcare facilities must implement systems to monitor for illness in the facility workforce and manage those who are symptomatic or ill.
• Implement a system to educate personnel about occupational health issues related to pandemic influenza.

• Screen all personnel for influenza-like symptoms before they come on duty. Symptomatic personnel should be sent home until they are physically ready to return to duty.

• Healthcare personnel who have recovered from pandemic influenza, and should develop antibody against future infection with the same virus, and therefore should be prioritized for the care of patients with active pandemic influenza and its complications. These workers would also be well suited to care for patients who are at risk for serious complications from influenza (e.g., transplant patients and neonates).

• Personnel who are at high risk for complications of pandemic influenza (e.g., pregnant women, immunocompromised persons) should be informed about their medical risk and offered an alternate work assignment, away from influenza-patient care, or considered for administrative leave until pandemic influenza has abated in the community.

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 unnecessary contact with healthcare facilities caring for pandemic influenza patients (i.e., do not visit patients, postpone nonessential medical care).

F. Healthcare setting-specific guidance

All healthcare facilities should follow the infection control guidance in S4-IV.A-E above. The following guidance is intended to address setting-specific infection control issues that should also be considered.

1. Hospitals

a) Detection of persons entering the facility who may have pandemic influenza

• Post visual alerts (in appropriate languages) at the entrance to hospital outpatient facilities (e.g., emergency departments, outpatient clinics) instructing persons with respiratory symptoms (e.g., patients, persons who accompany them) to:
  • Inform reception and healthcare personnel when they first register for care, and
  • Practice respiratory hygiene/cough etiquette (see www.cdc.gov/flu/professionals/infectioncontrol/resphygiene.htm). Sample visual alerts are available on CDC’s SARS website: http://www.cdc.gov/ncidod/hip/INFECT/RespiratoryPoster.pdf

• 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 not every patient presenting with symptoms will have pandemic influenza, 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.
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 healthcare 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 on CDC’s SARS website: http://www.cdc.gov/ncidod/hip/INFECT/RespiratoryPoster.pdf

- 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 handwashing 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
  - Limit admission of influenza patients to those with severe complications of influenza who cannot be cared for outside the hospital setting.
  - Admit patients to either a single-patient room or an area designated for cohorting of patients with influenza.

- Cohorting
  - Designated units or areas of a facility should be used for cohorting patients with pandemic influenza. During a pandemic, other respiratory viruses (e.g., non-pandemic 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 pandemic 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 who accompany patients with influenza-like illness to the hospital 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.

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 healthcare 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 (except for other pandemic influenza patients) to the affected unit(s)
  - Restriction of visitors to the affected unit(s) to those who are essential for patient care and support

- If widespread nosocomial transmission occurs, controls 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 pandemic influenza and disease complications. Pandemic 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 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 pandemic 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 symptoms of pandemic influenza are apparent (see Supplement 5), 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 pandemic 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. Prehospital care (emergency medical services)

Patients with severe pandemic 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 healthcare services
Home healthcare 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 healthcare 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 healthcare 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 nonemergency 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 nonclinical 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 healthcare personnel when they first register for care
  • Practice respiratory hygiene/cough etiquette (see www.cdc.gov/flu/professionals/infectioncontrol/resphygiene.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.

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 healthcare 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 pandemic 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) healthcare services. When pandemic 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 nonemergency
• Canceling all nonemergency services when there is pandemic influenza in the community

G. Care of pandemic influenza patients in the home
Most patients with pandemic 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 pandemic 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 pandemic influenza and who are not essential for patient care or support should not enter the home while persons are actively ill with pandemic influenza.
   • If unexposed persons must enter the home, they should avoid close contact with the patient.
   • Persons living in the home with the pandemic 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 healthcare resources, it may become necessary to provide care at alternative sites (e.g., schools, auditoriums, conference centers, hotels). 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 healthcare 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.

S4-V. RECOMMENDATIONS FOR INFECTION CONTROL IN SCHOOLS AND WORKPLACES

• In schools and workplaces, infection control for pandemic 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 and employers should ensure that materials for respiratory hygiene/cough etiquette (i.e., tissues and receptacles for their disposal) and hand hygiene are available. Educational messages and infection control guidance for pandemic influenza are available for distribution. (CDC will develop educational materials appropriate to various audiences.)

S4-VI. 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. Mask 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 pandemic 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.
**BOX 1. SUMMARY OF INFECTION CONTROL RECOMMENDATIONS FOR CARE OF PATIENTS WITH PANDEMIC INFLUENZA**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>RECOMMENDATIONS</th>
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<tbody>
<tr>
<td><strong>STANDARD PRECAUTIONS</strong></td>
<td>See <a href="http://www.cdc.gov/ncidod/hip/ISOLAT/std_prec_excerpt.htm">www.cdc.gov/ncidod/hip/ISOLAT/std_prec_excerpt.htm</a></td>
</tr>
<tr>
<td>Hand hygiene</td>
<td>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, rinses, 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.</td>
</tr>
<tr>
<td>Personal protective equipment (PPE)</td>
<td></td>
</tr>
<tr>
<td>• Gloves</td>
<td>For touching blood, body fluids, secretions, excretions, and contaminated items; for touching mucous membranes and nonintact skin</td>
</tr>
<tr>
<td>• Gown</td>
<td>During procedures and patient-care activities when contact of clothing/exposed skin with blood/body fluids, secretions, and excretions is anticipated</td>
</tr>
<tr>
<td>• Face/eye protection (e.g., surgical or procedure mask and goggles or a face shield)</td>
<td>During procedures and patient care activities likely to generate splash or spray of blood, body fluids, secretions, excretions</td>
</tr>
<tr>
<td>Safe work practices</td>
<td>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).</td>
</tr>
<tr>
<td>Patient resuscitation</td>
<td>Avoid unnecessary mouth-to-mouth contact; use mouthpiece, resuscitation bag, or other ventilation devices to prevent contact with mouth and oral secretions.</td>
</tr>
<tr>
<td>Soiled patient care equipment</td>
<td>Handle in a manner that prevents transfer of microorganisms to oneself, others, and environmental surfaces; wear gloves if visibly contaminated; perform hand hygiene after handling equipment.</td>
</tr>
<tr>
<td>Soiled linen and laundry</td>
<td>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.</td>
</tr>
<tr>
<td>Needles and other sharps</td>
<td>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.</td>
</tr>
</tbody>
</table>
**BOX 1. SUMMARY OF INFECTION CONTROL RECOMMENDATIONS FOR CARE OF PATIENTS WITH PANDEMIC INFLUENZA (cont.)**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>RECOMMENDATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STANDARD PRECAUTIONS (cont.)</strong></td>
<td>See <a href="http://www.cdc.gov/ncidod/hip/ISOLAT/std_prec_excerpt.htm">www.cdc.gov/ncidod/hip/ISOLAT/std_prec_excerpt.htm</a></td>
</tr>
<tr>
<td>Environmental cleaning and disinfection</td>
<td>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 rails, phones, lavatory surfaces).</td>
</tr>
<tr>
<td>Disposal of solid waste</td>
<td>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 waste containers; perform hand hygiene.</td>
</tr>
<tr>
<td>Respiratory hygiene/cough etiquette</td>
<td>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.</td>
</tr>
<tr>
<td>Source control measures for persons with symptoms of a respiratory infection; implement at first point of encounter (e.g., triage/reception areas) within a healthcare setting.</td>
<td>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.</td>
</tr>
<tr>
<td>Patient placement</td>
<td>Wear a surgical or procedure mask for entry into patient room; wear other PPE as recommended for standard precautions.</td>
</tr>
<tr>
<td>Personal protective equipment</td>
<td>Limit patient movement outside of room to medically necessary purposes; have patient wear a procedure or surgical mask when outside the room.</td>
</tr>
<tr>
<td>Patient transport</td>
<td>Follow standard precautions and facility procedures for handling linen and laundry and dishes and eating utensils, and for cleaning/disinfection of environmental surfaces and patient care equipment, disposal of solid waste, and postmortem care.</td>
</tr>
<tr>
<td>Other</td>
<td>During procedures that may generate small particles of respiratory secretions (e.g., endotracheal intubation, bronchoscopy, nebulizer treatment, suctioning), healthcare personnel should wear gloves, gown, face/eye protection, and a fit-tested N95 respirator or other appropriate particulate respirator.</td>
</tr>
</tbody>
</table>
**BOX 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.

Healthcare 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.
SUMMARY OF PUBLIC HEALTH ROLES AND RESPONSIBILITIES FOR CLINICAL GUIDELINES

S5-I. RATIONALE

S5-II. OVERVIEW

S5-III. CLINICAL GUIDELINES FOR THE INTERPANDEMIC AND PANDEMIC ALERT PERIODS

A. Criteria for evaluation of patients with possible novel influenza
   1. Clinical criteria
   2. Epidemiologic criteria

B. Initial management of patients who meet the criteria for novel influenza

C. Management of patients who test positive for novel influenza

D. Management of patients who test positive for seasonal influenza

E. Management of patients who test negative for novel influenza

S5-IV. CLINICAL GUIDELINES FOR THE PANDEMIC PERIOD

A. Criteria for evaluation of patients with possible pandemic influenza
   1. Clinical criteria
   2. Epidemiologic criteria

B. Initial management of patients who meet the criteria for pandemic influenza

C. Clinical management of pandemic influenza patients

Box 1. Risk of Novel Influenza in Persons with Severe Respiratory Disease or Influenza-like Illness during the Interpandemic and Pandemic Alert Periods

Box 2. Clinical Evaluation of Patients with Influenza-like Illness during the Interpandemic and Pandemic Alert Periods

Box 3. Special Situations and Exceptions to the Clinical Criteria

Box 4. Home Care Infection Control Guidance for Pandemic Influenza Patients and Household Members

Figure 1. Case Detection and Clinical Management during the Interpandemic and Pandemic Alert Periods

Figure 2. Case Detection and Clinical Management during the Pandemic Period

Table 1. Pandemic Influenza Infection Control Guidance for Healthcare Providers

Appendix 1. Clinical Presentation and Complications of Seasonal Influenza

Appendix 2. Clinical Presentation and Complications of Illnesses Associated with Avian Influenza A (H5N1) and Previous Pandemic Influenza Viruses

Appendix 3. Guidelines for Management of Community-acquired Pneumonia, Including Post-influenza Community-acquired Pneumonia
SUMMARY OF PUBLIC HEALTH ROLES AND RESPONSIBILITIES FOR CLINICAL GUIDELINES

INTERPANDEMIC AND PANDEMIC ALERT PERIODS

Healthcare providers:
- Be aware of case definitions; procedures for screening, infection control, and laboratory testing; and antiviral regimens for influenza A (H5N1) and other novel influenza viruses.
- Notify health departments about suspected/confirmed novel influenza cases and fatalities.
- Collect recommended specimens for diagnosis of novel influenza, and forward specimens to designated state and federal laboratories.

State and local public health agencies:
- Help educate healthcare providers about novel and pandemic influenza.
- Provide or facilitate testing and investigation of suspected novel influenza cases.
- Conduct follow-up of suspected novel influenza cases.

HHS agencies:
- Develop and disseminate recommendations on the use of influenza diagnostic tests, antiviral drugs, and vaccines during a pandemic (see also Supplement 6 and Supplement 7).
- Develop a national stockpile of antiviral drugs for use during a pandemic (see also Supplement 6).
- Work with partner organizations to discuss and resolve clinical issues related to pandemic influenza response.
- Assist ministries of health and WHO in characterizing cases of human infection with avian influenza A (H5N1) or other novel strains of influenza, particularly with regard to antiviral susceptibility, transmission parameters, and clinical outcomes.
- Work with state and local health departments to investigate and manage suspected cases of human infection with avian influenza A (H5N1) or other novel strains of influenza.
- Establish case definition and reporting mechanisms.

PANDEMIC PERIOD

Healthcare providers:
- Regularly consult updates on case definitions, screening, laboratory testing, and treatment algorithms for pandemic influenza.
- Report pandemic influenza cases or fatalities as requested by health departments.
- Collect recommended specimens for ongoing pandemic influenza surveillance, and forward specimens as requested to designated state and federal laboratories.
- Report atypical cases, breakthrough infections while on prophylaxis, or any other abnormal cases throughout the duration of the pandemic to public health agencies.
S5-I. RATIONALE

Healthcare providers play an essential role in the detection of an initial case of novel or pandemic influenza in a community. If implemented early, identification and isolation of cases may help slow the spread of influenza within a community. Clinical awareness of novel or pandemic influenza disease can also benefit the individual patient, as rapid diagnosis and initiation of treatment can avert potentially severe complications. Detection is complicated, however, by the lack of specific clinical findings and commercially available laboratory tests that can rapidly distinguish novel or pandemic influenza from seasonal influenza. In addition, neither the clinical characteristics of a novel or pandemic influenza virus strain nor the groups at highest risk for complications can necessarily be defined beforehand. Therefore, clinicians face significant challenges in: 1) quickly identifying and triaging cases, 2) containing the spread of infection, 3) beginning an efficient and comprehensive workup, 4) initiating antiviral and other supportive therapy, and 5) anticipating clinical complications.

S5-II. OVERVIEW

Supplement 5 provides clinical procedures for the initial screening, assessment, and management of patients with suspected novel influenza during the Interpandemic and Pandemic Alert Periods, and for patients with suspected pandemic influenza during the Pandemic Period. The Appendices include information on the clinical presentation and complications of seasonal influenza, the clinical features of infection due to avian influenza A (H5N1) virus and previous pandemic influenza viruses, and the management of patients with community-acquired pneumonia or secondary bacterial pneumonia during a pandemic. The guidance is current as of October 2005, and is subject to change as experience is gained. Updates will be provided, as needed, on the CDC website (www.cdc.gov/flu/).

During the Interpandemic and Pandemic Alert Periods, early recognition of illness caused by a novel influenza A virus strain will rely on a combination of clinical and epidemiologic features. During the Pandemic Period (in a setting of high community
prevalence), diagnosis will likely be more clinically oriented because the likelihood will be high that any severe febrile respiratory illness is pandemic influenza. During periods in which no human infections with a novel influenza A virus strain have occurred anywhere in the world (Interpandemic Period: Phases 1, 2; see Box 1), or when sporadic cases of animal-to-human transmission or rare instances of limited human-to-human transmission of a novel influenza A virus strain have occurred in the world (Pandemic Alert Period: Phases 3, 4), the likelihood of novel influenza A virus infection is very low in a returned traveler from an affected area who has severe respiratory disease or influenza-like illness. Since human influenza A and B viruses circulate worldwide among humans year-round, the possibility of infection with human influenza viruses is much higher and should be considered. Once local person-to-person transmission of a novel influenza A virus strain has been confirmed (Pandemic Alert Period: Phase 5), 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 (Box 1).

This supplement is designed to serve as a guide for clinicians, with the understanding that the management of influenza is based primarily on sound clinical judgment regarding the individual patient as well as an assessment of locally available resources, such as rapid diagnostics, antiviral drugs, and hospital beds. Early antiviral therapy shortens the duration of illness due to seasonal influenza and would be expected to have similar effects on illness due to novel or pandemic influenza viruses (see Supplement 7: Antiviral Drug Distribution and Use).¹

Clinical management must also address supportive care and management of influenza-related complications.

Other supplements that cover topics of potential interest to clinicians:
Supplement 1. Pandemic Influenza Surveillance
Supplement 2. Laboratory Diagnostics
Supplement 3. Healthcare Planning
Supplement 4. Infection Control
Supplement 6. Vaccine Distribution and Use
Supplement 7. Antiviral Drug Distribution and Use

S5-III. CLINICAL GUIDELINES FOR THE INTERPANDEMIC AND PANDEMIC ALERT PERIODS

During the Interpandemic and Pandemic Alert Periods, the primary goal of rapid detection is to quickly identify and contain cases of novel influenza. To limit the need to evaluate an overwhelming number of patients, the screening criteria should be specific, relying on a combination of clinical and epidemiologic features. Although febrile respiratory illnesses are one of the most common indications for medical evaluation, particularly during the winter, during the interpandemic and pandemic alert period, human cases of novel influenza are expected to be quite rare; laboratory diagnosis will most likely be sought for those with severe respiratory illness, such as pneumonia. The main features of detection and clinical management during the Interpandemic and Pandemic Alert Periods are outlined in Figure 1.

A. Criteria for evaluation of patients with possible novel influenza

The following criteria are based on the features of recent avian influenza A (H5N1) cases but are intended for use in evaluating suspected cases of infection with any novel influenza A virus strain. During the Pandemic Alert Period, human infections with novel influenza A viruses will be an uncommon cause of influenza-like illness; therefore, both clinical and epidemiologic criteria should be met. The criteria will be updated when needed as more data are collected.

¹ Information on HHS recommendations on the use of limited stocks of antiviral medications during a pandemic is provided in Supplement 7.
1. Clinical criteria

Any suspected cases of human infection with a novel influenza virus must first meet the criteria for influenza-like illness (ILI), defined as temperature of >38°C plus either sore throat or cough. Since lower respiratory tract involvement might result in dyspnea (shortness of breath), dyspnea should be considered as an additional criterion. Therefore, the full clinical criteria are: fever plus one of the following: sore throat, cough, or dyspnea.

Although recent infections with novel influenza viruses have resulted in severe respiratory illness, the next pandemic influenza virus strain might present with a different clinical syndrome (see Appendix 1 and Appendix 2). In such a situation, the clinical criteria will be modified accordingly and posted at www.cdc.gov/flu.

Given the large number of influenza-like illnesses that clinicians encounter during a typical flu season, laboratory evaluation for novel influenza A viruses during the Interpandemic and Pandemic Alert Periods is recommended only for:

- Hospitalized patients with severe ILI, including pneumonia, who meet the epidemiologic criteria (see below), or
- Non-hospitalized patients with ILI and with strong epidemiologic suspicion of novel influenza virus exposure (e.g., direct contact with ill poultry in an affected area, or close contact with a known or suspected human case of novel influenza).

(See Appendix 2, Supplement 2: Laboratory Diagnostics)

Recommendations for the evaluation of patients with respiratory illnesses are provided in Box 2. Exceptions to the current clinical criteria are provided in Box 3.

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 1 to 4 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.

Exposure risks—Exposure risks fall into two categories: travel and occupational.

- Travel risks

Persons have a travel risk if they have: 1) recently visited or lived in an area affected by highly pathogenic avian influenza A outbreaks in domestic poultry or where a human case of novel influenza has been confirmed, and either 2) had direct contact with poultry, or 3) 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), WHO (www.who.int/en/), and CDC (www.cdc.gov/flu/).

Direct contact with poultry is defined as: 1) touching birds (well-appearing, sick, or dead), or 2) touching poultry feces or surfaces contaminated with feces, or 3) consuming uncooked poultry products (including blood) in an affected area. 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.

Because specific testing for human infection with avian influenza A (H5N1) 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.

Clinicians should recognize that human influenza viruses circulate worldwide and year-round, including in countries with outbreaks of avian influenza A (H5N1) among poultry. Therefore, during the Interpandemic and Pandemic Alert Periods, 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 October 2005, such persons are currently more likely to have infection with human influenza viruses than with avian influenza A (H5N1) viruses.
• Occupational risks

Persons at occupational risk for infection with a novel strain of influenza include persons who work on farms or live poultry markets or who process or handle poultry infected with known or suspected avian influenza viruses, workers in laboratories that contain live animal or novel influenza viruses, and healthcare workers in direct contact with a suspected or confirmed novel influenza case.


During the Interpandemic and Pandemic Alert Periods, when there is no sustained human-to-human transmission of any novel influenza viruses, direct contact with animals such as poultry in an affected area or close contact with a case of suspected or confirmed human novel influenza—for any reason—is required for further evaluation. During the Pandemic Alert Period, Phases 3 and 4, the majority of human cases of novel influenza will result from avian-to-human transmission (see Box 1). Therefore, a history of direct contact with poultry (well-appearing, sick, or dead), consumption of uncooked poultry or poultry products, or direct exposure to environmental contamination with poultry feces in an affected area will be important to ascertain. During the Pandemic Alert Period, Phase 5, 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.

Other avian influenza A viruses — Although the epidemiologic criteria for novel influenza are based on recent human cases of avian influenza A (H5N1), they are intended for use in the evaluation of suspected cases of infection with any novel influenza A virus strain, including other avian influenza viruses. Other avian influenza A viruses that have caused human disease include the highly pathogenic viruses H7N7 and H7N3 and the low pathogenic viruses H9N2 and H7N2 (see Supplement 2, Box 3). Some of these human cases have occurred in Europe (Netherlands) and North America (Canada and the United States). Therefore, the same high-risk exposures defined above for avian influenza A (H5N1) also apply to other avian influenza A viruses. A strong epidemiologic link to an avian influenza outbreak in poultry—even in areas that have not experienced poultry outbreaks of avian influenza A (H5N1)—may raise the index of suspicion for human infection with avian influenza A viruses.

In the future, other animal hosts (in addition to poultry) or novel influenza A virus subtypes (in addition to H5N1) might become significantly associated with human disease. If such events occur, this guidance will be updated.

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, healthcare personnel should initiate the following activities:

• 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. Healthcare personnel should wear surgical or procedure masks on entering a patient’s room, as per Droplet Precautions, as well as gloves and gowns, when indicated for Standard Precautions (Table). 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).

• Notify the local and state health departments. 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). Designate one person as a point of contact to update public health authorities on the patient’s clinical status.

• Obtain clinical specimens for novel influenza A virus testing and notify the local and state health departments to arrange testing. Testing will likely be directed by public health authorities; current guidelines are provided in Supplement 2. Since the optimal specimens for detecting novel influenza A virus infections are currently unknown, if feasible, 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). Store specimens at 4°C in viral transport media until transported or shipped for testing. Acute (within 7 days of illness onset) and convalescent serum specimens (2–3 weeks after the acute specimen and at least 3 weeks after illness onset) should be obtained and refrigerated at 4°C or frozen at minus 20–80°C. Serological testing for novel influenza virus infection can be performed only at CDC.

Clinicians should immediately notify their local health departments of their intention to ship clinical specimens from suspected cases of human infection with avian influenza, to ensure that the specimens are handled under proper biocontainment conditions (see Supplement 2).

Novel influenza can be confirmed by RT-PCR or virus isolation from tissue cell culture with subtyping. RT-PCR for testing of novel influenza viruses cannot be performed by a hospital laboratory and is available only at state public health laboratories and CDC. 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.

Rapid influenza diagnostic tests and immunofluorescence (indirect fluorescent antibody staining [IFA] or direct fluorescent antibody staining [DFA]) may be used to detect seasonal influenza, but should not be used to confirm or exclude novel influenza during the Pandemic Alert Period. Rapid influenza tests have relatively low sensitivity for detecting seasonal influenza,2 and their ability to detect novel influenza subtypes 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 in clinical laboratories that perform a high volume of testing. Such tests can identify influenza A viruses but cannot distinguish between human infection with seasonal and novel influenza A viruses. A negative rapid influenza test result does not necessarily exclude human infection with either seasonal or novel influenza A viruses. A positive rapid influenza test result could be a false positive or represent infection with either seasonal or novel influenza A 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. Further information on rapid diagnostic testing is provided in Supplement 2.

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.

• 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). 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.

• 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 4). 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. 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 4).

• 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 the

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The sensitivity of the currently available tests for detecting novel influenza viruses in clinical specimens has not been thoroughly evaluated with a full range of specimen types. Consequently, false-negative test results may occur. Therefore, if test results are negative but the clinical and epidemiologic suspicion remains high, continuing antiviral treatment and isolation procedures should be considered. Test results might be negative for influenza viruses for several reasons. Some patients might 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, particularly in the absence of a strong epidemiologic link, if the alternative diagnosis is made using a test with a high positive-predictive value, and if the clinical manifestations are explained by the alternative diagnosis.

S5-IV. CLINICAL GUIDELINES FOR THE PANDEMIC PERIOD

During the Pandemic Period, the primary goal of rapid detection is to appropriately identify and triage cases of pandemic influenza. During this period, outpatient clinics and emergency departments might 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 (which may be in
short supply) and epidemiologic criteria. Nevertheless, 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 the Pandemic Period are outlined in Figure 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 ILI: temperature of >38°C plus either sore throat or cough. Since lower respiratory tract involvement might result in dyspnea (shortness of breath), dyspnea should be considered as an additional criterion. Therefore, the full clinical criteria are: fever 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 1 and Appendix 2). During a pandemic, updates on other clinical presentations will be provided at: www.pandemicflu.gov and www.cdc.gov/flu/.

Recommendations for general evaluation of patients with influenza-like illness are provided in Box 2. Exceptions to the clinical criteria are provided in Box 3.

2. Epidemiologic criteria
During the Pandemic Period, 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, healthcare personnel should initiate the following activities:

- Follow local and state health department recommendations on reporting for patients who meet the criteria for pandemic influenza. See Supplement 1 for guidance on case reporting during the Pandemic Period.
- If the patient is hospitalized, implement infection control precautions for pandemic influenza, including Respiratory Hygiene/Cough Etiquette (see Table and Supplement 4). Place the patient on Droplet Precautions for a minimum of 5 days from the onset of symptoms. Healthcare personnel should wear surgical or procedure masks on entering a patient’s room, as per Droplet Precautions, as well as gloves and gowns when indicated, as per Standard Precautions (Table). Once a pandemic is underway, hospital admission of patients should be limited to those with severe complications who cannot be cared for outside the hospital setting. 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 Table).
- Obtain clinical specimens for general evaluation, as clinically indicated (see Box 2). Once pandemic influenza has arrived in a community, influenza testing will likely not be needed for most patients. Laboratory testing in conjunction with health departments will likely be performed in a subset of pandemic influenza cases, however, as part of ongoing virologic surveillance to monitor the antigenic evolution of the strains for vaccine strain selection purposes (see Supplement 1). At the beginning or end of a pandemic outbreak in a community, diagnostic testing might aid cohorting decisions, but may be optional in the setting of high local prevalence. Influenza diagnostic testing should be considered before initiating treatment with antivirals (see Supplement 7). Guidelines for pandemic influenza virus testing are provided in Supplement 2.
As with seasonal influenza, RT-PCR and virus isolation from tissue culture will be the most accurate methods for diagnosing pandemic influenza. Generally, specimens should include combined nasopharyngeal aspirates or nasal swabs, and throat swabs, stored at 4°C in viral transport media. During the Pandemic Period, BSL-2 conditions should be sufficient for viral culture of clinical specimens from suspected pandemic influenza patients.

Rapid diagnostic tests for influenza and immunofluorescence may be helpful for initial clinical management, including cohorting and treatment (see above). However, rapid influenza tests 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. Because during a pandemic a negative rapid test may be a false negative, 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; however, in a setting of limited antiviral drug availability, treatment decisions in less high risk situations could be based on test results. 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. Further information on rapid diagnostic testing can be found in Supplement 2.

- **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 and Supplement 4.

An unstable patient will be considered a high priority for admission, but patients with high-risk conditions (see Appendix 1) might also warrant special attention, such as observation or close follow-up, even if disease is mild. On the other hand, home management with follow-up might be appropriate for well-appearing young children with fever alone. See Supplement 7 for inpatient and outpatient treatment strategies.

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 4). 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 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 (Box 4).

**C. Clinical management of pandemic influenza patients**

See Supplement 7 for current antiviral information and treatment strategies. In addition to use of antivirals, clinical management of severe influenza should address supportive care and the rapid identification and treatment of secondary complications. During the Pandemic Period, CDC may request virus isolates from persons who fail treatment or antiviral prophylaxis, as these strains may more likely be drug resistant. In addition, randomly collected isolates will be tested for resistance to establish nationwide rates (see Supplement 1).

Children aged <18 years with suspected or confirmed pandemic influenza should not be treated with aspirin or other salicylate-containing products because of an increased risk of Reye syndrome (characterized by acute encephalopathy and liver failure) in this age group.

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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.
The major clinical presentations and complications related to seasonal human influenza occur more commonly in persons with certain underlying medical conditions, such as chronic respiratory or cardiovascular disease and extremes of age, and are described in Appendix 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. A summary of the clinical presentations and complications associated with recent influenza A (H5N1) viruses is included in Appendix 2. In particular, post-influenza community-acquired pneumonia will likely be a commonly encountered complication, and clinicians will need to be aware of recommended methods for diagnosis and treatment. Guidance on the management of influenza-related pneumonia is presented in Appendix 3.
BOX 1. RISK OF NOVEL INFLUENZA IN PERSONS WITH SEVERE RESPIRATORY DISEASE OR INFLUENZA-LIKE ILLNESS DURING THE INTERPANDEMIC AND PANDEMIC ALERT PERIODS

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, 2: Interpandemic Period

A novel influenza A virus has been detected in animals but not in humans. During these phases, the risk of human infection with a novel influenza A virus strain 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.

Phases 3, 4: Pandemic Alert Period

A novel influenza A virus has been detected in humans through sporadic animal-to-human transmission in an affected area (e.g., direct contact with infected poultry), and few cases of limited, local human-to-human transmission have occurred (small clusters of cases). During these phases, the risk of human infection with a novel influenza A virus strain is very 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 5: Pandemic Alert Period

A novel influenza A virus has been detected in humans in larger clusters in an affected area, suggesting that the virus is becoming better adapted to spread among people. During this period, the risk of human infection with a novel influenza A virus strain is higher, depending on specific exposures, in persons living in or traveling to affected areas. Human infection with human influenza viruses or other viruses will occur and should still be considered.
Patients who require hospitalization for an influenza-like illness for which a definitive alternative diagnosis is not immediately apparent should be questioned about: 1) travel to an area affected by avian influenza A virus outbreaks in poultry, 2) direct contact with poultry, 3) close contact with persons with suspected or confirmed novel influenza, or 4) 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 A virus should be initiated as follows:

- Collect all of the following specimens: 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 hospital laboratories and must be performed at a qualified laboratory such as a state health department 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
- 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 (see Box 3).*

**Healthcare 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 Table and Supplement 4).**
BOX 3. SPECIAL SITUATIONS AND EXCEPTIONS TO THE CLINICAL CRITERIA

Persons with a high risk of exposure—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—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), WHO (www.who.int/en/), and CDC (www.cdc.gov/flu/).
BOX 4. HOME CARE INFECTION CONTROL GUIDANCE FOR PANDEMIC INFLUENZA PATIENTS AND HOUSEHOLD MEMBERS

Most patients with pandemic influenza will be able to remain at home during the course of their illness and can be cared for by family members or others who live in the household. Anyone who has been in the household with an influenza patient during the incubation period is at risk for developing influenza. A key objective in this setting is to limit transmission of pandemic influenza within and outside the home.

Management of influenza patients in the home

- 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 respiratory hygiene/cough etiquette (i.e., cover the mouth and nose when coughing and sneezing) and should wear a mask.

Management of other persons in the home

- Persons who have not been exposed to pandemic influenza and who are not essential for patient care or support should not enter the home while persons are still having a fever due to pandemic influenza.
- If unexposed persons must enter the home, they should avoid close contact with the patient.
- Persons living in the home with the patient with pandemic influenza should limit contact with the patient to the extent possible; consider designating one person as the primary care provider.
- Household members should be vigilant for the development of influenza symptoms. Consult with healthcare providers to determine whether a pandemic influenza vaccine, if available, or antiviral prophylaxis should be considered.

Infection control measures in the home

- All persons in the household should carefully follow recommendations for hand hygiene (i.e., hand washing with soap and water or use of an alcohol-based hand rub) after contact with an influenza patient or the environment in which they are receiving care.
- 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.
- 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 may 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 self-contamination. Hand hygiene should be performed after handling soiled laundry.
- Tissues used by the ill patient should be placed in a bag and disposed of with other household waste. Consider placing a bag for this purpose at the bedside.
- Environmental surfaces in the home should be cleaned using normal procedures.
Figure 1. Case Detection and Clinical Management During the Interpandemic and Pandemic Alert Periods

Situation: No human cases of novel influenza are present in the community. Human cases might be present in another country or another region of the United States.

**Clinical Criteria**
An illness with all of the following:
- Temperature >38° C, and
- Cough, sore throat, or dyspnea, and
- Requiring hospitalization; or nonhospitalized with epidemiological link

**Epidemiologic Criteria**
The clinician should ask the patient about the following within 10 days of symptom onset:
- History of recent travel to an affected area and at least one of the following:
  - Direct contact with poultry or poultry products, or
  - Close contact with a person with suspected or confirmed novel influenza, or
  - Close contact with a person who died or was hospitalized due to a severe respiratory illness
- Employment in an occupation at particular risk for novel influenza exposure, such as:
  - A health care worker in direct contact with a suspected or confirmed novel influenza case, or
  - A worker in a laboratory that contains live novel influenza virus, or
  - A worker in a poultry farm, live poultry market, or poultry processing operation with known or suspected avian influenza infection

If yes to either criterion
- Initiate Standard and Droplet Precautions
- Treat as clinically indicated
- Notify state or local health department about the case
- Initiate general work-up as clinically indicated
- Collect and send specimens for novel influenza virus testing to the state health department or CDC
- Begin empiric antiviral treatment
- Help identify contacts, including HCWs

If no to any, treat as clinically indicated, but reevaluate if suspicion

If no to both criteria, treat as clinically indicated, but re-evaluate if suspicion

Novel influenza positive by culture or RT-PCR
- Continue Standard and Droplet Precautions
- Continue antivirals
- Do not cohort with seasonal influenza patients
- Treat complications, such as secondary bacterial pneumonia, as indicated
- Provide clinical updates to health department

Seasonal influenza positive by culture or RT-PCR
- Continue Standard and Droplet Precautions
- Continue antivirals for a minimum of 5 days
- Treat complications, such as secondary bacterial pneumonia, as indicated

All influenza testing negative
- Continue infection control precautions, as clinically appropriate
- Treat complications, such as secondary bacterial pneumonia, as indicated
- Consider discontinuing antivirals, if considered appropriate
Footnotes to Figure 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 2).

2. Updated information on areas where novel influenza virus transmission is suspected or documented is available on the CDC website at www.cdc.gov/travel/other/avian_flu_h5n1_031605.htm and on the WHO website at 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/resphygiene.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 (Box 3). 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
   - 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 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 healthcare 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

FIGURE 2. CASE DETECTION AND CLINICAL MANAGEMENT DURING THE PANDEMIC PERIOD

Illness with both of the following:
- Temperature >38°C
- Cough, sore throat, or dyspnea

If no to either, treat as clinically indicated, re-evaluate if suspicion

Yes

- Initiate Standard and Droplet precautions
- Test for pandemic influenza virus in a subset of cases

Requires hospitalization?

Yes

- Admit to cohort or single room
- Initiate work-up, as clinically indicated
- Treat complications, such as secondary bacterial pneumonia, as clinically indicated
- Follow current antiviral treatment strategies
- Notify health department

No

- Give instructions to return if worsens
- Give instructions for home isolation and care
- Arrange home health care or other follow-up (if needed)
- Follow current antiviral treatment strategies
- Provide other supportive therapy as indicated

Situation: Pandemic influenza viruses are circulating in the community.
Footnotes to Figure 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/resphygiene.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
   - 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 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 3.

8. Strategies for the use of antiviral drugs are provided in Supplement 7.

9. Guidance on the reporting of pandemic influenza cases is provided 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 (Box 4). 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.
# Table 1. Pandemic Influenza Infection Control Guidance for Healthcare Providers

<table>
<thead>
<tr>
<th>Component</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Standard Precautions</strong></td>
<td>See <a href="http://www.cdc.gov/ncidod/hip/ISOLAT/std_prec_excerpt.htm">www.cdc.gov/ncidod/hip/ISOLAT/std_prec_excerpt.htm</a></td>
</tr>
<tr>
<td><strong>Hand hygiene</strong></td>
<td>Perform hand hygiene after touching blood, body fluids, secretions, excretions, and contaminated items; after removing gloves; between patient contacts. Hand hygiene includes both handwashing with either plain or antimicrobial soap and water and use of alcohol-based products (gels, rinses, 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 microbiocidal activity, reduced drying of the skin, and convenience.</td>
</tr>
</tbody>
</table>
| **Personal protective equipment (PPE)** | - For touching blood, body fluids, secretions, excretions, and contaminated items; for touching mucous membranes and nonintact skin  
- During procedures and patient-care activities when contact of clothing/exposed skin with blood/body fluids, secretions, and excretions is anticipated  
- During procedures and patient care activities likely to generate splash or spray of blood, body fluids, secretions, excretions                                                                 |
<p>| <strong>Safe work practices</strong>          | 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). |
| <strong>Patient resuscitation</strong>        | Avoid unnecessary mouth-to-mouth contact; use mouthpiece, resuscitation bag, other ventilation devices to prevent contact with mouth and oral secretions. |
| <strong>Soiled patient care equipment</strong> | Handle in a manner that prevents transfer of microorganisms to oneself, others and to environmental surfaces; wear gloves if visibly contaminated; perform hand hygiene after handling equipment. |
| <strong>Soiled linen and laundry</strong>      | 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. |
| <strong>Needles and other sharps</strong>     | 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. |</p>
<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>RECOMMENDATIONS</th>
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<tbody>
<tr>
<td><strong>STANDARD PRECAUTIONS (cont.)</strong></td>
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</tr>
<tr>
<td>Environmental cleaning and disinfection</td>
<td>Use EPA-registered hospital detergent-disinfec tant; follow standard facility procedures for cleaning and disinfection of environmental surfaces; emphasize cleaning/disinfection of frequently touched surfaces (e.g., bed rails, phones, lavatory surfaces).</td>
</tr>
<tr>
<td>Disposal of solid waste</td>
<td>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 waste containers and perform hand hygiene.</td>
</tr>
<tr>
<td>Respiratory hygiene/cough etiquette</td>
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<tr>
<td>Source control measures for persons with</td>
<td></td>
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<tr>
<td>symptoms of a respiratory infection;</td>
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<tr>
<td>implement at first point of encounter</td>
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<tr>
<td>(e.g., triage/reception areas) within a</td>
<td></td>
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<tr>
<td>healthcare setting.</td>
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<tr>
<td><strong>DROPLET PRECAUTIONS</strong></td>
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</tr>
<tr>
<td>Patient placement</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>*During the early stages of a pandemic, infection with influenza should be laboratory-confirmed, if possible.</td>
</tr>
<tr>
<td>Personal protective equipment</td>
<td>Wear a surgical or procedure mask for entry into patient room; wear other PPE as recommended for standard precautions.</td>
</tr>
<tr>
<td>Patient transport</td>
<td>Limit patient movement outside of room to medically necessary purposes; have patient wear a procedure or surgical mask when outside the room.</td>
</tr>
<tr>
<td>Other</td>
<td>Follow standard precautions and facility procedures for handling linen and laundry and dishes and eating utensils, and for cleaning/disinfection of environmental surfaces and patient care equipment, disposal of solid waste, and postmortem care.</td>
</tr>
</tbody>
</table>
Standard Precautions for home health care
Healthcare providers who enter homes where there is a person with an influenza-like illness should follow the recommendations for Standard and Droplet Precautions. Standard Precautions include performing hand hygiene and respiratory hygiene/cough etiquette, wearing gloves and gowns, using face/eye protection when needed; and following safe work practices.

Droplet Precautions for home health care
Healthcare providers who enter homes where there is a person with an influenza-like illness should follow the recommendations for Standard and Droplet Precautions. Droplet Precautions include all Standard Precautions plus separating the patient from others in the household as much as possible and wearing a surgical or procedure mask for patient interactions. Professional judgment should be used in determining whether to don a mask upon entry into the home or only on entering the patient’s room. Factors to consider in this decision include the possibility that others in the household may be infectious and the extent to which the patient is ambulating within the home.

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>AEROSOL-GENERATING PROCEDURES</th>
</tr>
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<tbody>
<tr>
<td>AEROSOL-GENERATING PROCEDURES</td>
<td>During procedures that may generate small particles of respiratory secretions (e.g., endotracheal intubation, bronchoscopy, nebulizer treatment, suctioning), healthcare personnel should wear gloves, gown, face/eye protection, and a fit-tested N-95 respirator or other appropriate particulate respirator.</td>
</tr>
</tbody>
</table>
APPENDIX 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. Appendix 2 includes a brief clinical summary of illnesses associated with previous influenza pandemics and with avian influenza A (H5N1) virus in humans.

Presentation

- 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.

Influenza is 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

No routine laboratory test results are specific for influenza. Leukocyte counts are variable, although thrombocytopenia and severe leukopenia 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 below).
Differential diagnosis

The fever and respiratory manifestations of seasonal influenza are not specific and can occur with several other pathogens, including respiratory syncytial virus (RSV), parainfluenza viruses, adenoviruses, human metapneumovirus, rhinoviruses, coronaviruses, and *Mycoplasma pneumoniae*. In contrast to influenza viruses, most of these pathogens do not usually cause severe disease, particularly in previously healthy adults. RSV and parainfluenza viruses can, however, 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.

The tendency for influenza to occur in community epidemics and to affect persons of all ages can sometimes allow the clinician to diagnose seasonal influenza with reasonable certainty in the absence of laboratory testing. Nevertheless, a definitive diagnosis requires laboratory testing. Rapid influenza diagnostic tests and immunofluorescence testing using a panel of respiratory pathogens have become increasingly available for aiding clinical management of patients with suspected influenza. Further information on diagnostic testing for influenza can be found at http://www.cdc.gov/flu/professionals/labdiagnosis.htm.

Complications

Groups at risk for complications of influenza

The following groups are currently recognized by the Advisory Committee on Immunization Practices (ACIP) to be at higher risk for complications of seasonal influenza (e.g., hospitalization; death) compared to healthy older children and younger adults:

- Persons aged ≥65 years
- Residents of nursing homes and other chronic-care facilities that house persons of any age who have chronic medical conditions
- Adults and children who have chronic disorders of the pulmonary or cardiovascular systems, including asthma
- Adults and children who required regular medical follow-up or hospitalization during the previous year because of chronic metabolic diseases (including diabetes mellitus), renal dysfunction, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medications or by infection with human immunodeficiency virus [HIV])
- Children and adolescents (aged 6 months–18 years) who are receiving long-term aspirin therapy (and are therefore at risk for Reye syndrome)
- Pregnant women
- All children aged <2 years
- All persons with conditions that can compromise respiratory function or the handling of respiratory secretions, or that can increase the risk of aspiration

Excluding the last group, in 2003 approximately 85 million persons in the United States belonged to one or more of these target groups.

Types of influenza complications

Exacerbations 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.

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Secondary bacterial pneumonia, another 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*.

Influenza virus infection can also result in a primary 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. Mixed viral-bacterial pneumonia 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.

Bronchiolitis due to influenza is more common in children, with a clinical picture similar to that of RSV or parainfluenza virus infections. Influenza is a cause of croup (laryngotracheobronchitis) in children, and, although influenza viruses are a less common etiology than other respiratory viruses, the illness can be more severe. 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.

Seasonal influenza can cause a range of cardiovascular complications, 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.

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.

Myositis related to influenza is another complication more commonly found in children, although more frequently associated with influenza B. Involvement may be limited to pain and weakness of the lower extremities but can progress to rhabdomyolysis and renal failure in some cases.

Among the neurologic complications associated with seasonal influenza, uncomplicated self-limited febrile seizures are the most common, usually occurring in younger children with high fever. 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. Guillain-Barre syndrome and transverse myelitis have been reported to occur in very rare instances after influenza, but no definite etiologic relationship has been established.

Reye syndrome is another serious neurologic complication associated with influenza. It 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.

Seasonal influenza can be associated with systemic complications, 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* has been reported. Toxic shock syndrome without bacterial co-infection has also been reported.
APPENDIX 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, 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, 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.

Whereas all patients described above presented with pulmonary symptoms, subsequently published case reports suggest that other clinical syndromes can occur with H5N1 infection. 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 healthcare community on a regular basis.

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APPENDIX 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*, 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.\(^9\)

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 the Interpandemic Period 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 than during the Interpandemic Period. 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) and the American Thoracic Society (ATS).\(^{10,11}\) For children, the guidance incorporates recommendations from the British Thoracic Society (BTS),\(^12\) a published review,\(^13\) and expert opinion.

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Prevention

Efforts to maximize vaccination coverage against *Streptococcus pneumoniae* is an important component of post-influenza bacterial community-acquired pneumonia prevention during the Interpandemic, Pandemic Alert, and Pandemic Periods. Current guidelines on the use of the 23-valent pneumococcal polysaccharide vaccine among adults and the 7-valent pneumococcal conjugate vaccine among children are available.\(^\text{14,15}\)

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,\(^\text{16,17}\) 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 the Pandemic Period 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 1) might also warrant special attention. Home management with follow-up might be appropriate for well-appearing young children with fever alone.

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<table>
<thead>
<tr>
<th>Patient Characteristic</th>
<th>Points Assigned</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographic Factor</strong></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>Number of years</td>
</tr>
<tr>
<td>Female</td>
<td>Number of years–10</td>
</tr>
<tr>
<td>Nursing home resident</td>
<td>+10</td>
</tr>
<tr>
<td><strong>Comorbid illnesses</strong></td>
<td></td>
</tr>
<tr>
<td>Neoplasic disease</td>
<td>+30</td>
</tr>
<tr>
<td>Liver disease</td>
<td>+20</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>+10</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>+10</td>
</tr>
<tr>
<td>Renal disease</td>
<td>+10</td>
</tr>
<tr>
<td><strong>Physical examination finding</strong></td>
<td></td>
</tr>
<tr>
<td>Altered mental status</td>
<td>+20</td>
</tr>
<tr>
<td>Respiratory rate &gt;30 breaths/minute</td>
<td>+20</td>
</tr>
<tr>
<td>Systolic blood pressure &lt;90 mm Hg</td>
<td>+20</td>
</tr>
<tr>
<td>Temperature &lt;35°C or &gt;40°C</td>
<td>+15</td>
</tr>
<tr>
<td>Pulse &gt;125 beats/minute</td>
<td>+10</td>
</tr>
<tr>
<td><strong>Laboratory and /or radiographic finding</strong></td>
<td></td>
</tr>
<tr>
<td>Arterial pH &lt;7.35</td>
<td>+30</td>
</tr>
<tr>
<td>Blood urea nitrogen &gt;30 mg/dl</td>
<td>+20</td>
</tr>
<tr>
<td>Sodium &lt;130mmol/l</td>
<td>+20</td>
</tr>
<tr>
<td>Glucose &gt;250 mg/dl</td>
<td>+10</td>
</tr>
<tr>
<td>Hematocrit &lt;30%</td>
<td>+10</td>
</tr>
<tr>
<td>Hypoxemia</td>
<td>+10</td>
</tr>
<tr>
<td>&lt;90% by pulse oximetry OR &lt;60mm Hg by arterial blood gas</td>
<td></td>
</tr>
<tr>
<td>Pleural effusion on baseline radiograph</td>
<td>+10</td>
</tr>
</tbody>
</table>
### TABLE 3. PNEUMONIA SEVERITY INDEX RISK CLASSIFICATION

<table>
<thead>
<tr>
<th>PSI Risk Class</th>
<th>Characteristics and Points</th>
<th>Recommended Site of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Age &gt;50 years + no comorbid conditions, normal range vital signs, normal mental status</td>
<td>Outpatient</td>
</tr>
<tr>
<td>II</td>
<td>&lt;70</td>
<td>Outpatient</td>
</tr>
<tr>
<td>III</td>
<td>71–90</td>
<td>Outpatient / Brief inpatient</td>
</tr>
<tr>
<td>IV</td>
<td>91–130</td>
<td>Inpatient</td>
</tr>
<tr>
<td>V</td>
<td>&gt;130</td>
<td>Inpatient</td>
</tr>
</tbody>
</table>

### TABLE 4. CURB-65 SCORING SYSTEM

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confusion(^1)</td>
<td>+1</td>
</tr>
<tr>
<td>Urea &gt;7mmol/l (20mg/dl)</td>
<td>+1</td>
</tr>
<tr>
<td>Respiratory rate &gt;30 breaths per minute</td>
<td>+1</td>
</tr>
<tr>
<td>Blood pressure (Systolic &lt;90 or diastolic &lt;60 mm Hg)</td>
<td>+1</td>
</tr>
<tr>
<td>Age &gt;65 years</td>
<td>+1</td>
</tr>
</tbody>
</table>

\(^1\) Based on a specific mental test or disorientation to person, place, or time.

### TABLE 5. RECOMMENDED SITE OF CARE BASED ON CURB-65 SYSTEM

<table>
<thead>
<tr>
<th>Number of Points</th>
<th>Recommended Site of Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–1</td>
<td>Outpatient</td>
</tr>
<tr>
<td>2</td>
<td>Admit to medical ward</td>
</tr>
<tr>
<td>3–5</td>
<td>Admit to medical ward or ICU</td>
</tr>
</tbody>
</table>
Diagnostic testing

Adults

Generally, the etiologies associated with CAP during the Interpandemic Periods will continue to occur during a pandemic. Familiarity with the appropriate use of available diagnostic tests is therefore a key feature of clinical preparedness.

- Draft IDSA-ATS guidelines recommend obtaining appropriate specimens for etiologic diagnosis whenever such an etiology would alter clinical care. Given that the most common etiologies of post-influenza bacterial community-acquired pneumonia—*S. pneumoniae* and *S. aureus*, including community-acquired methicillin-resistant *S. aureus* (CA-MRSA)—are treated differently, diagnostic testing should be performed to the extent feasible to distinguish among these pathogens.
- For hospitalized patients, blood cultures, pneumococcal urine antigen testing, and pleural fluid aspiration with Gram stain and culture should be considered.
- Because the diagnostic utility of sputum Gram stain and culture is highly dependent on patient and technical conditions, these are considered optional for hospitalized but non-severe patients.
- For patients admitted to an ICU, aspiration and Gram stain and bacterial culture of endotracheal secretions might also be useful.

Children

Diagnostic studies for identifying bacterial pneumonia in young children are severely limited.

- Blood cultures should be obtained from all children suspected of having post-influenza bacterial community-acquired pneumonia.
- Sputum samples are rarely useful in children, but tracheal or pleural fluid aspirates—if available—should be submitted for Gram stain and bacterial culture.
- If pleural effusions are present, they should be aspirated and submitted for Gram stain and culture.
- When feasible, antibiotic susceptibility testing of any bacterial isolates is encouraged to direct treatment.

Antibiotic treatment

Adults and children

Antibiotics, particularly those needed to treat CAP, will likely be in short supply during the Pandemic Period. Therefore, use of empiric therapy for all persons with post-influenza bacterial community-acquired pneumonia will likely not be feasible. Antimicrobial therapy will have to be driven by culture and susceptibility testing of appropriate clinical specimens and by awareness of local antibiotic susceptibility patterns. (See Figures 1 and 2.)

- A history of preceding influenza-like illness, especially when pandemic influenza is circulating in the community, might help to screen patients.
- Empiric therapy in adults should be directed toward the most likely etiologies of post-influenza bacterial community-acquired pneumonia.
- Concurrent antiviral treatment might also be beneficial, depending on the timing and presentation of illness (see Supplement 7).
Figure 3: Management of Community-Acquired Pneumonia during an Influenza Pandemic: Adults

Management of Community-acquired Pneumonia during an Influenza Pandemic: Adults

- **Site of Care**
  - Ward
  - Intensive Care Unit
  - Outpatient

- **Diagnostic testing**
  - Ward: Two sets of blood cultures, Influenza testing, Urine antigen testing (Pneumococcal +/- Legionella), Culture of pleural fluid if effusion present, Sputum gram stain & culture (optional)
  - Intensive Care Unit: Same as Ward PLUS Culture of adequate expectorated sputum specimen bronchoalveolar lavage fluid or endotracheal aspirate, Legionella urine antigen
  - Outpatient: Optional based on clinical judgment

- **Initial Empiric Antibiotic Therapy**
  - Narrow or broaden therapy based on: Results of diagnostic studies, Results of susceptibility testing, Clinical judgment

- **Tailor therapy to pathogen(s)**
  - Patients whose chest radiographs show no evidence of CAP should not be treated for CAP.
  - Pneumonia Severity Index (Fine et al. NEJM 1997; 336: 243–50).

- **Consider treatment with antibiotics**

- **Admit?**
  - Admit if clinically indicated

- **Possible oral antibiotic regimens for OUTPATIENTS include**
  - Previously healthy & no use of antimicrobials within the previous 3 months: macrolide or doxycycline.
  - Comorbidities or use of antimicrobials within previous 3 months (choose from a different class): fluoroquinolone, telithromycin, β-lactam PLUS a macrolide.
  - In regions with a high rate of “high-level” macrolide-resistant S pneumoniae: fluoroquinolone telithromycin.

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1. Patients whose chest radiographs show no evidence of CAP should not be treated for CAP.
4. Possible antibiotic regimens for WARD INPATIENTS include β-lactam PLUS macrolide PLUS either vancomycin or linezolid, Fluoroquinolone PLUS either vancomycin or linezolid.
5. Regimens for INTENSIVE CARE UNIT PATIENTS include those listed for WARD INPATIENTS but should include azithromycin or a fluoroquinolone.
FIGURE 4. MANAGEMENT OF COMMUNITY-ACQUIRED PNEUMONIA DURING AN INFLUENZA PANDEMIC: CHILDREN

Management of Community-acquired Pneumonia during an Influenza Pandemic: Children

<table>
<thead>
<tr>
<th>Site of Care</th>
<th>Possible Admission Criteria</th>
<th>Inpatient</th>
<th>Outpatient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient with community-acquired pneumonia (radiographically confirmed or clinically diagnosed)</td>
<td>Respiratory rate, Respiratory distress, Intermittent apnea, Blood pressure, Oxygen saturation, Poor feeding / dehydration, Clinical judgment</td>
<td>Influenza testing, Culture of pleural fluid if effusion or empyema present, Culture of bronchoalveolar lavage fluid or endotracheal aspirate, Sputum gram stain &amp; culture (optional)</td>
<td>Admit?</td>
</tr>
</tbody>
</table>

Inpatient: Consider treatment with antibiotics that will cover:
- *S. pneumoniae*
- *H. influenzae*
- Methicillin susceptible *S. aureus*
- Methicillin resistant *S. aureus*
- *M. pneumoniae, C. pneumoniae* (≤5 years of age)

Outpatient: Consider treatment with antibiotics that will cover:
- *S. pneumoniae*
- *H. influenzae*
- *M. pneumoniae, C. pneumoniae* (≥5 years of age)

Initial Empiric Antibiotic Therapy

Narrow or broaden therapy based on:
- Results of diagnostic studies
- Results of susceptibility testing
- Clinical judgment

Modify therapy and consider admission if clinically indicated

Possible Admission Criteria: Optional based on clinical judgment

Possible antibiotic regimens:
- **Outpatients include:**
  - Children ≤5 years of age: β-lactam (e.g. Amoxicillin, Amoxicillin/clavulanic acid, 3rd generation cephalosporin [cefotaxime, ceftriazone]) PLUS either vancomycin or linezolid.
  - Children ≥5 years of age: β-lactam (e.g. Amoxicillin, Amoxicillin/clavulanic acid) or a macrolide depending on clinical severity. *M. pneumoniae* & *C. pneumoniae* generally present with less severe illness than *S. pneumoniae* or *H. influenzae*.

2 Pulse oximetry should be performed for all children hospitalized with CAP.

3 Although chest radiography is not necessary to make the diagnosis in all pediatric patients with CAP, patients who do undergo chest radiography and whose radiographs show no evidence of CAP should not be treated for CAP.

4 Possible oral antibiotic regimens for OUTPATIENTS include:
  - Children ≤5 years of age: β-lactam (e.g. Amoxicillin, Amoxicillin/clavulanic acid).
  - Children ≥5 years of age: β-lactam (e.g. Amoxicillin, Amoxicillin/clavulanic acid) or a macrolide depending on clinical severity. *M. pneumoniae* & *C. pneumoniae* generally present with less severe illness than *S. pneumoniae* or *H. influenzae*.
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The roles and responsibilities of healthcare partners in vaccine distribution and use are described in Supplement 3.

INTERPANDEMIC AND PANDEMIC ALERT PERIODS

State and local health departments:
- Work with healthcare partners and other stakeholders to develop state-based plans for vaccine effectiveness, safety, distribution and use.

HHS agencies:
- Work with manufacturers to expedite public-sector vaccine purchasing contracts during a pandemic.
- 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) that may occur with mass influenza vaccination, and improve capacity for responding to them.
- Identify mechanisms and define protocols for conducting vaccine-effectiveness studies.
- Develop a system for monitoring state-specific vaccine coverage rates at regular intervals, using a pre-existing population-based survey.
- Develop reporting specifications for tracking data on vaccine administration and provide a vaccine database for optional use by states.
- Develop and distribute communication and education materials for use by states and other stakeholders.

PANDEMIC PERIOD

After the first reports of pandemic influenza are confirmed and before a pandemic vaccine becomes available

State and local health departments:
- If stockpiled vaccine of the pandemic subtype is available, work with healthcare partners and other stakeholders to distribute, deliver, and administer vaccines to designated groups.
- Mobilize healthcare partners, and prepare to activate state-based plans for distributing and administering vaccines.
- Keep the healthcare and public health workforce up-to-date on projected timelines for availability of vaccines against pandemic influenza.
- Review modifications, if any, to recommendations on vaccinating priority groups.
- Accelerate training in vaccination and vaccine monitoring for public health staff and for partners responsible for vaccinating priority groups.
PANDEMIC PERIOD (CONT.)

- Work with other governmental agencies and non-governmental organizations to ensure effective public health communications.

**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 (e.g., virulence, transmissibility, drug resistance, geographic spread, age-specific attack rates, morbidity and mortality rates).
- Provide state and local partners with guidance on reporting specifications for tracking administration of vaccine doses, to be used when vaccine becomes available.
- Provide state and local partners with guidance on Investigational New Drug (IND) and Emergency Use Authorization (EUA) procedures if new types of influenza vaccines for pandemic purposes are developed but not yet FDA approved.
- Provide guidance to state and local health departments on which adverse event reports are highest priority for investigation.
- Provide regulatory guidance to vaccine manufacturers for the manufacture and shipment of pandemic vaccines.

After a vaccine becomes available

**State and local health departments:**

- Work with healthcare partners and other stakeholders to distribute, deliver, and administer pandemic vaccines to priority groups.
- Monitor vaccine supplies, distribution, and use.
- Monitor and investigate adverse events.
- Phase-in vaccination of the rest of the population after priority groups have been vaccinated.
- Provide updated information to the public via the news media.
- Work with federal partners to evaluate vaccine-related response activities when the pandemic is over.

**HHS agencies:**

- Provide forecasts of pandemic vaccine availability from manufacturers.
- Continue to provide input into appropriate strain selection for seasonal influenza vaccine.
- Distribute public stocks of vaccines to state and large city health departments and to federal agencies with direct patient care responsibility, as needed.
- Implement protocols for assessing vaccine effectiveness.
- Monitor vaccine coverage rates.
S6-I. RATIONALE
The initial response to an influenza pandemic will include medical care, community containment and 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 priority lists
- Rapidly determining vaccine effectiveness
- Providing ongoing and timely monitoring of vaccine coverage
- Providing ongoing and timely monitoring of vaccine safety

S6-II. OVERVIEW
Supplement 6 provides recommendations to state and local partners and other stakeholders on planning for the different elements of a pandemic vaccination program. The recommendations for the Interpandemic and Pandemic Alert Periods focus on planning for vaccine distribution, vaccination of priority groups, monitoring of adverse events, tracking of vaccine supply and administration, vaccine coverage and effectiveness studies, communications, legal preparedness, and training. The recommendations for the Pandemic Period focus on working with healthcare partners to implement plans for vaccination against pandemic influenza and initiate monitoring activities.

The activities described below are primarily the responsibility of government health authorities at the state, federal, local, and tribal levels. Additional issues that might be of interest to healthcare partners that administer vaccine are addressed in Supplement 3.

S6-III. RECOMMENDATIONS FOR THE INTERPANDEMIC AND PANDEMIC Alert PERIODS

A. Vaccination against seasonal influenza virus strains
During the Interpandemic Period, state and local health departments should work with healthcare partners to enhance levels of 1) seasonal influenza vaccination in groups at risk for severe influenza and in healthcare workers, and 2) pneumococcal polysaccharide vaccination among those for whom it is recommended.

The success of the pandemic influenza vaccination program will be determined in large part by the strength of state and local vaccination programs during the Interpandemic Period. Higher annual vaccination rates will foster increased familiarity with
and public confidence in influenza vaccines, increased manufacturing capacity for influenza vaccines, and strengthened distribution channels. HHS is working with industry partners to ensure that influenza vaccine can be produced on an emergency basis at any time throughout the year (see Box 1).

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 Interpandemic Period and Pandemic Alert is the ideal time to deliver this preventive measure. Pneumococcal vaccine is indicated for most persons for whom influenza vaccine is recommended. For specific guidelines on the prevention of pneumococcal disease, please see the Recommendations of the Advisory Committee on Immunization Practices (ACIP) (http://www.cdc.gov/mmwr/pdf/rr/rr4608.pdf).

B. Preparedness planning for vaccination against a pandemic influenza virus

A limited amount of avian influenza A (H5N1) vaccine is being stockpiled and will be considered for early use in the event of an H5N1 pandemic. Development of vaccines against other strains with pandemic potential is also being considered. A monovalent vaccine directed against the circulating pandemic virus strain of influenza should begin to be available within 4–6 months after identification of the new pandemic virus strain (Box 1). 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 (µg) 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 any immunity. Preliminary results from a recent clinical trial of an H5N1 vaccine in healthy adults suggested that two doses of 90 µg were required. 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 (Part 1, Appendix D). After vaccination of these priority groups, vaccination of all those who desire it will be phased in depending on available supplies.

In working with healthcare partners to develop state-based plans for distributing vaccines, state and local health departments might use existing state-based plans for emergency mass distribution of medical supplies as the basis for developing local pandemic vaccination plans (e.g., smallpox and bioterrorism response plans).

1. Vaccination of priority groups

A list of priority groups for receiving vaccination and the rationale for prioritization is provided in Part 1, Appendix D, as interim recommendations. In addition, during a pandemic, changes may be made based on the characteristics of the causative virus (e.g., transmissibility, virulence, initial geographic distribution, age-specific attack rates, complication rates) and on vaccine effectiveness.

To prepare for vaccination of priority groups, state and local health departments should:

- Identify a process for reviewing national recommendations for pandemic influenza vaccination and developing state-specific modifications or refinements in priority groups, depending on local circumstances.
- Develop specific definitions for priority groups (e.g., public safety workers, essential service providers) identifying occupational categories and sub-categories, as needed, within each broad priority.
- Estimate the size of relevant priority groups.
- Develop a plan on how persons in priority groups would be identified at vaccination clinics and how vaccine would most efficiently be provided to those groups.
- Educate professional organizations and other stakeholders about the need for priority groups and the rationale for the groups currently recommended.
2. Vaccine production, procurement and distribution

HHS is working to expand pandemic influenza vaccine production capacity and will signal to manufacturers when to shift from annual to pandemic vaccine production and assure that pandemic vaccine is produced at full capacity.

At the onset of an influenza pandemic, HHS, in concert with the Congress in collaboration with the States, will work with the pharmaceutical industry to acquire vaccine directed against the pandemic strain. Distribution of pandemic vaccine to health departments and providers will occur via private-sector vaccine distributors or directly via manufacturer. (Only stockpiled pre-pandemic vaccine would be distributed by the federal government, if used.)

Each state and federal agency with direct patient care responsibility will receive available vaccine in proportion to the size of its population in defined priority groups. For priority groups that have been identified, state and local health departments should:

- Determine whether vaccine will be shipped directly from the manufacturer to vaccine providers or to public health clinics for further distribution
- Identify organizations that will provide vaccination to persons in priority groups (e.g., local health departments, occupational health clinics, private clinics identified by the employer or union of an occupational group)
- Identify contacts in and obtain written commitments from each clinic or facility responsible for vaccinating a priority group
- Work with these contacts to develop strategies for rapid distribution and administration of vaccines, taking into account vaccine security issues, cold chain requirements, and transport and storage issues
- Estimate the size of the priority groups that will be vaccinated based on extrapolation from national data or on local data, where available
- Identify locations for vaccination clinics that will be operated by health departments and enter into memoranda of agreement with organizations that agree to provide vaccinators or other staff
- Develop procedures for collecting, removing, and disposing of used syringes, needles, and other vaccination supplies
- Develop a plan for training vaccinators and other staff responsible for mass vaccination
- Develop strategies for vaccinating hard-to-reach populations

State and local health departments’ plans should also specifically address the delivery of pandemic vaccine to medically underserved 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, state and local health departments should:

- Develop mechanisms to allocate vaccine based on projected need.
- Develop mechanisms to collect unused vaccine (if any) from healthcare providers who have met their priority vaccination goals and distribute the vaccine to those who have not.
- Provide vaccination information to healthcare providers. This may best be accomplished by developing a communications plan for private-sector vaccine use.
- Monitor that vaccine administration follows existing plans on priority groups.

a) Second-dose vaccination

A vaccine against pandemic influenza will likely require two doses, administered at least a month apart, to provide a level of immunity comparable to that obtained with seasonal influenza vaccines. 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. State and local planners should do the following:

- Arrange for information about the need for a second dose to be provided at the time of vaccination.
- Ensure that planning for vaccine procurement and distribution to clinics and other facilities accounts for the need to use portions of future shipments for second doses, thus reducing the number of available first doses.
- Consider implementing a call-back system or immunization registry that would accomplish the goals of pandemic vaccination (see 3.b below).

b) Contingency planning for Investigational New Drug use

State and local health departments should 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 (http://www.access.gpo.gov/nara/cfr/waisidx_99/21cfr_99.html).

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/cber/gdlns/emeruse.pdf).

3. Vaccine monitoring and data collection

To ensure optimal use of a new pandemic influenza vaccine, state and local health departments should be prepared to collect data on vaccine effectiveness, vaccine supply and distribution, vaccine coverage, and vaccine safety.

a) Vaccine effectiveness

Vaccine effectiveness will be assessed by comparing rates of influenza-related illness, hospitalization, and/or death among vaccinated and unvaccinated persons. These studies will be implemented by CDC in collaboration with healthcare and university partners and with state and local health departments that participate in influenza surveillance systems.

b) Vaccine supply and distribution

Mechanisms for tracking vaccine supply and distribution will depend on how vaccine is purchased and distributed. Tracking will be implemented by state and local health authorities-who will have major responsibility for allocation decisions-working in association with CDC and vaccine producers. Data also will be obtained from vaccine producers and commercial distributors.

- 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.
• States with immunization registries may adapt them for use in tracking coverage with pandemic influenza vaccine. Or, states may use a vaccine database that will be supplied by CDC. At a minimum, tracking data should include:
  • Number of doses administered, by date and age, priority group, and state or county (or zip code)
  • Number of doses that represent second doses, as applicable
  • State and local authorities may consider additional data requirements for their own needs.

c) Vaccine coverage

CDC will work with states to develop a system for monitoring vaccination rates at regular intervals, using a 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.

d) Vaccine safety

State and local health departments should develop a system to report and investigate adverse events following immunization (AEFI) with a pandemic influenza vaccine. Planning steps might include:

• Designating a state-level coordinator to plan for and implement adverse-events reporting and outreach to and education of providers (e.g., adapting and distributing federally developed Dear Doctor letters and materials for vaccine recipients) and who will serve as the state’s contact with federal government staff overseeing the Vaccine Adverse Event and Reporting System (VAERS) (www.vaers.hhs.gov).

• Reviewing existing policies for AEFI reporting and follow-up to ensure timeliness of reporting.

• Developing a plan to ensure timely reporting of and communication about large numbers of AEFI reports.

• Reviewing procedures for and familiarizing program staff with the strengths, limitations, and objectives of VAERS. VAERS typically involves direct reporting by individual healthcare providers, with periodic feedback to the states. During a pandemic, some state health departments may wish to receive direct reports of AEFI to conduct investigations of adverse events and minimize duplicate reporting of adverse events to VAERS. State-level AEFI reporting can build on the infrastructure and experience developed during the 2003 smallpox vaccination program.

Adverse events related to use of IND vaccines may be reported through other mechanisms in addition to or in place of VAERS, in accordance with specific regulatory or policy requirements. Adverse events will also be monitored through the Vaccine Safety Datalink (www.cdc.gov/nip/vacsafe/default.htm#VSD), a network of seven geographically diverse health maintenance organizations through which active surveillance vaccine safety studies are conducted. Another potential resource for vaccine safety research is CDC’s Clinical Immunization Safety Assessment (CISA) network (www.vaccinesafety.org/CISA/index.htm).

4. Public health communications

The provision of vaccine information will be an important component of ongoing public health communication during a pandemic (see Supplement 10).

• State and local health departments should work with federal partners to disseminate accurate, useful, and consistent public health messages and should tailor information to local needs as indicated.

• Health departments should provide information to healthcare providers, state and local government officials, and the news media on:
  • Rationale for prioritization and list of priority groups (see Part 1, Appendix D)
  • Phasing of vaccination, if any, 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
• As noted above, state and local health departments should be prepared to disseminate information on vaccine use to healthcare providers who purchase private stocks of pandemic influenza vaccine. In addition, all vaccine providers will need vaccine information sheets that describe the risks and benefits of, and contraindications to, vaccination.

5. Coordination with bordering jurisdictions
State and local health departments should review and coordinate vaccine distribution plans with health authorities in bordering jurisdictions, including neighboring states, tribal governments and other unique populations.

6. Legal preparedness
State and local health departments should ensure that appropriate legal authorities are in place to facilitate implementation of plans for distributing pandemic influenza vaccines. Health departments might undertake these legal preparedness steps:

• Ensure that plans for distribution of vaccines are reviewed by appropriate legal authorities.
• Determine whether state and local laws allow non-licensed volunteers or healthcare workers from other jurisdictions to administer influenza vaccines.
• Work with professional organizations and unions to consider options for emergency performance of tasks outside of standard job descriptions.
• Determine whether state and local laws allow mandatory vaccination to the protect public health, if needed.

7. Training
State and local health departments can assist healthcare partners in conducting training exercises to facilitate rapid and effective delivery and use of vaccines (see Supplement 3). Exercises and drills are essential to ensure that emergency procedures are in place and that roles and responsibilities are well understood. It may be useful, for example, to practice emergency implementation of mass vaccination (e.g., receiving large quantities of vaccine; storing and handling vaccine; setting up and staffing clinics; administering vaccine; testing information management systems; educating the public, media, and medical providers; targeting specific priority groups).

S6-IV. RECOMMENDATIONS FOR THE PANDEMIC PERIOD

A. Before a vaccine is available
Before a vaccine becomes available—state and local health departments should do the following:

• Meet with partners and stakeholders to review the major elements of the state's vaccine distribution plan.
• Modify the plan to account for possible updated interim recommendations on priority groups, projected vaccine supplies and timelines for availability, and staffing estimates for mass vaccination.
• Notify the medical community about the status of the plan and the expected availability of vaccines.
• If stockpiled vaccine of the pandemic subtype is available, work with healthcare partners and other stakeholders to distribute, deliver, and administer vaccines to designated groups.
• Update and disseminate public information on the production, distribution, and use of pandemic influenza vaccine before it becomes available (see Supplement 10).
• Conduct training for public health staff and partners involved in distributing and administering vaccines.
B. When a vaccine becomes available

- Once a vaccine is ready for distribution, state and local health departments should work with healthcare and community partners to activate plans to:
  - Vaccinate persons in priority groups, in accordance with existing recommendations.
  - Provide a second dose, if required for immunity.
  - Monitor vaccine supply, distribution, and use.
  - Monitor and investigate adverse events.
  - Continue communication with partners and the public.

- After priority groups have been vaccinated and additional vaccine stocks become available, public health authorities should phase-in vaccination of the rest of the population, based on age or other criteria that will ensure fair, equitable, and orderly distribution (see III.B). HHS will issue national recommendations to aid in this process.

- After the pandemic has ended, state and local health departments should evaluate all response activities, including vaccine tracking and delivery, adverse event monitoring, and communications.
BOX 1. DEVELOPMENT OF VACCINES AGAINST PANDEMIC STRAINS OF INFLUENZA

HHS is working with industry partners to ensure that influenza vaccine can be produced on an emergency basis at any time throughout the year (http://www.HHS.gov/nvpo/pandemicplan/) and to facilitate the development of cell- and recombinant-based interpandemic and 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 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 is also spearheading the development of human vaccines against avian influenza A (H5N1) and against other influenza A viruses with pandemic potential. HHS is providing funding to develop and manufacture pilot investigational lots of these vaccines at licensed influenza vaccine manufacturers and to evaluate their safety and immunogenicity in NIH-sponsored clinical trials in healthy adult, elderly, and pediatric populations.

HHS is acquiring commercial scale lots of influenza A (H5N1) vaccine to provide vaccine manufacturers with experience initially and then to establish and maintain stockpiles of pre-pandemic H5N1 vaccine.
APPENDIX. RESOURCES FOR MASS VACCINATION AGAINST PANDEMIC INFLUENZA

- **Department of Health and Human Services**
  - Guidelines for large-scale influenza vaccination clinic planning. Developed by CDC’s National Immunization Program in response to the 2004 influenza vaccine shortage, this document was prepared to assist in planning for large vaccination clinics. It provides a general overview and guidelines for establishing and running a mass dispensing clinic (http://www.cdc.gov/flu/professionals/vaccination/pdf/vaxclinicplanning0405.pdf).
  - Guidelines for large-scale smallpox vaccination clinics. Although this document is specific to smallpox, most of the content is applicable to and can be adapted to other mass vaccination clinics (http://www.bt.cdc.gov/agent/smallpox/response-plan/files/annex-2.pdf).

- **Private-sector partners**
  - Community-based mass prophylaxis: a planning guide for public health preparedness. This report from Cornell University’s Weill Medical College describes the five components of a mass prophylaxis/vaccination response to an epidemic (http://www.ahrq.gov/research/cbmmprophyl/cbmmpro.htm).
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SUMMARY OF PUBLIC HEALTH ROLES AND RESPONSIBILITIES FOR ANTIVIRAL DISTRIBUTION AND USE

INTERPANDEMIC AND PANDEMIC ALERT PERIODS

State and local health departments will work with healthcare partners to:

- Use antivirals in medical management of cases of novel strains of influenza
- Procure and maintain local stockpiles of antiviral drugs
- Develop state-based plans for distribution and use of antiviral drugs during a pandemic

HHS responsibilities:

- In advance of an influenza pandemic, HHS, in concert with the Congress and in collaboration with the States, will acquire sufficient quantities of antiviral drugs to treat 25% of the U.S. population and, in so doing, stimulate development of expanded domestic production capacity sufficient to accommodate subsequent needs through normal commercial transactions.
- Develop national guidance on use of antivirals during a pandemic, including identification of priority groups for antiviral drug treatment and prophylaxis.
- Continue procurement and maintenance of national supplies of antivirals in the Strategic National Stockpile.
- Maintain a program to test and extend dating of stockpiled antivirals, as needed, based on demonstration of continued potency.
- Develop protocols for monitoring antiviral effectiveness, safety, and resistance during a pandemic.
- Develop and distribute communication and education materials about antivirals for use by states and other stakeholders.

PANDEMIC PERIOD

State and local health departments will work with healthcare partners to:

- Prepare to activate state-based plans for distributing and administering antivirals to persons in priority groups.
- Review modifications, if any, to interim recommendations on antiviral prophylaxis in selected groups or circumstances.
- Accelerate training on appropriate use of antiviral drugs among public health staff and healthcare partners.
- Work with other governmental agencies and non-governmental organizations to ensure effective public health communications.

HHS responsibilities:

- Revise recommendations for treatment and prophylaxis with antivirals for priority groups, if necessary, guided by accumulating data about the pandemic virus (e.g., susceptibility, virulence, transmissibility, geographic spread, and age-specific attack rates).
- Provide state, territorial and local health departments, and healthcare partners with guidance on reporting specifications for tracking distribution, effectiveness, and safety of antivirals.
S7-I. RATIONALE

Drugs with activity against influenza viruses (“antivirals”) include the adamantanes amantadine and rimantadine and the neuraminidase inhibitors oseltamivir and zanamivir (see Table 1 and Appendix). Appropriate use of these agents during an influenza pandemic may reduce morbidity and mortality and diminish the overwhelming demands that will be placed on the healthcare system. Antivirals might also be used during the Pandemic Alert Period in limited attempts to contain small disease clusters and potentially slow the spread of novel influenza viruses. A huge and uncoordinated demand for antivirals early in a pandemic could rapidly deplete national and local supplies. Preparedness planning for optimal use of antiviral stocks is therefore essential.
S7-II. OVERVIEW

Supplement 7 provides recommendations to state and local partners on the distribution and use of antiviral drugs for treatment and prophylaxis during an influenza pandemic. The Interpandemic and Pandemic Alert Period recommendations focus on preparedness planning for the rapid distribution and use of antiviral drugs (e.g., procurement, distribution to priority groups, legal preparedness, training, and data collection on use, effectiveness, safety, and the development of drug resistance). These recommendations also cover the use of antiviral drugs in the management and containment of cases and clusters of infection with novel strains of influenza, including avian influenza A (H5N1) and human strains with pandemic potential.

The Pandemic Period 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. National recommendations for optimal use of limited stocks of antivirals will be updated throughout the course of an influenza pandemic to reflect new epidemiologic and laboratory data. Interim recommendations will also be updated as an effective influenza vaccine becomes available.

The activities described below are primarily the responsibility of government health authorities at the state, federal, and local levels. Additional issues that may be of interest to healthcare partners who administer antiviral drugs are outlined in Supplement 3.

S7-III. RECOMMENDATIONS FOR THE INTERPANDEMIC AND PANDEMIC ALERT PERIODS

A. Use of antivirals in management of cases of novel influenza

Influenza infections may be due to:

1) Interpandemic (i.e., 'normal') seasonal strains of influenza

2) Novel strains of influenza that do not appear to be easily transmissible but could be precursors to human pandemic strains (e.g., avian influenza A [H5N1] viruses)

3) Novel strains of influenza that demonstrate person-to-person transmission and therefore have pandemic potential (e.g., a new human pandemic strain)

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.

1. Use of antivirals for treatment

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 the Pandemic Alert Period provided in Supplement 5. As of fall 2005, the recommendation for treatment includes the use of oseltamivir or zanamivir, administered as early as possible and ideally within 48 hours after onset of symptoms. These neuraminidase inhibitors are preferred because the majority of avian influenza A (H5N1) viruses currently affecting humans are resistant to amantadine and rimantadine, and resistance to these drugs typically develops rapidly when they are used for treatment of influenza. Although resistance to

1 Information on seasonal outbreaks of interpandemic influenza, including public health measures to contain outbreaks, can be found at http://www.cdc.gov/flu/.
zanamivir and oseltamivir can be induced in influenza A and B viruses in vitro, multiple passages in cell culture are usually required to produce neuraminidase inhibitor resistance, in contrast with adamantane resistance, which can develop after a single passage.2,3 Because the neuraminidase inhibitors have different binding sites for the enzyme, cross-resistance between zanamivir- and oseltamivir-resistant viruses is variable. Current U.S. recommended doses for antiviral treatment are provided in Table 2.

2. Use of antivirals for prophylaxis of contacts

State 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 postexposure antiviral prophylaxis.

Close contacts may include family, schoolmates, workmates, healthcare 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 healthcare 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

In special circumstances, state and local health departments could consider “targeted antiviral prophylaxis” as a community-based measure for containing small clusters of infection with novel strains of influenza (see Supplement 8). This measure could 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, its feasibility should be evaluated in light of antiviral drug supply and interim recommendations on antiviral drug use during a pandemic (see S7-III.B). 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.

B. Preparedness planning for use of antivirals during a pandemic

1. National recommendations on use of antivirals during a pandemic

HHS is working with private-sector partners to increase production of antivirals and to procure additional stocks of antivirals for the Strategic National Stockpile (SNS) (http://www.HHS.gov/nvpo/pandemicplan/). Despite these efforts, demand for antivirals during an influenza pandemic is likely to far outstrip supplies available in stockpiles or through usual channels of distribution.

- A list of priority groups for receiving antiviral treatment or prophylaxis and the rationale for prioritization are provided in Part 1 Appendix D. During an actual pandemic, these recommendations could 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. State-level planning

State and local health departments should work with healthcare partners to develop state-based plans for antiviral need, procurement, distribution, and targeted use. Materials of potential benefit in these efforts include:

- Strategies outlined in Box 1 for optimizing antiviral use in treatment and prophylaxis. These strategies are based on scientific findings summarized in the July 2005 recommendations of the Advisory Committee on Immunization Practices (ACIP). http://www.cdc.gov/mmwr/PDF/rr/rr5408.pdf
- Clinical treatment algorithms provided in Supplement 5
- Interim recommendations developed by NVAC on priority groups for prophylaxis and treatment (see Part 1, Appendix D)
- Existing plans for emergency distribution of medical supplies (e.g., bioterrorism plans or SARS plans)

State-based planning for antiviral use should include obtaining antiviral drugs from national, state, and local stockpiles, and their distribution to priority groups by healthcare providers; data collection on drug use, drug-related adverse events, and drug resistance; coordination with bordering jurisdictions; legal preparedness; training; and dissemination of public health information.

These planning efforts require coordination and collaboration with healthcare providers who will administer antivirals during a pandemic. Examples of collaborative planning activities include:

- Convening local or 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)
- Involving the local medical community (critical care, infectious disease, emergency medicine, and other specialties) in refining national guidelines for treatment and prophylaxis and providing information to the media and local populations on the appropriate use of antivirals
- Identifying contacts in tribal authorities and bordering states for coordinating distribution of antivirals (see below)

a) Procurement

Examples of planning steps for state-level procurement of antivirals include:

- Estimating the quantities of antiviral drugs that will be needed for treatment and prophylaxis of priority groups (see below)
- Identifying sources of antiviral drugs (e.g., state stockpiles, private sector, and federal supplies from the SNS). Drug procurement strategies might include:
  - Creating state or local stockpiles
  - Encouraging healthcare facilities to create institutional stockpiles
  - Making arrangements with local private-sector distributors for emergency purchase of antiviral drugs, if available

The establishment of state, local, or institutional stockpiles should take into account the expiration dates of the purchased material. All drugs are marked with an expiration date, based on review of stability data, at the time of manufacture. However, when purchased, the drugs might have been stored for some time in warehouses so that the time to expiration might be shorter than the time from initial manufacture to expiration date. Moreover, one shipment might consist of several batches with different expiration dates. Antivirals maintained in the national stockpile may be tested for potency and dating extended under the FDA shelf life extension program. Currently, state stockpiles are not included in this program.
b) Establishing priority groups

Based on interim recommendations on priority groups for antiviral treatment and prophylaxis (see Part 1, Appendix D), state and local health authorities should determine how certain priority groups (e.g., public safety workers, essential service providers, key decision makers) will be defined in their jurisdictions.

The Department of Defense (DoD) has purchased a supply of antivirals for use during a pandemic. Should the pandemic occur before the stockpile is received, DoD may require a portion of the national stockpile to treat or protect personnel in order to continue current combat operations and to preserve critical components of the military medical system. Should the military stockpile be exhausted and additional antiviral medication required to ensure national defense or continued support to civil authorities, use of antiviral drugs from the national stockpile may also be required.

c) Distributing and dispensing antivirals to priority groups

Planning steps for distribution of antivirals to priority groups might include:

- Estimating the size and needs of priority groups in local jurisdictions, using interim recommendations
- Assessing antiviral stocks available at the state, local, and hospital levels
- Establishing a mechanism to request antivirals from the federal stockpile, if needed (see below)
- Activating pre-existing plans for the transport, receipt, storage, security, tracking, and delivery of:
  - Antiviral stocks for use in treatment to hospitals, clinics, nursing homes, alternative care facilities, and other healthcare institutions. Prompt dispensing to point-of-care locations is crucial, because clinical efficacy for these agents has been demonstrated when treatment begins within 48 hours of the onset of symptoms.
  - Antiviral stocks for use in post-exposure prophylaxis (e.g., for direct contacts of infected patients)
  - Antiviral stocks for use in prophylaxis (e.g., if recommended for healthcare workers, public safety workers, and essential service providers)
- Considering the use of standing orders for treatment of certain priority groups, such as hospitalized patients and healthcare workers
- Developing a communication plan to explain the rationale for establishing these target groups (see also Supplement 10)

The decision to deploy federal assets from the SNS during an influenza pandemic will be made by HHS officials, as it would be during any public health emergency. Each state and federal agency with direct patient care responsibilities should designate a representative (e.g., the state epidemiologist or public health director) to make emergency requests for federal assets in the SNS.

Federal supplies of antivirals will be delivered to a site designated by state planners in each state or large city (e.g., state health department; existing SNS receipt, storage, staging site). State SNS coordinators should provide logistical guidance on the receipt and distribution of federal assets to priority groups.

d) Monitoring and data collection

To ensure optimal use of antiviral drugs during an influenza pandemic, state and local health departments and healthcare partners should work with federal officials and collect data on:

- Distribution of state or federal supplies of antiviral drugs
- Occurrence of adverse events following administration of antiviral drugs
State and local departments could also participate in federal efforts to collect data on:

- Effectiveness of treatment and prophylaxis
- Development of drug resistance

**1) Distribution.** Allocation and distribution of antiviral drugs from state and local health departments to drug delivery or dispensing sites will be established based on state and local pandemic plans. Health departments should develop strategies to monitor drug distribution and use, assessing whether drugs are being effectively targeted to priority groups and whether distribution is equitable within those groups (e.g., among racial and ethnic minorities and persons of different socioeconomic levels).

**2) Antiviral effectiveness.** Studies to evaluate the effectiveness of antiviral drug use during a pandemic will be conducted by federal agencies in collaboration with state and local health departments and other healthcare and academic partners. The effectiveness of antiviral therapy and prophylaxis will be assessed by comparing rates of severe influenza-related illness and death among treated and untreated persons and among persons who did and did not receive prophylaxis. Analyses of antiviral drug effectiveness should take into account characteristics that will vary among individuals and those that may vary over time, such as diagnostic practices, length of time to initiate therapy, and changes in the pandemic virus.

**3) Adverse events.** Serious adverse events associated with the use of antiviral drugs for prophylaxis and treatment of influenza should be reported to FDA, using the MedWatch monitoring program. During an influenza pandemic, state and local health departments can assist in this effort by providing protocols and information to healthcare providers and encouraging hospitals to download MedWatch forms (available at http://www.fda.gov/medwatch/) for distribution to patients. Adverse events reported to MedWatch are collated and analyzed by FDA’s Adverse Events Reporting System (AERS).

Use of antivirals will be much greater during a pandemic than during a regular influenza season. To help improve the detection of serious adverse effects (especially rare effects or effects in vulnerable populations), additional efforts to encourage recognition and reporting of adverse events will be needed. These efforts might include:

- Active monitoring for adverse events observed at emergency rooms, through the National Electronic Injury Surveillance System Cooperative Adverse Drug Event project (NEISS-CADE)
- Local campaigns to educate healthcare workers about the recognition and reporting of adverse events
- Distribution of MedWatch forms and descriptions of known adverse events to each end-user who receives antiviral drugs

In addition, CDC, FDA, and AHRQ will explore the use of existing drug-monitoring systems that have access to individual health utilization records that may allow active, population-based surveillance for adverse events following the use of antivirals for treatment or prophylaxis.

**4) Antiviral drug resistance.** CDC will work with state and local partners to monitor the development of resistance to antivirals. Because resistance to M2 inhibitors may involve a single base pair change, resistance may develop rapidly if these drugs are used widely. Information about resistance to M2 inhibitors and neuraminidase inhibitors can be found in the July 2005 recommendations of the ACIP http://www.cdc.gov/mmwr/PDF/rr/rr5408.pdf.

Global surveillance for neuraminidase resistance during a pandemic will also be conducted by the Neuraminidase Inhibitor Susceptibility Network (NISN). The global NISN was established in 1999 to address public health and regulatory concerns regarding the potential emergence and consequences of drug resistance in influenza viruses following the introduction of the influenza neuraminidase inhibitor (NI) class of antiviral agents. The Network includes representatives of each of the four WHO global influenza reference laboratories and scientists from regions of the world where increasing use of these drugs is anticipated.
 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). State and local health departments should encourage clinicians to obtain specimens from patients who develop severe disease while receiving treatment or prophylaxis. State health departments should provide these specimens on a periodic basis, preferably after testing them by RT-PCR, viral culture, or rapid diagnostic testing to confirm the presence of strains of influenza A (see Supplement 2).

Surveillance for antiviral resistance may be particularly important during the later stages of the pandemic, especially if M2 agents have been widely used. Under these circumstances, the detection of widespread M2 inhibitor resistance might require a re-evaluation of priorities for prophylaxis and treatment.

E) Coordination with bordering jurisdictions

State and local health departments should review and coordinate antiviral drug distribution plans with health authorities in bordering jurisdictions, including:

- Counties
- States
- Tribal governments and other unique populations

During an influenza pandemic, states should share details regarding their distribution of antivirals with bordering jurisdictions to optimize targeting of antiviral use and clarify, in advance, any apparent inconsistencies in proposed policies.

F) Legal preparedness

State and local health departments should ensure that appropriate legal authorities are in place to facilitate implementation of plans for distributing antivirals. For example, if a state plan includes a provision for the state health commissioner to issue a blanket prescription for dispensing of antivirals, then the state health officer will need the authority and the plan will need to be consistent with state prescription laws. In addition, legal issues may include reviewing worker's compensation laws to determine how they apply to healthcare workers and other essential workers who take antivirals for prophylaxis.

G) Training

State and local health departments should enhance training and education efforts related to use of antiviral drugs during a pandemic. Exercises that involve healthcare providers who will administer antivirals to individual patients are essential to ensure that distribution systems are in place and that roles and responsibilities are well understood. It may be useful, for example, to provide healthcare providers with educational materials and to practice emergency distribution of antiviral drugs to target groups.

H) Public health information

State and local health departments should 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
i) Contingency planning for Investigational New Drug (IND) use

State and local health departments should be prepared to distribute unlicensed antiviral drugs (if needed) under FDA’s Investigational New Drug (IND) provisions. IND provisions require strict inventory control and recordkeeping, 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). 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. http://www.access.gpo.gov/nara/cfr/waisidx_99/21cfr_99.html

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/cber/gdlns/emeruse.pdf

S7-IV. Recommendations for the Pandemic Period

Interim recommendations for use of antivirals may be updated 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, state and local health departments should:

- Use antiviral drugs in the management of persons infected with novel strains of influenza and their contacts, as described in S7-III.A or its updates.
- Work with healthcare partners to consider providing antiviral prophylaxis to persons at highest risk for pandemic influenza. Examples of such persons include:
  - Public health workers who investigate suspected cases of pandemic influenza
  - Meet with local partners and stakeholders to review the state-based antiviral drug distribution plan (see S7-III.B). As part of this effort, state and local partners could:
    - Modify the distribution plan to take into account possible updated recommendations on target groups and 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 that help minimize the development of drug resistance.
    - Provide the public with information on interim recommendations and their rationale for the use of antiviral drugs during an influenza pandemic.
    - 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, state and local health departments should:

- Activate state-based plans for targeting antiviral drugs to priority groups for prophylaxis and treatment (see S7-III.B).
• Request antiviral drugs, as needed, from previously identified sources (see S7-III.B), including the SNS.
• Continue to work with healthcare partners to ensure appropriate use of antivirals in the medical management of early cases and contacts (see S7-IV.A).
• Assist hospitals in implementing procedures for early detection and treatment of influenza in healthcare 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 transmission of pandemic influenza has become widespread, the paramount goals of antiviral use will be to treat those at highest risk of severe illness and death and to preserve the delivery of healthcare and other essential critical services through early treatment and limited prophylaxis.

After a vaccine becomes available, antiviral drugs may 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, state and local health departments should continue to work with healthcare and federal 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 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.
- Pooled analyses of clinical trials of neuraminidase inhibitors administered to outpatients with seasonal influenza suggest that early treatment may reduce the risk of hospitalization by ~50%. There are no data on the effectiveness of neuraminidase inhibitors in preventing either serious morbidity (e.g., requirement for intensive care) or mortality (see July 2005 recommendations of the AHIC (http://www.cdc.gov/mmwr/PDF/rr/rr5408.pdf ).
- Antiviral agents used against seasonal influenza have demonstrated efficacy in clinical trials when treatment is initiated within 48 hours of the onset of symptoms. Assuming that they have a similar level of effectiveness against pandemic influenza, rapid diagnosis, distribution and administration of antivirals during a pandemic will be essential.
- 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), and strains that may evolve from these viruses may become 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 inhibitors (amantadine and rimantadine). Neuraminidase inhibitors may also have a lower incidence of severe side effects (see July 2005 recommendations of the AHIC (http://www.cdc.gov/mmwr/PDF/rr/rr5408.pdf ). Oseltamivir and zanamivir should therefore be reserved for treatment whenever possible. Because supplies of oseltamivir and zanamivir are currently depleted, early depletion of oseltamivir and widespread use of M2 inhibitors could lead to increased rates of side effects and drug resistance.

2. Strategies for treatment

Treatment strategies for optimizing the use of limited stocks of antiviral drugs will vary depending on the phase of the pandemic. The following interim guidance will be updated as more information becomes available. Strategies for consideration include:

At all stages of a pandemic:

- Targeting therapy to influenza patients admitted to a hospital who present within 48 hours of symptom onset.
- Implementing mechanisms 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).
BOX 1. STRATEGIES FOR ANTIVIRAL USE IN PANDEMIC INFLUENZA TREATMENT AND PROPHYLAXIS (CONT.)

During the earliest stages of a pandemic in the United States:

- Basing treatment decisions on laboratory-confirmed subtype identification of the pandemic strain by viral isolation, RT-PCR, or other means recommended by CDC. 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.
- Interpreting negative results of influenza testing as permitting termination of treatment, given the overall low rate of infection in a particular community.
- Considering targeted use of antivirals to contain small, well-defined disease clusters, to possibly delay or reduce spread to other communities (see also Part C [below] and Supplement 8).

When there is increasing disease activity in the United States:

- Basing treatment decisions on:
  - Laboratory-confirmed identification of the pandemic subtype by viral isolation and subtyping, RT-PCR, or other means recommended by CDC, or
  - Detection of influenza A by rapid antigen test, or
  - Epidemiologic and clinical characteristics.
- Permitting initiation of antiviral treatment 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:

- Basing treatment decisions on clinical features and epidemiologic risk factors, taking into account updated knowledge of the epidemiology of the pandemic virus.

As the pandemic progresses, strategies for antiviral treatment may be revised as new information is obtained about the pandemic strain.

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, particularly with long-term use of M2 inhibitors
  - The need for antiviral prophylaxis may decrease once an effective pandemic influenza vaccine becomes available for use among healthcare workers and other groups receiving prophylactic antivirals.
BOX 1. STRATEGIES FOR ANTIVIRAL USE IN PANDEMIC INFLUENZA TREATMENT AND PROPHYLAXIS (CONT.)

- Post-exposure prophylaxis might be useful in attempts to control small, well-defined disease clusters (e.g., outbreaks in long-term care facilities [see section C below]). A study of post-exposure prophylaxis using amantadine—conducted during the 1968 pandemic—demonstrated little effectiveness, possibly due to rapid development of resistance (see July 2005 recommendations of the AHIC (http://www.cdc.gov/mmwr/PDF/rr/rr5408.pdf).

- Oseltamivir has demonstrated >70% efficacy as prophylaxis against laboratory-confirmed febrile influenza illness during interpandemic periods in unimmunized adults (see July 2005 recommendations of the AHIC (http://www.cdc.gov/mmwr/PDF/rr/rr5408.pdf).

- Prophylaxis with amantadine or rimantadine decreased the risk of influenza illness during the 1968 pandemic and the 1977 reappearance of H1N1 viruses (see July 2005 recommendations of the AHIC (http://www.cdc.gov/mmwr/PDF/rr/rr5408.pdf).

- 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 frontline 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 should be reserved for prophylaxis, although drug resistance may emerge quickly.

- Rimantadine is preferred over amantadine, because it is associated with a lower incidence of serious side effects (see July 2005 recommendations of the AHIC (http://www.cdc.gov/mmwr/PDF/rr/rr5408.pdf). Strains that are resistant to one M2-class antiviral are likely resistant to the other.

2. Strategies for prophylaxis

Strategies for effective use of antiviral prophylaxis during a pandemic include:

- Targeting prophylaxis to priority groups (see Part 1, Appendix D for interim recommendations) throughout the first wave of the pandemic. 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 (see part C above).
  - Protect individuals with a known recent exposure to a pandemic virus (e.g., household contacts of pandemic influenza patients).

When a vaccine becomes available, post-exposure prophylaxis may also be used to protect key personnel during the period between vaccination and the development of immunity.

Strategies for antiviral prophylaxis may be revised as the pandemic progresses, depending on supplies, on what is learned about the pandemic strain and on when a vaccine becomes available.
BOX 1. STRATEGIES FOR ANTIVIRAL USE IN PANDEMIC INFLUENZA TREATMENT AND PROPHYLAXIS (CONT.)

C. Strategies for Combined Treatment and Prophylaxis

During the Pandemic Alert Period, combined antiviral treatment for ill persons and targeted post-exposure prophylaxis of contacts might be considered in attempts to contain small disease clusters (e.g., institutional outbreaks or household introductions). The potential use of targeted prophylaxis to contain disease clusters is considered 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. Additional human data on the safety of these agents in the treatment of influenza in young children are needed.

Oseltamivir is available as an oral suspension for use in children. This formulation of oseltamivir may not be available in sufficient supply during a pandemic to treat all pediatric patients. If physicians consider opening 75 mg oseltamivir capsules and using the contents in an attempt to deliver a partial, pediatric dose to children, it must be recognized that there are insufficient data on palatability, stability, and dosing consistency to predict the safety or effectiveness of such unapproved use. Additional study of these issues is needed.
BOX 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. As of October 2005, the SNS (http://www.bt.cdc.gov/stockpile/) contained 2.26 million treatment regimens of oseltamivir (capsules and suspension), 5 million treatment regimens of rimantadine (tablets and syrup), and 84,000 treatment regimens of zanamivir. Two million additional oseltamivir courses will be delivered to the SNS by November 2005 and additional purchases of antivirals are pending.

The details of the HHS approach for allocation and distribution of SNS assets during an influenza pandemic are currently under consideration. State and local health departments and federal agencies with direct patient care responsibilities should begin to:

- Develop plans to allot antivirals to healthcare 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 healthcare workers.
- Consider the use of standing orders for the prescription of antivirals, particularly for use in healthcare workers.
- Consider the use of occupational health clinics in hospitals and other healthcare organizations for delivery of antivirals to healthcare workers.

It is not recommended that individuals, fearing a pandemic, stockpile oseltamivir in homes or that healthcare providers prescribe oseltamivir to individuals for prophylaxis against pandemic influenza. At the present time, quantities are insufficient to address all of the interim pre-determined groups, and thus stockpiling oseltamivir will take away limited resources from those with highest priority.
TABLE 1. CHARACTERISTICS OF ANTI-INFLUENZA ANTIVIRAL DRUGS

<table>
<thead>
<tr>
<th>Inhibits</th>
<th>Acts on</th>
<th>Administration</th>
<th>Common Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amantadine</td>
<td>M2 ion channel</td>
<td>Influenza A</td>
<td>Oral</td>
</tr>
<tr>
<td>Rimantadine</td>
<td>M2 ion channel</td>
<td>Influenza A</td>
<td>Oral</td>
</tr>
<tr>
<td>Oseltamivir</td>
<td>Neuraminidase</td>
<td>Influenza A and B</td>
<td>Oral</td>
</tr>
<tr>
<td>Zanamivir</td>
<td>Neuraminidase</td>
<td>Influenza A and B</td>
<td>Inhaler</td>
</tr>
</tbody>
</table>

These agents differ in mechanisms of action, pharmacokinetics, FDA-approved indications, dosages, cost, and potential for emergence of drug resistance (see July 2005 recommendations of the AHIC (http://www.cdc.gov/mmwr/PDF/rr/rr5408.pdf ).

The neuraminidase inhibitors and rimantadine are superior to amantadine with regard to the frequency of serious side effects.

The use of M2 inhibitors, particularly for treatment, is likely to lead to the emergence and spread of drug-resistant influenza viruses.
### TABLE 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), July 2005)*

<table>
<thead>
<tr>
<th>Antiviral Agent</th>
<th>1–6</th>
<th>7–9</th>
<th>10–12</th>
<th>13–64</th>
<th>≥65</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amantadinea</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment, influenza A</td>
<td>5mg/kg body weight/day up to 150 mg in two divided doses&lt;sup&gt;a&lt;/sup&gt;</td>
<td>5mg/kg body weight /day up to 150 mg in two divided doses&lt;sup&gt;b&lt;/sup&gt;</td>
<td>100 mg twice daily&lt;sup&gt;c&lt;/sup&gt;</td>
<td>100 mg twice daily&lt;sup&gt;c&lt;/sup&gt;</td>
<td>≤100 mg/day</td>
</tr>
<tr>
<td>Prophylaxis, influenza A</td>
<td>5mg/kg body weight /day up to 150 mg in two divided doses&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5mg/kg body weight /day up to 150 mg in two divided doses&lt;sup&gt;b&lt;/sup&gt;</td>
<td>100 mg twice daily&lt;sup&gt;c&lt;/sup&gt;</td>
<td>100 mg twice daily&lt;sup&gt;c&lt;/sup&gt;</td>
<td>≤100 mg/day</td>
</tr>
<tr>
<td><strong>Rimantadined</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment, influenza A</td>
<td>NA&lt;sup&gt;f&lt;/sup&gt;</td>
<td>NA</td>
<td>NA</td>
<td>100 mg twice daily&lt;sup&gt;g&lt;/sup&gt;</td>
<td>100 mg/day</td>
</tr>
<tr>
<td>Prophylaxis, influenza A</td>
<td>5m/kg body weight /day up to 150 mg in two divided doses&lt;sup&gt;b&lt;/sup&gt;</td>
<td>5mg/kg body weight /day up to 150 mg in two divided doses&lt;sup&gt;b&lt;/sup&gt;</td>
<td>100 mg twice daily&lt;sup&gt;c&lt;/sup&gt;</td>
<td>100 mg twice daily&lt;sup&gt;c&lt;/sup&gt;</td>
<td>100 mg/day&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td><strong>Zanamiviri,j</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment, influenza A and B</td>
<td>NA</td>
<td>10 mg twice daily</td>
<td>10 mg twice daily</td>
<td>10 mg twice daily</td>
<td>10 mg twice daily</td>
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<td><strong>Oseltamivir</strong></td>
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</tr>
<tr>
<td>Treatment, influenza A and B</td>
<td>dose varies by child’s weight&lt;sup&gt;f&lt;/sup&gt;</td>
<td>dose varies by child’s weight&lt;sup&gt;f&lt;/sup&gt;</td>
<td>dose varies by child’s weight&lt;sup&gt;f&lt;/sup&gt;</td>
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</tr>
<tr>
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<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>75 mg/day</td>
<td>75 mg/day</td>
</tr>
</tbody>
</table>

**NOTE:** Amantadine manufacturers include Endo Pharmaceuticals (Symmetrel (R)–tablet and syrup) and Geneva Pharms Tech (Amantadine HCL–capsule); USL Pharma (Amantadine HCL–capsule and tablet); and Alpharma, Carolina Medical, Copley Pharmaceutical, HiTech Pharma, Mikart, Morton Grove, and Pharmaceutical Associates (Amantadine HCL–syrup), and Sandoz. Rimantadine is manufactured by Forest Laboratories (Flumadine (R)–tablet and syrup); Corepharma, Impax Labs (Rimantadine HCL–tablet), and Amide Pharmaceuticals (Rimantadine HCL–tablet). Zanamivir is manufactured by GlaxoSmithKline (Relenza (R)–inhaled powder). Oseltamivir is manufactured by Roche Pharmaceuticals (Tamiflu (R)–tablet). Information based on data published by the U.S. Food and Drug Administration at [www.fda.gov](http://www.fda.gov), accessed 3/30/2005.
a The drug package insert should be consulted for dosage recommendations for administering amantadine to persons with creatinine clearance \( \leq 50 \text{ ml/min/1.73m}^2 \).

b 5 mg/kg body weight of amantadine or rimantadine syrup = 1 tsp/2.2 lbs.

c Children aged \( \geq 10 \) 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 \( \leq 10 \text{ mL/min} \). 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.

gh 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 \( \geq 65 \) 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 \( <30 \text{ mL/min} \).

I The dose recommendation for children who weigh \( \leq 15 \) 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.
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S8-I. RATIONALE

The initial response to the emergence of a novel influenza subtype that spreads between people should focus on containing the virus at its source, if feasible, and preventing a pandemic. Once spread beyond the initial focus occurs and with 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. For the purposes of this document, containment measures refer to measures that attempt to fully limit transmission as well as those that attempt to slow transmission. 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 snow days). Guided by epidemiologic data, state and local authorities will implement the most appropriate of these measures in efforts to maximize impact on disease transmission and minimize impact on individual freedom of movement. HHS will provide assistance to states and localities as requested, including sharing experience of others and providing advice on decision-making as the situation evolves. 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 USC 264), the 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 Pandemic Alert Period 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 measures (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.

Although there are few data from past pandemics to guide containment efforts, the potential effectiveness of strictly implemented movement restrictions is supported by historical accounts that describe the use of such measures in American Samoa and in some Alaskan villages during the pandemic of 1918–1919. American Samoa banned inbound and outbound travel and mail service and (unlike Western Samoa) remained influenza-free. In Alaska, quarantine and isolation measures apparently delayed introduction of pandemic influenza into the Alaskan interior for several months, and some isolated villages were completely spared. Today, much more extensive international and domestic travel and the interdependence between communities make it unlikely that strict restrictions could be effectively imposed and that, except in unique settings, communities could prevent outbreaks from occurring. Preliminary mathematical modeling results suggest that travel restrictions would need to be about 99% effective to delay introduction into a country by one to two months. Based on these results, the goals of containment activities during a pandemic should be to slow the spread of disease early after introduction into the U.S. and to limit the number of persons who become infected in community outbreaks throughout the pandemic.
S8-II. OVERVIEW

Supplement 8 provides recommendations to state and local partners on the use of disease containment strategies to prevent or decrease transmission at different phases of an influenza Pandemic Alert Period and Pandemic Period. Recommendations for the Interpandemic and Pandemic Alert Periods focus on preparedness planning for implementation of containment measures. They also outline actions that may be taken during the earliest stage of a pandemic when the first potential cases or disease clusters are detected. In this setting, individual-level containment measures (e.g., patient isolation and identification, monitoring, quarantine of contacts) may be useful in slowing the spread of pandemic influenza and may be used without causing undue strain on limited public health and other healthcare resources.

Recommendations for the Pandemic Period focus on measures that may be beneficial and practical when there is a large number of cases and extensive viral transmission. In such a setting, individual-level measures may no longer be effective or feasible (e.g., if most contacts cannot be traced in time to prevent further exposures; if staffing constraints make contact tracing impractical). In this setting, state and local health departments might consider measures that decrease social contact within groups or whole communities (e.g., self-shielding, cancellation of public events, snow days, quarantine of groups of exposed persons, widespread community quarantine). Effective use of community containment measures during a pandemic will require periodic assessment of the properties of the pandemic virus and the distribution and clinical presentation of the cases. Guidance on containment recommendations will be updated, as needed.

S8-III. RECOMMENDATIONS FOR THE INTERPANDEMIC AND PANDEMIC ALERT PERIODS

A. Community preparedness for implementation of pandemic influenza containment measures

Both individual and community-based containment measures raise legal, logistic, and social challenges that should be addressed during the Interpandemic Period. This section provides information on planning for disease control and containment, legal preparedness, planning for potential use of influenza hotlines (preparing for influenza clinics is discussed in Supplement 3), and the role of communications in preparing the public to accept the possible need for restrictive measures to reduce the spread of pandemic influenza. Appendix 2 provides additional guidance on these topics, as well as on preparedness activities related to management of cases and contacts, non-hospital-based isolation of cases, and implementation of community containment measures. Information on hospital preparedness for patient isolation is provided in Supplement 3.

1. Planning for disease control and containment

Experience during the 2003 SARS outbreak (Appendix 3) suggests that local officials will face logistic, economic, ethical, legal, social, and psychological challenges in implementing disease control and containment measures during a Pandemic Alert and Pandemic Period. Although individual quarantine as a control measure is likely only to be used during the Pandemic Alert and very early during the Pandemic Period—for example, among communities where initial cases are introduced into the U.S.—all state and local health departments and tribal authorities should anticipate and 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 Appendix 2):

- Identifying and engaging traditional partners (e.g., public health and healthcare workers) and non-traditional community partners (e.g., transportation workers) and inviting them to participate in preparedness planning and in pandemic influenza containment 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

2. Legal preparedness

States, localities, and tribes have primary responsibility for public health matters within their borders, including isolation and quarantine. Current quarantine laws, regulations, and enforcement procedures vary widely from state to state. Many of these laws date to the 19th century. In response to a request from CDC, the Center for Law and the Public’s Health at Georgetown and Johns Hopkins universities has developed a draft Model State Emergency Health Powers Act (www.publichealthlaw.net/MSEHPA/MSEHPA2.pdf) to assist state and local health agencies in reviewing emergency public health powers to ensure they are adequate to respond to modern disease and bioterrorism concerns.

Under the authority of Section 361 of the Public Health Service Act (42 USC 264), the 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. Under authority delegated by the HHS Secretary, the CDC Director may isolate and quarantine persons who have been exposed to or are infected with certain specified communicable diseases and are arriving into the United States from a foreign country or traveling from one state or possession into another (42 CFR 71.32(a) & 42 CFR 70.6). The communicable diseases for which individuals may be subject to federal quarantine are specified in an Executive Order of the President, upon recommendation of the HHS Secretary in consultation with the Surgeon General. The most recent Executive Order is Executive Order 13295 of April 4, 2003, as amended by Executive Order 13375 of April 5, 2005. The April 5 amendment added influenza that is causing or has the potential to cause a pandemic to the list of federal quarantinable diseases (http://www.cdc.gov/ncidod/dq/index.htm). In addition, under section 311 of the PHS Act (42 USC 243), HHS may cooperate with and aid state and local authorities in the enforcement of their quarantine and other health regulations.

New International Health Regulations (IHR) were recently adopted by the World Health Assembly, which requires member states to report cases of human infection caused by a new subtype. When WHO has determined that a particular event constitutes a public health emergency, the IHR require WHO to make a “real-time” response to the emergency. Based on the details specific to the emergency, the Director General of WHO will recommend measures for implementation by the affected state as well as by other states. These time-limited recommendations are made available to states and, subsequently, made public. Depending on the evidence, recommended measures could be modified or ended.

3. Planning for influenza clinics and hotlines

An influenza pandemic is likely to put great stress on the healthcare delivery system, in particular emergency departments. To prevent overwhelming demand from compromising the function of emergency departments, healthcare providers, organizations, and public health authorities should consider optimal methods for delivering assessment and care to individuals with probable influenza. This may include designating certain offices or clinics or otherwise discrete areas for screening, triage, and care of individuals with influenza-like illness. While the large majority of outpatient care during a pandemic will be provided by patients’ usual medical care practitioner, health authorities may decide to establish special facilities (influenza clinics) to provide rapid medical assessment of potentially infected persons, as part of efforts to control and contain small,
well defined disease clusters (see S8-III.C), or in geographical areas that are medically underserved. Ill persons will be encouraged to call special influenza hotlines that provide advice on whether to stay home or to seek medical care. Local public health systems supporting hotlines as triage and information systems must be aware of the healthcare resources available in the community. These “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. Preparedness planning for establishing influenza hotlines includes:

- Establishing telephone hotline numbers that people can call to report specific symptoms (e.g., fever) that will be specified by the state health department and CDC
- Identifying sites, staff members, and volunteers
- Developing protocols for hotline staff members that include training components and triage decision trees or algorithms
- Establishing communication systems with influenza clinics, if they are established

Organization of outpatient care in a community and potential establishment of influenza clinics is discussed in Supplement 3.

4. Public understanding of disease containment measures

Community preparedness for implementation of both individual and community control measures can be enhanced during the Interpandemic Period by improving public understanding of the dangers of pandemic influenza and the benefits of community-wide disease control practices, including social-distancing measures that can prevent illness and death (Appendix 4). Strategies for disease control will be facilitated by clear communication of the rationale for—and duration of—containment measures.

Local public health education campaigns that involve community partners can build public confidence in the ability to cope with an influenza pandemic. Partners may include schools, faith-based organizations, community-based organizations, and other “civil society” institutions that can help educate the public and provide support to families and persons who are incapacitated by illness.

Local public health campaigns should explain how individual action (e.g., strict compliance with respiratory hygiene, staying home when ill) and community efforts (e.g., implementation of snow days and self-shielding) can help reduce disease transmission. Education campaigns can 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. They can also explain that quarantine—which temporarily restricts personal movement—is a collective action implemented for the common good. In addition, they can allay public concerns about privacy issues related to the provision of medical information to healthcare workers and public health officials. These key messages should be translated and modified as required to address the cultural and linguistic needs of local neighborhoods.

Key messages prepared for use during the Interpandemic Period can be adapted for use during an actual pandemic (see Appendix 5 and Supplement 10.)

5. 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 transmission (see Appendix 3). This idea is in accordance with data from modeling studies that suggest that quarantine and other community-based measures may be effective even if compliance is less than perfect. Nevertheless, states, localities, and tribes should be prepared to enforce individual and community-based containment measures, if needed. The role of other Federal agencies in enforcing community containment measures will be detailed in the Federal Pandemic Influenza Plan.

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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 avian or animal influenza strains that can infect humans (like influenza A [H5N1]) and new or reemergent human viruses that cause cases or clusters of human disease. Guidance on the detection and identification of persons who might be infected with novel strains of influenza is provided in Supplement 1. Guidance on the clinical management of persons with novel influenza infection is provided in Supplement 5.

The choice of measures to contain the spread of novel strains of influenza during the Pandemic Alert Period will vary depending on the assessment of risk, as reflected in the three Pandemic Alert Phases described by WHO (Box 2).

1. Patient isolation

Infection control precautions and procedures for isolating influenza patients—at home or in a residence, community facility, or hospital—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 6.

The state or local health department, in consultation with federal agencies, will advise the healthcare provider and healthcare facility on additional steps that may be taken, before and after laboratory test results become available, via the state public health laboratory or CDC.

2. Management of close contacts

In most situations—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, especially during the later phases of the WHO Pandemic Alert Period (Box 2), 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 avian influenza A (H5N1) or another novel strain of influenza in travelers on airplanes or cruise ships about to arrive in the United States (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 local and/or state public health departments, in consultation with CDC, taking into consideration:

- 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 (as reflected in the designated Pandemic Alert phase)
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 healthcare providers. Management of contacts might include passive or active monitoring without activity restrictions and/or quarantine at home or in a designated facility. In the Pandemic Alert Period, especially during Phase 3 or 4 when little or limited person-to-person transmission has been documented, 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.

Contacts who are quarantined should be monitored by a health department official (or designee) at least once a day—by phone or in person—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. 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 disease. (Experience with seasonal influenza suggests the incubation period is 1-4 days, with an average length of 2 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 1-10 days. For the purposes of this document, 10 days is referred to as the incubation period; however, public health authorities should be prepared to adjust the time frame as more is known about the virus.) Additional information on monitoring and evaluating persons in quarantine is provided in Appendix 6.

3. Data collection

Public health officials or designees should collect information on cases and contacts, including:

- Number of contacts identified per case
- Information on each contact:
  - Relationship to the case-patient
  - Nature and time of exposure
  - Whether the contact was vaccinated or on antiviral prophylaxis
  - Underlying medical conditions
- Number of contacts (including any in quarantine) that become ill
- Number of days between onset of symptoms and reporting to health officials

These data will guide decision-making on whether to implement more stringent containment measures.

C. Containment of small clusters of infection with novel strains of influenza

Community-based control measures that state and local health officials might use to contain small clusters of infection with novel strains of influenza (during the later Pandemic Alert phases or when cases are first introduced into the U.S.) 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 state 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 because they are most effective when provided within 48 hours of symptom onset or when used as post-exposure prophylaxis before onset of illness.

2. Influenza hotlines and clinics

During the later phases of a Pandemic Alert, 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 instructions from the state health department and CDC. 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 referral, or proceed to a neighborhood influenza clinic established by local public health and healthcare authorities.

Healthcare workers at the clinic will determine whether the patient’s symptoms are likely due to pandemic influenza, to a different contagious disease, or to a noncontagious condition. If a person is judged likely to be infected with pandemic influenza, they will be referred for isolation and care as needed.

The establishment of hotlines and influenza clinics requires preparation to identify sites and personnel and to facilitate the procurement and distribution of thermometers and other supplies. Clinic personnel should be prepared to keep records and report cases, as requested, by state health departments and CDC.

S8-IV. RECOMMENDATIONS FOR THE PANDEMIC PERIOD

During the Pandemic Period, 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, state and local health departments should consider measures that decrease social contact within groups or whole communities (e.g., self-shielding, cancellation of public events, snow days) and measures that individuals can take personally to decrease their risk of infection.

Box 2 outlines measures that may be employed at different stages of a pandemic, as disease becomes more widespread. These begin with containment activities for individuals and move on, as needed, to community-based measures. Depending on the specific circumstances of an epidemic, these steps may not necessarily be taken in sequential order.

A. Containment measures for individuals

1. Patient isolation

As noted above, a patient with a suspected or confirmed case of pandemic influenza should be separated from persons who are well, using infection control measures described in Supplement 4. If a surge in patients overwhelms healthcare capacity or if home isolation is not feasible, health departments may need to use alternative facilities for isolation of influenza patients. Guidance on use of alternative facilities for isolation of influenza patients is provided in Appendix 7.

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, health authorities should consider community-based measures that reduce disease transmission by increasing social distance.
B. Community-based containment measures

If disease transmission in the community is significant and sustained, state and local public health authorities should consider implementing community-based containment measures. CDC will promote an active process of engagement and discussion to help states and localities decide what actions to take as the situation evolves. 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 1 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 local 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 has fallen 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 cruise ship or other closed conveyance (see also Supplement 9)
  - At their school or workplace
- Healthcare 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 healthcare providers and health officials. However, many levels of government (local, state, federal) have the basic legal authority to compel mandatory isolation and quarantine of individuals and groups when necessary to protect the public’s health (see below). Recommendations for quarantine and monitoring of quarantined persons in different situations (home quarantine, quarantine in a designated facility, working quarantine) are provided in Appendix 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)

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)
- Snow days and self-shielding
- Closure of office buildings, shopping malls, schools, and public transportation (e.g., subways, buses; see Supplement 9)
- Widespread community quarantine (cordon sanitaire)

Measures that affect whole communities should 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 Box 3). Community-based measures may also include school closures, snow days, and self-shielding.

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, religious services, public meetings) when pandemic 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 healthcare 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 healthcare worker’s 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 healthcare workers who necessarily have close contact with ill patients, the general public should try to avoid close contact with ill individuals.
Nevertheless, persons may choose to wear a mask 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 and those who are unable to avoid close contact with others or must travel for essential reasons such as seeking medical care. 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 healthcare settings where the importance and effectiveness of this use has been documented.

b) Snow days and self-shielding
Implementation of “snow days”—asking everyone to stay home—involves the entire community in a positive way, is acceptable to most people, and is relatively easy to implement. Snow days may be instituted for an initial 10-day period, with final decisions on duration based on an epidemiologic and social assessment of the situation. States and local authorities may wish to consider recommendations to the public for acquisition and storage of necessary provisions including type and quantity of supplies needed during snow days. Snow days can effectively reduce transmission without explicit activity restrictions (i.e., quarantine). Consideration should be given to personnel who maintain primary functions in the community (e.g., law enforcement personnel, transportation workers, utility workers [electricity, water, gas, telephone, sanitation]). Compliance with snow days might be enhanced by “self-shielding” behavior (i.e., many people may stay home even in the absence of an official snow day ["reverse quarantine"]).

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. All of these have significant impact on the community and workforce, however, and careful consideration should be focused on their potential effectiveness, how they can most effectively 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 a Pandemic Period, parents should be encouraged to consider child care arrangements that do not result in large gatherings of children outside the school setting.

d) Widespread community quarantine (cordon sanitaire)
In extreme circumstances, public health officials may consider the use of widespread or community-wide quarantine, which is the most stringent and restrictive containment measure. Strictly speaking, "widespread community quarantine" is a misnomer, since "quarantine" refers to separation of exposed persons only and (unlike snow days) usually allows provision of services and support to affected persons. Like snow days, widespread community quarantine involves asking everyone to stay home. It differs from snow 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 healthcare workers.

Implementation of this measure during a pandemic is unlikely to prevent the introduction or spread of pandemic disease except in uncommon or unique circumstances (such as in a community able to be completely self-sufficient). In many cases, other less restrictive approaches such as snow days can be implemented to slow disease spread or decrease its magnitude in
a community. Because of this, *cordon sanitaire* is not recommended during a pandemic unless a community is in a setting where it is likely to be applied effectively and has planned with neighboring jurisdictions how such an approach would be implemented and maintained during a pandemic.

3. Scaling back community containment measures

The decision to discontinue community-level measures must 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. Decisions should 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)

General recommendations are to withdraw the most stringent or disruptive measures first (e.g., widespread community quarantine, snow days, mass transit interruptions).
**Box 1. Containment measures: terms and definitions**

**Isolation** is the separation and restriction and 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; healthcare 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, healthcare 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 the closing of community borders or the erection of a real or virtual barrier around a geographic area (a cordon sanitaire) with prohibition of travel into or out of the area.

**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).

**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., snow days, establishment of fever clinics, and community-wide quarantine).
## BOX 2. GRADED IMPLEMENTATION OF COMMUNITY CONTAINMENT MEASURES

<table>
<thead>
<tr>
<th>Level of influenza activity</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>No novel influenza strains of public health concern in global circulation</td>
<td>Preparedness planning</td>
</tr>
<tr>
<td>Limited novel influenza virus(^2) transmission abroad; all local cases are either imported or have clear epidemiologic links to other cases</td>
<td>Quarantine of close contacts</td>
</tr>
<tr>
<td>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</td>
<td>Quarantine of close contacts</td>
</tr>
<tr>
<td>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</td>
<td>Focused measures to increase social distance;(^3) consider community-based measures</td>
</tr>
<tr>
<td>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</td>
<td>Community-level measures to increase social distance; consider snow days and community-wide quarantine</td>
</tr>
<tr>
<td>Decreases in the number of new cases, unlinked (or “unexpected”) cases, and generations of transmission</td>
<td>Quarantine of contacts</td>
</tr>
<tr>
<td>Transmission has been controlled or eliminated; no new cases reported</td>
<td>Active monitoring in high-risk populations; continue for 2-3 incubation periods after control or elimination of transmission.</td>
</tr>
</tbody>
</table>

\(^2\) “Novel influenza viruses” include avian or animal influenza strains that can infect humans (like avian influenza A [H5N1]) and new or reemergent human viruses that cause cases or clusters of human disease.

\(^3\) “Focused 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 1. 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, state and local departments may also evaluate social considerations, such as levels of community cooperation and mobility.

<table>
<thead>
<tr>
<th>Potential parameters</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cases and contacts</strong></td>
<td>Number of cases (absolute or estimated)</td>
</tr>
<tr>
<td></td>
<td>Rate of incident cases</td>
</tr>
<tr>
<td></td>
<td>Number of hospitalized cases</td>
</tr>
<tr>
<td></td>
<td>Number and percentage of cases with no identified epidemiologic link</td>
</tr>
<tr>
<td></td>
<td>Morbidity (including disease severity) and mortality</td>
</tr>
<tr>
<td></td>
<td>Number of contacts under surveillance and/or quarantine</td>
</tr>
<tr>
<td><strong>Healthcare resources</strong></td>
<td>Hospital/facility bed capacity</td>
</tr>
<tr>
<td></td>
<td>Staff resources</td>
</tr>
<tr>
<td></td>
<td>Patient/staff ratio</td>
</tr>
<tr>
<td></td>
<td>Number of ill or absent staff members</td>
</tr>
<tr>
<td></td>
<td>Availability of specifically trained specialists and ancillary staff members</td>
</tr>
<tr>
<td></td>
<td>Availability of ventilators</td>
</tr>
<tr>
<td></td>
<td>Availability of other respiratory equipment</td>
</tr>
<tr>
<td></td>
<td>Availability of personal protective equipment and other measures</td>
</tr>
<tr>
<td></td>
<td>Availability of therapeutic medications</td>
</tr>
<tr>
<td></td>
<td>(influenza and non-influenza specific)</td>
</tr>
<tr>
<td><strong>Public health resources</strong></td>
<td>Investigator to case and contact ratios</td>
</tr>
<tr>
<td></td>
<td>Number of contacts under active surveillance</td>
</tr>
<tr>
<td></td>
<td>Number of contacts under quarantine</td>
</tr>
<tr>
<td></td>
<td>Ability to rapidly trace contacts (number of untraced/interviewed contacts)</td>
</tr>
<tr>
<td></td>
<td>Ability to implement and monitor quarantine (staff member to contact ratio)</td>
</tr>
<tr>
<td></td>
<td>Ability to provide essential services (food, water, etc.)</td>
</tr>
<tr>
<td><strong>Community cooperation, mobility, and compliance</strong></td>
<td>Degree of compliance with voluntary individual isolation</td>
</tr>
<tr>
<td></td>
<td>Degree of compliance with active surveillance and voluntary individual quarantine</td>
</tr>
<tr>
<td></td>
<td>Degree of movement out of the community</td>
</tr>
<tr>
<td></td>
<td>Degree of compliance with community-containment measures</td>
</tr>
</tbody>
</table>
APPENDIX 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 Pandemic Period, when quarantining individuals and tracing close contacts may not be possible. The range of interventions includes the following:

**Passive Monitoring**

*Definition*  
The contact is asked to perform self-assessment at least twice daily and to contact authorities immediately if respiratory symptoms and/or fever occur.

*Application*  
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

*Benefits*  
Requires minimal resources  
Places few constraints on individual movement

*Challenges*  
Relies on self-reporting  
Affected persons may not perform an adequate self-assessment

*Resources Required*  
Supplies (thermometer; symptom log; written instructions)  
Hotline to notify authorities about symptoms or needs  
Staff to receive telephone reports and provide in-person evaluation and care  
Plans and procedures for rapid isolation of persons who develop symptoms

*Partners*  
Household members

*Forms/Templates*  
Symptom logs  
Instructions for patients and healthcare workers

**Active Monitoring without Explicit Activity Restrictions**

*Definition*  
A healthcare 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

*Application*  
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

*Benefits*  
Places few constraints on individual liberties

*Challenges*  
Requires adequate staffing  
Requires a system to track information and to verify monitoring and appropriate actions based on findings

*Resources Required*  
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
Active Monitoring with Activity Restrictions (Quarantine)

**Definition**
The contact remains separated from others for a specified period (up to 10 days after potential exposure), during which s/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 healthcare provider. Restrictions may be voluntary or legally mandated; confinement may be at home or in an appropriate facility.

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.

**Application**
Situations in which the risk of exposure and subsequent development of disease is high and the risk of delayed recognition of symptoms is moderate.

**Benefits**
Reduces risk of spread from persons with subacute or subclinical presentations or from delayed recognition of symptoms.

**Challenges**
May infringe on personal movement
May lead to a feeling of isolation from family and friends
May lead to loss of income or employment
Requires plans/protocols for provision of essential services
Requires plan for provision of mental health support
Risk of noncompliance, particularly as duration increases
May require enforcement for noncompliance

**Resources Required**
Staff for monitoring and evaluation
Appropriate facility if home setting is unavailable or inadequate
Staff, funding, and goods for provision of essential services
Hotline for notification of symptoms or personal needs
Mechanisms to communicate with family members outside the household or facility
Mental health and social support services
Delivery systems for food and other essential supplies

**Partners**
Professional and lay healthcare workers to perform assessments on behalf of the health department
Community volunteers/workers to assist with provision of essential services
Potential need for law enforcement to assist with noncompliant persons
Forms/Templates

- Checklist for active monitoring
- Template for recording results of clinical evaluation
- Checklist and guidelines for evaluation of homes for quarantine
- Checklist and guidelines for evaluation of community-based sites for quarantine
- Guidelines for monitoring compliance with home quarantine
- Guidelines for monitoring compliance with quarantine in community-based facilities
- Forms for recording compliance with quarantine

Examples

- Home quarantine (voluntary or mandatory)
- Facility quarantine (voluntary or mandatory)

Working Quarantine

Definition

Employees are permitted to work but must observe activity restrictions while off duty. Monitoring for influenza-like illness before reporting for work is usually required. This may change based on the clinical presentation of the pandemic strain. Use of appropriate PPE while at work is required (see Supplement 4).

Application

Persons for whom activity restrictions (home or facility quarantine) are indicated but who provide essential services (e.g., healthcare workers)

Benefits

- Reduces risk of community spread from high-risk contacts while minimizing adverse impact of activity restrictions on provision of essential services
- Clinical monitoring at work reduces the staff required for active monitoring at the quarantine site

Challenges

- Need for close and consistent pre-shift monitoring at the work site to prevent inadvertent exposures
- May require means of transporting persons to and from work site to minimize interactions; persons in working quarantine should wear appropriate PPE during transport. (See Supplement 4)
- Must maintain close cooperation and communication between work site and local health authorities
- Need to provide mental health services to address concerns about isolation from family and friends

Resources Required

- Appropriate facility for off-duty quarantine if home is unavailable or inadequate
- Staff, funding, and goods for provision of essential services
- Personal protective equipment (see Supplement 4)
- Hotline for notification of symptoms and personal needs
- System to track results of work-site monitoring and location(s) of off-duty quarantine
- Mental health, psychological, and behavioral support services, especially if work includes care of influenza patients

Partners

- Work-site administrators and infection control personnel
- Community volunteers/workers
- Staff/volunteers to assist with transportation to and from work
- Mental health professionals
- Potential need for law enforcement to assist with noncompliant persons
Forms/Templates
- Guidelines and instructions for persons in working quarantine
- Instructions for supervisors of persons in working quarantine
- Checklist to evaluate homes for quarantine
- Guidelines for monitoring compliance
- Checklist for active monitoring at work site
- Template for recording results of clinical evaluation
- Forms for recording compliance

Focused Measures to Increase Social Distance

Definition
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.

Examples
- Quarantine of groups of exposed persons
- Cancellation of public events
- Closure of office buildings, schools, and/or shopping malls; closure of public transportation such as subways or bus lines

Application
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

Benefits
- Applied broadly, reduces the requirement for urgent evaluation of large numbers of potential contacts to determine indications for activity restrictions
- May enable reductions in transmission among groups of persons without explicit activity restrictions (quarantine)

Challenges
- May be difficult to solicit cooperation, particularly if popular buildings are closed or popular events are cancelled
- Requires excellent communication mechanisms to notify affected persons of details and rationale
- May need to provide replacement for affected activities (e.g., school, essential services)
- Generally relies on passive monitoring

Resources Required
- Systems to communicate relevant messages
- May require enforcement, particularly if closure of buildings or gathering places is necessary
- Requires resources for passive monitoring
- Hotlines to report symptoms and obtain follow-up instructions
- Transportation for medical evaluation, with appropriate infection control precautions

Partners
- News media and communication outlets
- Law enforcement
- Community groups

Forms/Templates
- Messages for affected persons
- Messages for employers of affected persons
- Messages for persons supplying essential services
Community-Wide Measures to Increase Social Distance

**Definition**
Intervention applied to an entire community or region, designed to reduce personal interactions and thereby transmission risk. The prototypical example is implementation of a "snow day," in which offices, schools, and transportation systems are cancelled as for a major snowstorm.

**Examples**
Snow days

**Application**
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

**Benefits**
Reduces need for urgent evaluation of large numbers of potential contacts to determine indications for activity restrictions
May enable reductions in transmission among groups without explicit activity restrictions (quarantine)
"Snow days" are familiar concepts and thus are easy to implement on short notice

**Challenges**
May be difficult to solicit cooperation
Requires excellent communication mechanisms to notify affected persons of details and rationale
May need to provide replacement for affected activities (e.g., school, essential services)
May need to address mental health and financial support issues
When an entire community is involved, requires cooperation with neighboring jurisdictions that may not be using a similar intervention, particularly in situations where persons live in one city and work in another and only one locale is affected by the intervention
Generally relies on passive monitoring
Social and economic impact of public transportation closures

**Resources Required**
Communication outlets
Enforcement
Resources for passive monitoring
Hotlines and other communication systems to report symptoms and obtain follow-up instructions

**Partners**
News media and other communication outlets
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

**Forms/Templates**
Messages for affected persons
Messages for employers of affected persons
Messages for persons supplying essential services

Widespread Community Quarantine, Including Cordon Sanitaire

**Definition**
Legally enforceable action that restricts movement into or out of the area of quarantine of a large group of people or community; designed to reduce the likelihood of transmission of influenza among persons in and to persons outside the affected area. When applied to all inhabitants of an area (typically a community or neighborhood), the intervention is referred to as cordon sanitaire (sanitary barrier).
Application

All members of a group in which 1) extensive transmission is occurring, 2) a significant number of cases lack identifiable epidemiologic links at the time of evaluation, and 3) restrictions placed on persons known to have been exposed are considered insufficient to prevent further spread. Widespread quarantine is unlikely to be necessary because other less restrictive measures (e.g., snow days) may be equally effective.

Benefits

Reduces need for urgent evaluation of large numbers of potential contacts to determine indications for activity restrictions

Challenges

Controversial because of the degree that individual movement is restricted

Difficult to solicit cooperation for extended periods, particularly if the rationale is not readily apparent or was not clearly explained

Requires excellent communication mechanisms to inform affected persons and to maintain public confidence in the appropriateness of the chosen course of action

Need to ensure continuation of essential services

Need to provide financial support and mental health support services for the affected population

When an entire community is involved, requires cooperation with neighboring jurisdictions that may not be using a similar intervention, particularly in situations where persons live in one city and work in another and only one locality is affected by the intervention

Need to provide mechanisms for isolating symptomatic persons with minimal delay

Resources Required

Systems to communicate relevant messages

Enforcement to maintain security at borders

Transportation for persons requiring medical evaluation, with appropriate infection control precautions

Staff and supplies to maintain access to and availability of essential services and goods, including food, water, medicine, medical care, and utilities

Psychological support staff

Plan to divert flow of critical infrastructure supplies and materials that normally transit through quarantined area

Partners

News media and other mass communication outlets

Public and private groups, industries, and officials to coordinate supply and provision of essential services to affected area

Law enforcement to maintain security at borders and to enforce movement restrictions

Transportation industry

Forms/Templates

Messages for affected persons

Messages for employers of affected persons

Messages for persons supplying essential services

Examples

Quarantine (cordon sanitaire) of a city or town

Quarantine of occupants of a housing complex or office building
APPENDIX 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, healthcare 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, healthcare 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 nonresponsiveness 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 7 for a list of facility characteristics)

- Identify appropriate community-based facilities for isolation of patients who have no substantial healthcare 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 healthcare 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, healthcare 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, healthcare 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 3. RECENT EXPERIENCE WITH QUARANTINE: THE 2003 SARS OUTBREAK

Large-scale quarantine strategies were implemented during the 2003 SARS outbreak in several severely affected countries. Strategies included quarantine of close contacts in healthcare and household settings, work and school contacts, travelers arriving from other SARS-affected areas, and in some cases, of entire apartment complexes or areas of a city. Other strategies used to control and prevent SARS transmission in these countries included 1) requiring fever screening before entry to schools, work sites, and other public buildings; 2) requiring use of face masks in certain settings, such as public transportation systems; 3) implementing population-wide temperature monitoring and SARS fever hotlines and referral services; and 4) implementing community-level disinfection strategies.

The impact and effectiveness of individual isolation and quarantine measures and community- and population-level interventions undertaken to contain the SARS epidemic globally are not yet fully understood, but some important generalizations can be made. Overall, strategies associated with timely and successful control of local outbreaks were characterized by rapid and aggressive use of case and contact identification and community containment strategies.

Other lessons learned from this modern experience with community containment include the following:

- Strict infection control measures were needed for isolation of SARS patients; these may be difficult to implement in home and community settings.
- Community control measures such as cancellation of public events and other "snow day” measures may have reduced the risk of exposure to SARS at the population level by limiting social interactions.
- Although quarantine of individual contacts was an integral part of SARS control in most settings, quarantine of large groups was used only in selected settings where transmission was extensive.
- To be effective, quarantine did not have to be mandatory and compliance did not have to be 100%; voluntary compliance with quarantine requests was >90% in most settings.
- A variety of quarantine strategies (e.g., home quarantine, working quarantine) were used, depending on specific needs.
- Isolation and quarantine raised legal, social, financial, psychological, and logistical challenges (e.g., financial support, provision of services, prevention of stigmatization and discrimination) that should be anticipated and addressed in the future. Meeting the social, financial, and psychological needs of persons in isolation and quarantine and their contacts was key to the successful application of containment measures.
- Effective implementation of quarantine required a clear understanding of the roles and legal authorities of local, state, and federal public health officials.
- Effective implementation of quarantine required identification and engagement of appropriate traditional and non-traditional partners (e.g., law enforcement) in coordinated planning and response.
- The financial, social, and psychological impact of quarantine measures is substantial; preparedness planning should include measures to reduce this impact.
- Obtaining and maintaining public trust are key to successful implementation of these measures; clear messages about the criteria, justification, role, and duration of quarantine and ways in which persons will be supported during the quarantine period will help generate public trust.
APPENDIX 4. PRINCIPLES OF MODERN QUARANTINE

The goal of quarantine is to protect the public by separating those exposed to a dangerous communicable disease from the general population. It represents collective action for the common good that is predicated on aiding individuals who are already infected or exposed and protecting others from inadvertent exposure. Principles of modern quarantine include:

Principle 1. Modern quarantine is used when:

- A person or a well-defined group of people has been exposed to a highly dangerous and highly contagious disease
- Resources are available to care for quarantined people
- Resources are available to implement and maintain the quarantine and deliver essential interventions

Principle 2. Modern quarantine encompasses a range of disease-containment strategies, including:

- Short-term, voluntary home-curfew
- Restrictions on the assembly of groups of people (e.g., school events)
- Cancellation of public events
- Suspension of public gatherings and closings of public places (e.g., theaters)
- Restrictions on travel (air, rail, water, motor vehicle, pedestrian)
- Closure of mass transit systems
- Snow days
- “Cordon sanitaire” (a guarded barrier restricting passage in and out of an area)

Principle 3. Modern quarantine is used in combination with other interventions and public health tools, including:

- Enhanced disease surveillance and symptom monitoring
- Rapid diagnosis and treatment for those who fall ill
- Preventive interventions for quarantined individuals, including vaccination or prophylactic treatment, depending on the disease

Principle 4. Quarantined individuals will be sheltered, fed, and cared for under the supervision of trained healthcare professionals. They will also be among the first to receive all available medical interventions to prevent and control disease, including:

- Vaccination (e.g., in the case of smallpox)
- Antibiotics (e.g., in the case of plague)
- Early and rapid diagnostic testing and symptom monitoring
- Early treatment if symptoms appear

Quarantined people may be cared for at home, in a designated emergency facility, or in a specialized hospital, depending on the disease and the available resources.

*These principles apply to the use of quarantine as a control measure against a wide variety of infectious diseases.*
Principle 5. Modern quarantine lasts only as long as necessary to protect the public by providing public health interventions (e.g., immunization or drug treatment, as required) and ensuring that quarantined persons do not become ill or infect others.

Principle 6. Modern quarantine does not have to be absolute to be effective. Modeling exercises suggest that partial quarantine can be effective in slowing the rate of smallpox spread, especially when combined with vaccination. The goal is to reduce the reproductive rate (the number of secondary cases from an index case) to < 1 to extinguish an epidemic.

Principle 7. Modern quarantine is more likely to involve limited numbers of exposed persons in small area, than to involve large numbers of persons in whole neighborhoods or cities. The small areas may be thought of as “boxes” or “concentric circles” drawn around individual disease cases. Logistical issues will vary in each case, depending on the size and location of the boxes.

Examples of “boxes” include:

- People on an airplane or cruise ship on which a passenger is ill with a suspected quarantinable disease
- People who have contact with a contagion-infected person whose source of disease exposure is unknown

Principle 8. Implementation of modern quarantine requires a clear understanding of public health roles at the local, state, and federal levels, based on well understood legal authorities at each level.

Principle 9. Implementation of modern quarantine requires coordinated preparedness planning by many public and private response partners, including agencies and groups involved in public health, healthcare, transportation, emergency response, law enforcement, and security.

Principle 10. Implementation of modern quarantine requires the trust and participation of the general public, who must be informed about the dangers of quarantinable diseases before an outbreak occurs, as well as during an actual event.
APPENDIX 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 snow 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.

part 2: community disease control and prevention
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. Early in the 2003 SARS outbreak in Singapore, the average delay from onset of symptoms to initiation of isolation was 7 days. Officials were able to reduce this delay only to 3 days, even with an aggressive public awareness campaign on the importance of symptom recognition and isolation.

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. The indication for quarantine for diseases purely transmitted by the airborne route is clear. 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 6. RECOMMENDATIONS FOR QUARANTINE

(Note: Recommendations on patient isolation are provided in Supplement 3.)

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 or 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 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 healthcare 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 7).

Working quarantine

This type of quarantine applies to healthcare 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 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 healthcare 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 healthcare 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.
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SUMMARY OF PUBLIC HEALTH ROLES AND RESPONSIBILITIES IN MANAGING TRAVEL-RELATED RISK OF DISEASE TRANSMISSION

INTERPANDEMIC AND PANDEMIC ALERT PERIODS

State and local responsibilities:
- Improve readiness to implement travel-related disease containment measures.
- Work with CDC quarantine stations and federal partners to provide public health information to travelers who visit countries where avian or animal influenza strains that can infect humans (e.g., avian influenza A [H5N1]) or human strains with pandemic potential have been reported.
- Work with CDC quarantine stations and federal partners to evaluate and manage arriving ill passengers who might be infected with avian or animal influenza strains (e.g., avian influenza A [H5N1]) or human strains with pandemic potential.

HHS responsibilities:
- Work with state and local health departments 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 and cruise ship 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.

PANDEMIC PERIOD

State and local responsibilities:
- Minimize travel-related disease transmission using a range of containment strategies.
- Evaluate the need to implement or terminate travel-related containment measures as the pandemic evolves.

HHS responsibilities:
- Work with state and local health departments and CDC quarantine stations to prevent the importation and exportation of cases of pandemic influenza.
- Promote a process of active engagement and discussion with state and local partners to support local decision-making on implementation of travel restrictions and other travel-related containment strategies.
- Coordinate with other countries and WHO to prevent the spread of pandemic influenza via international travel.
S9-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 (Appendix 1). Disease spread will likely be even faster during an influenza pandemic because a typical influenza virus has a shorter average incubation period (typically 2 days vs. 7–10 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. Early in a pandemic, state and local health departments might also 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 for influenza. Nevertheless—depending on the situation—these activities might slow spread early in a pandemic, allowing additional time for implementation of other response measures such as vaccination.

Once a pandemic is underway, exit screening of travelers from affected areas ("source control") is likely to be more efficient than entry screening to identify ill travelers. Early in a pandemic, this intervention may decrease disease introductions into the U.S. Later, however, as pandemic disease spreads in communities, ongoing indigenous transmission will likely exceed new introductions and, therefore, federal authorities might modify or discontinue this strategy. Voluntary limitations on travel during a pandemic alert and pandemic, as persons decide to limit their own personal risk by canceling nonessential trips, will also decrease the amount of disease spread. Limiting or canceling travel of U.S. residents and others from affected countries will depend on the properties of the pandemic virus that emerges, and will be informed by the facts on the ground at the time of emergence.

S9-II. OVERVIEW

Supplement 9 provides recommendations to state and local partners on 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. State and local health departments will implement these strategies in coordination with CDC quarantine stations located at 18 U.S. ports of entry (Box 1). The recommendations for the Interpandemic and Pandemic Alert Periods focus on preparedness planning and on management of arriving ill passengers on international flights or cruise ships. The recommendations for the Pandemic Period focus on travel-related measures to decrease disease spread into, out of, and within the United States.

S9-III. RECOMMENDATIONS FOR THE INTERPANDEMIC AND PANDEMIC ALERT PERIODS

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 the United States, 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. Results of mathematical models suggest that even with international flights, if persons are asymptomatic but incubating influenza when they board, they may remain asymptomatic when they arrive and therefore may not be detected by either exit or entry screening. Nevertheless, the ability to detect some cases early in the pandemic may slow disease spread even for a short time.

The effective implementation of travel-related containment measures depends on advance planning, preparedness, and coordination at the state, local, federal and international levels. This section provides information on engagement of partners, protocols for managing ill travelers, quarantine preparedness at ports of entry, and legal preparedness.

1. Engaging community partners

   • In collaboration with the CDC, state and local planning for managing travel-related disease risk during a Pandemic Alert and Pandemic Period might include:
     • Quarantine officers
     • First responders (firefighters, police officers)
     • Local members of the legal community
     • Emergency medical services and other emergency responders
     • Hospital personnel
     • Representatives of airports, seaports, and the transportation industry, including unions
     • Political leaders
     • American Red Cross and other humanitarian organizations
     • Business services

   • In collaboration with these partners, state and local health departments should:
     • Develop plans for training, mobilizing, and deploying public health staff and other emergency workers.
     • Conduct exercises and drills at ports of entry.
     • Train healthcare workers and emergency responders in the use of personal protective equipment (PPE) (see Supplement 4).

   • State and local health departments should work with quarantine officers to develop memoranda of agreement with hospitals near ports of entry that are equipped to isolate, evaluate, and manage suspected influenza patients (see Supplement 8) and with emergency medical services that can help perform on-site assessments of ill passengers and transport them to hospitals for evaluation.

2. Protocols for managing ill travelers at ports of entry

   • In collaboration with law enforcement authorities and other partners, public health officials and quarantine officers should develop protocols for managing ill arriving passengers identified by airplane or cruise ship personnel. The protocols should 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 CDC (see Supplement 1)
• 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 (see also Supplement 8)
• Identifying other ill passengers and separating them from passengers who are not sick
• Transporting and quarantining contacts, if necessary (see 3 below)
• Enforcing isolation and quarantine, if necessary, when ill travelers or their contacts are uncooperative

CDC is working with partners in the travel industry to ensure that airplane and cruise ship personnel are familiar with:
• Case definitions (e.g., symptoms, travel history) for avian influenza A (H5N1) and other novel influenza strains of public health concern as they arise. CDC will provide additional and updated case definitions, as necessary, during the Pandemic Alert and Pandemic Periods.
• Actions to take and persons to contact at their home offices, local quarantine station, or CDC if they are concerned about a sick passenger who might have novel influenza

3. Quarantine preparedness at ports of entry
• State and local public health officials, in collaboration with the CDC should identify quarantine facilities for housing passengers, crew, and emergency workers who may have been exposed to an ill traveler. These facilities should be equipped for:
  • Temporary quarantine (a few days), until the results of diagnostic tests become available
  • Longer-term quarantine (up to 10 days) if a diagnosis of pandemic influenza is confirmed
• State and local health departments and community partners should plan for the provision of goods and services to persons in quarantine (see Supplement 8).

4. Legal preparedness
While the federal government is primarily responsible for preventing the introduction, transmission, and spread of communicable diseases from foreign countries into the U.S., state and local health authorities may also take measures, such as quarantine of ill travelers and their contacts, to prevent the spread of communicable diseases within their borders. State and local authorities are primarily responsible for restricting travel within their borders while the federal government may take measures to prevent the interstate spread of communicable diseases.

Because jurisdictions and authorities at airports and other ports of entry overlap, local, state, and federal health authorities should establish protocols and outline roles and responsibilities in advance of a public health emergency. To be adequately prepared for management of travel-related risks, state and local health departments should:

• Ensure that legal authorities for the isolation of ill persons and the quarantine of exposed persons (at the local, state, and federal levels) are known and understood (see Supplement 8).
• Develop procedures for addressing overlapping multi-jurisdictional issues.
• Ensure legal authorities and develop protocols for:
  • Requirements for pre-departure screening of international and domestic travelers
  • Requirements for arrival screening and/or quarantine of international and domestic travelers
  • Prohibitions on travel by ill persons and their contacts
  • Restrictions on use of mass transit systems
  • Cancellation of nonessential travel
  • Work closely with local, state, and federal law enforcement officials to develop plans and protocols for enforcing travel restrictions, if necessary.

B. Health information for travelers

CDC’s Travelers’ Health website (www.cdc.gov/travel/) will provide up-to-date travel notices for international travelers to countries affected by novel influenza viruses during the Pandemic Alert Period and Pandemic Period. These notices are issued depending on the scope, risk for travelers, and recommended preventive measures. Four types of travel notices can be issued: In the News, Outbreak Notices, Travel Health Precautions, and Travel Health Warnings. Additional Travel Health Precautions or Warnings (see Box 2) may be issued to inbound and outbound travelers during the Pandemic Alert Period if avian influenza spreads internationally and causes additional cases of human influenza.

C. Evaluation of travel-related cases of infection with novel strains of influenza

During the Pandemic Alert Period, travel-related cases of infection might be detected after entry into the United States or reported during transit by airline or cruise ship 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.

1. Managing ill passengers

• State and local health departments should follow protocols prepared in advance for the management of arriving ill passengers who meet the clinical and epidemiologic criteria for infection with a novel strain of influenza. Additional or updated case definitions for infection with novel strains of influenza will be issued, as needed, if the level of heightened surveillance increases from a situation of little immediate pandemic risk (corresponding to WHO Pandemic Alert Phase 3), to one in which pandemic risk is moderate or substantial (corresponding to WHO Pandemic Alert Phases 4 or 5).

• If an ill passenger with a suspected case of novel influenza is reported aboard an arriving airplane or cruise ship, a state or local health official or quarantine officer should do the following:
  • All partners should be notified, including the nearest Quarantine station, state and local authorities, and the CDC.
  • Request information on the ill passenger’s symptoms and travel and exposure history to make an initial assessment if the illness meets the current clinical and epidemiologic criteria for avian influenza A (H5N1) or is suspicious for a novel influenza strain.
  • Determine if a state or local public health worker and/or quarantine officer should meet the airplane or cruise ship to further evaluate the ill traveler.
  • Provide the crew with guidance on infection control procedures, if needed (e.g., separate the ill passenger as much as possible from other passengers; provide the ill passenger with a mask or tissues to cover coughs and sneezes).
  • If a state or local public health worker and/or quarantine officer decides to meet the airplane or cruise ship and perform an initial medical evaluation of the ill traveler, the passengers and crew should be informed of the situation and should not be allowed to disembark until the evaluation is complete.
2. Managing travel contacts

- Local and/or state health departments, in consultation with CDC, should decide how to manage an ill person's travel contacts on a case-by-case basis, taking into consideration the following factors:
  - Likelihood that the suspected case is due to a novel influenza strain (based on symptoms and travel history, if laboratory results are not available)
  - Likelihood that the causative virus is transmitted from person to person with a moderate or high efficiency (as in later phases of the Pandemic Alert Period)
  - Feasibility of tracing and monitoring travel contacts, as well as the patient's family members, workmates, schoolmates, and healthcare providers

- Management of contacts might include:
  - Passive or active monitoring without activity restrictions
  - Quarantine at home or in a designated facility, and/or
  - Antiviral prophylaxis or treatment.

For retrospectively identified cases, if passengers and crew members cannot be traced within 48-72 hours of the presumed exposure, local and/or state health departments, in consultation with CDC, might consider other options (e.g., issue a public notice through the news media).

- During the Pandemic Alert Period, especially during the earlier phases, health departments should quarantine travel contacts (i.e., passengers, crew, response workers) only when there is a high probability that the ill passenger is infected with a novel influenza strain that is transmitted between people.

If a decision is made to initiate quarantine, persons who cannot be quarantined at home should be housed in a pre-designated temporary care facility until the diagnosis of the ill passenger is confirmed or disproved. Each quarantined person should receive a preliminary medical assessment and should be interviewed to ascertain their travel and exposure histories.

- If the diagnosis of a novel strain of influenza is confirmed, quarantined persons should be transferred as soon as possible to a pre-designated longer-term quarantine facility and should remain there for the maximum length of the incubation period for influenza. Each quarantined person may receive antiviral medication and should be monitored twice a day for fever and other signs of influenza (see Supplement 8).

- Medical follow-up and travel assistance should be provided to all quarantined persons when the quarantine period is over.

D. Preventing the importation of infected birds and animals

State health departments should continue to assist federal agencies with responsibility for preventing the shipment of infected birds and animals into the United States. Federal agencies with responsibility for inspecting imported animals, implementing veterinary quarantine orders, and enforcing U.S. Department of Agriculture (USDA) trade bans and HHS import bans include

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1 Protocols and memoranda of agreement with ambulance service and hospitals with appropriate infection control measures in place should be established.
the Animal and Plant Health Inspection Service (APHIS), USDA; HHS/CDC; Bureau of Customs and Border Protection, Department of Homeland Security; and U.S. Fish and Wildlife Service, Department of the Interior.

USDA regulates the importation of all avian species (poultry, pet birds, birds exhibited at zoos, ratites) into the United States (9 CFR, Part 93). In general, birds submitted for entry into the United States must be quarantined in USDA-approved facilities. During quarantine, avian influenza virus isolation is attempted on samples collected from all dead birds and some live birds. These precautions are taken to prevent the introduction of exotic avian diseases, including avian influenza, into the United States. USDA import procedures for avian species are provided at www.aphis.usda.gov/vs/ncie/importing.html.

Under section 316 of the PHS Act (42 USC 264) the HHS Secretary may make and enforce regulations necessary to prevent the introduction, transmission, and spread of communicable disease from foreign countries into the U.S. and from one state or possession into any other state or possession. CDC has implemented this statute through regulations and those that authorize CDC’s order banning birds and bird products that might carry avian influenza A (H5N1) can be found at 42 CFR 71.32(b). A current listing of CDC’s orders banning the importation of birds and bird products that might carry avian influenza A (H5N1) can be found at www.cdc.gov/flu/avian/outbreaks/embargo.htm.

S9-IV. RECOMMENDATIONS FOR THE PANDEMIC PERIOD

Over the course of an influenza pandemic, state and local health authorities might consider a range of travel-related control measures to decrease the spread of disease into the United States, out of the United States (Appendix 2), or within the United States. The following factors may be considered in developing policy:

- The relative magnitude, duration, and stage of indigenous transmission versus the risk associated with further introduced cases. When pandemic 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 the 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 choose to cancel nonessential travel to decrease their potential exposure and risk of acquiring influenza infection. In this context, the added value of compulsory restrictions should be considered relative to the societal disruptions that limitations on movement would cause.

HHS will promote an active process of engagement and discussion to help states and localities decide on which actions to take as the situation evolves. Because travel-related measures implemented by one jurisdiction will inevitably affect others, communication, collaboration, and especially coordination before any measures are implemented is crucial.

A. Travel-related containment measures

1. Travel into the United States

Early during an influenza pandemic that begins outside the United States, health authorities will heighten disease surveillance at U.S. airports and seaports and maintain close communication with WHO, foreign governments, and the airline industry. 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.

a) Managing arriving ill passengers

Identification and management of incoming ill travelers may delay and decrease the introduction of novel influenza strains into the United States during the Pandemic Alert Period. These efforts will continue during the early stages of the Pandemic Period, especially if a pandemic 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 ("source control") 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 should do the following:

- If a suspected case of pandemic influenza is reported aboard an arriving airplane or cruise ship 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, consider these actions:
  - Notify the airport to mobilize its first responders, and arrange for patient transport and preparation of quarantine facilities.
  - Meet the airplane or cruise ship, perform a medical evaluation of the ill traveler, and assess the risk to public health.
  - Inform the passengers and crew of the situation, and do not allow them to disembark until the evaluation is complete. Procedures for medical management of the patient, passengers, and crew are described in S9-III.C.

b) Travel health precautions and warnings

As the pandemic spreads from country to country, HHS will update country-specific travel notices and post them on the CDC Travelers' Health website (http://www.cdc.gov/travel/). Advisories might include:

- Travel Health Precautions that describe steps that can be taken to reduce the risk of infection (e.g., avoiding travel to high-risk settings and communities where transmission is occurring)
- Travel Health Warnings that recommend postponement of nonessential travel

c) 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, HHS and state and local health departments might consider the following actions:

- Initiate enhanced disease surveillance at ports of entry.
- Provide guidance on infection control procedures that can be implemented, if needed, on airplanes or ships (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, 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).

d) Travel-related measures at later stages of a pandemic

If the situation worsens overseas and there is extensive and sustained transmission in other countries, HHS and state and local health departments might consider 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).
• Arrange with airline industry partners to show videos or public announcements about pandemic influenza on airplanes or cruise ships arriving from affected countries.
• Recommend canceling or limiting nonessential travel to affected countries.
• Collect information on all arriving passengers if notification is warranted (e.g., for antiviral administration, vaccination, or health monitoring).

Decisions regarding the implementation of these actions may depend on how widely the pandemic disease has spread within the U.S.

Other potential control measures might include increasing disease surveillance among passengers arriving from affected countries by visually inspecting travelers as they disembark, screening travelers for fever or other influenza symptoms, or administering questionnaires on possible exposures to influenza (e.g., contacts with influenza patients or visits to high-risk areas). Experience during the 2003 SARS outbreak (Appendix 1) suggests that implementation of these measures—which are highly labor-intensive and of unproven benefit—would be especially burdensome during an influenza pandemic. However, it is possible that the transmissibility of a unique pandemic strain may differ from that of seasonal influenza strains or SARS, warranting consideration of alternative measures.

2. Travel out of the United States

If the level of influenza transmission in the United States presents a high risk for exportation of disease, HHS and state and local health authorities should consider 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.
• Implement pre-departure screening (e.g., temperature screening or visual screening) of outbound travelers.

3. Travel within the United States

• If the level of influenza transmission in a U.S. area is high and if most other areas have not yet been affected, HHS and state and local health authorities might decide to recommend limiting or canceling nonessential travel to that area or to implement increased disease surveillance measures.

• Other containment measures and travel restrictions to slow disease spread within the United States that might be considered include:
  • Distributing travel health alert notices on domestic flights
  • Isolating ill arriving passengers on domestic flights and quarantining passengers and crew, following protocols developed for international flights (see S9-III.C)
  • Closing mass transit systems (e.g., buses and subways; see Supplement 8)
  • Closing interstate bus and train routes

The potential effectiveness of these measures (see S9-IV) and the feasibility of implementing them should be considered in decision-making.
B. De-escalation of travel-related control measures

Decisions to de-escalate control measures related to international travel will be made in consultation with WHO.

1. Outbound passengers

CDC will downgrade a Travel Health Warning for outbound U.S. passengers to a Travel Health Precaution for a given country or area when there is adequate and regularly updated reporting of surveillance data from the area, and limited or no recent instances of cases in the area.

2. Inbound passengers

On arrival, inbound passengers from areas under a Travel Health Warning should be provided with travel health alert notices. Because it is often difficult to determine passengers’ points of origin, it may be more practical to continue providing travel health alert notices until Travel Health Precautions have been lifted for all areas.

CDC will remove a Travel Health Precaution when there is adequate and regularly updated reporting of surveillance data from the area and limited or no recent instances of cases exported from the area.
BOX 1. CDC QUARANTINE STATIONS

CDC operates 18 quarantine stations that are responsible for preventing the introduction of infectious diseases of public health importance into the United States. The stations are located at major international airports in Los Angeles, San Francisco, Seattle, Miami, Honolulu, Chicago (O'Hare), New York City (JFK), Atlanta, Houston, El Paso, and Washington, DC. Each station also covers other ports of entry (airports, seaports, land borders) in the region. The stations' quarantine officers evaluate ill passengers who are identified by flight crews, U.S. Customs Service inspectors, or other Federal Inspection Service1 personnel. Quarantine inspectors also work with regulatory agencies to inspect imported animals and other cargo (http://www.cdc.gov/ncidod/dq/quarantine_stations.htm).

Some ports of entry (with and without quarantine stations) have local physicians on call, and HHS has an ongoing program to establish agreements with local hospitals that accept patients referred by quarantine station staff.

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1 Federal Inspection Service agencies include the Animal and Plant Health Inspection Service (APHIS/USDA), Centers for Disease Control and Prevention (CDC/HHS), Customs and Border Protection (CBP/DHS), and Food Safety and Inspection Service (FSIS/USDA).
**BOX 2. TRAVEL-RELATED DEFINITIONS**

**Travel Notices:** Different types of notices for international travelers. During the 2003 SARS outbreak, CDC issued two types of travel notifications about disease occurrences in specific geographic areas. A travel alert, a lower-level notice, provided information on the outbreak and informed travelers about how to reduce their risk of acquiring infection. When the health risk for travelers was thought to be high, CDC issued a travel advisory recommending against nonessential travel to the area. Travel advisories were intended to reduce the number of travelers to high-risk areas and the risk for spreading disease to other areas. The levels of notification have since been revised to include four types of travel notices: In the News, Outbreak Notice, Travel Health Precautions, and Travel Warnings.

**In the News:** Notification by CDC of an occurrence of a disease of public health significance affecting a traveler or travel destination. The purpose is to provide information to travelers, Americans living abroad, and healthcare providers. "In the News" is issued when the risk for disease exposure is not increased beyond the usual baseline risk for that area, and only standard guidelines are recommended.

**Outbreak Notice:** Notification by CDC that an outbreak of a disease is occurring in a limited geographic area or setting. The purpose is to provide information to travelers, Americans living abroad, and healthcare providers about the status of the outbreak and to remind travelers about standard or enhanced travel recommendations for the area. Outbreak Notices are issued when the risk for disease exposure is increased but well defined and limited to specific settings.

**Travel Health Precaution:** Notification by CDC that a disease outbreak of significant scope is occurring in a large geographic area. The purpose is to provide information to travelers, Americans living abroad, and healthcare providers about the status of the outbreak (its magnitude, scope, and rapidity of spread), specific precautions to reduce the risk of infection, and what actions to take if they become ill. Travel Health Precautions are issued when the risk for the individual traveler is increased in defined settings or associated with specific risk factors (e.g., transmission in a healthcare or hospital setting). Travel Health Precautions do NOT recommend canceling travel to the area.

**Travel Health Warning:** Notification by CDC that a widespread outbreak of a disease of public health concern is expanding outside the area or populations that were initially affected. The purpose is to provide information to travelers, Americans living abroad, and healthcare providers about the status of the outbreak (its magnitude, scope, and rapidity of spread), specific precautions to reduce the risk of infection, and what actions to take if they become ill. Travel Health Warnings recommend canceling nonessential travel to the area because the risk for the traveler is considered high (i.e., there is evidence of transmission outside defined settings and/or inadequate containment). Additional preventive measures may be recommended, depending on the circumstances (e.g., travelers may be requested to monitor their health for a certain period after their return; arriving passengers may be screened at ports of entry). A Travel Health Warning may reduce the volume of traffic to an affected area, which in turn can reduce the risk of disease spread to previously unaffected sites.

**Travel Health Alert Notice:** Notice with travel-related information and recommendations designed for inbound travelers.

**Travel contact:** A person on the same conveyance as the ill person.

**Close contact:** A person who has cared for or lived with the ill person or had a high likelihood of direct contact with respiratory secretions and/or body fluids of the ill person. Examples of close contact with an ill person include kissing or hugging, sharing eating or drinking utensils, talking within 3 feet, and direct touching. Close contact does not include activities such as walking by a person or briefly sitting across a waiting room or office.
APPENDIX 1. RECENT EXPERIENCE WITH TRAVEL-RELATED CONTAINMENT MEASURES: THE 2003 SARS OUTBREAK

During the 2003 global response to severe acute respiratory syndrome (SARS), the control strategy for the United States included issuing travel notifications, distributing Travel Health Alert Notices to travelers arriving from areas with SARS, and conducting visual inspections of arriving travelers to facilitate early identification of imported cases and response to reports of ill passengers. CDC staff met more than 11,000 direct and indirect flights from SARS-affected areas and distributed more than 2.7 million Travel Health Alert Notices to arriving passengers as well as to persons arriving at 13 U.S. land border crossings near Toronto and departing passengers bound for the United States from the Toronto airport. Travel Health Alert Notices informed returning travelers of potential exposure to SARS-associated coronavirus (SARS-CoV). They alerted travelers to the symptoms of SARS-CoV disease and advised them to promptly seek medical attention if symptoms developed. The notices also provided information and instructions for physicians.

During the SARS outbreak response, CDC quarantine staff met planes reporting an ill passenger to facilitate 1) evaluation of the passenger for possible SARS-CoV disease, 2) collection of locating information on the other passengers, and 3) coordination with federal and local authorities. If the ill passenger was determined to be a possible SARS case, the locating information was forwarded to state and local health departments for contact tracing.

Border and travel-related activities implemented in countries more seriously affected by SARS included pre-departure temperature and symptom screening, arrival screening (asking passengers about travel history and possible exposure to SARS-CoV), “stop lists” (maintaining lists of persons who were possible SARS cases or contacts to prevent them from traveling), and quarantine of travelers returning from other SARS-affected areas.

Lessons learned from this response include the following:

- SARS-CoV can spread rapidly on a global scale through international travel if control measures are not implemented.
- SARS-CoV transmission can be halted through aggressive global measures to educate, detect cases early, effectively isolate cases, and identify, monitor, and quarantine contacts.
- Patients with SARS can transmit infection to other passengers on conveyances and should postpone travel until they are no longer infectious.
- SARS-CoV transmission can occur within the close confines of conveyances. Resulting infections usually represent a failure to recognize symptomatic index cases and their high-risk contacts who should have been prevented from traveling.
- Active follow-up of passengers on conveyances with SARS cases can help prevent further spread by informing passengers of their exposure and providing instructions for monitoring their health and seeking medical evaluation if they become ill.

While these lessons may have some relevance, their applicability to an influenza pandemic is limited by the substantial differences between the epidemiology of transmission of influenza and SARS-CoV. The much shorter incubation period and intergenerational period for influenza compared with SARS-CoV poses enormous time challenges to case isolation, contact tracing, and selective individual quarantine. The possibility of influenza virus transmission by asymptomatic persons makes the ability to effectively implement control measures such as selective quarantine necessarily incomplete and potentially decreases the impact significantly. In addition, with SARS-CoV, peak communicability occurred most often during the second week of illness when cases were extremely ill and often hospitalized; this enabled containment to focus heavily on institutional infection control measures. Influenza virus transmission will occur much earlier in relation to illness onset and is expected to
be preferentially community-acquired rather than nosocomial. Finally, there were fewer than 10,000 documented human cases of SARS worldwide whereas past influenza pandemics have caused symptomatic infection in about 30% of the U.S. population. Thus, in the current U.S. population alone there would be almost 90 million illnesses, and many more persons would have asymptomatic infections. Given the vastly greater number of persons who will be spreading influenza infection within and between communities, approaches to control will inevitably need to be different.
## APPENDIX 2. TRAVEL-RELATED INFLUENZA RESPONSE MATRICES

### Matrix 1: Inbound Travel

<table>
<thead>
<tr>
<th>Level of influenza transmission</th>
<th>Suggested actions to manage inbound travel</th>
</tr>
</thead>
</table>
| Potential for imported cases in the United States and limited transmission (clusters of human-to-human cases or second-generation spread) in the inbound traveler’s location of origin | CDC will distribute travel health alert notices to all arrivals.  
**Suggested actions:**  
- Consider enhanced disease surveillance at ports of entry.  
- Request information on the ill passenger’s symptoms and travel and exposure histories.  
- Determine if a state or local public health worker and/or CDC quarantine officer should meet the airplane or cruise ship to further evaluate the ill traveler.  
- Provide the crew with guidance on infection control procedures, if needed (e.g., separate the ill passenger as much as possible from other passengers; provide the ill passenger with a mask or tissues to prevent viral spread via coughing).  
- Isolate arriving ill passengers, and quarantine their contacts, as necessary. |
| Imported cases in the United States and extensive transmission in the inbound traveler’s location of origin | Additional actions:  
- Consider prohibiting all nonessential arrivals.  
- Consider active monitoring of all arriving passengers for fever and respiratory symptoms. |
| Extensive transmission in the inbound traveler’s location of origin | Additional actions:  
- Prohibit all nonessential arrivals. |
## APPENDIX 2. TRAVEL-RELATED INFLUENZA RESPONSE MATRICES (CONT.)

### Matrix 2: Outbound Travel

<table>
<thead>
<tr>
<th>Level of influenza transmission</th>
<th>Suggested actions to manage outbound travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited transmission (clusters of human-to-human cases or second-generation spread) in the outbound traveler’s destination</td>
<td>CDC will issue Travel Health Precautions and Travel Health Warnings for particular destinations, as needed.</td>
</tr>
<tr>
<td><em>Suggested actions:</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Distribute targeted health education messages to outbound travelers.</td>
</tr>
<tr>
<td>Extensive transmission in the outbound traveler’s destination</td>
<td>Additional actions:</td>
</tr>
<tr>
<td></td>
<td>• Arrange with airline industry partners to show videos or air public announcements about pandemic influenza on airplanes and cruise ships.</td>
</tr>
<tr>
<td></td>
<td>• Cancel or limit nonessential travel to affected countries.</td>
</tr>
<tr>
<td>Extensive transmission in the outbound traveler’s destination and in the United States.</td>
<td>Additional actions:</td>
</tr>
<tr>
<td></td>
<td>• Consider implementing medical screening at exit points in the United States.</td>
</tr>
</tbody>
</table>
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SUMMARY OF PUBLIC HEALTH ROLES AND RESPONSIBILITIES IN PUBLIC HEALTH COMMUNICATIONS

INTERPANDEMIC AND PANDEMIC PERIODS

State and local responsibilities:

- Assess and monitor readiness to meet communications needs in preparation for an influenza pandemic, including regular review and update of communications plans.
- Plan and coordinate emergency communication activities with private industry, education, and nonprofit partners (e.g., local American Red Cross chapters).
- Identify and train lead subject-specific spokespersons.
- Provide public health communications staff with training on risk communications for use during an influenza pandemic.
- Develop and maintain up-to-date communications contacts.
- Participate in tabletop exercises and other collaborative preparations to assess readiness.
- Address rumors and false reports regarding pandemic influenza threats.
- Confirm any contingency contracts needed for communications resources during a pandemic.

HHS responsibilities:

- Develop a Communications and Public Engagement Strategy for Pandemic Influenza (see appendix 4).
- Develop key messages and materials, conduct audience research and message testing, and share results with international, other Federal departments, state and local communications staff. Materials will be available on www.pandemicflu.gov.
- Coordinate pandemic influenza media messages to ensure consistency.
- Provide tools and resources through the www.pandemicflu.gov and www.cdc.gov/flu/ websites and other avenues to help educate state and local communications staff.
- Identify and train lead spokespersons.
- Provide state and local health agencies with guidance about developing and integrating communications aspects of preparedness plans.
- Work with state and local governments to incorporate communications preparedness as part of larger preparedness exercises.
- Provide regular updates about situations that pose potential pandemic influenza threats (e.g., through Health Alert Network [HAN] notices, Epi-X, and web postings).
- Distribute educational messages and materials about pandemic influenza and ways that people can protect themselves and their families.
- Distribute practical information, such as travel advisories, infection control measures, availability and appropriate use of antiviral medications and vaccines, and specific public health actions that may be advised.
- Address rumors and false reports regarding pandemic influenza threats and related issues.
- Coordinate international information exchange and communication strategies with WHO and other international partners, as appropriate.
SUMMARY OF PUBLIC HEALTH ROLES AND RESPONSIBILITIES (CONT.)
IN PUBLIC HEALTH COMMUNICATIONS

PANDEMIC PERIOD

State and local responsibilities:

- Contact key community partners and implement frequent update briefings.
- As appropriate, implement and maintain community resources, such as hotlines and websites to respond to local questions from the public and professional groups.
- Tailor communications services and key messages to specific local audiences.
- 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.

HHS responsibilities:

- Coordinate pandemic influenza media messages to ensure consistency across Federal government.
- Coordinate communications activities with state and local communications staff, including regional or local communications centers as appropriate.
- Promptly respond to rumors and inaccurate information to minimize concern, social disruption, and stigmatization.
- Coordinate international information exchange and communication strategies.

S10-I. RATIONALE

Strategic communications activities based on scientifically derived risk communications principles are an integral part of a comprehensive public health response before, during, and after an influenza pandemic. Effective communication guides the public, the news media, healthcare providers, and other groups in responding appropriately to outbreak situations and complying with public health measures.

The goals of Supplement 10 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 local and state health officials, community healthcare 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 supplement 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 others with special needs (e.g., non-English speaking populations, difficult-to-reach communities, and persons living in institutional settings) to receive appropriate information.
- Acknowledge the anxiety, distress, and grief that people experience during long-term, major public health events such as pandemics.

S10-II. OVERVIEW

Communications preparedness for an influenza pandemic, as outlined in this supplement, 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, healthcare providers, policy makers, and news media. Healthcare 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.

During the Interpandemic Period, national, state, and local health communications professionals should focus on preparedness planning and on building flexible, sustainable communications networks. During the Pandemic Period, they should focus on well coordinated health communications to support public health interventions designed to help limit influenza-associated morbidity and mortality.

S10-III. RECOMMENDATIONS FOR THE INTERPANDEMIC AND PANDEMIC ALERT PERIODS

During the Interpandemic and Pandemic Alert Periods, health communications professionals should 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
• Conducting collaborative planning
• Developing and testing standard procedures for disseminating information
• Developing, testing, and disseminating locally tailored messages and materials

A. Assessing communications capacity and needs

A first step in effective risk communications preparedness is to conduct an assessment of communications strengths and challenges. Planning should include the following.

1. Capacity
   • As part of overall pandemic influenza preparedness planning, develop a phased risk communications plan.
   • Determine whether adequate human and fiscal resources will be available for all phases of a pandemic. If not, plan to augment these resources.
   • Review or establish procedures to help ensure that technology such as networks, servers, and system backups are available, periodically tested, and integrated into overall planning for pandemic influenza. Identify and include other types of technology, such as faxes and mass mailing systems. Establish priorities and implement improvement plans for any technology deficiencies.
   • 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 proficiency among all staff engaged in pandemic influenza response, especially given personnel changes, reorganization, or other variables.

2. Needs
   • Review and update risk communications plans at least annually to ensure that they remain practical and evidence-based. Share the plans in advance with stakeholders.
   • Identify communications professionals and media spokespersons; 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; apprise policy and key decision-makers of plans to deploy staff and resources during an influenza pandemic.
   • Prepare basic communications resources in advance, and plan to update them during a pandemic. Appendices 2 and 3 provide sample templates, fact sheets, and other communications tools that will be available through the www.pandemicflu.gov and www.cdc.gov websites, as well as links to other resources.
   • Identify common communications opportunities or challenges with neighboring jurisdictions, particularly with regard to reaching people in high-priority risk groups; consider novel opportunities to pool communications resources.
   • Continuously monitor the effectiveness of risk communication activities, adjusting as necessary to achieve public health communications objectives.

B. Conducting collaborative planning

Collaborative planning should begin as early as possible. 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. Federal interaction with WHO and other international partners is vital to surveillance and other essential information
exchange and to building collaborative and consistent messaging strategy. The following recommendations are critical elements of a comprehensive domestic response:

- When appropriate, coordinate training and other preparedness activities that include options for backing up key communications personnel in the event of their personal illness or emergency.
- Coordinate with partner agencies to prepare for appropriate public, healthcare provider, policy, and media responses to outbreaks of pandemic influenza. Be prepared to address the following topics as a pandemic alert 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.
- Consider when and how to use federal assistance when available. For instance, background information and frequent updates for communications and other healthcare professionals will be available on the www.pandemicflu.gov website and through other official mechanisms.
- 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.
- 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 in the Interpandemic and Pandemic Alert periods.

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 should identify dissemination procedures and channels for forwarding communications from federal agencies to ensure that partners and stakeholders at all levels remain informed but protected from redundant or unnecessary messaging. As an influenza pandemic unfolds, HHS and its agencies will relate essential information through well established channels and formats (e.g., CDC’s Emergency Communication System).

The following recommendations can aid development of effective state and local information dissemination plans for use during an influenza pandemic:

- Establish expedited procedures for reviewing and approving pandemic influenza-related messages and materials.
- Establish 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.
- Establish and maintain a website with current information.
- Work with local information technology (IT) professionals to identify development servers on which to build state or local emergency websites that can help manage information requests when needed. Consider whether to develop some
communications materials in advance and store them on these secure servers. Add the www.pandemicflu.gov website as a link to local websites. Also see other available links in Appendix 3.

• Federal hotlines, such as the CDC-INFO telephone line (1-800-CDC-INFO; 1-800-232-4636), will be available for public information. However, during an influenza pandemic, state and local health departments may also wish to tailor additional information for their localities. Determine if agreements or contracts will be needed to establish a local toll-free public information hotline. Hotline staff should be trained in advance. They should have access to the www.pandemicflu.gov website and to an evolving state or local database of frequently asked questions. Consider options for adapting existing networks into pandemic influenza response systems, either singularly or in combination with neighboring jurisdictions.

• Prepare contingency plans to manage increased media demands. Jurisdictions with possible or early confirmed cases of pandemic influenza can expect focused media attention. Local media relations specialists will need to prepare for media requests and facilities needs, especially for television. Regularly scheduled press briefings may reduce the volume of inquiries to press offices. Media interest may merit daily briefings.

• Develop ongoing coordination procedures with other 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 Interpandemic messages and materials

The Interpandemic period is the 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 pandemic influenza. In addition, the need to inform and educate the public, healthcare 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 the Interpandemic Period to prepare communications materials for use during the Pandemic Alert and Pandemic Periods. 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 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 1 and 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 should 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 sections 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
should work ahead of time with others—including mental health experts—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.
- 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. States and localities will find much information for a portfolio through the www.pandemicflu.gov website and other resources during a pandemic and are encouraged to use or adapt these materials.
- 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.
- 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.
- Identify preferred channels for target audiences. For example, many healthcare providers will have no experience with an influenza pandemic and will rely in part on state and local health departments for rapid access to information.
- Ensure the availability of communications products in multiple languages, based on the demographics of the jurisdiction. Health departments may choose to use or adapt translated materials that will be available on the www.pandemicflu.gov and www.cdc.gov/flu/ websites. Test key messages with local target audiences and revise them as needed. CDC will engage in message and materials testing activities and share the results broadly through websites and via the National Public Health Information Coalition (NPHIC).
- 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.
- Provide coordinated information on ways to access help (e.g., hotlines, helplines) and self-help (e.g., psychological resources, and stress and anxiety management).

**S10-IV. RECOMMENDATIONS FOR THE PANDEMIC PERIOD**

HHS will coordinate international information exchange and the coordination of messaging through WHO and other international partners, as appropriate. Domestic health communications, including state and local public health communications efforts, should be directed to rapid sharing of appropriate, up-to-date information on what is known and what is unknown about the progression of the outbreak, the possible disruptions to routines and events, and contingency measures. Consistency in messaging across jurisdictions is strongly advised.
The Pandemic Period is likely to last much longer than a typical influenza season and may occur in waves within communities. During this period, watch especially for challenges that may arise with staff fatigue or absenteeism due to illness, difficulties with continuity of services, and problems associated with institutional memory that may occur with high staff turnover. Communications staff and others may need to modify plans made during the Interpandemic and Pandemic Alert Periods.

Primary areas on which communications professionals should focus during the Pandemic Period are 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

Consider the context of the local situation when making decisions to activate formal emergency communication systems at the state and local levels. State and local health departments may want to consider potential thresholds and triggers that might indicate that communications demands are likely to escalate quickly. These might include developments that raise the health risk to local populations (for example, if a human case of avian influenza is reported in a local jurisdiction). As communications demands escalate, state and local health departments may want to activate emergency communications plans, including local toll-free information hotlines and an emergency communications website with links to the www.pandemicflu.gov website.

B. Refining and delivering messages

The following are steps for states and local areas to consider, in collaboration with federal partners:

- 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 should 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.
- 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)

• Work with state and local officials to involve communications professionals on senior leadership teams, including roles as liaisons to national communications teams at CDC and other agencies as necessary.

• Maintain strong working relationships with colleagues in other jurisdictions and regions, even when an outbreak may not yet have affected your area directly or may have subsided locally. The following colleagues are especially important to consider.
  • Public affairs directors and information officers from other local and state health departments
  • City and state government public affairs officers
  • Communications staff at congressional and other government offices
  • Communications staff at local and regional police, fire, and emergency management offices
  • Regional health and emergency preparedness colleagues
  • State and local mental health agencies
  • Hospital public relations-affairs departments
  • State and local Emergency Operations Center coordinators
  • Federal Emergency Operations Centers

• Promote public acceptance and support for national response measures and contingency plans.

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.
APPENDIX 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 interpandemic 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 handwashing, 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.

- The United States is preparing for pandemic influenza by:
  - Developing a coordinated national strategy to prepare for and respond to an influenza pandemic
  - Educating healthcare workers about pandemic influenza diagnosis, case management, and infection control practices
  - Refining global and domestic pandemic influenza surveillance systems
  - Developing guidelines for minimizing transmission opportunities in different settings
  - 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 states and localities can adapt as guidance for use during an influenza pandemic.
APPENDIX 2. SAMPLE MATERIALS

HHS will provide communications materials for states and localities throughout all pandemic phases. Many of these resources will made available at appropriate times on the www.pandemicflu.gov website. Others will be disseminated by using the Health Alert Network (HAN), Epidemic Information Exchange (Epi-X), and other resources for health professionals. The following list offers a sample of the types of communications materials that states and local areas can expect from CDC. This is not an inclusive list and may change depending on the nature and circumstances of a specific influenza pandemic threat. See Appendix 3 (of this supplement for additional resources.

Pandemic Influenza Fact Sheet
http://www.cdc.gov/flu/avian/gen-info/pandemics.htm

Avian Influenza Fact Sheet
http://www.cdc.gov/flu/avian/gen-info/facts.htm

Guidance to Travelers
http://www.cdc.gov/travel/other/avian_flu_ah5n1_031605.htm

Interim Guidance for U.S. Citizens Living Abroad
http://www.cdc.gov/travel/other/avian_flu_ig_americans_abroad_032405.htm

Sample CDC News Conference Transcript
http://www.cdc.gov/od/oc/media/transcripts/t040127.htm

Managing Anxiety in Times of Crisis
http://mentalhealth.samhsa.gov/cmhs/managinganxiety/default.asp
APPENDIX 3. ADDITIONAL RESOURCES

HHS and its agencies will make resources available to state and local health professionals to assist with their communications responsibilities during Interpandemic, Pandemic Alert, and Pandemic Periods. Because information may change frequently, check the www.pandemicflu.gov and 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 healthcare and public health professionals and for public audiences, as well as specific versions for low-literacy populations. As appropriate and feasible, material will be provided in a variety of languages.

One of the most comprehensive and practical resources for communications professionals is the CDCynergy CD-ROM set produced by CDC. Emergency Risk Communication CDCynergy is applicable to communicating before and during an influenza pandemic. Communications staff also may find the CDCynergy 3.0 disk helpful. Information about CDCynergy is available on CDC’s website at http://www.cdc.gov/communication/cdcynergy.htm.

Communicating in a Crisis: Risk Communication Guidelines for Public Officials is available on SAMHSA’s website at http://www.riskcommunication.samhsa.gov/index.htm and bound copies can be ordered online at no charge from SAMHSA’s National Mental Health Information Center (http://store.mentalhealth.org/publications/ordering.aspx) or by calling 1-800-789-2647. This pocket reference describes basic skills and techniques for clear, effective crisis communications and information dissemination, and provides some of the tools of the trade for media relations.

Other resources

National Vaccine Program Office Pandemic Influenza Website
http://www.HHS.gov/nvpo/pandemics/

WHO Pandemic Influenza Website

MMWR Guide for Influenza
http://www.cdc.gov/mmwr/mguide_flu.html

Epidemic Information Exchange (Epi-X)
http://www.cdc.gov/mmwr/epix/epix.html

Health Alert Network (HAN)

Centers for Public Health Preparedness
www.asph.org/acphp

• 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 countrywide defense system through the preparation of front-line public health workers and first responders.

Vaccine-Specific Sites and Resources

Vaccine Adverse Events Reporting System (VAERS) website at http://vaers.hhs.gov/ or call 1-800-822-7967
Surveillance Sites
CDC Influenza Surveillance Data
EISS: European Influenza Surveillance Scheme
EuroGROG: International Influenza Surveillance
World Health Organization (WHO): Flunet

Outbreak Sites
Animal and Plant Health Inspection Service (APHIS), Veterinary Services, U.S. Department of Agriculture (USDA)
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

Research Sites
National Institute of Allergy and Infectious Diseases (NIAID)

USDA Agricultural Research Service
Agricultural Research Service (ARS), USDA
The ARS’ Southeast Poultry Research Laboratory publishes information on avian influenza research and contacts for further information.

Manufacture and Licensing of Influenza Vaccine
Center for Biologics Evaluation and Research (CBER), FDA
CBER plays a critical role in the manufacture and licensing of influenza vaccine.

WHO Global Influenza Preparedness Plan
APPENDIX 4. HHS PANDEMIC INFLUENZA RISK COMMUNICATION AND PUBLIC OUTREACH STRATEGY

OVERVIEW

Pandemic influenza risk communication strategies are a critical and necessary component of pandemic influenza preparedness. To be effective, these strategies should be based on scientifically derived risk communications principles and are critical before, during, and after an influenza pandemic. Effective communication guides the public, the news media, health-care providers, and other groups in responding appropriately to outbreak situations and adhering to public health measures.

The main objective of this HHS communication strategy is to prepare the U.S. public and communities for an influenza pandemic by developing messages and materials to share with local, public and private sectors as well as our global partners. In advance of a pandemic, a system can be developed for alerting the public and draft messages and materials can be prepared.

A critical component of national preparedness for an influenza pandemic is informing the public about this potential threat and providing a solid foundation of information upon which future actions can be based. Once a pandemic occurs, our ability to communicate effectively will help HHS manage the public health implications of a pandemic. Studies have shown that the public will respond and cooperate more readily if they are involved directly in discussions and planning for future events. The HHS plan includes both strong risk communication and public outreach in order to build public trust, confidence, and cooperation. For many communities, local leaders may have to rely on risk communication as the primary tool to manage the crisis.

The communication strategy provides HHS guidance on the type of information that is crucial to convey in initial messages in order to prompt appropriate public responses after a crisis situation; the messages that can be delivered prior to, during, and after an incident; the obstacles to effective communications and how they can be minimized; opportunities that currently exist and how to maximize resources; the questions that we can anticipate from the public. This strategy reflects a two year agenda for pandemic preparedness communication and public outreach activities.

Importantly, pandemic influenza risk communication must be approached differently than many other disasters and emergencies. For example, pandemic influenza is likely to be widespread (not localized) and will therefore strain National resources. Communities will need to develop local plans for community continuity. In addition, pandemic influenza is likely to be a prolonged event, which will require a plan for ensuring sustained societal functions.

The objectives of this HHS communication strategy are to:

- prepare the U.S. public and communities for a pandemic;
- communicate the need for local preparedness and that because of that "not business as usual";
- develop central messages and materials that can be shared broadly;
- coordinate across HHS and other Federal Departments; and
- provide support to our global partners.

GENERAL RISK COMMUNICATION PRINCIPLES

Using sound and thoughtful risk communication strategies can assist public officials in preventing fear-driven, and potentially damaging public responses to crises such as bioterrorism and pandemic disease outbreaks. These strategies can help foster trust and confidence that are vital to public health. (Covello et al., 2001; Maxwell, 1999). Before a crisis occurs, public officials can prepare communities, risk managers, government spokespersons, public health officials, the news media, physicians, and hospital personnel with appropriate messages that can help build public confidence in public officials and the measures they recommend. (O'Toole, 2001).
The HHS National Pandemic Influenza Risk Communications and Public Outreach Strategy follows seven key risk communications concepts.

1. When health risks are uncertain, as likely will be the case during an influenza pandemic, people need information about what is known and unknown, and interim guidance to formulate decisions to help protect their health and the health of others.

2. An influenza pandemic will generate immediate, intense, and sustained demand for information from the public, healthcare providers, policy makers, and news media. Healthcare workers and public health staff may need training in media relations and public health communications.

3. Timely and transparent dissemination of accurate, science-based information about pandemic influenza and the progress of the response can build public trust and confidence, particularly when such communication efforts are guided by established principles of risk communication.

4. 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.

5. Guidance to community members about how to protect themselves and their family and colleagues is an essential component of crisis management.

6. Information to public audiences should be technically correct and sufficiently complete to encourage support of policies and official actions without seeming patronizing to the public.

7. Information presented during an influenza pandemic should minimize speculation and avoid over-interpretation of data, overly confident assessments of investigations and control measures, and critical comments related to other jurisdictions.

The two most important concepts relate to communicating uncertainty, openly and honestly acknowledging that “this will not be business as usual.”

Recognizing and admitting uncertainty is a component of most risk communication situations (Plough et al., 1988; and Chess, 1989). Scientific uncertainty can complicate communications when officials try to satisfy the public’s demand for reliable and meaningful information for many risk situations. Public health officials frequently face the dilemma of having to acknowledge and explain uncertainty to a public that thinks scientific findings are precise, repeatable, and reliable. Moreover, the public often associates correlation and association as being the same as causality. As a result, officials often face the additional task of trying to explain the data’s limitations and uncertainties. Audiences need to be provided as much information as possible to help them understand that uncertainty is part of the process and that the answers may change as new information and science becomes available.

Public officials must also acknowledge that a crisis demands an acknowledgment that “this will not be business as usual.” This can be communicated by:

- Emphasizing the rationale and importance of adherence to public health measures that some people may consider intrusive (e.g., quarantine).
- Helping to set reasonable expectations of public health and health care systems.
- Promptly address rumors, inaccuracies, and misperceptions.
- Minimizing stigmatization that may occur during a pandemic.
- Ensuring that high-risk groups and others with special needs (e.g., non-English speaking populations, difficult-to-reach communities, and persons living in institutional settings) receive appropriate information.
- Acknowledging the anxiety, distress, and grief that people experience during long-term, major public health crises such as pandemics.
HHS PANDEMIC INFLUENZA RISK COMMUNICATION AND PUBLIC OUTREACH STRATEGY

During the prepandemic or interpandemic period, national, state, and local communities need to disseminate messages explaining why pandemic influenza is a potential public health threat, what is being done to prepare, how a pandemic would be different from annual influenza outbreaks, and what communities can do in advance. A portfolio of materials, including other sources of information is being developed by HHS for use by communities and other groups. A national website www.pandemicflu.gov will be updated regularly and serve as a national information clearinghouse. Nine key components define the HHS communications strategy:

1) PLANNING AND ASSESSMENT OF CURRENT KNOWLEDGE
   • Determine what communications actions will be taken and by whom in advance of a pandemic (i.e. prepandemic) and once a pandemic is confirmed by WHO
   • Ascertain communication needs for various audience segments (i.e. What materials, resources, processes, and systems, will be necessary in both phases?)
   • Conduct an environmental scan or an assessment of current knowledge of pandemic influenza, which will include:
     • Scholarly literature review on Avian Flu or whatever pandemic flu strain is the problem, public health risks, public and political response to similar incidents (e.g., SARS),
     • Review of media coverage of pandemics, Review of web sources
     • Assess and analyze media and public baseline knowledge and attitudes.
     • Review current national and international efforts and programs to control the pandemic and work with international partners to coordinate activities (WHO)

2) FORMATIVE AUDIENCE RESEARCH
   • Define public perceptions, attitudes, beliefs. Study these from communication perspective to determine how to position information so that people attend to messages and act upon them.
   • Conduct 2 sets of 9 cognitive interviews and 16 focus groups with general public.
   • Conduct 18 telephone stakeholder interviews with health professionals and community leaders.

3) MESSAGE AND MATERIAL DEVELOPMENT
   • Develop prepandemic (WHO intrapandemic and pandemic alert levels) and pandemic messages and materials based on risk communication principles, as outlined in the WHO Outbreak Communication Guidelines.
   • Define audiences and develop materials for these audiences.
   • Develop message maps and concepts appropriate for each “Phase” of an influenza pandemic development. To test event messages, a video-based scenario will be used to simulate emotional response during a pandemic.
   • Coordinate with other agencies to identify pre-event and event material needs and to develop new materials as needed. Materials may include:
     • “HHS Prepares for Pandemic Influenza” - a sixteen page, color version of the pandemic plan for the public that describes the major issues, decisions, actions regarding pandemic influenza.
     • Live announcer copy
     • Core Q&As
     • Hotline response materials

part 2: public health communications
• Fact sheets
• B-roll
• Graphics to support HHS communication (animation)
• Conduct focus groups with general public to pretest event messages separately and/or materials. Provide additional support for material development as needed.

4) CROSS GOVERNMENT COLLABORATION AND COORDINATION

• Establish a cross agency working group that includes communication, policy and subject matter experts. This working group will review and shares strategies and activities being undertaken by each agency and develop a coordinated communication approach. This working group will:
  • Develop consistent messages about pandemic influenza
  • Ensure common understanding of HHS objectives and strategies
  • Leverage existing activities and resources to address pandemic influenza
  • Develop an inventory of current activities
  • Identify gaps and make recommendations on how they can be filled
  • Coordinate media planning, stakeholder outreach
  • Coordinate communications systems as appropriate.
  • Outreach to other Departments in the Federal government and international partners.

5) TRAINING

• Coordinate Training sessions for emergency risk communication among “master trainers” as identified through previous training courses provided by CDC, as well as CDC recommendations. These core trainers would then provide on the ground training within their regions and states focusing specifically on Pandemic Influenza.
• Conduct media training for spokespersons on public health crisis response and risk communications principles.
• Prepare a highly specialized risk communication and message development workshop. This workshop would be focused on building trust across policy makers, communications experts, and subject matter experts across HHS and partner agencies to support effective risk communication during an outbreak of Pandemic Influenza.
• Run a senior official pandemic influenza/communication-focused exercise in cooperation with other government departments.

6) MEDIA OUTREACH

• Coordinate closely with the CDC and other HHS agencies on a National Pandemic Influenza Media Plan, which would include:
• Develop core press materials to serve as backgrounder documents for federal, state and local partners, using existing CDC materials as a starting point
• Conduct media briefing with key national outlets to demonstrate how HHS will function and discuss community planning
• Coordinate media relations with Canada, UK, Mexico, WHO, PAHO, Japan, the EU, and GHSAG, as appropriate.
• Coordinate and host a total of six informational roundtables with:
Key science and health writers/reporters to lay out the groundwork for basic understanding of a pandemic, the risk of an outbreak, the public health response, fact/myths about pandemics, the role of infection control in managing the outbreak, etc.

Key minority media and those representing special-needs groups.

- Review and enhance media lists.

7) COMMUNITY CONTINUITY PLANNING

In collaboration with other government offices (e.g. Department of Education) HHS will develop toolkits specific to different audience segments (e.g. socio-economic considerations) to help inform them about the potential threat of a pandemic, the implications of a pandemic for this sector, and what this sector needs to know in advance so that they can best prepare.

HHS will:

Conduct research into existing infrastructures and plans that can be models for this effort.

Engage community leaders in pre-pandemic planning

- Convene multiple stakeholders meeting.
- Publish proceedings as a document on community continuity planning for Pandemic Influenza and distribute widely including online/electronically
- Develop tool kits for communities for continuity planning working with other governmental partners (e.g. Dept of Education on Tool Kit for Schools)
- Provide exercises/scenarios with leaders’ guide on the Pandemic so that communities can use these to determine what they need to put in place, what choices/options they face.
- Develop an online exercise activity designed to help community groups plan for ensuring that community members have access to needed services (e.g., child care, transportation to essential appointments and essential supplies) in a pandemic influenza event. The exercise will be designed similarly to a board game. The outcome for community groups participating in the game will be to have developed a set of materials such as telephone trees, transportation plans, and community maps marked with the location of essential services, the location of individuals who need assistance, etc. Training will be based on core scenario developed for other trainings.

8) BUSINESS CONTINUITY PLANNING

Stimulate and support business leader continuity planning.

Engage Business Leaders in Pandemic Flu Continuity Planning.

Help them understand nature of the outbreak and why employees should stay home. Provide information on how to plan to continue operations during a pandemic.

Support their exploration of how they can use volunteers to deliver good and services to quarantined community members.

Support their exploration of how they can support public health response

Conduct Business Roundtables

Work with SBA, DOC, DOL and other stakeholders such as Chambers of Commerce, to convene four key business leader and union representatives in a series of roundtables segmented by business size, and/or geography, and/or nature of business.

- Publish outcome of meeting proceedings and widely distribute
• Provide handbook for business leaders and other stakeholders to encourage and support their planning for/coping with Pandemic Influenza. This would include background information on all relevant topics.

9) PUBLIC ENGAGEMENT

Expert Discussions

Host roundtable discussions with medical influencers and opinion leaders Identify and convene key health professional influencers for an “expert discussion” to better understand the likely criticisms the agency may face from the public, and also help these influencers better understand the challenges of pandemic influenza management, relevant research underway, etc. so that they will have a better understanding of what they are commenting on if called upon by the media during an outbreak.

Town Hall Meetings in Six Cities (San Diego, San Francisco or Seattle; Detroit; Miami; Dallas or Fort Worth; Philadelphia and Mobile) Work with Council for Excellence in Government to convene town meetings across the nation with key stakeholders to engage them in planning for pandemic and community continuity.

- public health/public officials
- private sector clinicians
- education sector
- business sector
- non-profit/volunteer sector

Format of town meetings will include a primary session of 200 participants across stakeholder groups, with breakout sessions following. This will include location scouting, panelist research, media and community outreach. Tasks will include:

- secure panelists and sub panelists in the following areas: HHS leadership; local public heath leadership; local private sector clinical officials; local nonprofit/volunteer community; local education community; local business leaders
- publicize event through media partnerships and strategic outreach to build community audience of 200 people
- conduct on-line registration that includes audience pre-event polling
- research on locality and specific issues and concerns for discussion
- secure nationally recognized media personality for moderator and A/V vendor
- produce moderator guide (show script)
- oversee all media relations prior, during and post event
- produce town hall event, including show production, live audience polling and on-site event management
- produce and facilitate post town hall leadership symposium

Public Dialogue Sessions—Meetings with National stakeholder organizations at IOM in July, Sept to discuss priority groups for vaccination during a pandemic. Meetings with local citizens in Atlanta, Omaha, Boston, and Portland in August and September.

10) INTERNATIONAL SUPPORT

• Work with WHO to support public health risk communications needs globally.
• If requested, provide template materials that can be adapted to local needs.
• Support global risk communication training through WHO
HHS RESPONSIBILITIES

Pandemic Period
Develop key messages and materials and conduct audience research and message testing and share results with state and local communications staff.

Provide tools and resources through the www.pandemicflu.gov and other avenues to help educate state and local communications staff.

Identify and train lead spokespersons.

Provide state and local health agencies with guidance about developing communications aspects of preparedness plans.

Work with state and local governments to incorporate communications preparedness as part of larger preparedness exercises.

Work with other non-public health sectors to help provide communications tools for their communities.

Work with the World Health Organization (WHO) and other international public health partners to plan and coordinate communication activities for an influenza pandemic.

Pandemic Alert
Coordinate pandemic influenza media messages to ensure consistency

Provide regular updates about situations that pose potential pandemic influenza threats (e.g., through Health Alert Network [HAN] notices and Web site postings).

Distribute educational messages about pandemic influenza and ways that people can protect themselves and their families

Distribute practical information, such as travel advisories, infection control, availability and use of antiviral medications and vaccines, and specific public health actions that may be needed.

Address rumors and false reports regarding pandemic influenza threats.

Pandemic Period
Coordinate pandemic influenza media messages to ensure consistency

Coordinate communications activities with state and local communications staff, including regional or local communications centers as appropriate.

Promptly respond to rumors and inaccurate information to minimize concern, social disruption, and stigmatization.
SUMMARY OF PUBLIC HEALTH ROLES AND RESPONSIBILITIES IN WORKFORCE SUPPORT

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S11-III. RECOMMENDATIONS FOR THE INTERPANDEMIC AND PANDEMIC ALERT PERIODS
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Box 1. Psychosocial Issues for Response Workers
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Appendix 1. Bibliography: Psychosocial Issues Related to Public Health Emergencies
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SUMMARY OF PUBLIC HEALTH ROLES AND RESPONSIBILITIES IN WORKFORCE SUPPORT

INTERPANDEMIC AND PANDEMIC ALERT PERIODS

Healthcare institutions, state and local health agencies, first-responder organizations, and employers of essential service workers:

- Institutionalize psychosocial support services for employees who participate in or provide support for the response to public health emergencies such as influenza pandemics.
- Prepare educational and training materials on psychosocial issues for distribution to employees during an influenza pandemic.

State and local health departments and other groups:

- Lay the groundwork for the development and implementation of workforce resilience programs to maximize responders’ performance and personal resilience during a public health emergency.
- Use behavioral health expertise to develop public health messages, train staff on the use of personal protective equipment (PPE), and conduct other relevant activities.

HHS agencies:

- Create, collect, and provide educational and training materials on psychosocial issues related to pandemic influenza for use by hospital administrators, emergency department staff, safety and security professionals, behavioral health providers, social workers, psychologists, chaplains, and others.
- Provide guidance on the development of self-care strategies and workforce resilience programs.

PANDEMIC PERIOD

Healthcare institutions, state and local health agencies, first-responder organizations, and employers of essential service workers:

- Provide psychological and social support services for employees and their families.
- Address stigmatization issues that might be associated with participation in such services.

Healthcare institutions:

Provide employees with ongoing access to up-to-date information on healthcare and training issues, as well as on the national and local status of the pandemic.

State and local health departments and other groups:

- Implement workforce resilience programs.

HHS agencies:

- Provide medical, public health, and community partners with educational and training materials on psychosocial issues related to pandemic influenza.
- Provide occupational health guidance on psychosocial issues related to the pandemic, including information on anticipated reactions to restrictive public health measures such as quarantine.
S11–I. RATIONALE

The response to an influenza pandemic will pose substantial physical, personal, social, and emotional challenges to healthcare providers, public health officials, and other emergency responders and essential service workers (Box 1). Experience with disaster relief efforts suggests that enhanced workforce support activities can help responders remain effective during emergencies (Appendix 1).

During an influenza pandemic, however, the occupational stresses experienced by healthcare providers and other responders are likely to differ from those faced by relief workers in the aftermath of a natural disaster. Globally and nationally, a pandemic might last for more than a year, while disease outbreaks in local communities may last 5 to 10 weeks. 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 community-based organizations and nongovernmental organizations with expertise in and resources for psychosocial support services or training.

S11–II. OVERVIEW

Recommendations for the Interpandemic and Pandemic Alert Periods focus on the establishment of 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. The recommendations also address the preparation of informational materials for employees and their families and the development of workforce resilience programs to assist families of deployed workers. Recommendations for the Pandemic Period focus on the delivery of psychosocial support services to response workers, provision of occupational health information to healthcare providers, and implementation of workforce resilience programs.

Supplement 11 addresses the psychological and social (“psychosocial”) needs of the occupational groups that will participate in the response to an influenza pandemic. These groups include:

- Healthcare workers who provide medical care to ill persons
- Emergency field workers and other public health personnel who help control the spread of infection
- First-responder and nongovernmental organizations whose employees assist affected groups (e.g., persons in quarantine or isolation)
- Essential service workers whose activities maintain normal functions in the community and minimize social disruption
- Family members of all of these groups

Examples of the psychosocial issues faced by these groups and their families are listed in Boxes 1 and 2. Preparedness planning to address these issues will also be useful in responding to other types of public health emergencies. A checklist outlining key workforce support and resource concerns is provided to assist planners (see Appendix 2).

S11–III. RECOMMENDATIONS FOR THE INTERPANDEMIC AND PANDEMIC ALERT PERIODS

A. Institutionalizing psychosocial support services

Healthcare institutions and state and local health agencies should consider incorporating psychosocial support services into occupational health and emergency preparedness planning for an influenza pandemic. First responders and essential service workers employed by companies and local governments (Box 2) might also benefit from these services. Healthcare and public health planners should also contact community-based organizations and nongovernmental organizations to determine the types of psychological and social support services and training courses available in their jurisdictions.
• Healthcare and public health officials should consider needs for information sharing with emergency planners in schools, law enforcement agencies, and local businesses.

• Planning for the provision of psychosocial support services might include the following activities:
  • Ensuring that administrators, managers, and supervisors are familiar with and actively encourage the use of tools and techniques for supporting staff and their families during times of crisis (see S11-IV.A and Appendix 3)
  • Training staff in hospitals and occupational health clinics (e.g., social workers, psychiatrists, nurses, psychologists, counselors) in behavioral techniques to help employees cope with grief, stress, exhaustion, anger, and fear during an emergency (see S11-IV.A and Appendix 3)
  • If feasible, providing training in psychological support services to persons who are not behavioral health professionals (e.g., primary-care clinicians, emergency department staff, medical/surgical staff, safety and security personnel, behavioral health staff, chaplains, community leaders, staff of cultural and faith-based organizations)
  • Identifying additional resources that can be available to employees and their families during and after a pandemic
  • Developing strategies to assist staff who have child-care or elder-care responsibilities or other special needs that might affect their ability to work during a pandemic

B. Preparing workforce support materials

Employers of response workers and providers of essential services should obtain or prepare workforce support materials (in hard copy or electronic format) for distribution during a pandemic. These materials should 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 about techniques for coping with these emotions (see Appendix 3).

• 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 pandemic influenza in the workplace (see Supplement 4) and employment issues related to illness, sick pay, staff rotation, and family concerns.

Healthcare institutions should be prepared to provide materials that address healthcare and training issues related to pandemic influenza (see S11-IV.B). To support these efforts, CDC, HRSA, NIH, and SAMHSA will collaborate with the Department of Homeland Security, other federal agencies, and nongovernmental organizations to identify or develop educational materials on:

• Stressors related to pandemic influenza
• Signs of distress
• Traumatic grief
• Psychosocial aspects related to management of mass fatalities
• Stress management and coping strategies
• Strategies for building and sustaining personal resilience
• Behavioral and psychological support resources
• Strategies for helping children and families in times of crisis
• Strategies for working with highly agitated patients
C. Developing workforce resilience programs

State and local health agencies should consider establishing workforce resilience programs that will help deployed workers prepare for, cope with, and recover from the social and psychological challenges of emergency field work. CDC has used this approach with staff members who participated in the tsunami relief effort in 2004-2005 and the Marburg hemorrhagic fever outbreak in Angola in 2005.

To prepare for implementation of workforce resilience programs to cope with the special challenges posed by an influenza pandemic, agencies should do the following:

- Plan for a long response (i.e., more than 1 year).
- Identify pre-deployment briefing materials.
- Augment employee assistance programs with social support services for the families of deployed workers (see S11-IV.C).
- 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).

S11-IV. RECOMMENDATIONS FOR THE PANDEMIC PERIOD

A. Delivering psychosocial support services

Healthcare facilities and public health agencies—as well as companies and local governments that employ essential service providers—should make full use of public health techniques and communication tools that can help response workers manage emotional stress and family issues and build coping skills and resilience. These tools can include:

- Stress control/resilience teams. These teams can 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" (see below)
  - Distributing informational materials (see S11-III.B).
  Stress control teams in hospitals should observe recommended infection control precautions.
- 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:
  - Help 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 (see S11-III.B)
  - 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.

A list of additional resources is provided in Appendix 3.

B. Providing information to responders

1. Healthcare providers

Healthcare providers—especially those who work in hospitals—are likely to be under extreme stress during a pandemic (see Box 3) and will have special needs for open lines of communication with employers and access to up-to-date information. Healthcare facilities should ensure that employees have ongoing access to information on the following:

• International, national, and local progress of the pandemic
• Work issues related to illness, sick pay, staff rotation, shift coverage, overtime pay, use of benefit time, transportation, and use of cellphones
• Family issues, especially availability of child care
• Healthcare issues such as 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”); and 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 healthcare workers might be called upon to fill in for sick colleagues and perform unfamiliar tasks, healthcare facilities should consider providing written instructions for “just-in-time” cross training on essential tasks.

2. Other occupational groups

Other occupational groups that might participate in the response to pandemic influenza (including police, firefighters, and community outreach workers) should receive training materials that will help them anticipate behavioral reactions to public health measures such as movement restrictions (e.g., quarantine, isolation, closure of national or regional borders), especially if such actions are compounded by an economic crisis or abrupt loss of essential supplies and services.

3. Stigmatization issues

Healthcare workers and other emergency responders should 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 without delay.

C. Implementing workforce resilience programs

During an influenza pandemic, state and local health agencies should consider implementing workforce resilience programs that meet the special needs of deployed workers—including workers who do not change job site but whose assignments shift to respond to the pandemic—and the central operations personnel who support them around the clock. First-responder or nongovernmental organizations that send employees or volunteers to assist patients at home or in hospitals might establish similar programs. Workforce resilience programs could provide the following services:
1. Predeployment/assignment
   - Conduct briefings and training on behavioral health, resilience, stress management issues, and coping skills.
   - Train supervisors in strategies for 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 central operations personnel:
     - Enlist stress control or resilience teams to monitor employees’ occupational safety, health, and psychological well-being (see S11-IVA).
     - Establish rest and recuperation sites (see S11-IVA), and encourage their use.
     - Provide behavioral health services, as requested.
   - For families of responders:
     - Provide all of the services listed under “Services for Families” in S11-III.A (Note: Services for Families not listed in S11-III.A)
     - Enlist employee assistance programs to provide family members with instrumental support (e.g., assistance obtaining food and medicine) and 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 responders and family members (including children) to assess lessons learned that might be applied to future emergency response efforts (see Box 4).
   - Provide ongoing access to post-emergency psychosocial support services for responders 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.
BOX 1. PSYCHOSOCIAL ISSUES FOR RESPONSE WORKERS

Psychosocial issues that response workers might need to address include:

- Illness and death among colleagues and family members
- Fear of contagion and/or of transmitting disease to others
- Shock, numbness, confusion, or disbelief; extreme sadness, grief, anger, or guilt; exhaustion; frustration
- Sense of ineffectiveness and powerlessness
- Difficulty maintaining self-care activities (e.g., getting sufficient rest)
- Prolonged separation from family
- Concern about children and other family members
- Constant stress and pressure to keep performing
- Domestic pressures caused by school closures, disruptions in day care, or family illness
- Stress of working with sick or agitated persons and their families and/or with communities under quarantine restrictions
- Concern about receiving vaccines and/or antiviral drugs before other persons

These issues may be exacerbated by:

- Lack of information
- Rumors, misconceptions, or conspiracy theories
- Loss of faith in health institutions, employers, or government leaders
- Belief that medical resources are not available or fairly distributed
- Death of immediate supervisors or other leaders in the response effort
- Mass casualties and deaths among children
- Economic collapse or acute shortages of food, water, electricity, or other essential services
- Restrictions on civil liberties that are perceived to be inequitable
- Infection control procedures that limit personal contact or hinder communications

Psychosocial issues related to the general public are addressed in Supplement 10.

BOX 2. PSYCHOSOCIAL ISSUES FOR FAMILIES OF RESPONSE WORKERS

The families of responders will face many challenges in addition to the fears and disruptions that everyone will face during a pandemic. For example:

- Responders might be frustrated, tired, worried, irritable, argumentative, restless, emotional, or distressed.
- Responders might be impatient and less understanding, energetic, optimistic, good natured, or helpful than usual.
- Increased emergency work loads (which might be exacerbated by staffing shortages) can make it difficult for responders to communicate regularly with family members.
- Family members might experience stigmatization or discrimination.
**BOX 3. IMPACT OF PANDEMIC INFLUENZA ON HEALTHCARE WORKERS**

In addition to the issues faced by all response workers (Box 1), healthcare workers may experience:

- Increased risk of exposure to pandemic influenza
- Constant need to take special precautions to avoid exposure to the pandemic virus
- Illness and death among patients, as well as among colleagues and family members
- Stigmatization and discrimination associated with being perceived as a source of contagion
- Ethical dilemmas, such as conflicts between one’s roles as healthcare provider and parent/spouse, or concern about receiving vaccines or antiviral drugs before other people
- Increased difficulty in performing crucial tasks and functions as the number of severely ill patients increases, the healthcare staff decreases, and medical and infection control resources are depleted
- Frustration regarding the need/expectation to maintain business as usual
- Physical isolation associated with use of infection control measures that limit interpersonal contact

Psychosocial issues related to hospital workers are also addressed in Supplement 3.

**BOX 4. LESSONS LEARNED DURING THE 2004-2005 TSUNAMI RELIEF EFFORT**

- It is difficult to prepare responders for everything they might encounter.
- Even seasoned responders can face situations and issues that cause uneasiness and distress.
- It is not unusual for responders to be asked to work outside their areas of expertise.
- Concerns about family and friends rank high on responders’ lists of priorities.
- Timely, accurate, and candid information should be shared to facilitate decision-making.
- Self-help activities are essential to mission completion.
- Everything possible should be done to safeguard responders’ physical and emotional health.
- Responders do not need to face response challenges alone. They may share their experiences with buddies, teammates, family members, and colleagues.
- It is especially difficult for responders to maintain personal resilience when they witness the deaths of children.
- Organizational differences among groups of responders and cultural differences between victims and responders can impede the timely and efficient provision of emergency services.
APPENDIX 1. BIBLIOGRAPHY: PSYCHOSOCIAL ISSUES RELATED TO PUBLIC HEALTH EMERGENCIES


Background papers from an International Conference on Stigma and Global Health: Developing a Research Agenda (2001 September 5-7; Bethesda, Maryland) are available at http://ww.stigmaconference.nih.gov/papers.html.
APPENDIX 2. CHECKLIST FOR WORKFORCE SUPPORT SERVICES/RESOURCES

A. Checklist for Interpandemic and Pandemic Alert Periods

Include psychosocial issues in planning

- Incorporate psychosocial support services into emergency preparedness planning for an influenza pandemic.
- Coordinate with business, corporations and other private sector interests in planning for behavioral health response and consequences.
- Develop plans to prepare and support emergency service responders (e.g., police, fire, hospital emergency department staff, mortuary workers) during and following deployment.
- Prepare for a significant surge of individuals who fear they may be infected, but aren’t, who may present at emergency departments or other healthcare locations, or contact health information hotlines.
- Develop a demographic picture of the community (e.g., ethnic, racial, and religious groups; most vulnerable; special needs; language minorities) and plan for how they might be reached in a disaster.
- Identify rest and recuperation sites for responders. These 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.
- Develop confidential telephone support lines to be staffed by behavioral health professionals.
- Use behavioral health expertise to develop public health messages, train staff on the psychological impact of the use of personal protective equipment (PPE), and conduct other relevant activities.

Identify and access existing resources

- Work with community-based organizations and nongovernmental organizations to determine the types of psychological and social support services and training courses available in their jurisdictions.
- Establish public-sector links with private mental health resources such as Red Cross and other national voluntary organizations active in disasters.
- Develop a plan to manage offers of assistance and invited/uninvited volunteers.
- Identify gaps, such as culturally competent and multilingual providers, that might affect disaster services.

Train behavioral health and related professionals in disaster response strategies

- Train behavioral health staff in hospitals, clinics, and related agencies in techniques to help people cope with grief, stress, exhaustion, anger, and fear during an emergency.
- Train nonbehavioral health professionals (e.g., primary-care clinicians, safety and security personnel, community leaders, and staff of cultural- and faith-based organizations) in basic psychological support services.
- Establish links to health and medical entities for purposes of assisting in screening potential victims for mental disorders and psychogenic symptomatology, functional impairment, substance abuse, etc.

Develop resources and materials

- Prepare educational and training materials on psychosocial issues for distribution to workers during an influenza pandemic.
B. Checklist for Pandemic Period

During the first 4 weeks

- Meet basic needs such as food, shelter, and clothing.
- Provide basic psychological support (psychological first aid).
- Provide needs assessments.
- Monitor the recovery environment (conducting surveillance).
- Provide outreach and information dissemination.
- Provide technical assistance, consultation, and training.
- Foster resilience, coping, and recovery.
- Provide triage.
- Provide treatment.
- Provide psychological and social support services for employees and their families.
- Address stigmatization issues that might be associated with participation in such services.
- Implement workforce resilience programs.
- Work with communications experts to shape messages that reduce the psychological impact of the pandemic.
- Provide medical, public health, and community partners with educational and training materials.

During subsequent weeks

- Provide continued outreach, triage, and services.
- Monitor workforce for signs of chronic or severe psychological distress.
- Provide assistance in reintegration for workers who were deployed or isolated from work and family.
APPENDIX 3. PSYCHOLOGICAL FIRST AID FOR EMERGENCY RESPONDERS

Along with increased efforts to institutionalize workforce services that support the emotional well-being of responders—both during and after an emergency—a consensus is growing on the usefulness of a set of psychosocial tools and techniques for providing “psychological first aid.” The organizations listed below provide information for those interested in learning more about this topic.

- American Psychiatric Association
  www.psych.org/disasterpsych/links/weblinks.cfm
- American Psychological Association (APA) Help Center
  www.apahelpcenter.org
- Disaster Epidemiology Emergency Preparedness (DEEP) Center, University of Miami Miller School of Medicine
  www.deep.med.miami.edu
- National Center for PTSD, Department of Veterans’ Affairs
  www.ncptsd.va.gov/
- National Child Traumatic Stress Network
  www.nctsnet.org
- Project Liberty
  www.projectliberty.state.ny.us/

Resources from HHS agencies include:

- CDC/American Red Cross. Maintaining a healthy state of mind
  http://www.redcross.org/preparedness/cdc_english/health.asp
- National Institute of Mental Health (NIMH/NIH/HHS)
- Substance Abuse and Mental Health Services Administration (SAMSHA/HHS)
  Disaster Readiness and Response
  www.samhsa.gov/Matrix/matrix_disaster.aspx
  Disaster Technical Assistance Center. Research listings and fact sheets on self-care
  www.mentalhealth.samhsa.gov/dtac/Selfcare.aspx
  Center for Mental Health Services