



# supplement 9 managing travel-related risk of disease transmission

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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/](http://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.

- If public health officials determine that the ill passenger meets the clinical and epidemiologic criteria for infection with a novel influenza strain, the patient should be sent by ambulance to a hospital, using appropriate infection control procedures for transit and patient isolation (see Supplement 4).<sup>1</sup>

## 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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<sup>1</sup> 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](http://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](http://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 Service<sup>1</sup> personnel. Quarantine inspectors also work with regulatory agencies to inspect imported animals and other cargo ([http://www.cdc.gov/ncidod/dq/quarantine\\_stations.htm](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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<sup>1</sup> 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

Level of influenza transmission	Suggested actions to manage inbound travel
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	<p>CDC will distribute travel health alert notices to all arrivals.</p> <p><b>Suggested actions:</b></p> <ul style="list-style-type: none"><li>• Consider enhanced disease surveillance at ports of entry.</li><li>• Request information on the ill passenger's symptoms and travel and exposure histories.</li><li>• 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.</li><li>• 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).</li><li>• Isolate arriving ill passengers, and quarantine their contacts, as necessary.</li></ul>
Imported cases in the United States and extensive transmission in the inbound traveler's location of origin	<p><b>Additional actions:</b></p> <ul style="list-style-type: none"><li>• Consider prohibiting all nonessential arrivals.</li><li>• Consider active monitoring of all arriving passengers for fever and respiratory symptoms.</li></ul>
Extensive transmission in the inbound traveler's location of origin	<p><b>Additional actions:</b></p> <ul style="list-style-type: none"><li>• Prohibit all nonessential arrivals.</li></ul>

## APPENDIX 2. TRAVEL-RELATED INFLUENZA RESPONSE MATRICES (CONT.)

### Matrix 2: Outbound Travel

Level of influenza transmission	Suggested actions to manage outbound travel
Limited transmission (clusters of human-to-human cases or second-generation spread) in the outbound traveler's destination	<p>CDC will issue Travel Health Precautions and Travel Health Warnings for particular destinations, as needed.</p> <p><b>Suggested actions:</b></p> <ul style="list-style-type: none"><li>• Distribute targeted health education messages to outbound travelers.</li></ul>
Extensive transmission in the outbound traveler's destination	<p><b>Additional actions:</b></p> <ul style="list-style-type: none"><li>• Arrange with airline industry partners to show videos or air public announcements about pandemic influenza on airplanes and cruise ships.</li><li>• Cancel or limit nonessential travel to affected countries.</li></ul>
Extensive transmission in the outbound traveler's destination and in the United States.	<p><b>Additional actions:</b></p> <ul style="list-style-type: none"><li>• Consider implementing medical screening at exit points in the United States.</li></ul>