



## Supplement B: SARS Surveillance

### IV. Plan for Surveillance of Cases of SARS-CoV Disease

#### *A. Surveillance in the Absence of Person-to-Person Transmission of SARS-CoV in the World*

**Objective:** Establish surveillance aimed at early detection of cases and clusters of severe unexplained respiratory infections (i.e., pneumonia) that might signal the re-emergence of SARS-CoV.

Continued vigilance is critical to ensure the rapid recognition and appropriate management of SARS patients if person-to-person SARS-CoV transmission recurs. In the absence of known areas with SARS-CoV transmission, the likelihood that a patient with fever or respiratory symptoms has SARS-CoV disease will be exceedingly low unless the patient has both typical clinical findings and some accompanying epidemiologic evidence that raises the suspicion of exposure to SARS-CoV. Therefore, U.S. surveillance efforts should focus on specific clinical syndromes (i.e., cases of pneumonia requiring hospitalization) in groups likely to be first affected by the re-emergence of SARS-CoV (e.g., travelers to areas previously affected with SARS-CoV; healthcare workers).

The 2003 SARS-CoV outbreak likely originated in mainland China, and neighboring areas such as Taiwan and Hong Kong are thought to be at higher risk due to the large volume of travelers from mainland China. Although less likely, SARS-CoV may also reappear from other previously affected areas. Therefore, clinicians should obtain a complete travel history. If clinicians have concerns about the possibility of SARS-CoV disease in a patient with a history of travel to other previously affected areas (e.g., while traveling abroad, had close contact with another person with pneumonia of unknown etiology or spent time in a hospital in which patients with acute respiratory disease were treated), they should contact the health department.

In the absence of SARS-CoV transmission in the world, the screening of persons requiring hospitalization for radiographically confirmed pneumonia for risk factors suggesting SARS-CoV exposure should be limited to adults, unless there are special circumstances that make the clinician and public health personnel consider a child to be of potentially high risk for having SARS-CoV disease. During the 2003 global outbreaks, infants and children accounted for only a small percentage of SARS cases and had a much milder disease and better outcome than adults. Although information on SARS-CoV disease in pediatric patients is limited, the role of children in transmission is likely much less significant than the role of adults.

#### **Activities: Healthcare providers**

- Consider SARS-CoV disease in patients who require hospitalization for radiographically confirmed pneumonia (or acute respiratory distress syndrome) of unknown etiology *and* who have one of the following risk factors in the 10 days before illness onset:

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- Travel to mainland China, Hong Kong or Taiwan, or close contact<sup>1</sup> with an ill person with a history of recent travel to one of these areas, *or*
- Employment in an occupation associated with a risk for SARS-CoV exposure (e.g., healthcare worker with direct patient contact; worker in a laboratory that contains live SARS-CoV<sup>2</sup>), *or*
- Part of a cluster of cases of atypical pneumonia without an alternative diagnosis
- Use SARS-CoV testing judiciously and in consultation with local or state public health officials, given that: 1) the positive predictive value of a positive laboratory test in the absence of SARS-CoV transmission is extremely low, and 2) false-positive tests may generate tremendous anxiety and concern and expend valuable public health resources.
- Be alert for clusters of unexplained pneumonia among two or more healthcare workers who work in the same facility.
- *Report* to the state or local health department:
  - All persons requiring hospitalization for radiographically confirmed pneumonia who report at least one of the three risk factors listed above
  - Any clusters of unexplained pneumonia requiring hospitalization, especially among healthcare workers
  - Any positive SARS-CoV test result (requires immediate notification of the health department by telephone).

### Activities: State and local health departments

- ◆ Disseminate surveillance guidelines regarding timely recognition, evaluation, and reporting of possible SARS-CoV cases to healthcare providers, particularly triage, emergency department, and hospital-based providers.
- ◆ Establish a surveillance system to receive reports of:
  - Persons who require hospitalization for radiographically confirmed pneumonia and who are found to be at greater risk for SARS-CoV disease based on the provider-based screening described above,
  - Clusters of persons with unexplained pneumonia, and
  - Positive SARS-CoV test results.
- ◆ Review and obtain information needed to assess reported pneumonia cases and clusters for the likelihood of SARS-CoV disease. Considerations that increase the likelihood of SARS-CoV disease include:
  - Illness onset dates grouped within a 10-day period
  - Ill travelers who had contact with healthcare settings or persons hospitalized for unexplained respiratory infection while abroad and within 10 days of illness onset
  - Clusters of pneumonia among any group of persons for whom alternative diagnoses have been reliably excluded or clusters in which one case is linked to travel to a previously affected area or to an ill healthcare worker
- ◆ Review reports of persons who are hospitalized for pneumonia and are at increased risk for SARS-CoV disease to ensure that:

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<sup>1</sup> Close contact: A person who has cared for or lived with a person with SARS-CoV disease or had a high likelihood of direct contact with respiratory secretions and/or body fluids of a person with SARS-CoV disease. Examples of close contact 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.

<sup>2</sup> Persons who work in laboratories that contain live SARS-CoV should report any febrile and/or respiratory illnesses to the supervisor. They should be evaluated for possible exposures, and their clinical features and course of illness should be closely monitored. If laboratory workers with fever and/or respiratory illness are found to have an exposure to SARS-CoV, they should be managed according to the recommendations in Supplement F, Appendix F6.

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- Adequate testing is done to rule out other infectious causes of pneumonia
- SARS-CoV testing is ordered only when appropriate (see *Clinical Guidance on the Identification and Evaluation of Possible SARS-CoV Disease among Persons Presenting with Community-Acquired Illness*, [www.cdc.gov/ncidod/sars/clinicalguidance.htm](http://www.cdc.gov/ncidod/sars/clinicalguidance.htm)).
- ◆ Consult CDC as needed about cases or clusters of special concern.
- ◆ Report to CDC any positive SARS-CoV test results.
- ◆ Inform CDC of other cases or clusters of pneumonia that are of particular concern by calling 770-488-7100.

### Activities: CDC

- Provide guidance to health departments, hospitals, and healthcare providers on SARS surveillance.
- Assist state and local health departments in the development of an electronic reporting system and related forms to facilitate uniform reporting.
- Assist states, as requested, in investigations of cases and clusters of persons with possible SARS-CoV disease.
- Collect and review reports of pneumonia requiring hospitalization in travelers and clusters of healthcare workers associated with a high index of suspicion for SARS-CoV disease, as specified in the preceding section.

## ***B. Surveillance in the Presence of Person-to-Person Transmission of SARS-CoV in the World***

**Objective:** Establish surveillance to promptly identify and report all new U.S. cases of SARS-CoV disease to facilitate outbreak management and control.

If person-to-person SARS-CoV transmission is documented in the United States or abroad, the likelihood that a person with fever or lower respiratory symptoms might be infected with SARS-CoV will increase but will remain low unless the person has a history of recent exposure to a known case of SARS-CoV disease or to a setting in which SARS-CoV transmission is occurring. Surveillance efforts should be modified to incorporate available risk factor information, particularly regarding geographic transmission patterns. The scope of surveillance activities in specific communities may differ substantially depending on the extent of disease in both the community and local healthcare facilities or institutions. Ongoing analysis of surveillance data and other information will be critical to inform decisions about the need to implement or discontinue various elements of enhanced surveillance.

Surveillance activities should also be enhanced or accelerated as needed by a particular community or institution. *Basic surveillance activities* should be initiated in areas with no or little SARS-CoV transmission and continued in areas with increased transmission. *Enhanced surveillance activities* should be considered if a community or facility experiences a significant increase in number of cases, if epidemiologic links between cases cannot be readily established, or if changing transmission patterns are identified. Enhanced surveillance activities should focus both on increasing the sensitivity of case detection through use of less specific clinical criteria when screening cases (see note below) and on evaluation of suspicious illnesses regardless of identification of an epidemiologic link.

**NOTE:** For persons with a high risk of exposure to SARS-CoV (e.g., persons previously identified through contact tracing or self-identified as close contacts of a laboratory-confirmed case of SARS-CoV disease; persons who are epidemiologically linked to a laboratory-confirmed case of SARS-CoV disease), respiratory symptoms used to screen patients should be expanded to include upper respiratory symptoms such as sore throat and rhinorrhea, in addition to any other early non-respiratory symptoms of SARS-CoV disease such as chills, rigors, myalgia, headache, or diarrhea. The

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more common early symptoms include chills, rigors, myalgia, and headache; in some patients, myalgia and headache may precede the onset of fever by 12-24 hours. However, diarrhea, sore throat, and rhinorrhea may also be early symptoms of SARS-CoV disease.

### Activities: Healthcare providers

#### *Community-based surveillance*

##### Basic Activities

- Continue case detection and reporting as detailed above (absence of SARS-CoV transmission in the world) to identify potential SARS cases with no known epidemiologic links.
- Consider screening all patients presenting to outpatient clinics with a fever or lower respiratory symptoms for SARS risk factors. SARS risk factors include:
  - Travel within 10 days of illness onset to a foreign or domestic location with documented or suspected transmission of SARS-CoV (see [www.cdc.gov/ncidod/sars/travel.htm](http://www.cdc.gov/ncidod/sars/travel.htm)), or
  - Close contact within 10 days of illness onset with a person with known or possible SARS-CoV disease.
- If a patient with a fever or evidence of respiratory illness has a SARS risk factor, notify the local health department, and evaluate and isolate the patient according to the algorithm in *Clinical Guidance on the Identification and Evaluation of Possible SARS-CoV Disease among Persons Presenting with Community-Acquired Illness* ([www.cdc.gov/ncidod/sars/clinicalguidance.htm](http://www.cdc.gov/ncidod/sars/clinicalguidance.htm)).

##### Enhanced Activities

- If epidemiologic links between some local SARS cases cannot be readily established (i.e., the source of infection is unclear), consider SARS-CoV disease in the differential diagnosis and management of all patients with fever or lower respiratory symptoms, regardless of whether the patient has SARS risk factors (see Supplement C and Supplement I for guidance on triage and infection control).

#### *Hospital-based surveillance*

This section includes recommendations for SARS surveillance in healthcare facilities. For detailed recommendations on screening and triage, access controls, and infection control measures in healthcare settings, see Supplement C and Supplement I.

##### *Healthcare facility with no cases of SARS*

##### Basic Activities

- ◆ Continue to implement case detection and reporting efforts as detailed above (absence of SARS-CoV transmission in the world) to identify potential SARS patients for whom an epidemiologic link is unknown.
- ◆ Screen all patients presenting to emergency rooms or hospital clinics with a fever or respiratory symptoms for SARS risk factors.
- ◆ Infection control personnel, occupational health officials, and providers should be alert for clusters of pneumonia requiring hospitalization among healthcare workers. Any clusters with illness with onset within the same 10-day period should be reported to local or state health officials.
- ◆ Report any potential SARS cases to the state or local health department according to their instructions.

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### Enhanced Activities

- ◆ If SARS-CoV transmission is occurring in the surrounding community, screen all visitors upon entry to the facility for fever or lower respiratory symptoms. Screen symptomatic persons for SARS risk factors. Patients with risk factors should be isolated and evaluated according to the algorithm in *Clinical Guidance on the Identification and Evaluation of Possible SARS-CoV Disease among Persons Presenting with Community-Acquired Illness* ([www.cdc.gov/ncidod/sars/clinicalguidance.htm](http://www.cdc.gov/ncidod/sars/clinicalguidance.htm)).

*Healthcare facility with a few SARS cases, but no evidence of nosocomial transmission*

### Basic Activities

- ◆ Continue all recommended surveillance plans outlined in the previous section. Implement daily monitoring of all healthcare workers caring for SARS patients. If a healthcare worker caring for SARS patients develops fever or lower respiratory symptoms or two or more early symptoms of SARS-CoV disease (chills, rigors, myalgia, headache, diarrhea, sore throat, rhinorrhea), notify the local health department, begin SARS isolation precautions, and initiate a clinical evaluation as outlined in the algorithm in *Clinical Guidance on the Identification and Evaluation of Possible SARS-CoV Disease among Persons Presenting with Community-Acquired Illness* ([www.cdc.gov/ncidod/sars/clinicalguidance.htm](http://www.cdc.gov/ncidod/sars/clinicalguidance.htm)). The more common early symptoms of SARS-CoV disease include chills, rigors, myalgia, and headache; in some patients, myalgia and headache may precede the onset of fever by 12-24 hours. However, diarrhea, sore throat, and rhinorrhea may also be early symptoms of SARS-CoV disease.

### Enhanced Activities

- ◆ Screen all patients, visitors, and employees upon entry to the facility for fever or lower respiratory symptoms. Screen symptomatic persons for SARS risk factors. Patients with risk factors should be isolated and evaluated for both alternative respiratory illnesses and SARS-CoV disease ([www.cdc.gov/ncidod/sars/clinicalguidance.htm](http://www.cdc.gov/ncidod/sars/clinicalguidance.htm)).

*Healthcare facility with a larger number of SARS cases OR nosocomial transmission with all cases linked to a clearly identified source*

### Activities

- ◆ Continue all recommended surveillance plans outlined in the previous section.
- ◆ Monitor *all* healthcare workers daily for fever or lower respiratory symptoms. If a healthcare worker has fever or lower respiratory symptoms, begin SARS isolation precautions (Supplement I), obtain a chest x-ray, and initiate a preliminary clinical evaluation ([www.cdc.gov/ncidod/sars/clinicalguidance.htm](http://www.cdc.gov/ncidod/sars/clinicalguidance.htm)). Continue to screen all healthcare workers caring for SARS patients using the expanded clinical criteria. In addition to fever or lower respiratory symptoms, screen for the presence of any of the following: chills, rigors, myalgia, headache, diarrhea, sore throat, rhinorrhea.
- ◆ Begin inpatient surveillance. Monitor patients daily for new or worsening respiratory symptoms. If found, investigate the patient for exposure to known or suspected SARS patients. If there is evidence of exposure, isolate the patient and test for alternative respiratory illnesses and SARS-CoV disease ([www.cdc.gov/ncidod/sars/clinicalguidance.htm](http://www.cdc.gov/ncidod/sars/clinicalguidance.htm)).

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### *Healthcare facility with cases attributed to nosocomial transmission with no clearly identified source* Activities

- ◆ Continue all recommended surveillance plans outlined in the previous section.
- ◆ Expand inpatient surveillance. Test any patient with new or worsening fever or respiratory symptoms for SARS-CoV regardless of whether the patient has an epidemiologic link to a SARS case ([www.cdc.gov/ncidod/sars/clinicalguidance.htm](http://www.cdc.gov/ncidod/sars/clinicalguidance.htm)).
- ◆ Consider surveillance for illness and absenteeism among healthcare workers.

### **Activities: State and local health departments**

- Continue activities outlined above, as appropriate.
- Identify, evaluate, and monitor exposed contacts of SARS cases to identify previously unrecognized or secondary cases, as outlined below.
- Disseminate modified surveillance and patient screening guidelines to providers through the state/local Health Alert Network.
- Facilitate reporting from hospitals. If necessary, consider placing surveillance staff in hospitals with multiple SARS admissions.
- Review reports daily of persons reported from hospitals/providers to: 1) evaluate the level of risk for SARS, 2) ensure adequate testing to rule out SARS-CoV, 3) identify new clusters that might require special attention, 4) identify contacts and ensure that they are evaluated and monitored (as outlined below), and 5) monitor trends.
- Once person-to-person SARS-CoV transmission is documented anywhere in the world, report to CDC any person who meets the case definition for a probable case of SARS-CoV disease or a confirmed case of SARS-CoV disease, as defined by CSTE (see Appendix B1).
- Immediately report to CDC any positive SARS-CoV test results.
- Following discussions between CDC and CSTE, CDC may also require reporting of other potential SARS-CoV cases (e.g., SARS reports under investigation [SARS RUIs]) as needed to meet national surveillance objectives. Updated national reporting requirements will be circulated to state and local health departments and posted on CDC's SARS website ([www.cdc.gov/sars](http://www.cdc.gov/sars)) as indicated.

### **Activities: CDC**

- Continue activities outlined above, as appropriate.
- Ensure that all states have systems to identify and monitor potential SARS cases and contacts.
- Ensure that states and hospitals have adequate guidance to implement effective surveillance and containment measures.
- As SARS activity evolves, work with CSTE to determine what surveillance information and related reporting mechanisms are needed to meet national surveillance objectives.
- Monitor the level of activity of SARS-CoV disease nationwide to:
  - Monitor the effectiveness of U.S. efforts to diagnose and contain SARS-CoV
  - Provide timely feedback to states in the form of data and other information
  - Mobilize additional resources, and arrange surge capacity as needed
  - Report activity to WHO to assist with global surveillance and control
- Oversee surveillance at ports of entry to aid in the identification of possible imported SARS-related illnesses, as outlined in Supplement E.
- Facilitate coordinated surveillance and related activities in settings that may not be under state/local jurisdiction (e.g., military bases).
- Provide guidance regarding possible laboratory-acquired SARS-CoV infections, as outlined in Supplement F.

For more information, visit [www.cdc.gov/ncidod/sars](http://www.cdc.gov/ncidod/sars) or call the CDC public response hotline at (888) 246-2675 (English), (888) 246-2857 (Español), or (866) 874-2646 (TTY)