

Council of State and Territorial Epidemiologists
Position Statement

See <http://www.cste.org/pdffiles/Positionstatementprocess2003table.pdf>

Committee: Executive Committee

Title: Revision of the CSTE case definition for Severe Acute Respiratory Syndrome (SARS)

Statement of the problem:

In June 2003, CSTE passed a revised case definition for SARS. This first revised definition divided the working case definition used by the World Health Organization to define and control the original outbreak of SARS into two definitions: a) a sensitive, non-specific case definition for SARS reports under investigation, and b) a more specific case definition for SARS-CoV disease. At the time, CSTE recommended that these definitions be reviewed and changed as needed.

Since June 2003, SARS-associated coronavirus (SARS-CoV) has ceased circulation among humans. In response to this, CDC has convened workgroups which have included CSTE representatives to discuss surveillance to detect newly re-emerging SARS-CoV disease in people and to be able to monitor and control spread of SARS-CoV if and when it re-emerges. During these discussions, it has become apparent that the non-specific case definition for SARS reports under investigation needs to be updated and broken into a number of distinct categories to fully cover reporting needs in the range of epidemiologic situations that may occur. These situations range from surveillance to detect the re-emergence of SARS to surveillance for monitoring and control purposes where there is some activity in some parts of the world to situations where there is already considerable SARS activity in a local community.

Statement of the desired action to be taken:

CSTE recommends that: the existing CSTE case definition for SARS be revised to include a hierarchy of specific categories of reports under investigation.

Goals of surveillance:

1) Rapidly identify illness that could be SARS, to screen for SARS-CoV and monitor and contain the potential for transmission; 2) rapidly recognize SARS-CoV disease outbreaks and geographic areas with increased SARS activity; 3) identify areas of possible SARS transmission to implement appropriate infection control practices in health care settings; 4) identify imported cases that may serve as sentinels for SARS-CoV activity in other regions of the world; 5) improve our current understanding of the epidemiology of this emerging disease; 6) assess the national public health impact of SARS-CoV disease and monitor trends; and 7) demonstrate the need for public health intervention programs and federal resources, and provide data to allocate resources.

Methods for surveillance:

Clinician and laboratory reporting. Core surveillance data for cases meeting the SARS-CoV disease case definition will be reported to the Centers for Disease Control and Prevention's (CDC's) National Notifiable Disease Surveillance Systems (NNDSS, a component of the NPHSS), through the National Electronic Telecommunications System for Surveillance (NETSS). Core records will be the official source of the SARS-CoV disease case count. Selected additional clinical, epidemiologic, and laboratory data will be collected and linked to the core NNDSS data. All surveillance data from persons meeting the definitions for SARS-CoV disease (i.e., core NNDSS and clinical, laboratory, and case investigation data) will be reported to CDC using electronic methods consistent with the NEDSS and Public Health Information Network (PHIN) architecture. In particular, CDC will assure that the following actions be implemented:

- Establishment of a dedicated, secure Web-based data entry system for SARS.
- Inclusion of a SARS module in the NEDSS base system, including electronic transmission of laboratory test results.

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- Establishment of an XML schema that states can use to transmit information related to SARS cases to CDC, using the CDC secure data network.

States should be offered the options to choose the reporting method that fits their information system best. CDC will work closely with the states to determine the method(s) and frequency of data reporting.

In addition, CDC will work closely with the states to define a system outside the NPHSS to report SARS cases under investigation and the method(s) and frequency of reporting these data.

Case definitions: See below.

Period of surveillance: Indefinite.

Background and justification:

See CSTE Position statement ID-03-12 and Statement of Problem above.

In the United States, public health officials at state and territorial health departments and CDC collaborate in determining which diseases should be nationally notifiable. CSTE, in conjunction with CDC, makes recommendations annually for additions and deletions to the list of nationally notifiable diseases. As knowledge increases and diagnostic technology improves, some definitions will change to reflect those trends. Thus, future revisions of surveillance case definitions can be expected. In addition, surveillance case definitions are to be used for identifying and classifying cases, both of which are often done retrospectively, for national reporting purposes. For many conditions of public health importance, action to contain disease should be initiated as soon as a problem is identified; in many circumstances, appropriate public health action should be undertaken even though insufficient information is available to determine whether cases meet the case definition. Thus, surveillance case definitions should not be used as sole criteria for public health action.

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Revised CSTE Surveillance Case Definition for Severe Acute Respiratory Syndrome (SARS), December 2003

Clinical Criteria

Early illness

- Presence of two or more of the following features: fever (might be subjective); chills; rigors; myalgia; headache; diarrhea; sore throat; rhinorrhea

Mild- to-moderate respiratory illness

- Temperature of $>100.4^{\circ}\text{F}$ ($>38^{\circ}\text{C}$),¹ and
- One or more clinical findings of lower respiratory illness (e.g., cough, shortness of breath, difficulty breathing)

Severe respiratory illness

- Meets clinical criteria of mild-to-moderate respiratory illness, and
- One or more of the following:
 - Radiographic evidence of pneumonia, **or**
 - Acute respiratory distress syndrome, **or**
 - Autopsy findings consistent with pneumonia or acute respiratory distress syndrome without an identifiable cause

Epidemiologic Criteria

Possible exposure to SARS-CoV

One of the following exposures in the 10 days before onset of symptoms:

- Travel to a foreign or domestic location with documented or suspected recent transmission of SARS-CoV³ **or**
- Close contact² with a person with mild-moderate or severe respiratory illness and with history of travel in the 10 days before onset of symptoms to a foreign or domestic location with documented or suspected recent transmission of SARS-CoV³
- Work or presence in a laboratory that contains SARS-CoV

Likely exposure to SARS-CoV

One or more of the following exposures in the 10 days before onset of symptoms:

- Close contact² with a confirmed case of SARS-CoV disease
- Close contact² with a person with mild-moderate or severe respiratory illness for whom a chain of transmission can be linked to a confirmed case of SARS-CoV disease in the 10 days before onset of symptoms

Laboratory Criteria

Tests to detect SARS-CoV are still being refined and their performance characteristics assessed.⁴ Thus, criteria for laboratory diagnosis of SARS-CoV are changing. The following are the general criteria for laboratory confirmation of SARS-CoV:

- Detection of serum antibody to SARS-CoV by a test validated by CDC (e.g., enzyme immunoassay [EIA]), **or**
- Isolation in cell culture of SARS-CoV from a clinical specimen, **or**

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- Detection of SARS-CoV RNA by a reverse-transcription-polymerase chain reaction (RT-PCR) test validated by CDC and with subsequent confirmation in a reference laboratory (e.g., CDC)

Information on the current criteria for laboratory diagnosis of SARS-CoV infection is available at <http://www.cdc.gov/ncidod/sars/labdiagnosis.htm>.

Exclusion Criteria

A person may be excluded as a SARS Report Under Investigation, including as a CDC-defined probable SARS-CoV case, if any of the following apply:

- An alternative diagnosis can fully explain the illness⁵
- Antibody to SARS-CoV is undetectable in a serum specimen obtained >28 days after onset of illness⁶
- The case was reported on the basis of contact with a person who was subsequently excluded as a case of SARS-CoV disease; then the reported case is also excluded, provided other epidemiologic criteria or laboratory criteria are not present.

Case Classification

SARS Reports Under Investigation (RUI):

Reports in persons from areas where SARS is not known to be active

- SARS RUI-1: Patients with severe illness compatible with SARS in groups likely to be first affected by SARS-CoV⁷ if SARS-CoV is introduced from a person without clear epidemiologic links to known cases of SARS-CoV disease or places with known ongoing transmission of SARS-CoV.

Reports in persons from areas where SARS activity is occurring

- SARS RUI-2: Patients who meet the current clinical criteria for mild-moderate illness and the epidemiologic criteria for possible exposure (Spring 2003 CDC definition for suspect cases⁸).
- SARS RUI-3: Patients who meet the current clinical criteria for severe illness and the epidemiologic criteria for possible exposure (Spring 2003 CDC definition for probable cases⁸).
- SARS RUI-4: Patients who meet the clinical criteria for early or mild-moderate illness and the epidemiologic criteria for likely exposure to SARS-CoV.

SARS-CoV Disease Classification

- Probable case of SARS-CoV disease: a person who meets the clinical criteria for severe respiratory illness and who meets the epidemiologic criteria for likely exposure to SARS-CoV.
- Confirmed SARS-CoV case: a person who has a clinically compatible illness (early, mild, moderate or severe disease) that is laboratory confirmed.

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Footnotes

¹ A measured documented temperature of >100.4° F (>38° C) is expected. However, clinical judgment may allow a small proportion of patients without a documented fever to meet this criterion. Factors that might be considered include patient's self-report of fever, use of antipyretics, presence of immunocompromising conditions or therapies, lack of access to health care, or inability to obtain a measured temperature. Initial case classification based on reported information may change, and reclassification may be required.

² Close contact is defined as having cared for or lived with a person with SARS or having a high likelihood of direct contact with respiratory secretions and/or body fluids of a person with SARS (during encounters with the patient or through contact with materials contaminated by the patient) either during the period the person was clinically ill or within 10 days of resolution of symptoms. Examples of close contact include kissing or embracing, sharing eating or drinking utensils, close conversation (<3 feet), physical examination, and any other direct physical contact between persons. Close contact does not include activities such as walking by a person or sitting across a waiting room or office for a brief time.

³ Types of locations specified will vary (e.g., country, airport, city, building, floor of building). The last date a location may be a criterion for exposure for illness onset is 10 days (one incubation period) after removal of that location from CDC travel alert status. The patient's travel should have occurred on or before the last date the travel alert was in place. Transit through a foreign airport meets the epidemiologic criteria for possible exposure in a location for which a CDC travel advisory is in effect. For information on CDC travel alerts and advisories and assistance in determining appropriate dates, see <http://www.cdc.gov/ncidod/sars/travel.htm>.

⁴ The identification of the etiologic agent of SARS (SARS-CoV) led to the rapid development of enzyme immunoassays (EIA) and immunofluorescence assays (IFA) for serologic diagnosis and reverse-transcription PCR (RT-PCR) assays for detection of SARS-CoV RNA in clinical samples. These assays can be very sensitive and specific for detecting antibody and RNA, respectively, in the later stages of SARS-CoV disease. Both are less sensitive, however, for detecting infection early in illness. Most patients in the early stages of SARS-CoV disease have a low titer of virus in respiratory and other secretions and require time to mount an antibody response. SARS-CoV antibody tests may be positive as early as 8-10 days after onset of illness and often by 14 days after onset of illness, but sometimes not until 28 days after onset of illness. Information on the current criteria for laboratory diagnosis of SARS-CoV is available at <http://www.cdc.gov/ncidod/sars/labdiagnosis.htm>.

⁵ Factors that may be considered in assigning alternate diagnoses include the strength of the epidemiologic exposure criteria for SARS-CoV disease, the specificity of the alternate diagnostic test, and the compatibility of the clinical presentation and course of illness for the alternative diagnosis.

⁶ Current data indicate that more than 95% of patients with SARS-CoV disease mount an antibody response to SARS-CoV. However, health officials may choose not to exclude a case based on lack of a serologic response if reasonable concern exists that an antibody response could not be mounted.

⁷ Consensus guidance between CDC and CSTE on which groups are most likely to be first affected by SARS-CoV if it re-emerges is in development. In principle, SARS-CoV disease should be considered *at a minimum* in the differential diagnosis for persons requiring hospitalization for radiographically confirmed pneumonia or acute respiratory distress syndrome without identifiable etiology AND who have one of the following risk factors in the 10 days before the onset of illness:

- Travel to mainland China, Hong Kong, or Taiwan, or close contact with an ill person with a history of recent travel to one of these areas, OR

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- 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-CoV0, *OR*
- Part of a cluster of cases of atypical pneumonia without an alternative diagnosis

Guidelines for the identification, evaluation, and management of these persons are available at <http://www.cdc.gov/ncidod/sars/absenceofsars.htm>.

⁸ During the 2003 outbreak of SARS, the CDC case definitions were:

Suspect Case

- Meets the clinical criteria for mild-moderate respiratory illness and the epidemiologic criteria for *possible* exposure to SARS-CoV but does not meet any of the laboratory criteria and exclusion criteria, *OR*
- Unexplained acute respiratory illness resulting in death in a person on whom an autopsy was not performed and who meets the epidemiologic criteria for possible exposure to SARS-CoV but does not meet any of the laboratory criteria and exclusion criteria.

Probable Case

- Meets the clinical criteria for severe respiratory illness and the epidemiologic criteria for *possible* exposure to SARS-CoV but does not meet any of the laboratory criteria and exclusion criteria.