

Council of State and Territorial Epidemiologists Position Statement

The following is an interim position statement adopted by the CSTE Executive Committee on 30 October 2003. (At the June 2003 annual meeting, CSTE modified its process for approval of resolutions. An interim position statement is required to be ratified at the subsequent annual meeting. See <http://www.cste.org/pdf/files/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.
- 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.

Agencies for information:

- (1) Mary E. Chamberland, MD, MPH
Deputy Director
Division of Viral and Rickettsial Diseases
National Center for Infectious Disease
Centers for Disease Control and Prevention
1600 Clifton Road, NE
M/S A30
Atlanta, GA 30333
Phone: (404) 639-4350
Email: MChamberland@cdc.gov
- (2) George E. Hardy, MD, MPH
Executive Director
Association of State and Territorial Health Officers
1275 K. Street NW, Suite 800
Washington, DC 20005
Phone: (202) 371-9090
Email: Ghardy@astho.org
- (3) Rosemary Humes, MS, MT
Director, Infectious Disease Programs

Association of Public Health Laboratories
2025 M Street, NW, #550
Washington, DC 20036-3320
Phone: (202) 822-5227
Email: Sbecker@aphl.org

- (4) Gregory Wagner MD
Director, Division of Respiratory Disease Studies
CDC NIOSH
1095 Willowdale Rd, H-2900
Morgantown WV 26505
Phone: 304-285-5749
Email: grw3@cdc.gov
- (5) Michael Tapper, MD
President, Society of Healthcare Epidemiology of America
19 Mantua Road
Mt. Royal, NJ 08061
Phone: 856-423-0087
Email: mtapper@lenoxhill.net
- (6) James G. Masland
Executive Director, Association for Professionals in Infection Control and Epidemiology,
Inc.
1275 K Street, NW, Suite 1000
Washington, DC 20005-4006
Phone: (202) 789-1890
Email: jmasland@apic.org

Agencies for response:

- (1) James M. Hughes, MD
Director, National Center for Infectious Disease
Centers for Disease Control and Prevention
1600 Clifton Road, NE
M/S C12
Atlanta, GA 30333
Phone: (404) 639-3401
Email: JHughes@cdc.gov
- (2) Sam Groseclose, DVM
Chief, Surveillance Systems Branch
Centers for Disease Control and Prevention
Epidemiology Program Office, MS K-74
1600 Clifton Road, NE
Atlanta, GA 30333
Phone: (770) 488-8359
Email: SGroseclose@cdc.gov

Authors:

- (1) James Hadler, MD, MPH
State Epidemiologist and Director, Infectious Diseases Division
Connecticut Department of Public Health
410 Capitol Ave. MS 11-FDS
P.O. Box 340308

Hartford, CT 06106
Phone: (860) 509-7995
Email: james.hadler@po.state.ct.us

- (2) Umesh Parashar, MD, MPH
Medical Epidemiologist
Division of Viral and Rickettsial Diseases
National Center for Infectious Disease
Centers for Disease Control and Prevention
1600 Clifton Road, NE
M/S G04
Atlanta, GA 30333
Phone: (404) 639-3577
Email: UParashar@cdc.gov

Clinical description:

SARS-CoV disease typically begins with a prodrome, often with fever, chills and rigors, headache, malaise, and myalgias. After 3--7 days, a lower respiratory illness develops in most cases with a dry, nonproductive cough or dyspnea, sometimes with hypoxemia. Diarrhea has been described in ~20% of SARS patients, and has been an early and prominent feature in some. Chest radiographs show evidence of focal or generalized interstitial infiltrates in most patients; cavitation, lymphadenopathy, and pleural effusion are generally absent. Lymphopenia, thrombocytopenia, and elevated lactate dehydrogenase levels are common.

Clinical Criteria

Early illness

- Presence of two or more of the following features: fever (may 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-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 or more of the following exposures in the 10 days before onset of symptoms:

- Travel to a foreign or domestic location with documented or suspected recent local transmission of SARS-CoV³
- 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 local transmission of SARS-CoV³.

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

Laboratory Criteria

- Detection of serum antibody to SARS-CoV by a validated test (e.g., [enzyme-linked immunosorbent assay \(ELISA\)](#)), *or*
- Isolation in cell culture of SARS-CoV from a clinical specimen, and PCR confirmation using a test validated by CDC, *or*
- Detection of SARS-CoV RNA by a [reverse transcription-polymerase chain reaction \(RT-PCR\)](#) test validated by CDC from:
 - One specimen tested on two occasions (different runs) using the original clinical specimen on each occasion, *or*
 - Two specimens from different sources (e.g., nasopharyngeal and stool), *or*
 - Two specimens collected from the same source on 2 different days (e.g., 2 nasopharyngeal aspirates).

Exclusion Criteria

A person may be excluded as a 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 illness.⁴
- Antibody to SARS-CoV is undetectable in a serum specimen obtained >28 days after onset of illness.⁵
- The case was reported on the basis of contact with a person who was subsequently excluded as a case of SARS-CoV, 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***

- RUI-1: Patients with severe illness compatible with SARS-CoV infection in groups likely to be first affected by SARS-CoV⁶ should SARS-CoV be introduced from a person without clear epidemiologic links to known SARS-CoV cases or place with known ongoing transmission of SARS-CoV.

Reports in persons from areas where SARS activity is occurring

- RUI-2: Patients who meet the current clinical criteria for mild-moderate illness and epidemiologic criteria for possible exposure (Spring 2003 CDC definition for suspect cases⁷).
- RUI-3: Patients who meet the current clinical criteria for severe illness and epidemiologic criteria for possible exposure (Spring 2003 CDC definition for probable cases⁷).
- RUI-4: Patients who meet the clinical criteria for early or mild to moderate illness and epidemiologic criteria for likely exposure to SARS-CoV.

SARS-CoV Disease Classification

- Probable SARS-CoV case: 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.

Summary Tables of SARS-CoV Case Classification by Laboratory Testing Status

Reports Prior to Definitive Laboratory Testing

<u>Epi Criteria for Exposure</u>	Clinical Criteria for Degree of Illness		
	<u>Early</u>	<u>Mild-Moderate</u>	<u>Severe</u>
Unknown	-	-	RUI-1
Possible	-	RUI-2	RUI-3
Likely	RUI-4	RUI-4	Probable SARS-CoV case

Classification of Reports Following Definitive Laboratory Testing

<u>Initial Reporting Category</u>	Laboratory Testing Results		
	<u>Negative*</u>	<u>Positive</u>	<u>Not Done</u>
RUI 1-4	Excluded	Confirmed SARS-CoV case	Indeterminate
Probable SARS-CoV Case	Excluded	Confirmed SARS-CoV case	Probable SARS-CoV Case

* negative test as defined by a negative antibody titer taken > 28 days after the onset of symptoms. A negative PCR test does not rule out SARS-CoV infection.

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 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 fever. 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. Transit through a foreign airport meets the epidemiologic criteria for possible exposure in a situation with a suspected or documented community transmission of SARS in that location (i.e., when a CDC travel advisory is in effect for that location). The surveillance periods for documented or suspected local transmission of SARS in specific locations are available at <http://www.cdc.gov/ncidod/sars/casedefinition.htm>. Types of locations specified will vary, e.g., country, airport, city, building, or 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 notice. The case-patient's travel should have occurred on or before the last date the travel alert was in place. For assistance in determining appropriate dates, see <http://www.cdc.gov/ncidod/sars/travel.htm>.
4. Factors that may be considered in assigning alternate diagnoses include the strength of the epidemiologic exposure criteria for SARS, the specificity of the alternate diagnostic test, and the compatibility of the clinical presentation and course of illness for the alternative diagnosis.
5. Current data indicate that more than 95% of SARS patients 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.
6. Consensus guidance between CDC and CSTE on which groups are most likely to be first affected by SARS-CoV should it re-emerge is currently in development. In principle, SARS-CoV infection should be considered *at a minimum* in the differential diagnosis in persons hospitalized with pneumonia or ARDS of suspected but unknown infectious cause who are in any of the following groups: a) health care workers who provide direct patient care; 2) travelers to or persons in close contact in the preceding 10 days with other ill persons who recently (within 10 days of their illness) traveled to mainland China, Hong Kong, or Taiwan; 3) persons who are affected by an outbreak of severe, atypical pneumonia. Dynamic guidelines for identification, evaluation and management of these persons are available at <http://www.cdc.gov/ncidod/sars/sarsprepplan.htm>
7. During the original Spring 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.