



# MMWR<sup>TM</sup>

Morbidity and Mortality Weekly Report

**MMWR Dispatch**  
**Vol. 52 / March 21, 2003**

## Preliminary Clinical Description of Severe Acute Respiratory Syndrome

Severe acute respiratory syndrome (SARS) is a condition of unknown etiology that has been described in patients in Asia, North America, and Europe. This report summarizes the clinical description of patients with SARS based on information collected since mid-February 2003 by the World Health Organization (WHO), Health Canada, and CDC in collaboration with health authorities and clinicians in Hong Kong, Taiwan, Bangkok, Singapore, the United Kingdom, Slovenia, Canada, and the United States. This information is preliminary and limited by the broad and necessarily nonspecific case definition.

As of March 21, 2003, the majority of patients identified as having SARS have been adults aged 25–70 years who were previously healthy. Few suspected cases of SARS have been reported among children aged  $\leq 15$  years.

The incubation period for SARS is typically 2–7 days; however, isolated reports have suggested an incubation period as long as 10 days. The illness begins generally with a prodrome of fever ( $>100.4^{\circ}\text{F}$  [ $>38.0^{\circ}\text{C}$ ]). Fever often is high, sometimes is associated with chills and rigors, and might be accompanied by other symptoms, including headache, malaise, and myalgia. At the onset of illness, some persons have mild respiratory symptoms. Typically, rash and neurologic or gastrointestinal findings are absent; however, some patients have reported diarrhea during the febrile prodrome.

After 3–7 days, a lower respiratory phase begins with the onset of a dry, nonproductive cough or dyspnea, which might be accompanied by or progress to hypoxemia. In 10%–20% of cases, the respiratory illness is severe enough to require intubation and mechanical ventilation. The case-fatality rate among persons with illness meeting the current WHO case definition of SARS is approximately 3%.

Chest radiographs might be normal during the febrile prodrome and throughout the course of illness. However, in a substantial proportion of patients, the respiratory phase is characterized by early focal interstitial infiltrates progressing to more generalized, patchy, interstitial infiltrates. Some chest radiographs from patients in the late stages of SARS also have shown areas of consolidation.

Early in the course of disease, the absolute lymphocyte count is often decreased. Overall white blood cell counts have generally been normal or decreased. At the peak of the respiratory illness, approximately 50% of patients have leukopenia and thrombocytopenia or low-normal platelet counts (50,000–150,000/ $\mu\text{L}$ ). Early in the respiratory phase, elevated creatine phosphokinase levels (as high as 3,000 IU/L) and hepatic transaminases (two to six times the upper limits of normal) have been noted. In the majority of patients, renal function has remained normal.

The severity of illness might be highly variable, ranging from mild illness to death. Although a few close contacts of patients with SARS have developed a similar illness, the majority have remained well. Some close contacts have reported a mild, febrile illness without respiratory signs or symptoms, suggesting the illness might not always progress to the respiratory phase.

Treatment regimens have included several antibiotics to presumptively treat known bacterial agents of atypical pneumonia. In several locations, therapy also has included antiviral agents such as oseltamivir or ribavirin. Steroids have also been administered orally or intravenously to patients in combination with ribavirin and other antimicrobials. At present, the most efficacious treatment regimen, if any, is unknown.

In the United States, clinicians who suspect cases of SARS are requested to report such cases to their state health departments. CDC requests that reports of suspected cases from state health departments, international airlines, cruise ships, or cargo carriers be directed to the SARS Investigative Team at the CDC Emergency Operations Center, telephone 770-488-7100. Outside the United States, clinicians who suspect cases of SARS are requested to report such cases to their local public health authorities. Additional information about SARS (e.g., infection control guidance and procedures for reporting suspected cases) is available at <http://www.cdc.gov/ncidod/sars>. Global case counts are available at <http://www.who.int>.

**Reported by:** World Health Organization, Geneva, Switzerland. Immunization and Respiratory Infections Div, Centre for Infectious Disease Prevention and Control, Health Canada, Ottawa, Canada. CDC SARS Investigation Team; TA Clark, MD, and B Park, MD, EIS officers, CDC.

### Acknowledgments

This report is based on data provided by A McGeer, MD, S Poutanen, MD, Mount Sinai Hospital, D Low, MD, Mount Sinai Hospital and Univ Health Network, I Salit, MD, Univ Health Network, A Simor, MD, Sunnybrook and Women's College Hospital, Univ of Toronto; S Finkelstein, MD, Scarborough Grace Hospital, B Henry, MD, Toronto Public Health, Toronto; W Bowie, MD, E Bryce, MD, K Craig, MD, P Doyle, MD, J Ronco, MD, F Ryan, MD, Univ of British Columbia and Vancouver Hospital and Health Sciences Center, L Srour, MD, British Columbia Centre for Disease Control, Vancouver, Canada. S Chang, MD, Y Chen, MD, P Shueh, MD, G Chen, MD, B Kuo, MD, National Taiwan Univ Hospital, Taipei; S Chen, MD, Ilan Hospital, Ilan; M Liin, MD, Chia-Yi Christian Hospital, Chia-Yi; T Chen, MD, L Lee, MD, S Twu, MD, Taiwan Center for Disease Control, Taipei, Taiwan. S Tansuphaswadikul, MD, V Pinyowiwat, MD, J Wongsawat, MD, Bamrasnaradura Institute, Nonthaburi, Thailand.

MMWR now publishes important health information, like reports related to terrorism and other health emergencies, as often as required to protect the public health. MMWR Dispatch provides the latest and most accurate information regarding public health investigations, surveillance, prevention and treatment guidelines, and other clinical information. Visit [cdc.gov/mmwr](http://cdc.gov/mmwr), and sign up to receive MMWR Dispatch by e-mail. In addition to MMWR Dispatch, you'll also receive MMWR Weekly, MMWR Recommendations and Reports, and MMWR Surveillance Summaries. As always, MMWR is also available in print. Anytime MMWR Dispatch is published online, it also appears in the next printed MMWR issue. MMWR Dispatch. Another way MMWR helps you stay current on important public health, clinical, and scientific topics.

know what matters.



All *MMWR* references are available on the Internet at <http://www.cdc.gov/mmwr>. Use the search function to find specific articles.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.

References to non-CDC sites on the Internet are provided as a service to *MMWR* readers and do not constitute or imply endorsement of these organizations or their programs by CDC or the U.S. Department of Health and Human Services. CDC is not responsible for the content of these sites. URL addresses listed in *MMWR* were current as of the date of publication.