

# The science of SARS

## Stuart Siddell

Dept. of Pathology and Microbiology, Bristol  
University, UK

The SARS coronavirus (SARSCoV) is an enveloped RNA virus that infects humans and initially causes a characteristic febrile illness with respiratory symptoms and myalgia (headaches, muscular pain). Many patients recover within a few days but a significant proportion progress to develop an atypical pneumonia, cumulating in an acute respiratory disease known as Severe Acute Respiratory Syndrome (SARS). The case fatality rate is estimated to be 15%.

SARS emerged as a disease in Southern China in November 2002 but has quickly spread to over 30 countries worldwide. The epidemic has now subsided, but a total of almost 8500 cases with over 800 deaths have been recorded. SARSCoV is transmitted mainly by exposure to respiratory secretions.

SARSCoV is most probably derived from a virus that naturally infects a wild or domestic animal. If this is the case, eradication will be difficult and periodic "re-emergence" from the animal reservoir is possible. Another concern is that adaptation of the SARSCoV to humans may result in different patterns, or a higher frequency, of disease.

The development of improved diagnostic tests and effective SARSCoV vaccines will be a high priority for the future control of SARS. These developments will be facilitated by research on the molecular biology of SARSCoV but are likely to take years rather than months.

The SARS epidemic is a textbook example of an emerging infectious disease. Viruses mutate and evolve and, inevitably, they will cross the species barrier into humans and cause novel diseases. In the case of SARSCoV, the problem was confounded by an absence of definitive diagnostic tests or effective treatments. This time, massive intervention appears to have

prevented a worldwide disaster. However, if the effective reproduction number of SARSCoV (a measure of the virus transmissibility) had been higher, we would have had to deal with a pandemic of frightening proportions.

In my talk, I shall describe epidemiological and virological aspects of SARS-coronavirus infection and the molecular techniques that were used to diagnose and characterise the virus.

#### Reference:

- Peiris JS, et al. (2003) Coronavirus as a possible cause of severe acute respiratory syndrome. *Lancet*. 361:1319-25 (subscription/registration needed) - abstract in PubMed
- Ksiazek TG, et al. (2003) A novel coronavirus associated with severe acute respiratory syndrome. *N Engl J Med*. 348:1953-66.
- Rota PA, et al. (2003) Characterization of a novel coronavirus associated with severe acute respiratory syndrome. *Science*. 300:1394-9
- Anand K, et al. (2003) Coronavirus main proteinase (3CLpro) structure: basis for design of anti-SARS drugs. *Science*. 300:1763-7.