

# The SARS epidemic: lessons for Australia

*Forewarned is forearmed*

SEVERE ACUTE RESPIRATORY SYNDROME (SARS) is now a global phenomenon, but it remains heavily clustered in mainland China, Hong Kong, Toronto, Singapore and Hanoi.<sup>5</sup> The world is fearing a global pandemic, but it is not happening as initially predicted.

Although there are some uncertainties regarding particular clusters of cases, such as the Amoy Garden Estate in Hong Kong (where about 300 people in one block of flats were affected), the primary mode of spread appears to be by infected droplets, and healthcare staff taking strict barrier precautions appear to be protected. There is some evidence that the virus is present in all body fluids, including faeces and urine, so taking precautions with waste disposal are also recommended.

The World Health Organization case definitions of “suspected” and “probable” SARS are given in the Box. The clinical course of the disease follows a 2–16-day incubation period,<sup>4,5</sup> with high fevers, chills, rigors and myalgia. In contrast to the WHO definition, respiratory symptoms are not prominent and many cases have presented with diarrhoea, abdominal pain and loss of appetite (unpublished observations). There are very few patients with abnormal findings on chest examination at presentation, but these changes develop in severe cases after admission to hospital.<sup>5</sup> Laboratory tests typically show a reduced white cell and lymphocyte count, with a mild increase in the platelet count. Usually after 2–3 days of symptoms, x-ray changes become apparent. Typically, the changes are air-space consolidation, predominantly peripheral and often unifocal initially, but progressing over days to bilateral, multifocal changes. At around 7–10 days, about 20%–30% of cases deteriorate and require admission to an intensive care unit. Of these, about half require assisted ventilation. The overall mortality rate is 3%–5%, but may be higher in elderly people.

Treatment has been largely empirical and usually has included an antiviral agent, such as ribavirin, and steroids.<sup>5</sup> High-dose steroids have been effective in reducing fever and progression of x-ray changes, with the clinical response and radiological features suggesting bronchiolitis obliterans organising pneumonia as the possible underlying pathology.<sup>5,8</sup> It is unclear whether any of these treatments alter the ultimate course of the disease. Intravenous administration of convalescent plasma has also been trialled, in the belief that antibodies may halt the progression of the disease,<sup>5</sup> despite a theoretical risk of introducing another viral load.

Currently, there are a number of possible aetiological candidates, with corona virus being the most likely;<sup>9–11</sup> however, a metapneumovirus from the paramyxovirus group<sup>12</sup> has also been suggested. Unfortunately, in our experience, field testing for the viruses has so far been unconvincing. It is unlikely that, in the short term, there will be a reliable diagnostic test or vaccine, although work is progressing at a rapid rate.

In Australia, the response to SARS has been dichotomous — varying from panic that SARS will be another pandemic to complacency that this is another region’s problem. It is likely that Australia will be less affected than countries with open land borders and crowded cities with poor hygiene control. However, the outbreak in Toronto shows that any Western city may have to manage such an outbreak.<sup>3</sup> If this disease spreads in clusters rather than sweeps through communities, then the public-health response must be different.

It is clear that hospitals and healthcare workers are particularly at risk. In Hong Kong, in the first weeks of the outbreak, 25% of patients with SARS were healthcare workers.<sup>5</sup> The healthcare sector has to be particularly prepared, as this is most likely where a cluster will start.

Revision of infection control, with meticulous attention to detail, is important. At the Prince of Wales Hospital, Hong Kong, it took three weeks to bring the secondary infections in staff down to near zero. Despite this experience, other hospitals in the region did not take heed, and many more staff in these hospitals became infected because of suboptimal infection control procedures. It is to be hoped that hospitals in Australia will learn from this experience.

Screening potential cases of SARS is particularly difficult, as the signs and symptoms are vague and consistent with virtually any viral illness. Following up patients over a number of days is the only way of ascertaining whether they have SARS. The question of whether to admit all suspected cases to hospital is also an issue. If suspected cases are admitted, they may actually contract the disease in hospital. If they are discharged, they may infect their families and friends. In our recent experience of screening about 1000 people with suspected SARS, we uncovered over 100 confirmed SARS cases. We found that there was no secondary spread among the suspected cases followed at home with strict quarantine instructions. All people with confirmed SARS were admitted to hospital.

Guidelines for screening high-risk contact and low-risk non-contact subjects have recently been published, although there are no good studies evaluating their utility or the quality of the supporting evidence.<sup>13</sup>

SARS will fundamentally change the interaction between primary healthcare workers and patients, in much the same way that AIDS changed the way we handle blood products, with universal precautions to protect ourselves from potential HIV infection. It is likely that, in the future, all healthcare providers in regions where SARS is endemic will use the standard droplet precautions of a mask, goggles, gown and gloves for all patient contact.

SARS has the potential to totally disrupt the healthcare system of cities or states. Apart from the potential to use hundreds of general ward beds — a disaster in itself given the bed capacity of most Australian hospitals — the biggest threat is the need for intensive care unit (ICU) beds. If 20%–30% of cases required care in ICU, and a cluster of 200 cases occurred in Melbourne or Sydney, there would be little likelihood of finding 50 ICU beds at short notice. A further problem is that ICU staff are likely to contract the disease (unpublished data). If a number of staff contract the disease in an already overstretched ICU system, this may precipitate a fall in morale and staff departures. Furthermore, many nurses are of child-bearing age, and the antiviral agents and high-dose steroids used in the treatment of SARS are likely to be teratogenic. Health authorities need to think about their ability to provide “surge capacity” — not only in terms of ventilators, but also in terms of trained staff. This might include multiple-skills training for nurses and doctors working in non-intensive-care areas.

Some healthcare epidemiologists have suggested that this disease is no more serious than the usual winter influenza outbreaks, and not nearly as serious as a new mutation of the influenza virus would be.<sup>14</sup> The difference is that previously we have not seen a healthcare system paralysed

for a period of months from the impact of one infectious agent. The annual reported death toll from influenza is mostly due to its impact on elderly people, who may die anyway. SARS puts young healthy people into ICU, and otherwise healthy people die. The death toll from SARS is undoubtedly higher in the elderly, and we have not yet seen what may eventuate if a SARS outbreak occurs in a retirement home.

The sensible response of Australian health authorities is to remain on high alert, review infection control procedures within hospitals, develop contingency plans for a possible surge in demand for general and ICU beds, and develop an evidence-based approach to screening and quarantine procedures for potential cases.

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