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THE LANCET
Infectious Diseases

Reflections on SARS

In mid-November 2002, the international public-health community began receiving news of an outbreak of an atypical pneumonia in southern China. Little did the world know at the time that these cases marked the emergence of a new global infectious disease threat—severe acute respiratory syndrome (SARS). In this issue, we publish a collection of papers reviewing various aspects of SARS.

Isolation, identification, and characterisation of the coronavirus that causes SARS, and development of a diagnostic test, were achieved within a month because of an unprecedented level of international collaboration (see Malik Peiris and colleagues, p 663). Similarly, efforts to understand the spread of the disease and viral evolution gave greater insight into the processes underlying the SARS epidemic, as Christl Donnelly and co-authors describe on p 672.

Despite rapid progress in understanding the epidemic, lack of recent experience in dealing with such pathogens, failure of public-health measures, and lapses in infection control allowed the disease to spread. Among the most striking characteristics of the epidemic were the burden of disease among health-care workers and nosocomial transmission of the virus, as Paul Tambyah describes from Singapore (p 690) and Michael Gardam and colleagues from Toronto (p 697). These features of SARS put tremendous pressure on health-care systems, and are a reminder of the risks that health-care workers face even in a modern day hospital with sophisticated equipment and care-facilities.

The value of quarantine measures implemented during the SARS outbreaks has been questioned (see, for example, Mei-Shang Ho and Ih-Jen Su, p 684). It is a long time since such draconian quarantine restrictions have been imposed, and the legal, social, and economic effects of such measures need to be considered carefully before the next similar outbreak.

SARS can be considered the "model" emerging infectious disease for the 21st century, because it demonstrates how changes in society, the environment, and our increasing global interconnectedness converge to enhancing the likelihood of disease emergence. In some ways, SARS is a disease of growing affluence. Transmission of the SARS coronavirus has been linked to the handling and preparation of exotic animals such as civet cats and ferret badgers for human consumption. Because of China's economic growth, there is greater demand for such animals among newly wealthy people, thus increasing the likelihood of human exposure to infections from wild-caught animals. Furthermore, booming air travel, another indicator of a wealthy society, was the key driver in the international spread of SARS.

Another concern raised in the SARS articles is the occurrence of laboratory-associated disease. Last year, WHO issued biosafety guidelines for laboratory work. Although a valuable resource, the guidelines do not represent a legally binding, regulatory instrument for the implementation of appropriate biosafety standards. Indeed, at present there is no international agreement on criteria for assessment of laboratory containment procedures and practices, or on uniform standards of training for personnel working in containment labs. While sharing of dangerous pathogens such as SARS for identification, characterisation, and research continues—as it must—there is a need for effective and harmonised biosafety practices.

In response to SARS, there are indications that China has taken positive steps to reforming its health-care system. New laws have been passed on infectious-disease control (p 652) and regulation of public-health emergencies, both of which incorporate measures to combat SARS if it were to return. China's many centres for disease control are being rebuilt and equipped with the most advanced technology. But a major problem still is the lack of trained personnel in these centres. Furthermore, health-care facilities in rural areas of China remain neglected, with no outbreak-surveillance systems in place. Given that SARS originated in these rural villages, it seems unlikely that they would cope if SARS were to recur.

Another failing highlighted by SARS was the poor way in which outbreak information was communicated to the public. An initial delay, followed by misinformation that the virus was airborne, created unnecessary panic. Images of people wearing surgical masks became the symbol of SARS, even though clinical reports suggested that SARS was spread only by close contact requiring the inhalation of droplets.

Heightened surveillance, early detection, prompt isolation, stringent infection-control measures, and contact tracing were all key to bringing the outbreak under control. But, as with any newly discovered disease, much remains to be discovered about SARS—knowledge that will be essential to mounting a rational response should SARS or a similar respiratory pathogen recur.

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