

WILL THE SARS EPIDEMIC RECUR?

Host and environment are key factors

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On 5 July 2003, the WHO removed Taiwan from its list of areas with recent local transmission of SARS meaning that all known chains of person to person transmission of the severe acute respiratory syndrome (SARS) virus have now been broken.¹ However, the WHO executive director for communicable diseases advised that public health should not let down its guard, as more cases could still surface somewhere in the world.¹ It is therefore an important public health issue whether the SARS epidemics will recur.

If you had a crystal ball to view the future, this question would be answered. We would make some prediction based on the epidemiological triangle (fig 1) recognising the three main factors—agent, environment, and host in the pathogenesis of disease.² If we can control any two of the main factors, we would prevent the occurrence of a communicable disease.

Coronavirus has been identified in playing an aetiological part of SARS.³ A lot of work has been done to understand the genome of the virus that would lead to development of vaccine and treatment, but time is needed for such development. To prevent the recurrence of epidemics we should look at the host and environmental factors.

The agent must be capable of infecting the host for infection to develop. This depends on whether the environment is favourable for its survival and transmission, and also the susceptibility of the host. The susceptibility of the host depends on its ability to fight off the infection, which can be a disease specific defence mechanism such as vaccine, or non-specific defence mechanism. The ability of non-defence mechanism to fight off infectious disease will depend on the host's general health status, nutritional status, age, coexisting chronic illness, etc. If you have a population that is healthy, fit, and well nourished, the chance of infection would be low.

Epidemics are an increase in the frequency of occurrence of a disease in a population above its baseline level for a specified period of time. To calculate this, estimate the basic reproductive number that is defined as the expected number of new infectious hosts that one infectious host will produce during the period of infectiousness in a population that is susceptible. It depends on number of contacts per unit time, transmission probability, and duration of infectiousness. Apart from infectivity of the agent and host suscept-

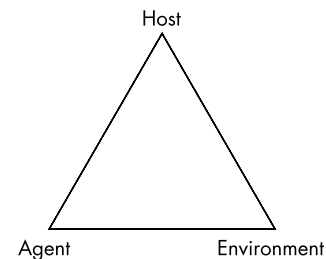


Figure 1 The epidemiological triangle.

ibility, transmission probability also depends on environmental factors. SARS is spread by droplet transmission. If the population has developed good personal hygienic practice to prevent the spread of droplet infection, and creates a clean and hygienic environment minimising the chance of survival of infectious disease agents, the transmission probability will be low. If the suspected SARS cases can be screened early and isolated, the number of contacts per unit time will be fewer and the duration of susceptible hosts exposed to suspected cases will also be short. Therefore environment improvement and good infectious disease control measures are the key factors to prevent an epidemic in the autumn of 2003.

Before a breakthrough in treatment and vaccine development, a SARS epidemic can easily recur if the population is unhealthy and has poor hygienic practices, and where there is inadequate infectious control measures and a poor living environment. The Hong Kong SAR government has taken measures to improve the environment, and also to promote community action and partnership in improving the health and hygiene. It really depends whether these initiatives can be sustained as to whether the epidemic is less likely to recur.

REFERENCES

- 1 WHO. Taiwan, China: SARS transmission interrupted in last outbreak area. *Communicable Disease Surveillance and Response* 2003;update 96, 5 Jul. http://www.who.int/csr/don/2003_07_05/en/.
- 2 Mansner JS, Kramer S. *Epidemiology: an introductory text*, 2nd edn. Philadelphia: Saunders, 1985.
- 3 Ksiazek TG, Erdman D, Goldsmith C, et al. A novel coronavirus associated with severe respiratory syndrome. *N Engl J Med* 2003;**348**:1953–66.

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Virus pathogens suggest an autumn return

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SARS is one of the deadly new emerging infectious diseases identified in the 21st century. Since its emergence in November

2002, SARS has created public panic and raised many issues among healthcare workers and policy makers around the world. Although