Will the SARS epidemic recur?

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On July 5, 2003, WHO has 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 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 SARS epidemics will recur.

If one has a crystal ball to view the future, this question would be answered. We would make some prediction based on the epidemiological triangle (Figure 1) recognizing the three main factors-agent, environment and host in the pathogenesis of disease. [2] If we can control any two of the main factors, one would prevent the occurrence of a communicable diseases.

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

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 disease specific defense mechanism such as vaccine, or non specific defense mechanism. The ability of non-defense 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 and fit, and well nourished population; the chance of infection would be low.

Epidemics is an increase in the frequency of occurrence of a disease in a population above its baseline level for a specified period of time. One should therefore estimate the basic reproductive number which is defined as the expected number of new infectious hosts that one infectious host will produce during period of infectious 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 susceptibility, transmission probability also depends on environmental factors. The 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 minimizing 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 less 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 coming autumn.

SARS epidemic can easily recur if we do not have a healthy population, poor hygienic practice, inadequate infectious control measures, and poor living environment before the breakthrough in treatment and vaccine development. The Hong Kong SAR Government has taken measures to improve the environment, and also promote the community action and partnership in improving the health and hygiene. It really depends whether these initiatives can be sustained so the epidemics is less likely to recur.

Reference:

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3. Ksiazek TG., Erdman D., Goldsmith C, ***et al.*** A Novel Coronavirus Associated with Severe Respiratory Syndrome. *N Eng J Med* 2003; www.nejm.org on April 10, 2003.

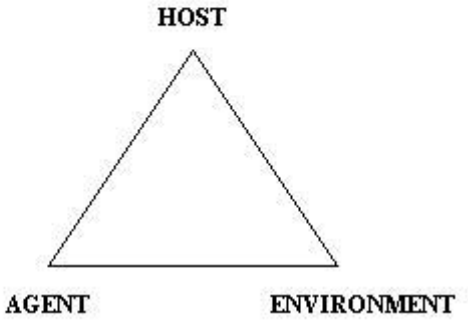

Figure 1. Epidemiological Triangle