

**For information**

**SARS Expert Committee**

**Measures to Prepare Hong Kong for Possible Resurgence  
of the Severe Acute Respiratory Syndrome:  
Enhancement of Infection Control Facilities  
in the Public Hospital System**

**Purpose**

This paper briefs members on the measures to enhance the infection control facilities in the public hospital system to prepare Hong Kong for the possible resurgence of the severe acute respiratory syndrome (SARS) or any other new emerging infectious diseases.

**Lessons Learnt from the Recent SARS Outbreak**

2. The existing inpatient wards in public hospitals are overcrowded. Prior to the SARS outbreak, beds in ward cubicles were in general closely spaced to cope with the ever increasing patient load. Given the highly infectious nature of SARS, the Hospital Authority (HA) had to space out patients during the SARS crisis to reduce cross-infection. Also the design of the general wards is not geared towards the treatment of infection diseases. There are no dedicated gowning/degowning areas. The ventilation systems in some wards have not been designed for the requirement of creation of negative pressure gradient with air flowing from “clean” zones to potentially contaminated zones for isolation facilities and have permitted mixing of air currents. Provision of hand washing and other sanitary facilities in wards is inadequate.

3. During the SARS outbreak, public hospitals have made make-shift arrangements to reduce cross-infection by spacing out patients and installing exhaust fans in SARS wards to create negative pressure.

While these make-shift arrangements could, to a certain extent, improve environment control for isolation purposes, they cannot provide proper isolation within the ward itself. In the case of SARS which is principally spread by droplets and aerosols, the isolation set up should desirably comprise negative pressure with independent toilet / shower facilities. To prepare for the possible resurgence of SARS later in the year, there is an urgent need to enhance the isolation facilities in public hospitals for the handling of SARS.

4. At present, there are only limited number of isolation rooms in our public hospitals. These isolation facilities are normally in the form of a pair of isolation rooms in a standard ward. They have been designed for handling episodic cases of infectious disease or hospital-acquired infections in wards designated for different specialties. There are however considerable difficulties in mobilizing these isolation rooms which are scattered all over a hospital in the event of a major infectious disease outbreak. There is a need to provide designated isolation facilities in our public hospitals.

5. Having reviewed local and international experiences in handling SARS, the handling of future SARS patients would be shared among acute hospitals using a strategy for cohorting patients based on the following principles:

- (a) A staged approach would be adopted in the mobilization of hospitals in handling SARS.
- (b) The number of confirmed SARS patients in any hospitals would be initially limited to 50 to avoid major disruption to existing services. The number could be increased to 100 in the case of a major outbreak.
- (c) Capacity planning should take into account the number of suspected SARS cases in addition to confirmed SARS cases.
- (d) Priority will be given to suspected SARS cases for the use of isolation facilities to minimize the risk of

cross-infection.

- (e) In case of major epidemic, confirmed SARS patients may be cohorted in specified wards with improved ventilation, and with beds suitably spaced as the risk of cross-infection among these patients is lower.
- (f) Adequate backup facilities and expertise, including intensive care, should be made available in hospitals treating SARS patients.

## **Proposals**

6. In the light of the SARS experience, we need to strengthen the capability and capacity of our public hospital system in handling possible future outbreaks of infectious diseases, including SARS, by enhancing the infection control facilities in our public hospitals.

### Interim Measures

7. Taking reference from the recent SARS outbreak, we estimate that the surge capacity required for handling future SARS outbreaks could be up to 2 000 beds. However, with the lessons learnt from the recent outbreak and the comprehensive public health measures that have been put in place for early detection, swift contact tracing, prompt isolation and quarantine as well as effective containment, our assessment is that there is a good chance for future SARS outbreaks to be brought under control before triggering the surge capacity. Such being the case, HA will carry out, as an interim measure, improvement works in nine major acute public hospitals to enhance ward facilities for confirmed and suspected SARS patients to cope with the possible resurgence of SARS later in the year. The improvement works for which \$409.6 million has been allocated aim to provide standard facilities required for isolation rooms, including the creation of negative pressure gradient in patient rooms, provision of 100% fresh air supply and dilution of bioload in sufficient air change rates, installation of high efficiency particulate air filters to filter out droplets and aerosols, and the provision of en-suite

toilet / shower facilities in ward cubicles. Upon the completion of the works in October 2003, there would be a total of about 1 280 beds for isolation of confirmed and suspected SARS patients in the nine hospitals. HA will also provide at least 10 isolation beds each for the remaining acute hospitals.

8. Having regard to the guidelines published by the World Health Organisation on the management of SARS, we shall provide separate wards for confirmed and suspected SARS patients respectively. We shall individually isolate suspected SARS cases whenever practicable, or cohort patients with similar conditions in two-bed or four-bed rooms as clinically appropriate. In general, confirmed SARS cases can be cohorted, though patients in more critical conditions may be placed in one-bed rooms for higher level of medical care.

#### Contingency Measures in the Event of Major Outbreak

9. As part of the overall contingency plan, HA will formulate a plan for the construction, commissioning and operation of temporary isolation facilities at pre-selected sites within short notice to accommodate patients with relatively mild SARS symptoms or convalescing SARS patients who require isolation. In this connection, one option is to convert an existing camp facility (such as Lei Yue Mun Park and Holiday Village) into a temporary isolation facility in the event of an extensive SARS outbreak to provide up to 300 temporary isolation beds for step-down and convalescent patients. HA has also identified suitable and readily available sites within the compounds of four existing acute hospitals for accommodating prefabricated structures (up to 300 isolation beds) for use as temporary isolation facilities when necessary.

10. With the assistance of the Housing Authority, 1050 vacant units were made available in Tin Yan Estate during the recent SARS outbreak for use as temporary accommodation for frontline health care staff. Should need arise, we shall approach the Housing Authority again for use of vacant public housing units as designated quarantine facilities for close contacts of SARS patients and frontline healthcare workers.

## Longer-term Measures

11. We have assessed the need to construct additional designated infectious disease facilities as a longer-term measure to further enhance Hong Kong's capability and capacity in coping with possible future outbreaks of infectious diseases. The isolation facilities that would be made available in all acute hospitals later in the year under the interim measures (as detailed in paragraph 7 above) could only provide the optimal level of infection control provisions for handling future SARS outbreaks within the constraints of the existing hospital facilities. We need to construct specially designed isolation facilities for handling new emerging infections caused by infective agents which could be in the form of virus, bacterium or fungus, and could spread through different modes of transmission

12. We have considered the option to build infectious disease blocks attached to a few selected acute hospitals against the option to build a stand-alone infectious disease hospital. According to international experience, infectious disease hospitals have been largely established according to the need to handle endemic infections of a region, rather than constructed to anticipate epidemic outbreaks of infectious disease. At present, we have facilities for handling communicable diseases endemic to Hong Kong, such as tuberculosis, hepatitis, as well as seasonal and sporadic outbreaks of cholera and typhoid. We see merits in building a few infectious disease blocks attached to major acute hospitals, as the arrangement would provide flexibility in terms of operation, logistic support and mobilization of resources. Moreover, modern treatment of infectious diseases require multi-specialty support. The infectious disease blocks can be mobilized by stages having regard to the extent of infectious disease outbreak. Extra manpower and additional support of diagnostic and treatment equipment and facilities (such as ICU, radiology, laboratory) can be easily mobilised within the acute hospital in question or the hospital cluster concerned in the event of outbreak. Complications of infectious disease patients can be readily supported by the specialty departments of the acute hospital, thus providing best patient care. The facilities of an infectious disease block can also be more flexibly deployed to serve as general wards when there is no infectious disease outbreak. Construction period will be shorter for

building an infectious disease block (about three years) as compared to six years for building an infectious disease hospital.

13. Our proposal is for the construction of about three specially designed purpose-built infectious disease blocks which will be attached to selected acute hospitals. The proposed infectious disease blocks will each have a capacity of about 100 isolation beds, and will be supplemented by existing services (such as diagnostic radiology (including CT scan), endoscopy, operating theatres and labour and delivery) in the respective acute hospitals. In this connection, we plan to build one of the infectious disease blocks at the Princess Margaret Hospital as the focal infectious disease centre of the territory.

### **Advice Sought**

14. Members are invited to comment on the proposals set out in paragraphs 6 to 13 of the paper.

Health, Welfare and Food Bureau  
August 2003