

For information

SARS Expert Committee **Contact tracing for SARS – then and now**

Introduction

The purpose of this paper is to give a descriptive account of the various measures adopted by the Department of Health (DH) to conduct contact tracing during the outbreak of SARS.

2. Contact tracing has always been an important public health tool employed by DH in the control of communicable diseases. The chief purposes of contact tracing are to confirm the diagnosis, determine the extent of secondary transmission, and identify control measures (Oxford Textbook of Public Health, 4th Edition). In the context of SARS, contact tracing for medical surveillance proved fundamental as a control measure in facilitating early diagnosis and treatment of disease among contacts and preventing disease spread in the community.

3. Notifications of infectious diseases are mostly received from registered medical practitioners working in hospitals and clinics to the respective Regional Offices (ROs) of DH. Once a notification is received, the RO will initiate case investigation and contact tracing immediately. Information required for contact tracing is obtained from the cases or their family members by using a structured questionnaire through face-to-face or telephone interviews. Contacts traced by DH may be put under medical surveillance, given health education, provided with chemoprophylaxis or vaccinations as appropriate, or referred to hospitals if indicated. Over the years, the DH has trained experienced staff in conducting timely and comprehensive contact surveillance.

4. The disease surveillance system was enhanced in February 2003 to include severe community acquired pneumonia (SCAP). On receipt of reports from hospitals on SCAP cases requiring assisted ventilation or ICU/HDU care in the hospitals, DH would initiate contact tracing on the patients and if a contact showed signs of illness, he/she would be referred to hospitals for further investigations and management.

Enhanced contact tracing for SARS

5. Contact tracing is imperative in the control of SARS, as it ensures that ill contacts of cases are detected early and promptly isolated in hospital to prevent spread in the community.

6. During the evolution of the SARS outbreak, the respective case definitions of SARS and contacts underwent changes to take into account new developments. DH's contact tracing covered both close contacts and social contacts. At the early stage, close contacts were defined as family contacts and selected contacts at workplace or school based on risk assessment, and other contacts were treated as social contacts. Since March 31, the WHO definition for close contact of SARS has been adopted, i.e. close contacts, for the purpose of contact tracing, include those who have lived with, cared for, or handled respiratory secretions of the SARS patients; whereas persons who have had contact with a person with SARS but do not satisfy this definition are defined as social contacts.

7. As the SARS outbreak unfolded and more knowledge was gained on the properties of the virus and the disease, DH made graduated enhancements in contact tracing in tandem with our evolving understanding of SARS. The enhancements were mainly in two areas: the mechanism for conducting contact tracing and medical surveillance of contacts.

Enhanced mechanism for conducting contact tracing

8. Upon receiving notifications of SARS cases, the DH ROs would conduct case investigations and promptly arrange contact tracing. Since April 14, collection of contact information by the ROs has been centralized by integrating with the Major Incident Investigation and Disaster Support System (MIIDSS) at the Police Headquarters's Wanchai Control Centre. The MIIDSS system enabled matching and validating different versions of names, addresses and other details of SARS cases; and it helped to link events, places and people to detect case clusters and generate leads for prompt investigation (e.g., cases in a housing estate,

cases seeing the same general medical practitioner). Once a notification of suspect/probable case was received, DH's medical staff stationed at the Control Center would collect contact information by interviewing patients through telephone using a structured questionnaire (attached in Annex). The information was then relayed to the respective ROs which could then immediately focus on risk assessment, health monitoring, provision of advice, and other aspects of contact control.

9. In contact tracing related to SARS outbreaks in hospitals, the DH ROs would follow up on cases referred by hospitals and covered hospitals visitors exposed to SARS patients. As a further measure to improve the integrity of our contact tracing system, beginning in April, non-SARS patients discharged from SARS wards were referred to the Designated Medical Centers (DMCs) (see para. 13) for daily surveillance for 10 days.

10. DH made particular emphasis on contact tracing in elderly homes, which represented a vulnerable target of SARS outbreaks due to frequent visits by the elders to hospitals. In the situation where a SARS case involved a resident of an elderly home, the concerned RO would immediately alert the home and initiate action, including investigation of the case and informing the DH Elderly Health Service (EHS). Medical surveillance would be done by the EHS with on-site visits and advice on infection control, on-going support and monitoring would be provided during the medical surveillance period. A special data system on such elderly homes was set up in the EHS for the collection, updating, analysis and monitor of the situation, as well as for sharing of information with the Hospital Authority and the Social Welfare Department in this connection.

11. The above represented significant enhancements in contact tracing in terms of speed and scope as compared with other infectious diseases, and this was significant in the control SARS. To further support the above activities, DH has developed a centralized case and contact information system, the "SARS-CCIS", providing a central database for all cases and contacts for tracking and analysis, with a view to ensuring the highest degree of comprehensiveness in contact tracing.

Enhanced medical surveillance of contacts

12. The second area of enhancement concerned medical surveillance of contacts for early case detection to prevent further spread of disease. Initially, close contacts of SARS cases were advised not to go to work for at least seven days with sick leave granted specifically for the purpose. Similarly, students who were close contacts of SARS cases were excluded from school for seven days.

13. On March 31, DH set up four DMCs, one in each region, and required close contacts to attend the DMCs on a daily basis, in addition to staying at home during the surveillance period, and at the same time lengthened the surveillance period to ten days in the light of increasing evidence suggesting a longer incubation period of the SARS disease. Social contacts were subject to telephone surveillance.

14. Close contacts attending DMCs were required to undergo a temperature check, and depending on the presence of significant symptoms such as fever, cough, shortness of breath, a chest x-ray examination might be performed on the spot. Suspected cases were referred to hospitals for further investigation and management.

15. As local and international data accumulated, household contacts of SARS patients were found to have a higher chance of developing SARS. In this light, household contacts of probable SARS patients were required to undergo home confinement effective from April 10.

16. Home confinees were required to stay at home for a minimum of ten days after last contact with the SARS case. They were not allowed to leave home without the permission of granted by a Health Officer in exceptional circumstances. Visiting health teams comprising of nurses would visit the confinees regularly for medical monitoring and the Police could conduct spot checks to ensure compliance. Non-compliant confinees would be removed to camp upon repeated warning. Confinees who developed symptoms were either referred to the DMCs for screening or directly to hospitals for further management.

17. While there had been initial concerns that mandatory home confinement would drive infected people underground and hence causing further spread of the disease, it was fortunate that the society was willing to accept some sacrifice of personal freedom and compliance to the home

confinement was good. The measure was later further extended to the household contacts of suspected SARS patients from 25 April onwards.

Challenges and obstacles

18. Effective organizational structure and information system as well as team work are crucial to contact tracing. Medical staff needs to have good communication skills, not only to convey effective and practical health advice, but also to solicit significant information from the clients for the purposes of risk assessment and determination of enhanced control actions. They also need to be tactful in handling sensitive information and vulnerable emotions of the contacts. As the SARS outbreak was evolving rapidly, frontline staff needed constant briefing and support on updates of new knowledge on SARS and new control measures introduced.

19. At the initial stage of the outbreak, electronic notification systems had yet to be developed and the traditional system of notification of cases between the hospitals and DH could no longer cope with the fast speed and the large number of cases reported. Besides, there were also issues with the case definition, data standardization and communication and institutional barriers. These issues were only partially resolved with the provision of extra staff and additional logistics support, and the staff was working under tremendous stress and physical exhaustion.

20. Practical difficulties in getting information also occurred where patients gave inaccurate data or refused to disclose information of contact history such as family members, other contacts, home address and workplace, etc. Some contacts even denied having symptoms due to various reasons.

Outcome of contact tracing

22. Over 26 000 persons, including close contacts and social contacts, have been traced by DH so far during the SARS outbreak and about 280 of them were subsequently found to be SARS cases, representing 16% of all SARS cases in Hong Kong.

23. According to a study which evaluated the impact of public health measures in the control of SARS, it was concluded that contact tracing and the other public health measures had been successful in greatly reducing the reproduction number of the SARS outbreak in Hong Kong. (Transmission dynamics of the etiological agent of SARS in Hong Kong: impact of public health interventions. Science. 2003 Jun 20;300(5627):1961-6).

Department of Health
July 2003