For Information

SARS Expert Committee

Post Amoy Gardens Clusters

This paper focuses on the clusters of Severe Acute Respiratory Syndrome (SARS) cases occurring between April and May 2003. During the period of 1 April - 31 May 2003, and excluding SARS cases related to Amoy Gardens, there were 887 SARS cases reported amongst which 229 health care workers (HCWs) were involved.

Hospital Clusters

2. About 60% of the SARS cases during the period were linked to hospitals. The cluster of the Prince of Wales Hospital (PWH) was detailed in [redacted] whereas the Princess Margaret Hospital (PMH) was a designated hospital for management of SARS cases at the time. In this light, this paper covers the clusters occurred in seven other hospitals, namely involving six public hospitals and one private hospital. A total of 291 persons were affected including 79 HCWs. And there were 103 deaths altogether.

3. Generally speaking, in addition to putting all household contacts of the cases under home confinement and following up on other contacts as appropriate, the Department of Health (DH) would immediately collaborate with the hospital concerned to implement control measures upon receiving notification of a suspected cluster of SARS cases in a hospital. The main measures included cohorting staff and patients of affected wards, surveillance of discharged patients and hospital visitors from affected wards, and freezing movement of people to these wards.

4. In particular, the concerned hospitals were advised to stop admitting patients to the affected wards and the in-patients would be cohorted for 10 days from their last day of exposure. Patients already transferred to other wards/hospitals were traced and put under medical surveillance. Those exposed to the cases but already discharged were referred to the Designated Medical Centres (DMC) operated by DH for

follow up. As regards the hospital staff, the hospital concerned would provide quarters as appropriate. Staff movement was frozen andthey were put under medical surveillance and urged to observe strict personal hygiene. The hospital management was advised on thorough disinfection of the affected wards as well as the common areas in the buildings. Where necessary, hospital visitors were urged to contact the DH SARS hotlines for surveillance purposes.

5. Brief highlights on these seven clusters in hospitals are provided in the following paragraphs.

Alice Ho Miu Ling Nethersole Hospital (AHNH)

6. DH received notification on 1 April that five staff working in different wards in AHNH developed symptoms suspicious of SARS. The source of infection was traced to patients admitted for other diseases in late March and found to have SARS subsequently.

7. A total of 156 persons, including 40 HCWs, 75 in-patients, 17 visitors and 24 close contacts of these cases were affected in this cluster. The onset dates were between 24 March and 5 May. 48 patients died. More than 900 discharged patients and visitors were put under surveillance.

United Christian Hospital (UCH) Ward 12A

8. DH received notification of a suspected SARS outbreak involving 11 HCWs of Ward 12A of UCH on 2 April. The source of infection was traced to three patients who were admitted into Ward 12A with a non-SARS diagnosis initially during 24 to 28 March but who were later confirmed infectionwith onset dates between 23 and 27 March. They included a resident of Amoy Gardens Block D and a contact of a SARS case who lived in Block E of the same housing estate.

9. The UCH cluster affected a total of 27 persons, including 16 HCWs, six in-patients and five family members. Onset dates were between 23 March and 15 April. Eight people died. A total of 149 ward staff were put under medical surveillance.

Tai Po Hospital (TPH)

10. On 23 April, TPH reported that two staff and 15 patients from different wards developed SARS symptoms from early to mid April. A total of three staff, 29 in-patients admitted for other diseases, three visitors and two close contacts were found to have SARS. 23 deaths were eventually resulted. The last case had onset of symptoms on 6 May 2003. The initial cases were likely to have contracted the disease while staying in SARS affected wards in AHNH during late March and early April. Altogether 143 contacts were traced.

Caritas Medical Centre (CMC)

11. On 23 April, DH was notified by CMC of a SARS outbreak in Ward 9E which involved two HCWs. Investigations revealed that the cluster involved Ward 9E first, then later the nursing quarters. A total of 24 cases were detected involving nine HCWs and 15 patients. The onset date of the last case was 18 May. Six patients died.

12. The source could be traced to a health care assistant who had probably acquired the infection outside the hospital. She had onset of symptoms on 16 April.

Tuen Mun Hospital (TMH) C8

13. TMH notified DH on 27 April that three staff of Ward C8 were suspected of SARS infection. Two had fever started on 23 April and were admitted on 26 April while the remaining one was febrile on 26 April.

14. This cluster involved 16 persons, including five staff, 10 in-patients and one visitor. The onset dates were between 18 April and 21 May. Eight patients died. Two source patients, a 73-year old lady and a 69-year old lady had stayed in the affected wards during the periods from 18 to 23 April and 8 to 11 April respectively. The total number of contacts traced jointly by TMH and DH amounted to 250.

North District Hospital (NDH)

15. On 25 May, NDH notified DH that three staff of Ward 4B developed symptoms suggestive of SARS. A total of four staff, 11 patients and three close contacts were affected in the NDH cluster. Seven patients died. The dates of onset were between 28 April and 31 May.

16. The source of infection was traced to two patients of Ward 4B. One was seropositive but without typical symptoms. The other was PCR positive for coronavirus. NDH and DH jointly traced 120 staff and 427 patients. Another 233 visitors were put under medical surveillance.

Baptist Hospital (9/F)

17. Baptist Hospital (BH) is one of the twelve private hospitals registered with the Director of Health in accordance with the Hospitals, Nursing Homes and Maternity Homes Registration Ordinance (Chapter 165). On 2 May, DH received notification of a SARS case involving a nurse working in the 9th floor General Ward of BH.

18. In this cluster, a total of 13 confirmed cases were identified, involving two nurses, six patients and five family contacts. The onset dates were between 13 April and 6 May. Three patients died. The source could be traced to two patients who had no definite exposure history and their onset dates were 13 and 19 April.

Clusters in Building Estates

19. The Amoy Gardens incident illustrated the importance of structural and environmental factors in the transmission of SARS. In this light, more proactive actions were taken to exclude these factors. In particular, a multi-disciplinary response team led by the DH and comprising building and environmental hygiene experts was mobilized for investigation and institution of control measures. More attention was given to environmental sampling, drainage and other piping systems, lifts and sewerage systems, building cleanliness, refuse storage and collection, and household health education. The need to step up cleaning and to

disinfect common areas was further emphasised to the respective building management.

20. Three building clusters identified during this period were effectively controlled. Brief highlights on these cases were provided in the following paragraphs.

Koway Court

21. On 9 April, DH received notification from Pamela Youde Nethersole Eastern Hospital that three residents of Koway Court had been admitted for suspected SARS. Given that a resident of this building estate had been diagnosed as SARS earlier on 5 April, DH immediately conducted site visits to Koway Court and provided health advice to the residents through the property management company. With experience gained from the Amoy Gardens incident, the residents were advised to fill up the U-traps of drainage outlets to ensure proper functioning and to disinfect their flats as precautionary measures. The property management company was advised to step up cleansing and disinfection of common areas of the building and shopping arcade. Door-to-door questionnaire interviews with the residents of the concerned building were conducted and health talk was jointly held by DH and Food and Environmental Hygiene Department.

22. Environmental swabs and water samples were taken from various sites in the affected and non-affected units as well as from the shopping arcade. All were tested negative for coronavirus.

23. A total of 12 persons in connection with Koway Court were diagnosed as SARS. Their dates of onset were between 25 March and 12 April. The source of infection was traced to a Koway Court resident who had probably contracted the disease from Ngau Tau Kok Lower Estate, a housing estate in the vicinity of the Amoy Gardens.

Hing Tung House

24. On 20 April, DH identified a cluster of six SARS patients from three families residing in units 14 on different floors of Hing Tung House, Tung Tau Estate. The first family of four cases had onset of symptoms

between 2 and 12 April. The other two cases had their onset on 9 and 11 April.

25. Household members of the concerned units in the vertical block were closely monitored by door-to-door interviews and daily telephone follow-up. Inspection by Housing Department revealed that the pipes and drains were in good condition. There was no shower cubicle or bath in the toilet and water used for showers was discharged via the floor drain of the toilet. Dry toilet floor drain which was the situation found in Amoy Gardens outbreak was therefore unlikely in these cases.

26. Appropriate disinfestation measures had been conducted and advised by FEHD as cockroach nuisance was common in refuse collection room and manhole areas. No rodent nuisance was detected.

27. Among the environmental swabs and water samples taken inside and outside the affected households, only one specimen from the rooftop soil stack serving the vertical block showed presence of residual genetic material of coronavirus but viral culture did not yield any growth. This finding of genetic traces of coronavirus probably reflected previous virus excretion by SARS patients into the soil stack, but it by no means proved spread of disease via the soil stack.

Wing Shui House

28. DH was notified of three SARS cases in two units in Wing Shui House, Lek Yuen Estate from 22 to 28 April. The index case had onset of symptoms on 17 April and his wife had onset on 21 April. A total of 12 persons residing in five units were confirmed to have SARS. The onset date of the last case was 22 May.

29. Thorough field investigation was carried out by the multidisciplinary response team. Though a few environmental swabs taken from units with no SARS patients were tested positive for coronavirus, no structural or environmental factors were found to have caused the outbreak. Person-to-person transmission and transmission by fomites were considered the most likely explanation. Prompt control measures including disinfection and disinfestation of all households and

the vicinity as well as repair of sewer system in Wing Shui House were carried out.

Lessons Learnt

30. The majority of the clusters occurring after the Amoy Gardens outbreak were related to hospital setting. Some hospital clusters were traced to SARS patients without typical symptoms. This highlights the importance of all-time vigilance among HCWs on the disease as well as strict adherence to the infection control guidelines. More emphasis should be placed on infection control and universal high-risk precaution in hospital setting and training of HCWs on these areas should be enhanced.

31. Experience gained from the Amoy Gardens outbreak was useful in that prompt investigations and public health and environmental control measures by the multidisciplinary response team were effective in limiting the spread of disease in the community. However, Hong Kong is densely populated with many high-rise residential buildings having structural design similar to the Amoy Gardens. As such, the public is constantly urged to incorporate good hygienic practice into their daily lives and guard against lapses in personal and environmental hygiene.

Department of Health
July 2003

Appendix

Post Amoy Gardens Clusters (April – May 2003)

	Date of onset		No. of person affected		Sex	Age (range)
	First case	Last case	Health Care Workers	Total		
Hospital						
AHNH	24 Mar	5 May	40	156	88M : 68F	17 – 91 yrs
UCH	23 Mar	15 Apr	16	27	4M : 23F	20 – 89 yrs
TPH	10 Apr	6 May	3	37	23M : 14F	23 – 100 yrs
CMC	16 Apr	18 May	9	24	1M : 23F	24 – 91 yrs
TMH	18 Apr	21 May	5	16	1M : 15F	19 – 95 yrs
NDH	28 Apr	31 May	4	18	0M : 18F	25 – 98 yrs
BH	13 Apr	6 May	2	13	8M : 5F	23 – 63 yrs
Sub-total	-	-	*79*	*291*	*125M : 166F*	*17 – 100 yrs*
Building Estate						
Koway Court	25 Mar	12 Apr	0	12	6M : 6F	4 – 72 yrs
Hing Tung House	2 Apr	12 Apr	0	6	2M : 4F	19 – 59 yrs
Wing Shui House	17 Apr	22 May	1	12	6M : 6F	4 mos –72 yrs
Sub-total	-	-	*1*	*30*	*14M : 16F*	*4 mos –72 yrs*
Total						
Total	-	-	***80***	***321***	***139M : 182F***	***4 mos – 100 yrs***