

**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, 4<sup>th</sup> 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

**SARS Case Questionnaire** (Version 12)  
 調查「非典型肺炎」 - 資料搜集中心 - 問卷

**Annex**  
 (translation)

**Please complete each item below**

Gum Label if available

Form No. \_\_\_\_\_ Region (No.) \_\_\_\_\_ S 03 \_\_\_\_\_

**PART I**

**Patient Particulars**

Name: \_\_\_\_\_ ( \_\_\_\_\_ )

Sex: M / F Age: \_\_\_\_\_ in chinese

DOB: \_\_\_\_\_

ID card no. \_\_\_\_\_

Tel. No. \_\_\_\_\_ (home)

\_\_\_\_\_ (mobile)

City: \_\_\_\_\_

Consent for release of information to foreign  
 consulate for foreigners Y / N

**Home Address**

Room / Flat \_\_\_\_\_ Floor \_\_\_\_\_

Building name / Block No. \_\_\_\_\_

Estate: \_\_\_\_\_

Street No. \_\_\_\_\_ Street Name: \_\_\_\_\_

District \_\_\_\_\_

**History**

Fever: Y / L / N \_\_\_\_\_ °C

Coughs: Y / L / N SOB Y / L / N

Rigor: Y / L / N Myalgia: Y / L / N

Sputum: Y / L / N Sore throat: Y / L / N

Malaise: Y / L / N Headache: Y / L / N

Cough: Y / L / N Dizziness: Y / L / N

Nausea: Y / L / N Abdo Pain: Y / L / N

Vomiting: Y / L / N Diarrhoea: Y / L / N

First Symptom Onset date: \_\_\_\_\_

\*Y - First onset symptom \*L - Later with symptom

\*N - No such symptom

**Patient / Patient's relative agreed our staff to contact those with close / social contact to patient & remind them the issues related to the atypical pneumonia Y / N**

**Work history**

Occupation: \_\_\_\_\_

Workplace / School Name : \_\_\_\_\_

Work address : \_\_\_\_\_

Health care worker Y / N

Ward movement \_\_\_\_\_

Work nature / procedures \_\_\_\_\_

Last day of work / school \_\_\_\_\_

Any symptoms before "sick leave" Y / N

Name of responsible person at workplace \_\_\_\_\_

Telephone of that person \_\_\_\_\_

Hospital / Ward admitted: \_\_\_\_\_

Date of admission \_\_\_\_\_

Condition : Good / Satisfactory / Fair / Critical

CXR : Atypical Pneumonia Y / N

White blood cell Count: \_\_\_\_\_

Virus results: \_\_\_\_\_

Ribavirin given: Y / N Ever admitted to ICU Y / N

Discharged on: \_\_\_\_\_ Died on : \_\_\_\_\_

History of blood transfusion (within 2 months): Y / N

Blood Transfusion date: \_\_\_\_\_

History of flu vaccination in th past 6 months Y / N

Smoking History: Current smoker/Ex-smoker/Non-smoker

## SARS Case Questionnaire

## 非典型肺炎問卷調查

Please complete each item below

Part II Close contacts 緊密接觸者

- 指病發前 10 天至入院，曾護理閣下、曾與你共住（如家人）或曾直接接觸你的分泌物和體液的人士，公司同事 (persons or colleagues who have cared for or lived with you e.g. family members, or who had direct contact with your secretions or body fluids during the period 10 days prior to onset of symptoms until your admission to hospital)

	Name / Sex / Age 姓名/性別/年齡	HKID 身份證編號	Contact 電話	Relationship 關係	Home/School/Workplace Address 厠住址、學校及工作地址	Symptoms Y/N	Date of Last Contact
e.g.	M/CHAN Fai, aged 49	A1234567	12345678	Son	Rm 123, Blk E, Amoy Gdn ABC School XYZ Co. at 2/F, 12 Nathan Rd.		
1.							
2.							
3.							
4.							
5.							

PART III Travel history 旅遊紀錄

你過去一個月內有否到過其他地方旅遊?

Y / N / Unknown

Had you traveled to any other places in the past one month?

	Country 國家/地區	Period 日期	Name of travel agencies / airline companies / flight number 旅行社名稱/航空公司名稱/航機編號
e.g.	中國/雲南	2003-03-15 to 2003-03-20	康泰旅行社/國泰航空公司/CX104
1.			
2.			
3.			

PART IV Doctors consulted after onset of symptoms 病發後曾求診之醫

Name of doctor 醫生姓名	Telephone 電話	Date of consultation 求診日期	Address of clinic 診所地址



**PART V**

(i) 你知否是從那裏（親戚朋友同事）感染到非典型肺炎或接觸任何人懷疑感染到非典型肺炎

Can you identify any confirmed or suspected SARS cases (e.g. relatives, friends or colleagues) whom you have contacted or caused your infection?

	Name/Sex/Age 姓名／性別／年齡	HKID 身份證編號	Contact 電話	Relationship 關係	Address 地址	Symptoms 病徵	Date of last contact 最後接觸 日期	Other information 其他資料
e.g.	M/CHAN Fai, aged 49	A1234567	12345678	Son	Rm 123, Blk E, Amoy Gdn			Place of contact 接觸地點
1.								
2.								
3.								

(ii) 在入院期間，有否任何人探你 Did anyone visit you during your hospitalization?

	Name/Sex/Age 姓名／性別／年齡	HKID 身份證編號	Contact 電話	Relationship 關係	Address 地址	病徵	最後接觸 日期	Other Information 其他資料
e.g.	M/CHAN Fai, aged 49	A1234567	12345678	Son	Rm 123, Blk E, Amoy Gdn			
1.								
2.								
3.								

(iii) 你通常用甚麼交通工具上班及搭車路線？

What are your normal means of transport to work and the route?

(iv) 你病發前 10 天，你有否前往/陪同他人到過以下地點：

Did you go to the following places alone or in company with others in the 10-day period prior to onset of symptoms :

酒店 Metropole Hotel	Y / N	瑪嘉烈醫院 Princess Margaret Hospital	Y / N
老人院 Elderly homes	Y / N	威爾斯醫院 Prince of Wales Hospital	Y / N
牛頭角下村 Ngau Tau Kok Lower Estate	Y / N	屯門醫院 Tuen Mun Hospital	Y / N
淘大花園住宅 Amoy Gardens domestic premises	Y / N	伊利沙伯醫院 Queen Elizabeth Hospital	Y / N
淘大花園商場 Amoy Gardens Shopping Centre	Y / N	東區尤德夫人那打素醫院 Pamela Youde Nethersole Eastern Hospital	Y / N
高威閣住宅 Koway Court domestic premises	Y / N	基督教聯合醫院 United Christian Hospital	Y / N
高威閣商場 Koway Court Shopping Centre	Y / N	將軍澳醫院 Tseung Kwan O Hospital	Y / N
私家醫院 Private hospitals	Y / N	雅麗氏何妙齡那打素醫院 Alice Ho Miu Ling Nethersole Hospital	Y / N
私家醫生診所 Private practitioner's clinics	Y / N	瑪麗醫院 Queen Mary Hospital	Y / N
牙醫 Dental practitioners	Y / N	廣華醫院 Kwong Wah Hospital	Y / N
耳鼻喉科診所 Ear, nose and throat clinics	Y / N	北區醫院 North District Hospital	Y / N
中醫 Chinese medicine practitioners	Y / N	其他公立醫院 Other public hospitals	Y / N

若有請詳細列明日期，那間醫院院舍病房及病人姓名

If yes, please specify the date, hospital ward and name of the patients.

**PART VI Places of Exposure**

**指病發前 10 天至入院曾經出現地點 (places where you had been to during the period 10 days prior to onset of symptoms until your admission to hospital)**

醫院 Hospitals	Y / N	嘉年華會 Carnivals	Y / N
診所 Clinics	Y / N	教堂 Churches	Y / N
酒店 Hotels	Y / N	喪禮 Funerals	Y / N
學校 Schools	Y / N	飲宴 Feasts	Y / N
食店 Food premises	Y / N	會議 Meetings	Y / N
卡拉 OK Karaoke	Y / N	家庭聚會 Family gatherings	Y / N
大食會 Buffet	Y / N	鵲局 mahjong	Y / N

若有，請詳細列於以下之表格 If yes, please set out the details in the following table:

**Social Contacts 社交接觸者 – 指病發前 10 天至入院，曾與你接觸，但不符合緊密接觸定義的人士 (persons who had contacted you during the 10-day period prior to onset of symptoms up to your admission to hospital, but who do not meet the definition of close contact)**

	Place 地點 & Event 性質	Date 日期	Social Contacts Name/Sex/Age 姓名/性別/年齡	Phone 電話	Area/Address 地區/地址	Health Surveillance	
						Day 1	Day 10
e.g.	Amoy Restaurant for Dinner	Bet. 1930-2030 hrs. on 2003-03-31	M/CHAN Fat, age 49	12345678	Ngau Tau Kok	No symptoms	
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

**PART VII 個人習慣 Personal practice**

(i) 你有否依照政府指示做以下之預防措施:

- (Have you adopted the following measures as advised by the Government?)**
- |   |       |
|---|-------|
| (a) 用稀釋之漂白水沖廁 Flush the toilet with diluted bleach  | Y / N |
| (b) 洗手習慣 Wash your hands  | Y / N |
| (c) 注意清潔 Observe cleanliness  | Y / N |
| (d) 常帶口罩 Wear masks   | Y / N |
| (e) 用稀釋之漂白水清潔家居 Clean your household with diluted bleach                                  | Y / N |
| (f) 你認為你個人所做之預防措施，還有否漏洞 Do you think the precautions you have taken are still inadequate? | Y / N |
- 若有，請詳述意見 If yes, please give your views:
- 

(ii) 若以上問卷內之資料未能顯示病源，請詳述病者之個人習慣 (例如: 外出食飯之習慣):  
(Should information in this questionnaire fail to show the source of infection, please give an account of your habitual way of life e.g. dining out.)

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(iii) 你認為今次有甚麼因素引致你患上非典型肺炎，請詳述:  
(What do you think are the reasons that caused your infection? Please give details.)

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Please inform patients / family that health staff may contact them against for further information / advice / instruction.

RN / NO \_\_\_\_\_

Investigator \_\_\_\_\_

Date \_\_\_\_\_

**Daily record of local movements in the 10-day period prior to onset of symptoms**

**病發前 10 天, 每天詳細記錄**

Date 日期	Time 時間	Means of transport 交通工具	Area / address 地區 / 地址	Contacts / Telephone 接觸任何人 / 電話
病發前 10 天 10 days prior to onset				
病發前 9 天 9 days prior to onset				
病發前 8 天 8 days prior to onset				
病發前 7 天 7 days prior to onset				
病發前 6 天 6 days prior to onset				
病發前 5 天 5 days prior to onset				
病發前 4 天 4 days prior to onset				
病發前 3 天 3 days prior to onset				
病發前 2 天 2 days prior to onset				
病發前 1 天 1 day prior to onset				
病發日 onset day				