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14 January 2004

Miss Flora TAI
Clerk to Select Committee
The Legislative Council
8 Jackson Road, Central
Hong Kong

In association with
GILBERT TOBIN

Dear Miss Tai

Select Committee to enquire into the handling of the Severe Acute Respiratory Syndrome outbreak by the Government and the Hospital Authority

Thank you for your letters of the 8 January 2004 (English version) and 30 December 2003 (Chinese version). You request the sources of information regarding the sentence in paragraph 4.7 of the Review Panel's report which states that he [redacted] told doctors "he suspected he himself may have contracted a very virulent disease". The primary source of the information is an official chronology on the World Health Organisation (WHO) website which in its entry for 22 February reads: "He [redacted] warns medical staff that he fears he has contracted a "very virulent disease"". This and the other sources of information accessible to the Review Panel in support of this point are listed below together with references to the original documents.

2. From the sources of information listed below the Review Panel understood that whilst it was possible that the professor was in denial when he entered KWH AED it soon became apparent when he was shown his x-rays that he may likely be suffering from atypical pneumonia. Indeed his previous x-rays on 17 and 20 February as informed by DH had suggested a worsening situation. During the

period he was conscious from his first entering the hospital at 11.06am on 22 February to his intubation at 00.41 on 23 February doctors obtained other information and took actions which suggested to the Review Panel that the Professor was now not in denial and suspected that he had contracted the same disease as many of his colleagues back in Guangdong. This included the history he gave to doctors; details of his place of work; what was already known about the spread of the mystery illness amongst HCWs from the earlier press releases from Guangdong; and the speed and level of activity with which the hospital and others responded to the patient including putting him into isolation and seeking samples.

Details of sources of information

3. The term "very virulent disease" comes from the WHO website: Update 95 - SARS: Chronology of a serial killer which states under the entry for 22 February: "He [redacted] warns medical staff that he fears he has contracted a "very virulent disease"". (Attachment 1).

4. At the Review Panel's first meeting on 9 June 2003 a presentation was given by Dr. Vivian Wong. Informal notes taken at the meeting record the following statement being made "item 9. Professor told them on admission that he thought it was the mystery virus". "item 10. Immediately when Professor told them the KWH set up infection control measures".

5. The submission from KWH to the Review Panel (Attachment 2) indicates events on 22 February were as follows:

Time	
11.06am	[redacted] walks into AED at KWH
11.55 am	Admitted to ICU in strict isolation
12.12 pm	Severe CAP form faxed to HAHO
18.40 pm	Additional information faxed to HAHO

6. Furthermore, the submission from KWH to the Review Panel states in paragraph 2: "[redacted] walked in to attend KWH's Accident and Emergency Department (AED) at 11:06, 22/2/03. He was triaged as category 3 – "urgent". According to the history he gave, he had been in contact with patients suspected to have atypical pneumonia during 11-13/2/03". Further in paragraph 8 it states: "After being seen by a Medical Officer, [redacted] was re-assessed by a Consultant (A&E). The latter advised A&E staff to wear paper masks. Upon admission into ICU, the patient was immediately placed in isolation room. All staff caring him wore N95 masks, cotton gown, and implemented droplet precaution and universal precaution measures since his admission".

7. Dr. CC LUK in a telephone conversation with Review Panel members on 15 August 2003 indicated that [redacted]:

- Gave medical staff a history of his experience in mainland China including informing them of an epidemic of pneumonia in mainland China.
- Informed them that the clinic where he worked in Guangdong had implemented infection control guidelines including wearing masks.
- Mentioned to doctors that he himself was not suffering from the illness {Dr. CC LUK however postulated that the Professor was 'in a state of denial' at the time}.
- Dr LUK went on to say that in light of other information in the news at the time about the situation in Guangdong doctors knew they were potentially dealing with something infectious and implemented droplet precautions.

8. DH letter to the Review Panel dated 18 August 2003 paragraph 25 states: "On 24 February, DH received notification that a tourist from Guangzhou ([redacted]) admitted to the ICU of KWH at around noon time on 22 February was suspected to suffer from SCAP" [Severe Community Acquired Pneumonia which was later to be renamed as SARS]. (Attachment 3B). This letter was in response to my letter dated 2 August, 2003 to the Director of Health (Attachment 3A).

9. DH letter dated 18 August 2003 paragraph 27 further states: [redacted] had good past health. In the evening of 15 February, he had a sudden onset of fever (39 degrees), chills and rigor. He took oral antibiotics that night. He later developed cough and sputum. CXR done on 17 February showed haziness in the left lower zone. He changed the antibiotic to intravenous Penicillin that day. Repeated CXR on 20 February showed increased haziness. As he had to attend the wedding banquet of his nephew he came to Hong Kong with his wife on 21 February by coach".

10. DH letter dated 28 August (from Dr P Y LAM) paragraph 5 concerning [redacted] stated: "This not withstanding, Dr Margaret Chan, my predecessor, was concerned and had many discussions with one of the attending physicians and the Consultant of the Government Virus Unit to explore further actions required for identifying the causative agent". (Attachment 4B). This letter was in response to my letter dated 20 August, 2003 (Attachment 4A).

11. A number of articles published in the South China Morning Post refer to AA [redacted]'s admission. Typical of these is an article dated 27 March 2003 entitled "The virus that stole across the globe" which includes the following "His name is [redacted] AA and on being admitted to KWH, he warns medical staff not to touch him as he fears he has contracted a very virulent disease. He tells staff he is a professor in respiratory medicine at Zhongshan University in Guangzhou and has been treating patients with atypical pneumonia at the university's number 2 hospital." (Attachment 5).

12. A Washington Post article dated 23/5/03 and entitled 'The Metropole Mystery' states: [initially] "[redacted] AA insisted he did not have atypical pneumonia. But when doctors showed him his chest x-rays he saw the tell-tale patchy white markings on his lungs, he could only nod. "Then he was convinced he had atypical pneumonia" said a doctor who treated him, "He was scared"...Because this strange disease had infected scores of doctors and nurses since February 8, [redacted] AA like his colleagues, began to wear a mask, gloves and gown for protection, he told staff". (Attachment 6).

Further information

13. In respect of the high infectivity of the disease the Select Committee may consider it relevant to note paragraph 12 of Annex 7 to DH's letter of 18 August, 2003 (Attachment 3B) where it is stated: ".....In view of the suspected high infectivity of the disease, detailed exposure history to possible sources of infection was obtained. "

14. Finally, it is worth saying a little about the Review Panel's methods. As I say in my foreword to the Report the Review Panel does not pretend that it has examined every minute detail. The primary objective of the Review Panel was to crystallize lessons learned for the future and make recommendations for major infectious disease outbreaks in the future. During the process we interviewed two staff members from KWH. Dr. CC Luk in his capacity as Hospital Chief Executive and Dr. Melissa Ho as a member of the HAHO working group. The majority of our interviewees were senior executives of HA whilst we used focus groups to listen to the opinions of frontline staff.

15. I hope that the Select Committee finds the above information useful. Please do not hesitate to contact me should you require further clarification.

Yours sincerely

Ronald Arculli

Ronald Arculli

World Health Organization

Update 95 - SARS: Chronology of a serial killer

16 November 2002
– First known case of atypical pneumonia occurs in Foshan City, Guangdong Province, China, but is not identified until much later.

10 February 2003
– The WHO Beijing office receives an email message describing a "strange contagious disease" that has "already left more than 100 people dead" in Guangdong Province in the space of one week. The message further describes "a 'panic' attitude, currently, where people are emptying pharmaceutical stocks of any medicine they think may protect them."

11 February 2003
– WHO receives reports from the Chinese Ministry of Health of an outbreak of acute respiratory syndrome with 300 cases and 5 deaths in Guangdong Province.

12 February 2003
– Health officials from Guangdong Province report a total of 305 cases and 5 deaths of acute respiratory syndrome. The cases and deaths occurred from 16 November to 9 February 2003. Laboratory analyses are negative for influenza viruses.

14 February 2003
– The Chinese Ministry of Health informs WHO that the outbreak in Guangdong Province is clinically consistent with atypical pneumonia. The outbreak is said to be coming under control.

17 February 2003
– A 33-year-old Hong Kong man, who had travelled with his family to Fujian Province, China in January, dies of unknown causes in Hong Kong. His 8-year-old daughter died previously, of unknown causes, while in mainland China. His 9-year-old son is hospitalized.

19 February 2003
– An outbreak of "bird flu" in Hong Kong is reported to WHO following the detection of the A (H5N1) influenza virus in the 9-year-old boy.
– WHO activates its global influenza laboratory network and calls for heightened global surveillance.

20 February 2003
– The Department of Health in Hong Kong confirms that the boy's father was likewise infected with a strain of the influenza A(H5N1) virus.

21 February 2003
– A 64-year-old medical doctor from Zhongshan University in Guangzhou (Guangdong Province) arrives in Hong Kong to attend a wedding. He checks into the ninth floor of the Metropole Hotel (room 911). Although he developed respiratory symptoms five days earlier, he feels well enough to sightsee and shop with his 53-year-old brother-in-law, who resides in Hong Kong.

22 February
– The Guangdong doctor seeks urgent care at the Kwong Wah Hospital in Hong Kong and is admitted to the intensive care unit with respiratory failure (he had previously treated patients with atypical pneumonia in Guangdong). He warns medical staff that he fears he has contracted a "very virulent disease". Health authorities in Hong Kong learn that his symptoms developed on 15 February, at which point he would have still been on the Chinese mainland.

23 February
– A 78-year-old female tourist from Toronto, Canada checks out of the Metropole Hotel and begins her homeward journey. On arrival in Toronto she is reunited with her family.
– A team of WHO experts arrives in Beijing, but is granted permission to work at the central level only.

24 February
– The Global Public Health Intelligence Network (GPHIN) picks up a report stating that over 50 hospital staff are infected with a "mysterious pneumonia" in the city of Guangzhou.
– In Hong Kong, a 26-year-old local man develops a respiratory tract infection, but does not seek medical attention. From 15 to 23 February, he had visited an acquaintance staying on the ninth floor of the Metropole Hotel.

25 February
– Brother-in-law of Guangdong doctor is admitted to Kwong Wah Hospital and discharged.

26 February
– A 48-year-old Chinese-American businessman is admitted to the French Hospital in Hanoi with a 3-day history of fever and respiratory symptoms. His recent travel history includes a January trip to Shanghai, and a private trip from 8 to 10 February to Guangdong Province, and Macao. He travelled to Hong Kong on 17 February, departed for Hanoi on 23 February, and fell ill there. Shortly before his departure from Hong Kong, he had stayed on the ninth floor of the Metropole Hotel in a room across the hall from the Guangdong doctor.
– The businessman is attended by a WHO official, Dr Carlo Urbani, based in Viet Nam..

28 February
– Dr Urbani, alarmed by the unusual disease and concerned it might be a case of avian influenza, notifies the WHO office in Manila. WHO headquarters moves into a heightened state of alert.

1 March
– Brother-in-law of the Guangdong doctor is re-admitted to Kwong Wah Hospital.
– A 26-year-old woman is admitted to a hospital in Singapore with respiratory symptoms. A resident of Singapore, she was a guest on the ninth floor of the Hotel Metropole in Hong Kong from 21 to 25 February.

4 March
– The Guangdong doctor dies of atypical pneumonia at Kwong Wah Hospital.

5 March
– In Hanoi, the Chinese-American businessman, in a stable but critical condition, is air medivaced to the Princess Margaret Hospital in Hong Kong. Seven health care workers who had cared for him in Hanoi become ill. Dr Urbani continues to help hospital staff contain further spread.
– The 78-year-old Toronto woman, dies at Toronto's Scarborough Grace Hospital. Five members of her family are found to be infected and are admitted to the hospital.

ATTACHMENT 2

Report on a SARS Patient from Guangzhou who was admitted to Kwong Wah Hospital

HA SARS 8/03

23 June 2003

Report on a SARS Patient from Guangzhou who was admitted to Kwong Wah Hospital (KWH)

Patient : AA [redacted], M/64
Admission : 22/02/2003 11:55 hour
Death : 04/03/2003 22:48 hour

Background

AA [redacted] was a doctor working in outpatient clinic in Guangzhou. He came to Hong Kong on 21/2/03 to attend the wedding of his relative. Apart from him, his brother-in-law ([redacted], M/53) and sister ([redacted], F/56) were eventually admitted to KWH too. Both he and [redacted] died.

CC's husband

CC

CC's husband

Clinical Course

2. AA [redacted] walked in to attend KWH's Accident and Emergency Department (AED) at 11:06, 22/2/03. He was triaged as category 3 – "urgent". According to the history he gave, he had been in contact with patients suspected to have atypical pneumonia during 11-13/2/03. He had flu-like symptoms on 15/2/03 with pleuritic chest pain. Chest X-Ray examination showed left lower zone hazziness. He self-treated with levofloxacin and penicillin and improved. He claimed that he had fully recovered from that episode of illness before coming to HK.

3. He presented with fever and shortness of breath for four days. In light of his critical clinical condition, he was admitted directly into Intensive Care Unit (ICU) at 11:55 for further management. He deteriorated and was intubated at 00:41, 23/2/03. KWH managed the patient jointly with the team of clinical microbiologists and respiratory specialist of Queen Mary Hospital since 24/2/03. He did not show any response to active treatments. His clinical picture was compatible with Acute Respiratory Distress Syndrome. He finally succumbed at 22:48, 4/3/03.

CC's husband
[redacted]

4. CC's husband [redacted] had history of accompanying AA [redacted] to go shopping for ½ day on 21/2/03. He attended KWH's AED on 23/2/03. He was discharged from AED with a diagnosis of acute tonsillitis. He was scheduled to have follow up in AED on 1/3/03. He re-attended KWH's AED on 28/2/03. He was admitted into isolation room of S3, a Medicine & Geriatrics (M&G) ward. He ran a downhill course and was transferred to ICU on 4/3/03. He succumbed on 19/3/03.

CC
[redacted]

5. CC [redacted] attended KWH's AED on 1/3/03. She was admitted to S2, a M&G ward. She was transferred to the isolation room of S2 on 2/3/03. She was diagnosed to have chest infection and discharged on 6/3/03 with antibiotics.

Reporting and Surveillance

6. This was done in accordance with the standing mechanism. At 12:12, 22/2/03 (Saturday), KWH notified Hospital Authority Head Office (HAHO) by fax, using the Report Form for Severe Community-acquired Pneumonia (CAP). Further details were supplemented by fax at 18:40, 22/2/03, using the Clinical Record Form for Severe CAP. At 10:12, 24/2/03, HAHO notified Department of Health (DH) through e-mail. Ms But of DH came to KWH to investigate on the same day.

7. On 3/3/03, KWH notified HAHO about CC's husband [redacted] and duty microbiologist (a consultant of Queen Elizabeth Hospital) about both [redacted] and CC [redacted]. Ms But of DH came to KWH to investigate both cases on the same day.

Infection Control

8. After being seen by a Medical Officer, AA [redacted] was re-assessed by a Consultant (A&E). The latter advised A&E staff to wear paper masks. Upon admission into ICU, the patient was immediately placed in isolation room. All staff caring him wore N95 masks, cotton gown, and implemented droplet precaution and universal precaution measures since his admission.

CC's husband

9. For [redacted], KWH adopted droplet precaution and universal precaution measures since his admission.

CC

10. For [redacted], KWH implemented contact isolation measures upon her admission on 1/3/03. Since placing her in the isolation room on 2/3/03, droplet precaution and universal precaution measures were implemented.

Infected Health Care Workers (HCWs)

11. There are 2 infected HCWs of KWH whose infection may be related to these patients. The first one, temporally related to [redacted] AB, is a Registered Nurse of AED. She was admitted on 28/2/03. She recovered well and was discharged on 18/3/03. She did not have direct contact history with [redacted] AA. On 22/2/03, She only worked in the cubicle next to one where he stayed. She wore surgical mask at the time because she was having flu symptoms herself.

CC's husband

12. The only infected HCW who had history of contact with [redacted] is a Health Care Assistant, [redacted]. She worked in S3 during [redacted]'s hospitalization. She attended KWH's AED on 6/3/03. She was discharged from AED with 2 days' sick leave given. She re-attended KWH's AED on 7/3/03. She was admitted into isolation room of S2. She was intubated and transferred to ICU on 12/3/03. KWH notified HAHO on the same day. Ms Lo of DH came to investigate on 13/3/03. [redacted] was eventually discharged from KWH on 27/3/03. CC's husband

CC

13. No HCW who had contact with [redacted] and no ICU staff get infected.

(i)

ATTACHMENT 3A

醫院管理局
HOSPITAL AUTHORITY

Quality Patient-Centred Care Through Teamwork

Our Ref : HA CON 101/83/1

2 August 2003

Department of Health
(Attn: Dr Constance CHAN)
17th & 21st Floor
Wu Chung House
213 Queen's Road East
Wan Chai
Hong Kong

Via Fax No. 2573 7432

Dear Dr Chan,

HA Review Panel on SARS Outbreak

Thank you for your response to my letter of 24 June 2003. In order for us to review and assess HA's actions in a proper context, I now have further questions with regard primarily to the period up to 24 March 2003 as follows :

1. Describe fully and chronologically with dates the steps taken and information obtained by the DH to ascertain the situation at different times during February/March 2003 in (a) Guangdong (b) Singapore (c) Vietnam and (d) Canada.

2. With reference to the information obtained as described in item 1 above what did DH do with the information. How was it disseminated to whom? When? What conclusions did DH draw based on such information and what action was taken by DH?

3. What information obtained under item 1 above was transmitted to the Hospital Authority? To whom? When?

4. Describe fully and chronologically the contact tracing process in terms of its purpose, extent, procedures (e.g., did the process involve a symptoms and temperature check, etc., to ascertain possible progression of individuals from contact alone to SARS symptoms). Please also provide specific information with regard to the 8 clusters referred to by the SHWF in his press briefing on 20 March 2003 and any other cases prior to 24 March 2003 specifically including AA [redacted], his brother-in-law and sister, [redacted] DD, the PWH index case and the Amoy Gardens index case.

5. Describe what the DH concluded from its visits/investigations to KWH on 24 February, and 3 March to see [redacted] AA, his brother-in-law and sister? What action did DH then take?

6. Describe the DH procedure for following up cases of suspected SARS on discharge from hospital with specific reference to the discharge of the Amoy Gardens index case on 19 March 2003 from PWH.

7. As information became available regarding the increase of SARS cases, describe the DH response in terms of allocation of resources for contact tracing and contingency planning with involvement of HA.

8. According to information we have Singapore's Ministry of Health (MOH) traced their 3 SARS cases to the Metropole Hotel, Hong Kong, on 6 March 2003. Describe DH's involvement and participation in this process including the first contact by MOH, Singapore with DH, information given by DH to MOH, Singapore. What conclusions did DH draw? What actions did DH take? Would this have any effect in facilitating the identification of the index case in PWH A8 ward?

9. Describe the DH's approach to contact tracing in the face of an unknown infectious disease with specific reference to the purpose and importance of this activity and how could HA take part.

10. What legal powers was vested in the HKSAR Government, SHWF and DH prior to 27 March 2003 amendment in respect of :

i. infectious diseases of unknown nature;
ii. SARS
iii. with regard to the authority to isolation and/or quarantine

Please also provide us with copies of all exchanges between the relevant parties in respect of the above items.

The Panel would appreciate to receive information on the above. While some of the points requested may not be directly related to HA, we feel that the information obtained will help our deliberation.

Yours sincerely,

Ronald Arculli

Ronald Arculli
Chairman
HA Review Panel on SARS Outbreak

ATTACHMENT 3 B

Our ref. 本署檔號 : DH/CR/PUB/31
Your ref. 來函檔號 : HA CON 101/83/1

18 August 2003

Mr Ronald Arculli, GBS, OBE, JP
Chairman
HA Review Panel on SARS Outbreak
Hospital Authority
Room 410S, 4/F Hospital Authority Building
147B Argyle Street
Kowloon

Dear Ron,

HA Review Panel on SARS Outbreak

Thank you for your letter of 2 August. The secretary to your Review Panel has asked for our response by not later than 18 August.

2. To facilitate your review, we have taken a while to put together a comprehensive response. We have also included some background information to enable the Review Panel to better understand the position.

Events outside Hong Kong

Guangdong Province

3. On 10 February, there was local media coverage about an outbreak of pneumonia in Guangzhou. The Director of Health in HKSARG (Director) immediately tried but in vain to contact by phone the Municipal Health and Anti-epidemic Station of Guangzhou and the Director General of the Department of Health, Guangdong Province. The

Department of Health
Wu Chung House, 21st Floor,
213 Queen's Road East,
Wan Chai, Hong Kong.
Telephone: 2961 8888
Fax: 2836 0071

衞生署
香港灣仔皇后大道東 213 號胡忠大廈 21 樓
電話： 2961 8888
圖文傳真： 2836 0071

Department of Health in HKSARG (DH) followed up with a letter faxed to the two officials to enquire about the reported outbreak. As subsequent phone calls were also unanswered, the Director approached the Director General of the Department of International Cooperation, Ministry of Health (MoH) for assistance.

4. On the following day, the Guangzhou Bureau of Health held a press conference informing the public that the situation in Guangzhou was under control. Details were uploaded onto the Internet (Annex 1). Separately, DH made verbal enquiries with the Hospital Authority (HA), private hospitals and sentinel doctors and they reported that no unusual pattern of influenza-like illness or pneumonia in Hong Kong was detected. With the information from Guangzhou and enquiry results in Hong Kong, the Director conducted a stand-up briefing and issued a press release (Annex 2) in late afternoon on 11 February on the reported outbreak in Guangzhou and provided health advice that should be observed in the usual peak season of influenza in Hong Kong (January - March).

5. DH had since maintained regular contacts with Beijing officials on the outbreak. On 7 March, the Mainland MoH verbally advised that no definite cause had been identified to account for the Atypical Pneumonia (AP) outbreak in Guangdong Province. The usual causative agents like influenza A, influenza B, adenovirus or chlamydia were isolated.

6. I should mention that the World Health Organization (WHO) stationed a team of experts in Beijing for two weeks in the latter part of February and early March to check media reports of the outbreak. On 16 August 2003, the South China Morning Post reported the visit, which took place between 23 February and 9 March, as "hitting a brick wall".

7. I now turn to efforts made in Hong Kong at the wake of the outbreak in Guangdong Province. I would first say that DH had all along been monitoring the pattern of pneumonia cases in Hong Kong. HA had an existing Task Force in Infection Control and DH became a co-opted member since its 24th meeting on 18 November 2002.

8. With the outbreak in Guangdong Province, HA set up on 11 February 2003 a Working Group on severe community acquired pneumonia (SCAP) cases with membership built on that of the Task Force. The aim was to review the statistics, clinical presentation and laboratory findings related to SCAP cases admitted into HA hospitals.

Rather than setting up a separate mechanism, DH joined the HA's Working Group to strengthen the surveillance system from the 2nd meeting. Under this arrangement, both HA and private hospitals were required to notify DH of SCAP cases to enable DH to co-ordinate actions on prevention and control measures.

Hanoi, Vietnam

9. On 3 March, WHO informed DH that an American Chinese with recent travel history to Hong Kong was hospitalized with severe pneumonia in Hanoi. Serological tests revealed positive IgM for influenza B. In response to an enquiry from WHO, DH replied that influenza B was prevailing at that time in Hong Kong and there were severe cases due to influenza B in the previous three weeks.

10. DD On 5 March, WHO notified DH that the American Chinese ([redacted]) was being transferred from the French Hospital in Hanoi to Hong Kong for treatment upon request of the family. Seven Health Care Workers (HCWs) who had assisted the patient in Hanoi reported high fever, malaise, headache, but not respiratory symptoms. DH immediately contacted Dr ST Lai, Consultant Physician, Princess Margaret Hospital (PMH) but he was not aware of the transfer. DH verbally informed Dr Lai as well as Dr Beatrice Cheng of HA Head Office of the above details.

11. DD [redacted] arrived Hong Kong on 6 March and was directly transferred to the intensive care unit (ICU) in PMH. He was too ill to be interviewed. A DH Nursing Officer tried to interview his wife on 7 March but in vain. She was not cooperative. Attaching great importance to this case, DH sent a health team of a Senior Medical & Health Officer (SMO) and a MO to approach [redacted] again on 8 March. DD's wife Although she agreed to be interviewed, difficulties were encountered. She did not have full details of her husband's travel history and she was reluctant to give information.

12. Based on clinical history and information provided by the wife, it was learnt that [redacted] DD travelled from the US to Shanghai in mid-January unaccompanied and visited Hong Kong by himself in mid to late February to apply for a visa. He stayed in Hong Kong for a few days and continued his journey to Hanoi. He was admitted to the Hanoi French Hospital in Vietnam on 26 February. Chest X-ray (CXR) taken upon

admission was clear but lymphocyte count was low. His condition deteriorated rapidly after admission and he required intubation and artificial ventilation support on 2 March. Investigation by the French Hospital suggested that the patient was suffering from influenza B complicated with Adult Respiratory Distress Syndrome. Later CXR showed bilateral interstitial infiltrations, the white cell count was raised but the lymphocyte count and platelet count were decreased.

13. During the interview with DD's wife [redacted], DD two relatives from Shanghai were also present. They advised that [redacted] did not have any contact with relatives in Shanghai. The wife and the relatives exposed to DD [redacted] in PMH were put under medical surveillance. Health advice on the prevention of respiratory infections and personal hygiene was given to them and they remained asymtomatic at the end of the surveillance period.

14. On 8 March, the DH health DD team discussed with the attending physicians on the condition of [redacted] and understood that PMH was aware that more than 10 HCWs who had taken care of him in the French Hospital were hospitalized. We noted that PMH had implemented strict infection control measures during [redacted] DD's stay and no HCW was infected.

15. Despite active treatment in Hong Kong, DD [redacted]'s condition further deteriorated with congested lung and renal failure requiring haemodialysis. He finally succumbed on 13 March.

16. Results of extensive laboratory investigations conducted by the University of Hong Kong (HKU) and the Government Virus Unit (GVU) were negative. Autopsy specimens were sent to the Centres for Disease Control and Prevention, US on 17 March and the case was subsequently diagnosed on 22 March, as reported during inter-laboratories teleconference, as a SARS case.

<u>WHO Global Alert</u>

17. On 11 March, there was media coverage that more than 10 HCWs in Prince of Wales Hospital (PWH) Ward 8A reported respiratory infection symptoms in the previous three to four days. DH immediately contacted PWH for case investigation and contact tracing. After assessing the situation, DH notified WHO of the outbreak on the following day (12 March). WHO immediately issued a global alert

(Annex 3), raising awareness all over the world. As a result, we had received reports from Singapore and Canada which had led to the discovery of the Metropole Hotel (Hotel M) cluster and the source of infection in Hong Kong.

Singapore

18. On 13 March, the Singapore MoH issued a press statement (Annex 4) about three persons who had traveled to Hong Kong at the end of February and who were admitted to hospital for pneumonia after they had returned to Singapore. None of the hospital staff attending to these patients had reported ill. In sending the press statement to DH, the Singapore MoH also mentioned that its investigations had identified no causative organism and that laboratory tests were negative for flu, paraflu, chlamydia, legionella or mycoplasma. The common factor was that the three cases stayed at Hotel M in Hong Kong around 20-25 February 2003.

[Note: The Singapore MoH first discussed with DH on the three patients in the course of a telephone conversation on another subject on 8 March. It was noted that they had all stayed in Hotel M in Hong Kong and two were friends. Laboratory investigations were pending and the patients' illnesses improved with antibiotics treatment. As there was insufficient evidence that their illnesses were related to Hotel M, DH asked the Singapore MoH to keep it posted of positive laboratory findings if any.]

19. On 15 March, DH was aware of a second press statement made by the Singapore MoH dated 14 March (Annex 5) and noted that some HCWs who had attended the patients got infected. In view of the PWH outbreak among HCWs, DH asked the Singapore MoH for more details of the incident, hoping to get more information on cause of the illnesses, mode of spread, clinical presentations, etc. Replies were received on 15 and 16 March. Nothing significant was observed.

20. On 19 March, with the suspicion of Hotel M (paragraphs 23-24 below) being the place where an outbreak might have occurred among residents, DH made further enquiries with the Singapore MoH to find if there were any linkages between the three Singapore cases and [redacted] AA the index case. A reply was received on 20 March but no definite route of transmission could be established.

21. I would like to point out here that [redacted] was initially suspected as the index case for PWH on 13 March and it was confirmed on 14 March (paragraphs 71-74 below). [redacted] was not a guest in Hotel M at the material time. It was only on repeated questioning that he admitted that he had visited a friend in Hotel M around that period (paragraph 23 below). The information provided by the Singapore MoH could not and would not help us in any way to identify him as the index case for PWH.

Toronto, Canada

22. On 18 March, Health Canada sent DH some information on three cases in Canada who had traveled to Hong Kong prior to their illnesses. Hotel M was mentioned for one of the patients.

Metropole Hotel Cluster

23. Having been aware that the Singapore tourists were residing in Hotel M before onset of their illnesses, the information from Canada triggered off an immediate investigation by DH on the same day (18 March). DH searched the patient records on the SCAP list and PWH cases, and interviewed all cases. By the following day, DH found a total of seven cases related to Hotel M. We inspected the hotel environment and 9/F immediately and found the general hygiene satisfactory. At the same time, DH verbally advised Dr WM Ko of HA of the cluster. In the evening (19 March), DH announced the findings in a press conference. [redacted] was identified as the index case as he had onset of symptoms on 15 February and he resided in the hotel on 21-22 February 2003.

24. On 20 March, WHO informed DH that the American Chinese from Hanoi had also stayed in Hotel M around that time. Announcement was made to the media again. More cases were subsequently found related to the Hotel M Cluster. For details, please refer to the investigation report at Annex 6.

[redacted] and Kwong Wah Hospital Cluster

25. On 24 February, DH received notification that a tourist from Guangzhou ([redacted]) admitted to the ICU of Kwong Wah Hospital

(KWH) at around noon time on 22 February was suspected to suffer from SCAP. He was fully sedated and intubated for supported ventilation on 23 February. The fever did not subside and his condition continued to deteriorate. He subsequently suffered from multi-organ failure and succumbed on 4 March.

26. DH initiated immediate and extensive epidemiological investigation in the afternoon upon receipt of notification. According to his wife and daughter, [redacted] worked in Guangzhou Sun Yat San Hospital as a doctor in the out-patient clinic of Medical Department. In the week preceding his onset of symptoms, he came into contact with two patients presenting with high-grade fever and chest symptoms. CXR of both patients showed haziness and [redacted] referred them to the Accident and Emergency Department (AED). [redacted] was not exposed to any poultry two weeks prior to the onset of symptoms.

27. [redacted] had good past health. In the evening of 15 February, he had a sudden onset of fever (39℃), chills and rigor. He took oral antibiotics that night. He later developed cough and sputum. CXR done on 17 February showed haziness in the left lower zone. He changed the antibiotic to intravenous Pencillin that day. Repeated CXR on 20 February showed increased haziness. As he had to attend the wedding banquet of his nephew (sister's son), he came to Hong Kong with his wife on 21 February by coach. They arrived Hong Kong at 12.30 hours and resided in Room 911 of Hotel M. In the night time, he had increased cough, shortness of breath, fever and peripheral cyanosis.

28. Contact tracing further revealed that [redacted]'s wife had fever (38.4℃) in the afternoon on 24 February. She returned to Guangzhou where she was hospitalised that evening. [redacted]'s daughter, who separately arrived in Hong Kong on 22 February, accompanied her mother on the return trip on 24 February. She was also admitted to a hospital in Guangzhou on 27 February for fever. In Hong Kong, [redacted]'s sister was hospitalised on 1 March and her husband (i.e. [redacted]'s brother-in-law) on 28 February, both for fever, cough and sputum. [redacted]'s brother-in-law subsequently died on 19 March. All other family members related to [redacted] eventually recovered.

29. [redacted] died on 4 March. Results of extensive laboratory investigations carried out in HKU and the GVU were all negative, except a 4-fold rise in adenovirus antibody titre.

30. With a number of persons fallen sick and although it appeared it was an intra familial spread due to close contact, the situation was a cause for concern. The Director had many discussions with one of the attending physicians and the Consultant of the GVU to explore further actions required for identfying the causative agent. AA [redacted]'s specimens were subsequently tested positive for coronavirus by polymerase chain reaction in mid-April. A full report on the detailed action taken by DH's Kowloon Regional Office in respect of [redacted]'s case is at Annex 7.

31. According to a HA paper prepared for the SARS Expert Committee, there were two infected HCWs whose infection might be related to the three patients in [redacted]'s family. The first case concerned a Registered Nurse who was hospitalised on 28 February. She did not have direct contact history with [redacted]. On 22 February, she worked in a cubicle next to the one where [redacted] stayed. She wore surgical mask at the time because she was having flu symptoms herself. She recovered well and was discharged on 18 March. DH was not notified of this case.

32. In the second case, the infected Health Care Assistant had a history of contact with the brother-in-law of [redacted] – she was working in the isolation room where he stayed. She attended KWH's AED on 6 March and was discharged with two days' sick leave. She re-attended KWH's AED on 7 March and was admitted into an isolation room. She was intubated and transferred to ICU on 12 March. DH was notified on 13 March when action on case investigation and contact tracing was immediately initiated. She was eventually discharged on 27 March.

Clusters by 24 March 2003

33. There were the following clusters by 24 March 2003 -

(a) the Metropole Hotel Cluster including tourists / patients from Vietnam, Singapore and Canada;

(b) the Kwong Wah Hospital Cluster;

(c) the Prince of Wales Hospital Cluster;

(d) two clusters involving medical practitioners' clinics;

(e) the Pamela Youde Nethersole Eastern Hospital Cluster;

(f) the St Paul's Hospital Cluster;

(g) the Queen Elizabeth Hospital Cluster;

(h) the Baptist Hospital Cluster; and

(i) Flights CA112 / CA115.

34. I have set out in details in the above paragraphs DH's actions on the clusters in (a) and (b). Cluster (c) will be dealt with at below from paragraph 35 onwards while clusters (d) – (i) are covered by Annex 8.

The PWH Cluster

35. Dr TK Au, Community Physician (New Territories East) [CP(NTE)], was the directorate officer in charge of case investigation, contact tracing and follow up action for the PWH cluster. He took four days sick leave during period 18-21 March and his temporary absence was covered by Dr Teresa Choi, another directorate officer at the same level.

36. In view of the magnitude of the cluster, I think it would assist the Review Panel by setting out in the following paragraphs a day-by-day account of work undertaken by DH colleagues at the initial stage (11-21 March). DH staff's attendance at meetings with PWH was confined to understanding the outbreak situation and discussions on the epidemiological study, contact tracing and related matters. We did not participate in discussions on operational matters of the hospital.

11 March 2003

37. On reading media reports about an abnormal pattern of sick leave among PWH Ward 8A staff, CP(NTE) immediately rang PWH management colleagues and managed to speak to the Deputy Hospital Chief Executive on the phone at about 10:45 a.m. The latter confirmed the media reports and advised that there would be a special meeting at PWH at 11:00 a.m. CP(NTE) volunteered and attended the meeting.

38. Prof Sung chaired the meeting. Participants included, among others, Dr Donald Lyon, Consultant of Microbiology and Infection Control; Prof John Tam, Professor of Microbiology and Virology;

Prof Paul Chan, Associate Professor of Virology; Dr S F Lui, Service Director in Risk Management and Quality Assurance; Dr Kitty Fung, Senior Medical Office (SMO) of Microbiology and Infection Control; Dr Nelson Lee and Dr Alan Wu, MOs of Infection Disease Medicine; and Ms Deborah Ho and Ms Regina Chan, Infection Control Nurses (ICNs).

39. PWH informed the meeting that more than 10 staff had reported sick. The cluster appeared only involved staff of Ward 8A and no abnormal pattern had been observed in in-patients. Admission and discharge of Ward 8A had been stopped and visitors restricted.

40. CP(NTE) advised PWH to isolate cases, screen other wards and monitor the sick leave pattern of staff. It was agreed that the DH New Territories East Regional Office (NTERO) would design a questionnaire and conduct an epidemiological survey for the list of staff reported sick and that PWH would provide the list by the afternoon. The survey would help better understand the cluster and provide a basis for working out the case definition and estimating the incubation period.

41. PWH further advised that it would set up a special staff clinic in the evening and recall staff for screening. PWH would also complete the questionnaire as designed by NTERO for those turning up at the special staff clinic and return the completed questionnaires to NTERO for case and contact follow up and epidemiological analysis. A copy of the questionnaire was sent to PWH later in the day.

42. A list of 36 affected staff was obtained from PWH in the evening. NTERO successfully interviewed 26 of them that night. Most were found to have symptoms of fever and chills. NTERO advised all of them to seek immediate medical treatment at the PWH special staff clinic. Advice on personal hygiene was also given. The remaining 10 could not be reached or refused interview, and they were followed up on the following day. The survey data were analysed for clinical and epidemiological features.

12 March 2003

43. CP(NTE) attended a meeting at PWH chaired by Dr Philip Li, Deputy Hospital Chief Executive. Participants included, among others, Prof Sydney Chung, Prof Joseph Sung, Dr S F Lui, Dr Donald Lyon, Prof John Tam, Prof Paul Chan, Dr Kitty Fung, Dr Nelson Lee,

Dr Alan Wu, Ms Deborah Ho and Ms Regina Chan. This was the usual makeup of colleagues from PWH / CUHK although sometimes certain participants did not show up while other colleagues joined in. For simplicity, we would not repeat the participants on every occasion hereafter. Normally, Dr Fung Hong, the Hospital Chief Executive (HCE) chaired these daily meetings.

44. At the meeting, PWH advised that more than 20 staff had been admitted and isolated. The 8th floor of the main building of PWH had been made a restricted area. There was no abnormal sick leave pattern for staff in other wards. CP(NTE) requested PWH to provide a master list of cases for follow up and contact tracing.

45. CP(NTE) then presented the preliminary epidemiological findings and the epidemic curve was tabled. The probable mode of spread was discussed and droplets and fomites were incriminated. The incubation period was estimated from one to seven days. The survey findings on clinical features were shared and PWH and NTERO agreed on a working case definition for active case finding and surveillance. As positive CXR findings were observed in some cases, CP(NTE) advised PWH to include CXR as one of the screening tools. He also advised PWH to freeze movement of staff who had been exposed in Ward 8A.

46. After the meeting, CP(NTE) asked the Ward Manager of Ward 8A to provide a list of patients who had stayed in Ward 8A on or after 24 February but had since been discharged home. The objectives were two-fold: to help identify the source of infection and active case finding.

47. DH set up a special Control Team in NTERO to deal with the PWH outbreak, including case follow-up, contact tracing and surveillance, epidemiological analysis, and prevention of spread to community.

13 March 2003

48. To facilitate communication, outbreak investigation and contact tracing, DH stationed a team of staff at PWH (in addition to the Control Team at NTERO). The DH Team comprised an experienced Medical & Health Officer (MO) and two Nursing Officers.

49. Dr TC Shiu (the DH MO) attended a meeting chaired by Dr Fung Hong in the morning. The meeting discussed the latest progress

of the outbreak, including figures on the number of affected staff, the number of specimens collected and laboratory results. The arrangements on control measures were also discussed. The meeting agreed on a proposal to step up infection control by separating staff into "clean team" and "dirty team".

50. The DH team started interviewing patients of Ward 8A to identify the source of the outbreak and assess the risk of spread to other patients. Communication with the special staff clinic was strengthened to facilitate return of questionnaires to speed up contact tracing and data compilation. Information on sick leave pattern of nursing and minor grades of all specialties of PWH was presented to the DH Team. No abnormal pattern of sick leave was observed in all other specialties except in medical wards.

51. A master list of cumulated cases was provided by PWH to the DH Team in the evening. Upon receipt of the master list from PWH, the Control Team at NTERO immediately sorted out new cases from the master list for follow up and contact tracing.

52. CP(NTE) attended a further meeting at PWH chaired by Dr Fung Hong in the evening. Participants included, among others, Dr Philip Li, Prof Joseph Sung, Dr S F Lui and Prof Paul Chan.

53. CP(NTE) presented the latest epidemiological findings. He observed that some staff outside Ward 8A, who did not have regular contacts with staff/medical students in that ward but who had attended to patients there, had contracted the disease. He therefore said that the source of infection from Ward 8A patients or from patients of other wards should be explored.

<u>14 March 2003</u>

54. Consultant (Community Medicine), Disease Prevention and Control Division of DH [Con(CM)] and CP(NTE) met the HCE of PWH and his deputy in the morning. Surveillance strategies were discussed, in particular the exploration of the inclusion of positive CXR findings in case definition.

55. In the evening, Con(CM) and CP(NTE) visited PWH again to share the updated epidemiological findings. They were joined by Dr TC Shiu of the DH Team. The usual makeup of PWH colleagues, led by HCE, was there. The findings of the index case was shared and discussed (details are set out in paragraphs 71-74) and he was immediately isolated. It was agreed that PWH would follow up staff, medical students and in-patients exposed to JJ [redacted] (index case) while DH would follow up discharged patients (non-SARS) and hospital visitors exposed to JJ [redacted] (index case). DH would also follow up community contacts of reported cases. CP(NTE) further advised that the first wave of cases was likely to have peaked but another wave from those of the affected close contacts incubating the disease might prop up in the following week and asked PWH to prepare for it.

15 March 2003

56. With the assistance of PWH, the DH Team found 36 patients who had been exposed to JJ [redacted] by having been in the same cubicle with him. Among the 36 patients, five had been investigated into and followed up by DH as reported cases.

57. DH immediately traced the remaining 31 patients (some of whom had already been discharged) and found they had 133 close contacts / hospital visitors. All of them were contacted for investigation, medical advice and medical surveillance. Symptomatic persons were advised to seek early medical treatment. Others were put under medical surveillance. At the end of the surveillance period, we found a total of 15 patients and 19 close contacts / visitors had developed symptoms. They were subsequently diagnosed as SARS cases.

58. The exercise to trace contacts who had been exposed to JJ [redacted] identified a total of 34 (15 + 19) cases. This had helped prevent the further spread of SARS into the community.

59. Dr TC Shiu attended the usual PWH meeting when the latest progress of the cluster and the arrangements of control measures were discussed. The meeting also discussed issues on the index case, contacts and secondary cases, including the possible mode of spread of infection from the index case.

16 March 2003

60. The list of persons requested by CP(NTE) on 12 March, which went further than those exposed to JJ [redacted] by having been in his cubicle, and included persons who had been to any part of Ward 8A since 24 February, was still not available by 16 March. CP(NTE) enlisted the assistance of Mr Albert Ng, Department Operations Manager (DOM). While expressing difficulty, the DOM agreed to make an attempt to compile the list.

61. Separately, CP(NTE) confirmed with PWH that the hospital had already adopted positive CXR as a parameter for confirmation as a clinical case. Accordingly, the new case definition was adopted for epidemiological analysis with effective from the following day with consequential changes to the guidelines on contact tracing.

17 March 2003

62. Con (CM) and Dr TC Shiu of DH accompanied WHO experts on a visit to PWH. They discussed with HCE on the epidemiological findings of the outbreak and the clinical presentation of the disease.

18 March 2003

63. Dr Teresa Choi covered for Dr TK Au as CP(NTE) while the latter was on sick leave up to 21 March. She attended the PWH meeting in the evening at which Professor Sydney Chung asked if the spread of the disease could be air-borne, as suggested by the CDC. CP(NTE) replied that current data supported the earlier findings that the spread was primarily through droplets.

64. CP(NTE) asked if control actions in the hospital had been in place. PWH confirmed that Ward 8A had been closed and infection control measures strengthened. Attendance figures of infection control seminars were reported at the meeting.

65. To speed up the flow of information and enable prompt follow up of cases and contacts, CP(NTE) asked if PWH could assign an officer to provide the necessary support. In response, HCE designated Dr Louis Chan to be the contact point for DH.

19 March 2003

66. CP(NTE) met with HCE in the afternoon to update PWH of the epidemiological findings and discuss ways to further streamline data collection. She also expressed the need to follow up patients and visitors who had been to Ward 8A before ward closure other than those confined to the same cubicle as the index patient.

67. CP(NTE) attended another meeting with PHW and the WHO for the latter to better understand the outbreak position.

68. At about 18:30, Dr Louis Chan of PWH faxed to CP(NTE) a list of printout of patient records (samples at Annex 9). This we understood to be the outcome of CP(NTE)'s request for contact telephone numbers.

20 March 2003

69. Con(CM) and CP(NTE) presented the latest epidemiological findings at a meeting in PWH and discussed matters with HCE on management of contacts.

21 March 2003

70. Deputy Director of Health (1) [DDH(1)], CP(NTE) and Principal Medical & Health Officer (1) [PMO(1)] had a meeting with PWH. At the suggestion of DDH(1), PMO(1) was redeployed to oversee the operation of a joint contact surveillance centre at PWH control room. Surveillance on visitors to all acute wards in PWH commenced.

Investigation into the source of outbreak

71. At the initial stage of the outbreak, PWH advised (on 11 March) that only staff of Ward 8A were affected while no abnormal pattern was observed in in-patients of the ward. An epidemiological survey conducted in the same evening found that medical students and some staff not of Ward 8A but having visited Ward 8A had been affected. Further interview of these non-ward 8A staff and medical students on 12 March supported that they had no close contact with Ward 8A staff. They went to Ward 8A to attend selective patients. NTERO and PWH visualized the need to explore if one or some patients in Ward 8A were

involved or served as the source. NTERO and PWH conducted joint investigation on 13 March by reviewing the contact and clinical history of Medical Ward 8A in-patients and patients who were discharged from Ward 8A since mid-February with respiratory or unexplained febrile illness.

72. Review of the clinical history of a Ward 8A in-patient [redacted] suggested his symptoms were compatible as a case, and he had the earliest onset date of 24 February. He had fever and respiratory symptoms before admission. Most of the initial cases including a number of the medical students had history of having visited the cubicle where r [redacted] stayed.

73. On 14 March, NTERO identified four cases with fever admitted to PWH on late 13 and early 14 March were relatives of [redacted]. Another relative of [redacted] was noted to be admitted to Baptist Hospital (BH) on 13 March with fever. While two were household contacts, other relatives only met [redacted] during his stay in PWH Ward 8A.

74. NTERO also informed PWH of the linkage, and the latter immediately reviewed exposure history of sick staff and identified a number of them had contact with [redacted] during the incubation period. The above discoveries and other epidemiological findings supported [redacted] as the index case. [redacted] was isolated on 14 March. PWH later postulated that the use of nebuliser in [redacted] had played an important role in the spread of the disease.

Special Control Team at NTERO

75. I would now like to sum up the deployment of resources to deal with the PWH outbreak. DH staff normally operate from Regional Offices in carrying out case investigation, contact tracing, surveillance, epidemiological analysis and prevention of spread of diseases to the community. In recognition of the scale of the outbreak at PWH, we set up a Special Control Team at NTERO within 24 hours of learning the outbreak (i.e. on 12 March). The team was strengthened on the following and subsequent days through redeployment from the Disease Prevention and Control Division (DPCD) and other service units to cope with increasing workload. By 25 March, there were 40 staff compared to the original figure of 14. A detailed day-by-day breakdown is at Annex 10.

DH Team at PWH

76. In view of the magnitude of the outbreak, the non-specific nature of the symptoms, the lack of a quick diagnostic test for the syndrome and the speed with which workload and cases were increasing, there was much confusion in the flow of information of cases from PWH to DH at the working level in the initial days. To facilitate communication, outbreak investigation and contact tracing, DH started to station a team of staff at PWH (in addition to the Special Control Team at NTERO) on 13 March. The DH Team spent a lot of time in wards interviewing cases and reviewing medical notes. In the light of developing situations, we had since 21 March put all visitors to acute wards (i.e., extending beyond those who had visited cases) under medical surveillance by the DH Team.

77. An experienced Medical & Health Officer headed the DH Team from 13 to 20 March and a Principal Medical & Health Officer from 21 March. The daily manpower provision is at Annex 11.

78. Both the Special Control Team at NTERO and the DH Team at PWH worked extended hours voluntarily throughout the period under review, very often late into the evenings and over weekends. Having regard to the reported caseload, there were less staff on Sundays but there was a standby arrangement to ensure that sufficient staff were available to cope with developing situations.

Workload Statistics

79. As an indication of workload generated in the PWH cluster, we have included at Annex 12 the number of referred cases interviewed and contacts (including hospital visitors) followed up. As at 25 March 2003, we had successfully interviewed 386 cases, of which 134 were confirmed to be SARS eventually. A total of 1 884 contacts were successfully followed up and subsequently 59 developed SARS.

80. Given that case interview and contact tracing form only part of the case investigation and medical surveillance, it was not possible to quantify separately the workload of the Special Control Team at NTERO and the DH Team at PWH. Suffice it to say that the workload generated for the Special Control Team at NTERO was much greater than that for the DH Team at PWH and hence the greater number of staff in the former

office. For example, for each referred case processed by the DH Team at PWH, the Special Control Team at NTERO had to deal with a number of contacts and put them under medical surveillance for two weeks following the last day of exposure to cases during which they were followed up several times by the Special Control Team. NTERO had also to deal with various enquiries, prevention and control measures in institutions, deliver health talks and process SARS cases reported from hospitals other than PWH.

Index Patient of Amoy Gardens Outbreak

81. With regard to the index patient of the Amoy Gardens outbreak, We would refer you to the chronology of events at Annex 13 and paragraph 2.10 of the Investigation Report dated April 2003. The paragraph reads -

> *The index case was a 33-year old man (YY) who traveled between Hong Kong and Shenzhen. He required haemodialysis for chronic renal failure due to systemic lupus erythematosus, and he was followed up at PWH. On 14 March 2003, he had onset of fever, malaise, chills, rigor and diarrhea. He visited his brother's family in Unit [redacted], Block E of Amoy Gardens, stayed overnight and used the toilet there. On 15 March, when he was followed up at PWH, he had a fever of 38 degrees Celsius, white cell count of 6.1, lymphocyte count of 0.5, and right lower zone haziness on chest X-ray. Nasophyrangeal aspirate was positive for influenza A. Upon hospital discharge on 19 March, he stayed at his brother's flat and passed stools in the toilet. On 22 March, he was re-admitted due to shortness of breath.*
>
> *[Note: YY returned to Shenzhen on 20 March and attended PWH direct from Shenzhen for scheduled haemodialysis. The earliest onset dates of Amoy Gardens Block E residents were 21 March (3), 22 March (4), 23 March (9), 24 March (41) and 25 March (26).]*

82. DH was aware that YY appeared in the patient list referred by PWH to NTERO in the evening on 16 March. After sorting out newly reported cases from old cases, DH staff embarked on case investigation

on 17 March. It was likely that by the time we were to interview YY [redacted] he had already been tested positive for influenza A. Hence no follow up action was required. His name was subsequently dropped by PWH from the list.

83. YY [redacted] stayed for the night in Amoy Gardens on two occasions: 14 and 19 March. On either days, DH would not have been able to prevent him from spreading SARS to Amoy Gardens residents. YY DH was notified of [redacted]'s case on 23 March and we commenced tracing of his close contacts on the same day. His brother and sister-in-law in Amoy Gardens were admitted as suspected SARS on 24 and 28 March respectively and later with the diagnosis confirmed on 26 March and 9 April respectively. All three finally recovered.

Contact Tracing and Medical Surveillance

84. 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). Together with medical surveillance, contact tracing has been an important public health tool employed by DH in the control of communicable diseases. It helps in facilitating early diagnosis, isolation, treatment of a disease among contacts and prevention of its spread in the community.

85. I have explained in the above paragraphs for the PWH cluster the involvement of HA in contact tracing in connection with an unknown disease. In particular, I would draw your attention to the following -

(a) the success of contact tracing depends to a large extent on the timely flow of information from HA and there were difficulties in the initial days;

(b) CP(NTE) had drawn to the attention of PWH on the likely workload arising from the second wave of cases (para 55). This should have assisted in HA contingency planning;

(c) the PWH index case is discussed in para 71-74;

(d) the deployment of resources is explained in para 75-80;

(e) the Amoy Gardens index case is discribed in para 81-83.

86. As you would appreciate, our contact tracing and surveillance arrangements were enhanced as we gained more knowledge of the disease. The evolution is described in the following paragraphs.

87. The scope of DH's contact tracing for SARS covered both close contacts and social contacts. Under the WHO definition close contacts include those who have lived with, cared for, or handled respiratory secretions of SARS patients. Persons who have had contact with a person with SARS but do not satisfy this definition are defined as social contacts by DH.

88. Once a SARS notification was received, the DH Regional Offices promptly initiated case investigation and contact tracing. Information required for contact tracing was obtained from the cases or their family members through face-to-face or telephone interviews. Medical staff of the Regional Offices called up contact households regularly and asked about their health status, especially if they had any fever, chills, myalgia, cough and respiratory symptoms. Contacts who reported compatible symptoms of SARS were referred to hospital. Asymptomatic contacts were advised of the symptoms to watch out and the appropriate precautionary actions to take in case symptoms appeared, such as wearing mask and observing general hygiene. They were also asked to contact Regional Offices if they developed symptoms. Household contacts were advised not to go to work or school during the surveillance period. Since March 31, close contacts of SARS cases were required to report daily to one of the four Designated Medical Centers (DMCs). They were required to undergo a temperature check. Depending on the presence of significant symptoms (fever, cough, shortness of breath), a CXR examination might be performed on the spot. Suspected cases were referred to hospital for further investigation and management. Close contacts were otherwise advised to stay at home and medical leave was granted for them. Social contacts were subject to telephone surveillance.

89. With effect from 10 April, household contacts of probable SARS patients were required to undergo home confinement. Home confinees were required to stay at home for a minimum of ten days after last contact with SARS case. They were not allowed to leave home without the permission of a Health Officer. Visiting health teams comprising nurses visited the confinees regularly for medical monitoring. The Police conducted spot checks to ensure compliance. Non-compliant confinees would be removed to camp upon repeated warnings. Confinees

who developed symptoms were either referred to DMCs for screening or directly to hospitals for further management. The measure was further extended to household contacts of suspected SARS patients from 25 April onwards.

90. In contact tracing related to hospital SARS outbreak, Regional Offices of DH followed up on cases referred by hospitals and covered hospital 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 DMCs for daily medical surveillance for 10 days.

91. DH gave particular emphasis to contact tracing in elderly homes, which was vulnerable to SARS outbreaks. When a SARS case involving a patient of an elderly home arose, the concerned Regional Office would immediately alert the home and initiate case investigation. The Elderly Health Services (EHS) would also be informed. Medical surveillance and health advice on infection control would be provided by EHS with on-site visits, detailed advice and on-going support and monitor during the medical surveillance period.

92. Over 26 000 persons, including close contacts and social contacts, have been traced by DH 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.

93. 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).

94. Finally, I now turn to your enquiry regarding legal powers. My responses are -

(a) According to r.24 the Prevention of the Spread of Infectious Diseases Regulations (Cap. 141B), the Director is empowered to order areas or premises to be isolated for the prevention of the spread of any infectious disease. Movement in any isolation area or premises is restricted further under r.25 of

Cap. 141B. In other words, the Director may order any public or private hospital as an isolation area or designate a particular block of a hospital as isolation premises and restrict movement thereof to achieve the practical effect of shutting down a hospital from service.

(b) Technically speaking, the Director did not have the legal authority to designate a hospital as an isolation place under r.24 of Cap. 141B prior to March 2003 because –

- Section 2 of the Quarantine and Prevention of Disease Ordinance (Cap. 141) stipulates that "infectious disease" means any disease specified in the First Schedule to the principal Ordinance.

- First named by WHO as a disease entity on 15 March 2003, SARS was included as an infectious disease in the First Schedule to the principal Ordinance of Cap. 141 on 27 March 2003.

- In other words, the provisions of Cap. 141 and its subsidiary legislation were applied to SARS only after 27 March 2003.

(c) Yet, being the authority under s.72 of Cap. 141 which may amend the First and Second Schedules of the principal Ordinance by order in Gazette, the Director indeed has the power to include SARS as an infectious disease so that provisions of Cap. 141 would apply with immediate effect so long as she sees a need to do so in the interest of public health. Such need is established only if the risk of spread from a hospital and the threat to public health is greater than the downsides of this drastic option e.g. disruption to services to patients.

(d) Apart from resorting to legal authority under Cap. 141 to order a public hospital as an isolation area, the Director may also escalate to the Chief Executive, HKSAR, through SHWF, who may then instruct CE/HA, the public hospital management authority, to close a public hospital administratively. Alternatively, the Director may persuade CE/HA direct for closure of a public hospital as long as the need is established. Indeed, the escalation and persuasion route allows CE/HA to

assess the need for hospital closure and other issues related to the control of SARS from the hospital management perspective. Even if the need for drastic measure to close a public hospital is not established, CE/HA may take administrative measures to improve infection control measures or patient management in the hospital.

(e) Hypothetically, if PWH were a private hospital licensed under the Hospitals, Nursing Homes and Maternity Homes Registration Ordinance (Cap. 165), the Director could also take advantage of the licensing conditions of private hospitals i.e. accommodation, staffing or equipment as provided by s.3 of Cap. 165, to exert control over PWH even in mid-March 2003 when SARS was not yet included as one of the infectious diseases of which the provisions of Cap. 141 apply.

95. I hope you find the above information useful.

Yours sincerely,

M Lehan

(Dr Margaret Chan)
Director of Health

Annex 1

(Translation)
(uploaded onto Internet)

Guangzhou City Government News Conference
Two people died in Guangzhou till now
(11 February 2003)

Director of Health Bureau in Guangzhou, Huang Jionglie, explaining the situation of atypical pneumonia in Guangzhou.

News Conference in progress

Deputy Secretary General of Guangzhou Government, Zhang Huoying, Speaking at the conference.

Deputy Mayor of Guangzhou, Chen Chuanyu, Speaking at the conference.

Guangzhou City Government held a news conference at 10:30 this morning. Huang Jionglie, Director of Health Bureau in Guangzhou, reported on the situation of atypical pneumonia in Guangzhou.

At the end of last year, atypical pneumonia cases were reported in certain parts of Guangdong Province. Since 12 January 2003, some of the seriously ill patients have been transferred to some major hospitals in Guangzhou for treatment. During the period around Lunar New Year, local cases were detected in Guangzhou region. To date, more than a hundred of cases have been reported in Guangzhou.

Pneumonia is an infectious disease commonly detected in winter and spring seasons. But unlike those in the past years, most pneumonia cases reported this year are atypical with a quick onset and fever as the first symptom. Patients may also develop apparent respiratory symptoms of dry and

unproductive coughs. Despite its quick onset, there is a low risk of fatality. The conditions of most patients are not serious with fever as the major symptom. All existing cases have been properly treated and the conditions of the great majority of patients are under control. Some patients have already been discharged after recovery. As at February 9, two people died among all cases detected in Guangzhou City.

Current situation shows that the disease is infectious and is mainly transmitted through close contact with the respiratory droplets or secretions of the patients. The risk of contracting the disease is generally low unless there is close contact with infected patients suffering from fever.

There are over a hundred cases in Guangzhou City, many of whom are healthcare workers who worked in a few local hospitals where there was neither enough awareness of the disease nor adequate supply of protective gear. They were infected while in close contact with seriously ill patients who came for treatment from places outside Guangzhou. So far, no healthcare workers have been infected in hospitals with adequate and active precautionary measures in place and full awareness of the disease. There is clinical proof that healthcare workers can avoid being infected by strictly complying with the relevant procedures.

The City of Guangzhou has been affected by the disease for more than a month now. The patients are all under effective treatment and their condition under control. There is no need to panic. People generally would not be infected if they follow the guidelines issued by relevant departments of the Guangzhou Province and Guangzhou City by avoiding close contact with patients suffering from fever, maintaining good ventilation of household and working environment, and avoiding excessive fatigue. People are advised to seek early medical treatment at nearby hospitals if they develop such symptoms.

Recently, all sorts of rumors about the disease have been spreading around in the community. It has been described as a biological attack, an inexplicable virus attack, and the spread of plague. All these have been found to be nothing but rumors. The public are urged not to believe in such rumors so as to avoid unnecessary worry and inconvenience.

Annex 2

Press Release on 11 February 2003

DH monitors situation closely

****

The Department of Health is closely monitoring the situation in Hong Kong in relation to the high incidence of pneumonia cases in Guangzhou, the Director of Health, Dr Margaret Chan said today (February 11).

The Department has already contacted Mainland health officials to get more information. As it is the high season for respiratory diseases in the Mainland, consultation and hospital admission rates have risen significantly recently.

Initial reports showed that the cases were not anthrax or plague. When further laboratory results are available, DH would be informed, Dr Chan said.

In Hong Kong, the Department of Health operates an effective surveillance system. No unusual patterns of influenza-like illness and respiratory tract infection including pneumonia have been identified through the surveillance network of hospitals, clinics and laboratories in the public and private sectors.

She reminded members of the public to take steps to prevent influenza as we have entered the usual peak season for influenza in Hong Kong between January and March.

To prevent influenza, it is important to:

* maintain good ventilation;

* avoid crowded places;

* observe good personal hygiene and wash hands after sneezing, coughing or cleaning the nose;

* build up good body immunity by having a balanced diet, adequate exercise and rest; and

* avoid smoking.

Travellers are also advised to observe these preventive measures.

Persons who fall sick are advised to seek medical advice early.

End/Tuesday, February 11, 2003

Annex 3

WHO issues a global alert about cases of atypical pneumonia
Cases Of Severe Respiratory Illness May Spread To Hospital Staff

12 March 2003 | GENEVA -- Since mid February, WHO has been actively working to confirm reports of outbreaks of a severe form of pneumonia in Viet Nam, Hong Kong Special Administrative Region (SAR), China, and Guangdong province in China.

In Viet Nam the outbreak began with a single initial case who was hospitalized for treatment of severe, acute respiratory syndrome of unknown origin. He felt unwell during his journey and fell ill shortly after arrival in Hanoi from Shanghai and Hong Kong SAR, China. Following his admission to the hospital, approximately 20 hospital staff became sick with similar symptoms.

The signs and symptoms of the disease in Hanoi include initial flu-like illness (rapid onset of high fever followed by muscle aches, headache and sore throat). These are the most common symptoms. Early laboratory findings may include thrombocytopenia (low platelet count) and leucopenia (low white blood cell count). In some, but not all cases, this is followed by bilateral pneumonia, in some cases progressing to acute respiratory distress requiring assisted breathing on a respirator. Some patients are recovering but some patients remain critically ill.

Today, the Department of Health Hong Kong SAR has reported on an outbreak of respiratory illness in one of its public hospitals. As of midnight 11 March, 50 health care workers had been screened and 23 of them were found to have febrile illness. They were admitted to the hospital for observation as a precautionary measure. In this group, eight have developed early chest x-ray signs of pneumonia. Their conditions are stable. Three other health care workers self-presented to hospitals with febrile illness and two of them have chest x-ray signs of pneumonia.

Investigation by Hong Kong SAR public health authorities is on-going. The Hospital Authority has increased infection control measures to prevent the spread of the disease in the hospital. So far, no link has been found between these cases and the outbreak in Hanoi.

In mid February, the Government of China reported that 305 cases of atypical pneumonia, with five deaths, had occurred in Guangdong province. In two cases that died, chlamydia infection was found. Further investigations of the cause of the outbreak is ongoing. Overall the outbreaks in Hanoi and Hong Kong SAR appear to be confined to the hospital environment. Those at highest risk appear to be staff caring for the patients.

No link has so far been made between these outbreaks of acute respiratory illness in Hanoi and Hong Kong and the outbreak of 'bird flu,' A(H5N1) in Hong Kong SAR reported on 19 February. Further investigations continue and laboratory tests on specimens from Viet Nam and Hong Kong SAR are being studied by WHO collaborating centres in Japan and the United States.

Until more is known about the cause of these outbreaks, WHO recommends patients with atypical pneumonia who may be related to these outbreaks be isolated with barrier nursing techniques. At the same time, WHO recommends that any suspect cases be reported to national health authorities.

WHO is in close contact with relevant national authorities and has also offered epidemiological, laboratory and clinical support. WHO is working with national authorities to ensure appropriate investigation, reporting and containment of these outbreaks.

Annex 4

THREE CASES REPORTED BUT NO LINK TO OUTBREAK OF ATYPICAL PNEUMONIA IN HONGKONG, VIETNAM AND GUANGDONG PROVINCE IN CHINA

The World Health Organisation (WHO) has on 12 March 03 issued a global alert about outbreaks of cases of a severe form of pneumonia in Hong Kong, Vietnam and Guangdong province in China.

2 In Vietnam, the outbreak began when a traveller was hospitalised on 26 February 03 for the treatment of severe and acute breathing difficulties of unknown origin. He had become sick shortly after arrival in Hanoi from Shanghai and Hong Kong. Following his admission to the hospital, about 20 hospital staff became sick with similar symptoms. Some of these staff are recovering but some remain critically ill.

3 In Hong Kong, an outbreak of respiratory illness has been reported on 11 March 03 in the Prince of Wales Hospital. More than 20 hospital staff were admitted for observation after they developed fever. Some of these staff, also developed pneumonia. Their conditions are stable.

4 In February 03, it was reported that about 300 cases of atypical pneumonia, with 5 deaths, had occurred in Guangdong province in China.

5 The signs and symptoms of the disease include initial flu-like illness (rapid onset of high fever followed by muscle aches, headache and sore throat). In some cases, they developed pneumonia progressing to difficulty in breathing.

6 The outbreaks in Hong Kong and Hanoi appear to be confined to the hospital environment. No link has so far been made between the outbreaks of pneumonia in Hong Kong and Hanoi and the earlier outbreak of 'bird-flu' A(H5N1) in Hong Kong in February this year. Investigations into the cause of the outbreaks are currently being carried out by the WHO.

7 The Ministry of Health is closely monitoring the situation. We had been notified of three persons who had travelled to Hong Kong at the end of February and who were admitted to hospital for pneumonia after they returned to Singapore. Two of them have recovered and been discharged from hospital. The remaining case is recovering in hospital. Investigations suggest a viral origin, however no causative organism has been identified. We have conducted contact tracing and given advice to the contacts of these cases to seek medical attention early should they become ill. The hospital staff attending to these cases were advised to take the necessary infection control precautions. None of the hospital staff attending to these patients have reported ill. So far, we have not established that these cases are related to the outbreak in Hong Kong and Hanoi.

8 Our surveillance has shown that there has not been any increase in the number of cases of acute respiratory infections. As a precautionary measure, we are advising all medical practitioners to be vigilant and to be on the look out for similar cases.

9 The Ministry advises you to build up your body's resistance to illnesses by having a proper diet with adequate exercise and rest. If you have returned from recent travel overseas, in particular to Hong Kong, Hanoi and Guangdong province in China, you are advised to seek medical attention early if you experience flu-like symptoms.

MINISTRY OF HEALTH
13 MARCH 2003

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Annex 5

Singapore Government Press Release

Media Relations Division, Ministry of Information, Communications and the Arts,

MITA Building, 140 Hill Street, 2nd Storey, Singapore 179369

Tel: 6837-9666

UPDATE ON ATYPICAL PNEUMONIA CASES IN SINGAPORE

In Singapore, in addition to the 3 cases reported yesterday, the Ministry of Health has been notified of 6 other persons who have been admitted to hospital for pneumonia. These persons had been in close contact with the patients who had developed pneumonia after returning from Hong Kong. Of these, two are hospital staff who had attended to the patients. Their conditions are stable. As a precautionary measure, all close contacts of the cases and hospital staff who have attended to the cases, are being monitored closely.

On-going investigations suggest a viral origin. However no causative organism has been identified. The transmission of the infection among the cases in Singapore appears to be due to close contact with the patients who had travelled to Hong Kong.

The Ministry is in touch with the WHO and the Hong Kong health authorities to closely monitor the situation in Hong Kong and Hanoi. Investigations into the cause of the outbreaks are still on going and no causative organisms have been identified.

On 13 March 03, the World Health Organisation (WHO) had started a worldwide surveillance of cases of atypical pneumonia.

The Ministry advises you to seek immediate medical attention if you develop fever, muscle ache and flu-like symptoms (cough, sore throat, shortness of breath or breathing difficulty) and have travelled to Hong Kong, Hanoi or Guangdong province in China, within 2 weeks of onset of the symptoms. If you are a close contact of such persons and you develop similar symptoms, you should seek immediate medical attention as well.

As a precautionary measure, the Ministry advises you to avoid travel to Hong Kong, Hanoi and Guangdong province in China for the time being, unless absolutely necessary.

MINISTRY OF HEALTH

14 MARCH 2003

FAX NOTE

HONG KONG TOURISM BOARD

Date 14/3/03

To Mr K K Tang From Bonnie Ng

Co. Phone #

Dept. Fax #

Fax # 2836 0074 # of pages 2

Report on Metropole Hotel Cluster

Background

Metropole hotel (Hotel M) at 75 Waterloo Road, Kowloon was associated with a cluster of SARS cases in Hong Kong. At this point, ongoing communication with the World Health Organization (WHO) and other health authorities revealed a total of 16 probable and suspected SARS cases associated with the hotel.

2. Initial investigation undertaken by the Department of Health (DH) in March 2003 found seven persons associated with Hotel M, including three visitors from Singapore, two from Canada, one Mainland visitor and a local resident. Epidemiological investigations revealed that these cases originated from the Mainland visitor who stayed at Hotel M during 21-22 February. All seven cases resided or visited the 9/F of the hotel between 12 February and 2 March.

Guangzhou visitor (Patient A)

3. According to information provided by the patient's wife: the visitor from Guangzhou came to Hong Kong on 21 Feb and stayed at Hotel M during 21-22 Feb. He stayed in room 911. He had been sick since 15 Feb **before** he came to Hong Kong. He was admitted to Kwong Wah Hospital on 22 Feb and he died on 4 March. His serum showed 4-fold rise in antibody against adenovirus. More detail about this case is at SARS EC 23/03.

Prince of Wales Hospital cluster index patient (Patient B)

4. According to information provided by the index patient himself, cross-checked with hotel records and Hong Kong Immigration records: he went to Hotel M to visit a friend from San Francisco who stayed in room 906 during 18-23 Feb. He developed illness on 24 Feb. He was the index case for the Prince of Wales Hospital cluster of SARS.

Singapore visitors (Patients C,D,E)

5. According to information provided by Singapore Ministry of Health, cross checked with hotel records and Hong Kong Immigration records: 2 pairs of female Singapore tourists (who did not know each other) visited Hong Kong, one pair during 21-25 Feb and the other 20-25 Feb. They stayed at Hotel M. Each pair shared a room in the hotel: the first pair in room 938 and the second pair in room 915. Two developed illness on 24 Feb, one from each of the rooms. The other roommate of room 938 also developed illness on 25 Feb (the other roommate of room 915 was asymtomatic). They returned to Singapore on 25 Feb and were admitted to hospital on 1 to 3 March respectively. They were discharged eventually.

Toronto tourist (Patient F)

6. According to information provided by the Health Canada, cross checked with hotel records and Hong Kong Immigration records: a Canadian resident traveled to Hong Kong to visit her family during 18-22 Feb. She stayed at Hotel M during this time (room 904). She departed Hong Kong on 22 Feb and arrived at Canada on 23 Feb. The date of onset was not precisely known and she died subsequently.

St. Paul's Hospital cluster index patient (Patient G)

7. According to information provided by the index patient himself, he was a Canadian resident who came to Hong Kong to visit relatives on 12 Feb. He stayed at Hotel M during 12 Feb – 2 March (room 902). He developed illness on 27 Feb and was admitted to St. Paul's Hospital on 2 March. He was the index case for the St. Paul's Hospital cluster of SARS. He was transferred to Queen Mary Hospital on 8 March and discharged on 14 April.

<u>Immediate measures taken</u>

8. Following the discovery of common linkage between the above cases and hotel M, an investigation team of the DH visited the hotel on 19 March. The hotel environment and 9/F were inspected. The general hygiene on 9/F was satisfactory. There were four elevators in the lift

lobby. Each had a capacity of 13 persons. Except for the lift lobby, there were no other common areas or toilets. The rooms were tidy and clean. Each room had its own ventilation control. According to hotel management, air ventilation in different rooms did not mix, and air ventilation on different floors did not mix. Laundry was collected by staff twice daily. They were sent to a laundry shop in Tuen Mun. Basically, four laundry staff worked on 9/F, and a few rooms on some other floors. There was no breakdown in electricity, ventilation systems and lift services during the past two months.

9. The hotel had 285 staff of which about 170 came into contact with visitors regularly. Sickness records were kept for individual staff. They did not reveal upsurges around the date of inspection. At any one time, not more than three staff who had direct contact with customers were sick according to the records. One staff was admitted to Yan Chai Hospital during 2-11 March with a diagnosis of bacteria pneumonia, with good response to antibiotic treatment. There was no increased sickness around 21-22 Feb.

10. During the inspection on 19 March, DH advised the hotel to inform all in-house guests that several SARS cases were found to be associated with 9/F of the hotel. The hotel manager was asked to evacuate guests on 9/F and thoroughly disinfect all rooms and areas on this floor and other floors. Disinfection guideline was given to the hotel to follow. The 9/F was not allowed to re-open until it was cleansed to DH's satisfaction. Advice was given that no sick staff should be allowed to work. The hotel floor plan and guest list were obtained from the hotel for follow up actions. Health talks and advice were given to hotel staff and a questionnaire survey on staff sickness was administered. No staff had symptoms of SARS.

11. On 19 March, DH announced the hotel findings in a press conference. A hotline was set up at DH headquarters for public enquiries. At the request of DH, the hotel management closed down 9/F temporarily for thorough cleansing and disinfection. The other floors of the hotel were also disinfected subsequently.

12. DH obtained a guest list from the hotel. We sought assistance from Immigration Department to match the hotel records and yielded data on nationality of the visitors. A list was prepared for guests who stayed

on 9/F at the hotel during 21-22 Feb. This was sent to the respective Consulates on 22 March for necessary follow up action. On 24 and 26 March, DH sent letters to Consulates of 43 countries providing them with a list of their citizens/residents who had stayed at the hotel any time during 18 Feb to 3 March. The whole list contained 1 730 people.

13. On 20 March, DH staff returned to the hotel to ensure that the hotel management had already conducted proper cleansing and disinfection. DH held a health talk and meeting with District Council members and residents of Kowloon City concerning the hotel.

14. On 22 March, DH staff again visited the hotel to inspect its hygiene and environment and the progress of disinfection, which was found to be satisfactory. DH advised the hotel that 9/F could be re-opened to the public.

Further case finding

15. Following DH's public announcement of the hotel cluster and distribution of letters to Consulates and health authorities in other countries, we received feedback from different sources that led to the identification of more suspect / probable cases associated with the hotel.

American Chinese in Hanoi (Patient H)

16. According to information provided by WHO/Vietnam, this American visitor arrived in Hong Kong from Shanghai on 19 Feb and left for Hanoi on 23 Feb. He stayed at Hotel M during 21-23 Feb (room 910). He developed illness while he was in Hanoi and returned to Hong Kong for treatment on 6 March. He passed away at Princess Margaret Hospital subsequently. Some healthcare workers who looked after him in Hanoi developed pneumonia.

Patients I, J and K reported by the CDC, US

17. Patient I traveled from US to Hong Kong with her husband and 3-year-old daughter to visit her family residing in Hong Kong. She stayed on the 9/F of Hotel M during 19-22 Feb and another room of 9/F during 24 Feb – 2 March. She began feeling ill on 24 Feb and sought medical treatment from private practitioner in Hong Kong. On return to United

States on 2 March, she was sent to hospital immediately. She was admitted and was discharged on 17 March.

18. Patient J came from US, stayed on 9/F of Hotel M on 1 March and stayed on 14/F during 2-6 March. His reported onset date was 13 March.

19. Patient K came from Canada. He stayed on 14/F in Hotel M for two periods, 20–24 Feb and 3-6 March. He had onset of illness on 28 Feb.

Patients L and M reported by Guangdong Health Authority

20. Patients L and M were a couple from Canada. They stayed on 9/F during 19-22 Feb, then they went to Guangdong through Macau to visit their relatives. The husband had onset of symptoms on 25 Feb and the wife's onset date was 24 Feb. They traveled to Guangzhou on 1 March. Both were admitted to the hospital for treatment on 6 March and recovered afterwards.

Patient N identified during active case finding

21. Patient N was Patient A's nephew in China. He did not live with Patient A in China. They traveled to Hong Kong separately to attend a relative's wedding. The two families met when they arrived at Hong Kong and stayed at 9/F of Hotel M. Patient N had onset of illness on 25 Feb.

Patient O and P notified by the WHO

22. WHO informed DH of two SARS cases that were related to Hotel M. A couple from the UK stayed on 9/F of Hotel M during 18-23 February and left Hong Kong for the Philippines on 23 February. The wife had onset of symptoms on 27 February and was admitted to the hospital with pneumonia on 6 March. She was discharged on 12 March and returned to the UK on 14 March. Because the woman was still unwell, a doctor in England was consulted. Blood sample taken on 18 March was positive for antibodies against SARS coronavirus.

23. The husband had onset of symptoms on 25 February and was

admitted to the hospital in Philippines on 5 March. He was discharged from the hospital on 12 March and returned to the UK on 14 March. Blood sample taken on 19 May was positive for antibodies against SARS coronavirus.

Investigating the mode of transmission

24. The staff who cleaned up Room 911 was interviewed. He started cleaning from the 901 side. Details of the room visit record was shown. After cleaning 911, he cleaned 910, 915 and 938 in succession. However, records did not show that he cleaned 902, 904 and 906 before 911.

25. Their routine was to throw away rubbish, made the bed, wiped the room with a wet cloth, washed the bathroom (wearing latex gloves) and then vacuum cleaned the floor. There has not been any repair of piping during February.

26. DH made a joint visit to Hotel M together with Environment Protection Department to inspect its sewerage and air ventilation systems. Air ventilation was delivered to each and every room separately through a system that draws air from the outside and extracts air out of the toilet. Air in one room would not be mixed with another room. Air flow in the corridor was delivered by an air vent system. The design was up to the standard required by the Buildings Department.

27. The sewerage system also had a U-shape device to prevent sewage inflow. It was constantly maintained so that it was functional. There was no complaint of foul smell from the drains. There was no possibility of sewage flow from one room to another. The wastewater pipe and toilet pipe were not linked.

28. A WHO team from Health Canada and DH conducted joint investigation on 2, 5 and 10 May 2003. Inspection was made on the general environmental condition, sewerage system and air conditioning system. The roof, 9/F and 14/F of the hotel were also inspected. Air flow tests were conducted on the hotel lifts as well as ventilation systems on 9/F, 14/F. A total of 154 environmental samples were taken. The samples were taken from hotel rooms, floor drains, air vents, carpet of the hallway on 9/F and 14/F. Preliminary results found positive RT-PCR for

coronavirus was on 9/F - 4 out of 31 samples collected from the carpet in the hallway and 4 out of 7 samples collected from the lift lobby area, suggesting contamination event had occurred in the hallway outside room 911 and the lift lobby area. The hotel staff had no record of any gathering of residents (e.g., fire alarm), or being called to clean up a vomitus on Feb 21-22.

29. The WHO environmental investigation report on Hotel M is still pending at the time of writing this summary.

Department of Health
3 July 2003

Annex 7

[redacted] – a visitor from Guangzhou

Introduction

On 24 February 2003, the Hospital Authority (HA) notified the Department of Health (DH) that a visitor from Guangzhou – [redacted] – was suspected to suffer from severe atypical pneumonia and was admitted to Intensive Care Unit (ICU) of Kwong Wah Hospital (KWH). His personal particulars were as follows:-

Name :	[redacted]
Sex / Age:	Male / 64
Ethnicity :	Chinese
Residential address :	An apartment in Guangzhou
Occupation :	Doctor in Sun Yat San Hospital located in Guangzhou
Past medical history :	Good past health
Date of Onset :	15 February 2003
Admission date & time:	11:47 hours on 22 February 2003 through Accident and Emergency Department (AED) of KWH
Date of death:	Certified at 22:48 hours on 4 March 2003

2. [redacted] was the index patient of a cluster of SARS cases involving three families in total (see summary at Appendix I). Actions taken by DH on cases investigation, contact tracing and medical surveillance in chronological sequence are summarized in this paper.

[redacted]'s history before admission to KWH (obtained from his wife and daughter)

3. [redacted] worked in Guangzhou Sun Yat San Hospital as a doctor in the out-patient clinic of Medical Department. In the week preceding his onset of symptoms, he contacted two patients presenting with high-grade fever and chest symptoms. Chest X-ray (CXR) of both patients showed haziness and [redacted] then referred both patients to attend AED of the hospital.

4. AA [redacted] had good past health. In the evening of 15 February, he had a sudden onset of fever (39°C), chills and rigor. He took oral antibiotic (exact name unknown) that night. He later developed cough and sputum. CXR done on 17 February showed haziness in the left lower zone. He changed the antibiotic to intravenous Penicillin that day. Repeated CXR on 20 February showed increasing haziness. As he had to attend the wedding banquet of his nephew (sister's son), he came to Hong Kong (HK) with his wife on 21 February from Guangzhou by coach. They arrived HK at 12:30 hours and resided in Rm 911 of Metropole Hotel in Mongkok. In the night time, he had increased cough, shortness of breath, fever and peripheral cyanosis.

Progress after Admission

5. On 22 February 11:00 hours, AA [redacted] (the patient) attended KWH AED. CXR showed bilateral infiltration. He was diagnosed to have severe fulminating pneumonia and was admitted to ICU directly. He was treated with Augmentin, Azithromycin, Ranitidine, Amantadine, Cisatracurium infusion and Dopamine infusion. His condition deteriorated and he developed adult respiratory distress syndrome. He was fully sedated and intubated for supported ventilation on 23 February. The fever did not subside and his condition continued to deteriorate. He subsequently suffered from multi-organ failure and finally succumbed at 22:48 hours on 4 March.

Contact Tracing and Case Investigation

24 February 2003

6. At 15:20 hours, Miss But, a Registered Nurse of Kowloon Regional Office (KRO) of DH departed for KWH. Before her departure, Miss But had informed the nursing staff of KWH Ward E5 that she was on her way for investigation and asked the nursing staff to keep the relatives of the patient in the ward for interview. However, when Miss But arrived at the ICU, the relatives of the patient had already left.

7. Miss But studied the case notes and made copies. No direct interview of the patient was done as he had already been intubated. She returned to KRO at 16:30 hours.

8. Miss But then rang the patient's sister in HK, Madam CC [redacted]. History of the patient was then obtained from Madam [redacted] and the CC patient's wife and daughter during the same phone call. The symptoms and

clinical course of the patient were noted and the travel history obtained. It was noted that the patient was not exposed to any poultry in the two weeks prior to the onset of his symptoms. He did not keep any chickens, ducks or birds, nor go to any market where live poultry was kept.

9. During this phone interview, five family contacts of the patient were identified. They were the patient's wife, daughter and son, all residents of Guangzhou, as well as his sister in Hong Kong and her husband. The following details were obtained during the phone interview –

(a) Mrs [redacted], the patient's wife, was a housewife. She complained that she had fever (38.4°C) on that day (24 February/date of the interview). Miss But advised her to attend AED for further management. However, [redacted] wanted to return to Guangzhou for treatment because of the high cost in Hong Kong. (Later on that day i.e., 24 February, [redacted] returned to Guangzhou with her daughter later at 18:00 hours.) AA's wife

(b) Miss [redacted], the patient's daughter, arrived HK on 22 February (left HK on 24 February). She was asymptomatic.

(c) Mr [redacted], the patient's son, also arrived HK on 22 February. He had gone back to Guangzhou on 23 February. He was asymptomatic.

(d) The patient and his wife stayed at Metropole Hotel, Room 911 on 21 February.

(e) Since 22 February, the patient's wife, daughter and son were staying at the home of the patient's sister in HK, Madam [redacted]. Madam [redacted] and her husband Mr [redacted] were asymptomatic on the day of the interview (24 February). CC

(f) The patient spent the afternoon of 21 February with [redacted] husband of the patient's sister [redacted], shopping in Central, HK. CC's husband CC

All the family contacts were advised to watch out for symptoms of respiratory tract infection and take care of personal hygiene.

Follow-up Action for Family Contacts
25 – 27 February 2003

10. Miss But and Dr Ma of KRO contacted KWH daily for the clinical progress including investigation results. The patient's sister, Madam [redacted] CC was called daily for active medical surveillance. It was noted that the patient's wife was admitted to Sun Yat San Hospital in Guangzhou on 24 February for fever. All other four close contacts mentioned in para. 9 above (i.e. the patient's daughter and son, his sister in HK and the latter's husband) were asymptomatic. (It later turned out that the patient's daughter was symptomatic and admitted to hospital on 27 February – para. 14 refers.)

28 February 2003 – 2 March 2003

11. Since 25 February, there were media reports about CC the patient's clinical details with personal particulars disclosed. Madam [redacted] (the patient's sister in HK) felt dissatisfied and eventually was not cooperative in giving further information from 28 February onwards. In fact, Miss But did call Madam [redacted] twice on 28 February but to no avail.

CC

3 March 2003

12. On 3 March CC p.m., KRO was CC's husband notified that two family contacts of the patient, Madam [redacted] and [redacted] (the patient's sister in HK and her husband) were admitted to KWH on 1 March and 28 February respectively. Another workup for contact tracing was performed by nursing staff Miss But and Miss Chiu on the same day through face to face interview with the two cases in the ward. In view of the suspected high infectivity of the disease, detailed exposure history to possible sources of infection was obtained.

13. CC [redacted] reported that there were two common meals with the patient on 21 February:

(a) Lunch was held at 12:30 hours in a Chinese restaurant. The following eight persons attended the lunch -
   (i) the patient and his wife;
   (ii) [redacted] and her husband [redacted]; and
   (iii) another sister of the patient and her son, daughter in law and grandson. This family lives in Guangzhou. They arrived HK at 11:00 hours on 21 February and returned to Guangzhou on 22 February. Only the son Mr [redacted] was noted to have symptoms suggestive of pneumonia.

(b) Dinner was held at 19:30 hours in Madam [redacted]'s home. In addition to the eight persons who attended the lunch ((a) above), two others also joined the party, namely Mr [redacted] (son of Madam [redacted]) and a friend.

4 March 2003

14. On 4 March a.m., Miss But phoned Mr [redacted] (son of the patient's sister in HK) for contact tracing. It was noted that Mr [redacted] and his wife were asymptomatic and that Mr [redacted] (the patient's son) had come to Hong Kong on 27 February and been staying at Mr [redacted]'s home. Mr [redacted] was also asymptomatic. In addition, it was noted that Miss [redacted] (the patient's daughter) had fever on 27 February and was admitted to a hospital in Guangzhou on the same day.

5 to 18 March 2003

15. From 5 to 18 March, Miss But contacted Mr [redacted] (son of the patient's sister in HK) and Mr [redacted] (the patient's son) several times for contact tracing. It was noted that Mr. [redacted] and Mr [redacted] and the latter's wife were asymptomatic. The patient's wife and daughter were still in hospital in Guangzhou and their conditions were stable. (Note: Both the patient's wife and daughter have eventually recovered.)

Laboratory Investigations

16. Extensive laboratory investigations on [redacted] were carried in the University of Hong Kong (HKU) and the Government Virus Unit. Initially, results were negative for all known atypical pneumonia agents, except a four-fold rise in adenovirus antibody titre. His specimens were subsequently tested positive for coronavirus by polymerase chain reaction (PCR) in mid April. The results are tabulated in Appendix II.

Department of Health
August 2003

Appendix I

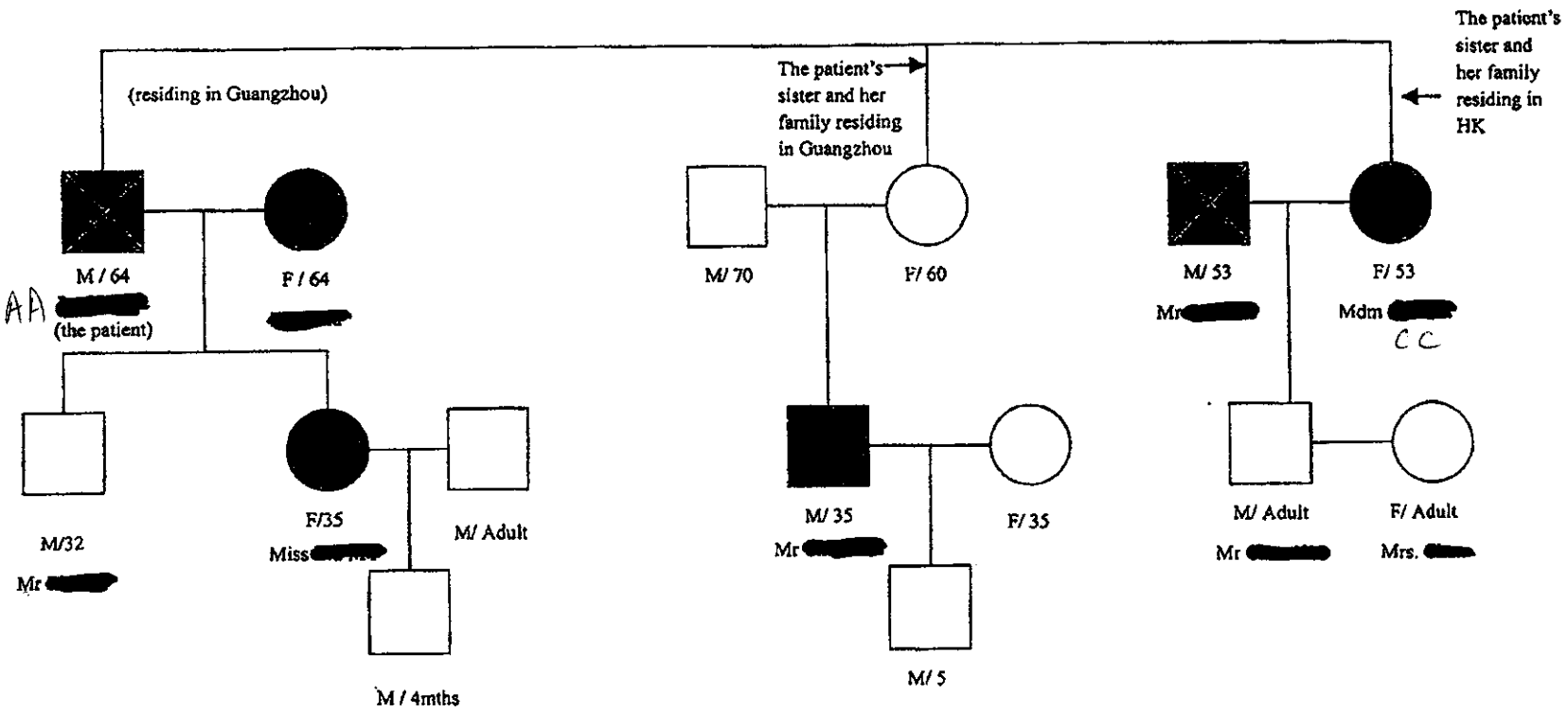
AA

[redacted]'s family and his two sisters' families

□ - male

○ - female

*Those shaded are symptomatic and those eventually succumbed are marked with a cross.



AA

Appendix II

Laboratory investigations results of [redacted]

Investigations done by Department of Microbiology, HKU:

Date of specimen collection	Specimen	Test	Result	Date of reporting	Remarks
24.2.2003	Urine	Pneumococcal antigen	Negative	25.2.03	
		Legionella antigen	Negative	25.2.03	
	Serum [Day 9]	Mycoplasma pneumoniae antibody	< 1:40	25.2.03	
		Chlamydia pneumoniae antibody (micro-IF)	1:128	25.2.03	Comments by (Dr P L HO): The titre is **not** diagnostic although it implies there has been an infection in the past. The Ab titre was expected to rise after 3-4 weeks if it *were* a recent infection.
		Chlamydia psittaci antibody	<1:32	25.2.03	
	Nasopharyngeal aspirate and tracheal aspirate	Direct IF for influenza A, B, adenovirus, Respiratory Syncytial Virus (RSV) and parainfluenza 1,2,3	Negative	25.2.03	
		PCR for influenza and Chlamydia nucleic acid	Negative	25.2.03	Quality of the specimens were poor & inadequate

Investigations done by GVU:

Date of specimen received	Specimen	Test	Result	Date of reporting
24.2.2003	Urine	Legionella antigen	Negative	N.A.
	Serum	Influenza A	<10	26.2.2003
		Influenza B	<10	-ditto-
		Adenovirus	10	-ditto-
		Chlamydia	10	-ditto-
		Mycoplasma	<10	-ditto-
		Parainfluenza 1	<10	-ditto-
		Parainfluenza 2	<10	-ditto-
		Parainfluenza 3	10	-ditto-
		RSV	<10	-ditto-
		Legionella	<32	-ditto-
		Risketsia mooseri	<40	-ditto-
		Ricketsia coronii	40	-ditto-
		Hantaan virus	<10	-ditto-
		Coronavirus	QI	10.6.2003
	Nasopharyngeal aspirate	Viral culture	Negative	12.3.2003
		PCR for coronavirus	***Positive***	19.4.2003
		PCR for other agents*	Negative	-ditto-
26.2.2003	Serum	Influenza A	<10	27.2.2003
		Influenza B	<10	-ditto-
		Adenovirus	10	-ditto-
		Chlamydia	10	-ditto-
		Mycoplasma	<10	-ditto-
		Parainfluenza 1	<10	-ditto-
		Parainfluenza 2	<10	-ditto-
		Parainfluenza 3	10	-ditto-
		RSV	<10	-ditto-
		Legionella	<32	-ditto-
		Risketsia mooseri	<40	-ditto-
		Ricketsia coronii	40	-ditto-
	Tracheal aspirate	Viral culture	Negative	17.4.2003
		PCR for coronavirus	***Positive***	19.4.2003

Date of specimen received	Specimen	Test	Result	Date of reporting
3.3.2003	Serum	Influenza A	10	5.3.2003
		Influenza B	10	-ditto-
		Adenovirus	40	-ditto-
		Chlamydia	10	-ditto-
		Mycoplasma	<10	-ditto-
		Parainfluenza 1	10	-ditto-
		Parainfluenza 2	10	-ditto-
		Parainfluenza 3	20	-ditto-
		RSV	10	-ditto-
		Legionella	<32	-ditto-
		Risketsia mooseri	<40	-ditto-
		Ricketsia coronii	40	-ditto-
		Hantaan	<10	-ditto-
12.3.2003	Left lung tissue	PCR for coronavirus	***Positive***	19.4.2003
	Right lung tissue	PCR for coronavirus	***Positive***	17.4.2003
	Liver tissue	PCR for coronavirus	***Positive***	19.4.2003

* Other PCR tested included Influenza A(H1, H3, H5, H7), Influenza B, Adenovirus, Chlamydia pneumoniae, Chlamydia psittaci, Mycoplasma pneumoniae, Parainfluenza 1,2,3, human metapneumovirus, Hantavirus and enterovirus.

Annex 8

Dr [redacted] clinic cluster reported on 13 March 2003

Department of Health (DH) received notification of a GP and his nurses suspected to be suffering from atypical pneumonia. DH immediately initiated follow up action on the same day. Case investigation by DH revealed that the cluster involved five persons, namely Dr. [redacted], his wife and three nurses in his clinic. A nurse first developed symptoms on 3 March, followed by the second nurse on 5 March. Dr. [redacted] was ill on 10 March, followed by his wife on 12 March and then the third nurse on 16 March.

2. The source of infection was not immediately obvious at the time of epidemiological investigation. It later transpired that the first nurse who fell sick could have acquired the infection from [redacted], who attended the clinic on 23 February and succumbed from severe community acquired pneumonia (SCAP) on 15 March. [redacted] had history of traveling to the Mainland before becoming sick.

3. Close contacts of Dr. [redacted], his wife, nurses of the clinic (four nurses in total) and their hospital visitors were given health advice and placed under medical surveillance. Apart from the doctor's wife who contracted the infection from her husband, no other contacts were identified. All patients recovered.

Pamela Youde Nethersole Eastern Hospital (PYNEH) cluster reported on 13 March 2003

4. DH received notification from PYNEH that six health care workers (HCWs) of A5 ward were suffering from atypical pneumonia. Their onset dates were between 4 and 10 March. DH staff immediately carried out face-to-face interviews with the patients, traced their close contacts for health advice and started daily medical surveillance.

5. Source of the infection was traced to a 44-year old salesman, [redacted], who stayed in A5 ward of PYNEH from 2 March to 7 March,

before transfer to high dependency unit. Ward staff did not take isolation or droplet precautions at that time. The case was reported to DH as SCAP on 11 March but direct patient interview was not possible as he was in a poor state. The patient's sister however volunteered a history of traveling to Zhongshan with his daughter and two friends on 22-23 February. The patient was said to have developed upper respiratory infection symptoms the day before, and fever during the trip. DH staff conducted medical surveillance and found no household or close contacts developing symptoms. The patient died on 16 March.

6. While DH was tracing contacts of the six HCWs, PYNEH stepped up hospital infection control and carried out surveillance of other HCWs and patients who shared the same cubicle with the index case. One patient, a visitor and another HCW were later found to be suffering from SARS. Contact tracing and medical surveillance were carried out.

7. At the conclusion of this outbreak, 14 persons including the index patient were affected. Secondary spread was limited to four close contacts of three HCWs.

St Paul's Hospital (SPH) outbreak reported on 17 March 2003

8. DH received notification from SPH of an outbreak of atypical pneumonia among three HCWs of Old-1 ward. Their onset dates were between 9 and 14 March. DH staff immediately carried out face-to-face interviews with the patients, traced their contacts for health advice and started daily medical surveillance. SPH was asked to step up hospital infection control and monitor the health of other HCWs.

9. Meanwhile, the source was traced to a 72-year-old male patient, [redacted], whose onset of illness was on 27 February. He was a Canadian visitor who stayed in Metropole Hotel since 12 February. He was admitted into Old-1 ward from 2 to 8 March before transfer to QMH for further management. Hospital staff did not take special isolation or droplet precautions at that time. DH was notified of the case as SCAP on 13 March and contact tracing and medical surveillance were carried out in the usual manner.

10. Once the index case had been identified, SPH immediately took follow-up action for all patients who stayed in the same room. Active case finding revealed that one patient and five visitors of Old-1 ward were infected.

11. At the conclusion of this outbreak, a total of 12 cases including the index patient were affected. Secondary spread was limited to one family contact of an affected HCW and one family contact of an affected visitor. All patients recovered.

Queen Elizabeth Hospital (QEH) Ward G6 cluster reported on 18 March 2003

12. A hospital cluster in Ward G6 came to light in a newspaper report. A doctor and two nurses with onset dates from 12 to 16 March were involved. DH conducted immediate epidemiological investigation and traced the source to a patient known by the name of [redacted] who had travel history to Guangzhou every weekend. [redacted] was admitted on 9 March and died on 30 March from SARS.

13. DH provided health advice to home contacts of the affected HCWs and conducted medical surveillance. At the same time, QEH carried out health surveillance of work contacts. None developed symptoms. All cases recovered.

Baptist Hospital (BH) 8/F outbreak reported on 21 March 2003

14. DH received notification from BH of a total of four healthcare workers suspected to be suffering from SARS. Two wards, namely N8 and O8, were involved. After active case finding and surveillance, 34 persons were found to have contracted the disease. They included 10 healthcare workers, one visiting doctor, 12 patients, eight contacts and three visitors. The onset dates ranged from 3 March to 31 March.

15. The source of infection could be traced to a patient who was the sister-in-law of the index case for the PWH outbreak. With disease onset

on 10 March, the patient admitted herself on 13 March and was sent to both N8 and O8 wards during her brief stay in the hospital. She was later transferred to a public hospital for further management.

16. DH asked BH to step up infection control measures in 8/F. Admission to these wards was temporarily suspended since 22 March and ward movement in N8 and O8 was frozen. Both wards were eventually closed for thorough cleansing and disinfection. Visitors to hospital were urged to observe strict personal hygiene during hospital visits. Health education was strengthened and ward staff was reminded to observe strict personal and environmental hygiene as well as infection control practices.

17. BH actively followed up patients discharged from O8 & N8 wards. None of them developed SARS. On the other hand, active surveillance of wards O8 and N8 staff identified six more healthcare workers who subsequently were confirmed SARS. One visiting doctor, his wife and his two patients were confirmed with SARS. Household/social contacts of all other patients were placed under medical surveillance and given health advice by DH. Among them, five household contacts developed SARS.

18. Four patients, including the visiting doctor, died. The others were discharged between March and May.

Dr [redacted] clinic cluster brought to light on 21 March 2003

19. In the process of investigating the PWH ward 8A outbreak, active tracing was conducted of discharged patients who stayed in the same ward with the index patient, [redacted] On 15 March, DH noted a discharged patient, [redacted], readmitting PWH for fever that started on 9 March. [redacted] He did not, however, report seeing a general practitioner before admission. All his close contacts were traced and monitored, with three developing symptoms and requiring admission on 20 March. When these three patients were re-interviewed, they admitted all, including [redacted], had visited Dr [redacted]'s clinic prior to admission.

20. DH made repeated attempts right away to contact Dr [redacted] only to learn that he had already been admitted on 20 March for SARS symptoms

appearing on 17 March. From Dr [redacted] active contact tracing for health advice and medical surveillance was initiated. A total of 544 patients, clinic staff and close contacts of the two symptomatic clients were traced. Among these contacts, a child and a 39-year old woman were found to have SARS. Further tracing and medical surveillance of their contacts were done, extending to cover the child's kindergarten. No new case was detected among them.

21. At the conclusion of this outbreak, a total of seven persons, including the index, had been affected.

Flights CA112/CA115 outbreak reported on 23 March 2003

22. DH received notification from Tuen Mun Hospital concerning a couple admitted the day before for fever since 18 March during their tour to Beijing from 15 to 19 March. The couple was on board CA112 for the outbound journey and CA115 on return. DH started case investigations the same day and quickly learned that a third case was admitted, again for fever since 18 March. Through the tour group leader, DH obtained information to contact the remaining 33 members, of whom seven subsequently had SARS. Their onset dates were from 17 to 23 March. Epidemiological investigation did not reveal a source of infection within the group.

23. Since the sick travelers were symptomatic and could be infectious on their return flight to Hong Kong, attempt was made to trace all other passengers on board CA115 on 19 March. Separately, while actively tracing contacts in connection with the PWH ward 8A outbreak, DH learned on 25 March that a Beijing resident had visited a terminally ill family member in PWH ward 8A in early March, subsequently to come down with illness when departing on board CA 112 on 15 March. DH rapidly extended contact tracing through public announcements to appeal to passengers of the flights CA112/CA115 to call a designated DH telephone hotline. Assistance from consulates of overseas passengers was sought. Tour agencies were invited to provide information regarding other tour groups who had taken the same flights.

24. 54 of 112 passengers on board CA112 and 124 of 164 passengers on

board CA115 have been contacted. Including the index patient, 23 passengers and two crew members were subsequently confirmed SARS. Among them, 13 were confirmed in Hong Kong, seven in the Mainland, four in Taiwan and one in Singapore. All had acquired the infection while traveling on board CA112 from Hong Kong to Beijing on 15 March.

Department of Health
August 2003

Fax

To: Dr Teresa Choy
Department of Health

Fax: [redacted]

From: Dr Louis Chan
PWH
Tel: [redacted]

Total no of pages (including this page): 63 + 2 → 65

Contact telephone phone

11/3 12:30 pm

Teresa [illegible] (1)
Louis Chan Address
eyeballing
Geographic cluster
yindu [illegible]

In patient [illegible]
∴ can't confirm inpatient before.
⇒ from Dr Teresa Choi by hand [illegible]

NAME: [redacted]S ([redacted])

CCC Code: [redacted]

Address: [redacted]

Room: [redacted] Floor: Block: [redacted] District: WTK Other Doc.:

HKID: [redacted](1) Sex: M Marital Status: U Religion:

Date of Birth: [redacted] Age: 33 yr Nationality: CH

Telephone: Home: [redacted] Office: Other: [redacted]2

[redacted]

Hospital Number	Admission Date/time		Source Code	Pay Code		Discharge Date/time		Destination
[redacted])	12/03/2003	07:12	4	PWH	EP1	12/03/2003	14:51	H+FU
[redacted](V)	08/03/2003	13:21	4	PWH	EP1	08/03/2003	20:35	H+FU
[redacted])	05/03/2003	07:02	4	PWH	EP1	05/03/2003	14:33	H+FU
[redacted])	01/03/2003	11:46	4	PWH	EP1	01/03/2003	18:26	H+FU
[redacted])	26/02/2003	07:11	4	PWH	EP1	26/02/2003	13:27	H+FU
[redacted]	22/02/2003	13:30	4	PWH	EP1	22/02/2003	20:22	H+FU

[redacted]

Hospital Number	Occupied Date Time	Ward	Specialty	Class	Type	Bed No.	Count
[redacted])	15/03/2003 13:46	8C	REN	3	A		1
[redacted]	15/03/2003 20:27	8A	MED	3	C		2
[redacted]	15/03/2003 20:52	8A	MED	3	B	25	3

Print with Movement List | NOK | Print | Return | Exit

Annex 10

Special Control Team at NTERO
Staff Composition

Date	Principal Medical & Health Officer	Senior Medical & Health Officer	Medical & Health Officer	Senior Nursing Officer	Nursing Officer	Registered Nurse	Clerical staff	Total
11 Mar (Tue)	1	1	4	1	3	2	2	14
12 Mar (Wed)	1	1	4	1	3	2	2	14
13 Mar (Thu)	1	2	3	1	3	5	3	19
14 Mar (Fri)	1	2	4	1	6	4	3	21
15 Mar (Sat)	1	3	7	1	5	4	3	24
16 Mar (Sun)	1		1		3			5
17 Mar (Mon)	1	2	5	1	7	4	3	23
18 Mar (Tue)	1	3	7	1	7	6	3	28
19 Mar (Wed)	1	3	8	1	7	6	4	30
20 Mar (Thu)	1	3	8	1	7	6	4	30
21 Mar (Fri)	1	4	8	1	8	7	5	34
22 Mar (Sat)	1	4	8	1	9	8	5	36
23 Mar (Sun)	1		2		4			7
24 Mar (Mon)	1	4	8	1	9	10	5	38
25 Mar (Tue)	1	4	8	1	9	12	5	40

Annex 11

DH Team at PWH
Staff Composition

Date	Principal Medical & Health Officer	Medical & Health Officer	Nursing Officer	Registered Nurses	Total no. of Staff
13 Mar (Thu)		1	1	1	3
14 Mar (Fri)		1	1	1	3
15 Mar (Sat)		2	3	1	6
16 Mar (Sun)		1	1	0	2
17 Mar (Mon)		2	2	2	6
18 Mar (Tue)		2	2	0	4
19 Mar (Wed)		1	2	0	3
20 Mar (Thu)		1	2	0	3
21 Mar (Fri)	1	2	2	1	6
22 Mar (Sat)	1	2	1	1	5
23 Mar (Sun)		1	2	1	4
24 Mar (Mon)	1	2	1	1	5
25 Mar (Tue)	1	2	1	1	5

Annex 12

Prince of Wales Hospital Cluster

Work done by DH Team at PWH and Special Control Team at NTERO

Date	Total No. of Referred Cases & Contacts Interviewed	Referred Cases Interviewed		Contacts Follow-up	
		Total No.	*No. turned SARS*	Total No.	*No. turned SARS*
11 Mar (Tue)	87	26	*24*	61	*0*
12 Mar (Wed)	66	17	*13*	49	*1*
13 Mar (Thu)	227	77	*12*	150	*3*
14 Mar (Fri)	133	26	*9*	107	*10*
15 Mar (Sat)	161	29	*18*	132	*19*
16 Mar (Sun)	95	4	*2*	91	*3*
17 Mar (Mon)	101	26	*5*	75	*5*
18 Mar (Tue)	63	20	*8*	43	*2*
19 Mar (Wed)	129	41	*12*	88	*6*
20 Mar (Thu)	179	56	*7*	123	*4*
21 Mar (Fri)	34	9	*3*	25	*1*
22 Mar (Sat)	805	37	*7*	768*	*1*
23 Mar (Sun)	53	6	*2*	47	*0*
24 Mar (Mon)	60	2	*2*	58	*1*
25 Mar (Tue)	77	10	*10*	67	*3*
Total	2270	386	*134*	1884	*59*

*Note: The figure includes 599 contacts of a private practitioner, 82 hospital visitors, 34 contacts of an ambulance man and contacts of other cases.

專責委員會(2)文件編號X1的附件13的替換頁
Replacement sheet for Annex 13 to SC2 Paper No. : X1

Annex 13

YY
[redacted]

Chronology of Events

DATES	ACTIVITIES & EVENTS
Before 14 March 2003	• Lived and worked part-time in Shenzhen. • Stayed overnight in younger brother's ([redacted] a SARS case) flat at Block E, Amoy Gardens two to three times a week. • Received regular haemodialysis (twice a week on every Wed & Sat) at Prince of Wales Hospital (PWH) for chronic renal failure due to systemic lupus erythematous (SLE).
14 March 2003	• Stayed overnight at Amoy Gardens. • Started to have fever, malaise, chills, rigors, and diarrhea.
15 March 2003	• Attended ward 8C of PWH for scheduled haemodialysis. • After the 2 hours' haemodialysis, he was noted to be sick with fever of 38°C by the attending nurses. • Further investigation revealed white cell count of 6.1 with lymphocyte count of 0.5, and right lower zone haziness on chest X-ray (CXR). • Transferred to ward 8A at around 20:50 for further management of the fever and chest infection. • Not reported to NTERO as suspected atypical pneumonia (or SARS) until 23 March.
16 March 2003	• Received treatment at ward 8A of PWH.
17 March 2003	• Received treatment at ward 8A of PWH. • Nasopharyngeal aspirate positive for influenza A.
18 March 2003	• Received treatment at ward 8A of PWH
19 March 2003	• Improved after treatment. Diagnosed as Influenza A infection. • Discharged home from PWH at around 3 pm. • NTERO not informed of [redacted]'s discharge from PWH ward 8A. Stayed overnight at Amoy Gardens with brother and brother's wife.

DATES	ACTIVITIES & EVENTS
20 March 2003	• Back to Shenzhen.
21 March 2003	• Stayed in Shenzhen.
22 March 2003	• Attended PWH directly from Shenzhen for scheduled haemodialysis. • Noted sick and having respiratory symptoms including shortness of breath by the attending nurses. • Admitted into 8D ward and later transferred to 9D ward for further management.
23 March 2003	• CXR revealed bilateral haziness. Suspected to be SARS. • Serum for SARS coronavirus testing IgG: IgG titre <40. • Treatment with Ribavirin started. • PWH notified the DH health team stationed at the PWH control room about the case by means of a new case list. [redacted] was among the nine new cases on the list of 23 March. • DH health team staff conducted face-to-face interview with [redacted] and completed the standard questionnaire. • DH commenced contact tracing of [redacted]'s close contacts (his brother and sister-in-law in Amoy Gardens, onset of symptoms on 23 and 28 March respectively, admitted to hospitals on 24 and 28 March respectively, and confirmed SARS on 26 March and 9 April respectively).
24 March 2003	• Condition deteriorated. Transferred to Intensive Care Unit (ICU) for management.
9 April 2003	• Serum for SARS coronavirus IgG 1: 640.
6 May 2003	• Stool for coronavirus by PCR test: positive.
2 June 2003	• Discharged home.

Prepared by NTERO, 1 August 2003

[redacted]

醫院管理局
HOSPITAL AUTHORITY

PP12-2

群策群力為病人・優質醫護滿杏林
Quality Patient-Centred Care Through Teamwork

Our Ref : HA CON 101/83/1

20 August 2003

Dr Margaret Chan, JP
Director of Health
Department of Health
17 & 21 Floors Wu Chung House
213 Queen's Road East
Wanchai
Hong Kong

By Fax (28360071) & By Mail

Dear Dr Chan, Margaret

HA Review Panel on SARS Outbreak

Thank you for the detailed information provided in your letter of 18 August 2003. The Review Panel at its meeting held on 19 August 2003 has raised some follow up questions, listed below, and would appreciate very much if clarification could be provided:

(1) Did DH conduct any contact tracing (AA) at the Metropole hotel as a result of the information provided by [redacted]'s wife, daughter and sister to Nurse But on 24 February (paragraph 9(d) Annex 7 of your letter) . If yes, when did it start and what was done? If not, what was the reason?

(2) Did DH conduct any contact tracing at the Metropole hotel as a result of the telephone conversation with Singapore on 8 March? (paragraph 18 of your letter) If yes, when did it start and what was done? If not, what was the reason?

(3) Did the wife of [redacted] (DD) (the American Chinese) advised DH that [redacted] (DD) had stayed in the Metropole Hotel? If yes, on what date?

(4) Paragraph 23 of your response indicates that in light of the information from Singapore the further information from Canada on 18 March regarding the Metropole hotel triggered an immediate response. What were the reasons this response was not triggered earlier, given that the information that [redacted] and the Singapore tourists had stayed at the hotel was available on 8 March?

(5) Was the St Paul's Hospital (SPH) index case (AA) referred to in paragraph 7 of Annex 6 a severe CAP case when admitted to SPH on 2 March? When were DH notified of this case? Was contact tracing conducted? Were DH informed of his stay at the Metropole hotel?

(6) Paragraph 9 of Annex 6 refers to a sick staff admitted to Yan Chai Hospital. Have any staff of the Metropole hotel subsequently been confirmed as SARS?

(7) After contact tracing related to AA [redacted] was carried out, did DH advise HA or KWH of the infectivity of his disease?

(8) Regarding YY [redacted], in paragraph 82 you indicate that no follow up action was required. Does this mean no follow up action was taken when he was discharged on 19 March? Was DH aware whether or not he had been exposed to SARS patients in ward 8A? Paragragh 82 suggests he was dropped from the follow up list due to his positive testing for Influenza A. What was the policy at the time regarding follow up of patients discharged from ward 8A?

(9) 54 of the 112 passengers on board flight CA112 and 124 of the passengers on board CA115 have been contacted. Please advise why DH was unable to contact the remaining passengers.

(10) Did DH receive advice on Madam [redacted], an US citizen, who was first admitted to Union Hospital and transferred to PWH on 22 February. If yes, what contact tracing and follow-up action had been taken by DH. She was subsequently found positive for Coronavirus.

While the issue of contact tracing was not directly related to HA, we would appreciate to have clarification on the above to assist the Panel in its deliberation.

I should be grateful if the information could be made available by 29 August 2003.

Yours sincerely,

Ronald Arculli
Chairman
HA Review Panel on SARS Outbreak

ATTACHMENT 4 B

Our ref. 本署檔號 :DH/CR/PUB/31
Your ref. 來函檔號 :HA CON 101/83/1

28 August 2003

Mr Ronald Arculli, GBS, OBE, JP
Chairman
HA Review Panel on SARS Outbreak
Hospital Authority
Room 410S, 4/F Hospital Authority Building
147B Argyle Street
Kowloon

Dear Mr. Arculli,

HA Review Panel on SARS Outbreak

Thank you for your letter of 20 August.

Contact Tracing at Hotel M

2. In the following paragraphs, I shall focus our response to address an apparent concern of the HA Review Panel as to whether any contact tracing action by the Department of Health (DH) regarding the Metropole Hotel (Hotel M) cluster would have changed the course of events in the outbreak at Prince of Wales Hospital (PWH). I submit not.

3. First, I would like to amend Annex 6 of my last letter, following a recent advice from the Guangzhou authorities. It was [redacted] AA [redacted]'s wife, not his nephew, who had SARS. Accordingly, paragraph 21 should read -

Patient N was Patient A's wife. She lived with Patient A in China. They came to Hong Kong together on 21 February to attend a relative's wedding. They stayed together in Room 911 of Hotel M. Patient N had onset of SARS symptoms on 24 February. She eventually recovered.

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4. Second, I note from a paper prepared by HA for the SARS Expert Committee that the Kwong Wah Hospital had taken a very high level of infection control measures since the admission of [redacted] AA into the intensive care unit at 11:55 on 22 February and I quote: *"Upon admission into intensive care unit (ICU), the patient was immediately placed in isolation room. All staff caring him wore N95 masks, cotton gown and implemented droplet precaution and universal precaution measures since his admission"*. DH was notified of the case two days later (Monday, 24 February) and was not aware of the infectivity of Prof Liu when Nurse But went to see him that day. By then, he had already been intubated in an isolation room in the ICU and could not be interviewed. The spread of the disease among members of the family due to close contact was not an uncommon phenomenon.

5. Third, the fact that a number of persons related to [redacted] AA had fallen sick appeared to be an intra familial spread due to close contact (paragraph 30 of my last letter refers). There was no environmental factor supporting a case for initiating contact tracing at Hotel M. This notwithstanding, Dr Margaret Chan, my predecessor, was concerned and had many discussions with one of the attending physicians and the Consultant of the Government Virus Unit to explore further actions required for identifying the causative agent.

6. Fourth, as explained in the note in paragraph 18 of my last letter, as at 8 March, the illnesses of the three tourists from Singapore improved with antibiotics treatment and laboratory investigations were pending. There was then insufficient evidence that their illnesses were related to Hotel M. We therefore asked the Singapore Ministry of Health to keep us posted of any positive laboratory findings and monitored the development there.

7. Fifth, [redacted] JJ was initially suspected as the index case for the PWH cluster on 13 March and it was confirmed on 14 March. He had onset of symptoms on 24 February and was hospitalized on 4 March (paragraphs 21 and 71-74 of my letter of 18 August refer). Thus, even had DH initiated case investigation in Hong Kong on 8 March, it would not have any effect on the course of events in the outbreak at PWH. Neither would we be able to identify [redacted] JJ earlier as he was not a guest in Hotel M at the material time. It was only on repeated questioning that he admitted that he had visited a friend in Hotel M around that period.

DD DD's wife

8. Sixth, I can advise that Mrs [redacted] (wife of the American Chinese) did not tell us that [redacted] had stayed in Hotel M. She did not have full details of her husband's travel history and she was reluctant to give information.

9. Seventh, the St Paul's Hospital (SPH) cluster index case was not a severe community acquired pneumonia (SCAP) case when admitted to SPH on 2 March. DH was notified on 13 March when the index case became a SCAP case. DH learnt of his stay in Hotel M from the index case himself during case interview / contact tracing on 14 March.

10. Finally, there was no clinical SARS case among staff at Hotel M. The one admitted to Yan Chai Hospital during 2-11 March had a diagnosis of bacterial pneumonia and he subsequently recovered.

Amoy Gardens Index Patient – [redacted] YY

11. You have asked about the policy at the material time regarding follow up of patients discharged from PWH Ward 8A. The agreement with PWH was that the hospital would make available to DH a daily master list of persons for case investigation / contact tracing. DH would look into every person on the master list (whether discharged or not) and take appropriate follow up action, although DH's understanding was that PWH Ward 8A was closed to admission and discharge (paragraph 39 of my last letter refers). The follow up action taken by DH is illustrated by the Amoy Gardens index patient case described below.

12. [redacted] YY first appeared in the master list referred by PWH to DH in the evening of 16 March. After sorting out newly reported cases from old cases, DH staff embarked on case investigation on 17 March. The normal practice was that DH started with the more serious cases. We also discussed with PWH colleagues the latest clinical conditions of persons referred to us in the master list. It was likely that by the time we were to interview [redacted], he had already been tested positive for influenza A. Hence no follow up action was required. As pointed out in my last letter, it was PWH which took action to drop [redacted] from the master list subsequently. This was only a logical decision following the influenza A diagnosis and was a clear indication that PWH also did not consider it necessary for DH to follow up on [redacted]. There was no indication from PWH that [redacted] was discharged home on 19 March. We learnt this on 23

March when DH conducted a case interview with [redacted] upon notification by PWH.

13. At this juncture, I should perhaps refer you to paragraph 68 of my last letter and reiterate that the list of printout of patient records was meant to provide DH with telephone numbers to facilitate contact tracing and was different from the master list referred to in paragraphs 11-12 above which provided names for case investigation / contact tracing purpose. Incidentally, please note that there was a typo: the list of printout of patient records was received by fax at about 11:30 (not 18:30).

Flight CA112 and Flight CA 115

14. As mentioned in Annex 8 of my last letter, DH initiated active case investigation on the same day upon receipt of notification on 23 March. Passenger lists obtained from the airline contained very limited information for tracing the passengers. We therefore sought the assistance of the Immigration Department and the tour agencies with a view to obtaining contact information of as many passengers as possible. A public announcement was also issued to appeal to the passengers to contact the DH hotline.

15. Based on information on travel documents and nationalities reported, non-local passengers were identified from the lists and the relevant health authorities/consulates were duly informed to take appropriate action for follow up. The aforesaid group was not counted towards passengers contacted by DH. Moreover, despite meticulous checking and verification, information on some passengers was still incomplete, obsolete or unavailable, hence making contact impossible. Nonetheless, DH had taken a proactive and resourceful approach and had exercised professionalism and due diligence in tracing the passengers for surveillance.

Madam [redacted]

16. You have also asked about the SARS case of [redacted]. Our investigation indicated that one travel collateral of [redacted] also contracted SARS. Later on, DH was notified that a nurse ([redacted]) who had cared for [redacted] got the disease. All three eventually recovered. There was also another nurse ([redacted]) who was admitted to PWH on 1 March

for gastrointestinal tract symptoms and that was not a SARS case. More details about our case investigation / contact tracing action are provided in the following paragraphs.

17. On 22 February, DH was notified of [redacted]'s admission into PWH ICU as a SCAP case. DH initiated case investigation and contact tracing on the same day.

18. [redacted] was a 49-year old American Chinese living in the US for more than 10 years. She came back to Hong Kong on 30 January 2003 and travelled to Henan, Guangzhou to visit her mother from 31 January to 17 February. [redacted] developed fever and cough on 16 February while in Guangzhou. Her symptoms persisted after consulting doctor in the Mainland and she was admitted to the Union Hospital on the day of return from Guangzhou on 17 February. Chest X-ray findings were compatible with pneumonia. She was treated with Tamiflu, several antibiotics and intravenous immunoglobulin but her condition deteriorated with respiratory failure. She was transferred to PWH on 22 February and recovered eventually. Serological tests later confirmed her as a SARS case.

19. Four relatives from Hong Kong joined [redacted] in the visit to Guangzhou. Contact tracing revealed that one of them developed SARS. A 42-year-old female relative ([redacted]) who had fever and cough on 21 February was admitted to the Prince Margaret Hospital (PMH) from 22 to 24 February and re-admitted on 26 February. She recovered eventually and was later confirmed to be suffering from SARS.

20. On 28 February, DH was notified of the admission of [redacted] to PMH as a SCAP case. DH immediately initiated case investigation and contact tracing action.

21. Case investigation revealed that [redacted] was a nurse in the Union Hospital who had cared for [redacted] daily during 17-22 February. She developed malaise on 22 February followed by myalgia, cough, fever and chills two days later. She was admitted into PMH on 27 February and subsequently recovered. Serological tests later confirmed her as a SARS case. None of her eight close contacts (husband, daughter, domestic helper, parents-in-law and family of brother-in-law) developed symptoms. DH also contacted the Union Hospital on 28 February for medical surveillance of staff and patients exposed to [redacted] and [redacted], and noted that none of the contacts developed symptoms.

22. I hope you find the above information useful.

Yours sincerely,

(Dr P Y Lam)
Director of Health

ATTACHMENT 5

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HEIKE PHILLIPS
2003-03-27

The virus that stole across the globe

The date is Friday, February 21. A group of strangers gather in the lift lobby on the ninth floor of a Mongkok hotel, one of them coughing and sneezing. The elevator arrives and they share a brief journey to the ground floor before the doors slide open and they part company.

None could have expected this encounter would set in motion a chain of events that would claim the lives of three in their group and spread disease and fear among hundreds of people worldwide.

The man who sneezes is a 64-year-old who has arrived by bus from Guangdong a day ago to attend a wedding. Feeling too sick to attend, however, he is taken to hospital on February 22.

His name is AA [redacted] and on being admitted to Kwong Wah Hospital, he warns medical staff they should not touch him as he fears he has contracted a very virulent disease.

He tells staff he is a professor in respiratory medicine at Zhongshan University in Guangzhou and has been treating patients with atypical pneumonia at the university's no. 2 hospital. His colleagues in the intensive care unit have fallen ill one by one.

Health authorities in Hong Kong discover that the professor showed symptoms of the disease on February 15, at which point in time he would still have been on the mainland.

According to the World Health Organisation, the incubation period for the virus is between two and seven days.

Was AA [redacted] motivated to come to Hong Kong for a wedding, or was there an underlying motive of seeking medical help across the border, away from the hospital where the disease struck his colleagues?

On March 4, AA [redacted] dies in isolation. Over the next few days and weeks, 70 medical staff at the hospital are struck down, as well as 17 medical students.

Hospital staff take the virus home to their families, infecting eight children. Classes at

their schools are suspended.

The date is February 23. [redacted], a 78-year-old visitor from Toronto, checks out of the Metropole Hotel, where the man in the lift lobby sneezed, and begins her homeward journey.

On arrival in Toronto, she is reunited with her family. But she soon falls ill and is taken to Scarborough Grace Hospital, where she dies on March 5.

Five members of her family are found to be infected and taken to the same hospital. Her son, 44, loses his fight against the disease eight days after his mother.

Another hotel guest, an American-Chinese businessman from Shanghai, checks out of the Metropole. He catches a plane to Hanoi where, two days later, he is admitted to hospital.

He spreads the virus to staff at the French Hanoi Hospital before being flown to Hong Kong on March 6. He is treated at Princess Margaret Hospital, where he dies on March 13. A Vietnamese nurse who cared for him dies, along with three other people, and the virus spreads to 50 workers at two Hanoi hospitals.

The date is February 24. A 26-year-old man who has visited friends at the hotel where the man sneezed on February 21 begins to feel unwell. He thinks nothing of it, but by March 5 he is admitted to Ward 8A in the Prince of Wales Hospital.

Days later, his sister falls ill and is taken to Princess Margaret Hospital, having already infected at least three of her colleagues. One joins her at Princess Margaret Hospital, while the others are admitted to the Pamela Youde Nethersole Eastern Hospital on March 14.

A female hospital worker returns home from treating the patients at Eastern Hospital. She passes the virus to her 15-year-old son, a student at St Joan of Arc Secondary School in Braemer Hill, which later suspends classes.

The date is February 25. Three young Singaporean tourists end their four-day stay at the hotel where the man in the lift lobby sneezed.

They return to Singapore, and are later taken to hospital. They spread the virus to at least 17 medical workers, including a doctor who leaves for New York after treating atypical pneumonia patients. During the flight, he begins to feel unwell and is taken off the plane in Frankfurt.

The date is March 2. A Canadian man of 72 who has stayed at the Metropole since February 12 is transferred from St Paul's Hospital, where he has infected three workers, to Queen Mary Hospital.

The date is March 10. The Hospital Authority announces the outbreak of atypical

pneumonia.

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00111 : The Metropole mystery

Close

The Metropole mystery

Experts remain baffled as to how doctor spread Sars to other guests

Ellen Nakashima

AA [redacted], a greying physician from southern China, had a scare in mid-February, when it looked as if he'd picked up a strange new strain of pneumonia that was raging in his province.

But after he dosed himself with antibiotics, his chest X-rays looked clear. On February 21 he felt well enough to take a three-hour bus ride with his wife from their home in Guangdong to Hong Kong for a nephew's wedding.

Well enough to check in that day to Room 911 of the Metropole Hotel.

By the following morning AA he was feeling very ill, and by the time he checked out at 10am [redacted] had spread a deadly virus directly to at least eight guests. They would unknowingly take it to Singapore, Toronto, Hanoi and across Hong Kong, where the virus would continue to spread.

Of more than 8,000 cases of severe acute respiratory syndrome tallied so far worldwide, the World Health Organisation (WHO) estimates that more than 4,000 can be traced to [redacted]'s stay at the Metropole. AA

How AA [redacted] passed the virus to the other guests remains a mystery. Some investigators now believe he might have vomited in front of his hotel room door, somehow infecting passers-by. What is clear is that the transfer took place in that hallway, not in the rooms, the elevator or the lobby, WHO officials say.

As Hong Kong stands on the threshold of declaring Sars contained, political debate still rages over how the government responded during the critical first month after the disease emerged in the city.

On the day AA [redacted] and his wife checked in, the Metropole, a friendly three-star Kowloon hotel, was running at its usual 90 per cent occupancy.

Also on the ninth floor that night were three women from Singapore, two of them in 901, a concierge said.

Just opposite AA [redacted] in 910, he said, was a Chinese-American businessman, DD [redacted], who was en route to Hanoi from Shanghai. A Toronto woman, [redacted], and her husband checked out of their ninth-floor room the day AA [redacted] checked in. All six would eventually contract Sars.

According to the Hong Kong health department, 14 Sars cases among hotel guests can be traced, directly or indirectly, to [redacted]'s stay _ including a AA

26-year-old Hong Kong airport worker and tourists from China, Canada, the United States, Singapore and Ireland.

None of the hotel's 300 employees became ill. WHO officials say the hotel is completely clean, with no trace of live virus.

When AA checked out, he went straight to Kwong Wah Hospital, five blocks away. He entered the intensive care unit in critical condition. Alert staff knew he was from Guangdong, where an outbreak of atypical pneumonia was rampant, and that a Hong Kong father and son had just died of ``bird flu'' after visiting Fujian province. They put AA in an isolation ward.

AA insisted he did not have atypical pneumonia. But when doctors showed him his chest X-ray, he saw the tell-tale patchy white markings on his lungs. He could only nod.

``Then he was convinced he had atypical pneumonia,'' said a doctor who treated him. ``He was scared.''

In his final hours of consciousness, AA, 64, told the staff he was a retired kidney specialist working part-time at Zhongshan No 2 Hospital.

Because this strange disease had infected scores of doctors and nurses since February 8, AA, like his colleagues, began to wear a mask, gloves and gown for protection, he told staff.

Early on February 23, AA was hooked up to a ventilator. He would never regain consciousness.

Yip Waichun, chief of service of the hospital's surgery department called K Y Yuen, a microbiologist who headed Hong Kong University's microbiology department and oversaw a team researching the Guangzhou pneumonia outbreak. Yuen agreed to send two colleagues that day.

Yuen saw AA four days later. He had a 102-degree fever. He did not respond to anti-bacterial or anti-flu agents, including ribavirin, an antiviral drug.

Then AA's brother-in-law, [redacted], was admitted to Kwong Wah with the same symptoms. Yuen ordered an open-lung biopsy. ``He was very, very short of breath already,'' Yuen recalled.

``His lung was whited out completely. We thought it was extremely important to get the lung tissue.''

As AA lay unconscious in Kwong Wah Hospital, people were falling ill in Hanoi, Singapore, Toronto and elsewhere in Hong Kong. As they sought treatment, they began to infect doctors and nurses, too.

On February 26, [redacted] began to feel feverish in Toronto, and DD was admitted to the Hanoi French Hospital. Between March 1 and 3, the three Singaporean women were taken to hospital.

On March 4, a 26-year-old Hong Kong airport worker who had visited the Metropole was admitted to Prince of Wales Hospital.

That day, AA died in Kwong Wah after infecting his wife, sister and daughter.

On March 5, [redacted] died in Toronto, and her son, daughter-in-law and grandchild became ill.

By March 6, 11 doctors and nurses were infected in Hanoi, and WHO parasitologist Carlo Urbani alerted the world to an outbreak of atypical pneumonia.

The Hong Kong health department in February stepped up its surveillance system on pneumonia and requested that all hospitals report severe cases. But it didn't launch a broad investigation until March 10, when 18 doctors and nurses called in sick at Prince of Wales Hospital.

Hong Kong suddenly faced a health crisis of unprecedented proportion.

The hospital staff didn't know it at the time, but a patient in their midst, the young airport worker who had visited a friend at the Metropole, was infected.

Doctors had administered medicine to him with a nebuliser, which produces a fine spray. The nebuliser spread the virus around Ward 8A. By March 11, 50 doctors and nurses were infected.

On March 13, a 33-year-old kidney patient who visited Prince of Wales Hospital for dialysis was admitted to Ward 8A overnight to await his blood test result. Released on March 14, he visited his brother that day and on March 19 at Amoy Gardens in Kowloon Bay, a high-rise housing complex with about 16,500 people.

The kidney patient had picked up the virus at the hospital and by March 21, the disease was coursing through Block E at Amoy Gardens. Eventually, more than 300 people would be infected in what one WHO official called ``the mother of all environmental spreads''.

By March 13, the health department had stepped up infection-control measures at all hospitals. And as the virus was spreading, the department was contacting health authorities in other countries that had also reported Sars cases.

But the disease continued to create other unintended calamities.

Finally, health officials in Hong Kong got a break. Reports emailed from Singapore and Canada revealed a common link between two patients: the Metropole Hotel.

Other important breakthroughs followed.

On March 21, with the tissue from AA [redacted]'s brother-in-law, Yuen's team at Hong Kong University was able to grow the virus and spot the signature crown spikes of a particular family of viruses: coronavirus. It was the coronavirus that causes Sars.

Though the WHO has called Hong Kong's efforts to contain Sars ``heroic'', the territory's leaders initially tried to play down the threat. Deputy Health Director Leung Pak-yin said on March 13 that the cases appeared to be limited to hospitals, indicating the disease would not spread to the community. The next day, Health Secretary Yeoh Eng-kiong denied that Hong Kong was facing an outbreak.

``I was furious,'' fumed one doctor at a hospital hit by Sars. ``That was definitely an outbreak.'' He said Leung's attitude was dangerous.

Yeoh acknowledged on May 3 that the response was inadequate. ``It's a fact we weren't speedy enough,'' he said. But, he emphasised: ``When the outbreak first happened, we didn't even know what kind of virus it was. We didn't know how the virus manifested itself.''

Today, investigators still don't know why the Metropole Hotel staff escaped infection. They don't know why only one of the initial three Singaporean women infected transmitted the virus, leading to 198 cases. She survived, but her parents and pastor died.

Washington Post

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