Information provided by the Cluster Chief Executives of the Hospital Authority (HA) on internal investigations of the Severe Acute Respiratory Syndrome (SARS) outbreak

Cluster	Appendix	Internal investigation report
Hong Kong East	I	Enclosed
Hong Kong West	II	Enclosed
Kowloon Central	III	Not applicable because there was no outbreak
Kowloon East	IV	Enclosed
Kowloon West	V	Enclosed
New Territories East	VI	a. Outbreak at Ward 8A of Prince of Wales Hospital -- issued earlier (SC2 Paper No. : A87 vide LC Paper No. CB(2)798/03-04) b. Outbreak in Alice Ho Miu Ling Nethersole Hospital -- issued earlier (SC2 Paper No. : A91 vide LC Paper No. CB(2)798/03-04) c. Outbreak in North District Hospital -- issued earlier (SC2 Paper No. : A92 vide LC Paper No. CB(2)798/03-04)
New Territories West	VII	Outbreak in Tun Mun Hospital -- issued earlier (SC2 Paper No. : A101 vide LC Paper No. CB(2)798/03-04)

Appendix I

東區尤德夫人那打素醫院

PAMELA YOUDE NETHERSOLE EASTERN HOSPITAL

BY FAX (total: 12 pages)

2 March 2004

Miss Flora Tai
Clerk to Select Committee
Legislative Council
HKSAR of PRC
Legislative Council Building
8 Jackson Road
Central
Hong Kong

Dear Miss Tai

Select Committee inquiry into the handling of the SARS outbreak by the Government and the Hospital Authority

In response to your letter of 25 February 2004, I attach the copy of the report into the outbreak at A5 ward of Pamela Youde Nethersole Eastern Hospital.

This report had previously been submitted to the Hospital Authority and through them to the SARS Expert Committee and the HA Review Panel on the SARS outbreak.

Yours sincerely

Pamela Leung

(Dr Pamela Leung)
Cluster Chief Executive (HK East Cluster)
Pamela Youde Nethersole Eastern Hospital

Encl

香港柴灣樂民道三號 3 Lok Man Road, Chai Wan, Hong Kong.
電話 Tel No : 2595 6111 傳真 Fax No : 2515 0794

Report on A5 Health Care Worker (HCW) SARS Outbreak

Prepared by:

Dr Raymond YUNG, Infection Control Officer, HKEC

Dr Loretta YAM, Clinical Co-ordinator/ COS(Medicine), PYNEH

Dr C C LAU, COS(A&E), PYNEH

Ms WONG Suk-yee, RN (ICN), PYNEH

Ms Ida YIP, NS (ICN), PYNEH

Ms CHAN Wai-fong, RN (ICN), TWEH

Pamela Youde Nethersole Eastern Hospital

Infection Control Team

Infection Control Management on

A5 Health Care Worker (HCW) SARS Outbreak

I. Index case

2 Mar 03
- Index case ([redacted]) was admitted for community acquired pneumonia.
- History of travel to China (22 Feb 03 – 23 Feb 03).
- Onset of fever on 25 Feb 03.
- Stayed in ward A5 (2 Mar 03 – 7 Mar 03). Fever not responded to antibiotics.

7 Mar 03 Index case was transferred to D5 (MHDU) for non-invasive ventilation (NIV) using BIPAP. Lymphopenia noted.

9 Mar 03 Index case was intubated and was on mechanical ventilation. Intubation was carried out by COS(Med) using standard protection i.e. surgical mask, face shield, protective gown and gloves.

10 Mar 03
- Index patient was given hydrocortisone to treat as acute respiratory distress syndrome (ARDS).
- General condition deteriorated.

15 Mar 03 Index case was started on methylprenisolone plus ribavirin.

16 Mar 03
- Index case passed away. Electronmicrograph of paramortem lung biopsy showed viral particles compatible with coronavirus.
- Look back serological study on the serum collected showed elevated titer against coronavirus (1:2560)

Comment

The index case was identified soon after the admission of the first HCW affected, for both showed similar clinical and radiological presentations. Subsequently 1 patient contact, 1 visitor contact, 11 PYNEH HCW, 4 family contact of PYNEH HCW were epidemiologically linked to the index patient directly or indirectly (appendix I).

II. Patient and visitor contact to index case

(a) Patient contact

11 Mar 03
- Patient ([redacted]) was admitted for high swinging fever since 8 Mar 03.
- History of admission into A5 ward 27 Feb 03 – 4 Mar 03.

- for investigation of left chest wall lesion; which eventually turned out to be carcinoma of lung. He shared the same cubicle and stayed adjacent to the index case.
- Subsequent clinical course was compatible with SARS.
- Patient received methylpreduisolone plus ribavirin.

10 – 20 Apr 03
- Hospital acquired pneumonia requiring intubation and mechanical ventilation.
- General condition improved slowly and was discharged on 22 May 03.

(b) Visitor contact

14 Mar 03
- Patient ([redacted]) was admitted for fever and bilateral lower zone consolidation with lymphocyte 0.9.
- Patient was wife of patient ([redacted]) who stayed in the same cubicle but across the aisle to index case. She visited her husband regularly. Exact detail of contact could not be recalled by patient.
- Patient's general condition improved after methyprednisolone plus ribavirin treatment and was discharged on 4 Apr 03.

Comment

Both patients showed elevated serology against coronavirus. Exact nature of contact to the index case could not be recalled by both patients.

III. PYNEH HCW contact of index case

9 Mar 03
- HCW ([redacted]) was admitted into ward A5 for sign and symptom of pneumonia.
- Nursed in isolation room with negative pressure.
- Initial treated as community acquired pneumonia.
- Several staff were on sick leave in the previous three days.

11 Mar 03
- Staff who requested sick leave for fever and mild respiratory symptoms was called back for CXR and blood tests and to be followed up daily.
- All staff in A5 and D5 was checked for sign and symptom of pneumonia and were scheduled for CXR.
- Possible pneumonia outbreak was reported to Infection Control Team
- Index case was identified.

12 Mar 03
- CCE decided to set up A5 ward as CAP cohort ward.
- All existing patient without pneumonia like symptoms were to transfer to other medical wards. The remaining was cohorted and closely monitored in A5. Droplet and contact precaution were implemented.

Staff was advised to wear surgical mask, protective gowning, and gloves during patient care.

- COS(AED) was informed.
- Staff at AED was informed to wear surgical mask when contact with patients with respiratory symptoms.
- Staff of PYNEH were requested to attend AED if having respiratory tract symptoms.
- A checklist on the management of outbreak (appendix II) was prepared for the ICT.

13 Mar 03
- HCW #2([redacted]) who developed malaise abnormalities on CXR was admitted.
- Prof K Y Yuen, upon consultation by COS(Med) and COS(Path), visited PYNEH patients. He advised on improving airflow in wards and suggested steroid plus ribavirin treatment as experimental treatment based on success at KWH.
- Decanting of ward A5 of non-pneumonia patients was completed in late afternoon. The ward was operated as mixed male and female ward and was divided into AP triage and clinical AP section.
- Pregnant MO deployed to other ward areas.
- Respiratory and critical care specialists were assigned as supervisors in cohort ward.
- Air change of all medical wards was upgraded to over 8 air change per hour.
- DH and HAHO was informed.
- ICO attended Eastern District Council for CCE to brief members of the AP situation at PYNEH.

14 Mar 03
- All A5 ward staff had CXR and investigation done.
- HCW #3([redacted]), #4([redacted]), #5([redacted]), #6([redacted]) were admitted.
- Characteristic of AP disseminated to doctors, nurses, and COS(AED) to heighten awareness.
- Admission criteria to cohort ward was established and disseminated to doctors and nurses and COS(AED).
- Daily update to HAHO and CCE on staff developed AP.
- First open forum was conducted (follow up forum were conducted on 15 Mar, 17 Mar, 22 Mar, 28 Mar, 2 May).

15 Mar 03
- Works started in A5 ward by EMSD, including installation of exhaust fans and folding doors to cubicles.

16 Mar 03
- HCW #7([redacted]) was admitted for sign and symptoms of AP.
- Negative pressure ventilation in D5 achieved, air exchange increased to more than 10 per hour.

17 Mar 03
- Two cohort wards set up i.e. A5 for male patients and B5 for female patients.
- ICT met EMSD to refine air balance in A5, B5 and D5 to ensure airflow from clean to dirty zone.
- Advised visitors to A5, B5 and AED to wear masks.
- Minimized patient and staff transfer, restricted patient-related activities, e.g. physiotherapy, X-ray inside cohort ward.
- All volunteer work in PYNEH was stopped.
- All clinical teaching activities in PYNEH were suspended.

18 Mar 03 ICT PYNEH, RHTSK and TWEH met together to discuss SARS management, information sharing within cluster.

19 Mar 03
- Developed CAP case profile which would be shared electronically by ICT members at PYNEH, RHTSK and TWEH.
- The first version of Guideline on Management of SARS was issued by HAHO. Limited high risk procedure viz. nebulization and BIPAP in PYNEH to patients with clearly defined conditions. If considered deemed indicated by chest physician, it must be done in room with negative pressure and environment cleansing had to be carried out immediately after each patient.

23 Mar 03 HCW #8 ([redacted]) was admitted into PYNEH.

24 Mar 03
- HCW #9([redacted]), 10([redacted]) were admitted into cohort ward. Staff caring patients in A5, B5, ICU, MHDU, AED, CEU to put on surgical mask (N95 mark was recommended for direct patient contact activities), gown, gloves, and FACESHIELD. Hand hygiene was to be observed before and after each patient contact.
- Infection control measures were further enhanced to cover non-clinical areas including offices and canteens.
- Surgical mask to be worn by all staff within hospital compound.

26 Mar 03 Once Central Nursing Division staff HCW #11([redacted]) was admitted to HK Sanatorium, and was subsequently transferred to QMH on 28 Mar 03 for further management. He conducted survey on SARS staff in A5 ward on 17 Mar, wearing gown and mask but no protective eyewear. A total of 11 staff was admitted after unprotected exposure to an unexpected SARA case. No more staff epidemiologically related to the index case was admitted. Admission chart of A5 ward SARS outbreak was attached (appendix III).

Summary

A total of 11 HCW were epidemiologically linked to the index patient. The detail of contact history was described in the Contact column of appendix I. Two breakthrough infection were also charted. HCW #12 ([redacted]) was infected while carrying out terminal cleansing of the bronchoscopy suite for a suspected pulmonary TB patient who later happened to be suffering from SARS. HCW #13 ([redacted]) was infected while carrying out night duty in the SARS ward. Workflow in the two patient care areas were reviewed. Since 13 Apr, no more HCW was infected.

The key point in our strategy to prevent HCW from SARS infection include:

- Good communication between different teams
- Just in time training programme for all grades of staff
- Everybody march to the same drum

IV. Family contact of PYNEH HCW (appendix I)

20 – 22 Mar 03

- 4 household contacts of 3 infected HCW were admitted (appendix I).
- All underwent steroid plus ribavirin with little complication except Madam [redacted] (mother of staff [redacted]). She required pulse steroid and non-invasive positive pressure ventilation. HCW #6

Comment

Several hypothesis was postulated on the relatively low attack rate among family members of affected HCW. The most likely explanation was that HCW were usually admitted during the early course of the disease when the infectivity was still at a relatively low level.

Overall comment

Three key lessons learned from the outbreak:

1. It is essential to receive feedback from staff when preparing guideline, to ensure that the message was correctly received and the appropriate action were being carried out.
2. For contingency plan, a simulated drill is important to ensure different parties were coordinated in an efficiency manner.
3. An infection control enforcement team is crucial during outbreak to ensure compliance to the guideline promulgated and optimal protection to the HCW.

Summary of A5 SARS Outbreak (HCW and Patient Contact)

Appendix I

	Case no.	Hospital	Work location	Name	I.D. no	Sex	Age	Rank	Onset date	Admission date	Travel history	Contact History	Contact Detail	Discharge date
Patient Contact of Index Case	1	PYNEH		[redacted]	[redacted]	M	[redacted]		24/02/03	02/03/03	Y	N	Travelled to Chung Shan (中山) 1 week prior to admission. EM of lung biopsy showed viral particles.	16/3/03 (Death)
	1	PYNEH		[redacted]	[redacted]	M	[redacted]		09/03/03	11/03/03	N		Patient next to index case.	22/05/03
	2	PYNEH		[redacted]	[redacted]	F	[redacted]		07/03/03	14/03/03	N		Wife of patient [redacted] across the aisle to the index case.	04/04/03
HCW	1	PYNEH	A5	[redacted]	[redacted]	M	[redacted]	EN	06/03/03	09/03/03	N	A5 index	General nursing care during stay of index case.	06/04/03
	2	PYNEH	A5	[redacted]	[redacted]	M	[redacted]	HCA	04/03/03	13/03/03	N	A5 index	Bed making, packing index case's personal belongings while index case on CPAP.	06/04/03
	3	PYNEH	A5	[redacted]	[redacted]	F	[redacted]	HCA	07/03/03	14/03/03	N	A5 index	Transfer index patient.	15/04/03
	4	PYNEH	A5	[redacted]	[redacted]	F	[redacted]	HCA	08/03/03	14/03/03	N	A5 index	Clean bed next to index case while he is on CPAP.	11/04/03
	5	PYNEH	A5	[redacted]	[redacted]	M	[redacted]	MO	08/03/03	14/03/03	N	A5 index	Index case MO. Perform physical examination and interview of index case.	05/04/03
	6	PYNEH	A5	[redacted]	[redacted]	F	[redacted]	RN	10/03/03	14/03/03	N	A5 index	Take throat swab of index case and general nursing care for index.	13/04/03
	7	PYNEH	A5	[redacted]	[redacted]	F	[redacted]	WKM II	10/03/03	16/03/03	N	A5 index	Waste collection with mask and gloves.	29/04/03
	8	PYNEH	A5	[redacted]	[redacted]	F	[redacted]	RN	17/03/03	23/03/03	N	A5 index	General nursing care during stay of index case (barrier precaution since 13/3/03).	13/04/03
	9	PYNEH	A5	[redacted]	[redacted]	M	[redacted]	RN	24/03/03	24/03/03	N	A5 staff with SARS	General nursing care during stay of index case. Wear gown and mask but no eye protection. (Eyeshield provided since 23/3/03)	19/04/03
	10	PYNEH	A5	[redacted]	[redacted]	M	[redacted]	RN	24/03/03	25/03/03	N	A5 staff with SARS	Assisted index case for CPAP. Wear gown and mask but no eye protection. (Eyeshield provided since 23/3/03)	25/04/03
	11	PYNEH	CND	[redacted]	[redacted]	M	[redacted]	SNO	21/03/03	26/03/03	N	A5 staff with SARS	Perform survey of SARS case on 17/3/03. Wear gown and mask but no eye protection. (Eyeshield provided since 23/3/03)	18/04/03
Not related to index case	12	PYNEH	C5	[redacted]	[redacted]	F	[redacted]	WA	27/03/03	01/04/03	N	A5 patients	Take BP for a SARS patient. Post bronchoscopy environmental disinfection of that patient. PPE worn except eye wear and face shield.	23/04/03
Not related to index case	13	PYNEH	B5	[redacted]	[redacted]	F	[redacted]	HCA	12/04/03	13/04/03	N	B5 patients	Frequent changing of PPE (6 times) at night shift.	06/05/03

Summary of A5 SARS Outbreak (HCW and Patient Contact)

Appendix I

	Case no.	Hospital	Work location	Name	I.D. no	Sex	Age	Rank	Onset date	Admission date	Travel history	Contact History	Contact Detail	Discharge date
Family contact of HCW	1	PYNEH		[redacted]	[redacted]	F	[redacted]		16/03/03	20/03/03	N	Relative of infected A5 staff	Mother of SARS staff [redacted]	17/04/03
	2	PYNEH		[redacted]	[redacted]	F	[redacted]		17/03/03	20/03/03	N	Relative of infected A5 staff	Sister of SARS staff [redacted]	13/04/03
	3	PYNEH		[redacted]	[redacted]	M	[redacted]		13/03/03	21/03/03	N	Relative of infected A5 staff	Son of SARS staff [redacted]	14/04/03
	4	PYNEH		[redacted]	[redacted]	F	[redacted]		18/03/03	22/03/03	N	Relative of infected A5 staff	Mother of SARS staff [redacted]	13/04/03

Appendix II

Checklist on control of outbreak caused by an unknown agent

Action by

I. CASE DEFINITION — CICC

(Evolving, depending on the presentations and the surveillance findings)

II. CLINICAL MANAGEMENT — MED+A&E+ICO

A. Draw up diagnostic protocol
B. Draw up treatment protocol
C. Draw up laboratory and radiological contingency plan
D. Assess impact on the clinical service (clinic + inpatient service)
E. Staff deployment — HCE+ Clinical coordinator, Medical Committee

III. INFECTION CONTROL

A. Decide possible mode of transmission — ICT+ HAHO SARS coordinator centre
B. Decide mode of isolation
C. Decide mode of protection
D. Decide cohort / non cohort
E. Training and auditing — ICT+ICET

IV. MATERIAL MANAGEMENT

A. Drug — Pharmacy
B. Protective gear: supply + maintenance — Supplies dept.
C. Environmental control
   (i) air condition (ii) house keeping — General Support Service
   a) Transportation
   b) Catering
   c) Canteen facilities
   d) Changing room

V. STAFF SENTIMENT — HR+ICT

A. Open forum
B. Updated data
C. Counselling program
D. Occupational disease compensation

VI. SURVEILLANCE — ICT+SAR registry

A. Data to be collected
B. Mode of dissemination
C. Mode of communication to stake holders e.g. SHW, CE, CCE, COC, Dept, frontline HCW, DH, private practice, A&E, Family Clinic

Appendix II

Action by

VII. MEDIA PRO

A. Contain fear

B. Provide accurate update data

VIII. SEARCH FOR CAUSATIVE AGENT

A. Epidemiology PYNEH + HKU+DH+CUHK

B. Microbiology / Histological

C. Molecular

IX. BIOHAZARD PRECAUTION

A. Specimen handling: SOP for specimen handling, specimen collection

B. Laboratory safety: spillage control Mr K K Chan

C. Post mortem exam

X. SET UP LIASAR DIRECTORY WITH LINKING TO ICT

A. DH Regional Office

B. HAHO SARS Registry

C. QMH Lab

D. DH Lab

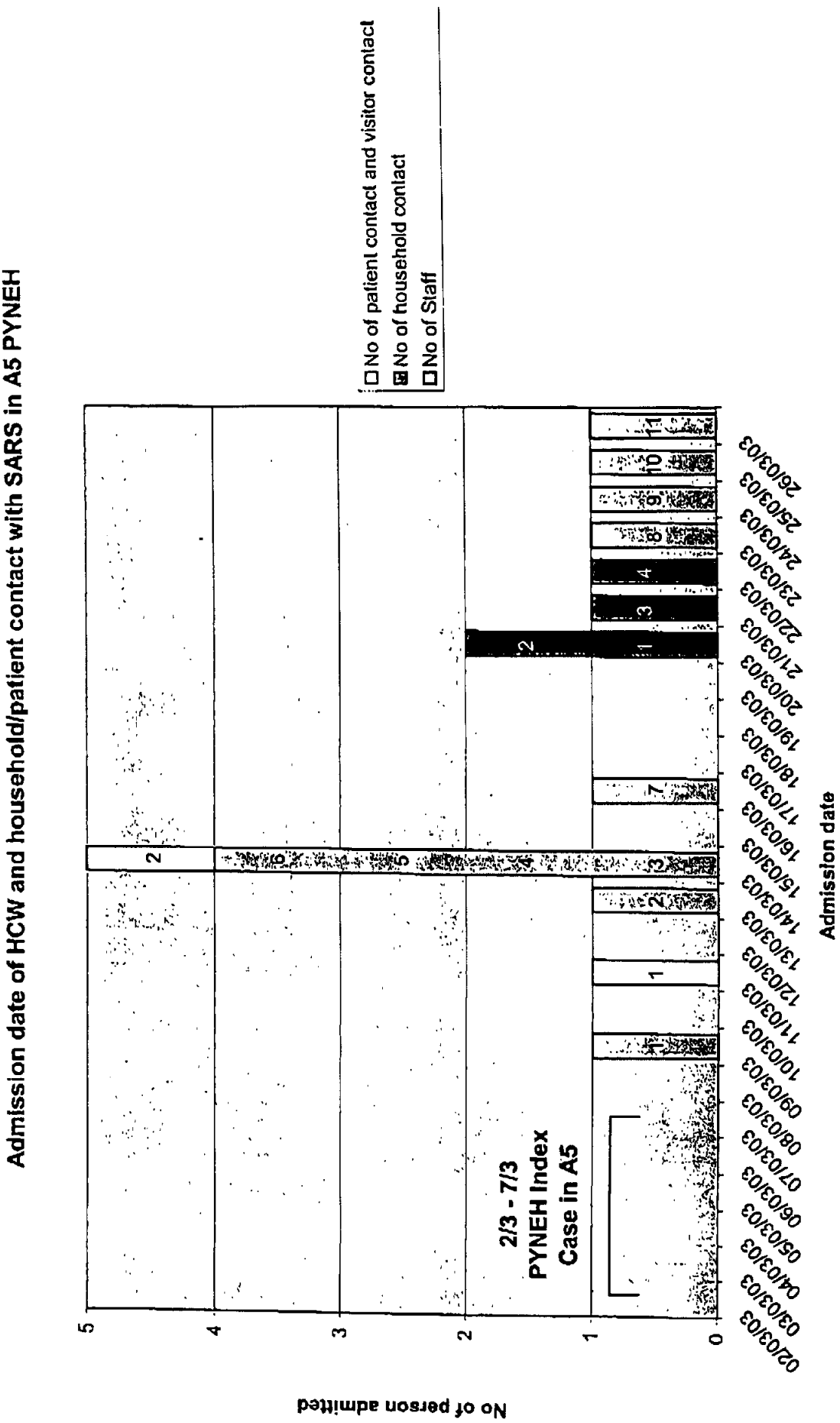
E. PYNEH Senior Administration

XI. HR ISSUE HR

A. Leave policy

B. Special consideration for family contacts

Appendix III



醫院管理局
HOSPITAL AUTHORITY

Dr. York Y.N. CHOW, SBS

1 March 2004

Miss Flora Tai
Clerk to Select Committee
Legislative Council
Legislative Council Building
8 Jackson Road, Central
Hong Kong

Dear Miss Tai,

Select Committee to Inquire into the Handling of the Severe Acute Respiratory Syndrome Outbreak by The Government and the Hospital Authority

In response to your request on 25 February 2004, I would like to confirm that :-

There were two staff in HKW who got infected with SARS when working in our B6 SARS ward, at Queen Mary Hospital in early May 2003. They were the only infected staff within our HKW cluster hospitals, presented with symptoms within two days of each other. Besides closing the B6 ward completely for disinfection, and recommended self-imposed isolation of social and work contacts of the two staff, our Infection Control Team conducted an intense investigation immediately after their admission prior to diagnosis confirmation. The investigation result was reported to me on 14 May 2003, and also communicated to all staff in our daily staff newsletter (Attachment 1). I also related the findings to the HAHO SARS Round-up Meeting the next morning, with the recommendation to take caution when administrating 100% oxygen to patients. The findings were separately reported in writing to HAHO by Dr. W.H. Seto and further updated with experimental simulation confirmation (Attachment 2).

Hong Kong West Cluster, Hospital Authority
C/o Queen Mary Hospital, 102 Pokfulam Road, Hong Kong.
Tel. (852) 2855-3021 Fax. (852) 2818-5170

We have also used this case study as a teaching tool for all the infection control education programme since, by our Infection Control Team to other HA and private hospitals.

The account of this experience (and Attachment 1 here enclosed) was submitted to HAHO in response to the requests from the SARS Expert Committee and the HA Review Panel on the SARS outbreak, and I also presented this experience to the HA Review Panel during their investigation.

Yours sincerely,

Dr. York CHOW
Cluster Chief Executive
Hong Kong West Cluster

Hong Kong West Cluster, Hospital Authority
C/o Queen Mary Hospital, 102 Pokfulam Road, Hong Kong.
Tel. (852) 2855-3021 Fax. (852) 2818-5170

Epidemiology Update on SARS situation in QMH 14/05/03

I am sure many are keenly aware of our two colleagues with suspected SARS. Although we have yet to report to HAHO, but for the RN, we believe she is definitely a confirmed case and had in fact started treatment. She showed a 4 fold rise in IgG to Coronavirus and should be a definite case. She is now afebrile and really doing well.

What is more important is that we had done a very extensive chain of investigations in the last 48 hours, and in fact have confidently identified the reason for these two unfortunate breakthrough infections to our staff, who had observed our meticulous infection control measures. An important aspect of such investigation is to generate possible hypothesis, to tests these out and to leave no stone unturned. We must have explored close to 20 different hypotheses. Remember the hypothesis must be able to explain why we have no infection for the last eight weeks. In other words – why now? So some of these hypotheses are not very probable – like our two nurses changed napkins for patients. Well they have been doing these for a long time and many nurses change napkins for patients – why an outbreak now? Finally, we noted that there were patients in B6 on 15L 100% O_2 therapy. So we pull out our QMH SARS cases data and found that from the start of our cohort SARS wards, there were only five cases on such therapy. However, three of these were being treated in B6 from 3rd to 8th of May, and all three were nursed on an isle bed. Thus there is a concentrated cluster of these patients blowing 45L per hour of air through SARS lungs on to the surrounding. This seems incriminating enough but we still need a case-control study. From the duty rooster of all nursing staff working in the 6th floor this is the 2 x 2 data set:

	Exposed To 15L O_2 pat.	Not Exposed	
Possible Infected SARS	2	0	p = 0.023 (Fisher's)
Non-infected staff	20	120	

Thus it comes up **significant.** Possibly the best is to give such high flow O_2 therapy in the ICU, where there are individual negative pressure rooms, in the future.

We also have solid evidence that poor gloving practice (not washing hands after glove removal), adjusting goggles with unwashed hands and also talking to patient too close (within 3 feet) are related to increased risks of infection. Please do avoid such practices.

While we do not have nil staff infection now, we should not despair. The key is that when we have colleagues infected, we must investigate thoroughly to prevent the next one. We are also fortunate to have identified the precise cause and it is something not yet described by others (15L O_2 therapy together). We can thus prevent further occurrences and this will also help others in the field.

In the meantime, Please do look after yourself.

Remember:
Wash hands,
Wear Masks,
Control SARS

Thank you.

Dr. Seto Wing Hong, Infection Control Officer

Report on 2 staff SARS infection in SARS cohort ward (B6) in QMH

Date	:	10.5.03
Staff infection	:	1 RN
		1 NO
Ward	:	B6 SARS ward
Staff quarantine	:	26
Patients infected	:	0 (All patients are SARS)

Investigation team was formed with ward NO, ward managers, DOM and SNO coordinator to investigate the outbreak. We have explored close to 20 different hypotheses able to explain why we have no infection for the last eight weeks. The whole investigation completed in 48 hours.

After intense review with all members, we noted that there were patients in B6 on 15L 100% O_2 therapy. So we pull out our QMH SARS cases data and found that from the start of cohort SARS wards, there were a total of five cases on such therapy. However, three of these were being treated in B6 from 3rd to 8th of May, and all three were nursed on an isle bed (refer appendix 1). Thus there is a concentrated cluster of these patients blowing 45L per hour of air through SARS lungs on to the surrounding. This seems incriminating enough but we still need a case-control study. From the duty rooster of all nursing staff working in the 6th floor this is the 2 x 2 data set:

	Exposed To 15L O_2 pat.	Not Exposed	
Possible Infected SARS	2	0	p = 0.023 (Fisher's)
Non-infected staff	20	120	

Thus it comes up significant.

A simulation study was also done in collaboration with Hong Kong Poly University. As shown in the appendix 2, oxygen flow rate of 15 litre per hour would contaminate as far as > 3 metre. In such case when nurses are attending the three patients or patrolling at the corridor were likely to be contaminated.

Recommendations

Possibly the best is to give such high flow O_2 therapy in the ICU, where there are individual negative pressure rooms, in the future.

It was also noticed that there were poor gloving practice (not washing hands after glove removal), adjusting goggles with unwashed hands and also talking to patient too close (within 3 feet) are related to increased risks of infection. Therefore to avoid further incidence of infection, it would be important to avoid such practices.

Appendix III

伊利沙伯醫院
QUEEN ELIZABETH HOSPITAL
九龍加士居道30號 30 Gascoigne Road, Kowloon, Hong Kong.

Your Ref: CB2/SC2

By Fax & Post

3 March, 2004

Miss Flora Tai
Clerk to Select Committee
Legislative Council
Legislative Council Building
8 Jackson Road
Central, Hong Kong
[Fax: 2248-2011]

Dear Miss Tai,

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

I refer to your letter of 25 February on the above subject.

Since there were no outbreaks of Severe Acute Respiratory Syndrome (SARS) in the ward(s) or units in hospitals of the Kowloon Central Cluster, there were no such internal investigations conducted in our cluster.

Yours sincerely,

(Dr Lawrence Lai)
Cluster Chief Executive
(Kowloon Central)

[Tel: (852)-2958-8882 Fax: (852)-2504-2784 e-mail: laifm@ha.org.hk]

HA 1110/QE

基督教聯合醫院
UNITED CHRISTIAN HOSPITAL
香港九龍觀塘協和街一百三十號
130, Hip Wo Street, Kwun Tong, Hong Kong
Tel 電話號碼: 2379 4702
Fax 圖文傳真: 2727 1990

Your ref: CB2/SC2

3 March, 2004

By fax and mail

Miss Flora TAI,
Clerk to Select Committee.

Dear Miss Tai,

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

I refer to your letter of 25.2.2004. UCH conducted an internal investigation into the SARS outbreak in Ward 12A, and the investigation report was submitted to Head Office of the Hospital Authority in early May 2003. A copy of the report is enclosed (appendix 1).

Although the SARS Expert Committee did not ask for submission of a report of the Ward 12A outbreak, to facilitate the understanding of the management of SARS in UCH, a short report of the ward 12A outbreak was submitted in late June 2003 to the SARS Expert Committee. A copy of this short report is enclosed (appendix 2). The main differences of this short report from the investigation report in May 2003 are:

1. The short report was an abstract of the investigation report;
2. The short report updated the number of non-SARS patients infected with SARS from 6 to 8;
3. A list of actions taken was added to the short report.

Thank you for your attention.

Yours sincerely,

Dr. C.Y. Tse
Hospital Chief Executive

Encs.

CYT/sn

Appendix 1

Investigation on 12A outbreak in UCH

United Christian Hospital had a massive influx of SARS patients from 25.3.03. Clinical SARS and suspected patients were admitted to SARS cohort wards of 6A, 6B, 8A and 9A. However, some patients initially not suspected to have SARS have been admitted to general medical and geriatric wards and eventually diagnosed as SARS and transferred to SARS cohort wards. Ward 12A is a general medical ward designated to admit female respiratory cases, in addition to general medical cases, and have admitted a number of such unsuspected SARS cases. The first batch of hospital staff infected from ward 12A started in 31/3/2003. Up to 12/4/2003 2 medical staff, 9 nursing staff, and 3 HCA of ward 12A have been infected with SARS and were admitted to UCH. (See Table 1) In addition, a total of 6 patient contacts have been infected with SARS of which 5 were in UCH and one was admitted to PMH. They were considered as secondary cases as a result of exposure to patients with SARS patient within the same cubicle or contact with staff.

From 22.3.03, 16 SARS patients were diagnosed in ward 12A. 10 were considered clinically as primary cases of SARS as their symptoms on presentation to AED were considered as related to SARS and 6 were considered as secondary cases (See Table 2). The length of stay of the primary SARS patients in 12A wards varied from 1 hour to 6 days before transferred to SARS cohort wards. 2 of them stayed for 1 hour, 5 stayed between 3 hours to 12 hours, 3 of them stayed for 1 – 6 days. Out of the 10 patients 3 were cared in isolation rooms on admission and contact isolation procedures were carried out. SARS patients staying in general wards are considered as risk to medical staff in general wards. After excluding those cared in isolation rooms and those just staying in the ward for less than 3 hours, a total of 4 potential index patients were identified namely, A [redacted], B [redacted], C [redacted], and D [redacted]. A [redacted] was unlikely because of the long gap between her admission and the onset of staff infections. On reviewing the list of secondary cases, 3 were staying in the same cubicle of B [redacted] and 2 were staying next to C [redacted]. (See Table 3). No patient has been in the same cubicle as D [redacted]. Therefore, the likely source of infection would come from 2 patients namely B [redacted] (6 days), C [redacted] (12 hours).

11 of the infected staff presented between 31.3.03 and 3.4.03. 3 nursing staffs have been infected SARS much later (6/4 – 11/4) than the first group. The possible cause could be staff social contact or contact with secondary cases. Contact with secondary case E [redacted] would be a high probable cause as the patient had been staying for

9 days in 12A and her relatives were also found to be infected with SARS later.

Investigation have also been made on the potential patient contacts / social contacts and has identified majority of infected staff have been in contact with patients [redacted], [redacted], [redacted], and [redacted]. Unprotected social contact with Chik [redacted] and Lau [redacted] were common amongst infected nursing staff. (See Table 4).

Infection control measures of ward 12A have been investigated also. Before 1/4/2003 the level of infection control measures were at general level. Following HAHO and hospital guidelines, all staffs have been put on surgical mask during clinical duty. Surgical masks with eye shield were used in high risk procedures. No surgical mask was provided to patients in general. Some patients were put on precaution of droplet isolation by mainly putting them together in same cubicle with hand washing after patient care. Goggles and protective gown were not used at that period of time. Cotton Gown was used only for patients in isolation rooms and cubicles with patients requiring droplet precaution. Gloves were used as indicated but not as a standard measure.

Conclusions

1. 12A ward has admitted a high number of unsuspected SARS patients.
2. The ward management was following HA and hospital Guidelines in the use of protective devices. The infection control measures were probably not adequate for SARS cases at that period of time in terms of lack of supply of surgical mask to all patients and the lack of provision of N95 masks, protective gowns and goggles
3. One index patient ([redacted]) has been staying in the ward for 6 days without precautions for SARS because the patient is not presenting with fever or pneumonia
4. Providing enhanced infection control measures in general wards and treating every patients in medical and geriatric wards as potential SARS patients would help to reduce the incidence of SARS outbreak in clinical staff in future.
5. Reduction of unnecessary movement of patients in wards would also reduce chances of spreading infection across different parts of the ward

(Table I)

12A outbreak incident

Date	Doctor	Nurses	HCA
31/3/2003	Yeung [redacted]		
1/4/2003		Chik [redacted] Lee [redacted] Lau [redacted]	Tang [redacted]
2/4/2003	[redacted] Kam	Lam [redacted]	Lau [redacted] Wong [redacted]
3/4/2003		Lau [redacted] Chow [redacted]	
4/4/2003			
5/4/2003			
6/4/2003		Lee [redacted]	
7/4/2003			
8/4/2003		Chiu [redacted]	
9/4/2003			
10/4/2003		Tong [redacted]	

(Table 2) 12A Patient Information

	Patients	Remark	Category of SARS	AED Dx	Fever in AED	Time stayed in 12A	Date to SARS
A	[redacted]	*	Primary case	Chest Infection	38.9	7 hours	22/3
B	[redacted]	*	Primary case	Hyponatraemia	No	6 days	1/4
	[redacted]	Isolation	Primary case	CAP	38.8	9 hours	28/3
G	[redacted]		Primary case	Chest Infection	37.3	1 hour	27/3
	[redacted]	Isolation	Primary case	Chest Infection	38.4	10 hours	27/3
	[redacted]		Primary case	Fever for Investigation	39.4	1 hour	28/3
C	[redacted]	*	Primary case	Pyelonephritis	38	12 hours	29/3
F	[redacted]	Isolation	Primary case	Chest Infection / ? TB	38.7	3 days	1/4
D	[redacted]	*	Primary case	CAP	40.1	20 hours	30/3
	[redacted]	*	Primary case	Lobar Pneumonia	38.5	3 huors	29/3
	[redacted]		Secondary case (same cubicle with [redacted] B)	DVT	No	5 days	2/4
	[redacted]		Secondary case (Next to [redacted] C and [redacted])	CVA	No	9 days	2/4
H	[redacted]		Secondary Case	DM	No	4 days	3/4
I	[redacted]		Secondary case ([redacted] C)	UTI	38.3	8 days	6/4
E	[redacted]		Secondary case (Next to [redacted] B)	Ca Lung, Chest Infection	38.1	9 days	Died in 12A
	[redacted]		Secondary case (opposite to [redacted] B)	Epilepsy and fever	38	4 days	PMH 4/4 Sym 31/3

(Table 3) **12A Patient Outbreak Investigation**

Bed Numbers

	Date	22/3	23/3	24/3	25/3	26/3	27/3	28/3	29/3	30/3	31/3	1/4	2//4	3/4	Time in 12A
A	[redacted]	26													7 hours
B	[redacted]					38	38	36	36	36	28				6 days
	[redacted]					39									9 hours
E	[redacted]			38	38	25	37	37	37	37	37	37			9 days
G	[redacted]						20								1 hour
	[redacted]						39								10 hours
	[redacted]							42							1 hour
C	[redacted]							42	24						12 hours
F	[redacted]								2	2	2				3 days
D	[redacted]								18-27						20 hours
	[redacted]								24						3 hours
	[redacted]						34	34	34	34	34				5 days
	[redacted]					41	41	41	41	41	41	41	40E	43	9 days
H	[redacted]						4	4				10	10		4 days
I	[redacted]					21E	21E	21E	23-32	32	32	32	2E		8 days
	[redacted]				32	22	35	35							4 days
	Daily Total	1		1	1	5	8	8	9	6	6	4	3	1	

Shaded patients are in isolation rooms

(Table 4) 12A ward staff and medical SARS

Staff Name	Potential Causes
Dr. Young	Patient Contact in 12A – looking after most patients with SARS in 12A
Dr. Kam	Patient contact – B(patient no mask, staff no goggle)
Chik	Patients contact B, C F, D
Lee	Patients contact B, E
Lam	Patients contact B, E, social contact Chik
Lau	Patients contact B, E, social contact Chik
Tang	Patients contact B, E, Social contact Chik
Wong	Patients contact B, E, C
Lau	Patients Contact B, E
Lau	Patients contact B, E social contact with Lau
Chow	Patients contact B, E, social contact with Lau
Lee	Patients contact B, E, social contact with Chik
Tong	Patients contact B, E, G, C, H, I, social contacts with Chik , Lee , Lau , Lau , Chow , Lee , Chiu
Chiu	Ward Manager – contact with most patients and staff affected

Appendix 2

Outbreak of SARS infection in Ward 12A of United Christian Hospital

HA SARS --/03

28 June 2003

Outbreak of SARS infection in Ward 12A of United Christian Hospital:

Overview:

United Christian Hospital had a massive influx of SARS patients from 25.3.03. Clinical SARS and suspected patients were admitted to SARS cohort wards of 6A, 6B, 8A and 9A. However, some patients initially not suspected to have SARS have been admitted to general medical and geriatric wards and eventually diagnosed as SARS and transferred to SARS cohort wards. Ward 12A is a general medical ward designated to admit female respiratory cases, in addition to general medical cases, and has admitted a number of such unsuspected SARS cases. The first staff infected from ward 12A was admitted on 31/3/2003. In total, 2 medical staff, 9 nursing staff, and 3 HCA of ward 12A were infected with SARS. Among the 12A patients contacts, there were 8 probable secondary infections, including the 2 cases detected on contact tracing by the Department of Health.

Reasons for the outbreak:

(a). On analysis, 2 primary cases and 1 secondary case were the likely index cases that caused the infection among the staff. One of them presented with fever and loin pain, one with mental confusion, and the third was a terminal Ca lung patient with little fever. Because SARS was not initially suspected, no extra precaution was taken when caring for these patients.
(b). Before 1 April 2003 the level of infection control in 12A was at general level. Following HAHO and hospital guidelines, all staff were put on surgical masks during clinical duty. Surgical masks with eye shield were used in high risk procedures. Surgical masks were not routinely provided to patients. Patients requiring droplet precaution but not suspected of SARS were put either in isolation rooms or together in a same cubicle. Goggles and disposable gowns were not used at that period of time. Cotton gowns were used for patients in isolation rooms and cubicles with patients requiring droplet precaution. Gloves were used as indicated but not as a standard measure.
(c). Social contacts among the staff might also have contributed.

Actions taken:

(a) The outbreak was reported to HAHO.
(b) The 12A patients were kept in hospital for 10 days for surveillance. Female medical admissions were stopped from midnight of 1-4-03 till 14-4-03.
(c) The unaffected staff contacts were closely observed, and advised to stay in temporary hospital accommodation for 10 days.
(d) The contact list was given to Department of Health for contact tracing.
(e) Thorough cleansing and disinfection was performed after the ward was vacated.
(f) Infection control measures for the general wards were stepped up. Infection control training were reinforced, and alertness to unsuspected cases emphasized.

Appendix V

醫院管理局
HOSPITAL AUTHORITY

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

27 February 2004

Miss Flora Tai
Clerk to Select Committee
Legislative Council

Dear Miss Tai,

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

With reference to your letter dated 25.2.2004, I hereby attach the Caritas Medical Centre Outbreak Report on SARS infected in wards 9E/9C, Wai Ming Block for the Kowloon West Cluster.

Yours sincerely,

Dr Lily Chiu
Cluster Chief Executive
(Kowloon West)

Enc.

Report on Outbreak of SARS Infection in Wards 9E/9C Wai Ming

Caritas Medical Centre (CMC)

Background

CMC is a 40 year old acute general hospital with 1,200 beds, serving the Shamshuipo district community of Kowloon (360,000). 700 beds for acute services are accommodated in a new block. 500 beds for extended care services and ambulatory services are located in 5 ageing blocks (including Wai Ming). CMC is linked to 6 other hospitals (Kwong Wah Hospital – KWH, Wong Tai Sin Hospital – WTSH, Our Lady of Maryknoll Hospital – OLMH, Yan Chai Hospital – YCH, Kwai Chung Psychiatric Hospital – KCH and Princess Margaret Hospital – PMH) to form the Kowloon West Cluster (KWC).

(2) PMH was designated the SARS hospital from 29 March 2003. Along with 3 other KWC hospitals, CMC provided support for relocated non-SARS related patient services, namely Surgery, Gynaecology, Oromaxillofacial, Medical & Geriatrics, A&E. In early April, 11 ICU staff and GM(N) were deployed to support PMH ICU. On 12 April, 2 SARS wards were opened and preparations made for ICU to admit SARS patients, following the decision on 11 April to close PMH for further SARS admissions.

(3) Infection Control:

- CMC has 2.5 Infection Control Nurses (ICN) and 1 part-time Infection Control Officer (ICO).
- 20 mandatory staff training sessions were held in March/April. (16 sessions end March – 11 April.)
- Infection Control Enforcement Task Group was formed 7/4.
- 4 forums/lectures were held emphasizing universal/droplet precautions.
- Patrols and audits performed.
- Mandatory masks (24/3) for staff and patients.
- 3/4— 'No visiting' policy in acute wards. 'Limited visiting' in extended care wards
- 5 PMH staff forums were made accessible to CMC by videoconference (VC).

9E/9C Wai Ming Outbreak

(4) 9E ward was providing extended care (medical rehabilitation) for 45 frail elderly ladies (with 1-4 co-morbidities) The annex ward 9C was providing infirmary care for 15 elderly female patients. Staffing for both areas was under the overall supervision of a ward manager within the Medical and Geriatrics Department (Staff numbers: 48, of whom 33 were on duty on 16/4/03).

(5) On 16/4, a Health Care Assistant (HCA) reported for duty at 2 p.m. after 3 days' leave, worked for 4 hours, reported feeling unwell and was sent to A&E for assessment, where she was found to be febrile. She was treated and given sick leave. A diagnosis of probable SARS was made in late afternoon 17/4. She was admitted for care. The infection was thought to be community acquired since cases had been reported in her residential block/area (Taipo).

The following actions were initiated that evening — 17/4 (Public Holidays on 18, 19, 20, 21):

- Patient and staff movement was frozen and daily health surveillance initiated.
- No visiting was allowed.
- All patients/relatives/staff concerned were informed.
- Contact tracing of patients discharged on 16 and 17/4 initiated.
- Infection Control measures were reinforced (Surgical mask, disposable apron, hand-washing).
- Thorough cleansing and disinfection was performed.
- All patient files were reviewed for possible hidden index cases but none found.

(6) Subsequently 4 (HCW) staff infections became evident from 22-25/4. 2 further staff infections were diagnosed on 28/4. All were admitted to SARS wards in CMC for care. Infection was thought to be linked to breaks in Infection Control procedures both on and off duty (e.g. unprotected social contact). Eventually 15 patients were confirmed to have contracted SARS of which 6 died, 6 patients fulfilled WHO criteria for SARS, 6 were strongly suspected because of the clinical picture, 3 were not consistent with SARS. All patients (mean aged 80) had co-morbidities, many had coexisting documented infections. Once SARS was suspected, the patients were transferred to SARS ward for care.

(7) Once an outbreak became evident it was decided to quarantine informally for 10 days all the 34 remaining original 9E/C staff either in home isolation or in hospital quarters. The ward operation was taken over by >30 staff deployed from other CMC wards/hospital on 24-25/4.

- 15 infirmary cases were transferred to WTSH for care on 25/4, allowing bed spacing for the remaining patients to be improved to 4-5 patients/cubicle. None developed SARS.
- Ventilation was upgraded.
- Infection Control measures were raised to SARS ward level standards, i.e. full protection gown, N95, hats, gloves, visors/goggles, tight access control and frequently cleansing.
- On 15/5, the ward was closed and the remaining patients were transferred to either SARS ward in CMC or WTSH.

Secondary Infections (2 HCW)

(8) An R/N deployed to 9E ward, developed SARS on 11/5 (? Secondary to poorly fitting N95 mask).

— Most of the staff working in CMC SARS wards chose to stay in hospital overnight accommodation to reduce risk to family members.

— An R/N working in CMC's hospice ward (10W Wai Ming) subsequently developed SARS on 18/5, following brief unprotected social contact in the lift lobby of the nursing quarters (11/F Wai Oi) on 10/5/03 with the above R/N.

— Following notification to Department of Health (2 cases in 1 residential setting), 21 staff using overnight accommodation on 11F, Wai Oi were quarantined (for 10 + 4 days) commencing 19 May — 17 in Sai Kung holiday village and 4 on home isolation: None was infected.

— All patient and staff activity in the hospice ward was frozen for 2 weeks from 18/5, no visiting allowed, reinforced infection control precautions, overnight accommodation for staff. No patients or staff was subsequently found to be infected.

(9) In summary,

- Of the 10 HCW SARS infection at CMC, 9 were related to the 9E/9C outbreak. All survived, 2 required ICU care.

- Frail elderly patients are a highly vulnerable group (The pre-existing crude mortality for this group was approximately 9-10%) Diagnosis for SARS infection in this group is difficult, retrospective (serology only) and mortality is high — 40%.

- There were breaks in infection control practice and procedures both on and off duty. Examples include going to work when feeling unwell, mask use, hand washing, changing gowns after contamination, precautions during feeding and suctioning. PPE for universal/droplet precautions and training were provided, but more reinforcement was needed to internalise good practice.
  The concept of some patients being "super spreader", as in the index HCA case, require definition.

- Long standing issues of ageing facilities, tight manpower and bed spacing in extended care wards were highlighted.

- Improvement measures recommended:

  - Tighter nursing supervision/reporting of fever before duty/audit of Infection Control practice
  - Improved bed spacing/ventilation
  - Improved ICO/ICN ratios.

Prepared by: Dr Helen Tinsley
Hospital Chief Executive
Caritas Medical Centre

Date : 21 June 2003

PRINCESS MARGARET HOSPITAL
瑪嘉烈醫院
Princess Margaret Hospital Road, Lai Chi Kok, Kowloon, Hong Kong Tel: (852) 2990 1111 Fax: (852) 2786 3629, (852) 2370 3449
香港九龍荔枝角瑪嘉烈醫院 電話：(852) 2990 1111 傳真：(852) 2786 3629, (852) 2370 3449
Home page http://www.ha.org.hk/pmh

6 March 2004

Your Fax No. 22482011

Miss Flora Tai
Clerk to Select Committee
Legislative Council

Dear Miss Tai,

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

Further to my letter dated 1 March, 2004, please note that the Caritas Medical Centre Outbreak Report on SARS infected in wards 9E/9C, Wai Ming Block for the Kowloon West Cluster has not been submitted to the Head Office of the Hospital Authority, SARS Expert Committee or Hospital Authority Review Panel on the SARS Outbreak.

Yours sincerely,

(Dr Lily Chiu)
Cluster Chief Executive (Kowloon West)/
Hospital Chief Executive
Princess Margaret Hospital

HA1110/PM

新界東醫院聯網
NEW TERRITORIES
EAST CLUSTER

Quality Effective Health Care

30-32 Ngan Shing Street, Sha Tin, N T, Hong Kong Tel: (852) 2632 2434 Fax: (852) 2648 4053
香港新界沙田銀城街三十至三十二號 電話: (852) 2632 2434 傳真: (852) 2648 4053

Yr Ref: CB2/SC2

2 March 2004

Miss Flora Tai
Clerk to Select Committee
Legislative Council
Hong Kong Special Administrative Region
of the People's Republic of China
c/o 3/F, Citibank Tower
3 Garden Road
HONG KONG

Dear Miss Tai,

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

I refer to your letter dated 25 February 2004. My response is as follows:

(a)&(b) Internal investigations were conducted and these were reported in the outbreak reports attached:-

(i) Report of the Outbreak of Severe Acute Respiratory Syndrome in Ward 8A of PWH ———— **A87**

(ii) The Report of the Outbreak of SARS in Alice Ho Miu Ling Nethersole Hospital (AHNH) ———— **A91**

(iii) Report of the SARS Outbreak in North District Hospital (NDH) ———— **A92**

(c) These reports have been submitted to the Head Office of Hospital Authority, SARS Expert Committee and HA Review Panel on the SARS Outbreak.

Yours sincerely,

(Dr FUNG Hong)
Cluster Chief Executive
(New Territories East)
Hospital Authority

新界西·醫院聯網
New Territories West Cluster

聯網辦事處 Cluster Office
屯門醫院 Tuen Mun Hospital
Tsing Chung Koon Road, Tuen Mun, New Territories, Hong Kong. Tel: (852) 2468 5111 Fax: (852) 2455 1911
新界屯門青松觀路 電話：(852)2468 5111 傳真：(852)2455 1911

Our ref.: ( ) in

3 March 2004

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

Dear Miss TAI,

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

I refer to your letter ref CB2/SC2 dated 25 February 2004 and would like to provide the following information as requested:

(a). There was internal investigation into the SARS outbreak in TMH.

(b). A copy of the investigation report is attached. ——————— **A101**

(c). Yes.

Thank you.

Yours sincerely,

(Dr. Cheung Wai Lun)
Cluster Chief Executive, New Territories West Cluster,
/ Hospital Chief Executive, Tuen Mun Hospital,
Hospital Authority

WLC/NL