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WRITTEN STATEMENT OF DR. S.H. LIU

I. *Notification of Severe Community Acquired-Pneumonia (CAP) cases by the Hospital Authority (HA) and individual hospitals to the Department of Health (DH)*

1.1 A mechanism of reporting Severe CAP was established by the Working Group on Severe CAP (WG) which was detailed in the memo issued by Dr S H LIU to all Hospital Chief Executives and Cluster Chief Executives on 12 February 2003. A report form was designed for such notification by the hospital. It was agreed that when the report forms were received by the Task Force on Infection Control (TFIC), they would be sent to Dr L Y Tse of DH and microbiologist in charge of the subject. A clinical record form was also designed to request hospital Infection Control Teams or Infection Control Officers to collect more patient history and clinical information on reported Severe CAP, including contacts with animals, birds and travel in past 2 weeks. These added forms were sent to all Infection Control Officers (ICOs) and Infection Control Nurses(ICNs) on 14 February 2003 together with Dr S H Liu's memo of 12 February 2003. As a result of discussion at the Joint meeting of WG and TFIC on 27 February 2003, the report form and clinical report form used for notification were combined into one single form. The revised arrangement was promulgated to all WG & TFIC members, Dr L Y Tse of DH, ICOs and ICNs on 28 February 2003. The reporting mechanism on Severe CAP was ended on the 22 March 2003 when all HA hospitals was informed of the registry on Severe Acute Respiratory Syndrome (SARS) with effective from 19 March 2003. Severe CAP cases reported previously and confirmed by clinicians to meet the case definition of SARS was included in the registry.

II. *Communication between the head office of HA (HAHO) and individual hospitals and between HA and DH*

2.1 The communication between HAHO and hospitals on issues of infection control and daily operations was mainly conducted through meetings of HA's Taskforce on Infection Control (TFIC) and circulation of written documents to ICOs and ICNs. Dr. S H Liu was the Convenor and Chairman of TFIC which was set up in 1994 by HAHO. TFIC was renamed Central Committee on Infection Control (CCIC) on 4 March 2003. The membership of the TFIC consisted of 12 HA Microbiologists, 4 senior infection control nurses, 1 Consultant in Infectious Diseases, 1 Paediatrician, 1 HCE, one representative from DH and one representative each from the two universities. With the setting up of the Working Group on Severe CAP (WG) on 11 February 2003, experts in Respiratory Medicine, Intensive Care, Paediatrician specialized in infectious diseases and Chief Pharmacist were co-opted to ensure a wider representation and promoting communication with frontline units.

2.2 During the initial phase of surveillance of Severe CAP, the following actions of communication were carried out:

a) A briefing was made to all CCEs and HAHO Directors at the Directors meeting held on 12 February 2003.

b) WG conducted 7 meetings between 11 February and 18 March 2003 with the last

five meetings held jointly with other members of TFIC. Respiratory physicians and A&E physicians were also invited to the last 3 joint meetings.

c) Memo on the Surveillance of Severe CAP was sent to all HCEs, CCEs, Chairmen and members of Coordinating Committees of Medicine, Paediatrics, ICU, Accident & Emergency Medicine, TFIC and WG members, ICOs and ICNs.

d) Documents of four issues of FAQs between 21 February and 12 March were sent to all ICOs, ICNs, TFIC and WG members. Subsequently the various updates of Guidelines on SARS were posted on specific webpage on HA intranet for access by all staff since 19 March 2003.

e) In order to access the potential of person to person spread of the Severe CAP infection in the healthcare setting as well as in the light of information related to an American-Chinese from Hanoi on healthcare workers falling ill, a survey designed by Dr Dominic Tsang on staff developing respiratory symptoms after contact with Severe CAP patients was sent to ICOs on 7 March. The request initially focused on four hospitals, namely PWH, QEH, PMH and KWH where cases with clustering were noted. On 14 March 2003, hospitals which had admitted Severe CAP patients were requested to report the number of symptomatic staff contact.

f) With the outbreak at PWH since 10 March 2003, the Secretariat of TFIC maintained a daily contact with the hospital infection control teams to update the number of admission of staff and patients with atypical pneumonia. A designated team and coordination center was set up at HAHO on 24 March 2003 to compile and collate the data from hospitals and report to DH daily.

2.3 After the commencement of the Daily SARS Round Up Meeting since 25 March 2003, HAHO and individual hospitals communicated through CCEs attending these meetings. An Infection Control Enforcement Network was also set up on around 6 to 11 April which is a hierarchy of infection control coordinators at all levels of the organization, ranging from HAHO, to hospitals, departments and workplace. This additional network enhanced existing communication network to facilitate promulgation of policy and guidelines, as well as collecting the feedback from frontline staff.

2.4 As regards communication between HA and DH, the DH representative was a member of the TCIF and served the liaison role. During the period of reporting Severe CAP, the TFIC secretariat sent the report forms and daily statistics to Dr. Tse Lai Yin of DH on daily basis (except Sunday and Public Holidays) Dr. Tse would also be informed of emergency message by telephone. Subsequent to the commencement of the Daily SARS Round Up Meeting, Dr. Liu contacted DH every day after checking with hospital Infection Control Teams to update DH on the number and details of newly confirmed SARS patients in order to facilitate the contact tracing by DH.

III. Admission of the American Chinese to Princess Margaret Hospital who was transferred from Hanoi

Please refer to the answers below to questions no. 1 to 5 in Appendix IV.

IV. Infection control

4.1 On 11 February 2003, the WG, comprising experts from clinical microbiology, internal medicine, intensive care, respiratory medicine, and executives, was formed. The WG was tasked to advise HA on the surveillance and management of Severe CAP. Since the setting up of WG, members were open regarding the causation agent of Severe CAP. Efforts were spent to ensure adequate laboratory testing for an aetiological diagnosis of whether it was a known virus, avian flu, mutated virus or a new pathogen.

4.2 Initially, based on the fact that influenza could cause severe atypical pneumonia, and that February was the annual peak for flu, staff were alerted through referring to the Fact sheet on severe influenza infection in the management of Severe CAP cases. Upon the expert advice within the WG, staff were reminded to adhere to proper infection control measures as advised for influenza by circulation of FAQs, namely droplets precautions in addition to universal precautions.

4.3 Infection control strategies were discussed among the experts of various specialties and proposed for adoption on a HA-wide basis through the WG meetings which later expanded to be jointly conducted with TFIC. The documents of Frequently Asked Questions (FAQ) on infection control, management and reporting of Severe CAP was issued to hospital through the infection control officers and infection control nurses. The purpose of FAQs was to supplement the framework for the surveillance and management of Severe CAP Briefing sessions and staff forums were held in hospitals by the infection control teams to heighten the awareness of front-line colleagues to the epidemiology of this new disease and the importance of personal protection when attending to patients suspected of contracting Severe CAP (later renamed as SARS).

4.4 In late March 2003, control of operational management of SARS was taken up by the Daily Round Up Meeting of the Directors and all Cluster Chief Executives. In view of the complexity of professional issues relating to different clinical disciplines, a number of specialty based advisory groups were established to provide professional input for decision making at the SARS Round up meetings. Updates on infection control measures were posted on the dedicated webpage for SARS at HA intranet.

4.5 By late April 2003, the Working Group on Infection Control for SARS was established under the HA Board's Task Force on SARS, to further focus on hospital infection control as one of the key areas of work related to SARS management. This move further consolidated and strengthened previous efforts in hospital infection control.

4.6 The overall infection control measures taken by HA were summarized as below:

a) Within hospitals, confirmed or suspected SARS patients were isolated and cohorted in designated units with barrier nursing and sufficient physical spaces provided. Corresponding precautionary measures and appropriate personal

protective equipments were implemented according to risk stratification. The environment and equipment were frequently disinfected.

b) In view of the significance of environmental factors in the effective management of infectious diseases, continuous improvement works were carried out on the ventilation system of clinical areas in hospitals, and the setting up of more negative pressure rooms & etc.

c) Efforts were focused on enforcing implementation of SARS precaution measures at all levels. In addition, to the works by hospitals' Infection Control Teams (ICTs), an infection control enforcement network with representatives from all HA hospitals was set up in the second week of April, spanning across HAHO, hospital management, all departments and individual workplaces. Members at different levels of the hierarchy provide links of communication and were empowered to supervise effective implementation of SARS precaution measures in accordance with HA policy. A warden was designated in each work shift to take charge of infection control enforcement at the workplace level.

d) The HAHO required all hospitals to provide mandatory training to staff including supporting staff and contractor staff, and thereafter receive further refresher training as and when necessary. The Public Affairs and Human Resources Sections of HAHO have produced posters and multimedia training resources to facilitate communication and training in hospitals.

e) A structural inspection of all workplaces to assess the compliance and effectiveness of the SARS precaution program was conducted in April - May 2003. Depending on the available expertise in different hospitals, the Hospital Infection Control Teams (ICTs) in hospitals or HAHO would organize independent inspection. At the hospital level, infection control wardens were designated to remind front-line colleagues of the importance of good infection control practices and proper utilization of personal protection gears when attending to SARS patients.

f) A daily newsletter "Battling SARS Update" to disseminate essential infection control messages and outbreak news was published since April 2003. In addition, a 24-hour "SARS Hotline" was established to improve communication with the frontline and provide immediate response to SARS-related problems. Regular hospital forums were conducted by HCEs/CCEs to update staff of the development and evolution of the outbreak scenario of the hospital and the overall picture, as well as to collect direct feedback and address to local operational issues. Hospital-based infection control resource centres were also piloted.

g) Studies on the circumstances leading to staff infections are essential for the prevention of future outbreaks. In addition to investigation by hospital ICTs, HAHO coordinated additional studies on staff infections. Information involving health care workers was analysed and common patterns and risk-associated factors were identified so that recommendations could be made and generalised for use in all hospitals.

h) Standard provisions of personal protective gears were defined having regard to the latest knowledge of mode of transmission of the coronovirus and local experience of breakthrough infections. Clinical areas were risk-stratified based on the level of risks of exposure. Assessments on the different types of PPE and the pros and cons of the various provisions were conducted and updated recommendations were disseminated via the SARS web-page in the HA intranet and internet.

Answers to the questions in Appendix IV

1. Dr. Tse Lai Yin ("Dr. Tse"), Assistant Director of DH, telephoned Dr. Liu on 5 March 2003 that a patient was to be transferred from Hanoi, Vietnam to Hong Kong for medical treatment. She asked HA to make arrangement for the admission of the patient to PMH. According to Dr. Tse, the patient was critically ill with a diagnosis of Influenza B, and that some healthcare workers there (i.e. in the Hanoi Hospital) had fallen sick.

2. As mentioned in the answer to question 1 above, Dr. Tse requested that arrangement be made for the patient to be admitted to PMH. Dr. Liu did not know the reason for the request for admission to PMH. In the past, cases of emergency transfer by air to Hong Kong for medical treatment were often admitted to PMH.

3. Dr Liu informed PMH of the transfer of the patient from Hanoi on 5 March 2003, soon after the telephone conversation with Dr. Tse.

4. The details provided by Dr. Tse to Dr. Liu over the telephone were provided to PMH. HA did not give any specific advice or instructions to PMH. HA's guidelines on the management of Severe CAP were applicable and PMH would deal with the patient appropriately.

5. The patient was reported by PMH as a Severe CAP case on the date of admission, i.e. 6 March 2003, to the Secretariat of TFIC. As to when and how HAHO was notified, please refer to the answer to question 1 above. PMH provided the following clinical information after the patient was admitted to the hospital :

   (a) Patient, 48 years old, non-smoker. Known hepatitis B cirrhosis for three years with history of variceal bleeding required banding.
   (b) He travelled to Shanghai in mid-January 2003 and returned to Hong Kong around 23 February 2003 for two days. He continued his journey to Hanoi, Vietnam. He started to develop flu like symptoms while in Hong Kong. These symptoms included fever, dry cough, muscular pain and poor appetite.
   (c) He was admitted to Hanoi Hospital on 26 February 2003. CXR was clear upon admission but lymphocytes count was low. However, his condition deteriorated and required intubation and IPPV on 2 March 2003. Initial investigations confirmed patient was suffering from Influenza B and ARDS. (serum Flu B IgM +ve).
   (d) The patient was flown back to Hong Kong, escorted by International SOS early that morning. He was directly transferred to ICU without going through A&E Department. His condition in ICU was critical, requiring adrenaline infusion, high FiO2 (70% O2) and high PEEP. Antibiotics and Tamiflu (oseltamivir) were given.
   (e) His wife came to join him from USA on 3 March 2003. She did not have any URI symptoms.

As from 21 February 2003, with the dissemination of the first FAQ in the Management of Severe Community Acquired Pneumonia (CAP) to all hospitals, all hospitals were advised to take infection control measures in the management of Severe CAP cases.

6. Please refer to the memo dated 12 February 2003 from Dr. Liu to all CCEs and HCEs, a copy of which is attached. Once the Task Force on Infection Control (TFIC) (later renamed Central Committee on Infection Control) was notified of a new Severe CAP case, Dr. Liu would pass the information to Dr. Tse of DH. A record of the registry of the Severe CAP cases was kept by the Secretariat of TFIC. All the reported Severe CAP cases would be analyzed by Dr. Dominic Tsang, the microbiologist in charge of the subject and discussed at the Working Group on Severe CAP (WG). If the investigation of any case within HA was required, the duty microbiologist in the WG would liaise with the relevant hospital to carry out the investigation. Any follow up action outside HA would be dealt with by DH.

7. Other hospitals were not informed of the case of Professor Liu and the case of the patient from Hanoi, but see also the answer to question 12 below.

As from 21 February 2003, with the dissemination of the first FAQ in the Management of Severe Community Acquired Pneumonia (CAP) to all hospitals, all hospitals were advised to take infection control measures when handling Severe CAP cases.

8. The role and functions of the Task Force on Infection Control (TFIC) were as follows:

(a) to develop and promulgate broad policy on issues relating to infection control throughout HA institutions;
(b) to provide expert advice and support to the HA on matters relating to infection control issues, including liaison with other concerned agencies;
(c) to provide a forum for exchange of views, expertise and information for hospital-based experts in IC, including providing the infrastructure for surveillance, policy on occupational health where infection is of concern, and reporting and co-ordinating both internal and external responses to significant outbreaks of infection;
(d) to support the continuing development and review of IC practice in HA institutions; and
(e) to advise on allocation of resources in support of effective IC practice.

Because it had been reported in the media that there was an increase in atypical pneumonia cases of unknown aetiology in Guangdong area, a Working Group on Severe CAP, under the TFIC (as it was then called) was set up to advise HA on the mechanism of monitoring and approach on cases of Severe CAP. Dr. Liu decided to set up the WG, after discussion with Dr. Ko Wing Man. The WG reported to the TFIC.

9. The WG was part of the TFIC and reported to TFIC. As from 25 March 2003, with the commencement of the Daily SARS Round Up Meeting, WG's and CCIC's functions were subsumed in the Daily SARS Round Up Meetings.

10. Since WG was part of TFIC and reported to TFIC, there was of course sharing of information. For example:

a) Surveillance mechanism was sent to all members of TFIC on 12 February 2003;
b) WG and TFIC held joint meetings;
c) FAQs on Severe CAP were shared among all members of WG & TFIC.

11. The information of WG was conveyed to hospitals as follows:

a) Surveillance mechanism was sent by e-mail to all HCEs/CCEs, Chairmen and members of Co-ordinating Committees of Medicine, Paediatrics, ICU, A&E Medicine, ICOs and ICNs;
b) FAQs on Severe CAP were emailed to all ICOs and ICNs;
c) Updated version of FAQs was posted at HA intranet;
d) FAQs issued on 12 March 2003 was sent to all staff via e-mail; and
e) A designated website for SARS under HA intranet was set up since 19 March 2003.

As mentioned in answer 9 above, as from 25 March 2003; WG's functions were subsumed in the Daily SARS Round Up Meetings.

12. The cases of AA [redacted] and the American Chinese patient from Hanoi were discussed at the joint meeting of WG and TFIC on 12 March 2003. Besides sharing of clinical information of the two cases, the following actions were taken:

a) The infection control measures, namely droplet precaution for Severe CAP and influenza like illness was endorsed;
b) FAQ was revised to include advice on seeking medical attendance, staying away from work and wearing of surgical masks if they had respiratory symptoms for health care workers with influenza like illness;
c) A case definition for atypical pneumonia was worked out for epidemiological data collection;
d) The infection control teams would organize staff forum and briefing to update the development of these cases and the effective infection control measures;
e) A survey of health care workers hospitalized with pneumonia-like symptoms was carried out and the daily statistics of new cases was provided to the public via press release.

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