SARS – observations and learning points

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1. Introduction

1.1 A fair reflection on the anti-SARS battle is difficult. Even with the benefit of hindsight, personal observations and judgements are affected by emotions in more than one way – what one chooses to hear and to highlight, and how one synthesizes the abundant information from all direction.

1.2 This paper is written from the point of view of both a manager and a clinician. The approach is to discuss particular observations during the SARS battle and consider whether there may be useful learning points. It does not assume "we could have done otherwise" in that difficult battle.

1.3 For information of readers not directly acquainted with Kowloon Hospital, our Department of Rehabilitation operates 460+ medical convalescent/rehabilitation and infirmary beds, admits patients in transfer from QEH, UCH and directly from the community via the Community Geriatric Assessment Team (CGAT). A separate pool of ~300 extended care beds (O&T, Surgical, Medical) are managed clinically by corresponding QEH Departments, here I contribute some support in general management. There are two other major clinical departments in KH (Respiratory Medical Department, who contributed directly to care of SARS patient in QEH; and Psychiatry Department). During SARS, I was designated as the Hospital Infection Control (IC) Coordinator. An IC Network was formed within the hospital with the support of our Hospital Adminstration, an IC Nursing Officer, and KC Cluster Command Centre for SARS provided us with valuable advice and suggestions on PPE and other IC-related issues. A huge among of information also came from HAHO via its Central Committee on IC; and via eKG alerts. UCH Dept of M&G was also in close contact with us on contact tracing and management of suspected SARS cases.

2. Why was timely response difficult?

"Everyone was caught by surprise" does not explain it all.

2.1 "Long supply chain" – SARS caught us at a time when hospital procurement and

supplies staff and procedures are highly clusterised. I can testify that colleagues in Supplies section are working non-stop and acting extraordinarily fast to cope with the sudden surge of purchase items (PPE, disinfectants etc), but cluster procurement means a huge number of clients (all departments in all hospitals within the cluster) to attend to. It would make more sense for bulk purchase of some core items like N-95 masks to be centralized, while setting aside a contingency budget ("SARS petit-cash") or allowing a simple reimbursement procedure for locally urgent items. This will take off substantial pressure on the acute hospital Supplies colleagues, so that they can better concentrate on the key procurements. This would also ease staff sentiments in non-acute frontline – what they perceive to be urgent can be quickly heard and handled within the local hospital.

2.2 "Misleading knowledge" – By and large, managers and clinicians alike have been "brainwashed" with evidence-based practice in the past few years. For SARS, we knew from the start that evidence and knowledge base were not very firm and adequate, yet in many key decisions, we responded as if we considered evidence-based practice safe and secure. A good example is in the early (and premature) judgment that the mode of transmission of SARS was by "droplet transmission". We stood by "surgical mask plus handwashing" for too long. As a result of that judgment, we lost precious time for sourcing and procuring N-95 masks, eye protection devices, and even disposable gowns. Infection control nurses were put in a very difficult position – they are faithful to the procedures and protections appropriate for "droplet transmission", yet frontline staff rightly disputed the ICN's recommendations. The rest of the dysfunctional dynamics are now familiar to all – "we can't trust the recommendations, therefore we demand maximal protection" was a common sentiment in the frontline.

2.3 "A Head Office too slim" – Frankly, my observation is that in the past few years, the HAHO staffing has been 'right-sized' to the wrong size – too slim to fight a battle like SARS. True, Dr William Ho and Dr Fung Hong's falling ill weakened the central command force, but it is very obvious to me that overwork of managers had something to do with failure to be rapidly responsive. Overwork probably contributed to questionable judgments in some cases; inability to see through implementation of decisions where they were the right ones; and "loss of cool" in harnessing the overall extremely complex battle.

3. Why were some non-acute hospitals affected by SARS while others escaped the scathe?

3.1 "We had good IC practice"? - KH had zero staff infection rate, but we would

be wrong to congratulate ourselves by claiming exceptionally particularly good IC practice. At micro- or individual staff level, other non-acute hospital colleagues – including those sadly affected by staff infection – were no less compliant than us. In retrospect, 4 factors (besides the pure luck of not having encountered an unsuspected "super-spreader") may be important:

3.1.1 "Surveillance and transfer out" – It was evident to us from the very beginning that we would not have time to train up and improve everybody's IC practice; we decided from the beginning that "droplet transmission" was a questionable assumption, yet adequate PPE (gowns and goggles in particular) was not in adequate supply till late part of April. In the first month we concentrated on surveillance of newly admitted and transferred in patients. We adjusted the threshold of transfer-out in accordance with the real-time prevailing background risk of SARS in KC and KE community (e.g. a lower threshold when we learned of the Amoy Garden outbreak). We weighed heavily history of SARS contact in our transfer-out decisions for the grey cases. Two cases transferred back to acute hospital (one to QEH and one to UCH) were subsequently confirmed to have SARS. Both cases were transferred back within 48 hours of detection of fever (before CXR positive). Note that this does not mean a low threshold of transferring out all fever cases – it would not be desirable as that would mean many more patients exposed to risk in acute hospital fever wards and carrying back the risk to nonacute setting.

3.1.2 "Bayesian probability" – For SARS, this essentially means that whatever test (e.g. CXR) or assessment you perform on a patient with suggestive signs and symptoms, the probability (or risk) of that patient actually being a SARS case is heavily dependent on the pre-test prevalence. Take a widely quoted case example – a patient on nasogastric tube feeding had a fever with abnormal CXR. The usual (good) practice is to see if this is simple aspiration – tube feeding withheld, prescribe antibiotics, review in 48 hours, adjust antibiotics and review again in another 48 hours. But if the patient was transferred in from the acute hospital whilst the acute unit was in the midst of a SARS outbreak, this normally "adequate" practice would mean false sense of security. What this implies in terms of clinical management is something that frontline staff are not accustomed to – we cannot use the same set of clinical management protocol or guidelines at all times. A fever case in an Old Age Home in Ngau Tou Kok during the Amoy Garden outbreak cannot be handled in the same way as another case in HK West when there was no background community outbreak.

3.1.3 "Cohorting and risk stratification": I do not believe it was mere luck or coincidence that all three convalescent hospitals (KH, BH, HHH) supporting QEH and UCH turned out to have zero staff infection rate. Bear in mind that we do have a

community outbreak in Amoy Garden and NTK. I believe (and this can only be a personal judgment) that the key factor here is that both QEH and UCH stood by two good practices: (1) During the stressful months of April and May, the two hospitals maintained an adequate risk stratification system. Patients with known co-cubicle contacts with an index SARS case (confirmed or probable) were usually kept cohorted in acute setting; correspondingly KH cohort observe the patients whose contact with index case were only known after transferred to us. Suspcious and unexplained fever cases were managed in QEH and UCH. Patients with fever from a non-SARS diagnosis were transferred to KH. The grey cases were still difficult but were kept to a minimum, and active interhospital email discussion of such grey cases allowed rapid decision of whether to send back the patient to acute setting.

3.1.4 "No sudden decanting of patients please." – in spite of the crisis in UCH during Amoy outbreak, they did not require us to abruptly take over a big batch of "non-SARS" cases to ease their pressure. Such en-bloc decanting of patients might have been, by my observation, an important factor why Lai King Block of PMH and some of the NTEC hospitals were affected. The point to make is NOT that hospitals within the same cluster should not be called upon to support the most stressed acute tertiary hospital; rather, the learning point may be that the receiving end must be appropriately prepared to take up the responsibility. This factor might also be at play in the PMH outbreak – again, sudden decanting of a large number of patients is problematic.

4. Why elderly SARS patients were such a thorny problem

4.1 "Too many, too sick" – Hong Kong has a high-standard public hospital system, yet overall SARS case-fatality rate is the highest in the world. Stratified into four age groups, the outcome of middle-age, young age, paediatric is similar to international averages, but age-adjusted mortality in HK elderly is higher than the international figures. It is often publicized that elderly SARS are "invisible" etc., but one would think that HK elderly should be no more invisible than their counterparts in other parts of the world. The key questions may be: (1) With acute SARS units stretched and sometimes overwhelmed, are elderly SARS patients getting adequately and appropriately managed; (2) Are elderly more prone to hospital-acquired SARS infections, and if so, are there ways to better manage elderly admissions during SARS outbreak?

4.2 "Non-specific presentation" – In Geriatric Medicine, it is well-known that elderly can present with non-specific and sometimes atypical clinical presentations. Elderly with occult infection presenting with a fall and fracture is not new knowledge; neither

is poor fever responses to infection in elderly a new finding. Ultimately the solution to this problem will be a more accurate rapid test of coronavirus in early phase of illness. Before then, suitable cohorting and careful assessment is still the major defense. An active geriatricians' group is reviewing the clinical issues in elderly SARS. This paper will skip the details.

4.3 "Non-specific aspects of care" – We are too pre-occupied with pulse steroids, ribavirin and protease inhibitors and forgets that a key variable influencing outcome of hospitalized elderly is simply adequate nursing care. This is true in both acute and convalescent settings – nutrition and hydration, turning and mobilization, prevention of pressure sores, bowel and bladder care cannot be left out. It is understandable that in this very difficult battle, even simple feeding and hydration, and prevention of immobilization, are often luxury. We have to do better in future battles, and we may have to explicitly insist that, for elderly patients, such non-specific care is as essential as the most advanced drug therapy. Nursing manpower is an issue.

4.4 "Iatrogenic" – Elderly patients do not do well with over-aggressive interventions. I have no data at hand to tell whether this is a problem, but have in surprise heard 90+ year olds treated in exactly the same way as a young patient with the full sequence of the most potent drugs, then intubated and mechanically ventilated, then died. In normal times we consider our duty to offer elderly with very poor quality of life pre-morbid the choice of "Do-not-resuscitate". In the whole year before SARS, HA has been promoting proper terminal care (including "good death"). It would be important to review whether, in the rush and stress of this crisis, we have inadvertently managed some elderly patients with a level of aggressiveness that may not be in the elderly person's best interests. Experts may have to develop a milder treatment regime for elderly SARS patients.

5. Saying 'yes' and saying 'no'

My last bit of reflection is intuitive, hence may well be mistaken. Fighting SARS and containing damage requires, at some critical junctures, daring to say 'NO' to obviously ill-advised moves and affirming a 'YES' as soon as evidence emerges. Is the prevailing management culture in HA and in hospital clusters conducing to saying 'NO'? Why was it so difficult to get our professional / managerial / academic *persona* to say 'YES' to a common set of Infection Control and PPE guidelines? Hong Kong may be the only medical community in the world that cannot agree on Infection Control and PPE guidelines even towards the end of the epidemic.