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The Hospital Authority and Public Health in Hong Kong – From Theory to Practice

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Dr Omi, Prof Lau, Prof Woo, Honourable Guests, Ladies and Gentlemen,

When I decided on the title of my speech several weeks ago, I didn't know one of the biggest public health challenges that Hong Kong had ever faced was waiting for me and for that matter the Hospital Authority (HA) and the whole Hong Kong community.

Hong Kong is porous. There are thousands of tourists coming in and out of Hong Kong almost every hour, including those crossing the border with Mainland China. People living in countries and places have administrative boundaries. Bacteria and viruses have not. Since 1997 when we had the Avian flu, we learned that birds had no respect for administrative boundaries either.

Thanks to the dedicated hard work and professionalism of our front line staff both in the Hospital Authority (HA) and the Department of Health (DH) we are able to get some clues out of the current myth about this outbreak of Atypical Pneumonia in our hospitals. It is amazing how people and germs are so connected across apparently disparate places and among those who do not even know each other. Starting from the outbreak in Guangzhou, when health officials and healthcare workers were doing everything possible to control the disease, the virus silently slipped into Hong Kong through one of the many thousands of visitors, this one coming for a wedding banquet. He didn't make it to the banquet, but rather ended up as a patient with pneumonia in our Kwong Wah Hospital on February 22. He was among the hundreds of pneumonia cases we saw each week in our public hospitals. But because he was a professor from a Guangzhou hospital where there was known outbreak of an unknown organism, staff in Kwong Wah Hospital did take precautions, thus avoiding a more massive outbreak among healthcare workers as the one we saw in Prince of Wales Hospital. Yet unfortunately, those

were the early days when little was known, and two of our workers in Kwong Wah did come down with the illness subsequently.

On March 6, our Princess of Margaret Hospital admitted a patient with pneumonia who had a history of treatment in Hanoi. We subsequently learned that many healthcare workers who had taken care of him in Hanoi also came down with atypical pneumonia, and there were casualties. Our patient died one week after admission. Again, there was precaution very early on regarding this known infective case, and none of the Princess Margaret Hospital staff was infected.

We had no idea of the immense problem we were about to face, as the virus from the Guangzhou professor had silently been spread to others, as detective work of the Department of Health found out a month later. We now know that this index case was connected to at least four other clusters of cases, including the man from Hanoi, three cases in Singapore, and closer to home, one cluster in St Paul's Hospital, and finally our famous patient in Prince of Wales Hospital who caused an outbreak of calamitous proportion. These people didn't know each other, but they shared the same lift lobby on the 9/F of a hotel in Kowloon, in fact just 10 minutes walk from my office. The Guangzhou professor had obviously been coughing in the lobby.

On March 10, all seemed well in the Prince of Wales Hospital until management was first alerted to seven Doctors and four Nurses taking sick leave in Ward A8. The Department of Health was immediately notified. In just two days' time, 24 colleagues from the same ward were already admitted with high fever and all of them would develop atypical pneumonia. No index case was identified, and the whole hospital was shrouded in deep worry. The hospital implemented immediate measures of tight infection control, and cohorting of both patients and healthcare workers. Despite such measures, 36 more came down in just four days, including doctors, nurses, physiotherapists, health care assistants, medical students, and staff of the Accident and Emergency Department. Besides, cases of staff developing atypical pneumonia also started to appear in Pamela Youde Nethersole Eastern Hospital, Queen Elizabeth Hospital, and Tuen Mun Hospital. By March 18, the figures had already ballooned to 123 admissions. Yesterday (21 March), this became 203, including 91 healthcare workers and 17 medical students. The figures are still climbing every day.

No doubt, the whole public hospital system in the Hospital Authority was put under immense pressure and severe stress. No one quite knew what it's all about. Yet everybody knew if the HA system was to collapse, Hong Kong would collapse. We had to hold tight, and we had to figure out fast our strategy to get on top of the situation. We knew that whatever organism we were dealing with, we had to apply sound public health and infection control principles. Let me talk about the practice of these principles one by one.

Firstly, Epidemiology and Surveillance. We have a very good network of patient information throughout our 44 public hospitals, and robust reporting mechanism to the Department of Health for contact tracing and epidemiological work. However, when the number gets big, such work becomes increasingly overwhelming. Case definition also presents a problem when there are so many background pneumonia patients, when we cannot even define the infective agent, not to say devising tests for diagnosis. We have to work with some presumptive inclusion and exclusion rules. Obviously, definite contact history with index cases, matching of dates of symptom onset, and infection occurring in otherwise young fit healthcare workers would be more accurate to include.

Secondly, Mode of Spread. Judging from the absence of massive outbreaks in the community, and the fact that none of the hotel staff are affected, it is safe to deduce droplet infection rather than airborne infection. That fits into the picture of only healthcare workers and close relatives getting infected, because they all got into close contact with the index patients. But what happened in Prince of Wales Hospital was very puzzling. We assumed droplet infection to occur within three feet of the infective patient. Yet almost the entire workforce of Ward A8, together with many visitors of many patients in the ward, got infected. Light was only shed when we went into the minute details of histories from dozens of staff, visitors and patients. The dates of contact, locations and dates of symptom onset finally helped us cone down on one patient, who was not seriously ill. We now know that prior to hospital admission, he had visited a friend in the same hotel, on the 9/F. Furthermore, he had been prescribed nebuliser treatment for almost a week, which possibly helped spreading the infective agent more widely than otherwise possible with droplet infection.

So here was a patient unknowingly shedding virus to all doctors, nurses, allied health workers and visitors, aided by the nebuliser. There was an undergraduate examination going on in the ward, and the bed opposite offered a patient with a beautiful heart murmur, which attracted medical students, clinical examiners, cardiologists, and cardiac surgeons, almost all of whom got infected. Prior to admission, the patient had actually attended Accident and Emergency Department twice, thus accounting for the victims there. From these first layer contacts, second layer contacts in terms of their family members and others are beginning to emerge these few days.

I now turn to Infection Control. I've alluded to the rapid introduction of cohorting in all affected hospitals. The problem was therefore quite well contained in other hospitals. For the Prince of Wales Hospital, the magnitude of the problem was mainly the result of the massive dose of virus transmission that must have occurred early on. Nevertheless, with major effort in infection control including frequent hand washing, use of masks, gloves and protective clothing, together with

separation of clean and potentially contaminated areas, things seemed improving. Partly because of manpower problem, we resorted to close its Accident and Emergency Department. The question now is how many potential patients are still out there in the community. Guidelines have been issued to General Practitioners. Yet just two days ago, the hospital admitted two General Practitioners from the local districts. We found out both had seen patients with history of exposure in Ward A8. We are now doubling our effort together with the Department of Health in further contact tracing in the community. The war is still on.

Just a bit on Treatment. How do you treat an unknown disease that's causing clinical deterioration with great rapidity, right before your eyes, and involving your colleagues or even family members? Well, you apply what you believe to be worth trying, observe very carefully, draw tentative conclusions, and compare notes and experience. There are definite advantages of a unified healthcare system like ours pooling the expertise from many hospitals. Within days, the clinical picture became clearer: incubation 2-7 days, high swinging fever with flu-like symptoms with or without diarrhoea, lymphopenia, CXR signs in about four days of symptom onset, and desaturation in some, requiring intensive care or even intubation. It soon turned out a new anti-viral agent, not yet registered in Hong Kong, showed some promising results. For those who still did badly, we postulated a possible culprit in terms of the patients' own immune system, and tried high dose pulse steroid. Such two-pronged approach definitely worked. But the disease course is notoriously fluctuating, and we are still some way from total success.

Fifth area: Staff and Public Education and Communication. I cannot emphasize more that this is close to half the battle. We have extremely distressed staff who are seeing their own colleagues falling one by one, and perhaps counting their own days; staff who would believe in any rumour they hear, and suspicious of management hiding information from them. We have mass media keen on sensation and playing one party against another. We have the public who doubts anything Government does. We need to strike a fine balance between getting across the correct messages, and avoiding unnecessary panic.

Firstly, we need to get data right and consistent, despite the many intrinsic murkiness and constantly changing situation of such information. Secondly, we need to provide frequent and timely information particularly to staff so that they feel they are in the know. The management in Prince of Wales Hospital e.g. is working flat out to give daily situation reports, daily and even twice daily staff forum. For me, email definitely helped in dissemination of my "Dear Colleague" letters to the 50,000 staff. Trouble is finding time to do it, and getting information right. For the public, we arrange daily release of figures, and the Government gives daily press conferences, plus entertaining the phone-in programmes. Thirdly, we need to emphasize and re-emphasize the basic principles of droplet precaution.

Few days ago, there was a sudden panic on availability of N95 masks that's meant for airborne infection, because all staff saw Prince of Wales people wearing N95 masks on television. The stock from the supplier was immediately wiped out, and staff were crying on radio phone-in programmes that they only got surgical masks. We had to launch very extensive education effort to reassure staff that surgical masks were entirely adequate. Yet because of the emotions, we still had to purchase N95 as soon as possible. Meanwhile, our microbiologists and epidemiologists ran a retrospective survey and drew 2 by 2 tables showing very significant difference between mask and no mask among staff on whether they develop pneumonia after contacting index cases, but as predicted, absolutely no difference between N95 and surgical masks. This is application of evidence-based medicine practice in the real world.

The last area I want to talk about is Command and Control. In such a crisis situation where things are changing extremely rapidly, this is crucial. There is a central nervous system in Prince of Wales Hospital where everybody feeds everything into the control room. I have set up one in the Hospital Authority Head Office. Because we have re-organized our 44 hospitals into clusters this year, it is now much easier to command and control through the seven Cluster Chief Executives through daily morning round up meetings, who would then disseminate information and orders down Hospital Chief Executives of their cluster hospitals and to individual departments. The decision to close a busy Accident and Emergency Department and divert cases from a major teaching hospital, the Prince of Wales Hospital, for example, was accomplished literally within hours. Having said that, it is still exhausting just to keep track of everything and getting on top of changes, but I can't imagine if we don't have such a system in place.

Ladies and gentlemen, I have given a quick account of where we are in this crisis, and there is definite evidence for optimism looking at the beautiful epidemiological curve. There is obvious elegance that we public health workers would discern in the pattern of outbreak and disease transmission, as well as disease control in this experience. However, I do not have the luxury of observing at a distance. I see fear, extreme anxiety, emotional breakdown, exhaustion, mistrust, and I see physical suffering and death. I see my own classmate and colleagues coming down with the illness. Yet I also see high professionalism, courage, perseverance, wisdom, and sheer will power to overcome immense difficulties among our colleagues. It is the latter that keeps me going these days.

Thank you very much.