

# SARS from the Trenches

*Why SARS Was a “Defining Moment” for Singapore  
—A Perspective from Two Infectious Disease Physicians*


By A/Prof Paul Ananth Tambyah and Dr Lee Cheng Chuan

The SARS epidemic was described by our then Prime Minister Goh Chok Tong as a “defining moment” for Singapore. It is surprising that an infectious disease that infected about 250 people and took almost 40 lives over a two-month period managed to capture the imagination, fear and anxiety of a nation. While it is true that SARS had a devastating economic impact with empty airports, hotels and tourist venues, the same occurred with the various financial crises that we have endured without any of them being classified as a defining moment. To put things into perspective, 250 is the number of people in Singapore who are infected with tuberculosis (TB) every two months or with dengue every two weeks, and 40 Singaporeans die from myocardial infarctions every two weeks. Now, with the benefit of ten years of “retrospectoscopy”, we can try to ask the question, “What was so special about SARS?” Why were we so scarred?

We suggest three possible reasons why SARS was so important for Singapore, and many parts of Asia and beyond, from the perspective of infectious disease (ID) physicians. SARS was first and foremost a tragedy. It took the lives of doctors and nurses in the course of their work, something that had not been experienced in recent memory. Data from the 1980s showed that dental surgeons who performed invasive procedures had high rates of hepatitis B antigenemia, probably related to previous exposures to blood-borne viruses while on the job. Many Singaporean healthcare workers with occupationally acquired hepatitis B went on to develop cirrhosis or hepatocellular carcinomas, but these have never been conclusively linked to their professions. The long incubation period for occupationally acquired TB or hepatitis makes it difficult to definitively link exposure to mortality and morbidity.

For SARS, however, it was very different. It was very clear when doctors and nurses were infected with SARS in the course of their duties, and it was very visible when they passed away. The names of those who died from SARS are etched in the minds of healthcare workers who worked in Singapore at the time. In the flurry of commemorations for the 10th anniversary of the SARS epidemic this year, we are glad that the *Straits Times* chose to show hospital leadership taking a moment of silence to remember those who gave their lives to SARS. In Singapore, occupational deaths are associated with construction workers, shipyard workers or other predominantly foreign workers who do the dangerous jobs that Singaporeans “do not want to do”. SARS, on the other hand, claimed the lives of a son of Singapore, who was a distinguished surgeon well loved by many of us; a bright young medical officer (MO) and his





mother, a GP; a senior Singaporean nurse; and a young migrant nursing staff.

For a while, there were young MOs who were reluctant to train in ID as they or their families were afraid that they might contract the next emerging infectious disease. We usually point out to such people that ID people are probably the most protected when it comes to the next novel emerging viral infection. By the time a referral is made to the ID department, the suspicion has been raised by the referring doctor or nurse so we can take all the necessary precautions. In contrast, the Emergency Medicine physicians or GPs usually have no idea whether the next patient that they see has just returned from an Ebola-infected village in Africa or some poultry farm in East Asia where the entire flock has died, until a detailed history has been taken.

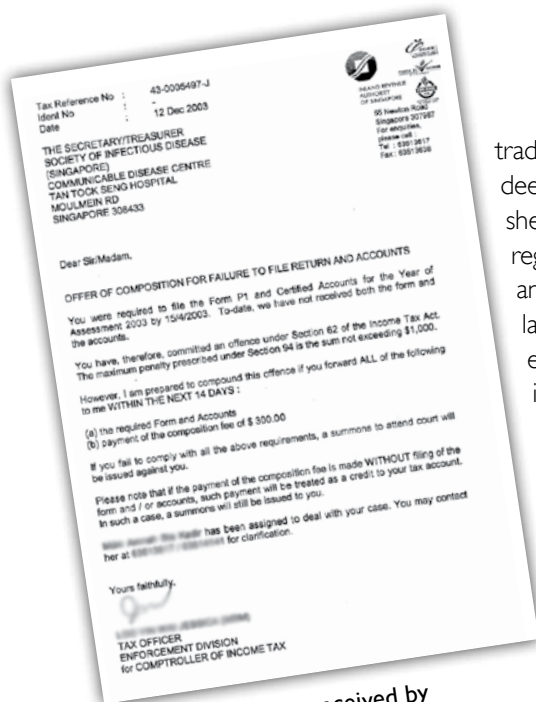
During the SARS outbreak, some hospital clinicians did not want to see patients until they had been “cleared by ID”, which put a tremendous amount of stress on the ID physicians. We had a few brave souls, however, who volunteered to help out where angels feared to tread. As many would recall, even during SARS, life had to go on. People still had fractures, cancer or strokes, and taxes had to be paid (Figure 1), regardless of how busy the ID physicians were in battling SARS. Fortunately, we have significantly increased the number of ID physicians in Singapore now. However, the population has also risen strikingly and there has been an exodus of ID physicians into the private sector, just like other more mature specialties in Singapore. There remains a need for more ID specialists to cover the increasingly diverse challenges, including infection control, antimicrobial stewardship, Travel Medicine, and so on.

The second reason why SARS made such an impact was that it was the first time healthcare workers were actually documented to have transmitted infections to their patients. Well-meaning healthcare workers, who were confronted with increasing numbers of their colleagues falling ill, continued to work while they themselves were unwell. Without realising it, some of these healthcare workers went on to infect some of their patients who then became ill with SARS, and some eventually died. Unfortunately, this had a profound impact on the level of trust in hospitals and the healthcare system.

For many years, we have known that when we fail to clean our hands in between patients, we risk spreading resistant bacteria. When we go to work with upper respiratory tract infections, we risk causing bronchiolitis or pneumonia in our immunocompromised patients. With SARS, for the first time, the public became aware of the hazards of nosocomial (hospital acquired) infections. This has been good for those of us involved in research in healthcare epidemiology and healthcare-associated infections. Many workers in Singapore and other Asian countries continued to work, sometimes wearing a mask if they are unwell. We often forget how vulnerable our patients are, especially the very young and the immunocompromised. This condition known as “presenteeism” has been raised as a serious public health concern in other countries and is something that needs to be urgently addressed in Singapore. Anecdotally, there are reports of healthcare institutions in Singapore which reward healthcare workers who do not take medical leave. That is something that surely the legacy of SARS should undo as soon as possible before more patients are harmed.

Finally, we think that SARS made such an impact because it shattered the aura of Singapore as a city favoured by fortune. We have always prospered because of our strategic location at the junction of the world’s busiest





**Figure 1: summons received by the Society of Infectious Diseases (Singapore) for not submitting its income tax return by 15 April 2003**

trade routes with our deep natural harbour sheltered from regional typhoons and tsunamis, by the large landmasses on either side of our island. In healthcare, we had the benefit of a small, largely urban population, a commitment to public health, and significant government investments in primary care which led to some of the world's lowest infant

mortality rates by the 1960s. We managed to significantly reduce TB with landmark Medical Research Council-Tan Tock Seng Hospital (MRC-TTSH) clinical trials, and we achieved what has been described as one of only two programmes ever to control dengue fever. True, we were affected by the polio outbreaks of the 1950s, but under the leadership of Prof Ernest Steven Monteiro in collaboration with Prof Albert Bruce Sabin, we ran the first clinical trials of the oral polio vaccine that would later bring the world so much closer to polio eradication. We were affected by the Nipah virus outbreak, but the team at TTSH were able to contain and control the disease very effectively in large part because we had abandoned pig farming in Punggol many years earlier.

In contrast, there were SARS patients who arrived in our neighbouring countries – Thailand, Malaysia, and so on (most notably Dr Carlo Urbani in Bangkok), but for some reason that is still not entirely clear, they did not have sustained epidemics triggered off by single imported cases the way we did. Some have speculated that this was due to climatic factors and some environmental studies have shown that the virus can survive longer in air-conditioned environments than in hot, humid conditions similar to the public hospitals in our neighbouring countries. Others believe that we were just unlucky that one of the first cases we had was a “super-spreader” – one of those “cloud individuals” who are efficient disseminators of respiratory infections. This is an entity which has not been well defined despite extensive genomic and virological analyses.

Whatever the reason, the blow to our psyche was profound. Many lessons were learnt in true Singaporean style, as medical administrators, clinicians, laboratorians and scientists were all determined to never let anything similar to the SARS tragedy happen again. Some would argue that

we overreacted to the H1N1 influenza A pandemic in 2009, but then again, we were merely following the guidance of the World Health Organization (WHO), which declared a pandemic without a new influenza subtype for the first time in its history. Now, we have a new subtype of influenza (H7N9) with widespread occurrence in the world's most populous country, but no declaration from WHO at the time of writing. This suggests that sometimes, the pendulum can swing too far in the opposite direction. WHO was stung by criticisms of conflicts of interest and other accusations which have probably contributed to its extreme caution at this time.

Singapore's response to the recent threats of the novel coronavirus in the Middle East, which looks a lot like SARS, and the H7N9 influenza outbreak in China has been exemplary to date. Hospitals, laboratories and clinics are quietly making preparations. The infrastructure built up after SARS, and tested by H1N1 in 2009 within the various scientific and clinical institutions, will be tested severely should either virus become more widespread in human communities. Singapore has also changed a great deal; we are more crowded, more diverse, but at the same time, hopefully, we are more prepared and will not need to have another defining moment when the lives of healthcare workers or other young people are placed at risk.

We do not want sick workers, whether in healthcare institutions or in clubs (like The Butter Factory where a cluster of H1N1 cases occurred in 2009), to feel the need to go to work regardless of how infectious they are, and as a result, place others at risk. We also would like to feel that Singapore can take the lead in providing resources, training and medical leadership for the region should, or rather, when the next SARS-like virus strikes. With SARS, the nation was brought together to mobilise the community for a disease which had already wreaked havoc in the hospitals. SARS was uniquely a nosocomial infection – three-quarters of SARS cases in Singapore occurred in hospitals and healthcare facilities. Almost all other emerging viral infections have occurred in community settings. That is when community mobilisation will really make a difference and a “redefining moment” can be experienced. That would be a fitting tribute to the memory of healthcare workers, patients and families who died of SARS. **SMA**



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**Photos: Society of Infectious Diseases (Singapore) and iStockphoto**