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Cover Picture:  
Andreas Vesalius (1514-1564):  
Father of Modern Anatomy  
(Refer to page 229-230)

## Heroes and Heroines of the War on SARS

Y C Chee

On 12 March 2003 the World Health Organization (WHO) issued a worldwide alert about the severe acute respiratory syndrome (SARS). The rapidly progressive, sometimes-fatal atypical pneumonia appeared to have risen in Guangdong in Southern China. Singapore was already one of the countries with known SARS cases, together with China, Hong Kong, Vietnam and Canada. By the end of March 2003 there were more than 1,600 cases and more than 50 deaths in over 12 countries.

As at 14 April, the situation had worsened. Newsweek reported the following statistics around the world – country, number of cases/number of deaths as follows: Canada 74/7, USA 115/0, Ireland 1/0, UK 4/0, Belgium 1/0, France 3/0, Spain 1/0, Italy 3/0, Germany 5/0, Romania 1/0, Switzerland 1/0, China 1,220/49, Hong Kong 800/20, Taiwan 17/0, Thailand 7/2, Vietnam 59/4, Malaysia 1/1, Singapore 101/6 and Australia 1/0.

SARS is an infectious disease with the coronavirus as its cause. There are documented primary, secondary and tertiary cases and even worse, community cases where tracing the SARS contact has become impossible<sup>(1)</sup>. SARS has spread throughout the world because people can be exposed in one area and be on the other side of the world a day later when they take ill.

In the New England Journal of Medicine issue dated 31 March 2003, three articles on SARS were published. The titles were A Cluster of Cases of SARS in Hong Kong, Identification of SARS in Canada and an Editorial, Case Clusters of the SARS<sup>(2-4)</sup>. They described 10 cases each in Hong Kong and Toronto. On 2 April 2003, the New England Journal of Medicine editorial was titled “Faster ...but Fast Enough?” Responding to the epidemic of SARS<sup>(5)</sup> and on 7 April, the same journal published “A Major Outbreak of SARS in Hong Kong” which analysed 138 cases in the Prince of Wales Hospital<sup>(6)</sup>.

On 10 April the same journal had two articles. The first was “Identification of a Novel Coronavirus in Patients with SARS,” by the group in Germany (where our Singaporean doctor was warded) and the other “A Novel Coronavirus Associated with SARS” by members of the SARS working group which included our Microbiologist Dr Ling AE of Singapore General Hospital and Dr Carlo Urbani<sup>(7,8)</sup>. Dr Urbani succumbed to SARS and the latter article was dedicated to the memory of him.

### DR CARLO URBANI

Dr Urbani was a 46-year-old WHO physician and infectious disease specialist whose work defined SARS. He died in Thailand on 29 March 2003 of SARS – a valiant fallen hero in the battle against SARS. The members of the SARS working group<sup>(8)</sup> proposed that the novel coronavirus be named the Urbani SARS – associated coronavirus.

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His involvement goes back to Hanoi, when he was called in as an epidemiological expert to examine patients at the Vietnam-French Hospital there. He alerted the world to the disease. Without the early warning by him, the outbreak could have been worse. He was an Italian WHO epidemiologist at the WHO office in Hanoi who first responded to anxious hospital officials who reported to him that a sick Chinese American businessman (Mr Johnny Cheng) was infecting doctors and nurses with a strange pneumonia. He visited the hospital daily and first treated Mr Cheng on 26 February. Over the next week, Dr Urbani was in the hospital taking samples and working with staff there, who themselves started to get sick. And then Dr Urbani himself got sick. It was Dr Urbani who recognised that health workers were being infected by close contact with patients and alerted health authorities that infection control safeguards were essential. WHO credited him with alerting the world to the need for heightened global surveillance for the disease and for bringing the SARS outbreak under control in Hanoi.

Many healthcare workers at the Hanoi hospital took ill, several critically so. Health officials therefore shut it down and imposed a quarantine. Dr Urbani, already ill was airlifted to a Bangkok hospital where despite treatment, he died. He was in 1999 the President of the Italian branch of *Medicins Sans Frontiers* and accepted the Nobel Peace Prize on behalf of the relief aid group. He was an expert in parasitic diseases of school children and had worked in Cambodia, Laos and Vietnam. As a young man of 22, he had left his hometown of Maiolati Spontini near Ancona on Italy's Adriatic coast to work among African communities.

His philosophy was this. "Health and dignity are indissociable in human beings. It is a duty to stay close to victims and guarantee their rights." In Hanoi he stayed close to the victims of the disease until he himself took ill and died. To the Bangkok team, Dr Urbani is a hero. Health care workers around the world may owe their lives to his recognition of the need for stringent protections, although that recognition came too late to save him.

"This is a much more serious illness than many people, including some health officials, appreciate. It is dramatically more severe than other diseases that are spread by the same route. People need to recognise that more needs to be done. Otherwise, I fear SARS is going to be with us for a long time," Dr Scott Dowell said. (Dr Dowell, from the Centre for Disease Control and Prevention in Atlanta, is director of a programme set up to detect new diseases in Asia and is based in Bangkok.)<sup>(9)</sup>

#### **HANOI HEROES AND HEROINES**

When Dr Carlo Urbani investigated the outbreak at the Vietnam-France Hospital in Hanoi, he met with a dedicated team of healthcare workers there who were treating Vietnam's only index patient – a 48-year-old Chinese-American businessman, Johnny Cheng, who first brought the disease to the country after having visited Shanghai and Hong Kong. He had fallen ill in Hanoi and was put on artificial respiration on 2 March and died on 13 March in a Hong Kong hospital. Events snowballed from there. Some days earlier, some of the staff began to complain of shivers and headaches. They were hospitalised and then the hospital was closed. Local companies refused to deliver food to the hospital. A support committee was formed to bring in meals and other aid. They were locked up with the beast. Draconian hygiene measures were put in place. But two nurses and two doctors died. Said Dr Vu Hoang Thu, "We were very scared. But we did

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*On 22 March 2003,  
Tan Tock Seng  
Hospital (TTSH)  
was declared the  
dedicated SARS  
hospital for  
Singapore.  
All SARS cases,  
suspect and  
probable as  
defined by the  
WHO case criteria,  
were isolated at  
Tan Tock Seng  
Hospital.*

not have a choice, we had to work, to care for our colleagues. Those who were in good health saw others falling sick and their health deteriorate. We cried a lot. But we had to encourage them; and for some, lie to them about the progress of the illness. What we lived through, it was like a war. Without force, without solidarity, we would not have been able to get through it”<sup>(10)</sup>.

So when the deadly SARS virus sweeping the world hit this Hanoi hospital, doctors and staff decided to lock themselves away with the killer virus to prevent it escaping into the wider community. Thanks to their quick action, the outbreak was contained but four health care workers died.

#### **SINGAPORE BATTLEFIELD**

On 22 March 2003, Tan Tock Seng Hospital (TTSH) was declared the dedicated SARS hospital for Singapore. All SARS cases, suspect and probable as defined by the WHO case criteria, were isolated at Tan Tock Seng Hospital. All other hospitals and clinics where patients were seen and SARS diagnosed were to have them transferred to TTSH. However, many of the frontlines of battle were also out there in the primary care clinics.

It was on 29 March 2003 that following a symposium organised by the College of Family Practitioners and the Ministry of Health that the “Interim Advisory on SARS for doctors practising in primary care and family practice settings in Singapore” was issued. It was updated subsequently on 3 and 12 April. The College SARS Workgroup was spearheading this effort to equip our frontline doctors with knowledge, skills and protective gear. Should they encounter any case in their clinics, they were to suitably protect themselves and their clinic staff before examining the patient and then referring the latter to TTSH via a private ambulance service.

So while there was much focus on TTSH and the work of its staff, “GPs deserve praise and government help too”. So was the title of a letter to the Straits Times forum page on 17 April 2003<sup>(11)</sup>. She wrote, “While the Tan Tock Seng Hospital doctors and nurses rightfully deserve the cheesecakes, roses and accolades piled on them, let us not forget the unsung heroes, the humble general practitioner (GP) and his clinic assistants. No less at the front line, they face increasing isolation as they grapple with a falling patient load and increase in overheads (masks, bleaches and antiseptic washes don’t come any cheaper to them) amid fears that they themselves may become infected by SARS”.

#### **HOSPITAL DOCTORS AND NURSES**

Although TTSH is the designated SARS hospital, it is obvious that all healthcare workers from doctors down to the cleaners are at risk of contracting the disease in the workplace in the other hospitals and clinics. Some problems were acutely faced by staff of TTSH. So I would like to be specific to TTSH but at the same time not lose sight of the issues affecting all health care workers working outside of TTSH.

Nurses faced the unknown when the SARS outbreak began. On 12 March when the first SARS case was reported in Singapore (the first index case was admitted to Tan Tock Seng Hospital on 1 March) no one knew how the virus spread, much less how patients should be treated. Within two weeks a system was in place that involved “gowning up” and showering before leaving the hospital. Uniforms would be left at the hospital for disinfection. Said a nursing officer, “It was unbearable to

see patients suffering. And it was crushing to lose any to SARS. What was worse, many of those falling victims to the disease were colleagues. However internal support was very strong. We would buy each other gifts and chocolates to cheer each other up”<sup>(12)</sup>.

What made it especially difficult were the prejudices nurses faced. Taxis and even buses refused to stop at the hospital. Neighbours did not want to ride the lift with them. At any packed food court, there would always be a seat for a TTSH nurse. Queue lines would quickly shorten when a nurse joined that queue. Then came the outpouring of tributes to these healthcare workers on the SARS frontline. Taxis began showing up at the hospital. Other hospitals sent their nurses to help out at TTSH – 18 from the Singapore General Hospital and two from Alexandra Hospital. To our nurses, patients come first. They deliver care to them regardless of the disease they have. They are not quitting.

In support of the critical roles nurses play, one writer to the forum page said, “Saying thanks is fine, but let us pay our nurses more”<sup>(13)</sup>. It is one thing to express gratitude and thanks to the healthcare staff who care for patients with SARS. But he said: “What Singaporeans have mistakenly identified as “exceptional courage” in nurses is in fact an inherent personality trait. Their capacity for love, sympathy and endurance, unfazed by the fatal experience of their fellows, defines who they truly are; tending to the sick and suffering in what they do. It is more than just a job or a passion. It is the conviction of their calling. This is their creed.... Their hospital workplace is a battlefield of germs, and the SARS virus is merely the latest, though not the deadliest, to enjoin the daily battles”. He went on to extol, “They perform their tasks with effortless cheer, as they fight the bugs to the end with every trick, knowledge and passion to make a difference to the comfort of the sick and unwell. Unknown to many, the nurse is also the doctor’s guard against forgetfulness, his ever-present and questioning conscience; at times, she is his challenge and often, his skilled right arm”. His conclusion? “We need to reward our nurses more, to demonstrate the sincerity of our messages of gratitude and thanks, failing which the Courage Fund and the compliments would be just empty symbols.”

On the other side of the coin, the President of the Health Corporation of Singapore Staff Union had this to say: “We are the union representing more than 5,000 workers in the restructured hospitals in Singapore. The last four weeks have been trying for healthcare workers and their families. The union is extremely proud that the healthcare workers have risen to the occasion. They have gone beyond the call of duty to combat and contain disease.

Recently incidents have been reported of healthcare workers being shunned by some members of the public. We understand the public’s anxieties for their safety and that of their families.... We are very touched by the kind words and gestures from the members of the public. On behalf of all the healthcare workers in Singapore, we would like to say “Thank You” to all of you.”

What about our doctors? Big sacrifices... behind doctors’ masks<sup>(14)</sup>. Bound by the Hippocratic Oath and The Physician’s Pledge of the Singapore Medical Council, TTSH doctors said fighting the unknown virus as well as fighting discrimination from the public and sometimes even their own families, had been worth it. Behind ‘the masks’ they had to deal with a lot of personal pain and sacrifices. One doctor had to stay with a colleague because his parents kicked him out of the family home. Another lived separately from wife and child, just to be safe. Another

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*As we know today, there are different parts of the virus from which primers have been made. There are three undergoing testing in Singapore and the German version called the Artus-Bernhard Nocht Institute version would have had inputs from our Singaporean colleagues who happened to be their patients. The other kits are from CDC (Centre for Disease Control, Atlanta) and GIS (Genome Institute of Singapore).*

said his brother's colleagues avoided him because he is working at TTSH. Yet others have begun sorting out their financial arrangements, in particular their insurance policies and wills. What boosts their morale? It is the messages of gratitude and encouragement from relatives of patients and even strangers.

#### **ILLNESS MADE PUBLIC**

It was in the news that one of our fellow colleagues took ill in New York in mid-March and was quarantined and hospitalised in Frankfurt when he was en route home to Singapore. Both he and his wife and mother-in-law were reported in the medical journal as cases from whom clinical samples were taken and from which a novel coronavirus was identified<sup>(7)</sup>. In this article our doctor colleague is the index patient, his wife (also a doctor) is contact one and contact two is the mother of contact one. Our colleague had treated a patient with atypical pneumonia who had arrived from Hong Kong and was warded at TTSH on 1 March 2003. From 3 to 9 March, our colleague treated her, then left for New York to attend a medical conference. His illness began when he was in New York and on 13 March he flew home but during the stopover in Frankfurt, Germany all three were transferred to an isolation unit with suspected SARS.

Our gratitude to him and his family must be for the samples they provided to the German doctors at the Frankfurt University Hospital. From there and yet other samples as reported in the publication<sup>(7)</sup>, a sequence of 300 nucleotides in length was obtained by a polymerase-chain reaction based random amplification procedure. Genetic characterisation of this coronavirus showed that it is only distantly related to known coronaviruses (identical in 50 to 60 percent of the nucleotide sequence).

Further downstream, this nucleotide sequence has resulted in the production of a diagnostic test kit which is undergoing clinical testing. As we know today, there are different parts of the virus from which primers have been made. There are three undergoing testing in Singapore and the German version called the Artus-Bernhard Nocht Institute version would have had inputs from our Singaporean colleagues who happened to be their patients. The other kits are from CDC (Centre for Disease Control, Atlanta) and GIS (Genome Institute of Singapore).

#### **TRIBUTE FROM A SISTER**

It was on 28 March 2003 that Dr Ong wrote a heart rending piece to the Forum Page<sup>(15)</sup>. I can do no better than quote excerpts from her letter. "As my family battles SARS – my brother and mother have been admitted to Tan Tock Seng Hospital – we would like to convey our deeply felt thanks to all the dedicated staff who have been caring for them. My brother who is a healthcare professional at TTSH caught SARS from a patient. He has since moved from intensive care to the general ward. We feel proud of the doctors, nurses and healthcare workers there, especially knowing that there were doctors who volunteered to go near the areas where the patients are most critically ill. The world is short of heroes and heroines and their contributions should not go unnoticed.... So thank you again on behalf of my family for taking care of my brother, your colleague. Our country needs more people with the same resilience and courage in these tough times...."

Unfortunately, tragedy of tragedies, both her brother and mother succumbed to SARS. Both were doctors battling to the last.



### **PRAISE FROM OUR PRIME MINISTER**

The Prime Minister was full of praise for the doctors and nurses who have to deal with SARS patients. "My word for them is, they are valiant people and we have to commend them for their task, which is a very difficult one to do," PM Goh said<sup>(16)</sup>. In spite of all precautions they have taken, there is still 0.01% chance of their catching the bug. Yet they soldier on. "To get nurses and doctors to work with SARS patients is a feat. I really admire the dedication and professionalism of our hospital workers."

His own Marine Parade grassroots leaders were penning a letter of support and other Singaporeans should show their appreciation too. And a surge of such letters flowed in the media in the days that followed.

### **THE COURAGE FUND**

The SARS Relief Fund was initiated on 2 April by the Singapore Medical Association (SMA) and the Singapore Nursing Association (SNA). By 11 April 2003, it had received \$76,000 in contributions. The Courage Fund with President SR Nathan (President of the Republic of Singapore) as its Patron in chief was launched on 11 April 2003 and more than \$700,000 was pledged. It is named in honour of healthcare workers in Singapore and is meant to provide relief to the families of needy SARS patients as well as healthcare workers who fall ill in the course of their duties. Later, its use was extended to families and people who were put on Quarantine Orders who were in need of financial assistance, paying up to \$70 per day.

Donations can be pledged by calling a 1900 telephone number and SingTel Mobile customers could also use the \*SEND service. SingTel would match dollar for dollar for donations made via calls to the 1900 and \*SEND numbers. As of 25 April 2003, the fund has received over \$3.3 million. Government is donating \$1 million more as part of its SARS relief package announced on 19 April 2003 and has promised to make donations dollar for dollar.

The Courage Fund also receives cheque donations sent to the National Healthcare Group (NHG) 6 Commonwealth Lane, Level 6, GMTI Building, Singapore 149547. The Chairman of this fund is the Chief Executive Officer of TTSH. The courage, commitment and sacrifices that our healthcare workers make in their daily lives, and have made in fighting the SARS epidemic ensure that our public healthcare system has been able to continue functioning during this difficult period. It is organised by NHG, Singapore Health Services, SMA, SMA, SNA and Singapore Press Holdings.

### **MORE TRIBUTES**

It would not be possible to publish all the letters of appreciation, encouragement, praise and salutations from members of the public and the community at large: from young school children to adults, strangers to us, to the elderly folk who follow the events of SARS on the media. Not to acknowledge some of them would be a missed opportunity. So I will end by quoting three different sources. The first is from yahoo.com (14 April 2003).

Dear Sir, Please convey this msg to all the working staff of TTSH; we, the people of Singapore are very proud of each and every one of you. Your sacrifices and perseverance in this "fight" against "SARS" have put many of us to shame (especially me!) You have shown through your deeds the meaning of the words "service to mankind". From the deepest of my inner being, we salute you! From the bottom of our hearts we pray that all of you stay in the pink of health and may God bless and keep you and your

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*Give all of them,  
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families in good health. May all patients currently undergoing treatments recover in quick time. May good thoughts and prayers of all Singaporeans be with all of you. Remember, “you never walk alone”; we are with you all the way till victory come! Take care and may the Great God bless you again.

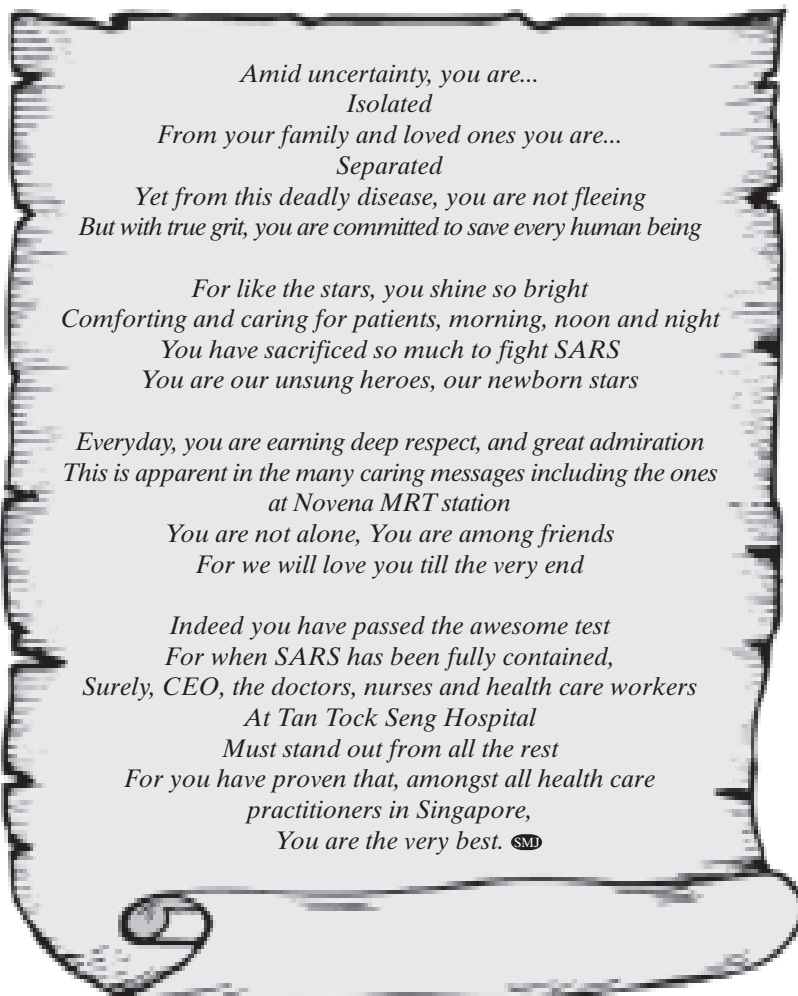
The second is from the newspapers titled “Medical Heroism” by a doctor<sup>(17)</sup>.

“Like any other people, Singaporeans need heroes and role models. We often turn to people featured in the media, that is, celebrities, sports personalities, politicians, successful entrepreneurs and so on. Media attention may be the last thing on the minds of the staff of Tan Tock Seng Hospital but perhaps this is precisely what they need: positive media attention. I can think of no better role models for young Singaporeans than these people. They are waging war against an unseen enemy and may be struck down at any time. They continue to give their heart and soul to the battle, even when their colleagues fall victim to the deadly virus. They show tremendous resolve in even setting foot outside the security of their home every day... Let us rally together in support of our heroes instead of treating them like the enemy. Give all of them, from doctors to hospital attendants, the recognition they so rightly deserve.

I would like to see our heroes receive an award from the President on National Day. They have more than earned it. Let us also remember them in our prayers”.

Thank you Alvin.

And lastly a poem from Mr RA Fernando, Author of “Poems from the Heart”, who composed this poem specially dedicated to staff of TTSH titled, SARS STARS:



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