SMA news

For Doctors, For Patients

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Elaborating on
COVID-19 Vaccine Concepts

Leading the NCID's Pandemic Response –
Prof Leo Yee Sin

VACCINATION

Another Tool in Our Fight against COVID-19

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We regret that only shortlisted candidates will be notified.

Ng Teng Fong General Hospital

Jurong Community Hospital

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The EDITOR'S MUSINGS

Dr Tina Tan

Editor

Dr Tan is a psychiatrist with the Better Life Psychological Medicine Clinic and a visiting consultant at the Institute of Mental Health. She is also an alumnus of Duke-NUS Medical School. Between work and family life, she squeezes time out for her favourite pastimes – reading a good (fiction) book and writing.

National Day 2021 was a quiet affair for my family. We looked out for the fighter jets in the sky and watched the ceremonial parade in the morning. I played this year's National Day Parade song on loop several times because my kids liked it so much.

This year's National Day is significant because Singapore has achieved and surpassed its targeted vaccination rate. It is at 70% and rising, whereas the Multi-Ministry Task Force had aimed for two-thirds vaccination rate by National Day. This is typical of Singapore – under-promise and over-deliver. And I mean that in the best way.

In line with the theme of celebrating our nation's accomplishments, we feature a variety of articles about one of the facets in the pandemic battle which will help us to reopen and travel again: vaccination. There are various reasons why there is a segment of the population that isn't vaccinated – a significant chunk are below 12 years of age, another segment has severe allergies, and some continue to have fears of the available vaccines. The ethics of differentiated policies for those who are vaccinated and those who aren't are interesting to consider, though this isn't the platform to debate about it. Nonetheless, the Government's messaging is clear: for now, to protect the vulnerable among us, we have moved into differentiated policies, while preparing to transition into a new reality where COVID-19 is endemic.

Do look out for the articles by A/Prof Hsu Li Yang, who gives an update on the efficacy of COVID-19 vaccines and objectives of mass vaccination, and Drs Wong Sin Yew and Loh Jiashen, both of whom have contributed a summary on vaccination in special populations.

I was also honoured to be able to interview Prof Leo Yee Sin, who has been an integral part of the National Centre for Infectious Diseases, and one of the early faces of our front-line fight against COVID-19. She reminds me a little of Dr Anthony Fauci from the US, actually, with the way she readily took to national television last year, speaking to the press and media about the virus, the disease and Singapore's strategy.

As Singapore prepares to reopen, I know many of us are looking forward to our next holiday. As it stands, travelling for leisure remains a mouth-watering dream for the moment. Will there come a day when vaccine passports are required? This is food for thought, and something that is not out of the realm of possibilities. Nonetheless, as we consider our end-of-year plans (which are unlikely to involve leisure travel for the time being) to lighten the mood, we asked some of our Editorial Board and Council members to write about their next travel destination. I hope this gives us all something pleasant to think about.

Last, but not least, I would sincerely like to thank Dr Ganesh Kudva, who will be stepping down from the Editorial Board as of this month. We wish him all the best in his future endeavours.

Happy National Day to all. ◆

Elaborating on COVID-19 Vaccine Concepts

Text by A/Prof Hsu Li Yang

Parts of this article are taken from a presentation delivered by the author in June 2021 for the National University of Singapore's geNiUSchannel on YouTube. The video is available at https://bit.ly/3zpHaro.

The COVID-19 pandemic has disrupted the world in a myriad number of ways in addition to the four million deaths it has caused to date. Aside from health services, sectors such as education, global shipping and supply chains, travel and tourism are just some others that have been impacted in an unprecedented manner.

The virus has also evolved as it spread. Although coronaviruses inherently mutate slower than influenza viruses, the huge number of infections has permitted natural selection to take place at speed, resulting in newer successful variants that are more transmissible than the original virus from Wuhan, which has been outcompeted to the extent that it can only be found in laboratories now and is no longer "in the wild". The Delta variant is currently the most worrying of these, having spread to over 100 countries and outcompeting all other local variants once it has established itself. Its estimated basic reproduction number R0 is between 5 and 8, meaning that each infected person has the potential to spread the virus to between five and eight other non-immune persons on average, assuming no precautions are taken and that the population mixes randomly.

This is far more infectious than seasonal influenza (median R0 approximately 1.3) and reinforces the understanding that COVID-19 will neither disappear nor be confined to a limited, few geographical locations for the foreseeable future, unlike the earlier zoonotic epidemic coronaviruses that caused SARS and MERS.

Thus far, a few countries including Singapore have successfully kept daily COVID-19 case counts low or even zero via non-pharmaceutical interventions including mask-wearing, safe-distancing and tight border controls. However, this is costly to sustain, and we have all experienced the stress and fatigue brought on by having to live under various conditions of heightened alertness over the past year and a half.

The silver lining to this pandemic is that it triggered an unprecedented pace of research in therapeutics and vaccines against COVID-19. While the work on novel therapeutics has not delivered anything paradigm-changing, we have developed a large number of effective and safe vaccines within a short period of time, with many more in the pipeline. To have not just one, but more than seven vaccines commercially available within a period of a year and a half is nothing short of miraculous. To put things in perspective, the prior record was held by the mumps vaccine, which took four years to develop and launched between 1963 and 1967. And we can certainly expect more COVID-19 vaccines in the future, as there are over a hundred in the clinical phase of development.

These vaccines span a range of different platforms, including classical ones such as inactivated viruses and protein subunits, to next-generation platforms such as the adenovirus vector and mRNA vaccines. They offer not just the possibility of reducing disease and death from COVID-19, but also the potential to transit to a post-pandemic future with fewer safe-distancing restrictions and greater freedom of travel. However, they have also generated a host of controversies, misunderstandings, misinformation and strong emotions on an astounding scale, even among those of us in the medical profession. Two of the relatively more confusing but important concepts will be discussed below.

Vaccine efficacy and effectiveness

A significant portion of COVID-19 vaccine controversies and misunderstandings revolve around ideas about vaccine efficacy. The term refers to the percentage reduction of disease or infection in vaccinated people compared to unvaccinated people, under optimal conditions

such as that of a randomised clinical trial, in order to minimise bias. Vaccine effectiveness is similar in concept, but refers to the comparison done via observational studies under "real world" conditions. In general, it is important to study how vaccines perform in the real world, because many groups of people are excluded from participating in clinical trials, including those who might be most vulnerable to a disease. Many people have this idea that once they are vaccinated, they can no longer be infected. But the important question is – what are we measuring efficacy or effectiveness against?

In clinical trials and a number of real-world observational studies, the key outcome measure is symptomatic disease. Most studies also looked at protection against severe disease (defined in various ways) and death, while a much smaller subset of studies looked at protection against asymptomatic infection as well.

A perfect vaccine will protect against not just symptomatic disease, but also prevent infection to the extent that transmission of the targeted pathogen does not occur. This latter effect is called "sterilising immunity". Sterilising immunity is not an all-or-nothing phenomenon at the population level. Measles, hepatitis A and human papilloma virus vaccines provide a very high degree of sterilising immunity, while varying degrees of sterilising immunity are seen in most other vaccines such as the influenza, pneumococcal, hepatitis B and pertussis vaccines. The current World Health Organization-approved COVID-19 vaccines do exhibit variable degrees of sterilising immunity – the evidence is particularly clear for the mRNA and Oxford-AstraZeneca vaccines which have reduced asymptomatic infection and spread of COVID-19 in observational studies.

It is important to note that vaccine efficacy and effectiveness can wane when the pathogen has mutated sufficiently. All currently approved vaccines – be it Pfizer-BioNTech, Moderna, Sinovac, AstraZeneca or Johnson & Johnson – as well as most in the development pipeline are designed based on the original Wuhan virus. The virus has evolved quite a bit since, and the Delta variant in particular is more resistant to neutralising antibodies produced post-vaccination or infection with earlier COVID-19 variants. Countries such as Thailand and Indonesia, for example, have stated that they will provide booster shots of either the AstraZeneca or Pfizer-BioNTech vaccine to healthcare workers who had previously received two doses of the Sinovac vaccine, in view of the latter's perceived poorer protection against the Delta variant. Although most of the other COVID-19 vaccines are still very effective at preventing severe disease and death from current variants of SARS-CoV-2, including the Delta variant, it is conceivable that the degree of protection may fall further against future variants of SARS-CoV-2.

The other major variable that affects vaccine effectiveness is time. Neutralising antibody levels post-vaccination inevitably fall, more rapidly in the case of Sinovac than the mRNA or AstraZeneca vaccines. Although immune memory created post-vaccination is likely to last for a long time, thus ameliorating the risk of severe disease and death, the risk of breakthrough symptomatic disease post-exposure may potentially rise over time even if the virus does not mutate significantly. This has led to discussions on the need for booster doses of vaccines or annual vaccinations just like the influenza vaccine. However, there is insufficient evidence at present to conclude whether third or annual shots are necessary. Under current circumstances where there are insufficient doses of COVID-19 vaccines for most low- and middle-income countries in the world, such discussions also come across as being inappropriate.

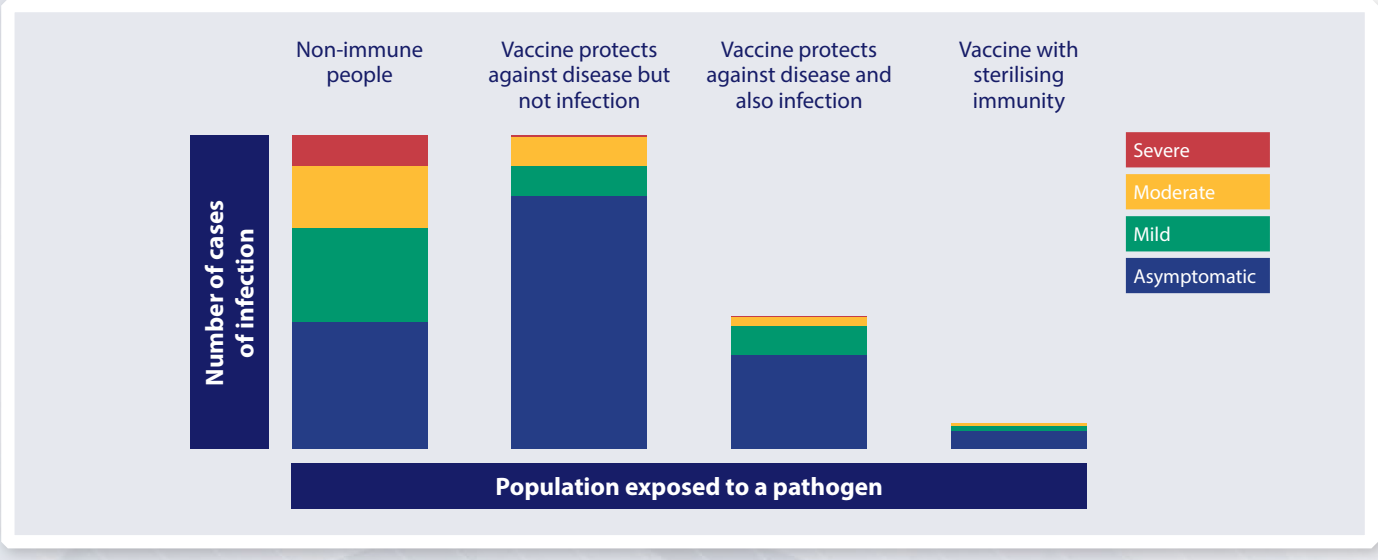

Figure 1. Illustration of vaccine effectiveness against infection and disease

Herd immunity

One formerly popular term that has seen less frequent usage recently is herd immunity. Herd immunity refers to the indirect protection provided to vulnerable members of a population by the majority that are immune – either due to vaccination or prior infection – to a particular pathogen. As the term might suggest, it was first conceived in the veterinary field, and one of the earliest records of its use was in 1894 by veterinary scientist Daniel Elmer Salmon (in whose honour the bacterium species *Salmonella* was named) from the United States Department of Agriculture, referring to resistance to disease in healthy herds of hogs.

The theoretical "herd immunity threshold" refers to the minimum proportion of a population that has to be immune, above which that pathogen will not spread successfully and will decline. The mathematical formula for calculating this theoretical herd immunity threshold would not challenge the average PSLE student, being 1 - 1/R0. Thus, this threshold is higher for a more transmissible pathogen; eg, for measles (R0 of 12-18) it would be approximately 92% to 95%, whereas for seasonal influenza (R0 approximately 1.3), a threshold of approximately 23% would suffice. For the COVID-19 Delta variant, this threshold will be between 80% and 88%.

In the real world, we humans do not move all over nor mix randomly, and the actual reproduction number R (as opposed to the basic reproduction R0) of a pathogen will vary under different circumstances. Hence, for migrant workers shut in dormitories during the circuit breaker (CB), for instance, the actual reproduction number R of SARS-CoV-2 would have been far higher than the basic reproduction number R0. The virus spread like wildfire through that population, with infection rates exceeding 50% in most dormitories, and reaching 90% in a few. However, R was <1 for the rest of us during CB, and the spread of COVID-19 was brought under control for the rest of Singapore. In the real world, therefore, the actual herd immunity threshold is very challenging to calculate, even for a small country like Singapore which will have multiple longstanding and transient communities with varying degrees of mixing.

Herd immunity conjures up images of zero COVID-19 cases or even eradication of SARS-CoV-2, but this view is fundamentally incorrect. As can be seen from the belaboured explanation above, the public health concept of the term is more nuanced: even if herd immunity is reached, there may be low levels of SARS-CoV-2 circulating in the community, as with measles in Singapore.

For many other people, herd immunity is viewed as a proxy to life returning to a near pre-pandemic normal with the relaxation of safe-distancing restrictions and greater freedom of travel. This is a fair approximation, although the outcome is neither binary nor cast in stone. The higher the vaccination rate, the more people will be protected against symptomatic and severe COVID-19. Non-pharmaceutical interventions such as mask-wearing in public and safe-distancing will also reduce the transmissibility of SARS-CoV-2. Thus, a combination of high vaccination rates and various community interventions will blunt the spread of the virus to acceptable levels that will not overwhelm our healthcare system.

Because the vaccines are imperfect, and new variants and time may reduce the effectiveness of current vaccinations, there is little certainty about what is actually required to reach herd immunity nor how long that state will last. It is probably best – which seems to be what is being practised in Singapore with regard to official communications – to drop the mention of herd immunity and develop clearer outcomes in describing the end of the transition to an endemic COVID-19 state.

Conclusion

The current aim of mass vaccination is to protect sufficient numbers of people from COVID-19, particularly those at highest risk of spreading the virus or developing complications from infection. This will prevent our healthcare system from being overwhelmed, as hospitalisations and deaths from COVID-19 remain low. In principle, if we "convert" COVID-19 into a disease that has about the same individual and population risk as influenza, then this will most likely be acceptable to most of us and will be the optimal outcome for exiting the pandemic.

We have been extraordinarily fortunate in having multiple effective and safe vaccines for COVID-19 within such a short period of time. It is now important to be clear about how we can transit out of this pandemic phase to a new normal that will be safe for as many people as possible, with relatively minimal impact to how we live our lives. Ideally, this should be done without significant fragmentation of the community, including among us doctors. ◆

Article was first submitted on 16 July 2021.

A/Prof Hsu is currently head of the Infectious Diseases Programme and vice dean of Global Health at the Saw Swee Hock School of Public Health.

EMERGING STRONGER: Together, We Can

Text by Dr Tan Yia Swam

Mental wellness

It was with great sadness that I read the *Straits Times* and *Channel NewsAsia* reports on the number of suicides in Singapore – 2020 saw 452 cases, the highest since 2012 and a 13% increase from the 400 cases recorded in 2019.[1]

Studies have shown the adverse impact of the COVID-19 pandemic on mental health.[2] The prolonged lockdown duration and many uncertainties are hard to endure, as they come relentlessly. When do people give up? When there seems to be no hope, no reprieve and their current suffering seems to be persistent. How can a seemingly manageable event push someone over the edge?

Suicide counselling is a specific skillset – advice such as "look on the bright side", "it'll get better" or "don't think so much" may do more harm than good. Someone may feel very stressed about a seemingly minor event and tell a friend about it. To the friend, it may seem like a minor thing, but to the person who has been fighting against many stressors for a long period, there's a whole lot of unspoken burdens which the well-meaning friend may not know about.[3]

It does not matter what your actual trigger is. It is the dreadful sense of doom hanging over you – that there is no end to the current bad situation and that there is no way out – that makes it feel so hard to carry on living.

Over the course of my general surgery training, aside from learning about surgical conditions, what fascinated me the most was the diverse range of responses. Some examples of major life-changing treatments include having a tracheostomy, a stoma, a permanent suprapubic catheter, an amputation or having to go on dialysis. When I talk to patients and ask how they feel about their treatments, I have noticed a few common responses.

Some accept it, as "no choice, I have to endure – but it's just for now. Things will get better in time." When it's permanent however, few may be able to accept it from the beginning, but most will have varying degrees of change adjustment: denial, anger, or grief before acceptance – if that ever happens. For those who cannot accept their diagnosis, they might progress to lifelong depression.

Prolonged COVID-19 fatigue

Looking back at the past year, how many changes have occurred and how many were mostly negative? What was our collective reaction?

Initially, people were worried about contracting COVID-19, as mortalities worldwide rose and international reports on shortages of hospital beds and oxygen supplies reached us. Singapore went into a circuit breaker beginning April 2020. Businesses rallied, with many food and beverage (F&B) outlets stepping up to provide delivery services. Subsequently, we seemed to enter a new normal and everyone meandered along. As a nation, we adapted to the idea of eating in groups of twos, fives, then eights. We joked and created online memes to cheer ourselves up.

Vaccines were greeted with great enthusiasm by some, but with mistrust by others. Open letters by a few medical professionals made headline news, and the Ministry of Health (MOH) had to undo the damage done to public confidence in science. Ongoing concerns about side effects, safety and investigations into cardiac complications cause lingering worries in parents. Updates on vaccine efficacy and announcements on booster shots have led to mixed responses. Even I feel that everything is changing too fast, and that I don't fully grasp the technology. I have to trust my specialist colleagues and the Government to have done their due diligence in keeping up to date and giving us the best recommendations.

International news are mixed as well – some countries are opening up, some are battling minor clusters and outbreaks, while others have rising numbers and increasing mortalities which fill me with concern and sadness. The evanescent nature of travel bubbles bring recurrent waves of rising hope and disappointment.

The Tan Tock Seng Hospital (TTSH) outbreak in May 2021 brought about the "segregation order". Out of concern that roommates from different hospitals might pass COVID-19 to each other, and that some healthcare workers (HCWs) were asked to leave their rental accommodations by their landlords, the hospitals helped to find alternative lodgings. This then extended to an order for families with two or more HCWs in different hospitals to ensure that they are "segregated" – either living in separate rooms, or moving out to hospital-provided facilities. The abrupt separation caused some inconvenience to young families, as their kids did not understand why their parents had to move out, and being a temporary single parent was difficult. Reports of discrimination against TTSH HCWs also made the news, which was highlighted by Member of Parliament Dr Tan Wu Meng in parliament as well.[4]

The rise of the Delta variant in the community brought about more stresses to the nation, increasing tensions along national and racial lines.[5] There are more open national conversations about this now, and I welcome it. There must be no discrimination. The virus does not discriminate, illnesses and death do not discriminate. We are in this together. Subsequently, the heightened alert phase came along and the economy faltered. The F&B, taxi and transport services, and retail sectors suffered. I sense that people are resigned and a few have given up. We see businesses closing for good.

On social media, there were a few reports of public nudity, and I personally witnessed a few incidents of road rage by commercial drivers, prompting me to ask for a Parliamentary written answer.[6] I note that the actual reports of road rage are stable (but then again, there are a lot less cars on the road) and verbal assaults have decreased, but cases of physical assault and nudity/indecent exposure seem to have risen. I cannot help but wonder, are these also signs and symptoms of a weakening of social cohesion and gradual deterioration in mental health?

Having to close down TTSH for a few weeks in May while the outbreak was contained brought about other stresses to the healthcare system. To prevent another similar outbreak, MOH decided to implement rostered routine testing to all inpatient HCWs, patients and visitors. This comprised the deep nasal swab for polymerase chain reaction testing every two weeks if vaccinated, or weekly if not vaccinated. This has been carried out on construction workers and maritime workers since June 2020.[7,8]

As we had learnt in medical school, a screening test should have various criteria.[9] Regarding the use of deep nasal swabs as a routine screening, I personally question its acceptability to the population and the cost-benefit.[10] I am still learning more about this, and asking colleagues in public health and infectious disease for my own learning.

I am a simple female surgeon – I can only think of simple analogies. Would I advise digital examinations for rectal or prostate cancers, or PAP smears for cervical cancers every two weeks? Of course, those are for cancer checks, which does not spread to others through droplets, so it is not a direct comparison. I look forward to more studies[11] to validate other more acceptable modalities of screening, which are just as sensitive and perhaps more cost-effective for the country.

Resilience and support

The closure of international borders has affected the global economy. The world is struggling together to get back on its feet. From our survey of Members in 2020,[12] we are aware that doctors in private practice are also facing financial challenges. We may be able to ride this out, but for how long more?

I personally believe that even though one may feel alone and abandoned during stressful times, we should reach out and lend each other strength and support. Thank you, to friends and colleagues who have been keeping in touch over emails, social media or even just a simple wrinkly-eyed smile while masked. These acts of friendship are deeply appreciated.

As always, we welcome feedback from our Members – so, do write in to sma@sma.org.sg. Stay well, and stay united. ◆

Dr Tan is a mother to three kids, wife to a surgeon; a daughter and a daughter-in-law. She trained as a general surgeon, and entered private practice in mid 2019, focusing on breast surgery. She treasures her friends and wishes to have more time for her diverse interests: cooking, eating, music, drawing, writing, photography and comedy.

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Honouring Excellence

The 62nd SMA Council warmly congratulates our Members who are recipients of the National Day Awards 2021.

The Public Service Star (Bar)

Prof Ho Lai Yun
Deputy Chairman
Singapore Children's Society

The Public Service Star

Dr Tan Yong Seng
Vice-Chairman
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The Public Administration Medal (Gold)

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Deputy Group Chief Executive Officer
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Singapore Health Services
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Rheumatology & Immunology
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Ministry of Health (MOH)

The Public Administration Medal (Silver)

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A/Prof Wong Kok Seng
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Renal Medicine & Internal Medicine
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Neurology (TTSH Campus)
Head
Neuromuscular Laboratory
National Neuroscience Institute
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Dr Derek Tse Wan Lung
Director
Regional Clinical Services, East
Director
Regional Clinical Services, North East (covering)
SingHealth Polyclinics
Singapore Health Services, MOH

The Public Administration Medal (Bronze) (Military)

COL (DR) Timothy Teoh Chi-Chan
Commander
Military Medicine Institute
Singapore Armed Forces

The Commendation Medal (Military)

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LTC (NS) Lim Kheng Choon
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This list may not be exhaustive. If we have inadvertently omitted the name of any recipient, we sincerely apologise for the oversight. ◆

HIGHLIGHTS

From the Honorary Secretary

Report by Dr Ng Chew Lip

Dr Ng is an ENT consultant in public service. After a day of doctoring and cajoling the kids at home to finish their food, his idea of relaxation is watching a drama serial with his lovely wife and occasionally throwing some paint on a canvas.

SMJ's five-year impact factor now at 2.053

The Council is happy to share that the *Singapore Medical Journal's* (*SMJ*) 2020 journal impact factor (JIF) has increased to 1.858, and their five-year JIF is now 2.053.

SMJ's steady progress over the years would not have been possible without the trust and continued support of their authors, reviewers and readers. We wish to express our heartfelt appreciation to the editorial board members led by A/Prof Poh Kian Keong, for their time and efforts, as well as the editorial staff for their hard work.

SMJ hopes to continue receiving high-quality submissions so that they can strive to advance their JIF and push your research even further.

Management of suspected abuse cases

We wish to highlight a Ministry of Health (MOH) circular (No. 91/2021), issued on 9 July 2021, which outlines the types of abuse cases a doctor may encounter, and the management and reporting of suspect cases.

The circular can be accessed at https://bit.ly/3IC4U7W. For clarifications, please email moh_info@moh.gov.sg.

Deferred implementation timeline for Healthcare Services Act

We wish to highlight a MOH circular (No. 81/2021) regarding the Healthcare Services Act (HCSA). Implementation of Phase 1 HCSA regulations has been deferred from September 2021 to 3 January 2022. The implementation of measles and diphtheria immunity requirements is similarly deferred from September 2021 to 3 January 2022.

The circular can be accessed at https://bit.ly/3BtmH6Q. ◆

Supporting Tomorrow's Doctors Today

SMACF Fundraising Appeal 2021

Text by Sara Kwok, Executive, SMA Charity Fund

In January 2020, the first case of COVID-19 hit Singapore. From that day onwards, the ripple effects of the pandemic swept through the country, upending the economy and our daily lives as well as adding tremendous stress to the healthcare sector.

The pandemic also brought about the collapse of businesses and threat of job retrenchments and income depreciation. Like many social service agencies, SMA Charity Fund (SMACF) was similarly affected, with donations significantly reduced due to the economic fallout.

SMACF was set up in 2013 to provide financial support to underprivileged medical students, and we are committed to supporting all individuals in their pursuit of a career in medicine.

With everyday activities still very much restricted and an economy struggling to recover from the pandemic fallout, many medical students continue experiencing financial challenges. We at SMACF will similarly also experience financial limitations in our capacity to support our beneficiaries.

This year, SMACF has rolled out the "SMACF Fundraising Appeal 2021", a new fundraising initiative with the aim of raising funds that will allow us to continue fulfilling our five main missions:

1. To continue providing financial support to needy medical students from the three local medical schools via the SMA Medical Students' Assistance Fund.
2. To continue advocating volunteerism among our medical students through sponsorship of meaningful community projects in order to nurture compassionate doctors who cure sometimes, treat often and comfort always.
3. To support learning exposure by providing needy medical students equal opportunities to gain international exposure and experience for better health outcomes for the public.
4. To recognise outstanding mentorship. The Wong Hock Boon Society-SMA Charity Fund Outstanding Mentor Award seeks to recognise outstanding mentors who have made a significant difference to their students' medical journey.
5. To support operational overheads incurred as a result of our charitable works.

"SMACF Fundraising Appeal 2021" runs from 26 April 2021 to 25 April 2022 and is dedicated to nurturing and inspiring our nation's doctors of tomorrow. Your support gives financially needy students an equal opportunity to pursue their passion and make a difference in the community. In appreciation of your generosity, all donors of the fundraising campaign will receive an exclusive car sun shade* with a donation of $100 and above.

We have witnessed how the COVID-19 pandemic has helped foster a community spirit among strangers through expressions of concern and acts of kindness. We have also seen healthcare workers from different hospitals, institutions and units come together to battle the virus and keep us safe. To the healthcare sector, this is an ongoing fight.

Help us bring about a positive impact on Singapore's healthcare by supporting our future doctors. ◆

Donate today by scanning the QR code below or visit https://bit.ly/2XDHaGF.

**Car sun shades will tentatively be available by the end of the year. Donors will be informed of collection dates when available.*

Vaccines and Variants:

Comparing Apples and Oranges

Text by Dr Wong Sin Yew and Dr Loh Jiashen

We are now just over 20 months into the COVID-19 pandemic and the amount of scientific data published has been nothing short of overwhelming. The same sets of data have at times been cut and spliced with different interpretations, conclusions and opinions. Clearly, in generating public health policies to move the country forward, it is not just the science that is needed, but political and economic considerations as well. There is no standard playbook to follow and we have already experienced how policies are constantly evolving. So, let us continue to follow the science with a short summary of the current status of vaccines and SARS-CoV-2 variants.

What's new in COVID-19 vaccines?

In the last six months, national COVID-19 vaccination programmes have demonstrated effectiveness in slowing the rampage of the pandemic. The pandemic's global scale has also resulted in different vaccine developments in different countries, many having diverse modes of action, efficacy and safety data against SARS-CoV-2. The main classes of COVID-19 vaccines are mRNA, viral-vectored DNA, inactivated virus and protein subunit.

The general structure of an mRNA vaccine is an optimised mRNA sequence in a lipid capsule. Delivery occurs via passive fusion of the lipid capsule with the cell membrane and delivery of the spike protein mRNA into the cytosol.

Viral-vectored DNA vaccines, like the Oxford-AstraZeneca, Russian Sputnik V, and Johnson and Johnson (J&J) vaccines, deliver their DNA via the cell entry mechanism intrinsic to the carrier adenovirus. However, since the pathogenic genes are removed and replaced by the DNA of interest, no further viruses may be produced by the host cell, which transcribes and translates the DNA into the protein of interest.

Inactivated virus vaccines, like Sinovac and Sinopharm, deliver an inactivated SARS-CoV-2 virus to the immune system to generate immunity.

A protein subunit vaccine delivers the protein of interest embedded in a lipid capsule and in a form similar to that presented by SARS-CoV-2. An adjuvant has been added to enhance the immunological response for such vaccines. mRNA and protein subunit vaccines present a spike protein molecule in a prefusion configuration to the immune system.

Vaccine efficacy

The discussion of efficacy of COVID-19 vaccines must be appropriately preluded. Firstly, the efficacy against asymptomatic and symptomatic infections, hospitalisation, severe disease and death should be clearly stated when quoting efficacy. Secondly, heterogeneity in health-seeking behaviour, healthcare access and trial protocols greatly influence the transmission risk of infection in vaccine trials. Thirdly, vaccine trials done in different parts of the world at different times bear the pressure of different virus variants which may again nuance the discussion of efficacy. Lastly, phase III trials describing vaccine efficacy should be distinguished from real world data describing effectiveness. While efficacy is calculated from rigorously conducted randomised placebo-controlled trials, effectiveness reflects real world application of a vaccination programme, with all the attendant compromises of reality such as disrupted cold chain, administrative flaws and reporting of infected cases using active or passive surveillance methodologies.

In phase III trials, the Pfizer-BioNtech, Moderna, AstraZeneca and Sputnik V vaccines quoted 95%,[1] 94%,[2] 90%[3] and 91%[4] efficacy respectively against symptomatic infection in late 2020, prior to the rise of the highly transmissible Delta variant.[5] With the exception of the AstraZeneca vaccine, these trials were not conducted in South Africa, where the resistant Beta variant circulated near the end of 2020. Late to join the pack, the Novavax protein subunit vaccine offered 86.4% efficacy against the Alpha variant and 96.4% against non-Alpha variants. Yet the breakdown of the non-Alpha variants was not detailed in the study nor in the supplementary appendix.[6]

Most vaccines available so far quoted high efficacy in preventing serious illness and death.[1-3, 6-8] The unique single dose J&J vaccine displayed 81.7% efficacy against severe COVID-19 in South Africa, where the resistant Beta strain circulates.[8] Local data at the time of writing showed that 100% of patients fully vaccinated with mRNA vaccines who were infected with COVID-19 in the past 28 days displayed no or mild symptoms, with none requiring oxygen or intensive care.[9] Real world data in Israel which deployed the Pfizer-BioNtech vaccine closely replicated the phase III trial results.

Phase III data involving the Sinovac vaccine recently became available. Unpublished vaccine efficacy in earlier trials in Brazil, Indonesia and Turkey quoted 50.7%, 65.3% and 91.3% respectively.[10] A more recent trial of a mass vaccination effort in Chile quoted a vaccine effectiveness of 65.9% against laboratory-confirmed COVID-19 and 86.3% efficacy against death. This is, however, undermined by the similar incidence rate of death between the two-dose vaccinated arm and the unvaccinated arm, casting significant doubt about the 86.3% efficacy against death.[10] Further undermining this data is the phase II finding that vaccinated individuals mounted lower neutralising antibody titres than convalescent patients.[11] As important as efficacy is the longevity of vaccine coverage. This was highlighted by Nicole Doria-Rose et al[12] who found high titres of neutralising antibodies in all 33 healthy study adults, six months after completing the Moderna mRNA vaccine.

Vaccine side effects

Vaccine safety is a major concern. The principle that the delivery of a therapeutic product in a completely healthy individual should rightfully not cause any harm, though sound in normal settings, could be challenged in a global pandemic of a transmissible lethal disease. It thus follows

that the tolerance for some side effects must be contextualised in the ongoing pandemic. Most local vaccine reactions and mild systemic side effects like fatigue, fever and malaise do not require detailed discussion, and are generally short lasting and of mild to moderate intensity. Three notable adverse effects deserve special mention: the thrombotic thrombocytopenia observed with the AstraZeneca and J&J vaccines, and myocarditis and anaphylaxis with mRNA vaccines in young persons.

The thrombotic thrombocytopenia observed with some of the adenovirus vector vaccines is pathologically synonymous with heparin-induced thrombocytopenia. Both vaccine- and heparin-induced thrombocytopenia are defined by the presence of the platelet factor 4 heparin antibody. In vaccine-induced thrombotic thrombocytopenia, central venous sinus thrombosis (CVST) is the most prominent disease manifestation, with CVST and other thrombotic events occurring in nine out of 11, and 13 out of 23 patients in a German[13] and English[14] cohort respectively, all within five to 24 days of the first dose of the AstraZeneca vaccine. Treatment is strict avoidance of second dose, institution of nonheparin-based anticoagulation and intravenous immunoglobulins. The mortality rate is high – 30% in the English cohort and 54.5% in the German cohort. This side effect is extremely rare and a large Danish and Norwegian study[15] found 11 excess events of venous thrombosis per 100,000 vaccinations with the vaccine. This low rate allowed most countries to continue vaccination with the AstraZeneca vaccine, now made vigilant of this side effect.

Myocarditis has been reported in young men after the second dose of mRNA vaccination. The rate of this rare side effect is difficult to establish but ranges from four in 560,000 persons who have completed the second dose[16] to 23 in 2.8 million doses.[17] Most cases occurred within five days after the second dose,[16,17] and are mild and recover uneventfully after supportive care.

Anaphylaxis mostly occurred within 30 minutes after the first dose of vaccinations. The latest reported rates are 4.7 and 2.5 cases per million doses for the Pfizer-BioNTech and Moderna vaccine respectively. For context, this is still considerably higher than the 0.1 cases per million doses reported for the influenza vaccine. Women and people with prior allergies are more likely to develop anaphylaxis. Most importantly, no deaths after anaphylaxis were reported.[18]

SARS-CoV-2 variants: Delta everywhere

The Delta variant, previously named B.1.617.2, was first discovered in February 2021. Since then, it has rapidly gained prominence in most regions of the world,[5] including Singapore. A national case-control study by Public Health England (PHE) found the odds of household transmission with the Delta variant to be 1.66 (95% CI 1.26-21.4, p<0.001) compared to the Alpha variant, constituting a 66% increase in transmissibility.[19] Local statistics by the Ministry of Health[9] at the time of writing reported 2.8% of cases ever requiring oxygen and 0.4% of cases ever requiring intensive care among unvaccinated patients. This compares favourably to the 28% of cases requiring oxygen and 16% requiring intensive care in a paper reporting 92 cases of wild-type COVID-19 in Singapore between January and March 2020.[20] Despite this, the increased transmissibility of the Delta variant has resulted in devastating outbreaks, overwhelming the healthcare systems in many countries.

Locally, the Delta variant is the predominant COVID-19 variant. Vaccine efficacy against the Delta variant remains an important question that may be answered in the form of non-peer reviewed reports and preprint. An important starting point is the data from the UK demonstrating Pfizer-BioNtech's 87.9% two-dose efficacy against the Delta variant compared to AstraZeneca's 66.1%. Importantly, the efficacy after one dose of Pfizer-BioNtech and AstraZeneca vaccine was only 33% against the Delta variant.[21] This strongly undermined the delayed second dose strategy employed in many countries earlier this year. PHE also released a preprint demonstrating Pfizer-BioNtech's 96% two-dose efficacy against hospitalisation compared to AstraZeneca's 92%.[22] A local paper reported two-dose mRNA vaccination to be only 69% effective against infection[23] by the Delta variant. Do note that the earlier data by PHE examined symptomatic infection while the local data examined infection as the main outcome. This figure is concerning because a 69% vaccine efficacy raises the proportion of vaccinated population required to achieve herd immunity to 95%, assuming an R0 of 3. Since children younger than 12 years are currently not eligible for vaccination, herd immunity is now mathematically impossible. This also means that vaccination for prevention of infection can no longer be the principal objective. The focus of the national vaccination programme must be for the prevention of severe illness and death.

Endless variants or convergent evolution

The appearance of COVID-19 variants is a direct consequence of its rampant spread.[24] So binding is the relationship between viral load and new mutations that even in a single person with persistent viremia, accelerated viral evolution may be observed.[25] Mutations are random, but retained mutations are not. Retained mutations provide viruses with new characteristics aimed at overcoming selective pressures. The greatest selection pressure faced by a virus is its inability to transmit more efficiently than before. Most mutations are also deleterious for the virus. Within each host, mutations may only occur during viral replication. In the case of SARS-CoV-2, each infected case can only afford relatively few replication cycles as the disease is acute and short-lasting.[26]

Convergent evolution describes the phenomenon where different independent lineages of viruses develop analogous mutations, resulting in lineages that are increasingly alike. Various lines of evidence support convergent evolution. After passaging a patient-isolated virus in a mouse adaptation model for 36 passages, two mutations that arose, K417N and N501Y,[27] were also found in the beta and gamma variants that arose on opposite sides of the Atlantic Ocean. E484K mutations have also arisen independently in beta and gamma variants and confers decreased viral susceptibility to vaccine-induced antibodies.[28] Whether such evolutionary pressures are created by post-infection seropositivity, vaccine-induced antibodies or simply a natural process to become more adapted to human hosts is currently unclear. The fact that the same mutations are arising independently in different parts of the world to increase viral fitness and survival is the strongest evidence of convergent evolution. The clear implication is that convergent evolution could potentially decrease the variability in the spike protein, allowing subsequent vaccine candidates to be more precise and retain longer or even permanent relevance.

Other considerations

There are many other areas of interest not elaborated on and these include:

1. Coupling of community vaccination rates with reopening of the economy. We are looking closely at the UK "Freedom Day" which started on 19 July 2021.
2. Heterologous vaccination schedule. There is increasing interest in determining if using different COVID-19 vaccines may produce a more robust humoral and cellular immune response.
3. Booster doses. The role of "third" doses of mRNA vaccines in immunocompromised patients are actively being pursued and we are likely to see more clarity on this issue in the coming months.
4. What will future versions of vaccines look like? Changing the mRNA or protein subunit to deal with variants will not be technically difficult in the current platform. Other considerations include adding influenza into the mix to induce immunity against both SARS-CoV-2 and influenza with the same shot.

Conclusion

The onslaught of new variants worldwide threatens the efficacy of our vaccines, especially in acquisition of "new" infections. In discussions on comparative efficacy, we need to ensure that we are not comparing apples and oranges. As in all other communicable diseases, we maintain that widespread vaccination with its beneficial effect in reducing severe disease and death remains as the principal public health strategy against the COVID-19 pandemic. ◆

Dr Wong is an infectious disease physician in private practice for the past 20 years. He helps to manage the Infectious Disease Specialists Group and its main focus is on enhancing patient care and safety. He contributes regularly to *SMA News* on contemporary issues relating to infectious diseases and patient safety.

Dr Loh is an infectious disease physician in private practice. He graduated from NUS Yong Loo Lin School of Medicine in 2007, completed his specialty training in Tan Tock Seng Hospital in 2016, and served in various clinical and leadership positions in Seng Kang General Hospital before entering private practice in January 2021.

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The New Section 37 – A Mirror Image of Current Case Laws?

Text by Dr Lim Ee Koon

The Civil Law (Amendment) Act Section 37[1] became law on 6 September 2020 and is now awaiting ratification by President Halimah Yacob. The amendment stipulates a new legal test in respect of the standard of care for medical advice given by healthcare professionals (including doctors, dentists and oral health therapists).

Medical professionals always have an edge in the interpretation of medical negligence cases over their legal counterparts. They know the medical settings, treatment protocols and terminology, and even nuances during incidents as opposed to dry memory by rote of legal practitioners.

The Bolam-Bolitho test

Medical consent-taking has always had its bedrock in the so-called Bolam test[2] with Bolitho addendum.[3] What most readers may have failed to realise is that the period between Bolam and Bolitho spans about 40 years and there were numerous case laws and court pronouncements in between these two landmark cases. In Bolam (1957), the doctor's defence is satisfied if he can gather a respectable group of medical professionals who practise in a similar way, even if another group may take another route or hold a contrary view. The Bolam test is totally doctor-centric, and was in fact a case of a patient who suffered a hip fracture during electroconvulsive therapy (ECT). The issue before the court then was whether patients receiving ECT should always be given a muscle relaxant.

The Bolitho addendum or "gloss" just adds on to the ruling in Bolam. The doctor's defence is not always satisfied by gathering a respectable body of practitioners with similar views, even though there may be a group holding contrary views. The deliberation of all views in the court must be logical to the *judge*. This signalled a slight shift away from a totally doctor-centric defence – the test of logical analysis lies with the *judge*. In Bolitho, a young child with croup was not immediately attended to by the paediatric registrar, and subsequently died. In her defence the paediatric doctor submitted that even if she had attended to the child immediately, she would not have performed endotracheal intubation, as the child had two similar episodes of respiratory difficulty before and had recovered well with no sequelae without endotracheal intubation after each episode. Moreover, endotracheal intubation was invasive and not without adverse side-effects. So, while she was in breach of her duty of care in not attending to the child immediately, she was not the "factual" cause of the child's death.

In the 40 years between Bolam and Bolitho, there were rumblings in the courts and a change in judicial tone to a more patient-centric rubric. This is exemplified in the cases involving Sidaway (1985),[4] when the patient developed paraplegia after a cervical spine operation and was not told of the small risk of this happening during consent-taking. Then there was the case of Wilsher (1988),[5] where a premature child became blind after over-oxygenation. The case was complicated in that there were also four other causes accounting for the child's blindness. Finally, the Australian court joined in giving more autonomy to patients in *Roger v Whitaker*,[6] where the patient became blind in the good eye from sympathetic ophthalmia after operation on the bad eye, and was not told of this risk before operation.

All the above three cases before Bolitho involved medical professionals not informing patients of the risks of operations or medical procedures, however low the incidence and it was left to the court to determine the degree of liability on the part of the medical professional – a clear shift in giving patients more autonomy in participating in their own treatment.

Even after Bolitho, there was the case of Chester (2005)[7] after a spine operation. This patient developed cauda equina syndrome after a spine operation. The patient was not warned of this small risk even though the operation may be performed meticulously, and said that if warned she would have postponed this operation to a later date. After escalation to the House of Lords, their Highnesses found for the patient in that the surgeon had breached his duty of care in not informing her of this small risk.

The Modified Montgomery test

The importance of patient autonomy finally culminated in the landmark decision in Montgomery (2015).[8] Here, a child suffered disability following traumatic brain injuries during childbirth. The mother, who was diabetic, already had a previous difficult delivery and was not told that she could have a C-section. The Montgomery test now shifts the decision-making to the patient after being informed of material risks of each alternative treatment or having no treatment. It allows for the patient's particular needs to be considered in the treatment plan.

Chief Justice Sundaresh Menon developed the decision in Montgomery further in *Hii Chii Kok v Ooi Peng Jin London Lucien*.[9] Here, the doctor in the course of history-taking or from reasonable reading of past notes has to take into consideration the patient's particular needs, and weigh the material risks relevant to each patient to help the patient arrive at a decision. The doctor can only choose not to inform when knowing the material risks in three circumstances: (a) during an emergency, (b) when the patient requests not to know more details, and (c) "therapeutic privilege" where the patient's best interest may be compromised when the doctor reveals certain material risks.

Post-Montgomery till the present Civil Law (Amendment) Act 2020, there has also been a spate of cases involving informed consent both in the English and Singapore courts. Generally, in cases where the risks are not material, the courts have found for the defendants, the converse also being true. Doctors now have to tailor advice to the particular and peculiar features of each patient. The English court affirmed this assiduously in Webster (2017)[10] where the court found the doctor's failure to advise a patient with a nursing degree appropriately, especially so when she had many unusual features in her pregnancy. It was submitted that the patient was not induced just before her due date and was allowed to go post-term with many adverse features complicating her pregnancy, namely low-lying placenta, head circumference being more than abdominal circumference, polyhydramnios, and the fetus being small for gestational age. The child later suffered from cerebral palsy.

The final question

Is the Civil Law (Amendment) Act Section 37 a complete mirror image encompassing all the case laws as pronounced by the English and Singapore courts?

The medical community has been issued with a medical advisory from law firm Drew & Napier[11] following the passing and enactment of the new Civil Law (Amendment) Act. Although the advisory is certainly welcomed, scholarly and useful, it is perhaps pertinent to look for the slight differences and the ways we try to improve with the passing of this new law:

1. Bolitho's test of logic was previously decided by the *judge*. The Singapore law has thrown this test of logic back for *medical professionals to decide* in the new Section 37(5). This is perhaps as it should be.
2. While the decisions reached in the Modified Montgomery test in *Hii Chii Kok* are intact, the new Act also allows for *anybody with the legal capacity to make medical decisions on behalf of a mentally incapacitated patient* similar powers of patient autonomy in the new Section 37(6).
3. The Bolam-Bolitho test is still good law and retained insofar as diagnosis and treatment of patients are concerned.
4. A mention at the end of the Bill holds that the new law will not involve any extra financial expenditure. The Ministry of Health Workgroup on the Singapore Medical Council (SMC) disciplinary process has called for the creation of a Legal Advisory Unit to improve legal resources to the Complaints Committee and Disciplinary Tribunals, together with the establishment of an in-house Prosecution Unit to conduct prosecution on behalf of SMC instead of making use of private law firms. Perhaps this may result in some cost savings as well – both for the prosecution (SMC) as well as the doctor being complained of. ◆

Disclaimer: The views expressed in this article are the author's own after reading the Goverment Gazette Bill 33 in early September 2020.

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Dr Lim has been in private practice in anaesthesia since 1987. His interest in medico-legal matters led to his obtaining the LBB(Hons)London. He keeps himself fit by doing long-distance running since his school days and has completed full marathons with creditable timings. However, he is now content with running 25 to 30 km per week.

Leading the NCID's PANDEMIC RESPONSE

Interview with Prof Leo Yee Sin

Interview by Dr Tina Tan, Editor
Photos by National Centre for Infectious Diseases

The past one-and-a-half years of combating COVID-19 has been a long-drawn journey with many Ministry and healthcare leaders stepping up to lead the charge. *SMA News* editor, Dr Tina Tan (TT), speaks with Prof Leo Yee Sin (LYS), the executive director of the National Centre for Infectious Diseases (NCID) and infectious disease specialist to find out about her work and thoughts on the nation's battle against COVID-19.

TT: Thank you so much, Prof Leo, for agreeing to the interview, and I'm really honoured to e-meet you. Focusing on COVID-19 and leading the NCID in the whole national response, how has life been for you, especially having to deal with so many constant changes?

LYS: My life is possibly not much different from many of yours and my colleagues', with every day being a full day of work both during and after office hours. I spend my day working, trying to keep up with the pace of the virus. It is still a long journey to understand fully the long-term consequences of the virus, not only in human bodies, but in the entire healthcare system and the broader scope of things. This virus has basically impacted almost every facet, every aspect of human life and human interactions, and how the systems will work and cope with it.

Technology and connectivity has evolved a lot since 2003. In the past, I had to make phone calls and prior connections to link up with counterparts in other parts of the world to be able to exchange information. Today, we have so many Zoom conferences and webinars for updates and discussions. It is convenient and useful, but it takes up a lot of time, especially in the evenings.

Early days of COVID-19

TT: If you look back at the early days of the pandemic, what was it like just trying to catch up with the constantly evolving nature of things, and dealing with the amount of information – both accurate and inaccurate?

LYS: There is still a lot of information going around and as you said, some of them are real while some are fake news. Sometimes, it is actually not that easy to differentiate the real from the fake, even for medical professionals. What you read in journals may not be what is reported. And sometimes, it is not because of intent, but about the science. When you address science from a different angle, you get a different result. And that different result may lead you to erroneous conclusions. I think SARS-CoV-2 really brings out a lot of things, including socio-economic issues in relation to health delivery. In my work with international partners, we face a different set of challenges.

In Singapore, we were able to engage international partners right from the beginning. We managed to link up with the National Institutes of Health in the US that has access to the latest medications. They brought in remdesivir at a very early stage, and we were fortunate to be able to partner with them and bring in the medicines on a clinical trial basis. We could then use it for our very ill patients.

There was a lot of information regarding some medication with clinical efficacy being published in high impact journals as well. That really confused the people on the ground with what would be the best for patients. But we were very fortunate in the sense that we have a good team of people who were able to understand the biology and the pharmacology, and guide us in terms of how we can best utilise or repurpose medications for treatment.

One medication that is still being debated in the international arena is ivermectin. The first ivermectin clinical trial came out very early, but it was a small and biased study that showed a beneficial effect in reducing mortality.

It was a profoundly significant survival benefit that, I would say from my own assessment, clouded the minds of many people and that sparked off a lot of debates as to whether these medications could be used to treat COVID-19. As you can imagine, it is not easy as a clinician on the ground who has to take extra effort to understand the information flooding the desk.

I am glad to say that Singapore is very fortunate and still maintains a very low mortality rate, owing to a few factors. One is our healthcare system that allows us to do early testing. We also learnt from the clinical trials about the best time to intervene with therapeutic agents. SARS-CoV-2 is a very tricky virus and you have to target its life cycle or different periods using different medication. We need to have that degree of understanding in terms of what would give the patient the best chance of survival with the use of therapeutic agents.

TT: Thank you so much for that very comprehensive response, Prof Leo. You've mentioned that you have a team of people analysing all this information. I would imagine you don't just have infectious disease physicians on this team. Who else do you have?

LYS: At the very early phase of the COVID-19 outbreak, I had asked Dr Shawn Vasoo, clinical director of NCID, to chair a therapeutic work group. We brought in ID clinicians from various public healthcare institutions, pharmacists, intensivists, immunologists, and also the drug regulators. The team has to date done up seven versions of the Therapeutic Guidelines, which are published as and when a new drug is released. The Guidelines are available on the Academy of Medicine, Singapore website (https://bit.ly/3IjSAZR) and NCID website (https://bit.ly/3IlFECP).

Keeping at it

TT: Things have been dithering along for one-and-a-half years, what do you suppose will be the continuing challenges of managing the pandemic?

LYS: I think we still face many, many challenges.

First of all, we look at the virus. The virus, I must say, runs faster than humans; we are just barely trying to catch up with the fast-moving pace of the virus. It will continue to mutate and evade, and I do not know how the virus will behave next or how it would change in terms of its characteristics. And because we don't know, we have to really keep an eye on the virus.

Next, the healthcare system. After these ups and downs, many healthcare workers are showing signs of fatigue. It is a constant battle, the virus is still there, it is still evolving. So, I think the greatest challenge within the healthcare system is physically fatigued and mentally stressed healthcare providers. We have put aside regular care for some time to cope with COVID-19. We need to now have the mechanisms and ability to bring back management of these other illnesses.

The next layer I want to touch on is the national layer, and how the entire nation is going to have to pull together to be able to cope with the situation. This is what a lot of people are looking at – how do we get to a stage where we can start seeing less restriction, allowing more businesses to go on and activities in the past to be reinitiated without overwhelming the healthcare system. That would really be a challenge in terms of how we would balance all these needs in a way to enable us to cope.

And then beyond the national layer, it's regional. If you look at our region, it has not shown signs of stability. Our immediate northern neighbour is seeing 17,000 cases a day and they have reached over one million cases nationally. Similarly, Indonesia is reporting big numbers, and Thailand and Vietnam are seeing a huge wave. These regions, in terms of COVID-19, are still quite volatile.

Coronavirus insights

TT: It is a very difficult balancing act for those in leadership positions, with many different sectors calling for different things based on their needs. So much seems at stake now, though in a different way than it was back during the time of SARS, where the disease lasted for a much shorter period of time but the mortality rate was also significantly higher. What do you feel is the difference between our battles with COVID-19 and SARS?

LYS: As you mentioned, the most distinctive difference and impact on our healthcare system is the duration. SARS in 2003 lasted about three months, so it was very intensive and it was fortunately, at that point, short-lasting. In contrast, COVID-19 is very intensive and it hits you real hard, but refuses to go away. It just lingers on, and intermittently, it would return and cause another surge of cases. It is quite a different ball game. In fact, these two viruses, although they both belong to the coronavirus family, behave differently.

TT: Do you have any other insights about COVID-19 that you wish to share with our readers?

LYS: I would just want to bring out this very distinct observation about COVID-19 and influenza. It is being observed across the whole world, that in areas where COVID-19 is surging, the number of influenza cases is being suppressed to very low levels. Because of that, we have had very low levels of influenza cases in the past year. Why is that so? What are the plausible reasons, scientifically? This is something that we have to continue to research on.

I recently also read a very interesting article looking at excess mortality – how much the impact of COVID-19 has led to an increase in the number of deaths in different parts of the world. Some of the countries that are being affected very badly have a significant excess mortality. Whereas in certain countries, like Singapore, it's a negative excess mortality. One of the reasons for this that I, and many epidemiologists, thought of is that it could be because of the reduced influenza cases. In other words, we reduce the number of influenza cases and therefore we ironically reduce the overall mortality during the COVID-19 outbreak. And yet the COVID-19 mortality in Singapore is relatively low – it's one of the lowest in the world – and therefore you have this negative excess mortality.

TT: That's very interesting because I didn't know about that negative excess

mortality. It's really great to know, because as a psychiatrist, what I do know is that we had a slight excess of suicide cases last year and I do wonder how things will be like this year. Speaking of 2020, I read a *BBC* report of you being in the BBC 100 Women 2020 list and you also received the Public Administration Medal (Silver). What are your thoughts on these recognitions for the work that you have done?

LYS: Of course, I am pleased and very honoured to receive all these recognitions, but I think the first thing I'd like to say is that it's not one person's work. I'm not the only one working on managing COVID-19. I have seen many colleagues who have worked so much harder, putting in effort around the clock to make sure that they can get the pandemic under control. I must say that I am very fortunate to receive these recognitions, but I also hope that my work is not restricted to just outbreaks. There are other areas of infectious disease work that I am also focusing on as well, so I certainly hope my work and what I've done can contribute to not just outbreaks, but the entire infectious disease field.

The infectious disease field

TT: I've also noted the significant contributions you've made in the research of dengue and HIV. You had set up an infectious disease programme for HIV in Singapore in 1995. Could you share more about the progress of HIV treatment since then, and what things are going to be like going forward?

LYS: It is a vast difference now from the time I picked up HIV medicine as my primary subspecialty in infectious disease. HIV medicine was almost like a doomsday medicine in the past, but the condition has become a chronic illness today. The disease itself is currently well under control and very treatable, with treatment of HIV universally accessible. What is actually lacking is in the public's mindset, the discrimination against HIV-positive people.

TT: Let's go back to your younger days. You were initially interested in immunology as a medical student, so what drew you towards infectious disease at the end of the day?

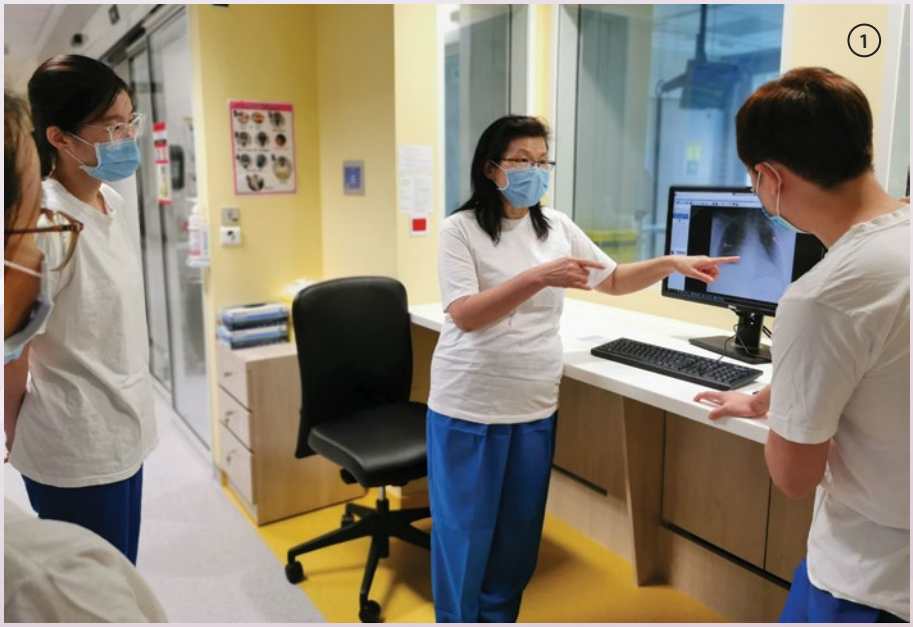
LYS: The infectious disease specialty was unheard of when I obtained my Master of Medicine and also my Membership of the Royal College of Physicians. It was not a specialty by itself at that point. I had wanted to do Rheumatology Immunology when I graduated, but unfortunately, there wasn't any available position.

However, I was very fortunate because almost immediately after I obtained my higher degrees, Prof David Allen came to Singapore and introduced the concept of infectious diseases. I then became one of his trainees – in fact, I was in the pioneer training group. Three of us, myself, Dr Wong Sin Yew and his wife, Dr Lam Mun San, graduated around the same time and decided to take up infectious disease. Before us, we had two other colleagues who had started work in infectious diseases – Prof Helen Oh went over to Canada to be trained as an infectious disease physician and Dr Brenda Ang trained under Prof Ti Teow Yee, who is a clinical pharmacologist. Because there were no infectious disease pioneer or specialty at that point in time, we had to find the closest specialty to train under. There were basically the five of us in the initial period.

The field has progressed and advanced so much. I had to go to the US to do my one-year Health Manpower Development Plan to study general infectious diseases. Today, I would not have to send my trainees for that, because they can pick up these skills in Singapore. They go overseas for skills that are not available locally.

TT: How different things are! Let's talk about your work at NCID. How has it been like and where do you see NCID moving forward in the future?

LYS: The SARS outbreak in 2003 gave us many learning points which we have implemented in the healthcare system. This included the need for a world class infectious diseases hospital with a purpose-built facility for handling infectious disease outbreaks. NCID was officially opened on 7 September 2019 with state-of-the-art medical facilities and features. So, in terms of the organisation, it is a very new organisation. In terms of the concept, why we need NCID and how it was put together, it's a very unique one as well. In comparison to many other parts of the world, Singapore was able to put the clinical components and outbreak response together with public health, and add to it the professional component, which is the research, training education and community engagement, all under one roof. There is a lot of interest in terms of studying the local policies and strategies, so we receive a lot of requests from different parts of the world trying to understand the Singapore system. I'm actually very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proud of it, because it is a Singapore brand that is being recognised by many other parts of the world.

Moving forward

TT: Do you have any words of encouragement for healthcare workers?

LYS: I think the most important thing is the system support, how we are able to support each other in our own respective team, and possibly beyond, within the institution as well as nationally. Community recognition and encouragement is very important, in my opinion. In other words, appreciation from the community for the hard work of the healthcare workers is one of the very important motivators. In contrast, if the community is discriminating against healthcare workers, that kind of negative effect can be very significant as well. We do need the encouragement and also support from all levels – within our teams, our institutions and community, as well as the public.

I just want to say, healthcare workers are not the only ones fatigued. In fact, you need to support everybody, regardless of their professions. It is not easy to sustain a livelihood in the pandemic. I also empathise with Singaporeans who have to bear with this very difficult period of their life. It's livelihoods we're talking about.

TT: One final question – I'm a little curious as to your thoughts on routine rostered testing (RRT). Healthcare workers started having bi-weekly RRTs, and migrant workers and those in other industries have been undergoing RRT for so much longer. What are your thoughts on continuing this?

LYS: I'm going to say something that our medical colleagues may not like to hear, but it is important to understand why we need to do RRTs, and why healthcare workers.

First of all, we need to understand the virus and how it manifests the disease in humans. For the current Delta strain, the vaccine effectiveness in preventing infection is just barely 60%. As such, any one of us, even though vaccinated, can still come down with the infection.

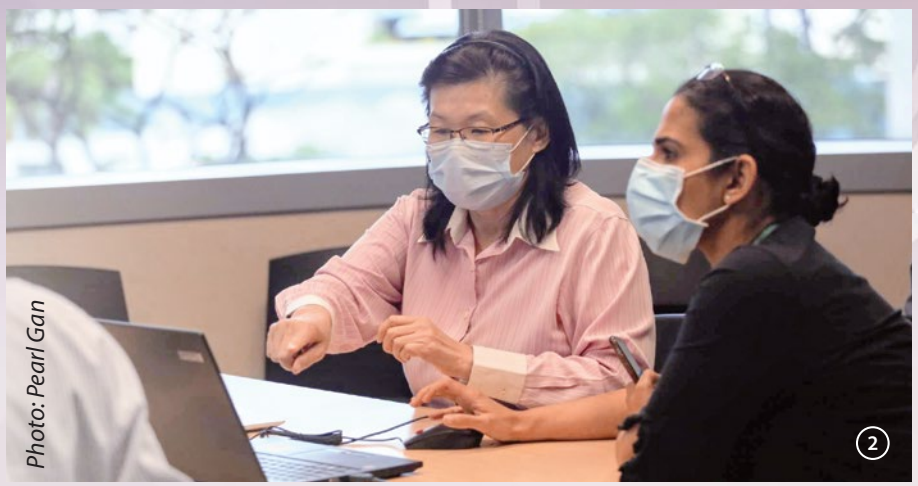

Photo: Pearl Gan

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Secondly, we also learn that many of the cases of infections post-vaccination are in fact asymptomatic or mild, which is good in preventing serious illness but the signal of infection is lost without testing. Thirdly, regardless of your vaccination status, the viral replication is in high quantity in the respiratory system. So now you're caught in the situation where you are asymptomatic, you've lost the signal, could still be infected, and could also excrete a large number of viruses. On top of that, you are working in a healthcare setting where you are seeing patients who could be vulnerable populations. You add up all these things, and you arrive at a question: should I be tested regularly to make sure that I'm safe to work in my working environment? If the answer is, "Yes, I will go for my test regularly", the next question you want to ask is, "How regular? What is the interval?"

Then I will come back to the virus dynamic again. There is a lot of evidence pointing toward high virus secretions during the pre-symptomatic period. In other words, again, no signal but you have high viral load. And the high quantity viral load will last for the first seven days, before slowly reducing subsequently. Now, returning to the question on interval, what do you think would be the appropriate interval if we want to test regularly?

TT: Actually, if you put it that way, it should be weekly. [*laughs*] Your arguments are convincing. I suppose, the follow-up question would be whether it necessarily has to be by an intranasal swab, because there are so many other means.

LYS: Yes, that can be explored. That is the technological advancement in terms of our diagnostic capability. And I agree that we need to continue to research and explore different modalities of testing. They may not be as sensitive as nasopharyngeal swabs for PCR tests, but it may be a reasonable substitute, and also because we truly need to have a relatively high viral quantity to transmit. So, I would agree that once you understand why you need to go for the test, the next thing would be to determine the appropriate diagnostic test that we can rely on.

TT: Thank you so much, Prof Leo. It has been fantastic talking to you. The amount of work that you and so many people have put in over the past year is really amazing, and we at *SMA News* hope that we can showcase some of that through this interview. ◆

For more pearls of wisdom, visit https://bit.ly/2WmFaC3 for the full interview with Prof Leo Yee Sin.

Legend

1. Prof Leo in discussion with the clinical team about a patient at an isolation ward in NCID

2. Prof Leo leading a discussion on managing the COVID-19 virus

For the Next Generation of Students

After an eventful year of new projects and initiatives, the time came for the 26th Singapore Medical Society of the United Kingdom (SMSUK) committee to pass the torch to the 27th SMSUK committee. We are grateful to *SMA News* for their continued support of SMSUK, and it is our aim to continue building upon this treasured relationship, especially as the COVID-19 pandemic continues to impact our world.

Our society's vision for this year is centred on two themes: "Career Development" and "Community". Through our events and initiatives, we hope to inspire confidence in our members as they make decisions pertaining to their future careers. It is also our aim to cultivate a stronger sense of community between SMSUK members that transcends geographical boundaries.

As SMSUK's newest editor, I hope our readers enjoyed the first column I had written back in June (https://bit.ly/5306-Letter) and I look forward to bringing everyone more exciting and relatable content about SMSUK and our members.

This time of the year, many fresh-faced Singaporean students will be preparing for their first year of medical school in the UK. It is without doubt that pursuing a university education far away from home and friends can be very daunting. Based alone in a foreign country, navigating unfamiliar accents and food, gaining independence and learning to take care of your own needs are just some of the rites of passage every Singaporean student studying in the UK has to undergo. Hence, this month, we asked our members to share some words of advice for Singaporean students embarking on this leap into a UK university education.

– Chin Sue-Kay, Editor, SMSUK

Text by Zhu Hongguang

Congratulations on being given the opportunity to pursue medicine in the UK. I can guarantee that the next five to six years will be one of the most fulfilling, adventurous and stressful periods in your life.

For most of you who have been through a rather mollycoddled life growing up in Singapore, there will be many firsts when you move to the UK. Some of you may be taking a long-haul flight alone, living alone or with friends, and even cooking your own meals or washing your own laundry, all for the first time. You may also feel terribly homesick during the early days of your studies.

Soon, you will realise how huge and diverse the world is after leaving the "little red dot". In your studies, you will have the opportunity to interact with classmates, teachers and patients from all backgrounds. Should you decide to continue your medical career in the UK after your studies, you will also gain valuable insights into a different healthcare system and working environment. Perhaps you can even bring home the positive aspects should you decide to return to Singapore after gaining a greater world view.

Try not to spend your whole university life buried in your textbooks. Take a cheap flight out to explore the nearby European countries on a weekend trip. Enjoy a night out with your friends. University life only comes once. It is great if you managed to snag that one additional mark on your examination. However, if it came at the expense of missing out on meaningful experiences, your university life in the UK is as good as wasted.

Zhu Hongguang is a medical alumni of Barts and The London School of Medicine and Dentistry.

Toong Ping Jing is a Year 2 medical student at University of Cambridge.

Text by Toong Ping Jing

To Singaporean students wanting to study in the UK, I would highly encourage you to do so. For those that will be starting university this year, congratulations on making it. It will be a significant milestone in your life and the beginning of your medical career. Just a year ago, I was in the same position as you. Preparing to begin university at a foreign place far away from my home and family was very daunting, and being exposed to a different culture really is both exciting and scary.

After a year at the University of Cambridge, I have grown and developed in many ways that would not have been possible if I had attended a local university. One of the main skills I picked up, of course, was cooking. I learnt to buy groceries, estimate the amount I would eat for each meal and even got to experiment with many different recipes. Initially, most of my food stuck to the pan and many were either overcooked and burnt, or undercooked. I also became more independent, having to keep track of my bills and finances on my credit card. I learnt to problem-solve, to ask for help when needed and to stand up for myself.

If you encounter challenges, do not hesitate to seek help. Do not feel shy or embarrassed to ask "stupid" questions as everyone has had to start somewhere. In university, there are many tutors that you can go to for help. Your peers and fellow students will also be more than happy to assist you. Additionally, there are many clubs and societies that become a family that you can turn to.

Finally, best of luck to all of you!

The Value of Chance:

Poverty, Homelessness and Healthcare

Text by Koh Ye Kai, Nicholas

There are moments in life when we may have the chance to interact with a stranger, albeit for a very short, fleeting period of time. A stranger who, a second ago, knew nothing about you (and vice versa), could for that short moment succeeding it leave such a profound impression that you could not forget the encounter for days after. I had the chance to meet someone like that on one of the experiential learning journeys with my school.

Stepping into an underprivileged community

It was the third day of a week-long programme, titled "Medicine for the Marginalised", that brought first-year medical students from the NUS Yong Loo Lin School of Medicine, such as myself, to various neighbourhoods in Singapore to learn about some of the social determinants of health. We were to report at Jalan Kukoh Food Centre just before sunset. As the sky darkened, it began to drizzle. I was hoping the rain would pass – our itinerary involved a whole evening of walking the stretch from the Jalan Kukoh neighbourhood to Chin Swee Avenue. From there, we would have dinner at Chinatown Food Centre before finishing our walk at Read Bridge. Located at the intersection of Chinatown, Clarke Quay and Outram Park, Jalan Kukoh is a vibrant neighbourhood comprising a few blocks of rental flats facing some of the most expensive, extravagant skyscrapers in Singapore. Just before I got off the car, the taxi driver asked me if I lived here. I told him I did not, and that it was my first time visiting the estate.

We set off toward the rental flats amid the faint drizzle. Puddles formed on some parts of the uneven ground as we traversed the corridors and stairs leading us to the basketball court at level four. The court was closed to the public when we visited due to COVID-19 safe-distancing regulations. The sky had already darkened when we made our way to Chin Swee Estate just across the street, where we passed by rows of alcoholic beverages displayed along the corridor in front of the Sheng Siong Supermarket at Block 52.

In front of the supermarket sat a stone pavilion. That December night, there were

a few people sitting under it, some with bags of groceries. At a corner sat a lady who was speaking loudly to a man seated beside her. The man appeared drunk. Curious, we approached them and introduced ourselves as medical students on a school trip walking around Jalan Kukoh to observe the sights and happenings there. The lady introduced herself as a volunteer. She lived in the vicinity and knew the elderly living in the area very well. She told us she was concerned about the man beside her who had injured his leg (one of his legs was encased in an orthopaedic cast made of white plaster) and his drinking habits. In a drunken state, the man did not seem to be listening to her. We asked her what we could do to help, in our capacity as students. Pointing at the stone benches situated right outside the air-conditioned entrance of the supermarket, the lady introduced us to another man seated on that same bench. He was homeless.

A chance meeting

"The best thing you could do to help right now is to buy him a packet of rice", the lady told us. After we did, she introduced us to the homeless man (whom I will call Uncle from now). Uncle did not say much except to thank us for the meal. We lingered around the stone bench for a little while longer, before continuing our walk towards the food centre. I thought about Uncle on my train ride home. I wondered: we have bought him dinner today, but what will he eat tomorrow? On that note, I returned the next evening with a packet of rice. However, upon returning to the same stone bench, I could not find Uncle there. I explored the vicinity to no avail and eventually recruited the help of a staff member at the supermarket to pass the food to Uncle if she saw him.

I managed to find Uncle the next week, seated on the metal benches facing the badminton court. I introduced myself and took a seat next to him. He remembered me from the week before. I learnt that Uncle would sit outside the supermarket because it was cooler there, with the air-conditioning seeping out of the entrance. He would find a resting spot along the corridors of the neighbouring blocks at night to sleep. I got to know that Uncle relied on food given free by the soup kitchen every Monday and Friday. From then on, I would bring Uncle water, bread, biscuits, fruits and a packet of chicken rice on Wednesdays.

I also learnt about his past: Uncle had been homeless for about three years. He quit his job as a cleaner the previous year as he had difficulty breathing when doing strenuous tasks, and relied on his savings to buy coffee and food for himself. He also depended on food from strangers. On one of the visits there, I met the volunteer lady again. She asked me if I could help Uncle find a place to stay.

I brought Uncle to the Social Service Office (SSO) at Kreta Ayer Community Club in late January. The social workers at SSO were very understanding of Uncle's situation and managed to find appropriate help for him. I felt grateful for their assistance and it made me happy to see Uncle have a safe and comfortable place to stay, a place to wash his clothes (he previously had to travel to East Coast Park to wash and dry his dirty laundry) and to cook meals. He also sought medical care, which was fully subsidised, to treat his chronic obstructive pulmonary disease.

Understanding privilege and chance

There are little things in life that I have taken for granted, like having a warm blanket and a soft mattress to sleep on every night. For people who live on the streets, they can only rely on a few pieces of clothing and cardboard to keep themselves warm against the unassuming cold concrete floor at night. This fateful experience humbled my perspective of what it means to care for others. Spending time with a stranger, while a seemingly small gesture, could really be the best thing one can do for someone in need. I sometimes think about what would have happened if I had not gone back to Chin Swee Avenue to visit Uncle, and how we would have remained strangers after buying him a packet of chicken rice. While my experience with Uncle seems to be a one-off chance encounter, I do acknowledge that many things in life happen because we were there at the right place and the right time. And I am immensely grateful for this chance.

This chance encounter with Uncle also gave me an opportunity to realise the importance of a medical education that focuses on health as well as the humanities. The week-long programme organised by the medical school allowed me to experience first-hand how marginalised communities live on a day-to-day basis, the ways in which these communities find help from charities or governmental organisations and how healthcare plays an integral role in managing the holistic concerns of people in promoting their well-being. As a first-year medical student, it really was a privilege to be given the opportunity to learn about the social determinants of healthcare outside of clinical practice.

A roll of the dice

I sat on a wooden bench beside Uncle, facing the building which housed the shelter, with the coconut tree providing us much needed shade from the glaring late-afternoon sun. Uncle shared with me what it was like to live at the shelter with the other residents. "One… two… three…" Uncle counted the rooms from the staircase on the left as he pointed a finger at his own room. "I stay there", he told me. And as the sun set, we talked about how our day went and arranged for our next meeting. It did not seem likely that we were merely strangers a few months ago, meeting for the first time at the stone benches outside the Sheng Shiong supermarket… ◆

Nicholas is an undergraduate at the NUS Yong Loo Lin School of Medicine. He enjoys analogue photography and the humanities.

There is No Health without Mental Health

Text by Dr Daniel Chang

Dr Chang is a diehard runner and Ultimate Fighting Championship wannabe who has never lost an official bout. He is a Catholic and family man, a father of three beautiful bohemian princesses. Together, they share a common inexplicable fear of butterflies, schoolwork and sugary drinks.

Growing up, I had several profoundly low points in my life. It was cyclical but I was blessed to have people God-sent to journey with me through those periods. I found their goodness and kindness authentic, and I want to pay it forward.

I believe that life is about building relationships with people. Singapore has come a long way from the days of kampong fishing villages. We have progressed and advanced technologically, economically and socially. However, with this came the loss of that sense of belonging – that sense of pride, community feel and kampong spirit.

Thus came the formation of Lives of SG with like-minded people, and our logo which consists of four hands holding each other, indicating support for our friends. We are a non-profit initiative led by a team of volunteers with the aim to improve the awareness of mental health conditions and provide early stage psychological first aid to young professionals.

Lives of SG consists of three focus groups:

1. **Awareness ambassadors** who focus on outreach to Gen X, Y and Z professionals via social media.
2. **Builders team** who focuses on story collection, and building an open, non-judgemental, inclusive and accepting society.
3. **Care team** who focuses on workplace Zoom talks to identify at-risk colleagues, sharing coping skills for those afflicted and teaching life skills to caregivers. Additionally, we have a team of psychologists who provide one-on-one counselling for those who qualify (based on the complexity of their mental issues), and this can be conducted face-to-face as appropriate.

Challenges faced

Mental issue are real – the stigma is ingrained and it is a serious matter. Our main challenges include the welfare of the team, recruiting new members and public outreach.

Running a pro bono project can be lonely and isolating; oftentimes, it gets frustrating. People often come and go, making it difficult to keep everyone aligned and on the same page so as to move forward together as a team. Lives of SG would not be possible without the team.

Frankly, it is not easy to keep the team together, as we are mostly busy parents juggling work and family, especially with the impact of COVID-19 on our lives. It is not easy to drive the team, without driving them up the wall. It is a fine balance and we all learn along the way. I would like to take this chance to thank my core team and team leads for their dedication and support, given that I have absolutely nothing to offer them in return for their contribution.

I have approached many people to join our community and to stand in solidarity with us, though I have realised

that I am often unable to reach out to the Gen Z effectively. Maybe it is due to the generation gap. I have also met many naysayers and took it personally initially. I guess we are all humans. But at the end of the day, if something is important enough to me, I will do it – start, middle and finish.

Finally, some challenges in our public outreach include coming across sufferers who have no motivation to seek help, have no money to seek professional help and/or do not want to talk to anyone about their issues.

Managing misconceptions

Feeling low, empty and sad may not necessarily stem from a mental condition. For some, it is from emotional needs being unmet growing up. For others, it could be a sign of burnout and not learning how to pace oneself. And increasingly in many, a lack of being fully present in the moment, held back by the past and uncertainty in the future. The choice of word is important, and depression and anxiety need not carry a negative label.

Our aim is to reach out to and support the following groups of professionals:

- Drivers – those who push themselves in their work, studies or sports and suffer burnout thereafter. Because this group tends to not know how to practise self-care, they may find watching shows, hanging out with friends and sleeping to be a glorious waste of time.
- Women with postpartum depression.
- Those facing workplace discrimination and bullying.

Tips and advice

Below, we share a few tips for our young professionals, especially those who are unable to relax.

Acceptance: Accept yourself for who you are. We have all been dealt a different set of cards. Love your cards.

Believe: Believe that you belong to this world, and that you have a role and a place. By building relationships with people and helping the less fortunate, we pay it forward.

Community: We may have progressed as a society, but we are still lacking as a "family". Technological advances have led us to be more digitally connected but more socially disconnected. There is an erosion of the kampong spirit. This, coupled with the unrealistic standards set by social media, have created a false sense of idealised images in our society.

We want to bring back the authentic experience of living as a community. A community in unity, with unity in diversity. There is no shame in being different. There is no shame in needing help. There is no shame in seeking help.

Below are some recommended coping skills for young professionals:

Self: Practise self-love, self-care and nurture your "me time".

Spirit: A sense of community spirit, to reach out to others, lend a helping hand and pay it forward.

Soul: Daily meditation, breathing and mental body-scan. Reflect on your thoughts, feeling and actions, and never judge, beat up yourself, or doubt your self-worth.

Future plans

In 2021, our awareness ambassadors will continue to reach out to our target groups because we know many suffer in silence and will not actively seek help. The builders team will continue to source for stories to share and people to care for, stand in solidarity and grow together as one community. Finally, the care team has embarked on a series of webinars for workplaces, aimed at helping workers identify at-risk colleagues, teaching people resilience and stressing the importance of caring for caregivers. Our team also conducts one-to-one therapy sessions for those who fit our criteria. There are also ongoing collaborations with other groups to achieve synergy in the mental health workspace.

We are actively looking for awareness advocates and builders to join our team and help with our outreach programme. Join our community, a community in unity, unity in diversity. Feel free to reach us at humansofsg2020@gmail.com or send us a message via our Instagram or Facebook. ◆

Feeling hopeless, anxious or depressed? You're not alone! 2020 and 2021 have been particularly challenging years for many people. Millennial suicide rates are rising exponentially. Depression in the workplace is serious and real. Unemployment is rising and retrenchments are looming. Fresh graduates are finding it hard to find work. If you are a young professional feeling stressed out and burnt out from having to deal with increased workload and reduced manpower, we want to help you. **You are not alone.** I am, because we are – ubuntu.

More about Lives of SG

1. Our vision is that through sharing personal stories, we grow in solidarity with one another, living stronger together as one community.
2. Our mission is to implement a comprehensive, systematic and clinical takedown of mental health stigma.
3. Our objective is to reduce stigma, and increase awareness and access to care.

Website: https://www.livesofsg.org/

Facebook page: LivesofSG

Instagram: @LivesofSG

YouTube channel: https://bit.ly/3cwOet0

Wanderlust Wishlist

Countries are looking at slowly and safely resuming international travel amid COVID-19 and many people are certainly looking forward to being able to travel leisurely again. Four Council and Editorial Board members share where their next dream stop (when travelling is possible) would be.

BOARDING PASS

YOUR **DESTINATION**
SG – AUT

Text by Dr Lambert Low

Dr Low is a psychiatrist with the National Addictions Management Service at the Institute of Mental Health. He completed his MSc in Addiction Studies at King's College London. Dr Low holds a Graduate Diploma in Acupuncture and is a registered acupuncturist with the Traditional Chinese Medicine Practitioners Board.

Vienna definitely comes to my mind as one of the top places I would like to revisit, should travel resume. Vienna is rich in culture, and the architecture of its buildings and its food are also quite extraordinary. Particularly, I love the taste of freshly served herb-crusted chicken schnitzel and the aroma of freshly baked apple strudels. And there is the world-famous Sachertorte cake as well.

When I last visited, I had the opportunity to watch an opera at the Vienna State Opera where the acoustics were excellent and its design overwhelmingly beautiful. The trip was particularly memorable as my wife, mother-in-law and I also had a delicious meal at gastronomic powerhouse Steirereck. The smell of their freshly baked loaves of bread still permeates my olfactory receptors from time to time. The experience was truly *wunderbar*!

BOARDING PASS

Text by Dr Chie Zhi Ying

YOUR **DESTINATION**
SG – NZL

Dr Chie is a family physician working in the National Healthcare Group Polyclinics. She also holds a Master of Public Health from the National University of Singapore and is a designated workplace doctor. She enjoys freelance writing and writes for Chinese dailies *Lianhe Zaobao*, *Lianhe Wanbao*, *Shin Min Daily News* and health magazine *Health No. 1*. She can be contacted at chiezhiying@gmail.com.

Once the pandemic is over, I would love to travel to Southern New Zealand to have a surreal escapade. With snow-capped peaks, sparkling coves, coastal glaciers and rainforests, its captivating scenery offers such a perfect respite to our bustling city life.

I would first stop over at Canterbury Plains at Christchurch to see the postcard-perfect Church of the Good Shepherd and the iconic Sheepdog statue at the edge of the sparkling lake. Then I would visit the picturesque Lake Tekapo with its radiant flora and blue waters and see it transform by night into a dazzling skyline – how magical! Next, I want to visit the scenic Lake Pukaki, with its turquoise waters and enchanting scenery from atop Mount Cook and feel myself literally at the top of the world. Lastly, I would immerse myself in the old town ambience at Arrowtown and enjoy a cup of coffee at one of the cafes. Hope we can all travel soon!

BOARDING PASS

Text by Dr Lee Yee Mun

My last two overseas destinations before the pandemic were to the Chinese cities of Beijing and Guangzhou. Both were work trips with pockets of time to explore the cities, after which my interest in China was piqued.

So, I have chosen the city of Wuhan in Hubei province as my destination of choice when travel is allowed again.

Wuhan may not be as modernised as many of the coastal cities, but has excellent transportation connectivity, and is one of the foremost technology hubs within China.

An attraction I plan to visit is the Yellow Crane Tower, one of the Four Great Towers of China. Another is the Wuhan Yangtze River Bridge, the first to be built across the great river.

Finally, though I doubt it will be permissible, a visit to the Wuhan Institute of Virology would definitely be the icing on the cake!

YOUR **DESTINATION**
SG – CHN

Dr Lee is a urologist whose passion lies in medical education and mentoring. He is an associate professor and principal lead for Urology with the Lee Kong Chian School of Medicine, and previously served as programme director for the NHG Surgery-in-General and Urology residency programmes.

YOUR **DESTINATION**
SG – WORLD

Text by Dr Ganesh Kudva

Dr Ganesh is an associate consultant at the Institute of Mental Health. He is passionate about mental health and public policy. In his free time, he avidly follows his favourite team, Liverpool FC, and travels when he can. Each country he visits makes him realise how alike we all are to each other and how much more united mankind should be.

BOARDING PASS

The familiar "welcome aboard" tune, the banal in-flight safety video, the smell of recirculated air, the stewardess who asks if you would like a meal, the feel of soft sequin seats juxtaposed with the limited legroom – these are experiences that for the longest time I would have viewed with little emotion. A part of the process rather than the highlight, a means to an end, a small, often glossed over detail in the highlights reel of a holiday.

Perhaps the dream holiday might involve taking in a scenic view of Manhattan, witnessing a tango in Buenos Aires, getting lost in a Moroccan souk, or taking the Trans-Siberian railway across the frozen Russian hinterland, but these now seem like distant, lofty fantasies of yesteryear. A vestige of an era long-gone, a time when social distancing and working from home seemed alien to us all. That is not what I yearn for now.

All I want is to step into a plane again. It could be to anywhere. Does it matter? All one needs is a break, a chance to remind ourselves that beyond our shores, a world exists. That a vast realm of seven billion people with a myriad of experiences awaits us with its sights, smells and sounds. And the way to get to it, by plane, is the travel experience that I now yearn for, and shall never take for granted again. ◆

5 things I believed about the COVID-19 vaccine VS what truly happened...

*brought to you by the over-enthusiastic MO who got vaccinated in JAN

#I got myshot
#get vaccinated

Another comic by Ada Ng, this time in colour

• SALE/RENTAL/TAKEOVER •

Singapore Clinic Matters Services: Singapore's pioneer clinic brokers. We buy and sell medical practices & premises and also provide other related clinic services too. Yein – 9671 9602. View our full services & listings at https://singaporeclinicmatters.com.

A 320sqft half unit HDB shop for rent at Blk 95 Aljunied Crescent Singapore 380095. Rental $2,800 per month negotiable. Available from September. Near FairPrice and Geylang East food centre. Full shop 650sqft can be arranged. Contact Yvonne at 8699 1399.

Established aesthetic clinic for takeover. United Square area. Interested doctor, please email: drbcng@gmail.com.

Established GP clinic in Eunos/Ubi HDB neighbourhood looking for doctor with commitment to service community, and vision for partnership/takeover. Low capital outlay. Comfortable work pace and environment, family friendly working hours, gratifying appreciative patients. Please message 97788160 to explore.

• POSITION AVAILABLE/PARTNERSHIP •

Established aesthetic / anti-aging group (The Artisan Clinic / The Artisan Wellness) recruiting physicians experienced in aesthetic treatments. Detailed training provided by international CynoSure / Silhouette Soft / Mint Lift / Ellanse / Teoxane trainer. Must have aesthetic COCs. WhatsApp 8808 9887 or email drwong@artisanclinic.sg.

• MISCELLANEOUS •

Aesthetic equipment with accessories on sale: Ulthera X 5 units; Fractional CO2 X 2 units; Accusculpt X 1 unit; Syneron Galaxy with LV and LVa handpiece; Alma Lovely and Alma Harmony with Pixel 1320, 2940, 1064 Handpieces; Fotona Fidelis long pulse 1064 hair removal; Introfill filler machine. All for S$250,000.00 (Two Hundred & Fifty Thousand dollars). Interested, email: drbcng@gmail.com.

A remedy for the healthcare industry

Supporting businesses #ForYou

We are all well aware of the adverse impact the Covid-19 pandemic has had on the world economy. Of the various economic sectors, it is widely acknowledged that the healthcare sector has heavily borne the brunt of this pandemic.

The general sense of fear and anxiety among members of the public seeking to understand a novel and rapidly evolving virus has translated into a decline in the inflow of patients seeking non-critical medical care.

Afraid of putting themselves at risk of contracting the virus at clinics and hospitals, these patients end up postponing appointments and delaying treatment for their long-term chronic diseases.

We understand that the subsequent reduction of demand for such services, which were once important revenue streams pre Covid-19, have caused a significant burden on healthcare institutions. Amid much uncertainty over patient numbers and inflow, we know that clinics, hospitals and laboratories are struggling to operate while meeting their monthly overheads such as rental, utilities and pharmaceutical supplies.

We also empathise with clinics that have been forced to split their operations to cater for dedicated facilities managing the surge in demand for Covid-19 testing, thus increasing their operational costs.

To overcome these issues, general practitioners or specialist clinics can consider the Maybank Temporary Bridging Loan Programme (TBLP). TBLP is a government-aided financing scheme for businesses to access working capital to alleviate problems of cash flow.

From 1 April 2021 to 31 March 2022, the TBLP will support enterprises with a maximum loan of S$3 million.

At Maybank, we are familiar with dealing with healthcare institutions and understand the cash flow needs of these businesses. Through in-depth conversations, we assist to uncover gaps and recommend appropriate solutions. Our assessment criteria is 'healthcare friendly' and we aim to empower healthcare institutions with the right financing tools so that they can securely offer the best healthcare services to the masses. After all, we are in the business of humanising financial services and want to work out the best financial solution for you.

Healthcare institutions are able to apply for the TBLP through Maybank Singapore. With Maybank TBLP, you can focus on giving the best to your business today, without worrying about an uncertain tomorrow.

Start planning ahead and get at the front of the curve. For more information on TBLP, please contact a Maybank representative at 1800-777 0022 or email smebanking@maybank.com.sg.

Supporting businesses #ForYou.

The first 20 readers who contact Maybank to learn more about the Temporary Bridging Loan Programme stand to receive a

complimentary Starbucks voucher worth S$50.

To claim the voucher, readers will need to mention voucher code "SMATBL" in the call or subject title of the email. Terms and Conditions apply.

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