

● Miraculous survivors ● Investing in testing ● 100 ways the world changed

THE STRAITS TIMES
Asian Insider

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SINGAPORE'S BATTLE WITH COVID-19

THE FIRST
100 DAYS

On Jan 23, Singapore saw
its first case of Covid-19.
100 days later, the fight is still on.

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Singapore's Covid-19 battle: Fixing the weak spots

As Singapore extends its circuit breaker till June 1, new weak links have emerged in its more than three-month fight against the coronavirus. Here is a look at what can be done to minimise the likelihood of infections.

ESSENTIAL WORKERS

The number of people who still leave home to work has been reduced from 20 per cent to 15 per cent of the workforce after the tightened circuit breaker measures took effect. But the size of this group remains substantial, consisting of at least

350,000

Singapore residents. The sheer number and the high exposure to different people potentially increase the risk of community spread.



F&B industry (including food delivery riders and staff who prepare food)



The number of delivery riders and staff has risen as more people turn to food deliveries

Deliveroo: It has around **7,000** riders and expects to hire another 2,000 riders by the end of the second quarter to meet growing demand.

Foodpanda: Fleet of more than **9,000** riders.

GrabFood: It has also expanded its delivery fleet but declined to reveal the number of riders.

At least

12



people in the food and beverage industry have been infected.

7 are McDonald's employees who worked in nine outlets of the fast-food chain.

The other five cases include those working in food outlets, food handlers and food delivery personnel.

- Safety precautions for all riders include wearing face masks and using hand sanitisers, safe distancing, and standing only at designated markings when waiting to pick up orders. A contact-free delivery service is encouraged, with customers' orders placed on their doorstep and online payments.



TEXT: CHERYL TAN, SHIVRAJ RAJENDRAN AND CLARA CHONG
ST PHOTOS: JASON QUAH, LIM YAOHUI, ONG WEE JIN, CHONG JUN LIANG, KUA CHEE SIONG
Source: MINISTRY OF THE ENVIRONMENT AND WATER RESOURCES STRAITS TIMES GRAPHICS

Healthcare workers

At least **41** infected cases have been linked to public and private healthcare institutions, though not all are healthcare workers

Safe distancing and SG Clean ambassadors, and enforcement officers



Around

3,000

safe distancing and SG Clean ambassadors and enforcement officers deployed daily as of April 16.

THOSE WHO CONTINUE TO FLOUT THE RULES

Weekly enforcement numbers

	Week 1 (April 7 to 13)	Week 2 (April 14 to 20)	Week 3 (April 21 to 27)
Stern warnings over safe distancing	Over 6,000	NA	NA
Fines for breakingsafe distancing rules	About 600 (April 10 to 13)	About 1,340	About 750
Fines for notwearing masks	NA	About 430 (April 16 to 20)	About 265

NOTE: Fines for non-compliance with safe distancing measures were issued from April 10, while fines for not wearing masks were issued from April 16.



SENIORS

- At least 21 cases have been linked to six different nursing homes, inclusive of residents and staff: Lee Ah Mooi Old Age Home, Vanguard Healthcare's Woodlands Care Home, Pacific Healthcare Nursing Home, Sunshine Welfare Action Mission Home, Kwong Wai Shiu Hospital, and All Saints Home.
- At least 15 cases have also been linked to a home for the destitute, Acacia Home in Admiralty.
- MSF and MOH have aggressively stepped up the testing of residents and staff at homes serving the elderly, which include nursing homes, welfare homes, sheltered homes and adult disability homes, for Covid-19.

CHILDREN AND STUDENT CARE SERVICES

- General services by childcare and student care centres have been suspended till June 1, in line with the extended circuit breaker measures.
- Nine children and 33 linked adults have been infected.
- Among these, 30 cases have emerged from two clusters, and 12 separate cases at 11 centres, including staff, children at the centres, and family members.

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ST PHOTO: KUA CHEE SIONG

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Cover Story

Living through a silent scream

A globalised world grown used to trade and travel suddenly finds itself set apart, afraid of coming together and also what might come after the crisis is past

SO, THIS IS WHAT A PANDEMIC LOOKS LIKE.

We've heard of these great eruptions, of course. One or two who survived the Spanish Flu pandemic. A handful may still exist who remember the Great Depression. A few more are around who survived World War II, its blackouts and shortages.

But to live through something like this is an altogether different experience, especially when you have not one but two crises rolled into one; an insidious health threat spreading fear, and crumbling economies causing panic. And that is what the Covid-19 pandemic has meant so far for the world.

At least 200 nations and territories have had at least one coronavirus case. The death toll has exceeded a quarter million and more than 3.7 million people have been infected.

And we aren't too sure if those numbers are accurate; on April 27, the Financial Times, after assessing data from 14 countries, estimated that the true death count may be 60 per cent higher than reported. The US Centres for Disease Control and Prevention says the death toll for seven US states hit hard by the pandemic could be 50 per cent higher than normal between March 8 and April 11 - 9,000 deaths more than were reported.

Other reports, citing the latest antibody studies, show that the virus has spread more widely than assumed but is also possibly less virulent than the 3 per cent to 4 per cent fatality rate the World Health Organisation (WHO) mentioned in early March.

Five decades ago, the American litterateur Archibald MacLeish, upon seeing the first photographs of Earth taken from the Moon, gushed about it as "small and blue in that eternal silence where it floats."

Today, in many places on Earth, the silence is not so much eternal as one borne out of compulsion, as shaking lambs would at the sight of approaching wolves.

Imagine, you are watching the movie Twister and suddenly you are shaking not because of the 3D effects in the hall but that you are in the midst of a tornado yourself.

For almost everyone, Covid-19 is no longer something "over there" but in our midst. From the locked-down boroughs of New York City to Sydney's Bondi beach - that totem of an outdoors-oriented land - and the shanty towns of Mumbai, it is a deafeningly silent scream.

In parts of the United States, such as Idaho where Ernest Hemingway ended his life, US farmers are culling livestock and destroying crops they cannot harvest. In India, farmers are unable to sow the summer crop even as the forecast is for a normal monsoon, which ordinarily would have meant bracing news for the rain-dependent economy.

SLOW AWAKENING

Looking back to Dec 31 - when China officially alerted the WHO to the outbreak - and to April 26,



ST ILLUSTRATION: CEL GULAPA

when the country announced that the last of its hospitalised coronavirus patients in Wuhan had been discharged, one aspect that stands out is how slow the world had been to wake to the disease's dangers.

It was not until Jan 20 that we knew, through WHO, there were "some cases" of human-to-human transmission of the virus and it was only in the second month that we became aware there could be asymptomatic carriers spreading the disease.

Beyond those facts is a fog of recrimination involving China, the WHO and the rest of the world that will continue long into the future. This has spawned implausible theories, just as there are those who find it hard to believe that a lone gunman could have assassinated President John F. Kennedy in 1963.

If this was a natural disaster like an earthquake, tsunami or cyclone, we would have had the playbook to deal with it. However, with the prospects of an effective vaccine at least a year down the road and even then not knowing how effective it could be against a mutating virus, we have only the experience of these past four months to go by.

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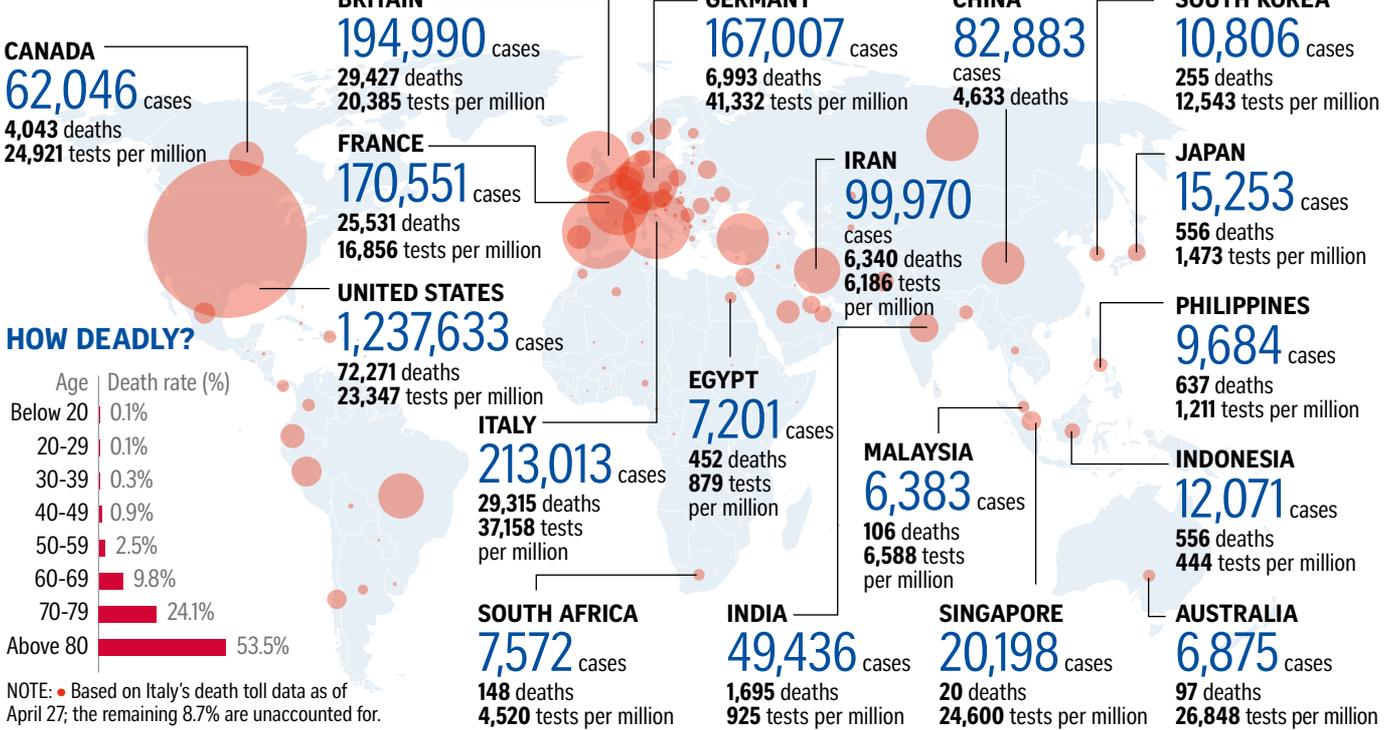
World wages war against an unseen enemy

Like an invader, the new coronavirus crept silently into our world, storming almost every corner of the globe in a matter of months, claiming hundreds of thousands of lives. Now, nations are struggling to combat the deadly disease.

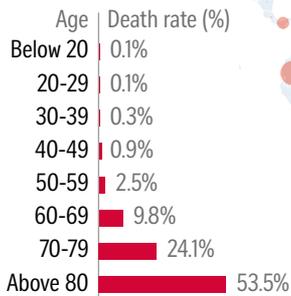
HOW INFECTIOUS?



HOW WIDESPREAD?

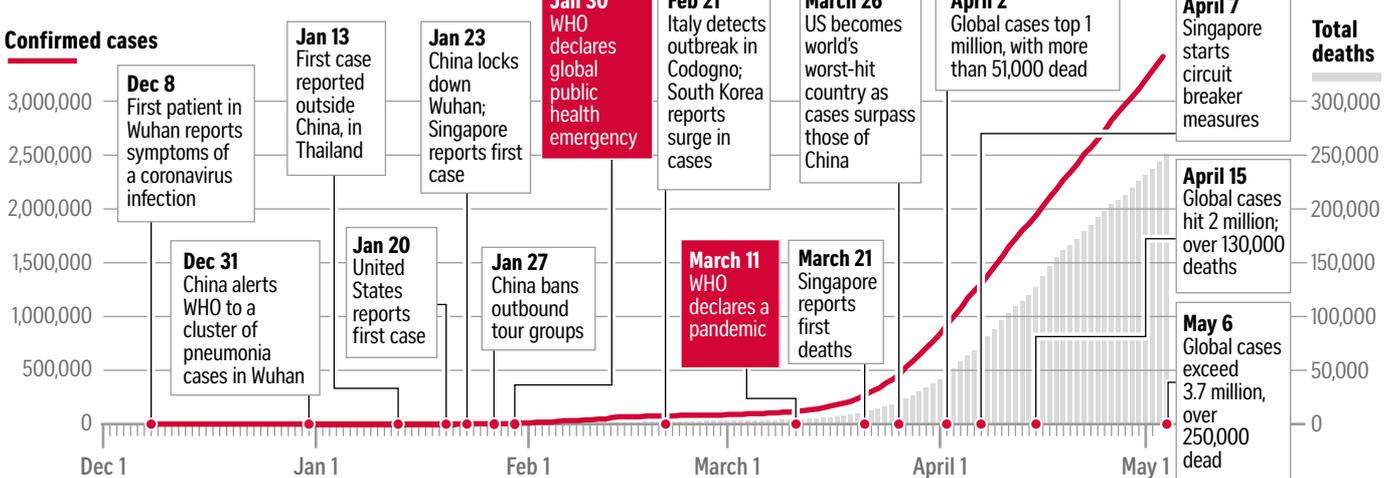


HOW DEADLY?



NOTE: ● Based on Italy's death toll data as of April 27; the remaining 8.7% are unaccounted for.
● Figures as of May 6.

HOW FAST DID IT SPREAD?



NOTE: Figures as of May 6.

First, we know that nations or territories led by leaders that have relied on science – the German, Norwegian, Taiwanese and Kiwi experience suggests that women score high marks here – have tended to do better.

Second, social distancing is essential, a key element in the cautious victory over the disease proclaimed by New Zealand Prime Minister Jacinda Ardern. Hongkongers, with experience of Sars (severe acute respiratory syndrome) still in memory, knew this instinctively and it has helped the territory cope with this crisis.

Third, mass testing is vital and as South Korea has demonstrated, sometimes repeated testing of the population is required.

Singapore has set itself along the same path, accepting the odium of having Asia's fifth highest disease count after China, India, Saudi Arabia and Pakistan in the interests of wiping out the virus, root and branch.

Fourth, and perhaps most important of all, there is no escaping universal health coverage as a key element of national security.

America's abysmal record and Singapore's success in continuing to be the gold standard in limiting fatalities – never mind the rising numbers caused, in part, by diligent testing – shows the importance of investing in public health.

Asian countries that haven't invested sufficiently in health are seeing the results. Indonesia has a mortality rate of almost 8 per cent, higher than the Philippines, which has a 6.6 per cent mortality rate.

WHO figures show that Indonesia has 4.27 doctors per 1,000 people compared with nearly 23 for Singapore. President Joko Widodo's reluctance to impose a harsh lockdown, fearing the effect on the livelihoods of millions of marginal folk, has proved expensive for the archipelago, with the virus spreading to more than 250 towns and cities. Many leaders like him are having to balance a health pandemic with an epidemic of poverty.

Amid the panic of what is nothing less than a war, there is no shortage of heroic tales.

Filipino doctors, often enduring a lack of critical protective equipment, have stepped out to battle the virus, taking a heavy toll themselves. Some Singapore nurses who handled Sars have returned to the front line to tackle Covid-19.

The Washington Post recently told a story about 43 men who lived for a month inside the Braskem petrochemical plant in Pennsylvania, which produces raw material for face masks and surgical gowns. Fearing production would slow down if any of them got sick, they had volunteered to stay in the plant, working long shifts.

GLIMMERS OF HOPE

Are there the first glimmers of light at the end of a very dark tunnel? Perhaps.

Business activity in major economies collapsed last month as governments clamped down to limit

the spread of the virus. Any significant revival will have to wait for the third quarter, if at all.

Now, China, first to substantially control the virus after absorbing a near 7 per cent first-quarter GDP decline, is back on its feet, even as it remains alert to a rebound of cases. While it has been cautious about sending children back to schools, most factories are running again. Travel within the mainland is stirring to life as well. Domestic Airbnb bookings, to name one indicator, reportedly rose last month from their March lows, suggesting people are moving about again.

New Zealand has begun a phased exit from the lockdown, with fishing, hiking and hunting allowed. Philippine President Rodrigo Duterte spoke of a "partial" lifting of the lockdown, with construction and some other sectors to restart, albeit with social distancing rules in place. Public transportation has been restored in Dubai, the most vibrant of Gulf cities.

A recent Stanford study cited by the Wall Street Journal found that those under 65 with no underlying conditions such as diabetes or hypertension made up 1.8 per cent of deaths in New York City. The Journal said the fatality rate for those over 75 is 69 times that for those between 18 and 44 years. This could suggest that while the elderly need the most protection, younger ones could possibly be sent back to work, or school.

Around the world, many leaders are at a loss as to what to do, often improvising as they go along.



ST ILLUSTRATION: MANNY FRANCISCO

For almost everyone, Covid-19 is no longer something "over there" but in our midst. From the locked-down boroughs of New York City to Sydney's Bondi beach – that totem of an outdoors-oriented land – and the shanty towns of Mumbai, it is a deafeningly silent scream.



FLATTENING THE CURVE

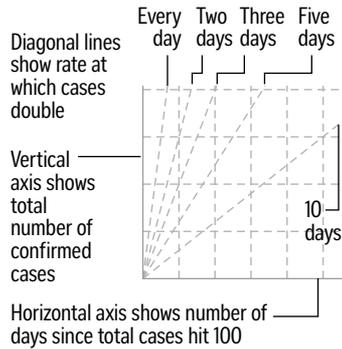
A key strategy to contain the pandemic is to slow its rate of infection. Governments are doing so through social distancing and enforced shutdowns.

A healthcare worker taking down details after performing a coronavirus test in Melbourne, Australia.

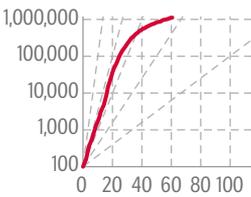
PHOTO: AFP



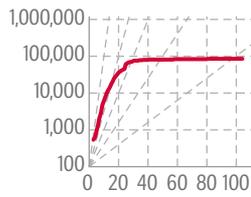
HOW TO READ



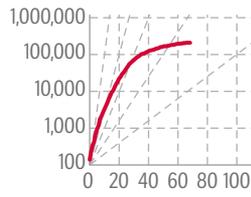
UNITED STATES



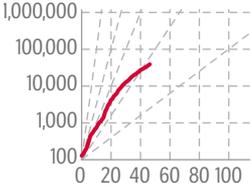
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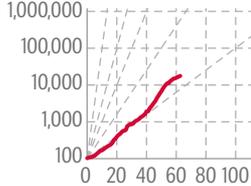
ITALY



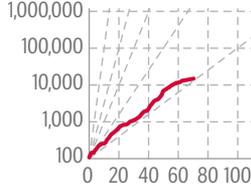
INDIA



SINGAPORE

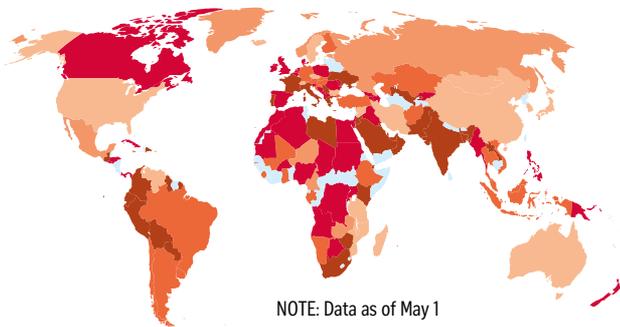
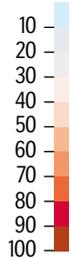


JAPAN



HUNKERING DOWN

Intensity of lockdowns



NOTE: Data as of May 1

- The map is based on the Oxford Government Response Stringency Index, which compares government policies implemented in response to the pandemic.
- Measures are tracked according to several indicators, including school and workplace closures, public transport and event cancellations, and restrictions on internal movement.

PUMPING CASH

Governments have unleashed unprecedented fiscal and monetary support to hold up their economies floored by the pandemic.

GERMANY

€2.06 trillion



ITALY

€781 billion



BRITAIN

£461 billion



JAPAN

117 trillion yen



UNITED STATES

US\$3.06 trillion



SINGAPORE

\$59.9 billion



CHINA

3 trillion yuan



INDIA

1.7 trillion rupees



NOTE: Data as of April 16

BUOYING MARKETS

Global stock markets plummeted as the pandemic intensified, but investor sentiment improved after governments' generous stimulus packages injected hope.

MSCI ACWI -14.80%



ST INDEX -20.11%



NIKKEI 225 -16.42%



SHANGHAI COMPOSITE -7.47%



DOW JONES -15.50%



FTSE 100 -19.25%



NOTE: Normalised as of Dec 31, data as of April 29

FINDING A CURE

Scientists are racing to develop coronavirus treatments and trying to compress the 10 to 15 years it normally takes to make a vaccine, into just 18 months.

Treatments in consideration:

197

Vaccines in development:

111

Countries involved:

Over 100

Sources: WORLD HEALTH ORGANISATION, WORLD ECONOMIC FORUM, WORLDDOMETER, OUR WORLD IN DATA, BRUEGEL, MILKEN INSTITUTE, STATISTA, BLOOMBERG, REUTERS STRAITS TIMES GRAPHICS



Given the hybrid nature of this challenge, there is no knowing what might work or won't.

Many governments – Singapore, Malaysia, Japan and Indonesia included – have thrown vast amounts of money into the fight to keep business running and jobs secure.

Nevertheless, no one doubts that the pain is going to be extremely severe. That makes it imperative that some way must be found to put people back to work.

US President Donald Trump has called to “liberate” certain American states that have imposed stay-home orders. Notwithstanding what looks like a tough election for him in November, his anxiety is understandable; the US shed some nine million jobs in the Great Recession. Today, as many jobs are being shed every 10 days.

The world needs the No. 1 economy and market of last resort back on its feet, but most think it is too early for that, never mind what their leaders think. Italy, one of the hardest hit, is considering a phased reopening.

Yet, Hokkaido's experience shows the perils of lifting lockdowns too soon. Japan's northern island did well to move early with a three-week shutdown. But when it was lifted, a second wave of infections hit and the island returned to lockdown in less than a month.

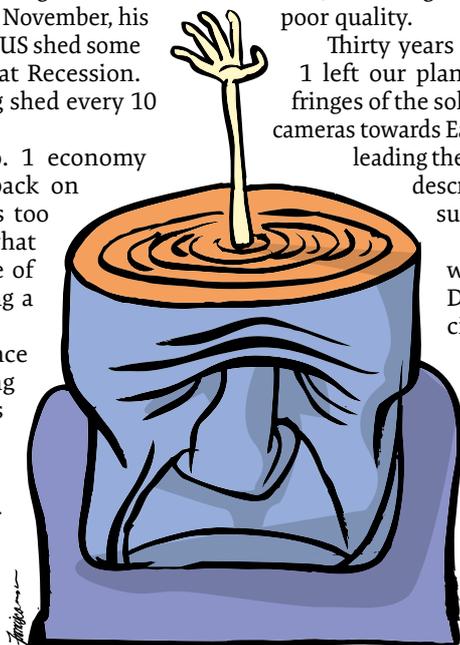
Will the pandemic prove an inflexion point in world affairs for US domination, just as the 1956 Suez Canal crisis is seen as a watershed for Britain's decline? That's too early to say.

China, once it got off its initial embarrassment over the outbreak having been first reported on its soil, won praise once it moved efficiently to curb its spread. But some of its sheen has worn off subsequently, in part because its diplomats were too eager to tout its victory and also because some of the medical equipment it shipped around the world, including test kits and ventilators, were of poor quality.

Thirty years ago, as the spaceship Voyager 1 left our planetary neighbourhood for the fringes of the solar system, engineers turned its cameras towards Earth at the request of Carl Sagan, leading the famed cosmologist to famously describe our abode as a “mote of dust suspended in a sunbeam.”

“Look again at that dot,” he wrote in his book, *Pale Blue Dot*, describing our planet and civilisation as the aggregate of our joy and suffering “where every saint and sinner in the history of our species lived.”

In time to come, we will have a clearer picture of who were the saints and who the sinners in this crisis. Meanwhile, the pandemic has reminded us that we share a common destiny. [ST](#)



A nurse comforting another at a hospital in Milan. In time to come, we will have a clearer picture of who were the saints and who the sinners in this crisis. Meanwhile, the pandemic has reminded us that we share a common destiny. PHOTO: AFP

Business activity in major economies collapsed last month as governments clamped down to limit the spread of the virus. Any significant revival will have to wait for the third quarter, if at all.



Newborn of parents with coronavirus could have Covid-19 antibodies

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Couple cleared of virus just before son's birth; they flew here from London a month earlier

LIKE ALL GOOD STORIES, THIS ONE HAS something to do with time – two hours to be exact.

On March 19, Mrs Natasha Ling and her husband Pele boarded a night flight from London to Singapore, just two hours before she entered her 36th week of pregnancy when she would have been

barred from flying.

“If we had missed that flight, we would now be stuck in London, and I’m not sure what would have happened,” says the 29-year-old Singaporean speech and language therapist. As it turns out, a lot happened to her and her British church worker husband here. Barely three days after their arrival, both were diagnosed with Covid-19.

A month of fears, anxiety and uncertainty followed before their son Boaz arrived on April 26, quite possibly the first baby born in Singapore to parents who had Covid-19.



Mrs Natasha Ling and her husband Pele with baby Boaz, who was born on April 26.

PHOTO: MATHEW PEREIRA

“The infectious disease doctors told us he’s a super baby, a super Singaporean baby,” says Mr Ling, 28.

Research and tests are yet to be completed but doctors also told the couple that all evidence and understanding of Covid-19 suggests Boaz could be the first Singaporean to be born with Covid-19 antibodies, although whether they confer lifelong immunity is still being debated in the scientific community.

The couple, who celebrated their fifth wedding anniversary in March, had originally planned to have their firstborn in London, where they live.

But the coronavirus upended their plans. Their decision to fly to Singapore was also prompted by the rising numbers of Covid-19 cases in the United Kingdom, which has almost 195,000 infections and 29,000 deaths as of May 6.

Friends told them they were crazy to get on a flight.

“But I just wanted to get to Singapore. I knew that once I was in Singapore, everything would be fine,” says Mrs Ling, whose father is The Straits Times’ Forum Editor Mathew Pereira and her mother a retired civil servant.

Getting a face mask before their trip proved even more difficult than getting their air tickets. The couple went to scores of pharmacies before they found just one, which cost £20 (\$\$35.40).

At Heathrow, the couple realised how dire the situation was.

“There were people wearing homemade hazmat suits, painting overalls and ski goggles. It was the weirdest flight ever. Natasha told me off because I was trying to take photos,” Mr Ling recalls with a grin.

His wife barely managed a wink on the 12-hour flight.

“I freaked out a bit because I was thinking: ‘I’m sure someone on this plane must have it’,” says the former student of Singapore Chinese Girls’ School who has a degree in speech therapy from the City University of London.

The thought that they might have the virus did not cross their minds but Mr Ling did feel under the weather. He had also lost his sense of taste and smell, although he did not know then that those were symptoms of Covid-19 infection.

“I’d been working all year producing a week of events for my church and that’s suddenly been cancelled. I thought I was just feeling down.”

Feeling relieved after clearing temperature checks at Changi Airport, the couple headed for her parents’ new and as-yet-unoccupied home to serve their 14-day stay-home notice (SHN).

But their ordeal was not over; in fact, it was just beginning. The baby was expected on April 17, and the couple barely had four weeks – for two of which they had to remain home-bound – to find an obstetrician. There was also the chance that Mrs Ling could go into labour during their SHN.

That night, Mr Ling went to bed with a slight fever. The next day, he consulted a general practitioner who sent him to the National Centre for Infectious Diseases (NCID) to get tested for the coronavirus.

After a nose swab and an X-ray, he was told to go



home and wait for the results. At noon the next day, he was roused from his jet-lagged slumber by a call informing him he had tested positive. His wife broke down. An ambulance took him to the NCID.

“I felt I was in a scene in a film,” says Mr Ling, who was also interviewed by a contact tracer. “Everyone was in hazmat suits. You’re talking to people and you can see only their eyes. You have no idea whether it’s a doctor, a nurse or a porter.”

His first concern was for his wife.

“I told everyone: ‘My wife is pregnant, she’s pregnant. Can you tell my wife to come here?’”

Later that day, a terribly anxious Mrs Ling got herself tested and spent the night alone. Like her husband, she had lost her sense of taste and smell but displayed no other symptoms. The next day, the dreaded call came.

“When I got into the ambulance, they weren’t sure where they were going to take me because I was so heavily pregnant. At first they told me I was going to NCID. That was a relief because then I would be with Pele. Then they said: ‘We’re taking you to SGH’. Then, it was KKH. They basically went down the list of public hospitals,” she recalls.

Mrs Ling adds: “Obviously they hadn’t had a patient with Covid-19 who was so pregnant. NCID didn’t have maternity facilities so they needed to find a hospital where I could get maternity care as well. I was like: ‘Do I have a say as to where I’m going?’ They said: ‘I’m sorry, you don’t.’”

She finally ended up at the National University Hospital (NUH). Tearful and frightened, she had to wait in the ambulance for 20 minutes before a group of masked men in protective suits whisked her off in a wheelchair.

“One was in front of me, one was beside me, one was pushing me and another group was shouting ‘get out of the way, get out of the way’ along the corridor. A lot of people were taking photos. It was funny even though it was horrible.”

Warded in an isolation room for three days, she was overwhelmed by fear and helplessness.

“No one was communicating with me about what was going to happen. I felt everything was out of

At the National University Hospital, the couple were in opposite wards separated by a 2m-wide corridor. PHOTO: PELE LING

Getting a face mask before their trip proved even more difficult than getting their air tickets. The couple went to scores of pharmacies before they found just one, which cost £20 (\$\$35.40).





Baby Boaz Ling could be the first Singaporean to be born with Covid-19 antibodies after both his parents were infected with the coronavirus prior to his birth. PHOTO: PELE LING

my control," she says.

She tried not to fret. "I was worried about getting worried because I was worried that if I worry, the baby would come sooner. My focus was on trying not to have the baby while testing positive," she says.

If that happened, mother and baby would be separated immediately. "I was told: 'You're going to have this number of people in the room, they're all going to be wearing PPE (personal protective equipment), your husband will not be allowed to be there, the baby will be taken away from you as soon as he's born and he will have to test negative for seven days before you're able to hold him.'"

The reason is to avoid contact. According to the NCID, no traces of the virus have been found in placenta or umbilical blood in the studies it has reviewed. This suggests it is unlikely a mother can infect her child while it is still in the womb.

Meanwhile, Mr Ling got himself transferred to NUH after much wrangling. He was "reunited" with his wife only a few days later when they were placed in

opposite wards with other Covid-19 patients.

"There were no doors so we could see into each other's rooms. We couldn't cross the corridor which was 2m wide but we could chat across it," says Mr Ling.

Because their circumstances were so unique, the couple were given swab tests daily, instead of once every two days. Patients had to have two consecutive negative tests before they were declared Covid-19 free.

At about 10pm on her 10th day at NUH, Mrs Ling was told she had a double negative. Her husband recalls: "She stood across the corridor, in floods of tears, and she said: 'But I don't want to go home without you.' But I, and everybody else, said: 'No, get out of here.'"

The next day, Mr Ling had his second consecutive negative and was discharged too. They were not out of the woods yet, though.

The gynaecological team at NUH told them that if, in the following five days, Mrs Ling were to go into labour, they were going to proceed as if she was still positive.

"They were still going to take the baby from her straight away. So the race was on to get past those

The Survivors

At 102, she fought and beat Covid-19

Madam Yap was among 16 residents at Lee Ah Mooi who caught the bug – a cluster that led to a ban on visitors to all nursing and old folks' homes in Singapore.

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AS SHE WAS WHEELED INTO LEE AH MOOI OLD Age Home on May 1, Madam Yap Lay Hong was greeted with beaming faces and cries of joy from staff and residents.

The Grand Old Lady of the Home smiled calmly and appeared bemused by the fuss.

But when dinner was served, she ate heartily. Soon, she was nodding off, ready for bed. The next day, Madam Yap was alert again as she bit into her favourite food: durian puff, a weekly treat before she was hospitalised on April 1.

At age 102, Madam Yap is Singapore's oldest coronavirus survivor. She was discharged from Tan Tock Seng Hospital on May 1.

It is the second time in her long life that a global pandemic has crossed her path.

She was born in 1918 during the Spanish flu – the world's worst pandemic – which reportedly killed more than 50 million people worldwide, including 2,800 in Singapore.

A fortnight earlier, in a 10-minute video call with the younger of her two daughters, she complained about the discomfort of having to stay in bed all the time, as ordered by the doctors.

Her second son, Mr Alan Ho, 72, who was



At age 102, Madam Yap Lay Hong is Singapore's oldest coronavirus survivor. PHOTO: COURTESY OF ALAN HO

five days,” says Mr Ling. Although they had planned to consult an obstetrician in a private hospital, they decided to go back to NUH.

“We had a chat with one of the doctors and she said: ‘It would be really valuable to us to have you because we can do all this research and you can help other pregnant women and their babies,” says Mr Ling, adding that they agreed to let researchers take their newborn’s blood for research. “We were going through such a horrible situation and we didn’t want others to go through it as well.”

The five days came and went without incident, but another type of stress set in: the baby took its time coming. Hoping exercise would help expedite the process, Mrs Ling took to walking 6km in the Botanic Gardens each day. It didn’t help so a week after the expected delivery date, doctors decided to induce labour.

Boaz, tipping the scales at 3.735kg, made his entrance at 4pm on April 26 and let out a lusty cry.

“Maybe we’re a bit old-fashioned but we decided



At the National University Hospital, the couple were in opposite wards separated by a 2m-wide corridor. PHOTO: PELE LING

we didn’t want to know the gender beforehand, we wanted it to be a surprise. All the doctors and nurses found it a bit strange,” says Mr Ling with a chuckle.

Moments later, the “miracle baby” was cradled against his mother’s bosom, staring at her tear-stained face, oblivious to the drama surrounding his birth. **ST**

listening in, tells The Straits Times: “My mother was grumpy and kept complaining. If she can do that, I think she is okay.”

Madam Yap Lay Hong was among 16 residents at Lee Ah Mooi who caught the bug – a cluster that led to a ban on visitors to all nursing and old folks’ homes in Singapore.

Mr Ho has not spoken to her even after her discharge, but he draws comfort from knowing she is eating and resting well.

During her one-month stay in Tan Tock Seng, Madam Yap did not have respiratory problems, was not in intensive care and did not have a fever or cough, according to two of her children.

Mr Ho believes her strong immunity helped her overcome the virus.

Madam Yap is among the rare centenarians worldwide battling Covid-19. The oldest to survive is a Dutch woman in the Netherlands, 107-year-old Cornelia Ras, who recovered in about 20 days.

Two Lee Ah Mooi residents, however, both aged 86, have died.

“My mother is very feisty. She is old but very independent. Her eyesight is still good. Her only weakness is her bones,” says Mr Ho, a retired office manager.

Madam Yap fell and broke her hip four or five years ago and had hip replacement surgery, he adds. But she can move around with a walker.

People often ask him for the secret to her long life and good health.

“I tell them she doesn’t smoke or drink or eat fast food. She cooked most of her meals herself until she came to stay in Lee Ah Mooi,” he says.

She sometimes indulges in her favourite hawker food such as prawn noodles and lontong (rice cakes in vegetable stew). She also loves durians, bak kwa

(barbecued pork) and coffee.

“I buy her durians when I visit her at the Home every week,” he adds.

Before her hip surgery, Madam Yap was still taking the bus on her own and visiting the casino at Marina Bay Sands. “Playing the roulette was her favourite pastime,” says Mr Ho.

He believes the years of taking the stairs up and down her fourth-floor Housing Board flat in Tiong Bahru have kept her fit.

She lived in the four-room flat for 55 years before moving to Lee Ah Mooi in Thomson Lane.

Madam Yap was barely 18 when she wed fishmonger Ho Peng Yee in an arranged marriage.

She had five children – three boys and two girls. Her oldest, a son, died of a heart attack six years ago, aged 72; her youngest, also a son, is aged 66. She is a grandmother to 11, who have given her 13 great-grandchildren.

Widowed about 18 years ago, she lived alone in the flat while her oldest son lived next door to keep an eye on her. He died in 2014 in Brunei while on a business trip.

“Mr brother was her favourite. She was very sad and kept finding someone to blame for his death. All we could do was console her,” says Mr Ho.

Two years later, her hip surgery slowed her and she wanted to move to an old folks’ home – which she did in 2018, he adds.

“She is fiercely independent and mobile even at the age of 102. She takes daily walks and bathes herself under supervision. Her daily lifestyle and overcoming Covid-19 are a true testament to her resilience and tenacity,” says Mr Then Kim Yuan, administrator of the Home. “Her story shines a light of hope for all of us overcoming this battle as a nation and community.” **ST**

At age 102, Madam Yap is Singapore’s oldest coronavirus survivor. She was discharged from Tan Tock Seng Hospital on May 1. It is the second time in her long life that a global pandemic has crossed her path.



Days in ICU scariest of my life



Mr Raymond Koh spent five days in the ICU. He was discharged on March 19.
ST PHOTO: NG SOR LUAN

In ICU, I was given sedatives to facilitate the intubation procedure in order to be connected to a ventilator. I woke up one day later and found six tubes on me – one in my mouth, one in my nose, one on my neck and three on my hands.

”

FOR AN ETERNITY, TIME STOOD STILL.

No matter how often he checked the clock on the opposite wall, its hands never moved.

Worse, he could not lift his own.

To prevent him from pulling out the tubes in his nose, mouth and hands in his delirium, IT manager Raymond Koh, 47, was tied down to his hospital bed. That week in March, when he lay seriously ill with Covid-19, was the scariest of his life, he told *The Straits Times*.

A day after the 47-year-old bank IT manager found out on March 10 that he had been infected with the coronavirus, his oxygen levels started to drop. X-rays showed patches in his lungs. His temperature was fluctuating.

Doctors at Sengkang General Hospital told him he would be taken to the intensive care unit (ICU) immediately.

He feared the worst, as his own father had become critically ill and died in intensive care eight years ago.

Mr Koh's own ordeal began with a fever on March 1. He visited a clinic in Buangkok the following day, and then again on March 5. As his fever was still running high on the night of March 8, his wife took him to a second clinic in Punggol.

He thought the persistent fever could be a case of dengue, but the doctor detected abnormalities in his lungs and decided to call an ambulance. He was taken to the emergency department at Sengkang General Hospital, and subsequent test results

confirmed the Covid-19 infection.

That evening, the contact-tracing team called to interview him.

HARROWING ORDEAL

Mr Koh, an employee of OCBC Bank, said his last working day at the office before he fell sick was Friday, Feb 28. He did not go to work the following week as he had five days of medical leave for his fever.

After he was confirmed with the infection, his wife and teenage son started their two-week quarantine.

Everything happened so fast after his diagnosis, he said.

“Just before I was wheeled into ICU, I quickly sent a text message to my wife to tell her I love her and I love our son,” he recounted.

“In ICU, I was given sedatives to facilitate the intubation procedure in order to be connected to a ventilator. I woke up one day later and found six tubes on me – one in my mouth, one in my nose, one on my neck and three on my hands.

“I couldn't speak and the only way for me to communicate with the doctors and nurses was through writing.”

That night, his condition worsened. “I was in a very uncomfortable position with my hands tied down to the bed and unable to move.”

He slept only 10 minutes and was wide awake until the next morning.

Five days later, there was some improvement in his lungs.

On the sixth day, a video call was arranged for Mr Koh and his family.

“I felt so relieved to see my wife and son,” he said. Tears flowed during the short 10-minute call. “I gave them a thumbs up, to tell them that I was doing well,” said Mr Koh.

“My wife forwarded a lot of messages to me and I was so comforted to see how much support my bosses and colleagues had given them.”

OCBC Group chief executive officer Samuel Tsien called his wife to check in on her, and told her that she is “part of the OCBC extended family”. They also bought groceries for her and offered to bring her food daily during her quarantine.

“My handphone had hundreds of messages from friends who sent me their prayers.”

Mr Koh's wife, 44, who declined to be named, said: “There was a lot of anxiety, especially when my son and I had to be quarantined and I couldn't be at the hospital with my husband, who was so sick.

“People came and left food outside our door as we couldn't go out to get our own food. It was the support from family, friends and colleagues that helped me through those two weeks.”

After five days in ICU, Mr Koh was moved to an isolation ward until his discharge on March 19.

He has tested negative twice now for the virus.

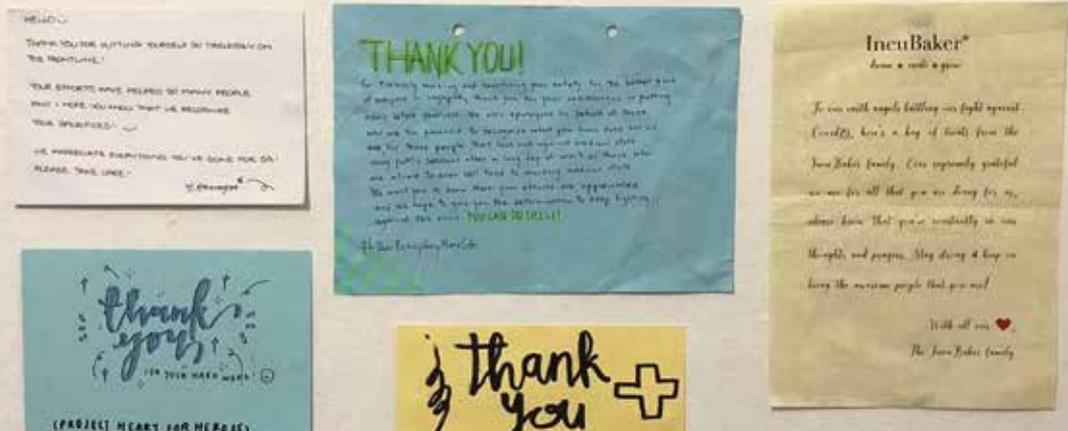
“The experience let me see up close how the medical workers put themselves at risk to save lives,” said Mr Koh. [S](#)

– Joyce Lim

Encouragement

Corner ☺

Fighting!



Frontline Fighters

Staying calm and positive despite fear and stress

For NCID ICU nurse Ling Ging Poh, the hardest thing is when a Covid-19 patient dies and the family cannot be at the bedside to say their last goodbyes

THE CARDS PROVIDE MOTIVATION, THEY OFFER comfort, they are perhaps reminders of her purpose. The cards arrive at the hospital from strangers, scribbles on blue paper, hearts drawn in black, and she takes these home and sticks them to her wall.

“Thank you,” the cards say.

Thank you for “sacrificing your safety for the better good of Singapore”. Thank you “for your hard work in protecting us”.

Every day Ms Ling Ging Poh looks at those cards and then she walks from her home to the National Centre for Infectious Diseases (NCID), which is treating only Covid-19 patients, enters the intensive care unit, puts on her personal protective equipment with its N95 mask, goggles, gown, gloves, shower cap to keep her hair in place, and then enters a patient’s room.

We carefully distance ourselves from Covid-19 but Ms Ling is a nurse and so she must advance towards it. Heroes, we sometimes like to say of her tribe, but she won’t wear that casual label. “I think I’m not a

hero,” she says quietly. “I just try my best to help.”

This is her daily job, her chosen life, and her armour is conviction, training and cutting-edge equipment. Each part matters in this pandemic. Asked how she feels about nurses in other lands, who must confront this virus with inadequate equipment, and she pauses:

“I feel heartbroken.”

Only this gowned sisterhood, this masked brotherhood, understands the uncertain world within Covid-19 wards, only they know what it’s like to wear these suits – “claustrophobic”, she says – and offer care. Crisis binds people and when asked if this has happened with the nurses, she says: “Yes, yes.”

“Because we are in the same boat, we have to support each other and we share information, help each other, and our bond will get closer and closer. And of course when we face any difficulties, we will also share with each other and find a solution.”

From the outside we see only passing images of wards across the world and clips of staff bustling down busy corridors. Long days distilled to a handful of newsworthy seconds. But television can’t translate the tension of patients in distress rolling into hospitals, it can’t completely convey the endless shifts that nurses and doctors spend on their feet – Ms Ling’s longest was 13 hours – as they try to unravel the reach of this new enemy.

It’s why the cards on her wall matter because, first, they represent a city reaching out. Nurses worldwide

Thank-you cards that nurse Ling Ging Poh has pasted on her wall at home. The cards fortify her, and on her wall, on top of the cards, she has pasted these words: “Encouragement Corner. Fighting!!!”

PHOTOS: COURTESY OF LING GING POH

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Nurses are accustomed to suffering but this virus' sly ability to spread has resulted in something profoundly sad: It allows for no goodbyes. And so, for Ms Ling, the hardest thing has been "when a patient passes away and the family can't be at the bedside, can't hold their hands and say their last goodbyes".



have elicited the best from us and the worst, applauded from balconies in some lands, yet spat on and sidled away from in others. No such rudeness has been visited on Ms Ling, but one of her nursing friends had a less than pleasant experience.

"She joined a fitness class," says Ms Ling, "and they have to sign a declaration form. One of the questions is, 'Have you ever had close contact with a positive patient?' So of course she ticked the 'yes' box. Next day her membership was terminated."

The cards speak of kindness but they also fortify her, and on her wall, on top of the stuck-on cards, she has pasted these words: "Encouragement Corner. Fighting!!!"

This virus is a daily struggle and if you ask her what goes through her mind as her day commences, she is direct: "I guess it is fear and stress of work. But I tell myself to stay positive. I always pray to God for protection, let me go to work and come (home) safely. I stay calm at work no matter what situation arises."

Ms Ling is 24, considers her words carefully, has a smile that unfolds shyly and is a Singapore permanent resident. She lives in a room in a shared apartment, with no one to comfort her on hard days and yet no child to fear infecting. She hails from Sarawak in Malaysia and while there her parents wait to see her, here she tends to us.

Parents might offer unconditional love to their children, but nurses provide unconditional care to strangers. Like soldiers who cannot choose wars, nurses cannot choose outbreaks or patients, and only during a crisis does the larger population see them clearly.

Experience is its own shield in a pandemic. Some nurses here have jostled with Sars, but for some Covid-19 is a first major crisis. Ms Ling has a diploma in nursing and also a degree, has worked in Tan Tock Seng Hospital for three years and at the NCID for over a year, but the sheer foreignness of Covid-19 has brought its own challenge.

The everyday healing of humans can be a taxing business but this, she says, is very different.

"Before the pandemic we still experienced stress at work but not so much stress as compared with now because we don't know what this disease is about. **ST**



Finding himself in the middle of a virus war

For doctors on the front lines of the battle against the coronavirus, the work is unending. But they have been stepping up to do more and help one another.

THIRTY-THREE-YEAR-OLD DR TAY WOO CHIAO started his stint at the National Centre for Infectious Diseases (NCID) in January, expecting to deal with patients with known diseases such as HIV infection and dengue fever.

There were "murmurings of an outbreak caused by what was then called the Wuhan virus, and everyone was on the alert, he says.

However, no one expected the coronavirus outbreak to evolve so quickly into the deadly pandemic that the world is now witnessing, in just two to three months.

The virus, initially seen as having an impact that was likely to be negligible, turned out to be a highly transmissible one 10 times deadlier than the swine flu that caused a global pandemic in 2009.

Before he knew it, Dr Tay, a resident with the National Healthcare Group (NHG) Internal Medicine Residency programme, found himself right in the middle of an escalating virus war.

At NCID, a centre specially built to manage



The Straits Times spoke with staff nurse Ling Ging Poh, who works in the intensive care unit at the National Centre for Infectious Diseases, about working on the front line. ST PHOTO: KUA CHEE SIONG

Racing to figure out and get ahead of the virus

Dr Tay Woo Chiao, who started his stint at the National Centre for Infectious Diseases in January, says he feels privileged to be fighting the epidemic from the heart of the action.
ST PHOTO: KUA CHEE SIONG

outbreaks, Covid-19 patients were first placed in single isolation rooms. As cases rose, capacity was ramped up. NCID says it started cohorting confirmed patients in the second week of March. They were family members like husband and wife, or siblings, or those of the same gender.

Along the way, as more became known about the disease, some approaches changed. For instance, disposable face shields gave way to reusable goggles to lessen wastage of personal protective equipment (PPE), given that this would be a “long-drawn-out battle”, says Dr Tay.

To protect his family at home, he started to take a shower at the end of each shift before leaving the hospital. He also keeps a pair of shoes at work and uses another pair to travel to and from home.

Once he is home, he makes a beeline for the nearest bathroom to take another shower before he catches up with his parents and sister.

As an extra precaution, he soaks his clothes in a Dettol solution before they are washed together with the family’s laundry.

Personally, he made a conscious effort to not bite his nails, and while working, he makes sure he does not touch his face. “I don’t want to be the... doctor to end up in the ward,” he says, adding that it would be very *sia suay*, using the Hokkien term for disgraceful.

While Dr Tay says he is a bit disheartened by the rising numbers, overall, he feels privileged to be fighting the epidemic from the heart of the action, from when the first case appeared.

Even as more is known about the disease, many questions remain unanswered.

For doctors on the front lines, the work is unending. 

– Joyce Teo

“IT DOESN’T QUITE MATTER TO ME NOW WHAT time I go home,” says Professor Leo Yee Sin, executive director of the National Centre for Infectious Diseases (NCID). “Because I continue to work at home.”

She works not only long hours, but also seven days a week since the Covid-19 outbreak hit Singapore.

On Mondays, Wednesdays and Fridays, her day starts with a two-hour meeting at 8am – so she needs to be in by 7.30am to get ready and to catch up with things that had occurred overnight.

These meetings look at the situation here and globally. The 20 to 30 people involved discuss – remotely – how Covid-19 affects different patients, the perspective from the laboratories and the sort of care patients need.

Aside from seeing more than half the Covid-19 patients here, the NCID, as the dedicated specialist institute for infectious diseases, also has to provide clinical leadership for the country.

Says Prof Leo: “In addition to providing care, we have to be able to analyse the cases and understand the disease characteristics.

“We give evidence-based advice to the Ministry of Health (MOH), which can then come up with policy that can translate into action.”

Some key findings include confirming that older people tend to get more severely ill.

The MOH says that as of April 16, “among the confirmed cases aged below 50 years old, 0.2 per cent required ICU (intensive) care, compared with 11 per cent for those aged 50 years and above.”

CRUCIAL MARKERS

The experts have also identified predictive markers from chest X-rays and blood tests, and are now able to identify patients who are likely to suffer no more than a mild illness, and those who might face more serious illness.

As a result, a young healthy patient whose swab tests positive at a polyclinic is no longer sent to a hospital but straight to a community setting.

Today, only patients who are likely to become very ill are housed in a public general hospital or at the NCID.

Those in the mid-range would be sent to the handful of community hospitals treating Covid-19 patients. The 317-bed Bright Vision Hospital is now dedicated to recovering Covid-19 patients. Yishun, Jurong and St Andrew’s community hospitals have each set aside a few wards for Covid-19 patients.

Prof Leo says not all nine community hospitals are suitable, as some still have other patients. These hospitals also have to be “very secure” if they are

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Professor Leo Yee Sin is one of Singapore's top infectious disease experts and led Singapore through another coronavirus outbreak, the severe acute respiratory syndrome or Sars.
ST PHOTO: KELVIN CHNG

treating patients infected with the coronavirus. She stresses that such pre-admission clinical assessments are continuously evolving. Meanwhile, the 330-bed NCID that was opened just last year, with provisions for expansion during an emergency to accommodate more than 500 beds, is running very full. "Every corner is being used," says Prof Leo. "We're very full, hovering about 90 per cent occupancy. Every single ward and every single room is being used." At maximum capacity, with two to three beds per cubicle, the centre can accommodate "an absolute maximum 586 patients", she says. But this is not possible. First, patients who are only suspect cases have to be kept isolated. Only confirmed patients can be roomed together. So the NCID can take in only slightly more than 500 patients at any one time. Furthermore, the centre discharges, or moves to other facilities, more than 100 patients a day. Those wards have to undergo a thorough cleaning that takes about two hours. This is on top of the daily cleaning of "high touch" areas in the wards. Prof Leo, who is one of Singapore's top infectious disease experts and led Singapore through another coronavirus outbreak, the severe acute respiratory syndrome or Sars, now has little time to practise her vocation. As the head of NCID, she participates in

patient care only outside of the wards, by trying to understand the disease and identifying the big picture.

Her time is now largely spent on administrative tasks, she says, and include worrying about "cranky" automatic doors acting up and electric power trips - both of which have happened this year, but fortunately did not affect patient care and were quickly fixed.

Anything in use has to be maintained, she says. Her job includes ensuring that when there are hiccups to the system, follow-up action is taken as quickly as possible.

Overseeing the care of patients, finding out as much as possible about the disease, and making sure the infrastructure works smoothly are both physically and mentally stressful, she says, "with a lot of work and little rest time."

She also has to take care of her staff and make sure they take precautions outside of work. She says: "A lot of times people forget. They think they are at risk when at work and there is no risk when going out."

They need to completely change their mindset, she says. In the wards, they are in no danger with personal protective equipment. She constantly reminds them that they need to maintain social distancing and not go out in a big group when they buy lunch.

She adds that the healthcare workers are very good at giving one another social support. Her staff even sees that she gets breakfast and lunch, which she takes on the run.

At home her family is also very understanding. Her three children are grown up, although two still live at home with her and her husband.

She tries to have dinner with them, and manages to do so about three times a week, although the dinners "are a bit rushed", she says, as there are usually night-time conference discussions.

Life like this will go on for quite a long time, says Prof Leo. Her greatest worry is whether people here are resilient enough and willing to do their part in beating the viral spread. **ST**

An example of the NCID isolation wards. The 330-bed NCID, with provisions for expansion during an emergency to accommodate more than 500 beds, is running very full.
ST PHOTO: MARK CHEONG



Many twists and turns in a deadly dance as Covid-19 tune plays on

WARREN FERNANDEZ
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The long fight against the coronavirus will ebb and flow, with surprises along the way

REMEMBER THESE WORDS: “TO SEE WHAT IS TO come, look to Lombardy, the affluent Italian region in the heart of the Covid-19 outbreak in Europe.

“Its hospitals provide world-class healthcare. Until last week, they thought they would cope with the disease – then waves of people began turning up with pneumonia.”

This haunting refrain to “look to Lombardy” has lingered in my mind since I came across it in an editorial in *The Economist* on March 14, when the pandemic was gaining pace around the world.

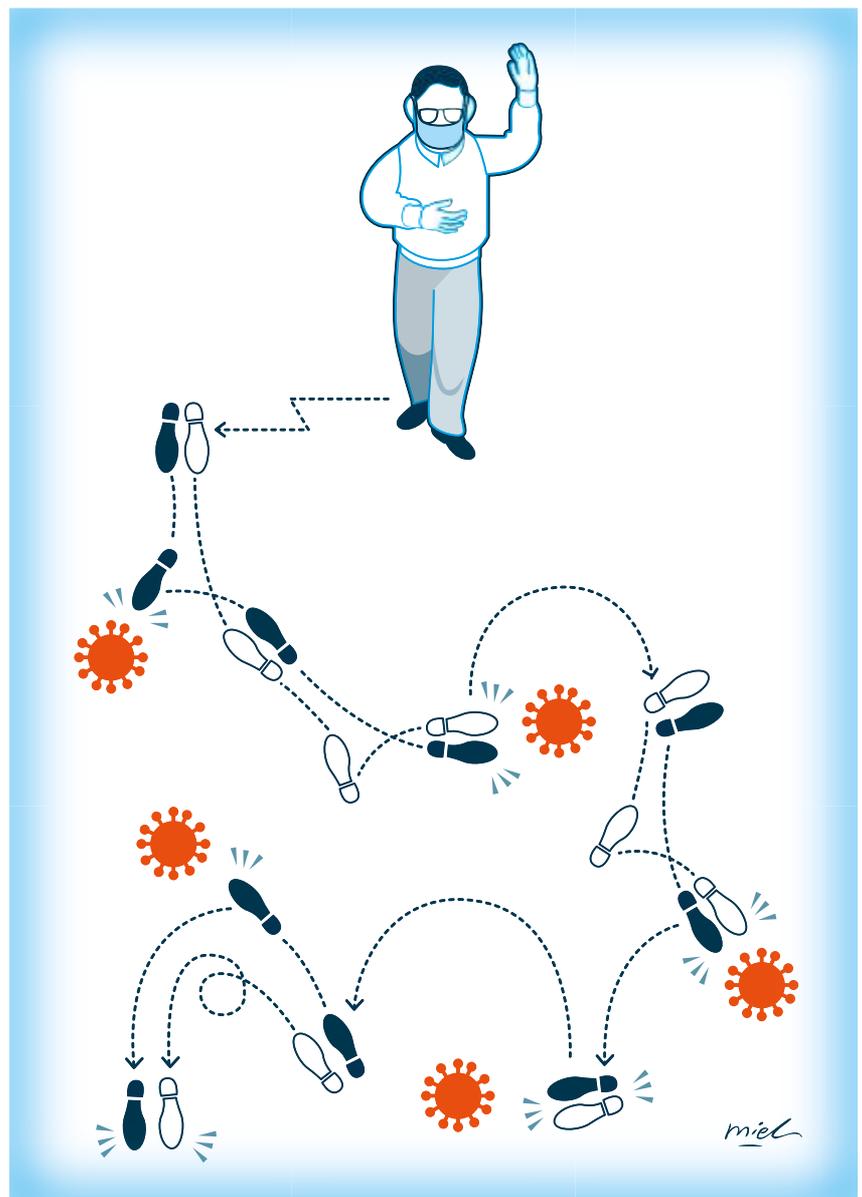
Like an oracle, the article declared: “All governments will struggle. Some will struggle more than others.”

The words have proved prescient, for in a sense, from Italy to Indonesia, South Korea to Singapore, we are all Lombardy now, grappling with a deadly coronavirus that is straining healthcare systems and ravaging economies everywhere, with some faring better than others.

The first weekend this month marks 100 days since the virus appeared in Singapore, weeks after people began turning up in hospitals in China amid a strange outbreak of pneumonia.

Along the way, there have been twists and turns, ebbs and flows, in this unfolding story. So whereas Singapore was initially hailed as the “gold standard” of how to beat the virus – its good healthcare, efficient and effective containment, trusted leaders and institutions widely cited by world leaders and the global media – it is now being pointed to as a “cautionary tale” of how even the best organised efforts to check the virus might be caught off-guard. A “smart” and merciless foe, the coronavirus has shown it is adept at seeking out kinks and blind spots in a society’s defences, targeting these for its next waves of attack.

But just as the rush to judgment then was premature, so too is it now, for we are by no means finished with this surreal saga playing out around the world. Even as they spoke yesterday about a gradual easing of some of the circuit breaker measures over the next weeks, ministers were at pains to emphasise that the fight against the virus will be a long one, to be sustained over many months.



ST ILLUSTRATION: MIEL



Foreign workers at a dorm. The surge in densely populated dormitories that house foreign workers, was a blind spot, says the writer. ST PHOTO: MARK CHEONG

Cruelly, however, Covid-19 is reminding us that to be special demands effort on our part; that freedom is not free, as rights (even to go out of our homes) carry responsibilities; trust has to be earned and never abused if it is to be called upon when needed; discipline is not something that can be summoned on demand, but has to be willed and lived out, day after plodding day.



Along the way, we must expect more shocks and surprises in the weeks and months to come, not only on the healthcare, but also on the economic, social and political fronts, just as there have been over the past weeks.

Indeed, let's be clear on this: The surge over the last month in the number of infections in Singapore, largely in densely populated dormitories that house foreign workers, was a blind spot for all of us. Few saw it as the most pressing area to focus on, although some are now claiming so, with ever-perfect hindsight.

In the run-up to the introduction of Singapore's circuit breaker measures on April 7, public attention was focused instead on the spread within the community, in churches and mosques, hospitals and old folks' homes, childcare centres and large social gatherings, as well as the wave of imported cases from Singaporeans returning home. It was only later that foreign worker dormitories emerged as an area of concern.

Let's not be hypocrites: To suggest that prior to the outbreak in the dormitories, there would have been widespread public support for the need for the authorities to move into those privately run facilities, taking them over and thinning them out, to resettle thousands of sick foreign workers in hastily set-up facilities, from floating hotels to exhibition halls and even Housing Board flats, is fanciful at best, or at worst, disingenuous.

Let's be honest: It could take many weeks, but eventually, the time will come when these unfortunate workers will be able to return to their usual dwellings. But given that many of the dormitories have all but been nationalised in a determined effort to bring the outbreak there under control, returning to the status quo ante might well be nigh impossible.

Hopefully, we as a society have learnt the hard way that we have to do better by them, improving the conditions in which they are housed. Doing so would mean everyone accepting that more dormitories will have to be built, closer to our own homes, and at considerable cost, which will inevitably have to be passed on to you and me, in the form of higher charges for just about everything, from housing to the everyday services we depend on.

No doubt, the usual howls of protest will arise, from the not-in-my-backyard crowd wanting more dormitories but only if they are built elsewhere, or from those supporting calls for more foreign

workers for businesses while lamenting the large numbers that need to be provided for, and from others demanding better-quality services so long as someone else picks up the tab.

If we as a society are to be clear-headed, honest and non-hypocritical, these voices will have to be countered. But that, as they say, is a battle for another day. With a general election on the cards, that day might come sooner than some might like.

For now, though, Singaporeans, who have been confined to barracks for weeks, will have to put on their dancing shoes.

Singapore has enjoyed some success in what experts have called the "hammer and dance" strategy. This refers to the use of aggressive measures - think quarantines, contact tracing and lockdowns - to hammer down the virus. This is now being followed up with a delicate dance, where society tiptoes out, gingerly easing up on some restrictions, to try to return to some semblance of normalcy.

Indeed, around the world, we are all dancers now, twisting and turning to the doleful music that seems to play on and on.

Consider South Korea, which drew much flak initially when it struggled to get a massive outbreak in a church community under control, but which has now emerged as the latest poster boy of how to test for, track and tame the virus. Yet, it too is treading nervously over a long holiday weekend wondering if the virus will spring forth again as people start to roam about the country.

Or look to Lombardy, and Italy as a whole, once dubbed the new epicentre of the outbreak, after China. It has since been overtaken by Spain and the United States in terms of the number of virus cases and deaths.

In recent weeks, like many others, the Italians have announced tentative steps to emerge in gradual stages from a state-enforced, nationwide lockdown, peering around anxiously for any signs of further waves of people turning up at hospitals with infections, forcing others to retreat once again into their homes.

By all accounts, we must be prepared to keep up this deadly dance in the months to come. There will be highs and lows, moments when hopes are raised that things seem to be coming under control, only to be dashed by new clusters surging forth and tripping the circuit breaker all over again.

This will test Singapore like never before, so used are we to having things go according to plan.

Given the globally connected, affluent lives we have all grown used to, we are understandably averse to being "cabined, cribbed, confined, bound in, to saucy doubts and fears", to borrow the words of William Shakespeare.

Given how we have been told over and over again, and come to believe, that Singapore is special, a place where things are supposed to work, we have become somewhat allergic to shocks and setbacks.

Cruelly, however, Covid-19 is reminding us that to be special demands effort on our part; that freedom is not free, as rights (even to go out of

our homes) carry responsibilities; trust has to be earned and never abused if it is to be called upon when needed; discipline is not something that can be summoned on demand, but has to be willed and lived out, day after plodding day.

Singapore did not become “special” simply by wishing it or sloganeering it into reality. Nor was it because we were smarter, richer, or somehow superior to others around us.

Rather, an earlier generation of Singaporeans earned that reputation the hard way, by self-sacrifice and sheer will, doggedly pressing on and pulling together, especially when the going seemed tough. Today’s generation is challenged by the present crisis to live up to that legacy.

Let’s not pretend: Even once we have beaten back the virus, the challenge of re-emerging from our respective retreats to pick up the pieces of our battered economy will be enormous and daunting. The debate on when and how best to do so will be intense and fraught, given that there will be no easy textbook answers.

Indeed, a sign of things to come might be seen in a recent article by the Financial Times columnist Martin Wolf, in which he grapples with the issue of whether there is an appropriate trade-off to be made between saving lives and safeguarding livelihoods, a dilemma many are pondering, here and elsewhere.

Pointing to a recent University of California, Berkeley, study, he said: “Yes, persisting with the lockdown until the disease has been brought to really low levels imposes big economic costs now. But it must also be seen as an investment, whose fruits will be a more tolerable future.”

Just what might that “more tolerable future” look

like? And what will we need to do to reshape our businesses, industries and society for this brave, new post-pandemic world?

Well, the most honest and clear answer I have come across so far comes from Mr Wolf again, in a separate piece last month: “We do not know what the pandemic has in store or how the economy will respond. We do not know what we must do to get through this terrifying upheaval with the least possible damage.

“We must bring this disease under control. We must invest massively in systems for managing it after the current lockdowns end. We must spend whatever is needed to protect both our people and our economic potential from the consequences.

“We must help the billions of people who live in countries that cannot help themselves unaided. We must remember above all else that in a pandemic no country is an island.

“We do not know the future. But we do know how we should try to shape it. Will we? That is the question. I greatly fear our answer.”

Mr Wolf was writing about the United Kingdom. But that indeed is the question for us here in Singapore too.

Do we know our answer? Can we be a little more sanguine than he, knowing that we have it in us to, once again, summon up the collective wit and will to shape the future, by pulling together, not turning against one another, or giving in to doubts and divisions, both those inherent within as well as instigated from without?

That is the Covid-19 test, of the past 100 days and many more to come, for today’s generation of Singaporeans. How we fare is up to us. **ST**

A “smart” and merciless foe, the coronavirus has shown it is adept at seeking out kinks and blind spots in a society’s defences, targeting these for its next waves of attack.



Eyes on Lombardy as Italy tries to return to normalcy

ITALY IS SLOWLY COMING OUT FROM THE WEST’S first and most extensive coronavirus lockdown. But persistently high numbers of coronavirus cases in the Lombardy region compared with elsewhere in the country remain a reason for concern as Prime Minister Giuseppe Conte begins to restart the Italian economy.

The region of Lombardy was the hardest-hit by the coronavirus crisis in Europe’s worst-affected country. As of May 6, 14,000 people have died of the virus in the densely populated region.

Italian research suggests the virus arrived in Lombardy between the second half of January and the beginning of February – weeks before the first infections were confirmed on Feb 20. Football players for Inter Milan have said they suffered symptoms of the virus at the beginning of the year. But no tests were conducted, according to Agence France-Presse.



Now, as close to four million people returned to work from May 5, health observers were keeping an eye on Milan, the capital of Lombardy, and other parts of the region.

Although the infection rate has been steadily falling, fear of the virus lingers, says a report by the Guardian. The vast majority of daily new cases are being registered in the northern regions of Lombardy, Piedmont, Emilia-Romagna and Veneto, it notes. **ST**

People walking across the Galleria Vittorio Emanuele II shopping mall on May 4 in Milan as Italy starts to ease its lockdown. PHOTO: AFP

A Covid-19 lexicon

From serology to RO, the global outbreak of Covid-19 has brought technical terms into mainstream vocabulary. **Cheryl Tan** and **Audrey Tan** highlight what key terms mean.

HEALTH TERMS

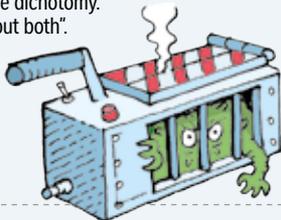


Asymptomatic

- An asymptomatic person does not show any symptoms of Covid-19, and may be an unwitting transmitter of the disease.
- Research shows that between 55 per cent and 70 per cent of coronavirus infections could be a result of asymptomatic carriers infecting others.
- National Centre for Infectious Diseases executive director Leo Yee Sin said Covid-19 manifests itself as a mild illness, but has a high viral secretion. Individuals may misjudge the seriousness of their illness and continue with routine activities.

Containment/mitigation

- **CONTAINMENT** is a pre-emptive stance taken by the Government since the early days of the outbreak, with the aim of limiting the spread of the virus through rigorous contact tracing and quarantining of suspect cases.
- **MITIGATION** measures aim to reduce the severity of the Covid-19 spread through social distancing measures such as those taken by Singapore during its current circuit breaker phase.
- World Health Organisation (WHO) chief Tedros Adhanom Ghebreyesus praised Singapore's "all-government approach" in battling the Covid-19 virus, adding that "it is not about containment or mitigation, which is a false dichotomy. It is about both".



Dorscon yellow/orange/red

- Dorscon refers to Singapore's Disease Outbreak Response System Condition, a colour-coded framework which reflects the current disease situation. There are four alert levels – "green", "yellow", "orange" and "red", which depend on the severity and spread of the disease.
- **YELLOW:** A mild infection, or a severe infection that is not spreading here, though the community needs to be careful. This is a step up from "green", which indicates minor problems.
- **ORANGE:** On Feb 6, Singapore raised the Dorscon level to orange, which means that the disease is severe with transmission, but it is generally contained and has moderate to high public health impact. This is Singapore's current status.
- **RED:** The disease is severe and spreading widely.



False negatives/false positives

- **FALSE NEGATIVES** are people who are carriers of the virus but have been tested negative for it, due to tests that are not 100 per cent reliable.
- As the tests are conducted through nasal swabs, they may come back negative as the virus might have shifted from the upper respiratory systems (where the back of the nose meets the throat) to the lower respiratory system (where the lungs are).
- Recovering Covid-19 patients must receive two negative test results in a row before they can be discharged.
- In South Korea, some patients who have recovered from the coronavirus have tested positive again, with experts citing reasons such as faulty tests and the possibility that the virus has been "reactivated".



- **FALSE POSITIVES** are people who test positive for a particular disease without actually having it.
- In March, two Covid-19 patients who tested positive for dengue were found later to not have the mosquito-borne disease.
- A paper published in The Lancet medical journal on March 4 cautioned doctors not to disregard the possibility of Covid-19 due to a positive dengue rapid test result, as failing to do so could have implications on both the patient and public health.



Isolation areas

- Several dormitories have been gazetted as isolation areas, due to the large number of Covid-19 cases.
- All foreign workers staying in these isolation areas will not be allowed to work or move between blocks, to limit interaction with other residents.
- Meals are provided to them, and communal toilets will have scheduled staggered shower times.
- Employers will still be required to pay the workers their salaries as the workers are considered to be on hospitalisation leave.



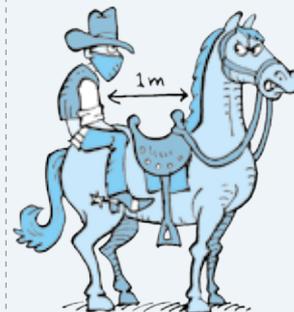
Lockdown

- On Jan 23, the first epicentre of the outbreak in Wuhan, China, went into lockdown, where all public transport services, including buses, railways, flights and ferries were shut down. Residents were barred from leaving without permission from the authorities.
- These strict quarantine measures had worked, with cases slowing to a trickle. On April 8, Wuhan reopened its borders, with major transport links reinstated.
- In Singapore, the Government has refrained from a complete lockdown. Instead, it has gone into a circuit breaker mode to curb local transmissions by shutting down most workplaces and schools.
- All short-term visitors have also been barred from entering or transiting through Singapore, with further curtails on work-pass holders entering Singapore.



Social distancing

- Social distancing measures aim to minimise inter-household interaction to reduce risks of seeding new local clusters.
- Those who refuse to comply will face at least a \$300 fine, while repeat offenders will face higher fines or prosecution in court for egregious cases.



Serology tests

- Serological tests detect the presence of virus-fighting antibodies, known as immunoglobulins, in the body.
- But as these antibodies take a few days to appear in patients' blood, they will not appear in the early stages of infection.
- Professor Wang Linfa of the Duke-NUS Medical School was the first in the world to develop a serological test which traced two people who were the sources of infection behind two local clusters.
- Both had mild symptoms and were not hospitalised, since they had recovered after developing antibodies against the coronavirus.



Unlinked cases

- Unlinked cases refer to cases with no known connection to existing cases, suggesting community transmission.
- In Singapore, the number of unlinked cases in the community has decreased slightly, from an average of 21 cases per day in the week before, to an average of 20 per day in the past week.



Covidiot

- A person who ignores social distancing rules.
- A person who hoards groceries.



Moronavirus

- What a covidiot is infected with.



FUNNY TERMS

Coffee

- A person who coughs without a mask.



Quarantini

- A slang term for a cocktail people drink at home while under quarantine during – and because of – the coronavirus pandemic.



The pandemic will trigger new economic trends

Some changes in economic thinking and behaviour may be here to stay

THE COVID-19 PANDEMIC WILL BE THE DEFINING issue of 2020. What changes in economic thinking and behaviour will it trigger? Here are eight possibilities.



A PIVOT TO MULTILATERALISM

International institutions such as the World Health Organisation (WHO), International Monetary Fund (IMF) and the World Bank had been all but marginalised, especially since the Trump administration came into office in the United States in 2017, harbouring a deep suspicion of multilateralism.

With the pandemic, these organisations are coming back into their own. They are especially critical for poor countries that lack the resources or expertise to cope with the impact of the pandemic.

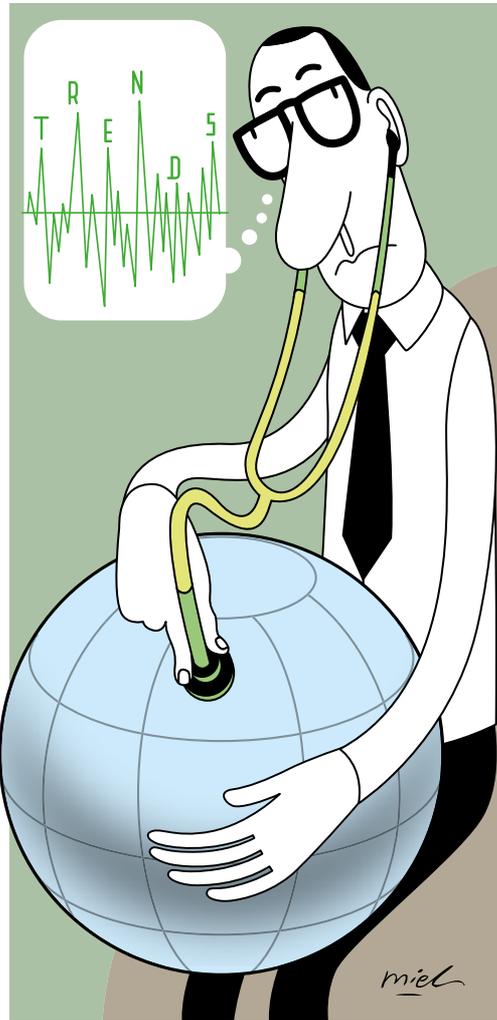
The WHO is in the news every day. After a slow start in its response to the pandemic (which it declared only on March 11, long after it had spread far and wide), it has established itself as a trusted source of information, expertise as well as medical supplies, including test kits.

The IMF is providing debt relief to poor countries and is readying to mobilise US\$1 trillion (\$\$1.4 trillion) in loans to help its members fight the pandemic. The World Bank Group has also pledged US\$150 billion in financial support over the next 15 months. There is now a growing appreciation for the role of these multilateral agencies.



THE RESHAPING OF SUPPLY CHAINS

Global supply chains are being reshaped. This process had already started during the US-China trade war as companies tried to circumvent US tariffs, but it will now accelerate. The emphasis will shift away from optimising efficiency - for example, through just-in-time input supplies - to optimising resilience, through a diversification of supply sources, additions to inventories and some reshoring of production.



ST ILLUSTRATION: MIEL

The Covid-19 outbreak has taught the world some hard lessons about supply chains.

For example, China is the world's largest supplier of medical protective gear. The interruption of its exports because of the initial outbreak led to major supply shortages which left health workers elsewhere dangerously exposed.

The car industry also suffered badly from a shortage of parts, many of which were made in Wuhan, a major motorcar-parts manufacturing hub. China is also a major supplier of active pharmaceutical ingredients for drug production, which was also disrupted.

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The diversification of supply chains and additions to inventory will have both positive and negative effects. On the plus side, it would lead to more investment in parts of the world other than China, such as South and South-east Asia and Mexico. But it would also lead to higher costs.





Workers producing medical gloves at a factory in Huaibei in China's eastern Anhui province. China is the world's largest supplier of medical protective gear. PHOTO: AFP

The diversification of supply chains and additions to inventory will have both positive and negative effects. On the plus side, it would lead to more investment in parts of the world other than China, such as South and South-east Asia and Mexico. But it would also lead to higher costs, as many production locations cannot match China's cost-efficiencies.

The need to hold more inventories will also add to costs.



UNLIMITED MONEY AND BIG BUDGET DEFICITS

With economies facing collapse, governments have pulled out all the monetary and fiscal stops. The goal is to keep companies alive and workers employed as far as

possible to prevent long-term damage to economies, so that they can recover when the pandemic passes.

This will be hugely costly, but in the circumstances, money is no object. As the governor of the Bank of Canada, Mr Stephen Poloz, put it: "Nobody ever accuses a firefighter of using too much water."

So there are now no limits to monetary easing or government spending. The United States, the euro zone, Japan, Britain, China, Canada and Singapore, among other countries, have rolled out massive economic stimulus packages. Budget deficits are going to blow out around the world.

How will the deficits be financed?

In Singapore's case, this is being done by drawing on its reserves. But in many other countries, the deficits are being monetised by central banks, which are printing money to buy government bonds.

This is essentially what so-called Modern Monetary Theory (MMT) prescribes. Its main

message is that there should be no financing restrictions in countries that have their own currencies, and in a recession, governments must offset the deficits of the private sector, however big they are; the priority is to balance economies, not to balance budgets.

MMT, advocated by a small minority of economists, was until recently considered heretical. But it has now gone mainstream. This is a major change in economic thinking.

Will massive deficits and debt lead to inflation? They didn't after World War II, and they haven't in Japan, which has been monetising deficits for years and has a national debt approaching 250 per cent of gross domestic product.

But what happens in the years after the pandemic - which is both a supply and demand shock - remains to be seen.



STRONGER SOCIAL SAFETY NETS

The Covid-19 pandemic will, or at least should, highlight the importance of social safety nets, such as unemployment insurance, universal healthcare, workers' compensation and paid sick leave.

This pandemic will lead to mass layoffs in many countries as well as rising inequalities. The costs of social distancing will also mount, directly impacting millions of workers in jobs that require human contact, such as healthcare workers, taxi drivers, customer-facing staff and daily-wage workers, who do not have the luxury of working from home and who often live pay cheque to pay cheque and have little or no savings.

It will dawn on governments that minimum social safety nets are essential to protecting such workers, by easing the pain of layoffs and enabling them to avoid being forced to work. Demands for universal healthcare, in particular, will grow.



MORE INVESTMENTS IN PUBLIC HEALTH

The pandemic has also underlined the importance of investing in public health. If any segment of society is especially vulnerable to the outbreak, that makes all of society more vulnerable.

Health inequality is also a hazard. Viruses, like other sources of infectious disease, do not discriminate between rich and poor. An outbreak that starts in a slum, for instance, will not be confined to the slum.

The recognition will grow that public health services that are weak on preventive measures such as basic sanitation and environmental standards are a threat to the personal health of everyone. The Covid-19 pandemic will be a wake-up call to countries that have under-invested in public health.



A REMOTE COMMUNICATIONS BOOM

Remote communication technologies are booming. Especially among white-collar workers, remote work has become the norm.

A poll of more than 800 companies by consulting firm Gartner in the middle of last month revealed that 88 per cent of companies now encourage or require employees to work from home.

With business travel also interrupted, many companies have introduced new tools for virtual meetings such as Google Hangouts, GoToMeeting and Zoom.

Telemedicine, until recently on the fringes of medical practice, is also taking off. Many clinics, especially in advanced economies, have launched telemedicine services, enabling some sick people to stay home and still get treatment – not only for Covid-19, but also other illnesses.

Hospitals have started using “tele-ICUs” – two-way bedside videos which connect intensive care unit patients with doctors and nurses in a remote location, who can monitor their progress.

In the US, the US\$2 trillion stimulus package also includes financial support for telehealth services as well as an easing of restrictions on their use.

In Singapore, there are 11 telemedicine providers, some of which provide 24/7 consultations via video by licensed practitioners, can prescribe medicines and issue medical certificates.

Other sectors are also relying increasingly on remote communication technologies. In the education sector, schools and universities have switched to online learning platforms. Conferences are being reconfigured as digital summits. More entertainment and cultural experiences are being delivered digitally, including theatre shows and tours of museums.

Although remote communication technologies have their drawbacks, when the pandemic passes, it is unlikely that people will abandon them and revert to the status quo ante. Their acceptance will have spread, both among users and organisations.

There will also be innovations that make them more user-friendly and powerful. The greater use of these technologies will have implications for several sectors of the economy, including office real estate, business travel, the educational and medical sectors, and the Mice (meetings, incentives, conferences and exhibitions) industry.



A MIXED IMPACT ON E-COMMERCE

It is tempting to believe that social distancing measures and stay-home advisories associated with Covid-19 will spur the growth of e-commerce as shoppers avoid

visiting retail stores, restaurants and bars.

The severe acute respiratory syndrome outbreak

of 2003 proved to be a boost to e-commerce, catalysing the growth of China’s e-commerce giants such as Alibaba and JD.com.

However, the Covid-19 outbreak is more serious, widespread and disruptive. The evidence so far relating to its impact on e-commerce is mixed.

Research by consumer tracking firm Nielsen and Europe’s national e-commerce associations indicate that while the demand for certain categories of goods – such as groceries, medicines and personal hygiene products – has soared, e-commerce activity related to a range of other goods and services, including consumer durables, fashion, luxury goods, airlines and hotels, has plummeted.

Overall, revenues are down because of lower demand, business closures and difficulties in fulfilling orders. But some long-time purchasing habits may permanently change. Nielsen’s China office reports, for instance, that people who had not embraced online shopping are now doing so and may not revert to their old habits.



A BOOST FOR CLIMATE CHANGE ACTIVISM

The spread of Covid-19 brings into sharp relief the fact that from time to time, the world will face collective dangers. Pandemics are but one example. Climate

change is another that has the potential to trigger catastrophes on a global scale. There will also be a growing realisation that the two are not unrelated.

The transmission of viruses from animals to humans is partly the result of deforestation and the loss of biodiversity, which have driven animals out of their natural habitats and closer to human populations, increasing the chances of cross-species contagion.

The United Nations Intergovernmental Panel on Climate Change has also warned that global warming is likely to accelerate the emergence of new viruses. The wildlife trade, which China has now banned but which is still prevalent in other countries, is also a hazard.

One of the silver linings of the Covid-19 pandemic is that it will create greater consciousness of climate change as an existential threat to the world. **ST**

A doctor speaking with a patient during an online consultation session at a telemedicine centre in Moscow. Telemedicine, until recently on the fringes of medical practice, has taken off with booming remote communication technologies says the writer. PHOTO: AFP



100 WAYS THE WORLD HAS CHANGED

The coronavirus outbreak has upended the world as we know it. Here are 100 ways our lives have been changed by the virus.



Wearing face masks is now a socially acceptable norm. ST FILE PHOTO

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- 1 STAY AWAY**
Social distancing, out of nowhere, is now an everyday term. Depending on which country you are in, the rules for keeping a safe distance from one another can range from 1m to 2m.
- 2 NO HUGS**
Handshakes and hugs have been replaced by the wave, bow and namaste – and also the elbow bump and foot tap.
- 3 MASK UP**
Masking up has become a socially acceptable norm. In fact, going maskless now makes one look out of place or even risk being ostracised.
- 4 EMPTY CAUSEWAY, CBD**
When Malaysia's movement curbs kicked in on March 18, Singaporeans witnessed an unprecedented sight: an empty Woodlands Causeway and Tuas Second Link. Likewise, on April 7, the first day of the circuit breaker, downtown Singapore was empty.
- 5 VIRTUAL TOMB SWEEPING**
During the Qing Ming Festival, the enterprising in China and Taiwan offered virtual grave sweeping services.
- 6 DATING**
Besides the usual text messaging and video conferencing, experts suggest that couples go on virtual dates like playing online games or watching a movie together.

- 7 MARRIAGE**
In places like New York and the United Arab Emirates, couples are now allowed to apply for marriage licences remotely, followed by a virtual wedding ceremony, complete with a registrar and witnesses.
- 8 'COVIDIVORCE'**
In China, the number of divorce applications surged in February in at least two provinces, Sichuan and Shanxi, as altercations intensified between quarantined couples.
- 9 COUGHING, SNEEZING ETIQUETTE**
Experts say you should cover your mouth and nose with a tissue paper, or cough or sneeze into your upper sleeve.
- 10 GHOST TOWNS**
From London to New York to Beijing, residents get used to the sound of silence as roads are emptied of cars and pedestrians.
- 11 NO SITTING**
X marks the spot in Singapore as hawker centres, malls, banks and parks mark alternate seats to enforce safe distancing.
- 12 7-STEP HAND WASHING**
The 20-second hand-washing method has become popular, ensuring a thorough cleaning.
- 13 ESSENTIAL ITEMS**
Masks, hand sanitisers and disinfectant wipes have become essential items in every home.



A near-empty street in Manhattan, New York City, in the United States last month. PHOTO: REUTERS



A priest livestreaming Easter Sunday Mass from an empty church in the town of San Giorgio Ionico, Italy, on April 12. PHOTO: REUTERS

14 PANIC BUYING

First, masks, disinfectants and hand sanitisers flew off the shelves. With stay-home measures, people stocked up on toilet paper and instant noodles. Queues formed for bubble tea here after drink and dessert shops were made to close.

15 MALLS AND MARKETS

Those visiting malls and markets are subject to temperature screening and queues. At some popular wet markets, patrons are allowed to shop only on alternate dates.

16 DIY

People are cutting their own hair and making their own bubble tea at home.

17 RELIGIOUS FESTIVALS

Christians spent an unusual Easter as churches stood empty. Pope Francis broke with centuries of tradition and livestreamed his Easter Sunday Mass to the world's 1.3 billion Roman Catholics. Muslims are observing their fasting month of Ramadan in unprecedented ways, refraining from the usual communal activities such as mass prayers and break-fast meals.

18 STIR CRAZY

There is a rise in "cabin fever", where people become irritable, claustrophobic or restless after being stuck indoors for too long. Some are also suffering from anxiety attacks owing to prolonged social isolation.

19 INEQUALITIES

The pandemic has worsened inequalities in society. Its impact on jobs has forced lower-income families to live pay cheque to pay cheque. And their children may be disadvantaged by the lack of digital devices and not having a conducive environment for home-based learning.

20 LOSS OF ACTIVITIES

Activities such as going for a stroll, having a burger at McDonald's, or hugging your partner in public, once taken for granted, have suddenly become difficult to do or even forbidden.

21 EATING TOGETHER, SEPARATED BY SCREEN

A South Korean firm has installed transparent screens in staff canteens to allow employees to interact easily over meals without the risk of spreading germs.

22 ACRONYMS

Our daily language is now peppered with new acronyms such as HBL (home-based learning), SHN (stay-home notice) and PPE (personal protective equipment).

23 CLEANER ENVIRONMENT

With less pollution, we are enjoying bluer skies, cleaner rivers and fresher air.

24 HOME-BASED LEARNING

Home-based learning in the form of online assignments, instructional videos and worksheets is now the norm, along with catching up over "Zoom recess".

25 DRIVE-THROUGH TO MEET TEACHERS

Schools in South Korea have drive-through parent-teacher meetings.

26 NO CHEATING

To prevent cheating during online exams, two universities in Singapore locked students' browsers so they could not access other websites during the exams.

27 ACADEMIC YEAR DELAYED

The start of the academic year is delayed for the Singapore University of Technology and Design, pushed to Sept 14 from May 18. Students in the 2020 cohort will graduate in May 2024 instead of September 2023.

28 ROBOTIC GRADUATION

While some graduation ceremonies have been cancelled, a university in Tokyo let students attend a graduation ceremony remotely by controlling avatar robots from home.

29 NEW POSSIBILITIES

Educators are finding new ways to impart knowledge, such as by using videos to conduct PE lessons and making use of online games and quizzes to teach subjects like mathematics.

30 EXAM TOPICS DROPPED

In Singapore, national exams such as the PSLE, O and A levels will still go on, but the Education Ministry says some topics will not be tested.

31 JOB LOSS

The outbreak will wipe out some 6.7 per cent of working hours across the world in the second quarter of this year, equivalent to 195 million full-time workers losing their jobs.

32 BIG MEETINGS CANNED

Major conferences have been cancelled or postponed, such as Facebook's developer conference and the Mobile World Congress in Barcelona, the largest annual smartphone conference.

33 WORK FROM HOME

A typical company saves about US\$11,000 (S\$15,570) per half-time telecommuter per year.



Singer Dace Cernisova during an online rehearsal on Zoom in Riga, Latvia, last month.
PHOTO: REUTERS

34 LOOKING GOOD ON ZOOM

Lighting and background have become key to looking good in Zoom meetings.

35 NO PYJAMAS PLEASE

Telecommuting etiquette: Do not lie in bed or be in pyjamas during video conferences.

36 DO NOT DISTURB

Experts say it is important to establish boundaries by signalling to those who live with you that you are at work.

37 JOB INTERVIEWS

Recruiters have been switching to online interviews.

38 TOUGH JOB MARKET

This year's graduates face a weakened job market.

39 JOB TRANSFORMATION

Cabbies and private-hire car drivers have turned to delivering food and groceries.

40 REDEPLOYMENT

Those who have had their jobs disrupted have been redeployed to roles such as social distancing ambassadors.

41 AIR TRAVEL

Airlines have grounded their fleets as demand for flights plunges. Some are now leaving seats vacant between passengers, even offering "one ticket, many seats" deals.

42 FEWER TRAINS, BUSES

The frequency of trains and buses has been reduced in Singapore.

43 NO ERP

Electronic Road Pricing was suspended at all gantries for the first time.

ST PHOTO: LIM YAOHUI



44 LONGER GRACE PERIOD AT CARPARKS

The grace period at public carparks has been extended from 10 to 20 minutes, as more Singaporeans turn to online shopping and food delivery.

45 CARPOOLING ILLEGAL

Carpooling is now illegal, as it has been deemed not an essential service.

46 NO GRABSHARE

GrabShare, GrabHitch and other carpooling services have also been suspended.

47 CHANGI T2 CLOSED

Changi Airport Terminal 2 has been closed and will remain so for 18 months, as demand for flights shrinks and it gets an early start on upgrading works.

48 OIL PRICE PLUNGE

US oil prices turned negative for the first time in history as output exceeded demand and storage facilities reached full capacity.

49 NO CHEEK BY JOWL

Observing safe distancing on public transport has become mandatory, with transport ambassadors and enforcement officers deployed to make sure this is done.

50 FREE BUS RIDES

Countries such as Britain have begun free bus travel and are restricting passengers to boarding from the middle doors for drivers' protection.

51 E-CAMPAIGNING

Virtual campaigning trumps traditional outreach in the United States. Some politicians have launched their own podcasts to reach out to voters.

52 ELECTIONS

Face masks, disposable gloves and temperature checks were de rigueur when South Korea voted at its recent polls. The election provides a model for other countries with polls due soon, such as Japan and Singapore.



A live video conference for the special Asean Plus Three Summit. PHOTO: ROYAL THAI GOVERNMENT

53 VIRTUAL COURT HEARINGS

Governments and the courts continue to function with virtual meetings. Singapore's apex court held its first Zoom hearing, while the European Council also met virtually.

54 VIRTUAL SUMMITS

Diplomacy has continued via virtual summits, as leaders discussed the global response to Covid-19. Asean leaders also held a virtual summit last month.

55 POLITICAL ENGAGEMENT

Political engagement on social media is up, particularly among the youth. Students, such as those in China, have taken to the Internet to raise funds for front-line workers.

56 NEW LAWS

New laws and powers have been enacted – such as in Israel to use mobile phone data for contact tracing, and in Singapore to suspend contractual obligations.

57 GREATER SURVEILLANCE

Advocacy groups are decrying what they see as greater surveillance and movement tracking, and have called mandatory tracking and emergency laws an infringement on people's liberty.

58 MEET-THE-PEOPLE SESSIONS

In Singapore, Meet-the-People Sessions are now online, as both People's Action Party and opposition MPs have suspended their physical outreach.

59 ANTI-LOCKDOWN PROTESTS

In the United States, thousands turned out for anti-lockdown rallies to demand the country's reopening, even as Covid-19 cases soared in the country.

60 POLITICAL CONSEQUENCES

The political consequences of the Covid-19 crisis are still to be seen. Experts say established parties and politicians with experience in government could see a resurgence.

61 TACKLING FAKE NEWS

Governments are keeping an eye on platforms such as Facebook and Twitter. Many have pushed back against fake news on the virus being spread online.

62 E-WALLETS

Mobile payment use around the world has shot up, as people fear the virus could be transmitted through money changing hands.

63 FOOD DELIVERIES

Deliveries of food and groceries are booming as more people order in.

64 ONLINE SHOPPING

Online retailers like Amazon are also thriving, as are delivery fulfilment firms such as Deliveroo and Ninja Van.

65 FREE TRADE

Some countries are rethinking globalisation. Even then, many have agreed it is important to keep trade open for essential items.

66 CREATIVE BUSINESS IDEAS

Businesses are finding new ways to reach customers, with fishmongers going online, for instance. Drive-in theatres have seen a resurgence in South Korea, Britain and the United States.

67 E-BAZAARS

In Singapore and Malaysia, hawkers and small traders have shifted to Ramadan e-bazaars.

68 FROM PERFUME TO SANITISER

Brands have repurposed their production lines. Luxury goods giant LVMH, for example, has used its perfume-making prowess to produce hand sanitisers.

69 SUPPLY CHAIN

Logistical chains are under pressure, causing delays to goods arriving from overseas as retailers like Amazon close their distribution centres.

70 GLOBAL TRADE

Global trade will fall by up to one-third this year, as the pandemic disrupts normal economic activity, said the World Trade Organisation.

71 ACT OF GIVING

Donations have gone up, especially online. In Singapore, fund-raising website Giving.sg, which supports more than 500 organisations, has seen donations spiking since February.

72 TOUCHLESS TECH

Touchless technology such as facial recognition (below) and sensors is gaining more traction. Lifts with contactless panels and biometric security that work with masks could see wider adoption.

ST PHOTO: ONG WEE JIN



The Family Drive-in Theatre in Stephens City, Virginia. Owner James Kopp successfully lobbied to reopen it during the coronavirus pandemic, by promising to adhere to strict social distancing guidelines. PHOTO: EPA-EFE

73 DEFINING MORTALITY RATE

Countries are rethinking the definition of the coronavirus mortality rate. It is measured differently in different places, which has caused it to appear higher for countries that test only serious cases of infection, compared with those that do widespread testing.

74 UV PHONE SANITISERS

Ultraviolet sanitisers for phones are now in vogue. Phones have been found to have up to 10 times more bacteria than most toilet seats.

75 CONTACT TRACING APP

Tech giants Apple and Google are teaming up for a contact tracing app. Smartphones running the two major mobile operating systems will soon be able to exchange data with one another and speed up contact tracing.

76 TESTING BOOTHS

Sealed testing booths that separate the doctor from the patient, which reduces the risk of contagion, are being used in more countries.

77 SCIENTIFIC TERMS

Terms like R0 (a measure of contagiousness) and RNA (ribonucleic acid) have entered the public consciousness, while others like "wipe down" and "second wave" are trending.

78 ASYMPTOMATIC

Evidence has been found that those with no symptoms can be carriers of the coronavirus and infect others. This has tremendous implications for public health policy.

79 TEST KITS

Scientists are working hard to develop new, low-cost tests that do not require special expertise or equipment. Such tests, likely based on a gene-editing tool called Crispr, would provide results far more quickly than today's tests.

80 HERD IMMUNITY

Herd immunity, or having enough infections in society to provide indirect protection, was touted as a possible solution but quickly debunked after scientists found that this would devastate populations and overwhelm healthcare systems.

81 RACE FOR VACCINE

Global efforts are under way to find a vaccine, but this could take 12 to 18 months. The most advanced candidates have entered human clinical trials, which is unprecedented as vaccines typically take 10 to 15 years to develop.

82 TRADITIONAL EVENTS CANCELLED

From the famous Oktoberfest in Germany to the running of the bulls in Pamplona, Spain, centuries-old traditional events have been cancelled. Packed events were found to have been a major source of virus transmission.

83 ONLINE CONCERTS

Artists and musicians have gone online, such as for the One World concert which raised US\$127.9 million (\$\$181 million) for charity last month.

84 DIGITAL ORCHESTRAS

Digital concerts have replaced live shows. The renowned Berlin Philharmonic is offering live chamber music concerts and archive recordings of orchestral works online. The Singapore Symphony Orchestra and the Singapore Chinese Orchestra are also offering content online.

85 NO LIVE MUSICALS

Broadway in New York and West End theatres in London go dark. Theatre companies are bringing filmed plays such as *Cats* and *Romeo And Juliet* to audiences worldwide.

86 VIRTUAL MUSEUM TOURS

From the Louvre in Paris to the Rijksmuseum in Amsterdam, some of the best museums in the world are offering virtual tours. In Singapore, the National Gallery Singapore and Lee Kong Chian Natural History Museum offer virtual tours and webinars.

87 NEW HOTEL SERVICES

Hotels are offering new services. In Singapore, the Six Senses hotels in Duxton and Maxwell have uploaded instructional videos on making hand sanitisers as well as microgreen planting, while hotel operator Accor is livestreaming exercise routines of popular football players.

88 STREAMING SERVICES

Streaming services and other stay-home entertainment options have seen a jump in consumption. Research firm Nielsen said time spent streaming video has more than doubled compared with a year ago, while use of video game consoles has risen 35 per cent.

89 VIRAL VIDEOS

Going viral has taken on a different meaning as more people go online. Videos such as of the "corona foot shake" challenge have lifted spirits. Video app TikTok has also teamed up with the World Health Organisation to issue challenges.

90 NEW TV CONTENT DRYING UP

Even as more are watching TV at home, advertising revenues have dropped, and channels are at risk of running out of content. Some shows are spacing out episodes and shortening seasons to avoid running out of content while production is halted.

91 MAJOR SPORTS EVENTS DISRUPTED

The Olympics and major leagues in sports ranging from football to tennis have been postponed or scrapped. This is the first time that the quadrennial Games have been postponed or cancelled in peacetime.



Virtual spectators – life-size cutouts depicting a crowd of spectators at the Taoyuan Baseball Stadium in Taiwan. PHOTO: AFP

92 CARDBOARD FANS

Cardboard spectators and mannequins replace real-life fans, who have been barred from live sporting events. In Germany, fans of a soccer club were represented as plastic cut-outs, while Taiwan launched its baseball season with mannequins dressed in home team colours.

93 RISE OF E-SPORTS

E-sports has risen in popularity even as mainstream sports has taken a hit. Twitch, the world's largest game-streaming site, saw viewership jump over 20 per cent in March to 1.2 billion hours.

94 DROP IN SPONSORSHIP

Sports teams are facing a steep drop in marketing and sponsorship dollars, as brands cut endorsement spending. Sponsorship consultancy IEG said that in the US market alone this year, deals worth over US\$10 billion will be affected.

95 ATHLETES TRAIN IN NEW WAYS

Like sports communities elsewhere, Singapore's athletes have found new ways to keep training even as circuit breaker measures disrupt their usual routines. Swimmers, for instance, train together over video conference, under the watchful eye of their coaches.

96 RERUNS

The suspension of sports events worldwide has led fans to seek new ways to get their sports fix. With no new English Premier League matches, National Basketball Association games or Formula One races, fans have had to make do with reruns or follow matches from smaller leagues.

97 DITCHING OLD SPORTS HABITS

From cricketers using saliva to aid swing bowling to pre-match handshakes between football teams, Covid-19 is likely to change long-entrenched sporting habits. Even traditions such as the exchange of jerseys will likely come under scrutiny.

98 SPORT VENUES REPURPOSED

Countries such as Singapore are converting sporting venues into isolation and housing facilities. The Singapore Sports Hub has converted its OCBC Arena halls to temporarily house foreign workers, while ActiveSG sports halls will also be used to house these workers as needed.

99 SOLO EXERCISE

More are taking to solo pursuits such as walking, running and cycling. Fitness studios and coaches have also put up more videos to cater to demand for at-home and no-equipment exercises, such as high intensity interval training.

100

CREATIVE WAYS TO KEEP FIT

No exercise equipment? That is not a problem as more follow the new trend of improvising with household items to keep fit. From stair runs to chair squats to water bottle dumbbells, fitness trainers say being stuck at home is no excuse to pack on the pounds. [ST](#)



A combination of pictures of people wearing masks on April 15. Mask-wearing when stepping out became mandatory on April 14.
 ST PHOTOS: MARK CHEONG, KELVIN CHNG, ALPHONSUS CHERN, TIMOTHY DAVID AND JOEL CHAN

Special Report

Pulling out all the stops to save lives, and the economy

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 Executive Editor



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The Covid-19 pandemic in Singapore has required a coordinated response from the Government to tackle the health, social and economic upheavals it has wrought

ON APRIL 3, AN ASSISTANT MANAGER AT THE Lido branch of McDonald's saw a doctor for a sore throat and fever. She was given five days' medical leave.

At the end of her medical leave on April 8, the 44-year-old mother of a teenage boy went back to the doctor.

This time, she was sent to Sengkang General Hospital for a Covid-19 swab test.

It was positive.

Over the next nine days, six other employees of the fast-food chain, who had worked across nine outlets, were diagnosed with the coronavirus.

Over at the Ministry of Health, doctors and officials watched with increasing concern.

Steps had already been taken by McDonald's to contain this cluster, but did they go far enough?

The company had told all employees from the affected outlets to isolate themselves for 14 days. These restaurants were also closed and underwent deep cleaning.

On April 18, McDonald's stopped takeaways - Singapore had already banned dining-in - and switched to delivery and drive-through service only.

But the ministry – by then battling huge numbers of foreign workers who got infected at worksites and living quarters – felt more had to be done.

A decision was made: From 11am the following day – April 19 – all 135 McDonald’s outlets would close down till May 4.

The decision wasn’t taken lightly.

The chain employs more than 10,000 people and serves more than six million hungry customers every month.

But, as McDonald’s noted on its website: “These are unprecedented times for all of us. With the safety of all our customers and employees as the top priority, we will do all we can to help Singapore flatten the curve.”

The company promised to pay salaries to its employees while operations were suspended.

FOUR WAVES

On Jan 23, Singapore saw its first case of Covid-19, a 66-year-old Chinese man from Wuhan, surnamed Wang, in town with his family for a 10-day holiday.

In the first 100 days since, the number of infections exploded to exceed 17,000, with more than 15,000 of them foreign workers; and 17 patients died.

Four waves of infection can be discerned so far.

The first was from Jan 23 to Feb 1, when there were 18 cases involving Chinese tourists from Wuhan as well as Singapore residents returning from the city on special evacuation flights.

The second was from Feb 3 to March 10. Infections rose by 152 cases when Singaporeans and residents with links to infected Chinese visitors came down with the virus. New cases with no apparent links to travellers from Wuhan also started to appear.

A third wave started from around March 11 to April 1, when 858 people were diagnosed with Covid-19. The majority were Singaporeans, including students, and residents returning from countries locking down their borders. These “imported” cases exceeded locally transmitted cases on most days.

Amid the worry about imported cases, a fourth wave – a tsunami, really – emerged around March 30. Foreign workers started coming down with the virus, following extensive testing.

Meanwhile, cases continue to pop up in the local community, most recently at the Institute of Mental Health. Overall, however, the local community spread appears to be on the decline, though no links have been traced in some cases.

SAVING LIVES & LIVELIHOODS

For governments everywhere, the pandemic is not just a health crisis but also an economic one.

To contain the virus and save lives, they must restrict movements and economic activity. To relax too soon would risk infections returning and spreading.

Since the pandemic, trade and investment, the lifeblood of an open economy like Singapore, has



been choked. Tourism is non-existent.

Domestic economic activity has slowed since the circuit breaker measures came into effect on April 7. The period was extended from May 4 to June 1, with gradual easing in some areas announced on May 2.

The multi-ministry task force managing the pandemic has had to calibrate its measures on both the health and business fronts.

The task force is chaired by Health Minister Gan Kim Yong and National Development Minister Lawrence Wong.

Deputy Prime Minister Heng Swee Keat, who is also the Finance Minister, is its adviser. Major decisions are deliberated at Cabinet level, which Prime Minister Lee Hsien Loong chairs and where other senior ministers share their expertise.

The task force is supported by civil servants and medical professionals, and also takes guidance from medical and research experts led by Chief Health Scientist, Professor Tan Chorh Chuan.

DPM Heng says strong measures, including the circuit breaker, have to be taken to protect lives. These have had an economic impact.

“Some have characterised the choices we had to make as a trade-off between ‘protecting lives’ and ‘protecting livelihoods,’” he tells The Straits Times.

“But this is a false dichotomy. If we do not take strong measures to contain the virus now, the situation can easily escalate and the economic disruption would be much more severe then.

“But if everyone cooperates fully during this circuit breaker period, we can break the chain of local transmission and resume economic activities in a calibrated way.”

Mr Wong believes the majority of Singaporeans understood the rationale behind the circuit breaker measures and did their part to comply.

“But not everyone can adjust to the requirements. There are very real social and economic costs. Jobs and livelihoods are at stake,” he says.

The impact is likely to be felt disproportionately by the lower- income and vulnerable groups, he adds. And being cooped up and isolated at home for long periods will also not be good for their health and well-being.

Deputy Prime Minister Heng Swee Keat joining a virtual press conference by the multi-ministry task force on April 21. With him are (from left) Professor Kenneth Mak, director of medical services at MOH; Health Minister Gan Kim Yong; and National Development Minister Lawrence Wong. Manpower Minister Josephine Teo was also present. PHOTO: MINISTRY OF COMMUNICATIONS AND INFORMATION

We will spare no effort to contain the situation and keep our people safe. This has been our priority from the start of this global pandemic, and will remain so.



– HEALTH MINISTER GAN KIM YONG, co-chair of the multi-ministry task force.

IN THIS TOGETHER

COMMUNICATIONS



6 Addresses to the nation by PM Lee Hsien Loong

22 Press conferences by the multi-ministry task force, 8 of which were virtual

233 Gov.sg WhatsApp messages (from Jan 27)

FRONT-LINERS

4,900

Immigration & Checkpoints Authority officers

3,170

Singapore Police Force officers

1,300

Singapore Civil Defence Force officers

1,050

NParks officers

1,900

from Ministry of Defence/Singapore Armed Forces (contact tracing/health monitoring)

822

Ministry of Manpower officers

800

Ministry of Health and Singapore Armed Forces staff involved in contact tracing

33

Hotels involved in the stay-home notice exercise

480

Ministry of Foreign Affairs officers involved in bringing Singaporeans home, including those in overseas missions

11,000

sign-ups with SG Healthcare Corps (as of May 5)

814

SG Healthcare Corps volunteers matched and progressively deployed (as of April 30)

HEALTHCARE

As of April 26:

143,919 swabs tested

99,929 individuals' swabs taken

About **25,200** total swab tests carried out per **1,000,000** population

About **17,500** individuals who had swab tests per **1,000,000** population

A total of **5,543** individuals cared for at community care facilities (D'Resort NTUC, Singapore Expo, Changi Exhibition Centre)

A total of **6,408** patients cared for at 21 hospitals (public, private and community hospitals)

PHOTO: MINISTRY OF COMMUNICATIONS AND INFORMATION STRAITS TIMES GRAPHICS

"We considered very carefully before we decided to proceed with the circuit breaker and then to extend it for another month," he says.

"We knew that businesses and workers were already hurting greatly. But in the end, we decided that we had to proceed, so as to break the transmission chain and stamp out the virus."

At the same time, he points out, the Government has drawn on the reserves to help Singaporeans tide through this period. Since February, DPM Heng has announced \$63.7 billion worth of support for workers, companies and households.

Policymaking is challenging because the virus is new and scientists are still struggling to understand it.

"In a crisis like this, we have to deal with fog-of-war decision making," says Mr Wong.

"We have to make consequential decisions within a very short period of time, with not a lot of data and information on hand. And these are important decisions that impact people's lives."

Openness and transparency are crucial in a health crisis.

Minister for Communications and Information S. Iswaran says Singapore has had to adapt its measures as it learns more about the virus from the evidence, the science, and the experience of other countries.

"Against this backdrop, we have done our best to explain the rationale for the measures, and any changes we have had to make, in a transparent manner in order to build public trust and social cohesion," he says.

"To succeed in this battle against Covid-19, we all need to know what we need to do and why we need to do it."

THE MEDICAL FIGHT

Because of Singapore's experience with outbreaks like the severe acute respiratory syndrome (Sars) in 2003 and H1N1 in 2009, the Republic had infectious disease protocols in place when China announced the virus to the world on Dec 31.

By Jan 2, temperature checks had been set up at checkpoints for incoming flights from Wuhan, and doctors islandwide alerted to watch out for pneumonia patients with a travel history to Wuhan.

Contact tracing systems were in place and the newly built 330-bed National Centre for Infectious Diseases in Novena, officially opened just last September, was at the ready.

In the weeks that followed and as infections rose, more measures were rolled out progressively, including border controls and quarantine orders, culminating - for now - in the circuit breaker measures.

Prof Tan, who was director of medical services during Sars, says the most important takeaway from that period was experience.

There are now many individuals, from administrative leaders to medical professionals

and front-line workers, who had gone through an epidemic.

They have the confidence and the knowledge of what to do – including the use of protective gear – which has led to somewhat less anxiety, he tells Insight.

In the early months of Covid-19, Singapore was held up as a model of virus detection, both by epidemiologists and the world media.

A widely quoted report by epidemiologists from the Harvard T. H. Chan School of Public Health in February described Singapore as “a gold standard of near-perfect detection.”

But the new virus was not so easy to beat.

“It’s actually a virus that’s been designed to be difficult to control,” says Prof Tan.

When news first emerged of its existence, the virus was thought to have initially jumped from an animal to man but with limited human to human transmission.

“At that point in time, it wasn’t such a big worry because you’ve seen this also with bird flu and others, where there’s no efficient transmission between people,” he says.

“But once the reports started that human to human transmission was occurring, and clearly was quite efficient, then that was the part where we all got worried.”

Worse was to come.

Studies then started showing people with mild or no symptoms spreading the virus, indicating some asymptomatic spread.

Prof Tan notes that the amount of virus shed by patients is highest very early at the onset of disease.

“All these things make it very hard to control,” he says, “and which is part of the reason we have difficulty in closing down on outbreaks as quickly as we’d like to be able to do.”

THE MASK ISSUE

The emerging knowledge of the coronavirus was a reason Singapore’s stance on the wearing of masks changed.

Early in the outbreak, people started hoarding masks. The Government took the decision to distribute four surgical masks to each household, to be used if a person was unwell and on the way to see a doctor.

In public messages, the focus was on how masks should be worn only by those who are unwell or in close contact with infected people.

Wearing a mask when well also gives a false sense of security, ministers said, as they emphasised personal hygiene instead. There was also the issue of how stocks of surgical masks had to be preserved for medical use.

On April 3, PM Lee announced that mask-wearing was no longer discouraged due to new evidence of asymptomatic transmission and the possibility of undetected cases in the community.

Mask-wearing when stepping out became mandatory from April 14.



Asked about this, Prof Tan says the Government has been taking an evidence-based, data-driven approach.

At the point when advice was first given, it was widely accepted that coronavirus transmission started only when a person was symptomatic.

The picture changed with convincing evidence that pre-symptomatic transmission could occur.

“It means that... even if I’m a very responsible person, I can’t even tell whether I’m infected, in which case then it argues for universal mask usage as a way to... reduce the risk of spread.”

That said, while an unwell person wearing a mask helps protect others from his infected droplets, the use of masks to protect yourself from other people is still not a settled issue.

“Certainly, cloth masks and so on are probably not very effective,” he says. “Surgical masks are better but then you have to be properly trained, you got to use it consistently, you got to use it properly and then you got to combine it with hand hygiene, etc.”

PROBLEM AT THE DORMS

More than the issue of masks, the explosion of cases at cramped, crowded foreign worker dormitories has led to questions about the Government’s handling of the pandemic.

Why had the Government allowed such poor conditions to linger? Why hadn’t it acted earlier to prevent the outbreak among the workers? If it had, wouldn’t the rush to find alternative accommodation for the workers been avoided?

On the poor conditions at dormitories – a longstanding issue in Singapore – Manpower Minister Josephine Teo says: “There will be a time to look back properly and follow up on the lessons learnt.”

For now, the focus is to look after the workers and make sure they stay healthy, she says.

She points out that MOM has been guided by medical evidence.

Up till mid-March, there was no evidence of widespread transmission among the migrant worker population.

Workers at S11 Dormitory. A fourth wave emerged around March 30 when foreign workers started coming down with the virus.
ST PHOTO: MARK CHEONG

In a crisis like this, we have to deal with fog-of-war decision making.



– NATIONAL DEVELOPMENT MINISTER
LAWRENCE WONG,
co-chair of the multi-ministry task force.



McDonald's in Singapore stopped takeaways on April 18 after some of its employees were diagnosed with the coronavirus. It decided the following day to close all 135 of its outlets.

ST PHOTO: JASON QUAH

There were no clusters except for a small one in mid-February at Seletar Aerospace Heights.

There were no clusters at the dormitories either, and the medical consensus then was that asymptomatic transmission was unlikely.

She says the foreign worker population hadn't been ignored.

The first thing the Government did upon news of the virus was to progressively limit the inflow of workers to minimise the risk of imported cases.

From late January, MOM told dormitory operators to be more vigilant. Materials were produced in the workers' native languages to encourage them to take steps to protect themselves.

Non-essential facilities like gyms and TV rooms were also closed, meal times and recreational hours were staggered and intermixing between blocks stopped.

MOM enforcement officers also worked weekends to discourage large congregations at popular hangouts.

Mrs Teo says epidemiological findings provide some preliminary clues on the infection among the workers.

A good number of infected dormitory residents were linked through common worksites. Workers from different dormitories may have also gathered during their rest days to socialise and shop. Back in the dormitories, they socialised with other friends, cooking, eating and relaxing together.

"Despite the safe distancing measures in place then, the virus spread in the dormitories much like how it had spread among housemates, friends and the community," she says.

"So it's not clear that measures at the dorms alone would have made enough of a difference. Interventions were probably needed at workplaces and even on the social front. The three must come together, as they do now."

THE ECONOMIC FIGHT

On the economic front, the Government has rolled out a list of help.

Key in DPM Heng's \$63.7 billion package is the Jobs Support Scheme where the Government pays out 75 per cent of wages for April and May on the first \$4,600 of a worker's gross monthly pay, and at least 25 per cent for a further seven months, depending on the sector.

There are also measures, like for the self-employed, and Mrs Teo points out initiatives like the SGUnited Jobs Initiative which lists readily available jobs.

For Trade and Industry Minister Chan Chun Sing, keeping Singapore's supply chains robust and resilient has been a major preoccupation.

The Government has to constantly review its plans to stay "two steps ahead" of the rapidly evolving challenges, he says.

A number of agreements have been signed with other countries, including a Joint Declaration with New Zealand. This saw Singapore receiving food supplies from New Zealand and the Republic helping facilitate New Zealanders making their way home and with sourcing for medical supplies.

In the short term, the key focus for the economy continues to be preserving jobs and ensuring businesses have access to credit lines and cash flow. "Our aim is to be among the first off the block when the recovery comes," he says.

The next 100 days will remain difficult on both fronts.

Prof Tan warns that the coronavirus "still has many tricks up its sleeve and we have to be really very vigilant."

Health Minister Gan gives this assurance: "We will spare no effort to contain the situation and keep our people safe. This has been our priority from the start of this global pandemic, and will remain so."

In his May Day message, PM Lee said circuit breaker measures can be eased after the number of new cases are brought down, and Singapore can then progressively restart the economy. But Singapore must proceed cautiously, with safeguards, so infections do not flare up again.

He also urged employers and workers to take a longer-term view.

"Workers must accept wage sacrifices to keep businesses going. And employers must make every effort to keep their workers, and help them through this difficult period."

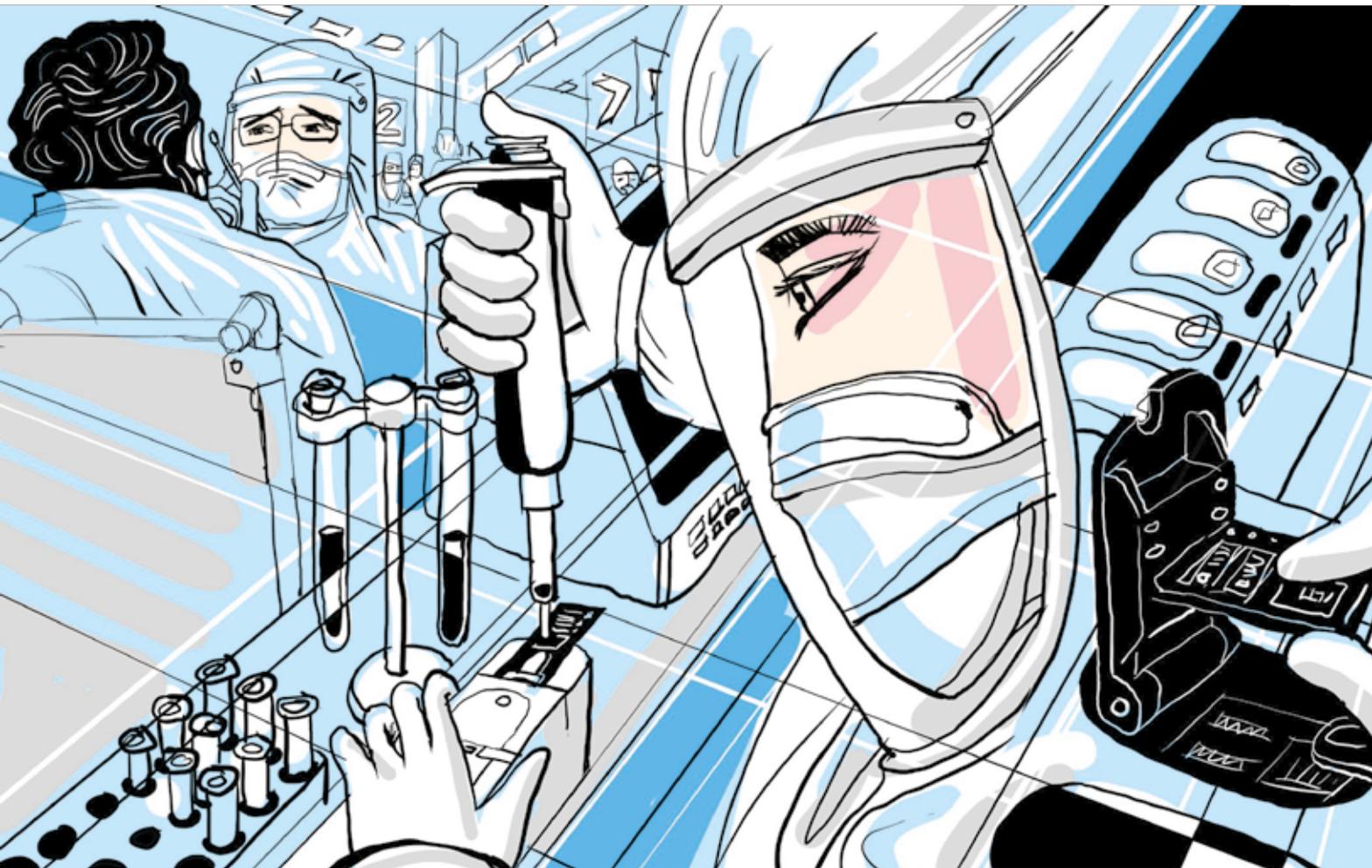
Over at McDonald's, the company announced that although it could restart operations on May 4, it was extending its closure for a little longer, for the safety and well-being of workers and customers.

As for the seven employees with Covid-19, there's some good news.

Its spokesman tells Insight that none was seriously ill.

One is fully recovered and resting at home, and the other six are on the road to recovery. **SI**

- Additional reporting by Timothy Goh



Science & Health

Preparing for a long term battle with medical, tech investments

Singapore able to respond to crisis effectively and quickly due to capability built up over time

THE WORLD IS FIGHTING A WAR AGAINST A virus and Singapore scientists are pulling their weight when it comes to building up an arsenal of knowledge that can be used to vanquish the enemy.

But their expertise did not spring up overnight. It is the fruit of the continuing investment in the health and biomedical sciences that Singapore started decades ago – an investment that, during this crisis, is paying off handsomely. For instance, in the early

stages of the coronavirus outbreak, scientists here developed a diagnostic test that allowed clinicians to identify and quickly isolate infected patients.

Since then, a multitude of inventions and discoveries have been rolled out.

Disinfection robots, armed with ultraviolet ray “swords”, will soon rove some public places to get rid of viruses lingering on surfaces. Swabbing booths have also been designed to provide extra protection for healthcare workers doing large-scale Covid-19 tests.

But as Mr Frederick Chew, chief executive of the Agency for Science, Technology and Research (A*Star), points out, these products do not just appear overnight. They are founded on a strong capability base built up and nurtured painstakingly over time, he tells Insight.

ST ILLUSTRATION: CEL GULAPA

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There are now at least 76 vaccine candidates and, in Singapore, the Duke-NUS Medical School has tied up with Arcturus Therapeutics in the United States to develop one, based on a new way of making a vaccine.
PHOTO: REUTERS

“In terms of peacetime dividends, Singapore is starting to reap tangible health and economic outcomes from investments made into the health and biomedical sciences,” he says.

“In this Covid-19 wartime period, the same peacetime capability sets are being strung together to swiftly address Singapore’s public health emergency needs.”

BUILDING AN ARSENAL

Today, Singapore’s biomedical manufacturing cluster makes up more than 4 per cent of the nation’s gross domestic product and employs more than 24,000 people, many of whom are in high-skilled jobs.

It also supports the development of healthcare solutions and products that benefit Singaporeans, given the focus of research on diseases prevalent among Asian populations, says a spokesman for Singapore’s National Research Foundation (NRF).

Many of the scientists have been working behind the scenes for years. But it was perhaps not until the Covid-19 crisis that the importance of their work has been highlighted.

Singapore has been building up the nation’s capabilities in the health and biomedical sciences over the past two decades, notes the NRF spokesman.

This started with the formation of A*Star and its Biomedical Research Council research institutes, which preceded the outbreak of the severe acute respiratory syndrome (Sars) in 2003. A*Star was formed in 2002, taking over from what was known as the National Science and Technology Board.

It was this long-term investment that allowed the country to respond quickly and effectively to the Covid-19 outbreak, adds the NRF spokesman.

For example, NRF supported scientists such as Professor Wang Linfa of the Duke-NUS Medical School to pursue basic research on bat-borne viruses, which include coronaviruses. This allowed Prof Wang and his team to achieve significant breakthroughs in Covid-19 when called upon.

Preliminary research has indicated that the

coronavirus-causing Covid-19 originated in bats.

It took Prof Wang’s team just one week to successfully culture the virus from an infected person’s sample after Singapore reported its first case on Jan 23, making it the third country in the world outside China to do so.

The ability to grow the virus in a laboratory during the early stages of the outbreak was a crucial starting point for scientists here, in terms of helping them develop new diagnostic methods or a potential vaccine, for instance.

The Sars outbreak had also spurred action, prompting an emphasis on infectious diseases as a focus area, says the NRF spokesman. This led to the formation of the National Centre for Infectious Diseases (NCID), which developed state-of-the-art facilities and created a national focal point for work around infectious diseases, she adds.

The experience with infectious diseases over the years, including Sars and the swine and avian influenza, also helped to hone the radars of researchers here.

The moment a series of pneumonia-like cases was reported in Wuhan, China, last December, scientists and clinicians at A*Star and Tan Tock Seng Hospital were already on high alert.

After China shared the genome sequence of the coronavirus in the second week of January, they – scientists and doctors – worked together to develop and roll out a diagnostic test kit in less than a month. This was a record, considering that a similar one for Sars had taken months.

Today, the Fortitude Kit has been deployed in 13 public and private hospitals and laboratories in Singapore, as well as in more than 20 other places, including Hong Kong, New Zealand and the United States, says A*Star.

Microbiologist Julien Lescar, an associate professor at Nanyang Technological University’s School of Biological Sciences, came to Singapore from France in 2002, just before the outbreak of Sars.

And since then, the scientific landscape in Singapore has progressed tremendously, says Prof Lescar, who studies the molecular structure of RNA viruses, including coronaviruses, and the ways they infect humans.

“I am amazed by the number of excellent dedicated scientists and superb facilities that are now in place here,” he says.

DEALING WITH UNKNOWNNS

Singapore had, over those 100 days or so, achieved a number of key scientific milestones.

But the work continues, as scientists move to peel back the remaining layers of unknowns about the virus. And many mysteries still remain, says Prof Lescar.

For instance, even though this virus is in the same family as the one that caused Sars, it is still not known why this one is so much more contagious, he says.

It is also unclear why some Covid-19 patients develop severe disease while others do not.

“The good news is that there is a huge international effort to address these issues, which hopefully will lead to vaccines and cures in the form of specific anti-viral drugs,” Prof Lescar says.

Preliminary studies have pointed to possible answers, and some important clues may lie in the structure of the virus.

Under a microscope, the coronavirus – called Sars-CoV-2 – appears spherical. In its centre, encased by an oily membrane, is a single-stranded genetic material called RNA. Protruding from the membrane is a crown of spikes made of protein, or S-proteins, Prof Lescar explains.

One possible explanation for the higher infectivity of the virus at the centre of the current outbreak, he says, is that compared with the virus that caused Sars, the spikes of this virus may have a higher affinity for the ACE-2 receptor on the human cell.

Scientists think this receptor, located on the surface of the human cell, could be used by the coronavirus as an entry route.

These spike proteins are what helps the virus “hijack” human cells, the first step of an infection. The S-proteins of the virus latch on to the receptors on the human cell, much like how pieces of a jigsaw puzzle fit together.

This enables the virus to inject its RNA into the human cell, and use the resources of its host to make new copies of the virus.

ST ILLUSTRATION: CEL GULAPA



Prof Lescar says: “It seems like just a few mutations at the surface of the spike protein of the virus are enough to affect how infectious the virus is and also its pathogenicity – the way it harms an infected person.”

Viruses are not static but are prone to mutation. This could change the behaviour of a virus, and also affect the sensitivity of a test kit.

Scientists such as Dr Sebastian Maurer-Stroh, deputy executive director of research at A*Star’s Bioinformatics Institute, are keeping an eye out on it in case it does.

The active surveillance of the viral genome is key to ensuring that the diagnostic test kits remain sensitive in detecting the virus in Covid-19 patients, says an A*Star spokesman.

A virus’ unique genome serves as a “fingerprint” to distinguish it from other viruses. By comparing the genome of the virus causing Covid-19 with that of other viruses, scientists were able to identify parts of the genetic code that were unique to Sars-CoV-2.

These differences allowed scientists to develop diagnostic tests, such as those in the Fortitude Kit. These tests work by flagging the unique parts of the viral genome in a person’s respiratory secretions through a process known as polymerase chain reaction (PCR).

Professor Tan Chorh Chuan, chief health scientist at the Ministry of Health, says new tools – including a new serology test developed by Prof Wang – to combat Covid-19 will soon be unveiled.

A serology test, or antibody test, is different from a PCR test.

PCR tests look for the presence of viral genetic material in a sample, but a serology test detects markers of the human immune system.

Specifically, serology tests flag the presence of antibodies, which are proteins developed by the immune system to fight off bacteria or viruses in the body.

“This can be used to assess if a patient had been recently infected, and will be also very helpful in assessing the extent of community exposure to Covid-19 infections,” says Prof Tan.

Associate Professor Hsu Li Yang, programme leader for infectious diseases at the National University of Singapore’s (NUS) Saw Swee Hock School of Public Health, says the test will not pick up an infection in someone who has just been infected, because antibodies are produced only between days 10 and 14 of the illness.

Antibody testing is also not foolproof, as some 5 per cent of the people who have been infected with the coronavirus disease do not develop antibodies, he says, adding that serological tests are being evaluated here.

While the presence of antibodies may be indicative that a person has recovered from Covid-19, it is not clear if they protect against the disease for sure.

For instance, there have been reports that South

Because there are so many parameters to consider – from the type of drug to the ways the drugs can be combined and in varying doses – it is a task that can sometimes feel like searching for a nail in 10 galaxies.



– Professor Dean Ho

Korea is seeing a growing number of recovered Covid-19 patients who relapsed.

VACCINES, DRUGS AND THE WAY FORWARD

A successful coronavirus vaccine, on the other hand, would confer immunity, and developing this is the subject of research worldwide.

Billionaire Bill Gates, whose Bill and Melinda Gates Foundation is funding seven Covid-19 vaccine candidates, recently said a coronavirus vaccine could be manufactured at scale in just a year.

There are now at least 76 vaccine candidates and, in Singapore, the Duke-NUS Medical School has tied up with Arcturus Therapeutics in the United States to develop one, based on a new way of making a vaccine. Clinical trials are expected to start by August.

In the meantime, groups of scientists are studying how infected patients could be better treated. This includes efforts across the local research ecosystem

to look at the use of repurposed drugs and explore various drug combinations that might prove to be an effective cure, says A*Star.

Professor Dean Ho, director of the N.1 Institute for Health and the Institute for Digital Medicine at NUS, is working with a collaborator to leverage artificial intelligence in the search for the best combination of drugs in the best doses to treat Covid-19 patients.

Because there are so many parameters to consider – from the type of drug to the ways the drugs can be combined and in varying doses – it is a task that can sometimes feel like searching for a nail in 10 galaxies, he says.

Enter IDentif.AI (pronounced Identify), a platform that can rapidly optimise drug regimens for infectious diseases.

The platform uses a pool of 12 carefully selected drugs – including the ritonavir and lopinavir combination used to treat HIV patients – to figure

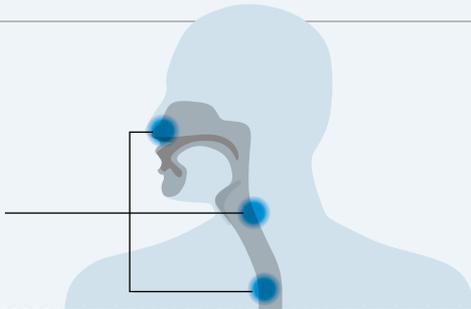
Covid-19 tests and their uses

If polymerase chain reaction (PCR) tests are the foot soldiers in the war against Covid-19, then antibody tests (or serology tests) are the generals. The PCR test allows for immediate action in case a person is currently infected, while the serology test shows if current measures are working well and shapes future policy planning. **Clara Chong** explores the different types of tests and how they are done.

RT-PCR TEST

Looks for: Genetic sequences specific to Covid-19.

Sample: Swab test from nose or back of throat, or from sputum.



How long?

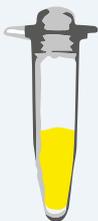
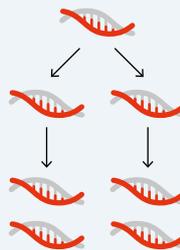
It takes around one to two hours to get results and requires the use of specialised machines. If samples need to be transported, the turnaround time is longer.

At the lab:

- Viral RNA from the samples are extracted and converted to DNA in a method known as reverse transcription (RT).
- This conversion is required so that the genetic material is compatible with the PCR process that can identify the virus.



- The PCR technique amplifies the genetic material of the virus so that it can be easily detected and analysed.
- This amplification is required to increase the presence of the genetic material targeted, which is usually present in small amounts.



- If the targeted genetic material is detected, it is highlighted via a dye that fluoresces in the presence of DNA.
- The more viral bits there are, the brighter it glows, creating a pattern of light that tells the technicians whether they have found Sars-CoV-2.



A scientist showing how a sample is extracted for the coronavirus test in a laboratory in Pasir Panjang.

out the optimal dosage of drugs that can be used in combination for the treatment of Covid-19 patients.

There are multiple ways that drugs can work, Prof Ho explains.

One, the drug could have a direct effect on the virus. For example, it could stop a virus from replicating in the body. But there may be limits on how high a dose can be administered to a patient, because of factors such as how toxic the drug is, for example.

Two, in a cocktail of medicine taken by a patient, a drug could also help by reducing the side effects caused by another drug in the mix. Or, it could work by reinforcing the positive effects of another drug.

Prof Ho, who is also head of the NUS Department of Biomedical Engineering, says: "Biology is complex and drug interactions can be unpredictable. But AI allows us to interrogate and study huge parameters in a short span of time."

IDentif.AI could soon be used to rank the best

drug combinations and dosing for Covid-19 patients, he says.

"And with the results, we will follow up with potential clinical collaborators in Singapore to potentially roll out a drug trial involving an AI-optimised combination of drugs, which may be a world's first."

Singapore's ability to respond rapidly with technology-driven solutions to the Covid-19 pandemic was possible only because of consistent investment in the nation's research, innovation and enterprise ecosystem, says NRF.

"Without the investments we made years ago, we would not have these capabilities today," says the spokesman.

"It is thus important that we continue to invest in building new capabilities today, so that we will also have the capacity to deal with the emergencies of tomorrow." 

SEROLOGY TEST

Looks for:

Antibodies produced by the immune system against the virus.

Sample:

Taken from blood.

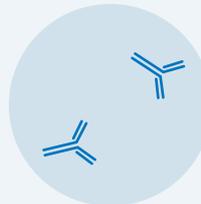


At the lab:

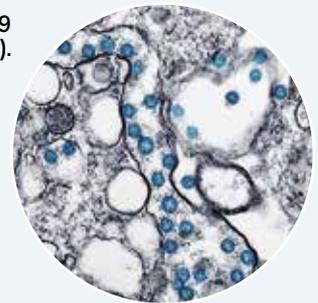
- Technicians test for IgM and IgG antibodies specific to the virus.
- The presence of both antibodies shows that a person has been infected.



- If only IgG is present it means the person is recovering or fully recovered.



Microscope image from the first case of Covid-19 in the United States (virus is coloured blue).



- Patients have antibodies around two weeks after they recover from the infection and will not have them at the point of infection.

- It remains inconclusive whether antibodies are always protective, or how long immune memory would last against Covid-19.

- Therefore an antibody test cannot be used to make clinical decisions for individual patients.

SENTINEL SURVEILLANCE

- A random testing programme used to pick up cases in the community that would otherwise have gone undetected.



- The test allows for surveillance of people who are at higher risk of contracting or transmitting the disease; and those who have the virus, but have very mild symptoms or do not complain of suspected infection.

- It has shown that coronavirus cases are still being transmitted within the community, and some of them remain infectious despite showing mild symptoms.

RAPID TEST KITS

- They allow speedy diagnostic tests to be done.
- These point-of-care test kits are used at the point where a patient receives medical care and do not require specimens to be sent to laboratories.
- They are currently being developed in Singapore.



Source: AFP PHOTOS: TIMOTHY DAVID, AFP STRAITS TIMES GRAPHICS

Testing times in Asia

The efforts of countries to increase testing for the new coronavirus have come under scrutiny as the global number of confirmed cases shows no sign of levelling off.

China bumping up coronavirus test kit production

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FROM THE EARLY DAYS WHEN AN ACUTE shortage of test kits left scores of people in Wuhan undiagnosed, China has dramatically ramped up the production of these supplies to meet both domestic and global demand.

In the 3rd week of April, e-commerce giants JD.com and Alibaba's Tmall both began offering customers the option of booking an appointment at designated laboratories to take a nucleic acid test for 258 yuan (\$52).

The authorities here are keeping up with Covid-19 testing even as the number of infections has fallen dramatically in China.

This is especially so with high-risk groups – people from infected areas or those showing symptoms of the coronavirus, said the head of China's top state-run research institute.

Premier Li Keqiang, in April, urged officials to boost testing capacity and roll out more widespread testing to prevent a second wave of infections and to allow for the resumption of work.

"China's current testing strategy is in line with our epidemic control and prevention strategy," said Dr Jin Qi, director of the Institute of Pathogen Biology at the Chinese Academy of Medical Sciences and Peking Union Medical College.

Besides those considered high-risk, all inbound travellers to cities or provinces like Beijing, Shanghai, Guangzhou and Heilongjiang will also have to take a nucleic acid test.

Testing can identify asymptomatic carriers, who number in the thousands or possibly more. The health authorities, under pressure, began to release daily figures of new asymptomatic cases only from April 1.

Since the two-month lockdown in the epicentre Wuhan was lifted on April 8, testing has continued in the central Chinese city. Screening has doubled to 60,000 to 65,000 a day, as only residents who test negative are allowed to leave the city.

But even as factories work round the clock to produce more than four million test kits a day, an increasing number of countries have rejected these China-made supplies, complaining they are defective and do not produce accurate results. **ST**



An engineer making a test on an experimental vaccine for the Covid-19 coronavirus in Beijing, on April 29.
PHOTO: AFP

Japan's low test rates resulted in wider spread

JAPAN HAS BEEN CRITICISED FOR TESTING PEOPLE only at a fraction of its capacity, a strategy that has proved ineffective amid growing community contagion with no clear links of transmission.

Still, there are complex reasons behind the initial reluctance to conduct more polymerase chain reaction (PCR) tests, said Japan Medical Association president Yoshitake Yokokura.

First, the testing capacity had been limited to only about 2,000 a day, a figure that has since risen to about 15,000. Prime Minister Shinzo Abe said on April 28 that he wants capacity to be raised further to 20,000 cases a day.

But what complicated matters early on, when tests were limited, was the Diamond Princess cruise liner off the coast of Yokohama. There were 3,711 people on the ship manifest, of whom 712 later tested positive.

Second, only public healthcare facilities were approved as PCR testing centres, though private facilities like university hospitals, health laboratories and research centres have since been tapped.

Third, by the country's antiquated infectious diseases law, all Covid-19 patients must be warded in hospital regardless of the severity of their symptoms.

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A demonstration of a drive-through polymerase chain reaction (PCR) swab test for the coronavirus in Fujisawa, Tokyo. PHOTO: AFP

This has since been revised to allow those with mild or no symptoms to recover in hotels, where a doctor and a nurse is on permanent standby.

Medical experts have long warned of a collapse of Japan's healthcare system given a lack of beds and ventilators for patients and masks, face shields and personal protective equipment for healthcare workers.

Mr Abe has apologised for the dire shortage owing to the "problem" of being heavily reliant on foreign production, particularly China.

To plug the gaps in equipment, Japan Inc has been mobilised to help alleviate shortages.

Carmakers Nissan and Mitsubishi Motors are making face shields, beverage giant Suntory and cosmetics maker Shiseido are making hand sanitisers and electronics giant Sony is making ventilators.

But above all was a lack of understanding of the threat. Preliminary guidelines asked people to stay home if they felt unwell and consult a doctor if they had a fever of 37.5 deg C or more for at least four days.

This time span was halved for the vulnerable, such as the elderly, children and pregnant women.

Dr Yokokura now advises those who suspect they may have contracted the coronavirus to promptly call the Covid-19 hotline for a referral - though doctors can still exercise discretion.

But this also means that not everyone who wants to be tested will be tested.

Despite the recent increase in PCR testing capacity nationwide, in some parts of worst-hit Tokyo, the waiting time to be tested could be up to a week.

Health Ministry data shows that between Feb 18 and April 27, a total of 250,554 tests were conducted in the country of 126 million. Some people - especially patients - were tested more than once.

More than 14,000 have tested positive as of April 29. [ST](#)

Despite the recent increase in PCR testing capacity nationwide, in some parts of worst-hit Tokyo, the waiting time to be tested could be up to a week.



South Korea's early action to boost production

AS SOON AS THE GENETIC SEQUENCE OF THE coronavirus was revealed in mid-January, biotech firms in South Korea started developing diagnostic kits for the new virus.

On Feb 4, two weeks after the first case in South Korea emerged, the Ministry of Food and Drug Safety gave emergency approval for Kogene Biotech to manufacture the country's first Covid-19 test kit.

The 12-month approval process was cut to just one week, after painful lessons from the Middle East respiratory syndrome (Mers) outbreak in 2015 - which killed 38 of 186 infected people in South Korea - led to a change in the law to allow emergency approval during a crisis.

Another biotech firm, Seegene Inc, received approval on Feb 12. Together, the firms supplied thousands of diagnostic kits a day when South Korea embarked on mass testing from Feb 20 to contain the outbreak in the south-eastern city of Daegu.

By mid-March, three other biotech firms - Solgent, SD Biosensor and Biosewoom - were also manufacturing test kits.

South Korea's massive testing capability, which reached 20,000 a day, has been widely lauded for containing the virus and helped the country flatten the infection curve in just two months.

The availability of test kits "played a major role in eliminating uncertainties in the early stages

of the viral spread", according to a joint ministry paper published on April 15, which also credited the biotech firms' innovative use of technology and investment in research for the swift development of test kits.

By the time the World Health Organisation (WHO) urged countries to "test, test, test" in mid-March, South Korea had already tested more than 270,000 people.

South Korea also exported US\$131.9 million (\$\$186 million) worth of test kits in the first 20 days of this month, and the kits are now available in 106 countries, including the United States, according to the Korea Customs Service. [ST](#)

SD Biosensor employees sorting through coronavirus diagnostic kits in Cheongju, South Korea, on March 28. PHOTO: AFP



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A man getting tested by a medical worker sitting inside a mobile test van in Ahmedabad, India. PHOTO: REUTERS

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India gunning for self-reliance

In January, when a laboratory in China shared the first genome coronavirus sequence, Mr Sankarapandian Selvaraj started work on an indigenous test kit in the southern city of Chennai in India, which that month recorded its first virus case.

His firm, Helini Biomolecules, had a kit ready by March, by which time a stringent lockdown was in

place, making it difficult to send the diagnostic test for government validation.

It was only in mid-April that the firm, along with a few others, was given permission to make real-time polymerase chain reaction test kits that can produce results in six to eight hours. The kits rely on molecular tests for Covid-19 using nasal and throat swabs.

Mr Selvaraj has since been inundated with requests from state governments. He said the company would send out the first batch of 20,000 test kits by May 4, with production to hit 50,000 tests every week after the lockdown is lifted on May 3.

“We can manage Indian demand. Not only me but all the other Indian manufacturers,” he said.

Other Indian firms like Mylab Discovery Solutions, the first to distribute indigenous kits at the end of March, are looking at increasing production from 150,000 to two million test kits a week.

India had relied on imported kits from a number of countries including Singapore, which supplied 70,000 test kits through the Temasek Foundation, and 30,000 through the Bill & Melinda Gates Foundation, according to the Indian High Commission in Singapore.

But federal Health Minister Harsh Vardhan said in April that India would be self-reliant very soon. **ST**

More coronavirus cases likely to be detected

THE NUMBER OF DETECTED CORONAVIRUS infections in Indonesia could rise dramatically as more tests are conducted.

Local officials are worried as data from the country’s 34 provinces showed more than 2,200 Indonesians died of Covid-19 symptoms, but they were not recorded as victims of the disease.

The proportion of people being tested is now 318 per million – an improvement over the 36 per million which made Indonesia the fourth-worst in testing rate among countries with a population of 50 million and above, according to pandemic data site Worldometer.

The country of 270 million has been hampered by a shortage of testing equipment and the chemicals needed for them, as well as specialists required to conduct the tests, noted University of Indonesia epidemiologist Pandu Riono.

Indonesia has more than 12,000 confirmed cases, with over 850 having died of Covid-19, official data shows. But there is also a backlog – more than 21,000 patients with symptoms are waiting to be tested.

Testing may reach more than 6,000 a day later, as equipment and more reagents used in reverse transcription polymerase chain reaction (RT-PCR) tests arrive.

But this is short of the 10,000 tests per day President Joko Widodo had targeted earlier.

To increase the testing capacity, Indonesia’s

Agency for the Assessment and Application for Technology (BPPT) has teamed up with state-owned and private companies to produce test kits locally.

BPPT chief Hammam Riza told The Straits Times that local companies would soon, start making test kits for both virology tests and the antibodies-focused serology tests. BPPT is also developing mobile laboratories that can be dispatched across the country.

Meanwhile, the government has purchased more than a dozen RT-PCR-testing machines – several of which have arrived – from Swiss multinational healthcare company Roche.

And it recently received enough reagent cartridges for 450,000 more PCR tests from South Korea, according to Covid-19 task force spokesman Achmad Yurianto. **ST**

– Additional reporting by Linda Yulisman and Jeffrey Hutton

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Indonesian youngsters taking a blood test after violating large-scale social restrictions at a police headquarter in Surabaya. Indonesia has predominantly relied on specialists manually mixing reagents with biological samples taken from suspect cases, a slow process that puts the personnel handling the work at risk. PHOTO: AFP



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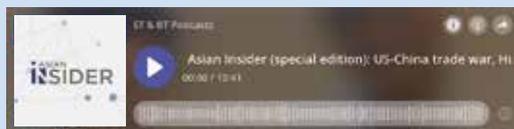
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We are caught in the midst of a stranded planet with its empty streets which resemble abandoned film sets, says the author.
ST PHOTO: KUA CHEE SIONG

Essay

The pull of hope

The virus will keep challenging us and pushing us, and we will need to adapt and invent and dig for answers.

ROHIT BRIJNATH

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LEWIS PUGH, AN OCEAN ADVOCATE WHO HAS swum in icy oceans and turbulent seas, knows about endurance and the elasticity of time. In a podcast late last year he spoke about the challenge of long-distance swims, and when I heard his words last week they resonated powerfully.

“The thing about long-distance swimming is how the goalposts can shift,” he said. “You think you’re going to do a 10-hour swim and then you get to the coast of France and suddenly a current picks you up and it’s going to be a 15-hour swim. You think it’s going to be 15 hours and suddenly it’s 20 hours.

“It can break your mind. And so you have to be able to have that resilience when the goalposts shift. Because they will shift. And they never shift in the direction you want them to shift. To keep on going, to put one arm in front of the next and to recalibrate yourself.”

In a way it’s what we have been doing for 100 days, watching lockdowns extend and recalibrating our lives. We flinch from the phrase “flattening the curve” and live according to a curious calendar. We think not in months or seasons, but in circuit breakers. Spring is passing us by and we barely care because we’re busy excavating a grit we never knew we had.

A hundred days is just a marker of how far we’ve come, a signpost, but it’s not a promise of anything. We don’t know if this is halfway to normality, or far away, because this virus doesn’t just sicken and kill, it teases and shifts our goalposts. Like Pugh in the water, we must endure.

We’re caught in the midst of a stranded planet with its empty streets which resemble abandoned film sets. Faith is being tested and human conceit is being punctured. For all our bragging about forecasts and algorithms, this virus has humbled us. We can’t

read the future, but we wish to exit the present. We're watching the corner of the TV screen and wishing the callous calculator that's measuring human lives lost – 224,708, 224,709 – would just, please, stop.

We're a species not in control, and it's strange and a trifle scary. We wish for things we never did before, like the simple pleasure of the noisy, lively street. We might smell a little better – all that soap – and because of masks we tend to look each other in the eye.

We're living a sort of tentative life where everything is provisional. Once it's over, you wonder, will men forget about mops and might parents lose their current veneration of teachers? We call nurses heroes now, as if they aren't on a normal, daily basis, and we've forgotten the touch of a mother's wrinkled hand on our faces. We're reordering our priorities and nod in amused assent when people tweet that bookshops must be kept open. They are, some argue, an essential service.

We've never been so devoted to science – antibodies, vaccines – nor been so drawn to the arts. From one we seek information, from the other solace. People are filling journals with reflection, digging out recipes from old aunts, growing life in veranda pots and watching Shakespeare plays on the Internet. A friend sends me two poems, one titled "The Last Today" and the other "The First Tomorrow".

We're divided by distance and looking for anything (Zoom) or anyone (riders) that can help bridge it. Cartoonist Christopher Weyant, a contributor to The New Yorker, draws a large Trojan horse on a drawbridge, with sentries looking on from the ramparts of a fort and saying: "Who cares what it is. I'm happy we still get delivery."

We're amending our understanding of space – how little some people have, how much we miss openness – and hopefully appreciating the idea of separation. The temporary partitioning of families that we agonise over now – maybe your kids are abroad or your parents are in another suburb – is the normal life, year after year, of the foreign worker and the maid.

Only in glib terms is this virus an equal opportunity thug, for if you look around the globe it's always the poor – out of a job, standing in food lines, uninsured – who suffer most. Reporters and photographers are brilliantly documenting forlorn cities but very few go to the villages and interiors. There is a grief out there which we must only imagine.

Little things have slipped out of our reach like a



Captain Tom Moore wanted to raise £1,000 (\$\$1,750) for Britain's National Health Service by completing 100 laps of his garden before his 100th birthday, but eventually raised over £32 million. PHOTO: AFP

child's toy in a sudden flood. A daughter's graduation has passed, a marriage postponed (a friend's niece told her, what is a wedding absent of hugs), a job offer now withdrawn, a tournament cancelled. For some this may seem trivial in the face of the larger chaos, but it isn't, for it tells us how this virus has rearranged our lives.

So what have we done for 100 days? We've sulked, moped, worried, but we've also reached for one another, for faith, for routine, for laughter. We've improvised, like the softball player who bench-presses her sofa. We've found our own sweet discipline, like my friend's wife, a banker, who dresses as elegantly as she would for office even though she is working from home.

Mostly we hang on to hope, a slim thread with unusual tensile strength. We look for it in photos, cartoons, tweets, stories. We see it in the landlord who waives a few months of rent and find it in the kindness of the volunteer who distributes food to the less fortunate.

In India, a young man – as the Hindustan Times marvellously recounted – cycles 1,700km interstate, armed with no phone and no map, to get home. In America, a man takes his newborn child to his parents' place and they stand, one group on the street, the other in a doorway, and love reaches across space and generations.

There is no such thing as victory over the virus because the suffering left in its wake will linger for long, but we must meet it like that old soldier Captain Tom Moore.

He wanted to raise £1,000 (\$\$1,750) for Britain's National Health Service by completing 100 laps of his garden before his 100th birthday, but eventually raised over £32 million. His story appeals to us because his act tells us of the things we're capable of as humans: willpower, empathy, generosity and modesty.

The virus will keep challenging us and pushing us, and we will need to adapt and invent and dig for answers. Inspiration comes to us all from various places and for me some of it arrives from a piece of paper, yellowed with age and torn, which was stuck to my father's ugly steel cupboard for over 25 years.

On it was scribbled an old Albert Camus quote and it read: "In the depths of winter, I finally learned that there lay within me an invincible summer."

Every time I think of it, I feel the pull of hope. **ST**

A hundred days is just a marker of how far we've come, a signpost, but it's not a promise of anything. We don't know if this is halfway to normality, or far away, because this virus doesn't just sicken and kill, it teases and shifts our goalposts. Like Pugh in the water, we must endure.



We call nurses heroes now, as if they aren't on a normal daily basis, and we've forgotten the touch of a mother's wrinkled hand on our faces, says the writer.

ST PHOTO: KEVIN LIM

Solitude – the new normal

Public spaces that would ordinarily be bustling with people are now near-empty

DESMOND FOO
Senior Executive
Photojournalist



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A lone man at Merlion Park, normally a big draw for tourists, on March 29, trying to get a low-angle shot of the iconic statue.

THE COVID-19 OUTBREAK IN SINGAPORE AND around the world has led to unprecedented efforts by the Government to isolate, control and halt the spread of the virus.

Except for essential services, most workplaces were ordered to shut from April 7, while all schools moved to full home-based learning a day later, as Singapore put in place a circuit breaker to pre-empt an escalation in coronavirus infections.

Bars, cinemas and all other entertainment outlets have been shuttered since March 26.

All centre-based tuition, enrichment classes and religious services have also been suspended. Once-bustling public spaces, beaches, the airport, restaurants, movie theatres and tourist attractions are deserted, as people stay at home to avoid spreading the virus.

For three weeks, Straits Times senior executive photojournalist Desmond Foo has been capturing images of the new normal in Singapore as it grapples with the pandemic. **ST**

ALL PHOTOS: ST PHOTO DESMOND FOO



On weekdays only a trickle of people pass by the now virtually shut and darkened, popular Bugis Street market.





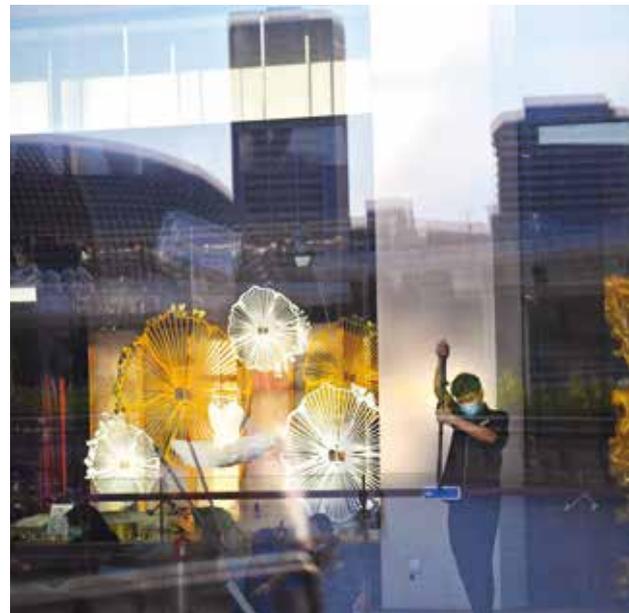
A small number of kite-flying enthusiasts at Marina Barrage on March 29, sending their kites soaring into the sky, with the usual weekend crowd nowhere to be seen.



An area outside Ion Orchard, usually a popular spot for selfies taken by shoppers and tourists, is now near-empty.



Joggers and cyclists taking the opportunity to have some fresh air at the Marina Bay Waterfront promenade.



A staff member cleaning part of the vast interior of one of the most iconic spots in Singapore, Marina Bay Sands.



Left: An atrium in Bugis Junction on April 2, filled with essential products that people would need to stock up on before circuit breaker measures kicked in.

Right: A couple getting their wedding photos taken on the steps of the National Gallery Singapore, days before stricter measures were imposed.





Against the stark backdrop of an empty amphitheatre, Wildlife Reserves Singapore's animal presentations manager Budiarkan Mawadi continues flight-conditioning sessions with a scarlet macaw. Singapore's four wildlife parks have since been closed to visitors.



Little India appears deserted with jewellers and other shops shuttered since April 7.



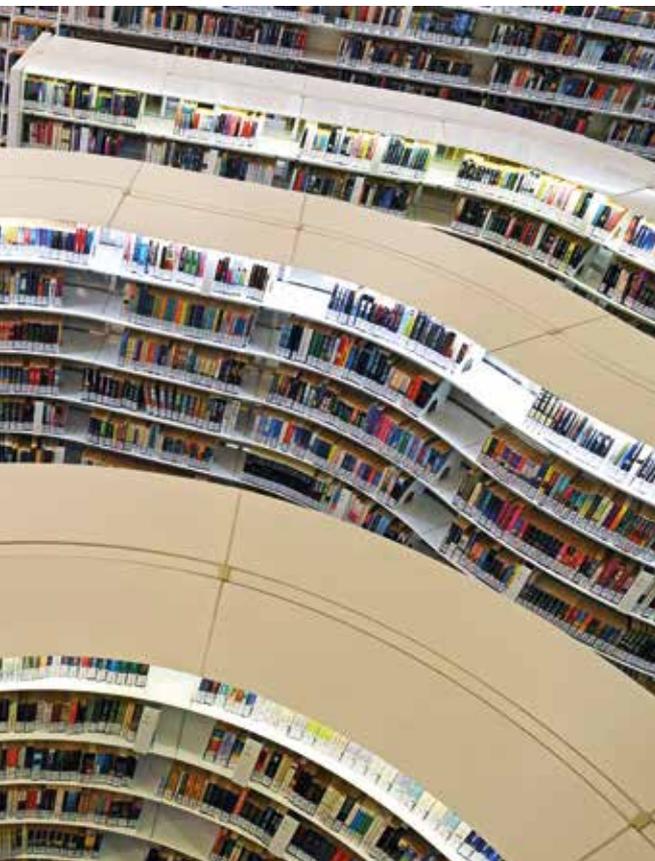
An elderly duo at a void deck in Aljunied Crescent, keeping a safe distance.



A staff member at Golden Village Suntec City disinfected one of the movie theatres' 11 halls on April 2, a day after the theatre was shut in compliance with a directive.



The busy Albert Street junction has become completely devoid of the usual crowd with the arrival of foreign visitors coming to an abrupt halt, on April 9.



A woman paying her respects at a niche in Mandai Columbarium on April 6, the day before the columbarium was to close as part of the nationwide circuit breaker measures.

Left: A lone visitor is seen among a cavern of books at the popular library@orchard, a day before it was shut down, on April 6.



PHOTO: REUTERS

Big Picture

Out for a run? Robots remind you to keep your distance

DANSON CHEONG



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NATIONAL WATER AGENCY PUB HAS A NEW kind of safe distancing ambassador on the ground.

It rumbles around on four wheels, has cameras that can see 360 degrees, and never tires of telling people to keep their distance and stay home.

Called the O-R3, the PUB has since April 23 started using the autonomous robot to broadcast safe distancing messages at Bedok Reservoir, Singapore.

Parks have become an area of focus during the circuit breaker period, as the Government zooms in on ways to ensure people stay home to curb the spread of the coronavirus.

During Singapore's circuit breaker phase, which began on April 7 and will last until June 1, people are allowed out of their homes only to perform essential tasks. Besides buying groceries and seeing a doctor,

this also includes exercising.

But parks have continued to be a draw for crowds, so the authorities have been progressively tightening the screws.

O-R3 is the latest effort to keep people from loitering outside.

Developed by local technology company Otsaw, which specialises in building security robots, O-R3 resembles a tiny car.

It is armed with sensors that can capture, record and process data that can be sent to officers in real time.

The robot conducts daily patrols in the mornings and evenings, when human traffic at the park is the highest.

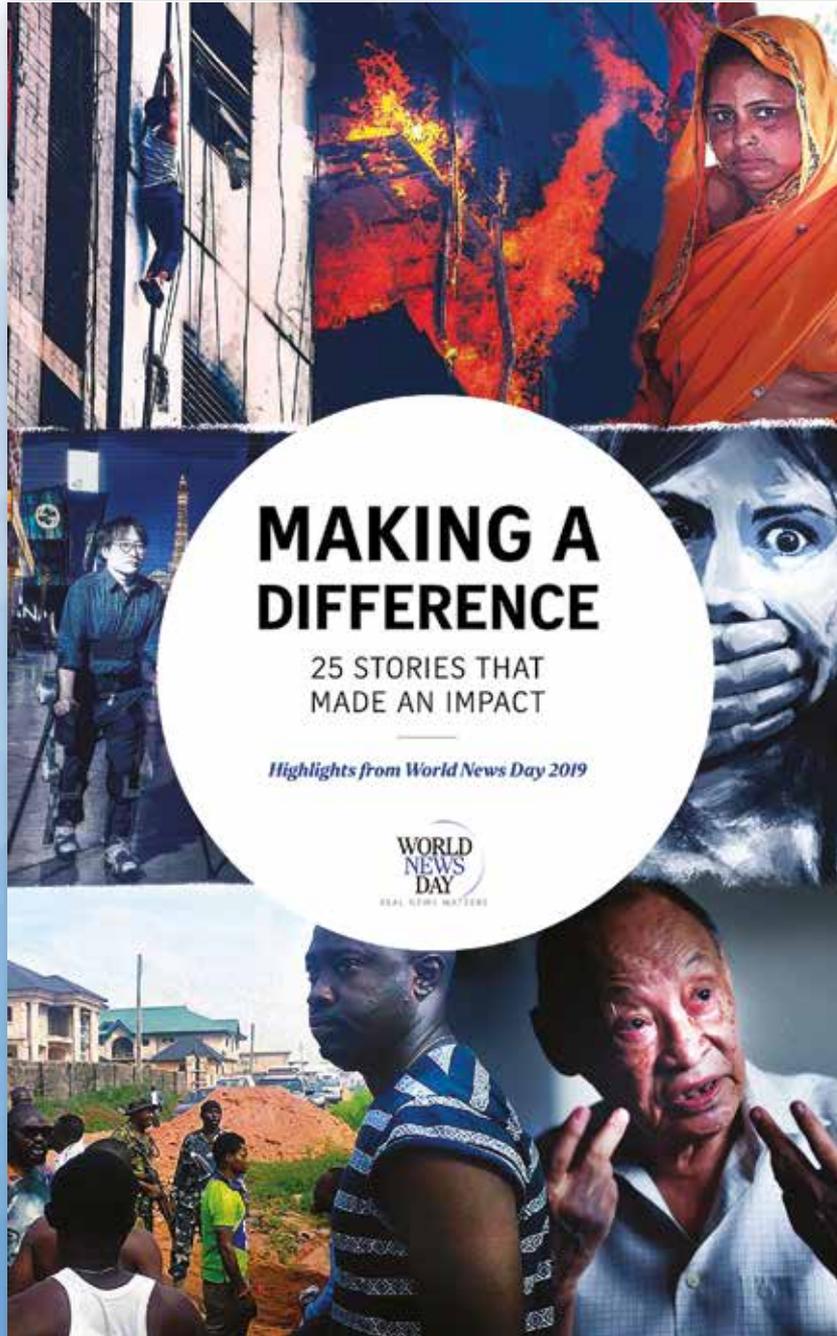
Similar robots will be deployed elsewhere in the Republic. [S](#)

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