

CHAPTER 8

TAKING THE SHOT



PHOTOS: INSTANT REPLAY PRODUCTIONS



AFTER the tough quest of clinching the best vaccines early, another arduous mission awaited: getting the shots to everyone, quickly yet systematically.

This required many agencies working in double quick time to ensure the mass vaccination programme would succeed, on a scale that Singapore had never attempted before.

“This country had not seen a nationwide mass vaccination exercise

since 1958,” noted Mr Dinesh Vasu Dash, who was tasked to lead the Ministry of Health’s (MOH) massive vaccination operations. He was referring to the polio inoculations over 65 years ago, when the country had 1.4 million residents. In 2020, there was a total of about 5.7 million people living in Singapore – an astounding four-fold growth in population.

The initial goal was to have half the population fully vaccinated within eight months, by National Day

on August 9, 2021. Later, the bar was raised to cover two-thirds of the population.

From administering around 40,000 vaccine doses a day in May, this rose to 47,000 in June and jumped to 80,000 in the weeks leading up to National Day. The hard work and cooperation of Singaporeans paid off. Not only did Singapore hit its vaccination target, it did so ahead of schedule by three days.

COVID-19 VACCINE DOSES THAT SINGAPORE HAD GIVEN OUT FROM DEC 2020 TO MAR 2023

16,999,547

↳ #IGotMyShotSG was a campaign launched by the Singapore government to encourage Singaporeans to get their COVID-19 shot whenever it was made available to them.

Six critical capacities contributed to the success of Singapore's mass vaccination campaign:

1
INFRASTRUCTURE

Accessible locations with ample space to hold large crowds, basic facilities like washrooms and good ventilation

2
MANPOWER

Medical professionals to prepare and administer vaccines, staff to support the registration process and monitor members of the public during the observation period

3
STRATEGY

A comprehensive plan for the vaccination rollout, including prioritising seniors above 60 and vaccinating home-bound individuals

4
MESSAGING

Transparent, clear and timely communications with the public

5
TECHNOLOGY

Easy booking of appointments and updating of vaccination records via an online portal

6
LOGISTICS

Transport and storage of vaccines and other supplies

This was how Singapore pulled off its biggest national vaccination campaign to date.



After receiving their vaccinations, members of the public had to wait in an observation area for 30 minutes in case of any adverse side effects. This was later cut down to 15 minutes for booster shots.

PHOTO: REUTERS/EDGAR SU



A nurse prepares a dose of the COVID-19 vaccine at a vaccination centre (right), while those who have received their vaccines wait at a holding area (above).



PHOTOS: AFP VIA GETTY IMAGES/ROSLAN RAHMAN

INFRASTRUCTURE: FACILITIES FOR MASS VACCINATION

The vaccination campaign began on December 30, 2020 – about a week after the vaccines arrived. But there was much more to be done, especially for the team that Mr Dinesh, Group Director of MOH's Crisis Strategy and Operations Group (CSOG), led.

The first thing he and his team had to consider was ways to ensure vaccination could be done in large numbers and smoothly. The airport, which was underutilised as planes were grounded, was just the right space.

With this, the largest vaccination centre was ready to run in just seven days. On January 13, 2021, Changi Airport's refashioned Terminal 4 opened its doors for vaccination.

Next was the Raffles City Convention Centre, followed by two more centres at



Vaccination centres administered an average of between 2,000 to 4,000 vaccinations a day. The atmosphere was made to feel as relaxing as possible, with soothing music played in the background and staff situated on-site to attend to members of the public at all times.

PHOTO: BLOOMBERG VIA GETTY IMAGES/WEI LENG TAY

“WE STARED AT A MAP OF SINGAPORE JUST TO MAKE SURE THAT THERE WAS AN ADEQUATE NUMBER OF VACCINATION CENTRES IN EACH OF THE AREAS... ESPECIALLY IN AREAS WITH MORE SENIORS.”

– PROF KENNETH MAK,
DIRECTOR OF MEDICAL SERVICES AT THE MINISTRY OF HEALTH

the end of January 2021, located at the former Hong Kah Secondary School and Woodlands Galaxy Community Centre.

The rationale was to set up community vaccination centres at locations that had high human traffic, such as public housing estates or areas along major public transport routes.

Professor Kenneth Mak, Director of Medical Services at MOH, explained that the accessibility of these centres was important.

“We stared at a map of Singapore just to make sure that there was an adequate number of vaccination centres in each of the areas where we expected people to be, especially in areas with more seniors,” he shared.

On the speed of setting up the vaccination centres, Dr Noel Yeo, then-Chief Operating Officer of IHH Healthcare Singapore, explained that it depends on the location. “For an unused school space,

it is very difficult. There’s definitely some renovation that needs to be done. You need to make sure the electrical supply is there, that the sewage and the toilets are all working,” he said.

The situation is far easier if the vaccination centres are in community clubs with existing facilities and support from the People’s Association to set up registration zones.

As Singapore increased its vaccination target, the number of centres logically followed suit. By March 16, 2021, a total of 24 vaccination centres were in operation. By April, this number further rose to 40. The average vaccination centre could administer about 2,000 injections a day, while larger vaccination centres like the one at Changi Airport Terminal 4 could complete up to 4,000.

But simply setting up vaccination centres was not enough – providing good service delivery was a big part of the

vaccination centre experience as well. Just like the COVID-19 injection, the entire process of getting vaccinated was made as pain-free as possible.

For instance, the COVID-19 injection hurt less than an average shot due to the use of special, finer needles. And to ease people’s anxieties, especially during their half-hour observation period after inoculation, soothing music was played and staff were situated on-site to answer any questions the public may have.

“I don’t know of anywhere else in the world where you go for vaccination and you get a box of masks, hand sanitisers, all these goodies,” quipped Professor Vernon Lee, Senior Director of the Communicable Diseases Division at MOH, in his signature good-natured manner.

“I had friends overseas who had to queue for hours in bad weather just to get their vaccine, but in Singapore, you only need to wait for about 15 minutes.”

“DO YOU WANT TERMINAL 2 AS WELL?”



PHOTO: CHANGI AIRPORT GROUP

Singapore’s largest vaccination centre was set up at Changi Airport Terminal 4 on Jan 13, 2021, opening its doors to airport workers and air crew to be vaccinated.

WHEN IT CAME TO choosing potential locations for vaccination centres, there was a general rule of thumb: the bigger, the better.

This was why Changi Airport Terminal 4 – the size of about 27 football fields – was an obvious choice.

Mr Dinesh Vasu Dash, Group Director of MOH’s Crisis Strategy and Operations Group, recalled that Changi Airport Group was swift to give their permission, and the terminal was quickly being retrofitted.

There was just one small problem – this decision had not been cleared with

the higher-ups in the civil service yet.

He quickly dashed out a brief email to the Permanent Secretary (PS) of the Ministry of Transport. “I think it was a two or three-line email. He replied within two hours and said, ‘Please go ahead and use it,’” he recalled.

It then hit him that he had not yet gotten approval from his own bosses, the two PSEs in MOH. Stressed, he quickly sent them an email to explain the situation. And thankfully, they were understanding.

The next day, he met then-Minister for Transport Mr Ong Ye Kung, at a

Multi-Ministry Taskforce conference and thanked him for allowing the use of Terminal 4. Mr Dinesh held his breath, bracing for a possible reprimand for the late notice, but Mr Ong’s response was instead: “Do you want Terminal 2 as well?”

Such was the speed of planning and seamless coordination behind Singapore’s vaccination campaign. Shorn of any bureaucratic requirements, it was clear from the responses that everyone was pulling in the same direction and ready to play their part.

2 MANPOWER: PUBLIC-PRIVATE PARTNERSHIPS

Vaccination centres were not complete without the people to run them. Ms Lavinia Low, Director of Manpower Planning and Strategy at MOH, shared that manpower requirements for vaccination operations were inherently different from those of swabbing operations.

“We could not simply recruit non-healthcare-trained candidates to do vaccinations; we needed personnel with prior relevant training,” she shared. “Moreover, our nursing colleagues highlighted that COVID vaccinations were done by intramuscular injection, not like insulin injections that are just below the skin. It is a technique that needed specific training and supervision.”

This was why ex-paramedics from the Singapore Civil Defence Force or those who had been in medic vocations during National Service were roped in to help as vaccinators.

Manpower allocations also had to match the different configurations of each vaccination centre.

“We had to understand how many lanes we needed, from queuing to



PHOTOS: MINISTRY OF DEFENCE

93-year-old Mdm Lai receives her COVID-19 shot from one of the Singapore Armed Forces’ (SAF) home vaccination teams. COVID vaccinations required specific training and technique, which was why those who served in medic vocations during National Service were recruited as vaccinators.



PHOTO: THE STRAITS TIMES © SPH MEDIA LIMITED

Land transport workers waiting to register for their COVID-19 shots at the vaccination centre housed in the former Hong Kah Secondary School on Jan 25, 2021.

vaccination booths to waiting areas, and what kind of manpower was needed for each lane, like how many administrative staff, nurses, non-nurses and doctors should be on standby,” Ms Low added.

The entire vaccination exercise would not have been possible without an army of private sector doctors, nurses and healthcare staff too. In December 2020, MOH reached out to IHH Healthcare Singapore to set up a number of community vaccination centres.

They agreed, and things moved quickly. Within three weeks, the first

centre was set up in January 2021 at the former Hong Kah Secondary School, one of the designated centres for essential land transport workers, such as bus and taxi drivers.

IHH Healthcare Singapore was eventually tasked to run two more public vaccination centres. Hundreds of healthcare workers from its network were deployed – doctors, nurses and even pharmacists volunteered to be vaccinators.

Similarly, Thomson Medical ran three vaccination centres from February 2021, which were community clubs in

mature estates with a high percentage of elderly residents. They recruited doctors and nurses on a contract basis since their permanent staff had to continue serving in their hospital for business continuity. The site supervisors, however, were full-time staff from Thomson Medical.

The workload was heavy, so morale had to be maintained by celebrating milestones. “The first time we hit 2,000 vaccines in a day, we bought bubble tea for the team,” shared Ms Chan Wei Ling, former Chief Executive Officer (Specialist Centres) of Thomson Medical.

VACCINATING CARGO DRIVERS



ON TOP OF running three public vaccination centres, IHH Healthcare Singapore began a “special vaccination project”, revealed Dr Noel Yeo, then-Chief Operating Officer of IHH Healthcare Singapore.

From March to June 2021, two locations in Singapore – Benoi Sector in the West and Sungei Kadut in the North – were identified as holding areas that were large enough to house up to 20 to 30 cargo trucks coming in from Malaysia at any one time.

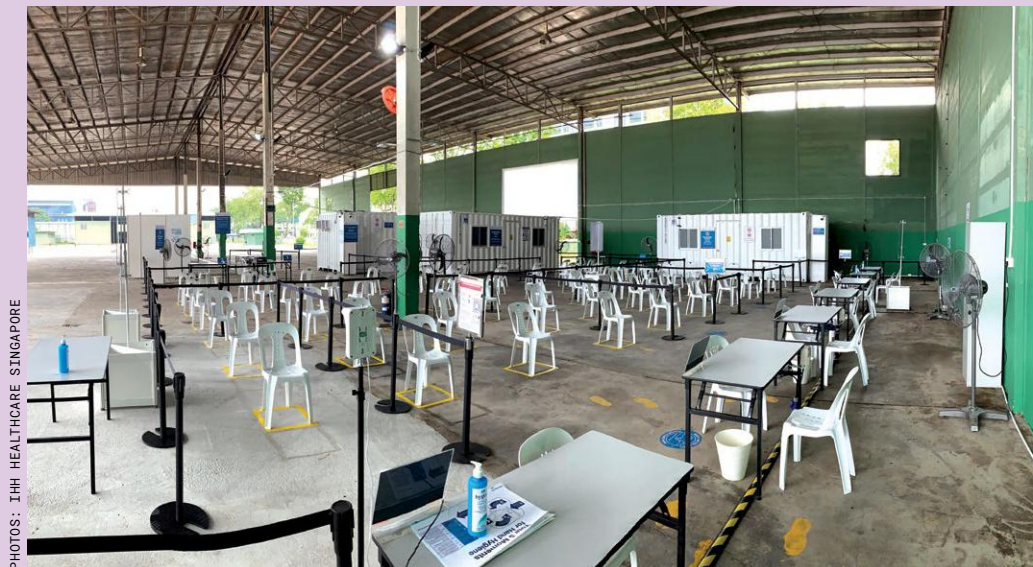
The goal: to ensure Malaysian cargo drivers were vaccinated so that they could continue to safely deliver goods to Singapore.

“This group of drivers who transport supplies from across the border are very important to our supply chain and our

survival. They are considered essential workers to us,” explained Dr Yeo. “Otherwise, who is going to help bring in our vegetables, our chickens, our ducks and most importantly... our durians.”

Thus, it was decided that Malaysian cargo drivers could receive their vaccinations here as needed. It was an effort that was well-received, with many Malaysian cargo drivers even hoping to be selected for the scheme to continue their routine journeys into Singapore.

From end-June 2021 to March 2022, the vaccination project continued with the need for booster shots, and was consolidated at the Sungei Kadut site.



PHOTOS: IHH HEALTHCARE SINGAPORE

“THIS GROUP OF DRIVERS WHO TRANSPORT SUPPLIES FROM ACROSS THE BORDER ARE VERY IMPORTANT TO OUR SUPPLY CHAIN AND OUR SURVIVAL.”

– DR NOEL YEO, FORMER CHIEF OPERATING OFFICER OF IHH HEALTHCARE SINGAPORE

Malaysian cargo drivers would receive their shots at vaccination sites (above) at either Benoi Sector or Sungei Kadut after parking their vehicles in a holding area (right), so that they could continue to safely deliver essential goods to Singapore.





Officers from the Vaccination Operations Task Group engaged in outreach efforts to explain vaccination policies to seniors in particular, who were one of the groups prioritised in the vaccination rollout.

3 STRATEGY: PRIORITISING CRITICAL GROUPS

The task fell on the Expert Committee on COVID-19 Vaccination (EC19V) to figure out how best to deploy the vaccines, as they were arriving in batches.

But not everyone could be vaccinated all at once, due to logistical and supply constraints. After studying the data from Singapore and other countries, EC19V's advice was to vaccinate vulnerable age groups first. Professor Benjamin Ong,

Chair of EC19V, explained that this was because without vaccines, the age at which more severe health risks start is actually 40.

Essential frontline workers – including nursing home staff, those working in the aviation and maritime industries – and people with vascular medical comorbidities were also prioritised.

MOH's Permanent Secretary for Health Mr Chan Yeng Kit called this staggering of vaccination rollouts a “zero-sum game”, where one group's gain was another group's loss.

“If we allocate a hundred doses of vaccines to the SQ (Singapore Airlines) crew, it means that we are devoting a hundred doses that could have gone to someone else,” he noted.

However, the vaccination rate began to plateau around July 2021, with about 30 per cent of seniors still unvaccinated. Naturally, this was a cause for concern as they were one of the most vulnerable groups.

Thus, to encourage more seniors to get vaccinated, mobile vaccination teams

were formed to reach out to those in the heartlands on July 7, 2021. This scheme was an extension of the initiative started by the Health Promotion Board (HPB) earlier in the year.

There was also a need to reach those who were unable to travel to vaccination centres due to mobility restrictions. Under the home vaccination programme, a nurse-doctor pair would make their way to the homes of these individuals, administer the jab upon their consent and stay by their side for the designated observation period.

With the support of the Agency for Integrated Care (AIC), who coordinated requests from the public for home vaccinations, homebound individuals could receive their vaccines easily. To date, more than 100,000 individuals have benefitted from this initiative.

But not everyone was keen on getting vaccinated, with rumours and misinformation circulating about the efficacy of vaccines. A well-considered communications plan was needed.



Homebound individuals, including those with mobility restrictions, could opt for home vaccinations, where a nurse-doctor pair would travel to their homes to administer the shot.

MEMORABLE MOMENTS SHARED BY VACCINATION OPERATIONS TASK GROUP OFFICERS

SAYING THANK YOU WITH FLOWERS

One patient who stood out to me was this old gentleman with a walking stick who came to get his vaccination. He started asking us a lot of questions, and even after we had assured him that the vaccine was safe, he asked the doctor a second round of questions. Eventually, he got his shot. But what surprised us the most was that he returned half an hour later, not to ask questions, but with a bouquet of flowers for the doctor. He was genuinely thankful that we took the time to explain things to him so patiently.

— MICHELLE CHEN

SPECIAL CARE

As I was conducting one of my routine spot checks of our home vaccination teams one day, I chanced upon a girl with special needs. She was violently rejecting the nurse and throwing such severe fits that her father had to physically pin her down to the chair. A fear of needles can be common in people with disabilities, especially when we consider their challenges in trying to understand the procedure and communicate their concerns. Home vaccinations, conducted in familiar and quiet spaces, can thus be regarded as a more conducive alternative for them. With my experience in working with special needs kids, I tried to make conversation and practise breathing techniques with her to calm her down. When she was distracted by my voice, I quickly signalled to the nurse to give her the injection. Her father could not thank us enough after that.

— SITI AQILAH

HEAVY LIFTING

I had similar experiences where many seniors would show their gratitude by bringing our team snacks and drinks. But one encounter in Ubi stood out to me. This senior and her family were living on the twelfth floor, but the lift was stuck at the tenth floor and she was a wheelchair user. Her son and I personally carried her down two floors — in her wheelchair — so that she could take the lift downstairs to get her shot. She held my hand and cried after that. I told her that I would do this for my grandma, and that there was no reason why I would not do the same for her.

— CITARRA RHEA



MESSAGING: PERSUADING THE MASSES

Ms Lim Siok Peng, Director of Corporate Communications at MOH, was caught in a dilemma — should she or shouldn't she take the vaccine?

"I suffer from allergies and anaphylaxis, and take antihistamines on a daily basis," she revealed. "So when vaccinations were first introduced, if you ask me, I'd rather have COVID than potentially have an anaphylactic reaction."

The irony was not lost on her. How could the person who had to drive the public health communications plan to persuade people to take the vaccine not take the jab herself? In the end, she was convinced by her own communications strategy.

She consulted Prof Ong, Chair of EC19V, and Professor Leo Yee Sin, Executive Director of the National Centre for Infectious Diseases (NCID), who explained the science behind the vaccines and their necessity.

Prof Leo's argument moved her: vaccination during a pandemic is not only for personal protection — it is also protection for the entire community. "During a pandemic, you can't just think for yourself," she recalled Prof Leo saying.

In some ways, it was also her own

experience that made her the best person for the communications role. She could empathise with many of the vaccine-related queries and appeals from the public that were flooding in. Some were scared of injections, while others were suffering from pre-existing health conditions.

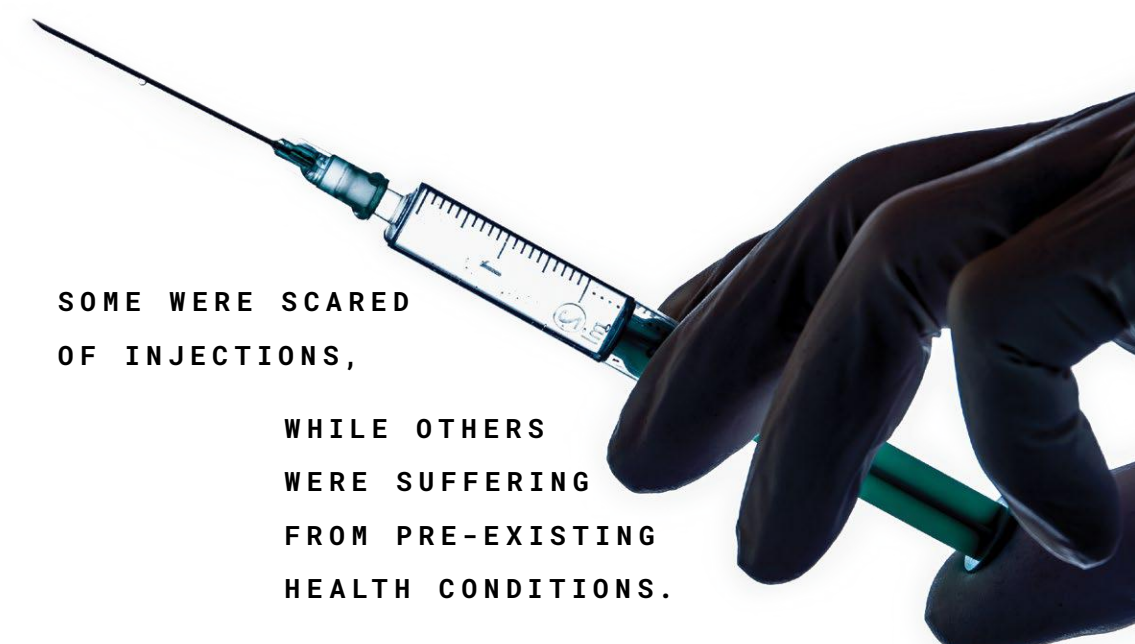
"We needed to reach a stage where we could convince people like me to take the vaccination. The value of communications is significant," said Ms Lim.

Publicity played a key part in this strategy, one that was open, transparent and based on science. MOH invited the media to visit vaccination centres and feature various profiles there, be it the first people to get vaccinated or

vaccinators themselves.

But what made a deeper impression was that doctors and nurses from NCID were part of the first group of people to get inoculated. "They are at the forefront and they know best what's happening. These showed people that the vaccines are safe enough for them and they trust it," Ms Lim shared.

The Silver Generation Office (SGO), the outreach arm of AIC, similarly helped to spread the message in their daily door-to-door efforts to engage seniors. Where such visits were not possible, SGO reached out to people via phone calls to check in on how seniors — especially those who were living alone — were coping.



SOME WERE SCARED OF INJECTIONS,

WHILE OTHERS WERE SUFFERING FROM PRE-EXISTING HEALTH CONDITIONS.



PHOTO: AGENCY FOR INTEGRATED CARE

To get as many vulnerable seniors to receive their vaccinations as possible, volunteers from the Silver Generation Office went door-to-door to explain vaccination policies, book appointments for them and even accompany them to vaccination centres.

Not only did they patiently unpack certain vaccination policies, which may have been confusing to the elderly, they also went the extra mile to assist less digitally-savvy seniors in booking their appointments online or even accompanying them to vaccination centres.

Ms Uma Mageswari, a Senior Division Lead of the SGO's Bishan-Toa Payoh Satellite Office, said

many seniors were willing to talk to volunteers and learn about the vaccine, despite their concerns regarding its side effects.

While the Government was encouraging people to get vaccinated, the anti-vax movement was stirring worldwide. Thankfully, the anti-vaxxers in Singapore were a minority, and did not derail the vaccination programme.

THE FIRST JOB

“RELAX,” said the healthcare staff about to inject Ms Sarah Lim. Behind the blue surgical mask, Ms Lim was composed, seemingly unfazed by the prospect that she would soon become the first person in Singapore to receive the COVID-19 vaccine.

The 46-year-old Assistant Nurse Clinician was among a group of 40 healthcare workers to take the jab before the rest of the nation. She was on the frontlines at the National Centre for Infectious Diseases (NCID)'s Clinic J, screening for suspected cases daily.

“I have to be responsible as a nurse and get vaccinated first so that I can protect others and deliver my patient care,” she said in a media interview afterwards.

Her vaccination signalled a

new chapter in the battle against COVID-19. It came just two days after December 28, 2020, which marked the beginning of Phase 3 of Singapore's gradual reopening.

Soon after, Prime Minister Lee Hsien Loong became the first member of Singapore's Cabinet to take the first dose of the Pfizer-BioNTech vaccine on January 8, 2021, along with MOH's Director of Medical Services Professor Kenneth Mak.

“My Cabinet colleagues and I, including the older ones, will be getting ourselves vaccinated early. This is to show you, especially seniors like me, that we believe the vaccines are safe,” said PM Lee.

By August 2021, over four million had joined them in receiving at least one dose of the vaccine.



PHOTO: NATIONAL CENTRE FOR INFECTIOUS DISEASES



PHOTO: MINISTRY OF COMMUNICATIONS AND INFORMATION

Assistant Nurse Clinician **Ms Sarah Lim** (below) and **Prime Minister Lee Hsien Loong** (bottom) are among the first Singaporeans to take their COVID-19 shots in late Dec 2020 to early Jan 2021. Eight months later, more than two-thirds of the population had done the same.

5 TECHNOLOGY: A USER-FRIENDLY APPOINTMENT BOOKING SYSTEM

As part of the effort to rally people to be vaccinated, technology was deployed to ensure convenience in scheduling vaccine appointments as well as maintain crowd control.

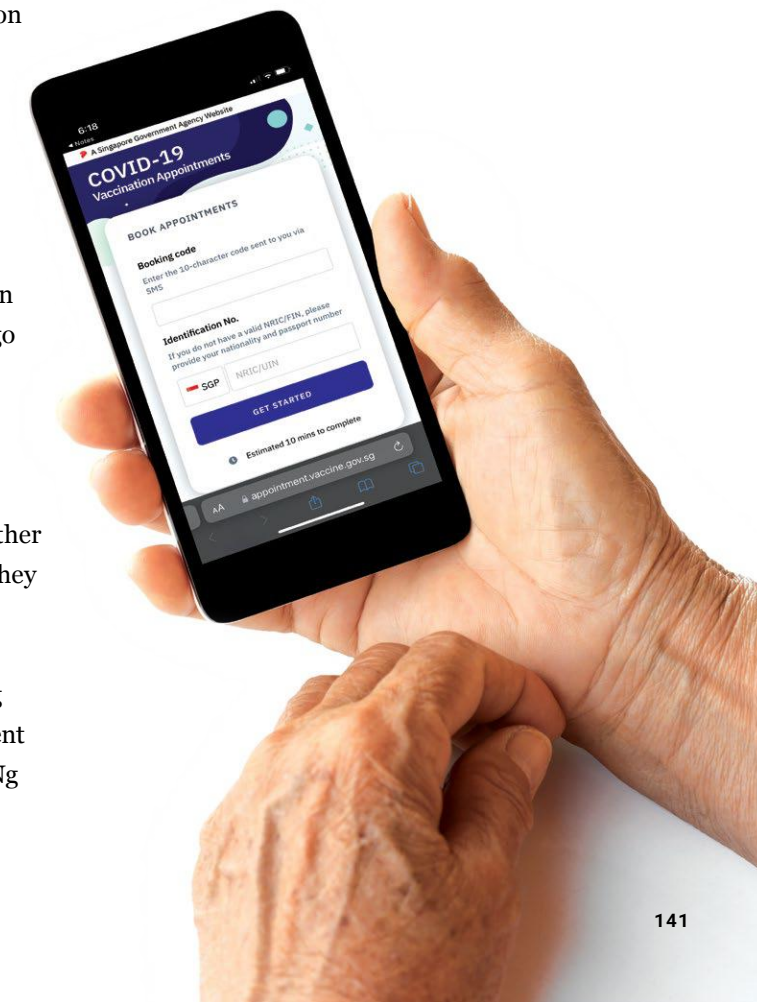
The National Appointment System (NAS) was set up to allow people to book and schedule appointments for both doses of the vaccine. Just like vaccination centres, this system was also developed from scratch and completed within three weeks.

Built by GovTech, the end result was an online platform that enabled a seamless user experience, allowing people to not only book their vaccination appointments but also be reminded to go for them.

It was designed to be user-friendly even to age groups who were less tech-savvy. Mr Dinesh shared that he felt reassured when both his 72-year-old father and 80-year-old uncle confirmed that they could easily navigate the system.

This was also a move that assured the public that operations were running smoothly, according to MOH's Permanent Secretary for Health Development Mr Ng How Yue.

“Imagine if you're already jittery, and then you find that the system doesn't allow you to book an appointment easily. That would discourage people from taking their shots. So creating a smooth system was good for public confidence,” he said.



**6 LOGISTICS:
SUSTAINING A STEADY STREAM
OF SUPPLIES**

The speed at which Singapore secured vaccines was quite a feat, but the logistics of the ensuing vaccine rollout were complex. At the back-end, the team had to ensure a steady supply of vaccines, and the country once came close to pausing its nationwide campaign when it almost ran out of supplies.

This predicament was wholly unexpected. Usually, Singapore would maintain one to two weeks' buffer for their vaccine stock. But with one week's worth of vaccines left in the inventory, CSOG received the unfortunate news that their new shipment of one million fresh doses would be delayed by four whole days.

And it came at an unfortunate time too, when Singapore was intensifying its vaccination campaign in June 2021 in the midst of the Delta wave.

"We had a transition strategy, but the supply was not cooperating," admitted Minister for Health Mr Ong Ye Kung. "Luckily, someone in the private sector was able to locate an unwanted batch of Pfizer vaccines – one million doses that were not required by whoever bought it."

Needless to say, anxiety was running high. "We were literally tracking the vaccinations from their storage house in

their host country all the way through their route movement into the aircraft to make sure that it lands on time," recalled Mr Dinesh.

Of course, they also had to contend with the likely possibility that there would be further delay. If that happens, "we had hundreds of contingency plans", he shared, including getting people to cancel their appointments.

But, as luck would have it, these contingency plans did not have to be activated as the new batch of vaccines arrived just in time, three days before the country would officially run out of them.

"The eagle has landed," Mr Dinesh quickly texted the senior leadership at MOH. He was greeted by a string of

thumbs-up and smiling emojis in response, with cries of joy reverberating across the room when the crisis was resolved.

There was also a plan to get more doses of vaccine from one vial – six, instead of five – so as to maximise the vaccine supply.

Today, Singapore has one of the world's highest vaccination rates, with 92 per cent of the population having completed their primary vaccination regimen as at March 29, 2022 – far surpassing the global average of 57.7 per cent.

While vaccines seemed to be the light at the end of the tunnel that everyone was hoping for on the road to normalcy, this light was dimmed when the Delta wave hit Singapore.



PHOTO: MINISTRY OF COMMUNICATIONS AND INFORMATION

The first batch of Pfizer-BioNTech vaccines arrives safely at Singapore Airport Terminal Services' (SATS) Coolport, a temperature-controlled cold chain facility in Dec 2020.

SINGAPORE ONCE CAME
CLOSE TO PAUSING ITS
NATIONWIDE CAMPAIGN

WHEN IT ALMOST
RAN OUT OF SUPPLIES.

HOW TO SQUEEZE 6 DOSES OUT OF 5-DOSE VACCINE VIALS

THE AVERAGE VACCINE comes in a single-dose vial. Simply put: one patient, one vial, one injection.

But as COVID-19 vaccines had to be manufactured so quickly in such a short period of time, they came in multi-dose vials that were easier to distribute and took up less storage capacity. Each vial contained five doses.

In a bid to maximise precious vaccine supplies, MOH decided to draw six doses out of five-dose vials.

"We really wanted to get the six doses in," shared Permanent Secretary for Health Development Mr Ng How Yue.

As long as each dose contained the full 0.3 millilitres of vaccine, this sixth dose worked just as well. If the remaining amount of vaccine in the vial does not amount to 0.3 millilitres, it will automatically be discarded, regardless of any excess volume.

The National Centre for Infectious Diseases (NCID) was the first to accomplish this feat "by pure skill", shared Mr Ng.

Subsequently, one of the Health Promotion Board (HPB)'s mobile vaccination teams followed suit, led by seasoned nurses whose

routine job scope already involved vaccinating children in schools as part of the National Vaccination Programme.

"If you're very careful, you might even be able to draw seven doses," Chief Operating Officer of HPB Mr Koh Peng Keng said, dropping his voice to a conspiratorial whisper.

Eventually, special low dead-volume syringes for COVID-19 vaccines were secured, allowing all vaccine administrators to achieve this standard. They were thinner than average and had less space between the needle and plunger when it is fully pushed in, giving them a built-in precision to draw the exact amount needed and waste less vaccines.

The limited supply of vaccines meant that they had to be treated like liquid gold. As Mr Ng put it: "Every droplet counted."

