



Above: Customer service officer Ginny Ong, 22, getting her Covid-19 vaccination at Toa Payoh West Community Club last month.

Right: People waiting in the observation area at the centre after receiving their Covid-19 jabs. Vaccines used in Singapore's national drive are messenger RNA ones such as the Pfizer and Moderna shots. ST PHOTOS: LIM YAQYU



Booster jabs: Some may get different shot from before

Experts considering pros and cons of mixing vaccines say more data is needed

Cheryl Tan

When Covid-19 booster shots are rolled out in Singapore, some people may be given the same vaccine they took earlier, while others may be administered a different one.

"Both approaches are being considered, with pros and cons to both strategies," Associate Professor Lim Poh Lian, director of the High Level Isolation Unit at the National Centre for Infectious Diseases, told *The Straits Times*.

"We have to look at which is more effective in protecting against the current and future virus strains circulating. We have to look at safety issues and different segments of the population."

Prof Lim, who is a member of the Expert Committee on Covid-19 Vaccination, added: "What might be good for older adults might have more side effects in younger persons, so it may not be a one-size-fits-all recommendation. Those kinds of data just take time to be collected, analysed and reported."

Those who received inactivated vaccines, such as Sinovac, may benefit from a messenger RNA, or mRNA, booster jab, some experts said.

Messenger RNA vaccines include the Pfizer and Moderna shots, which are part of Singapore's national vaccination drive.

Professor Ooi Eng Eong of Duke-NUS Medical School's programme in emerging infectious diseases explained: "Inactivated vaccines do not generate appreciable levels of

killer T-cells. Such individuals thus rely mainly on a single line of defence — their antibodies."

Associate Professor Hsu Li Yang, vice-dean of global health and infectious diseases Programme leader at the National University of Singapore's (NUS) Saw Swee Hoek School of Public Health, pointed out that China is reportedly considering the use of an mRNA vaccine as a booster following primary inoculation with the Sinovac or Sinopharm vaccine to broaden coverage against Covid-19 variants.

"Neutralising antibody levels appear to drop rapidly six months post-Sinovac vaccination, which is the other reason for considering a booster dose with either an mRNA or the same vaccine," he said.

The experts agreed, though, that with different countries taking different approaches, more data is needed before a decision is made.

Britain, for example, is looking into mixing vaccines for booster doses, after results from its Comm-Cov study launched in February showed that administering one dose of the Pfizer vaccine after a dose of the AstraZeneca jab could help to boost the immune response.

But Israel, which was the first country to administer booster shots of mRNA vaccines to those aged 60 and older, and recently extended the booster shots to those above 30, has decided not to mix jabs.

Prof Lim said the expert committee here is studying several things, including the incidence rate of adverse reactions from a booster shot in other countries and steps to take



Healthcare staff preparing Covid-19 vaccine doses last month. Health experts in Singapore are now studying the details involving the benefits or risks of giving fully vaccinated people Covid-19 vaccine booster shots.

to remove or mitigate the risk.

She acknowledged that there are theoretical concerns about the side effects of a third dose, though countries such as Israel and the United States that are already implementing booster shots can soon provide real-world data on the effectiveness and safety of the approach.

She noted that Moderna has tested different doses for its booster, and the US Food and Drug Administration has held discussions with the company on which dose provides the best combination of effectiveness and safety.

Each Moderna dose has 100 micrograms (mcg) of vaccine, while the Pfizer shot has 30mcg a dose.

Asked if a booster shot at a lower dose was more favourable in preventing adverse side effects, Prof Lim said that dosages are not di-

WHO SHOULD GO FIRST

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ASSOCIATE PROFESSOR DAVID ALLEN, an infectious diseases clinician at the National University of Singapore's Yong Loo Lin School of Medicine, on who should be given Covid-19 vaccine booster jabs first.

rectly comparable between vaccines or other medications. "Even in the same class of high blood pressure medicines, 5mg of one medicine may have the same therapeutic effect as 50mg of another."

On who should get the booster shots first, Associate Professor David Allen, an infectious diseases clinician at the NUS Yong Loo Lin School of Medicine, said: "If the goal is to decrease hospitalisation, severe disease and death, then give the booster to those people it has been shown to be efficacious for — such as the immunocompromised... and probably the elderly."

Prof Hsu said a vaccine booster is an extra dose of a vaccine that is given to maintain or augment the protection provided by the original dose or doses. "It will augment (or boost) whatever part of the im-

mune system the original vaccine targets, so in the case of Covid-19 vaccines, it will probably increase the number of memory B-cells and T-cells, in addition to the level of circulating antibodies targeting the Sars-CoV-2 virus."

Memory B-cells help to produce antibodies on demand to target the virus and its variants, thus preventing severe lung disease, while T-cells are able to detect and kill infected cells to prevent the Sars-CoV-2 virus — which causes Covid-19 — from spreading.

Prof Ooi noted that there is a suggestion that people's antibody levels should be measured, and boosters should be given to those with waning levels of antibodies against the Sars-CoV-2 virus.

"However, antibody measurements alone are insufficient to guide such decision-making on booster shots," he said, adding that measuring antibodies alone would mean missing out on "the different ways in which the immune system is able to protect us from Covid-19."

Prof Hsu pointed out that the experiences of Israel and Britain show that protection from asymptomatic and mild infection decreases within six months post-vaccination, particularly with the Pfizer jab.

"However, these same experiences also show that protection against severe Covid-19 disease (requiring hospital care or oxygen support) remains excellent, with more than 85 per cent effectiveness when compared with unvaccinated people, even for the elderly," he said.

"Will protection against severe disease wane over time? We do not know for sure at this point if and when this will happen, but it will certainly take a far longer period of time compared with protection

against infection."

He pointed out that different vaccines affect the immune system differently, so current results cannot be extrapolated to other vaccines, such as the Moderna shot.

As to how often Covid-19 jabs should be administered, Professor Paul Tambyah, president of the Asia-Pacific Society of Clinical Microbiology and Infection, said that it is still too early to tell — though it might be the case that Covid-19 is like hepatitis B or measles, each of which needs three jabs. "It is highly unlikely that we will need annual jabs as the mutation rate is much lower than influenza."

Prof Ooi said there is no fixed formula for when booster shots should be administered.

"The immune response does not wane at a fixed rate, but varies from vaccine to vaccine and infection to infection. Moreover, how much immune response is needed to prevent infection and disease varies from virus to virus. There is thus no theoretical way to estimate when booster shots are needed," he said.

He suggested that a more accurate way of determining when to give booster shots would be to conduct active surveillance of Covid-19 cases in hospitals to guide decision-making. Once a trend towards an increase in severe cases among the vaccinated is observed, then perhaps there will be sound evidence for the need of boosters.

This approach should also apply to groups of the population, such as people with compromised immune systems, Prof Ooi said.

Prof Lim also said waning immunity may be more of a problem in such people, as well as older adults.

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