

ScienceTalk

With Covid-19 likely to persist, wider vaccine coverage is crucial

Getting more protected can turn otherwise life-threatening disease into flu-like illness

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In recent weeks, Singapore has witnessed a steady and significant increase in the number of Covid-19 cases within the community.

Clusters have emerged in varied locations including hospitals, Changi Airport and a tuition enrichment centre.

In response, the Government has imposed further restrictions on social activities, with dining in prohibited and social gatherings capped at two people till at least the middle of next month.

Many are experiencing an unsettling sense of *deja vu*: We appear to be in exactly the same position as we were a year ago.

It is very likely that Covid-19 is here to stay for the foreseeable future, as Sars-CoV-2 – the virus which causes Covid-19 – has become firmly entrenched in humans.

This means we will sporadically see community Covid-19 cases.

Yet, there is a striking difference between now and last year: We now have access to safe and highly effective vaccines which can not only reduce the risk of severe Covid-19 and death, but also lower the risk of transmission.

Even as Singapore tries to contain the spread of the virus in the community by limiting social activities and interactions, the recent spike in Covid-19 cases underscores the importance for as many of us as possible to be vaccinated.

Promising findings that mRNA vaccines are effective on variants

Pfizer-BioNTech and Moderna vaccines – the two vaccines currently licensed for emergency use

in Singapore – have proven to be more than 95 per cent effective in preventing both symptomatic and severe disease, based on data from clinical trials and real-world experiences in Israel, the United Kingdom and several states in the United States where vaccination rates are high.

Surveillance data from Israel also showed vaccination reduces the rate of all infections, whether asymptomatic or symptomatic.

While more studies will be needed to confirm the effectiveness of these vaccines against new variants, we have seen promising data emerge.

For example, a high level of vaccine effectiveness was seen in Israel against the B117 variant, the variant first detected in the UK.

Likewise, the mRNA vaccine was 94 per cent effective in preventing Covid-19 caused by the new R1 variant among nursing home residents in the US.

Pre-review data from the UK also suggests that mRNA and other vaccines remain effective against the latest variant of concern, B1617, which was first detected in India.

The population level observations on immunity against the variants are backed by the fact that mRNA vaccines trigger the development of antibodies against Sars-CoV-2, as well as T cells that recognise infected cells and kill them to limit the spread of virus in our airway.

Hence, even if antibodies cannot fully block infection caused by the viral variants, the T cells produced by vaccination would still be effective in limiting the extent of infection to result in mild or no illness.

Asymptomatic or mild symptoms for breakthrough infections

Like many other vaccines that are currently in use, the mRNA

Covid-19 vaccines are not 100 per cent effective.

However, it is noteworthy that many of these breakthrough infections were picked up as a result of routine swabbing, and not because these individuals were ill.

This shows that vaccines do reduce the severity of Covid-19 and it is thus clear that vaccination can prevent people from contracting what could otherwise be a life-threatening disease.

The ripple effect of vaccination stretches well beyond the benefit to the individual, as a reduction in severe Covid-19 cases would mitigate the threat of our healthcare system being overwhelmed by patients requiring critical care and ventilatory support, as we have observed recently in countries like India.

Vaccination also reduces Sars-CoV-2 transmission.

There is now increasing evidence to suggest that although vaccinated individuals may carry the virus in their nasal passages, the chance of spreading the infection to others is very low.

In the UK, pre-review data suggests that vaccination, even after only a single dose, reduces transmission by a third to unvaccinated household members; this rate is halved in those who have completed two doses.

Even if such vaccinated individuals were to be infectious, the amount of virus shed by them has been recently found to be much lower than those from unvaccinated cases.

Moreover, the duration of infectivity is also likely far shorter than those of unvaccinated cases.

Finally, a person who is asymptomatic and not sneezing or coughing is also less likely to transmit the infection to others.

When we get vaccinated, we protect ourselves, our families and our country.

Focus on giving people first dose

Since last December, when Singapore rolled out its Covid-19 vacci-

nation programme in staggered phases, approximately 2.2 million doses of Covid-19 vaccines have been administered, with just over one-third of the population receiving at least one dose.

Compared with places that have begun to see the benefit of vaccination – namely Israel, the UK and some parts of the US where the population vaccinated with at least one dose has exceeded 50 per cent – Singapore's percentage is still too low for vaccines to make a significant impact on preventing outbreaks of Covid-19.

Besides the initial decision by the Government to vaccinate its population at a measured pace, another reason for the relatively slow roll-out has been due to limitations in supply, compounded by the need for two doses as part of a complete regimen.

To overcome this problem, the Ministry of Health will now delay administration of the second dose to six to eight weeks after the first dose, in order to allow greater vaccine coverage.

Such a strategy is not unprecedented and has been employed successfully in places such as the UK.

Recent published data from Scotland has shown that mass roll-out of the first dose of the vaccine resulted in a significant reduction in Covid-19-related hospitalisations; single-dose vaccine efficacy ranged from 70 per cent to 90 per cent.

The US Centres for Disease Control and Prevention estimate the efficacy after a single dose of mRNA vaccine to be 80 per cent.

Delaying the second dose may also produce a stronger immune response to vaccination.

New evidence from Public Health England shows that older individuals who received a delayed second dose of the Pfizer-BioNTech vaccine at 12 weeks had 3^{1/2} times more antibodies compared with those who received their second dose after three weeks.

While a second dose may still be necessary to extend the longevity

of immunity against Covid-19, a greater coverage of the population with a single dose of the vaccine would slow virus transmission, prevent large clusters of cases, and reduce severe Covid-19 cases and deaths.

Vaccinate for normality

Complete elimination of Sars-CoV-2 is now an unrealistic expectation. Covid-19 will be a part of our lives in the foreseeable future.

But with increased vaccine coverage, we can minimise the impact Covid-19 will have.

We can turn what is otherwise a life-threatening condition into nothing more than a flu-like illness.

We can expect a gradual return to our normal way of life. Israel, with 60 per cent of its population vaccinated, has done away with masks.

As scientific understanding of Sars-CoV-2 and vaccines continues to improve with time, more discoveries will also be made to address other urgent questions, such as the longevity of immunity against Covid-19, Sars-CoV-2 evolution and the need for booster vaccination.

These will add to our arsenal in the battle against Covid-19.

To paraphrase the ancient Chinese general and military strategist Sun Tzu: If we know the enemy (Sars-CoV-2) and ourselves (our immune system), we need not fear the battles we will fight with this virus.

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