



The Pfizer-BioNTech vaccine being manufactured at a facility in Marburg, Germany, in January. mRNA vaccines like this one involve injecting snippets of the virus' genetic material and not the whole virus into the body to stimulate an immune response. PHOTO: REUTERS

mRNA vaccines best at protecting against variants

Pfizer-BioNTech and Moderna found to work well against British and Brazilian strains

Clara Chong

Covid-19 vaccines that use mRNA technology have been found to be the best at preventing symptomatic infection from variant strains, a comparison of the efficacy levels of different vaccines against the variants has shown.

mRNA vaccines, notably the ones developed by Pfizer-BioNTech and Moderna, involve injecting snippets of the virus' genetic material – and not the whole virus – into the body to stimulate an immune response.

mRNA vaccines were found to induce high levels of neutralising antibodies against the original strain, as well as against Britain's B117 strain and the Brazilian P1 variant.

However, these levels of neutralising antibodies decline when used against South Africa's B1351 variant.

Neutralising antibodies bind to specific, important sites of the virus, preventing it from starting its invasion.

The success of mRNA vaccines is likely due to the high levels of antibody and T-cell response they induce in the body, according to Associate Professor David Allen from the National University of Singapore's (NUS) Yong Loo Lin School of Medicine.

"Antibodies have the capacity to block infection entirely... and

when it comes to limiting spread and severity of infection in an individual who has already been infected, both T cells and antibodies play a role," Prof Allen said.

The more traditional inactivated vaccines make use of killed virus particles.

These may elicit lower levels of response or none at all.

People with low levels of neutralising antibodies may still be protected from Covid-19 if they have robust T-cell immunity.

The immune system depends on the T cells, a type of white blood cells, working together with antibodies to eradicate the virus.

These findings were shared in a monthly webinar – Season Two of Covid-19: Updates From Singapore – last Thursday.

It brought together local and international experts to discuss the latest medical and scientific findings around the coronavirus.

It was hosted by Prof Allen, who is also the associate vice-president of health innovation and translation in NUS; Professor Dale Fisher, group director of medicine at the National University Health System and chair of the World Health Organisation's Global Outbreak Alert and Response Network; and Dr Louisa Sun, an associate consultant with the infectious diseases team at the National University Hospital and Alexandra Hospital.

Work on variant-specific vac-

Vaccines versus variants

A vaccine's efficacy is measured by its ability to prevent symptomatic infection – that is, patients displaying symptoms of Covid-19 after being infected.

Here's how the different vaccines work against the variants.

Vaccine	Original type	B117 (UK)	B1351 (South African)	P1 (Brazilian)
Pfizer-BioNTech	95%	90-95%	62%	Pseudovirus (non-infectious fragments of viral DNA) neutralised by vaccine
Moderna	94%	90-95%	62%	NI.*
AstraZeneca	70-79%	70-80%	10%	NI.*
Johnson & Johnson	66-72%	70%	47-55%	NI.*
Novavax	96%	85%	55%	NI.*
Sputnik V	92%	NI.*	60%	NI.*
Sinovac	50-91%	Press release states "yes"	Press release states "yes"	Press release states "yes"

NOTE: *No information

Source: NATIONAL UNIVERSITY OF SINGAPORE'S YONG LOO LIN SCHOOL OF MEDICINE STRAITS TIMES GRAPHICS

cines has already started globally, said Dr Richard Hatchett, a special guest of the webinar.

He is chief executive of the Coalition for Epidemic Preparedness Innovations – an international coalition set up to prepare for future infectious disease threats.

But challenges remain.

Although global vaccine-sharing scheme Covax aims to deliver some two billion doses this year, scarcity

in vaccine supply remains the key bottleneck.

Dr Hatchett said: "Vaccine supply is a major issue right now that will gradually improve..."

"We have at least nine manufacturers currently that are massively scaling up their production, and those vaccines will become available over time."

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