

# Understanding Variants

## COVID-19 Vaccine AstraZeneca

Latest data released

### Summary of the variant data for COVID-19 Vaccine AstraZeneca

It is well known that viruses constantly change through mutation, which can lead to the emergence of new variants. Only those that demonstrate increased transmission or virulence are considered variants of concern. Globally, there are currently four such variants:

- **B.1.1.7**, also known as the UK, or Kent variant
- **P.1**, also known as the Brazilian variant
- **B.1.351**, also known as the South African variant
- **B.1.617.2**, also known as the Indian Variant

We now have data – from non-clinical, pre-clinical, and clinical studies, as well as emerging real-world evidence – that demonstrate the effectiveness of *COVID-19 Vaccine AstraZeneca* against these new variants.

No variants have emerged that significantly undermine efficacy of our vaccine against severe disease and hospitalisation.

- Clinical studies confirmed the vaccine is effective against the Kent (B.1.1.7) variant, with comparable efficacy to the predominant global strain (the Victoria strain) (VE: 74.6%; CI: 41.6% to 88.9%).<sup>1</sup>
- In vitro analyses using sera from convalescent individuals that received *COVID-19 Vaccine AstraZeneca* demonstrate that antibodies from vaccinated individuals were able to neutralise the Brazil (P.1.) variant and the Indian variant (B.1.617.2) to a similar extent as the Victoria strain.<sup>2</sup>
- In addition, an early real-world analysis shows for the first time that two doses of *COVID-19 Vaccine AstraZeneca* is effective against the Indian variant (B.1.617.2), with similar levels of protection achieved as those seen against the Kent variant.<sup>3</sup>
- Pre-clinical studies have demonstrated the vaccine's effectiveness against the South African (B.1.351) variant, showing lower respiratory tract protection and viral clearance in hamster challenge models. Further clinical analysis is planned to confirm the effectiveness of the vaccine against severe disease from this variant.<sup>4</sup>

The World Health Organization's Strategic Advisory Group of Experts on Immunization (SAGE) of the SARS-CoV-2 virus has recommended *COVID-19 Vaccine AstraZeneca* in countries where new variants, including the South African variant, are prevalent.<sup>5</sup>

The best way to decrease the risk of more new variants emerging is to immunise the majority of the population across the world as quickly as possible. Experts agree that it is essential that current vaccines continue to be administered to as many people as possible. This is because currently available data suggest that the protection offered by the vaccines far outweighs the risk of vaccine escape from potential new variants.

### COVID-19 variants – the cause

When a virus enters the body – like the one that causes COVID-19 – it invades human 'host cells' and uses them to produce even more of the virus. Viruses survive through this process of replication (making more copies of itself using a host cell) and by spreading between people.

When a virus makes copies of itself, it sometimes changes a bit. These changes are called **mutations**. A virus that has mutated is referred to as a **variant**, meaning it's a different form of the original virus.<sup>6</sup> Sometimes it's called a **genetic variant**, because it's the virus's genetic material that has changed.<sup>7</sup>

Mutations and variants are very normal for any virus. *All* viruses are constantly changing and evolving over time – including the virus that causes COVID-19.<sup>8</sup>



### The impact of virus variants

When a virus is circulating widely in a population, it has a greater opportunity to replicate. With this, the likelihood that the virus will change a bit, or that variants will appear, also increases.<sup>6</sup>

Most of the time, variants don't impact how a virus works, or its ability to cause infection and disease.<sup>6</sup> Sometimes however, variants can:

- make the virus spread more easily
- affect how well a person responds to treatment for the virus
- impact testing for the virus and how well it is picked-up
- reduce the effect of vaccines against the virus
- cause more severe illness from the virus

A **variant of concern** is the name given to any variant of the COVID-19 virus that has any of the characteristics above.<sup>6</sup>

Some variants can also have positive effects e.g. reducing a virus's ability to spread. Variants can also disappear over time.

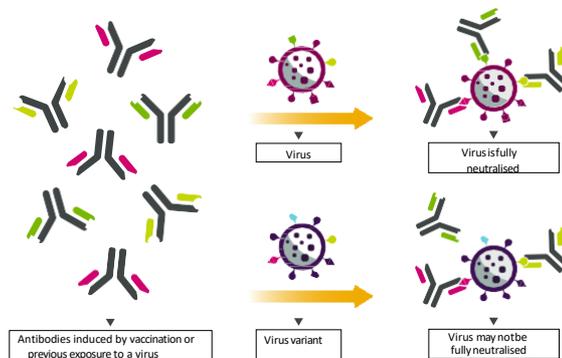


## What do we know about the SARS-CoV-2 virus variants that causes COVID-19?

Scientists and experts around the world are closely monitoring for new variants of the SARS-CoV-2 virus and are carefully assessing their impact. This monitoring is conducted using genomic surveillance, laboratory studies and epidemiological investigations looking at how the virus is spreading and why.<sup>8</sup>

The SARS-CoV-2 virus has a low rate of change, or mutation – approximately four times slower than the flu virus.<sup>9</sup> However, as the virus is so widespread, numerous variants have developed and are spreading quickly across the world, with more expected to develop.

Currently, there are four variants of concern, which are named based on the country where they were first identified. These include the UK, South African, Brazilian and Indian variants. Each of these variants has mutations which are thought to make them more transmissible. Early data also suggest that the UK variant is associated with an increased risk of death.<sup>10</sup>



The binding of neutralising antibodies to a virus variant may differ from their binding to the original virus

## How can we protect against SARS-CoV-2 variants?

The current vaccines for COVID-19 have been designed to give broad protection against the virus, offering a certain level of protection against different variants.<sup>6</sup>

The most effective strategy against variants is to prevent the spread of COVID-19.<sup>6</sup> Variants thrive when virus transmission levels are high, so we need to bring these levels down. Current measures to reduce transmission work e.g. hand washing, good ventilation, distancing, mask wearing and preventative treatments, such as vaccines. According to the World Health Organization, rolling out vaccines as quickly and widely as possible is also critical to protect people from the virus and risk of new variants.<sup>6</sup>

As part of the immune system response to the virus or following a vaccination, antibodies are produced to recognise the spike protein on the exterior of the SARS-CoV-2 virus. It is believed that the current vaccines will maintain some protection against new variants.

## Future strategies to protect against variants

In time, it is anticipated that different vaccine strategies will be employed to overcome new variants as they arise. This might include changing the vaccine dose, additional booster vaccinations, combination vaccines or adapting the vaccines themselves to target variants. Scientists are already working on 'next generation' vaccines and strategies to achieve the best protection.

As our knowledge of the COVID-19 virus continues to grow – including how it's transmitted, how it mutates and the impact of variants – we're working hard to predict changes and prepare for future challenges.

## References

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