

(MOH, 2023)  
[3 Jan 2021]  
[17 Aug 2021]



## COVID-19: variants

The SARS-CoV-2 virus that causes COVID-19 has undergone genetic mutations over time leading to the development of new variants of the virus.

*Last updated: 1 September 2023*

### On this page:

- [About SARS-CoV-2 variants](#)
- [Detecting variants](#)
- [Omicron variant](#)
- [Delta variant](#)
- [COVID-19 Variants of Concern framework](#)

## About SARS-CoV-2 variants

All viruses, including SARS-CoV-2, the virus that causes COVID-19, change over time. Most changes have little to no impact on the virus' properties. However, some changes may affect how easily the virus spreads, the disease severity, the ability of vaccines to prevent disease or the effectiveness of treatments, diagnostic tools, or other public health and social measures.

Many different SARS-CoV-2 variants have emerged over the course of the pandemic. Those that have had changes to the virus's properties are called 'Variants of Interest' (VOI) by the World Health Organization (WHO) and are monitored more closely. VOIs that significantly change the way the virus behaves and present an increased public health risk are called 'Variants of Concern' (VOCs).

During late 2020, the emergence of variants that posed an increased risk to global public health prompted the characterisation of specific VOIs and VOCs, in order to prioritise global monitoring and research, and ultimately inform the ongoing response to the COVID-19 pandemic.

The five main VOCs during the COVID-19 pandemic have been [Alpha \(B.1.1.7\)](#), Beta (B.1.31), Gamma (P.1), [Delta \(B.1.617.2\)](#) and Omicron (B.1.1.529).

The WHO and its international networks of experts monitor changes to the virus so that if significant changes to the virus structure are identified, that would necessitate an updated public health response, and countries and the public can respond to the variant to try to prevent its spread.

Read more: [Tracking SARS-CoV-2 variants – World Health Organization](https://www.who.int/activities/tracking-SARS-CoV-2-variants) (<https://www.who.int/activities/tracking-SARS-CoV-2-variants>)

## Detecting variants

Whole-genome sequencing (WGS) is required to identify which variant a person is infected with. This is possible for samples collected for PCR testing but not through rapid antigen testing (RAT). In Aotearoa New Zealand, individuals arriving from overseas who have a positive RAT are encouraged to receive a follow-up PCR test so that whole genome sequencing (WGS) can be performed. This helps identify which new variants are arriving in the country.

Ongoing wastewater surveillance is also used to monitor the variants circulating in the community.

Read about [COVID-19 testing](https://info.health.nz/conditions-treatments/infectious-diseases/covid-19/testing-and-reporting/) (https://info.health.nz/conditions-treatments/infectious-diseases/covid-19/testing-and-reporting/).

## Omicron variant

Omicron was first identified in mid-November 2021. The WHO rapidly classified Omicron as a Variant of Concern due to the large number of mutations it contains.

Omicron is much more transmissible than previous variants of the COVID-19 virus, and like other variants, it continues to evolve. The Omicron variant has spread rapidly worldwide and is now the sole variant in most countries.

Whilst still causing illness, a person is less likely to be severely ill if they contract Omicron rather than Delta. However, Omicron has resulted in many more people being hospitalised than at any other time in the pandemic. This is not because Omicron is very severe but because Omicron is more transmissible and so can cause many infections over a short period of time.

Omicron can still cause severe illness and even death, especially in those who are unvaccinated or not up-to-date with their COVID-19 vaccinations and people who are at risk of severe outcomes, such as elderly and those with severe underlying health conditions. However, a smaller proportion of people who are infected with Omicron end up hospitalised compared to those infected with Delta.

## Omicron in New Zealand

Omicron was first detected in New Zealand in an international traveller in managed isolation who arrived in the country on 10 December 2021. Managed isolation was still being used at that time, so community spread of Omicron was not detected until mid-January.

Two Omicron subvariants (BA.1 and BA.2) were detected in New Zealand around the same time. BA.2 became dominant during the first three months of 2022. Numerous Omicron subvariants have since been detected in New Zealand. This is not unexpected as New Zealand has reopened its borders and has become reconnected to the global community.

The identification and classification of Omicron subvariants has been possible due to the large number of SARS-CoV-2 samples that have been genomically sequenced. Given the number of Omicron subvariants, it is difficult to list all the subvariants that exist.

Nearly all current circulating Omicron subvariants are descendants of BA.2 and/or BA.5, in some form or another. Each subvariant has subtle changes to the genome that make it genomically distinct compared to its predecessor. This is how one subvariant is defined compared to another. These are given names such as BA.2, BQ.1, and CH.1. The names identify the lineage from which the subvariant evolved from and are known as its [PANGO](https://cov-lineages.org/) (https://cov-lineages.org/) designated name.

PANGO is a naming convention for classifying and naming genetically-distinct lineages of SARS-CoV-2, including variants of concern, and is based on the analysis of complete or near-complete virus genomes. The PANGO system uses numbers and letters to represent these different branches. For example, BA.1 is the first branch, or 'sublineage' of the subvariant BA; BA.1.1 is the first sublineage of BA.1; BA.1.1.7 is the seventh sublineage of BA.1.1, and so on. Occasionally you may hear names such as 'Kraken' (PANGO designated name XBB.1.5) being used on social media and in the news. These are not formal classifications of subvariants.

Subvariants that begin with an X (e.g. XBB or XBC) are what is known as 'recombinant' variants. These are subvariants that have emerged due to the fusion of two COVID-19 variant viral genomes during the viral replication process forming a new 'hybrid' variant that is unique to both parental variants. This can occur when a person is infected with two variants at the same time.

Although new variants of Omicron continue to emerge, there does not appear to be a change in the severity of disease due to these variants. Therefore, the public health settings already in place to manage current Omicron variants are appropriate for managing the subvariants present in our community.

## Vaccination and Omicron

The Omicron variant has a large number of changes to the spike protein which is the key the virus uses to gain access to cells. The spike protein is also the part of the protein, which is targeted by many vaccinations, including the Pfizer vaccination. Because of changes to the virus, the Omicron variant is more resistant to the protection provided by the original Pfizer vaccine, which was developed against the original SARS-

CoV-2 virus.

To provide better protection, Pfizer has developed a bivalent vaccine that induces the immune system to produce antibodies against spike proteins from both the original variant of SARS-CoV-2 and Omicron subvariants.

Vaccination also provides very good protection against developing severe disease if a person does become infected.

Read more about [COVID-19 vaccination](#) ([/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-vaccines](#)).

## Other protection measures

Using public health precautions remains important to continue to protect our communities against Omicron. As well as vaccination, early detection of cases and isolation, staying home if you're sick, wearing a mask, hand hygiene, improving ventilation and physical distancing remain important.

Read more about [protecting yourself and others from COVID-19](#) ([/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-health-advice-public/protecting-yourself-and-others-covid-19](#)).

## Delta variant

The Delta variant was first detected in late 2020 and was named a Variant of Concern by the WHO on 31 May 2021. As it was more transmissible than previous variants, Delta spread rapidly worldwide and became the main variant in most countries.

In August 2021, the Delta variant arrived in New Zealand. Delta posed very different challenges to earlier strains of COVID-19, with its rapid transmission, infectiousness and higher risk of needing hospital care. People who were not vaccinated were most at risk of severe illness.

The nature of Delta created a significant challenge in New Zealand and required a whole of system response in a way that had not been encountered previously. In October 2021, the Director-General of Health commissioned an independent review into the Ministry's response to the August 2021 Delta outbreak.

Read the about the [Delta Response Rapid Review](#) ([/publication/delta-response-rapid-review](#)).

Once the Omicron variant arrived in New Zealand, it replaced Delta as the predominant variant. The Delta variant has not been detected in Aotearoa New Zealand since 2 March 2022.

The [World Health Organization \(WHO\)](#) (<https://www.who.int/activities/tracking-SARS-CoV-2-variants>) considers Delta as a previously circulating Variant of Concern.

## COVID-19 Variants of Concern framework

To support Government preparedness and response efforts, Manatū Hauora – the Ministry of Health developed Aotearoa New Zealand's Strategic Framework for COVID-19 Variants of Concern which was released in June 2022. This has now been replaced by the [Aotearoa New Zealand Strategic Framework for Managing COVID-19](#) ([/publication/aotearoa-new-zealand-strategic-framework-managing-covid-19](#)).

The previous Variants of Concern framework, which has now been superseded, can be found here:

- [Previous Variants of Concern framework summary \(pdf, 300 KB\)](#) ([/system/files/documents/pages/variants-of-concern-framework-summary-jun22.pdf](#))
- [Previous Variants of Concern framework summary \(docx, 446 KB\)](#) ([/system/files/documents/pages/variants-of-concern-framework-summary-jun22.docx](#))