Omicron Variant: What to Know

A new SARS-CoV-2 variant called Omicron (B.1.1.529) has raised concerns around the globe. Here, we provide reliable information to answer questions you may have about the Omicron variant. This information is preliminary and subject to change as new scientific evidence continues to emerge. We will continue monitoring the situation and update this document moving forward as we learn more in the coming weeks.

What is Omicron?
The Omicron variant is a SARS-CoV-2 virus strain that was detected in South Africa on 11/25/21. Omicron has over 30 mutations on the spike protein, including 10 on the ACE2 receptor, a protein that helps create an entry point for the virus. For comparison, the Beta (B.1.351) variant has 3 mutations and the Delta (B.1.617.2) variant has 2 mutations on the ACE2 receptor. The World Health Organization (WHO) and US SARS-CoV-2 Interagency Group (SIG) have labeled Omicron a “variant of concern.”

There are three major classifications of variants: “variant of interest” (VOI), “variant of concern” (VOC), and “variant of high consequence” (VOHC). A variant is labeled as a VOC when its changes have a clinical or public health significance that affects one or more of the following:

- Transmissibility (spread)
- Virulence (disease severity)
- Protection from vaccine-induced or infection-induced immunity
- Diagnostic Testing
- Effectiveness of therapeutics

In the US, Delta is the only other variant that is currently labeled as a VOC. The SIG decided to label Omicron as a VOC based on multiple factors, including the detection of Omicron cases in multiple countries, transmission patterns in South Africa, and potential implications of Omicron's mutations. Many countries have confirmed cases of Omicron, including the US, which detected its first case on 12/1/21.

Is Omicron more transmissible?
Epidemiological data from multiple countries suggest Omicron is spreading faster than prior variants, including Delta. However, whether or not this growth advantage is due to an increase in Omicron's inherent transmissibility and/or its other attributes like immune evasion remains under investigation. Preliminary estimates from the UK suggest Omicron could be at least as transmissible as Delta. According to UK data on household transmission, Omicron carries a 3-fold risk of transmission from an infected household member to others compared to Delta. Preliminary data, including those from investigations of outbreaks in Oslo, Norway and Nebraska, US also suggests Omicron has a shorter incubation time (2-3 days) compared to prior variants, including Delta (4-6 days). This means a person infected with Omicron is expected to develop symptoms earlier after an exposure compared to individuals infected with other strains of the virus. This shorter incubation period likely contributes to Omicron's rapid spread.

As of 1/8/22, the Omicron represents 98% of newly sequenced cases in the US. Based on early data on the transmissibility of Omicron from other countries, the variant may have a doubling time of about 2 days.

Does Omicron cause more severe illness?
At this time, the intrinsic severity of the Omicron variant remains unconfirmed. Some preliminary analyses from the UK and South Africa show that Omicron has been associated with a lower risk of hospitalization compared to other variants, especially if individuals are fully vaccinated and/or have received a booster. Furthermore, several countries are seeing rising case rates...
“decouple” from hospitalizations and deaths that are rising, but are staying relatively low compared to other phases in the pandemic. However, more data is needed to know if Omicron infections can cause more severe disease or death than infection with other variants.

On one hand, lower hospitalization rates could be due to Omicron’s increased ability to escape immunity, which causes a higher proportion of infections among people who have vaccine-induced or infection-induced immunity; infections in these populations are more likely to be mild. However, these lower hospitalization rates could also be due to the Omicron variant being intrinsically less virulent. Emerging data suggests that the Omicron variant might be more likely to infect the upper respiratory tract than the lungs when compared to prior variants. While this data is still very preliminary and are based on laboratory experiments and studies done in animal models, these findings could suggest a reduced risk of pneumonia as a complication of COVID-19. Teasing out the difference between these factors to understand Omicron's virulence will take time.

How long does it take for symptoms to appear with Omicron?

Preliminary data suggests Omicron has a shorter incubation time (2-3 days) compared to prior variants, which means a person infected with Omicron is expected to develop symptoms earlier after an exposure compared to individuals infected with other strains of the virus. Symptoms for Omicron can vary by person based on factors such as health status, age, vaccination status, etc. According to self-reported data from the ZOE COVID study in the UK, the five most common symptoms reported are runny nose, headache, fatigue, sneezing, and sore throat; this symptom profile is similar to that of the Delta period in the UK.

Can Omicron reinfect people?

Due to Omicron’s mutations, there are concerns that the variant can evade infection-induced immunity. Researchers are currently growing cultures of the virus in labs to test against antibodies from recovered individuals. Preliminary South African data indicates a higher risk of reinfection, with those infected during the first wave of the virus seeing a 73% chance of reinfection with Omicron and those previously infected with the Delta variant having a 40% risk of reinfection with Omicron. This aligns with preliminary analyses by the UKHSA that indicate the risk of reinfection with the Omicron variant is approximately 3-8 times higher than with other variants.

Do the current COVID-19 vaccines work against Omicron?

Due to the mutations on Omicron’s spike protein, there are concerns that the variant can evade vaccine-induced or infection-induced immunity. Researchers are currently growing cultures of the virus in labs to test against antibodies from vaccinated individuals. To date, several preliminary studies indicate 5- to 40-fold reductions in levels of neutralizing antibodies against Omicron among both vaccinated and previously infected individuals. It is important to note that these are small, preliminary studies that have yet to undergo peer review. In addition, neutralizing antibodies are only one part of our immune response — T cells and memory B cells also play important roles in providing us with broader protection against the virus. Additionally, emerging research suggests T cell immunity is well-preserved even against Omicron.

Some preliminary studies from the UK, Denmark, and South Africa have also found the effectiveness of 2 Pfizer vaccine doses against infection drops to approximately 33-55% with the Omicron variant. However, vaccine effectiveness against hospitalization for Pfizer remains relatively high at 70%.

The good news is that emerging evidence suggests boosters can restore some of the antibody titers and enhance vaccine protection against Omicron. Data from the UK also suggests that a Pfizer booster could restore vaccine effectiveness against symptomatic infection with Omicron to approximately 76%.

Pfizer, Moderna, and Johnson & Johnson (J&J) are also testing their vaccines against Omicron. Pfizer and Moderna are conducting ongoing evaluations of their current vaccines and are able to develop Omicron-specific COVID-19 vaccines, if needed. President Biden has said the US government will take steps to support these research and development efforts and facilitate the US Food and Drug Administration's (FDA) and US Centers for Disease Control and Prevention's (CDC) review while ensuring scientific rigor.
However, experts believe the current vaccines, including boosters, will offer protection against infection, severe disease, hospitalizations, and deaths due to infection with Omicron. On 12/17/21, Dr. Anthony Fauci said that there is no need for a variant-specific booster at this time based on current evidence.

Should I get a booster now or wait for an Omicron-specific booster?

You should not wait for an Omicron-specific booster. While vaccine manufacturers have said they will be able to develop and deliver Omicron-specific boosters if they are needed, this will still take time. Furthermore, evidence suggests that broader and more robust antibody responses may be elicited by boosters, providing enhanced protection against variants. We and the [CDC](https://www.cdc.gov) recommend everyone to receive a booster shot to enhance your protection if at least 5 months have passed since completing your initial Pfizer (ages 12+) or Moderna (ages 18+) COVID-19 vaccine series or at least 2 months have passed since completing your initial J&J COVID-19 vaccine (ages 18+).

Are current diagnostic tests impacted by Omicron?

Per the [WHO](https://www.who.int) and [US FDA](https://www.fda.gov), widely-used COVID-19 PCR tests continue to detect infection, including infection with the Omicron variant. Manufacturers are engaged in ongoing monitoring to assess performance of their diagnostic tests against new variants; several manufacturers, including Abbott Laboratories, Becton Dickinson, ThermoFisher, Qiagen, and Lucira, have already made statements that their PCR and rapid antigen tests remain effective at detecting Omicron. The FDA is continuously monitoring authorized tests that may be impacted by the Omicron variant and provides additional detail regarding these tests [here](https://www.fda.gov). On 12/28/21, the FDA released a statement noting that authorized antigen tests do detect the Omicron variant, but may have reduced sensitivity. Studies are ongoing to determine whether other tests are impacted by the variant and to what extent.

How can I best protect myself against Omicron?

At this time, we and the CDC recommend you to get a COVID-19 vaccine booster to enhance protection if you are [eligible](https://www.cdc.gov). You should also consider exercising additional caution to protect yourself, your families, and friends from Omicron. [Prevention strategies](https://www.cdc.gov/ncidod/dvbid/coronavirus/prevention.html) include wearing a mask in indoor public spaces in areas with [substantial or high transmission](https://www.cdc.gov/coronavirus/2019-ncov/Transmission.html) and on public transportation if you are aged 2 and older, avoiding crowded and/or poorly ventilated spaces, practicing good hand hygiene, and maintaining physical distance from others, regardless of vaccination status. We also recommend continuing to follow all state and local public health guidance.

What should I be aware of if I engage in international business-related travel?

In light of the Omicron variant, many countries, including the US, have imposed travel restrictions. If you are planning to travel, you should still follow the news closely for any updates to travel restrictions, which could change quickly. If possible, we recommend that you avoid traveling to any international destinations on [CDC’s list](https://www.cdc.gov/travel/destinations). Regardless of vaccination status, all travelers should wear a mask, social distance, and practice good hand hygiene during travel. Furthermore, all travelers should self-monitor for symptoms for 14 days after travel and immediately isolate if any symptoms develop.