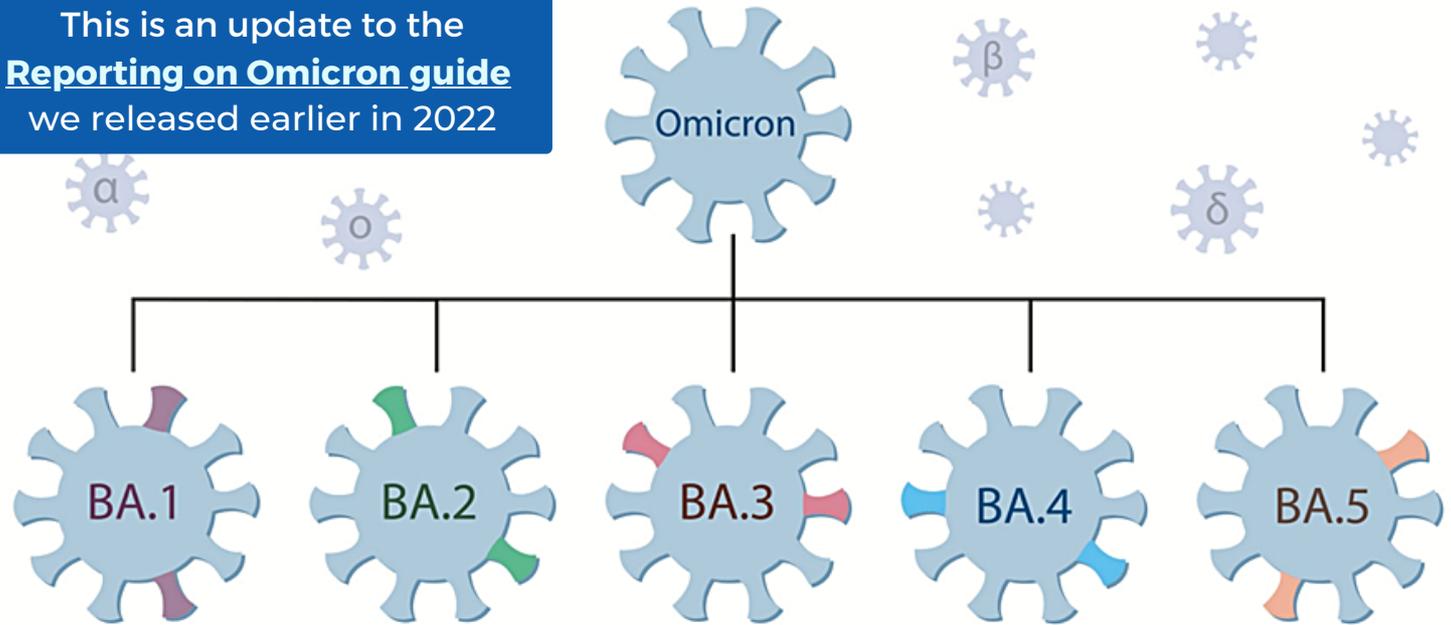




The Omicron variant and its subvariants: Making sense of them for your audiences

This is an update to the [Reporting on Omicron guide](#) we released earlier in 2022



Source: Johns Hopkins Bloomberg School of Public Health

What's in a name? What's in a number?

In late 2021, the Omicron variant of the SARS-Cov-2 virus that causes COVID-19 swept the globe. In 2022, Omicron continues to be dominant and it has also become known for its subvariants, from BA.1 – BA.5. While all variants have subvariants, this guide highlights why some of the Omicron subvariants have been in the news, or why they have significance, for example BA.2.12.1, which means it is the 12th lineage to branch off from BA.2.

In mid-August 2022, Omicron subvariants BA.4 and BA.5 are causing surging infections around the world.

One thing that has changed significantly from the early stages of the pandemic is that having COVID-19 multiple times is now likely. This virus continues to evolve, and the subvariants are better at escaping the antibodies conferred by vaccination or previous infections. They can better reinfect those who have had COVID-19 before. Avoiding infection has also become difficult because the virus has become increasingly transmissible.

The World Health Organization (WHO) depicts a grim picture:

“
We have said consistently that this virus will continue to evolve and we must be ready for whatever it throws at us. That could be a new version of the variants we already know or something completely new. We know that for any future variant to become widespread, it must be more transmissible than previous variants.
 ”

WHO Director-General Dr Tedros Adhanom Ghebreyesus, at a media conference in late July.

“But we can't know how deadly it will be. So all countries must be ready. Countries that have been dismantled some parts of the pandemic response systems are taking a huge risk,” Dr Tedros warned.



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Dr Devi Shridhar, a public health researcher at the University of Edinburgh, Scotland, reflects the WHO director-general's warning in her book *'Preventable – How a Pandemic Changed the World & How to Stop the Next One'*:

“

Most worrying, (is how) a variant (might) evade the protective immune response that vaccines (or infection) had provided for populations? It is unlikely that a variant would render a vaccine completely ineffective, but it could have enough immune-evasion to lower the effectiveness of vaccines, which would result in more severe 'breakthrough' infections – that is people getting ill with COVID-19 even after being fully vaccinated.

”

THE SUNDAY TIMES BESTSELLER

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Why is there an increase in infections?

Countries seem to be dropping most of their COVID-19 restrictions entirely and others adjusting them in tandem with local conditions, in the belief that the end of the pandemic now looks closer than ever, thanks to vaccines that are continuing to be effective at preventing severe illnesses and deaths from COVID-19. This has resulted in many people gathering freely and in large numbers in indoor spaces with much less mask wearing than in the earlier phases of the pandemic.

Some political parties and the business sector are saying 'we are over it, we need to move on' despite little evidence to support such thinking.

COVID-19 comes with gradients of risk due to new variants, continuously rising cases across the globe, varying levels of vaccinations across states and countries, and the uncertainty surrounding the long-term effects of infections.





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Back to how the virus mutated

The genetic evolution of the SARS-CoV-2 virus has been the subject of global attention among scientists.

It can be compared to a tree's branches growing and dividing into multiple smaller branches over time. Here, the trunk would be the original virus, initially named Wuhan (see: [Naming the new coronavirus – why taking Wuhan out of the picture matters](#)) for where it first came to scientists' attention.

With time, we got the first branch Alpha — a cluster of viral genomes with mutations that differed from the original strain. In a matter of months, other branches appeared in the form of new variants — all the way down the letters of the Greek alphabet. The Delta branch was significantly different from Alpha, and was dominant for a time till Omicron emerged and took over.

Since Omicron was first reported from South Africa in November 2021, several of its lineages have become dominant in different parts of the world.

When a set of sequences share certain mutations, they are called sublineages. Sublineages are like the thinner branches that arise from the branches of the tree.

The Omicron variant was first a family of three variants — BA.1, BA.2 and BA.3. Initially, BA.1 was circulating widely but was soon replaced by BA.2. This was when several countries were reporting their second wave of Omicron infections. After a few months, two more variants appeared — BA.4 and BA.5. These are sister lineages of BA.1 and BA.2, currently driving the rise of cases in several countries. Concurrently, the BA.2 branched out further, giving rise to thinner branches or subvariants, one of which is BA.2.75.

For now, the numbers of BA.2.75 sequences are still low, but the rapid increase suggests a growth advantage. This may fuel fresh reinfections and keep the pandemic going.



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Is BA.5 more infectious than measles?

The estimates of R_0 , the theoretical number of people each new case goes on to infect in a population with no immunity, are higher for the new variants that have emerged. The original Wuhan strain was estimated to have an R_0 of 3.3.

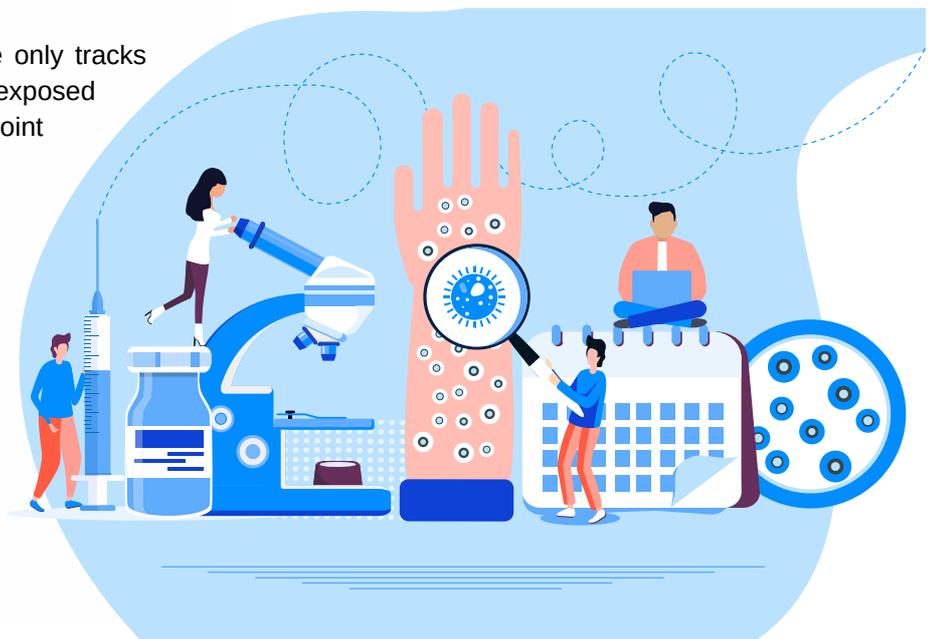
Delta's R_0 was estimated at 5.1, with an enhanced ability to reinfect people. For Omicron (BA.1) the R_0 rose to 9.5. Estimates from South Africa and Australia initially put the R_0 of BA.5 at 18.6 – alarmingly higher than measles, which has been considered the most infectious disease with an R_0 of 18.0. That calculation, however, has now proven to be misleading.

In a fact-check sent out by the [Associated Press](#) and [Reuters](#) experts said it would be difficult to accurately calculate the variants' infectiousness using R_0 , let alone compare it to other viruses, as the measure is only applicable to populations with no exposure to a virus, and does not account for prior infection or vaccination.

According to the AP fact-check, the R_0 value only tracks infection within a population that has not been exposed to the virus. Quoting experts it stated: "At this point in the pandemic, it is not a helpful measure of infectiousness."

"So it would be very difficult to accurately calculate the R_0 for the latest variants – and pointless to compare it with the R_0 value of other viruses such as measles," Christina M. Ramirez, a professor of biostatistics at the University of California, Los Angeles told AP. "We do not have this theoretical immune-naïve population to be able to get that head-to-head comparison. You're really trying to compare apples and oranges," she added.

With the emergence of each new variant, the task has become more challenging as the population's infection history (whether you've been infected before, when and how many times) makes interpretation of the data more and more difficult. [Revised calculations](#) by epidemiologists and biostatisticians in Australia put current best estimate for the R_0 for BA.5 in the range of 6-10, but the actual value remains uncertain.



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Is it possible to get COVID-19 more than once?

Yes, it is possible. As more variants emerge, including the BA.5 variant, reinfections become more likely because those variants can potentially evade the immune protection you already have. That means even if you were infected in 2020 with Delta or even Omicron BA.1, you can still get BA.5. Your previous immunity does not protect you from getting infected by the later variants.

The coronavirus spike protein is what the virus uses to infect human cells. Antibodies that you might develop after a previous COVID-19 infection have to bind to a really specific area of the spike protein to block the virus.

If the spike protein in subvariants keeps changing in significant ways through mutations, antibodies are not as able to do their jobs to protect you from infection. So, if more coronavirus variants emerge, that makes reinfections more likely.

Research suggests that with each repeat COVID-19 infection – even asymptomatic infection -- you increase your risk for complications including stroke, heart attack, [diabetes](#), [digestive and kidney disorders](#) and [long-term cognitive impairment](#), including dementia. Each reinfection also carries with it the risk of [Long COVID](#), a syndrome with ongoing COVID-19 symptoms that can last for weeks or months after infection.

How well do vaccines work against the subvariants?

A [study](#) out of Beth Israel Deaconess Medical Center of Harvard Medical School found that new Omicron subvariants BA.4 and BA.5 seem to evade antibody responses of people who are fully vaccinated and boosted, as well as people who had previous COVID-19 infections. However, vaccination appears to still offer significant protection against severe disease.

Laboratory studies consistently suggest that antibodies triggered by vaccination are less effective at blocking BA.4 and BA.5 than they are at blocking earlier Omicron variants, including BA.1 and BA.2. This could leave even vaccinated and boosted people vulnerable to multiple Omicron infections, scientists say. Even people with hybrid immunity, stemming from vaccination and previous infection with Omicron BA.1, produce antibodies that struggle to lock on to BA.4 and BA.5. Research teams have attributed that to the variants' L452R and F486V spike mutations.

Eric Topol, an American cardiologist, scientist, and the founder and director of the Scripps Research Translational Institute, in La Jolla, California puts it succinctly in a [blog post](#):

When the vaccines were first introduced in December 2020, the virus they were designed against was altogether different from what it is today. SARS-CoV-2 had little substantive functional evolution from late 2019 until we saw the Alpha variant in the first months of 2021. It was, in retrospect, an easy target with a fraction of the immune escape and transmissibility that we are dealing with now. Had the virus not subsequently evolved so profoundly, its containment would have been straightforward and we wouldn't be talking about a pandemic right now in the present tense. Breakthrough and reinfections wouldn't be commonplace.

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Why do we now need more innovative vaccines at this stage of the pandemic?

While vaccines have saved countless lives, they have not substantially reduced the spread of COVID-19. Innovation is needed to develop new vaccines that substantially reduce transmission, are easier to administer and give broader and longer-lasting protection.

Complete vaccine schedules, including booster doses as recommended by WHO, are an essential part of building immunity against virus strains circulating in communities worldwide. In the future, additional doses with current or updated vaccine products may be recommended if these are shown to meaningfully enhance protection.

The US government is planning on rolling out updated **Omicron-targeting booster shots** by the end of the year, specifically with a component of the BA.5 subvariant, which now accounts for 85 percent of infections. Even if some other Omicron sublineage becomes dominant by then, the shots could be a better match against what's circulating than the original formulation — and could help bolster protection against infection, and in turn act as a drag on transmission.

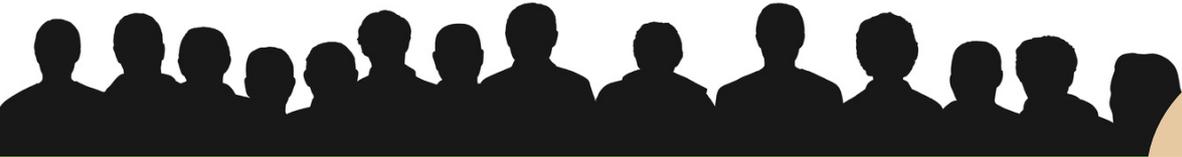


Scientists are also working on **nasal COVID-19 vaccines** that may stand a better chance of blocking infections and making people less contagious by working in the mucosa (the lining of the nose). Nasal vaccines are easy to administer in the form of a spray and offers a more palatable approach to immunity to those with a needle phobia.

A nasal vaccine will induce an immune response all over the body too, but it's actually concentrated in the upper respiratory tract where the COVID-19 virus, the SARS-COV2 virus, enters the human body, Dr Eric Topol and Dr Akiko Iwasaki point out in a recent editorial in [Science Immunology](#).

The prospects of a nasal COVID-19 vaccine candidate being accepted by the regulatory authorities in the US looks promising pending the results of late-stage clinical trials. There are at least 12 nasal vaccines that are in clinical development and four have reached Phase 3 randomized, placebo-controlled trials.

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How to advise your media audiences to defend themselves against the latest variants

1 Remind people that mask wearing can reduce the risk of transmission

Continually reminding people that the wearing of masks can help prevent transmission and protect vulnerable people, is one of the easiest things that journalists can do. We are in the midst of another COVID-19 wave driven by the highly contagious BA.4 and BA.5 variants, which have a mutation in the spike protein of the coronavirus that causes these variants to more easily attach to (and infect) people.

“Even small quantities of the virus floating around could infect you if you are not wearing a mask,” Dr Janak Patel, director of the Division of Infectious Disease and Immunology at the University of Texas Medical Branch, told the [HuffPost](#).

But scientists are still not clear how much the new COVID-19 subvariants are transmitted in outdoor settings.

At this point, the definition of outdoors isn't exactly agreed upon. For some people, a tented wedding is outdoors. For others, a restaurant with an open wall is outdoors. For the most cautious, a park or a hiking trail is the only truly outdoor space. It is important to remember that while the outdoors is considerably safer than many indoors spaces, the closer together people are in an outdoor space (and the more people there are), the more air people share with each other.

Therefore, to remain safe, it is imperative to wear a mask if you are in a jam-packed outdoor setting where you cannot appropriately socially distance from others.

2 Encourage your audiences to be up to date with their vaccines and boosters

Remind audiences that it is important to be up to date with their COVID-19 vaccinations and boosters. There is abundant evidence that being vaccinated and getting all of the boosters that you are eligible for helps protect you against severe disease.

Vaccination and booster doses strengthen protection. Though BA.5 can evade antibodies — the initial immune response that protects us from infection — prior infection and vaccination provide strong protection against severe outcomes.

Previous studies have looked at how vaccines and previous infections can protect against Omicron sub-variants, although the research was done before the rise of BA. 5.

A [study](#) published in *The New England Journal of Medicine* indicated that three doses of the vaccine provided better protection than two doses. Data from a study of people over age 50 from the US Centers of Disease Control similarly found that each additional dose boosts protection against infection.

Booster vaccinations increase antibodies quite a bit, which helps to overcome some of the virus' immune evasion. The most severe infections continue to be in unvaccinated people.

Public health authorities around the world are putting more of the responsibility for limiting viral spread on individuals. This is tough and introduces a special responsibility for journalists who need to give their audiences the information to help them make good decisions about their health.



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FURTHER RESOURCES

John Hopkins University:

[An Update on Omicron Subvariants](#)

Gavi:

[From Alpha to Omicron: Everything you need to know about SARS-CoV-2 variants of concern](#)

World Health Organization:

[Tracking SARS-CoV-2 variants](#)



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