What to know about Omicron XBB.1.5

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The Omicron subvariant XBB.1.5 rapidly spreading in the United States and Europe is the most transmissible SARS-CoV-2 strain to date, according to the World Health Organization (WHO). Meanwhile, a concerning surge in COVID-19 in China appears to be driven by subvariants BA.5.2 and BF.7.

"We are really concerned about the current COVID-19 epidemiological picture, with both intense transmission in several parts of the world and a recombinant subvariant spreading quickly," said WHO director-general Tedros Adhanom Ghebreyesus at a news conference.

What is XBB.1.5?

XBB.1.5 was first detected in the United States in October, where it has quickly overtaken other circulating strains. The subvariant evolved from XBB, a recombinant or fusion of two Omicron variants, which spread widely in Singapore and India this past fall.

XBB.1.5 now accounts for more than 40% of new COVID-19 cases in the U.S., including 75% of those in the northeast of the country, up from just 1.3% only a month ago. Hospitalizations are also trending upward, although it's still unclear how much that's related to the new subvariant versus recent holidays.

"We haven't seen a variant that's taken off at that speed," Pavitra Roychoudhury, director of COVID-19 sequencing at the University of Washington School of Medicine's virology lab, told *CNN*.

XBB.1.5 has since been identified in more than 25 countries, including Canada. As of mid-December, the federal government identified XBB.1.5 in 0.6% of about 1000 genomic tests conducted across the country.

However, because COVID-19 testing has dropped off in most jurisdictions, it's difficult to chart the spread of the new subvariant.

As of early January, the British Columbia Centre for Disease Control had detected at least five cases of XBB.1.5, while the health ministries for Alberta, Manitoba, and Ontario were unable to say whether the subvariant is circulating in those provinces.

XBB.1.5 hasn't shown up yet in wastewater testing in Canada's capital, but the overall prevalence of SARS-CoV-2 spiked over the holidays from 20% of the pandemic peak seen this time last year to nearly 50%, according to researchers at the University of Ottawa.

Is XBB.1.5 more contagious?

While data on XBB.1.5 are limited, the WHO says the new subvariant appears to have a marked "growth advantage" making it more transmissible than other circulating strains of SARS-CoV-2.

While XBB had a mutation that helped it evade immunity but hampered its ability to infect cells, XBB.1.5 has further evolved to bind more tightly to cells while continuing to dodge the body's immune defences, allowing it to spread more easily.

American scientists estimate that every person infected with XBB.1.5 will pass it on to 1.6 other people — an effective reproductive rate that's roughly 40% higher than the next most contagious variant.

Newer Omicron variants also attach to cells in the upper airways versus deeply in the lungs, meaning the virus doesn't need to travel as far to cause infection, according to B.C. Provincial Health Officer Bonnie Henry.

Is XBB.1.5 more dangerous?

Like the United States, B.C. has seen a recent uptick in hospitalizations due to COVID-19, but Henry told reporters this is due to more people being infected rather than a more virulent strain.

So far, XBB and its sublineages don't appear to cause more severe disease than other Omicron variants. But as a more transmissible and immune evasive strain, XBB.1.5 could still drive increases in hospitalizations and deaths as more people overall are infected and reinfected.

Do vaccines and treatments work against XBB.1.5?

Early research suggests XBB and its sublineages are more immune evasive than other variants, undercutting the protection provided by vaccines, past infections, and antibody treatments.

In one small study of 35 people published in the *New England Journal of Medicine*, neutralizing antibody levels against newer Omicron subvariants including XBB were 12 to 26 times lower than for the original strain of SARS-CoV-2 in people who had received a bivalent booster. However, the bivalent booster still appeared to offer some benefit, as neutralizing activity was even lower in people who had not received the updated vaccine.

In another recent study, researchers at Columbia University tested BQ and XBB subvariants against 23 monoclonal antibody treatments, as well as antibodies from people who previously had COVID-19, those who received the original and bivalent vaccines, and those who were both previously infected and vaccinated.

The results, published in *Cell*, showed that both BQ and XBB subvariants are "completely resistant" to current monoclonal antibody treatments and demonstrate a dramatically increased ability to evade neutralizing antibodies, even in people who received the bivalent mRNA booster.

XBB.1 particularly showed alarming levels of immune evasion, according to study lead David Ho. That subvariant was 49 to 63 times less likely to be neutralized

by antibodies in the blood of previously infected and vaccinated people compared to older strains — and XBB.1.5 is just as evasive, Ho told *CNN*.

Even so, the bivalent vaccine still provides protection against serious illness and death. "The most recent data we have show that for those who have the bivalent vaccine, they have a threefold lower risk of dying than those who don't," Ho said.

And although monoclonal antibody treatments are no longer effective against the new Omicron subvariants, antiviral treatments such as nirmatrelvir/ritonavir and remdesivir should still work.

Meanwhile, wider use of rapid tests and masks, as well as better ventilation and air filtration in public indoor settings, could help to reduce the risk of transmission.

"These are the measures we're going to need to take long term. If we do that for this variant and the next one to come, we will be in a good position," infectious disease specialist Brian Conway told *CBC News*.

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