

Can the Endemic Turn Pandemic with the Return of Vaccine Resistant Sub-Variants?

We are now in what some have considered the endemic – a time following the pandemic where the virus is still around consistently, but it is not affecting our daily lives. However, others are warning that we shouldn't get too comfortable. Subvariants are threatening a comeback, and unfortunately studies show that the current vaccinations are no match for them.

New [research](#) from Qian Wang, PhD, and colleagues predicts that the most common strains we will see in COVID infections this winter are four Omicron subvariants (BQ.1, BQ1.1, XBB, and XBB.1) of the virus that causes COVID-19 and these four subvariants are the most resistant to neutralizing antibodies. These subvariants are successfully replacing the subvariant that we have grown some immunity to over the last year, BA.5, which now accounts for only about 10% of cases. Essentially, even if you have been vaccinated multiple times, boosted, and had COVID-19, you may have little to no protection against these new variants of the virus. On a more positive note, although these subvariants are more likely to cause breakthrough infections, the vaccines have been shown to remain effective at preventing hospitalization and severe disease from omicron, the scientists wrote.

We are not out of the woods just yet, as Wang and colleagues also tested monoclonal antibody drugs against the four subvariants, which all performed well against the original Omicron variant, but found that 19 of these 23 monoclonal antibodies lost effectiveness “greatly or completely” against XBB and XBB.1.

Now the question on everyone's minds is are we going to see a repeat of COVID 2020? Although we can't say for sure, that level of widespread sickness is unlikely as we now are much more prepared. What we do know is that entirely new vaccinations are needed to protect against these new strains, and fortunately, some are in the works now.

When these vaccines are ready for mass distribution some pockets of the country, especially in rural America may be wondering if these subvariants will disproportionately affect them again, and if vaccines will make it to them in time. Due to the vaccination's current cold storage and transportation requirements, many of the local hospitals can't store and distribute the vaccines, forcing 20% of our population that makes up rural America, having to travel long distances just to get vaccinated.

Many rural health facilities do not have expensive, industrial freezers that can reach cold enough temperatures required to maintain the vaccines. Temperatures are required to be between -50°C and -15°C (-58°F and 5°F) for the Moderna vaccine and between -90°C and -60°C (-130°F and -76°F) for the Pfizer vaccine until expiration date. Additionally, these freezers must have enough storage space. Some of the vaccines ship in large batches, which are difficult to store until all are distributed.

Additionally, patients must receive both doses of these vaccines, requiring them to return to the facility, which again may be a long distance from their home.

Fortunately, there may be vaccine options with less stringent cold chain requirements, giving rural America more access to vaccines, potentially right in their own homes. With 12 [nasal vaccines](#) in clinical development and four reaching phase three of clinical trials, it is very likely that we may be seeing nasal vaccines in our near future, even with these new subvariants. With nasal vaccines immunization can be provided quickly, effectively, and safely by anyone, including the patients themselves. Since the vaccine can survive in ambient temperatures, it is easier to transport and store than the intramuscular COVID vaccines. Comparatively, the nasal vaccine can be stored at 39 °F (-4 °C) but survives at room temperature. [Phase change material](#) cold packs used in a thermal carrying tote can create an environment for nasal vaccines to travel at precisely the required temperature to ensure vaccine efficacy upon arrival to its destination and avoid [vaccine wastage](#).

Despite the concern of subvariants, science is prepared to fight back.

1. Wang, Q., Iketani, S., Li, Z., Liu, L., Guo, Y., Huang, Y., Bowen, A. D., Liu, M., Wang, M., Yu, J., Valdez, R., Luring, A. S., Sheng, Z., Wang, H. H., Gordon, A., Liu, L., & Ho, D. D. (2022). Alarming antibody evasion properties of rising SARS-CoV-2 BQ and XBB subvariants. Cell. <https://doi.org/10.1016/j.cell.2022.12.018>

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