

# PANTHR COVID-19 Response: SARS-CoV-2 Omicron Variant



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## OVERVIEW

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the virus that causes coronavirus infectious disease 2019 (COVID-19). As with other viruses, coronaviruses naturally mutate over time, leading to virus variants that may have different characteristics.

The SARS-CoV-2 Omicron variant (B.1.1.529) emerged in South Africa in November 2021,<sup>1</sup> and has since spread to at least 27 countries and territories.<sup>2</sup> On December 1, 2021, the U.S. confirmed its first COVID-19 case with the Omicron variant.<sup>3</sup> Preliminary information from South Africa indicates that there are no unusual symptoms associated with Omicron and that some individuals are asymptomatic.<sup>4-6</sup>

Early reports suggest that the Omicron variant is more transmissible than other variants (e.g., Delta).<sup>7</sup> Given a high number of mutations in the viral spike protein, it is anticipated that Omicron will be resistant to the antibodies produced by the currently authorized vaccines or prior infection and may lead to a higher rate of infection or reinfection,<sup>8-9</sup> but confirmation is needed.

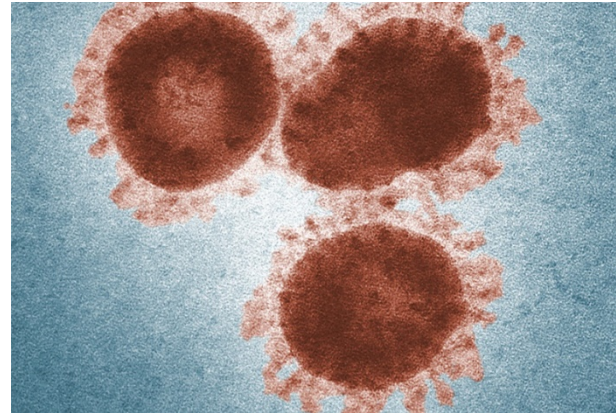
## TRANSMISSIBILITY

As of November 25, 2021, the effective reproduction number ( $R_e$ ), defining the average number of new infections caused by a single infectious individual, was 1.47 for South Africa nationally, where the Delta variant is dominant, but 1.93 in the Gauteng province, which is dominated by the Omicron variant.<sup>7</sup>

Mutations in the spike protein furin cleavage site may be linked to higher transmissibility.<sup>10-13</sup> The European Center for Disease Control recommends that existing non-pharmaceutical interventions, such as masks and social distancing, be maintained or reintroduced, even in countries with high vaccination levels.<sup>14</sup>

## VACCINES & MEDICAL TREATMENTS

The exact impact of the Omicron variant on vaccine efficacy is unknown, but the mutation profile of the spike protein, which is what the antibodies recognize, has been determined<sup>15</sup> and suggests reduced antibody recognition. Tests are underway to determine vaccine effectiveness, with results expected in mid-December.<sup>15-16</sup>



Several sequence mutations observed in Omicron have been associated with increased transmissibility and immune escape.<sup>14</sup>

Moderna is currently testing booster candidates against the Omicron variant, including two that were designed against Beta and Delta variants which have some of the same mutations as Omicron. They are also designing a new booster candidate specifically against Omicron which they anticipate will be ready in three months.<sup>17</sup>

There are currently no data suggesting this variant is resistant to any current COVID-19 treatments. Experimental research is in progress to understand the capabilities.

## KEY KNOWLEDGE GAPS

Currently, there are important gaps in our understanding of the Omicron variant:

- Ability to infect previously infected and vaccinated individuals
- Transmission rates in unvaccinated and vaccinated populations
- Clinical disease severity in patients of different ages and with different comorbidities
- Vaccine efficacy

## S&T/PANTHR NEXT STEPS

- Coordinate response through established relationships with research partners
- If needed, execute laboratory research to close key data gaps
- Continue to update the Master Question List for COVID-19, including updates for emerging variants



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Other aspects of the Omicron variant are either presumed or confirmed to agree with those of previously identified SARS-CoV-2 strains. Additional information can be found in the [DHS S&T Master Question List \(MQL\) for COVID-19](#), as well as the [Supplemental Reference for the Omicron Variant](#).

## REFERENCES

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