Omicron Variant: What do we know about it?

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A new variant of SARS-CoV-2 was reported to the World Health Organization (WHO) on 24Nov2021. This variant was first detected in South Africa and named the Omicron variant (lineage B.1.1.529). Subsequently, this variant was classified as a variant of concern (VOC) by the WHO. This variant has spread rapidly in several countries and is now spreading in the US. The first confirmed US case of Omicron was identified on 1Dec 2021 and was confirmed in Nebraska by the Nebraska Public Health Laboratory (NPHL) on 3Dec2021. The Department of Health and Human Services, and the Nebraska Public Health Solutions detected six cases of the Omicron variant in Nebraska at that time which originally represented the largest known cluster in the US. By 22Dec2021, 48 states have now identified the Omicron variant. See Figure 1.

The Omicron variant encodes around 50 mutations not seen in combination associated with the other variants. At least 30 of these mutations are located in the gene for the spike protein, which is used by the virus to attach to human cells for cell entry. These mutations allow for the Omicron variant to spread more easily than the original SARS-CoV-2 and studies now suggest that this virus is 3-4 times more transmissible than the Delta variant. Additionally, this variant is noted to be associated with a high viral load, even in individuals who are asymptomatic thus allowing for the increased spread of the virus to others.

Early results have suggested that the Omicron variant results in a less severe infection compared to other SARS-CoV-2 variants. However, one concern is the variant's effect on young children. A study from South Africa reported that a higher number of hospitalizations was noted for children under 2 suggesting that the Omicron variant might be of greater risk to young children. Additionally, due to the presence of a high number of mutations in the spike protein, there is a concern that the COVID-19 vaccines against this viral variant may not be as effective. The CDC suggests however that vaccines are expected to have protection against severe infections and hospitalizations caused by the Omicron variant. Other studies however have shown that the Omicron variant can escape the immune response in some earlier vaccinated people (what is now called immune evasion) therefore, scientists are recommending booster doses of the vaccines.

What is NPHL doing to detect the Omicron variant?

NPHL continues to be a leader in the fight against SARS-CoV-2 to provide diagnostic testing along with sequencing to identify mutational changes in the virus. NPHL provides diagnostic testing using the multiplex CDC real-time RT-PCR assay to test for both COVID-19 and the influenza viruses. Results for this initial testing are generally available within 24 hours after the specimen is received in the laboratory.

Subsequently, COVID-19 positive specimens that meet the criteria are sequenced for the detection and characterization of the Omicron variant and other variants. NPHL perform whole genome sequencing using the Clear Labs next generation whole genome sequencer with a turnaround time of about 24 hours. The results of testing are then provided to epidemiologists who are monitoring the spread of the virus within our state. NPHL also participates in the National SARS-CoV-2 Surveillance (NS3) program in collaboration with other public health laboratories and the CDC, as a means to monitor the spread of these viral variants in the US.

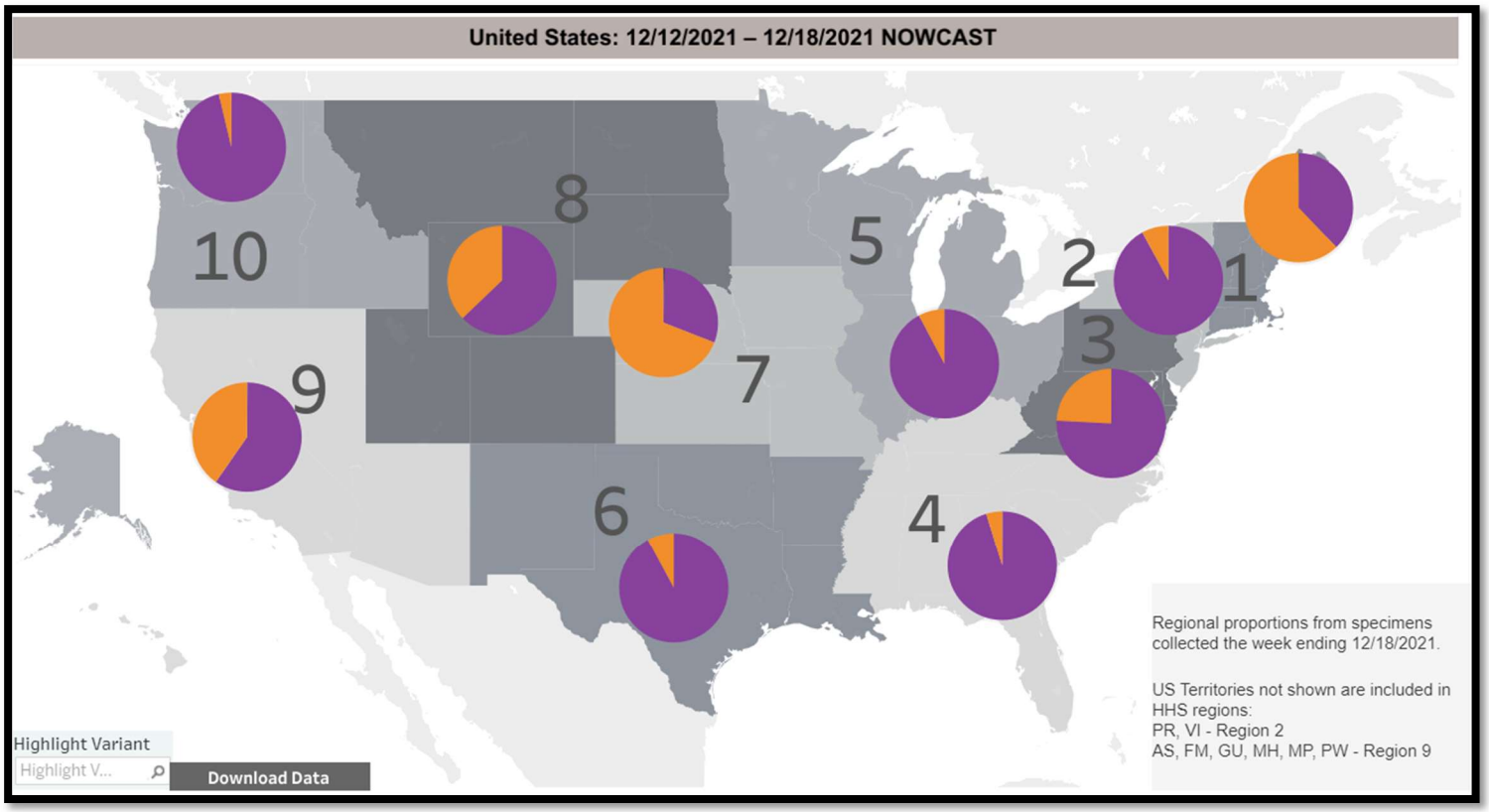

Figure 1 https://covid.cdc.gov/covid-data-tracker/#variant-proportions