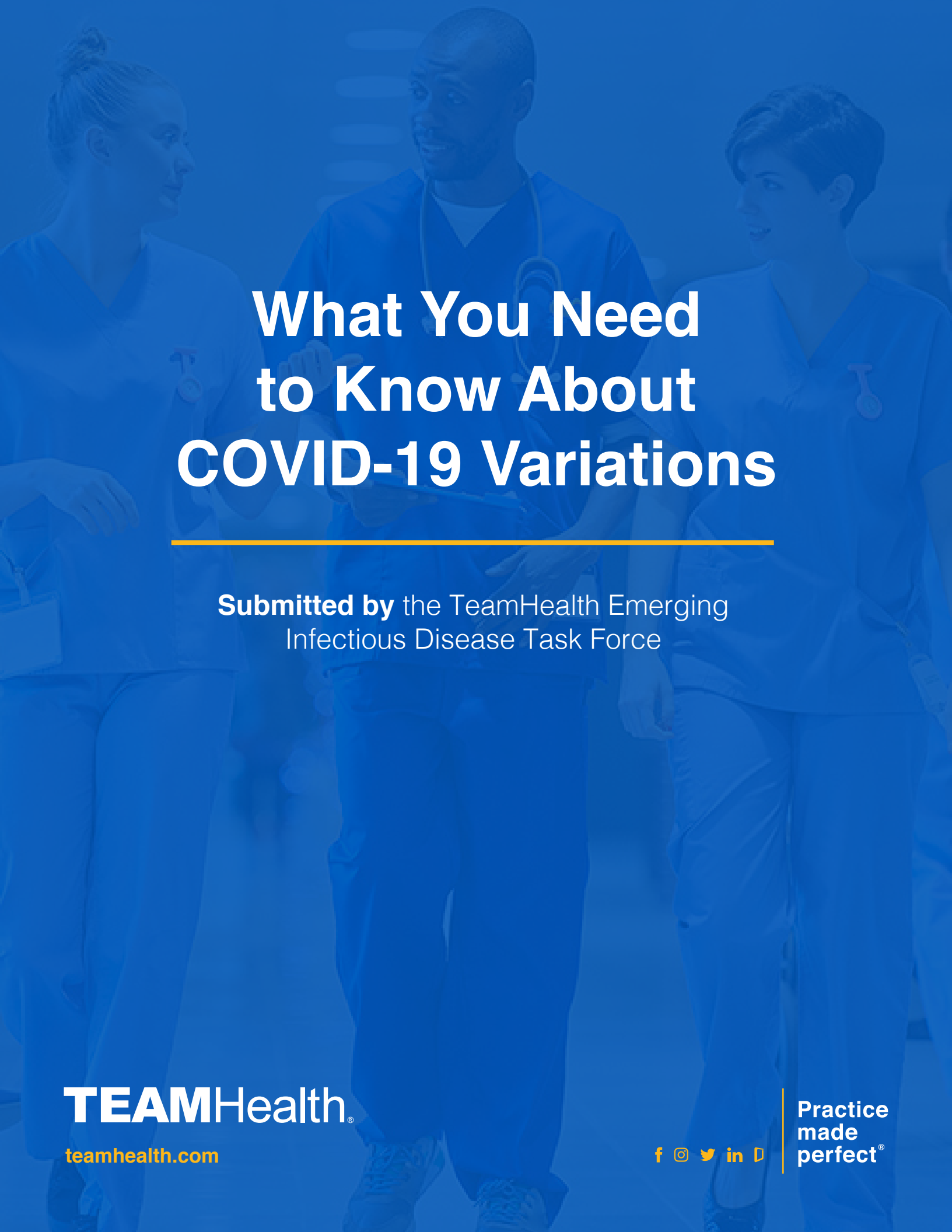

What You Need to Know About COVID-19 Variations

Submitted by the TeamHealth Emerging Infectious Disease Task Force

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What is the Difference Between a "Mutation" and "Variant?"

A mutation is a change in the genetic sequence of the virus. The mutation may do nothing, or it may significantly impact the function of the virus.

A variant is a group of viruses that have one or more specific mutations that differentiate them from other variants in circulation. The mutation or combination of mutations can alter the ease of transmission, severity of disease, lethality, or any of a number of other factors about the virus.

Monitoring for Mutations and Variants

COVID-19 viral variants are monitored by surveillance systems in the United States and globally. The United States Department of Health and Human Services recently organized the *Sars-CoV-2 Interagency Group* (SIG) to head up U.S. efforts regarding SARS-CoV-2 viral variants. The SIG has organized these variants into three classifications (Variant of Interest, Variant of Concern and Variant of High Consequence).

1) Variants of Interest

A variant of interest has one or more mutations that **might** alter receptor binding, reduce the virus sensitivity to antibodies from previous infection or vaccination, reduce medical treatment effectiveness, alter diagnostic test accuracy or cause a predicted increase in transmissibility or illness severity.

B.1.526 – This variant was detected in New York in November of 2020. It may decrease antibody effectiveness, but otherwise has not demonstrated other worrisome properties.

B.1.525 – Also detected in New York in December of 2020. It also may decrease antibody effectiveness and is similar to the B.1.526 variant mentioned.

P.2 – This variant was detected in Brazil in April of 2020. It may have the capacity to decrease antibody effectiveness from any source, including monoclonal antibody treatments. It is spreading slowly and, as with the other variants, is being monitored.

2) Variants of Concern

A variant of concern **has evidence** of mutations that increase transmissibility, disease severity, reduced antibody neutralization from previous infection or vaccination, reduced treatment effectiveness of both medications and vaccines, or diagnostic test failures.

B.1.1.7 – The B.1.1.7 variant detected in the United Kingdom September 2020, has about a 50% increased transmission rate. It results in increased disease severity causing somewhat elevated rates of hospitalization and mortality. Fortunately, there is little impact on antibody neutralization from vaccines, prior infection or monoclonal antibody therapy. This variant is present in the United States.

P.1 – The P.1 variant was detected in Japan and Brazil in January 2021. It has a moderate impact on neutralization from monoclonal antibody therapeutics and probably vaccines as well. It appears in the United States, but does not seem to be spreading rapidly at this time.

B.1.351 – The B.1.351 variant, commonly called the "South African" variant, was first detected in December 2020. It has at least a 50% increased transmission over previous variants with a moderate impact on neutralization by monoclonal antibodies and vaccines. There is also decreased protection in people having had a prior infection with the standard Wuhan variants. There are cases of this variant in the United States and it has spread widely in Europe.

B.1.427 – B.1.427 was detected in California starting in September 2020. It has since rapidly increased in the frequency of samples tested to over 50% as of the current time. It has about a 20% increased transmissibility and a significant impact on neutralization by some, but not all, EUA therapeutics. Fortunately, there is only a moderate reduction in neutralization from the current vaccines.

B.1.429 – The B.1.429 variant is another California detected virus found in July 2020. It has almost exactly the characteristics of the B.1.427 variant.

3) Variants of High Consequence

A variant of high consequence **has clear evidence** that prevention measures (such as public health or vaccines) or medical countermeasures are significantly less effective when compared to previously circulating variants.

There are currently no known variants of High Consequence known globally. Surveillance is continuing.

References

1. CDC Variant Proportions in the USA
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4. TeamHealth Video. Mutation and SARS-CoV-2
5. TeamHealth. Mutation and SARS-CoV-2