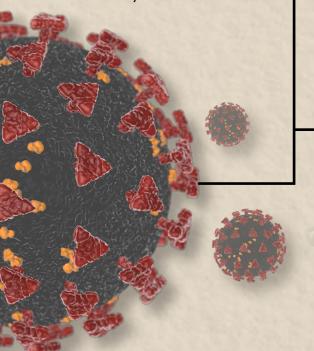
THE COVID-19 VARIANTS

WHAT YOU SHOULD KNOW

Written by Amir Arellano Saab Designed by Katrina Hass

A variant virus is a virus that has developed a mutation in its genetic sequence, resulting in physical changes to its protein structures, and ultimately its behaviour.



Although the word *mutation* can sound scary, it simply describes the virus as being different from the original strain. Viruses mutate naturally all the time! Mutations can make the virus stronger, weaker, or have no effect at all.



B.1.1.7.
DISCOVERED IN THE UK

N501Y

Genetics

This variant accumulated 17 mutations in a very short time. One of the important mutations is **N501Y**, found on the Spike protein of the virus. This mutation improves how the Spike protein binds to human cells. Essentially, this mutation makes the COVID-19 virus more "sticky" to human cells.

Concern.

Spreads 50% more easily and quickly

B.1.351.

DISCOVERED IN SOUTH AFRICA

N501

E484K

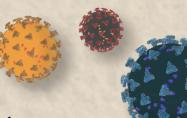
K417N K Genetic seq

In addition to N501Y, mutations K417N and E484K are also found on the Spike protein of this virus, specifically on the Receptor Binding Domain (RBD). Our body's immune system detects the virus through its RBD. These mutations alter the shape of the RBD, therefore "hiding" the virus from our immune system.

Concern

- Spreads more easily and quickly
- Better at evading our immune system

SHOULD YOU BE CONCERNED ABOUT THE NEW VARIANTS?



Here are the facts, based on available data:

While the variants spread more easily and quickly (they are more contagious) than the original strain, they are NOT more deadly. However, they can result in more COVID-19 cases, leading to more hospitalizations, and potentially more deaths.

PCR tests (the gold standard in COVID-19 testing) can still detect the new variants.

Early studies show that Pfizer and Moderna vaccines are effective against the variant, but their effectiveness may be reduced.

REFERENCES

- Rambaut A., et al. A dynamic nomenclature proposal for SARS-CoV-2 lineages to assist genomic epidemiology. Nature Microbiology, 2021
- Hodcroft E., et al. Emergence and spread of a SARS-CoV-2 variant through Europe in the summer of 2020. medRxiv, 2020.
- Starr T., et al. Deep Mutational Scanning of SARS-CoV-2 Receptor Binding Domain Reveals Constraints on Folding and ACE2 Binding. Cell, 2020
- Greaney A., et al. Complete Mapping of Mutations to the SARS-CoV-2 Spike Receptor-Binding Domain that Escape Antibody Recognition. Cell Host & Microbe, 2021.
- Starr T., et al. Prospective mapping of viral mutations that escape antibodies used to treat COVID-19. Science, 2021.
- Cele S., et al. Escape of SARS-CoV-2 501YV2 variants from neutralization by convalescent plasma. medRxiv, 2021.
- Wang P., et al. Increased Resistance of SARS-CoV-2 Variants B.1.351 and B.1.1.7 to Antibody Neutralization. bioRxiv, 2021.
- Horby P., et al. New and Emerging Respiratory Virus Threats Advisory Group note on B.1.1.7 severity. Proceedings from the United Kingdom Department of Health and Social Care, 2021.

SO, WHAT CAN YOU DO?

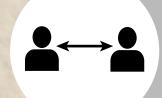




WASH YOUR HANDS







PHYSICALLY DISTANCE FROM OTHERS

The COVID-19 vaccines are becoming more available around the world. These vaccines are a clear example of the great effort and collaboration between thousands of scientists who have tested, re-tested, and tested again their safety and efficacy. When it is your turn, get the shot! You will not only be protecting yourself but also the members of your community.

New variants are more likely to appear with more COVID-19 cases, so it is up to us to prevent further spread of the virus!

For more information on the science behind COVID-19, visit **sciforall.org**

