

Classifications of Variants in COVID-19

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About the Study

The novel coronavirus disease (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), still remains a global challenge. Genetic variations of SARS-CoV-2 have been developing and spreading across the world throughout the COVID-19 pandemic. SARS-CoV-2 is highly contagious, so application of preventive methods, sensitive diagnostic approaches, and using current available drugs was initially practiced till the development of novel treatment. Only real-world experience can offer answers on the effectiveness of COVID-19 vaccinations against disease and mortality from SARS-CoV-2 variations without immunological correlates of protection.

The sequence-based monitoring as well as laboratory research and epidemiological studies routinely monitors viral mutations and variations. The three classes of SARS-CoV-2 variants developed by a US government interagency group effectively classify the variants as:

Variant of interest

Variation of particular genetic markers linked with alterations in receptor binding, reduced neutralization by antibodies generated against previous infection or vaccination, reduced therapeutic effects, potentially diagnostic impacts, or anticipated increased transmissibility or severity of disease. Possible attributes of a variant of interest include specific genetic markers expected to impact transmission, diagnosis, therapy, or immune escape or based on the confirmation that an increasing proportion of cases or distinct clusters of outbreaks occur.

One or more relevant measures on public health may be necessary for a variant of interest, such as improved sequence surveillance, enhanced laboratory characterization or epidemiological surveys for an assessment of how easily the virus spreads, the severity of the disease, therapeutic efficacy and the protectiveness of current vaccines.

Variant of concern

A variant for which an increasing level of transmissibility or more severe disease has been demonstrated (e.g. increased hospitalisation or

death), a significant reduction in neutralization by antibodies generated during previous infection or vaccination, decreased treatment or vaccine effectiveness or diagnostic detection failure.

Possible attributes of a variant of concern in addition to the possible attributes of a variant of interest include Evidence of impact on diagnostics, treatments, or vaccines, increased transmissibility, increased disease severity with widespread interference with diagnostic test targets. Evidence that one or more treatment classes are significantly less susceptible.

Variants of concern may require one or more appropriate public health actions, such as notification of the vaccine effectiveness and vaccine therapy to WHO in accordance with International Health Regulations, reporting to the CDC, local or regional spread control efforts, increased testing or research against the variant. Additional considerations may include the development of new diagnostics or the modification of vaccines or treatments based on the characteristics of the variant

Variant of high consequence

A variant with high consequences provides clear evidence of considerable reduction in the effectiveness of preventive measures or medicinal countermeasures (MCMs) relative to previously circulating variants.

Possible attributes of a variant of high consequence in addition to the possible attributes of a variant of concern include the Impact on Medical Countermeasures involving the demonstrated failure of diagnostics, Significantly reduced susceptibility to multiple Emergency Use Authorization (EUA) or approved therapeutics and the evidence of a substantial decrease in vaccination efficacy, a disproportionately large number of vaccine breakthrough cases, or extremely poor vaccine-induced protection against severe illness.

The variant of high consequence would involve notifying the WHO under the International Health Regulations, reporting to the CDC, announcing transmission prevention or control methods and updating therapies and vaccinations.