ISSUE BRIEF 2021

Emergence of new SARS-CoV-2 Variants of Concern: Should Kenya Review its Port of Entry Requirements for International Travelers?

What are variants of concern?

Virus variants of concern refer to new strains that are perceived to possess more dangerous epidemiological or immunological or pathogenic properties. Late in December 2020, two SARS-CoV-2 variants of concern were identified. One had arisen in South Africa (now reported in a further 10 countries) and the other in the United Kingdom (now reported in a further 48 countries) as of 12th January 2021.

What are the known characteristics of the current SARS-CoV-2 variants of concern?

The current SARS-CoV-2 variants of concern appeared to be rapidly spreading and displacing other SARS-CoV-2 genetic variants in their countries of first identification1,2. The United Kingdom variant was reported to have up to 70% higher transmissibility compared to other variants1. The South African variant was suspected to be efficient in immune escape i.e. evading acquired host immunity to initiate reinfection or get transmitted to a fresh host3. The two variants of concern have been reported to have similar virulence (pathogenicity) properties as the original SARS-CoV-2 strain i.e. do not result to more severe disease4. Most of the genetic changes in the two variants of concern affect the spike region of the SARS-CoV-2 genome. The specific changes found in the United Kingdom variant have been shown to prevent some diagnostic kits targeting this region from successful identification of infected persons in what has been termed as "Spike gene dropout" or "Spike gene target failure." Fortunately, preliminary data suggest that current vaccines (Pfizer for example) are still effective against the two variants of concern5. However, more scientific data on the characteristics of these two variants are needed to justify the need for additional control measures beyond those currently in place.

Priority actions

1. Additional control measures targeting individuals coming from the United Kingdom, South Africa, and other countries where the new SARS-CoV-2 variants have been identified are not necessary at this point in time

2. The current requirement for presentation of a COVID-19 negative certificate for all individuals coming into Kenya and screening of individuals for signs and symptoms of COVID-19 upon arrival should be maintained

3. Individuals presenting with signs and symptoms consistent with COVID-19 on arrival should be immediately quarantined and given a SARS-CoV-2 diagnostic test

4. The Ministry of Health should integrate genomic surveillance into current SARS-CoV-2 surveillance protocols to enable the identification of variants of concern

*Photo courtesy of Kenya Airports Authority (KAA)

Key findings

1. Control tools for all SARS-CoV-2 strains are currently identical. Therefore, more effort should be put into strengthening existing strategies rather than initiating additional new ones

2. Lack of comprehensive sequencing data from Kenya for October-January 2021, means we cannot rule out that these variants are already circulating in Kenya

Implications for Kenya's COVID-19 response

Identification of variants of concern is partly dependent on the amount of effort put into characterizing new SARS-CoV-2 positive patients through genomic sequencing. Thus, although Kenya has not identified any variant of concern, we cannot rule out that variants of concern have already been introduced to or independently arisen in the country. Therefore, new rules are unlikely to have a significant impact on control of variants of concern. Initiating new measures targeting individuals from South Africa, United Kingdom and other countries where these variants have been found could strain existing government resources with limited or no added public health benefit. However, emergence and circulation of new variants of concern in Kenya should be closely monitored as they may have implications on diagnostics, transmission, observed severity of disease and vaccine effectiveness requiring a review of the overall surveillance program. For the moment, we recommend against using diagnostics kits that target the spike region alone to determine a patient's SARS-CoV-2 acute infection status. But monitoring changes in the spike region using available tools e.g. by PCR and sequencing analysis would be important to identify possible escape mutants from current vaccines and those under development . Observation of inconclusive results on PCR testing could be attributed to variants of concern. This would necessitate continued vigilance and updating of diagnostic protocols used in the country. In addition, genomic surveillance among recent arrivals, would enable the Ministry to detect new variants of concern before they result in a widespread epidemic. We recommend targeted surveillance of SARS-CoV-2 variants across the full spectrum of COVID-19 clinical presentation (asymptomatic, mild, moderate and severe symptoms), those with long COVID-19 and deceased persons who tested positive for COVID-19 to document any role of specific variants in observed disease outcome.

Reference:

1. Leung, K., Shum, M. H., Leung, G. M., Lam, T. T. & Wu, J. T. Early transmissibility assessment of the N501Y mutant strains of SARS-CoV-2 in the United Kingdom, October to November 2020. Euro Surveill 26, doi:10.2807/1560-7917.Es.2020.26.1.2002106 (2021).
2. Houriiyah Tegally et al. Emergence and rapid spread of a new severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2) lineage with multiple spike mutations in South Africa. medRxiv, doi:https://www.medrxiv.org/content/10.1101/2020.12.21.20248640v1 (2020).
3. Greaney, A. J. et al. Comprehensive mapping of mutations to the SARS-CoV-2 receptor-bindingdomain that affect recognition by polyclonal human serum antibodies. bioRxiv, doi:https://www.biorxiv.org/content/10.1101/2020.12.31.425021v1 (2021).
4. Davies, N. G. et al. Estimated transmissibility and severity of novel SARS-CoV-2 Variant of Concern 202012/01 in England. doi:https://www.medrxiv.org/content/10.1101/2020.12.24.20248822v1 (2020).
5. Xie, X. et al. Neutralization of N501Y mutant SARS-CoV-2 by BNT162b2 vaccine-elicited sera. bioRxiv, doi:https://www.biorxiv.org/content/10.1101/2021.01.07.425740v1 (2021).

Contacts

This brief has been prepared by Charles Nyaigoti, Fatma Guleid, Edwine Barasa, Ambrose Agweyu, John Kiiru, Omu Anzala and Benjamin Tsofa.

For further information contact Dr Benjamin Tsofa: Btsofa@kemri-wellcome.org or Prof Omu Anzala: anzalaomu@gmail.com

KEMRI | Wellcome Trust

KENYA MEDICAL RESEARCH INSTITUTE KEMRI

UNIVERSITY OF NAIROBI
KAVI Institute of Clinical Research

REPUBLIC OF KENYA
MINISTRY OF HEALTH