Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Challenges of SARS-CoV-2 genomic surveillance in Africa

In the early days of the COVID-19 pandemic in Africa, Christian Happi, Director of the Africa Centre of Excellence for Genomics of Infectious Diseases told *The Lancet Microbe* that the only way the continent could avoid viral genomic mutations and the emergence of SARS-CoV-2 variants that could complicate the response in Africa would be to quickly break the transmission of the virus. About a year later, he attributed the emergence of clinically relevant mutations and Africa-wide spread of new variants of concern to inadequate enforcement of public health safety measures.

South Africa, the country where the 501Y.V2 (B.1.1135) SARS-CoV-2 variant of concern emerged, has moved on to administering the Johnson & Johnson COVID-19 vaccine, which has been shown to be more effective against this strain of the virus than the Oxford-AstraZeneca vaccine, but 501Y.V2 has already spread to several other countries. Nevertheless, WHO, the Africa Centres for Disease Control and Prevention (CDC), and several African health ministries and agencies continue to advocate for countries in the continent to still roll out the Oxford-AstraZeneca vaccine, on the basis that there is insufficient data to show that the strain is prevalent elsewhere.

In December, 2020, WHO enjoined African countries to boost genomic surveillance through the African genome sequencing laboratory network to detect any new mutations and strengthen the efforts to curb the pandemic. Under this arrangement, laboratories that have sequencing capacity will also receive and process samples from countries that lack such capacity. This collaborative approach was made necessary by the uneven and scarce availability of genomic sequencing capabilities across the continent.

South Africa is one of the countries that are helping other African nations to sequence SARS-CoV-2 genomes for surveillance purposes. At the South African National Bioinformatics Institute, Peter van Heusden and other bioinformatics experts are analysing viral genomic data from both South Africa—thus enabling the country to make informed public health decisions—and other nations. He said, however, that the network is not yet fully established. "Lots of effort being put in, lots of distance to cover", he told *The Lancet Microbe*.

This challenge isn't unexpected, according to van Heusden, as laboratories that are meant to support several countries are also dealing with their own difficulties. "The Gambia's sequences deposited recently include six from early February, three from January, and then a bunch from October last year. Kenya did a big data release in mid-February of a lot of January sequences. But this stuff all needs to get more regular. The most recent ones from DR Congo are from June last year, deposited in October", he said.

John Nkenkasong, Director of Africa CDC, told *The Lancet Microbe* that the goal is for Africa to have contributed 50 000 genomic sequences to the global database by the end of 2021, and the way to do this is to encourage and enable more countries and centres on the continent to do so. Towards this goal and to provide insights into the state of the pandemic in Nigeria Happi said his laboratory is sequencing 20% of all SARS-CoV-2-positive samples.

Matshidiso Moeti, regional director for WHO Regional Office for Africa, said the global body is fully behind measures to improve and expand genomic sequencing capabilities in Africa. But van Heusden said Africa's various sequencing laboratories are struggling with reagent shortages as well as paucity of scientists with the necessary know-how. "These kinds of shortages, not just skills,

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continue to be a problem. And not just for SARS-CoV-2 and not just in Africa. There are also the ever-present funding issues and our continent's reliance on external funders with their own agendas and priorities. While some of the sequencing money is safe in South Africa, budgets in general are under a lot of pressure", van Heusden said.

Beyond improving genomic surveillance, epidemiologist and infectious diseases specialist Salim Abdool Karim (University of KwaZulu-Natal, Durban, South Africa) said Africa needs to start more actions towards ensuring that mutations in the SARS-CoV-2 genome do not pose significant threats to current and control measures. "So, when the virus is making lots of copies of itself, the chances of having a variant are much higher. So we want to suppress that, we want to keep the number of copies of the virus being made, as low as possible. And the way to do that is to suppress viral replication. In other words, reduce the number of people getting infected", he said.

In addition to prevention measures such as social distancing and masks, Karim said it is also important for the continent to quickly roll out vaccines, which, according to him, are part and parcel of how the transmission of the virus can be contained.

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