

Genomic Surveillance Strategy

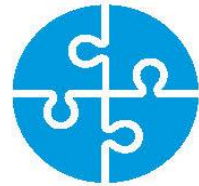
for pathogens with pandemic
and epidemic potential

What is the global genomic surveillance strategy for pathogens with pandemic and epidemic potential?

A 10-year unifying framework to strengthen country, regional and global genomic surveillance.



IT AIMS TO:



Link and embed pathogen monitoring within broader surveillance systems



Identify opportunities to strengthen and establish capacities and systems



Bring partners and stakeholders together to work on a common vision



The COVID-19 pandemic showed how critical it is to use genomics to protect public health. Genomics is just as relevant to help prevent and control other public health challenges, like influenza, Ebola virus disease and antimicrobial resistance. This is why the Strategy is pathogen agnostic.

The Strategy aims to mobilize genomic surveillance efforts against any pandemic or epidemic threat by strengthening and linking laboratories around the world.

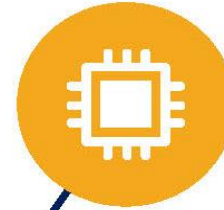
What are the Strategy's goals and objectives?

Goal

Genomic surveillance for pathogens with pandemic and epidemic potential is strengthened and scaled for quality, timely and appropriate public health actions within local to global surveillance systems.

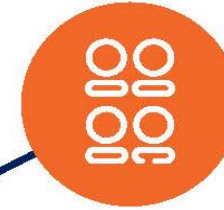
Objectives

5 objectives will support the achievement of the Strategy's goal. Each objective is underpinned by a set of strategic actions.



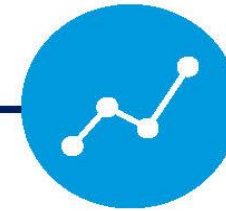
Objective 1

Improve access to tools for better geographic representation



Objective 2

Strengthen the workforce to deliver at speed, scale and quality



Objective 3

Enhance data sharing and utility for streamlined local to global public health decision making and action



Objective 4

Maximize connectivity for timely value-add in the broader surveillance architecture

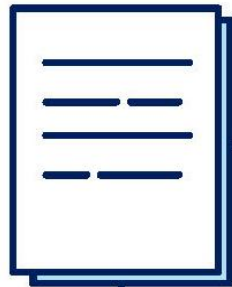


Objective 5

Maintain a readiness posture for emergencies

Implementation of this strategy will require a collaborative approach across governments, networks, programmes, and partners for maximal impact and contribution to public health.

The Strategy



Actions

- Country
- Regional
- Global

Principles



- Country-centred
- Value for money
- Sustainability
- Joint responsibility

Enablers



- Existing assets
- Leadership and policy
- Partnerships
- Financing
- Monitoring and evaluation

Indicative examples:

- Define national needs and stakeholders
- Map and monitor capacity
- Build and sustain genomics infrastructure
- Build or strengthen data collection, management, analysis and sharing
- Establish or maintain data sharing agreements and practice
- Adapt standard reference materials, norms and protocols
- Conduct exercises or reviews to strengthen system functionality
- Monitor implementation using metrics defined globally/locally

MONITORING AND EVALUATION

Monitoring and evaluation are key to understand progress towards and drive the achievement of the strategy's results hierarchy. The Strategy's key measure of success is:

By 2032, all 194 WHO Member States have, or have access to, timely genomic sequencing for pathogens with pandemic and epidemic potential.¹

- 1 Access to genomic sequencing may be through international collaboration including WHO collaborating centres. Timely is defined as triggering genomic sequencing within seven days of event or pathogen detection.



Global indicators monitored for strategy implementation

GOAL

OBJECTIVES

INDICATORS

Genomic surveillance is strengthened and scaled for quality, timely and appropriate public health actions within local to global surveillance systems



Objective 1

Improve access to tools for better geographic representation



Objective 2

Strengthen the workforce to deliver at speed, scale and quality



Objective 3

Enhance data sharing and utility for streamlined local to global public health decision-making and action



Objective 4

Maximize connectivity for timely value-add in the broader surveillance architecture



Objective 5

Maintain a readiness posture for emergencies



Indicator 1

Proportion of Member States with timely access to genomic sequencing for pathogens with pandemic or epidemic potential



Indicator 2*

Proportion of Member States participating in a global genomic characterization external quality assessment programme



Indicator 3

Proportion of Member States sharing pathogen genetic sequence data to a publicly accessible database

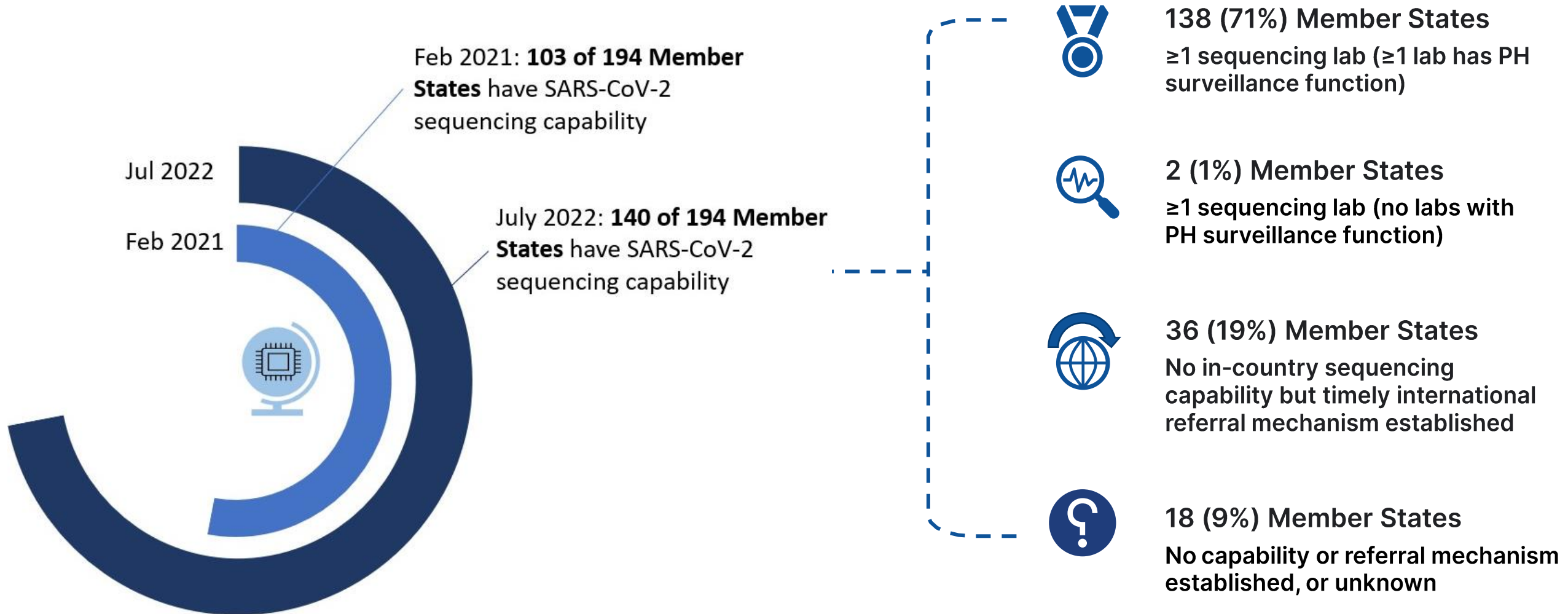


Indicator 4*

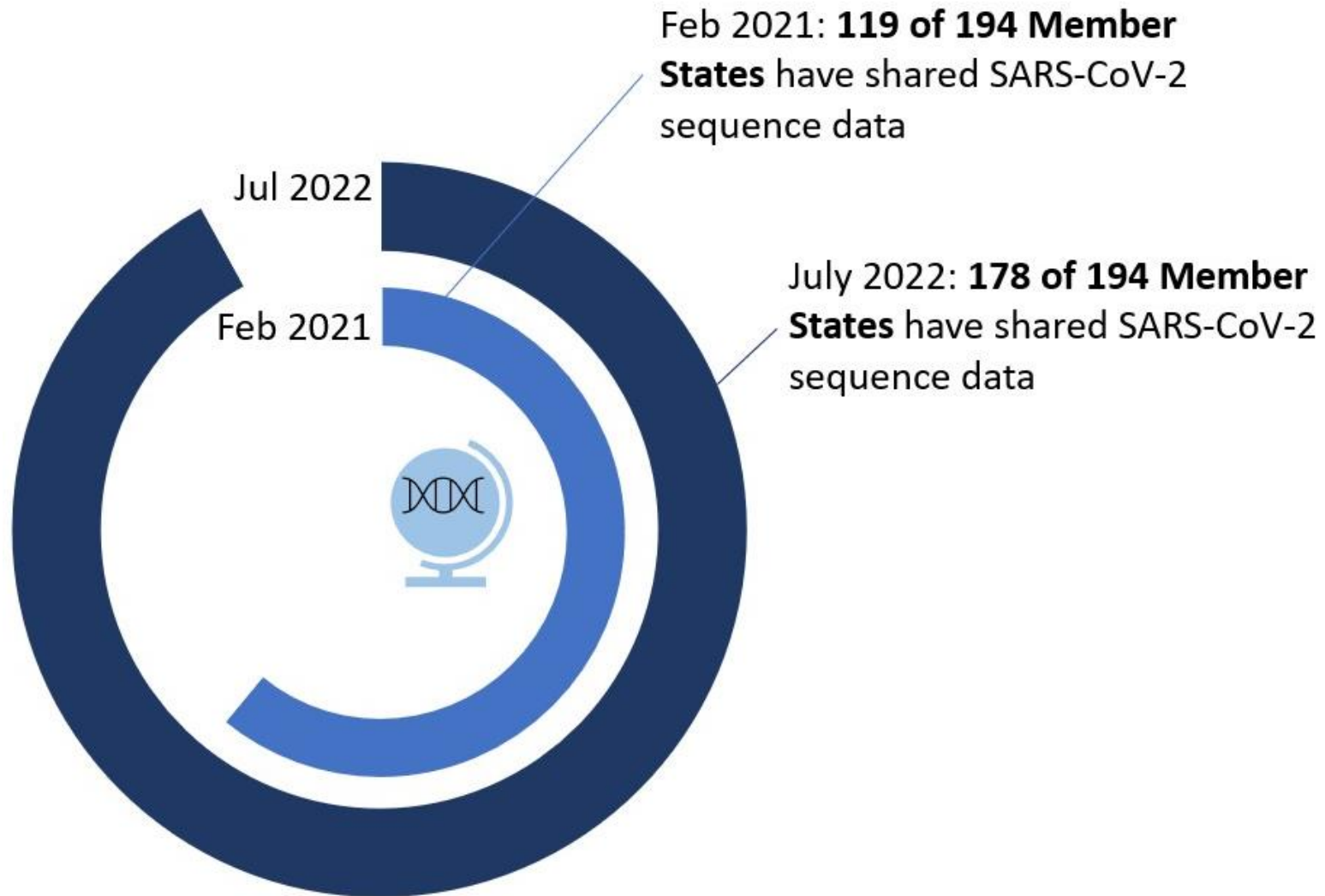
Member States that exercise their pathogen genomic surveillance system readiness for public health emergencies

*Indicator to start in 2023

Gains in WHO Member States sequencing capability: 36% increase in 2021 to 2022



Gains in global SARS-CoV-2 genomic sequence data sharing: 50% increase in 2021 to 2022



Challenges exist



Access and equity

Capabilities

Analysis and technical fragmentation

Connectivity and information sharing

Sustainability and scalability



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WHO's Monthly Operational Update on COVID-19



COVID-19 Epidemiology Focal Points from selected high-risk countries in Brazzaville (Republic of Congo). Credit: WHO/AFRO

Reflecting on the implementation of genomic surveillance for COVID-19 and beyond in the African Region

Since its first case was reported on 14 February 2020, the African Region has experienced four distinct waves of COVID-19. Throughout each of these, WHO has continued to work with countries to **scale up pathogen genomic surveillance** to enable the effective detection and response to SARS-CoV-2 variants, through **sustainable investments in infrastructure and human resources**.

To reflect on and further this work, the WHO Regional Office for Africa (AFRO) convened a meeting of COVID-19 epidemiology focal points from ministries of health of selected high-risk countries in Brazzaville (Republic of the Congo) which took place between 10 to 13 August 2022. The aim was to discuss ways to **improve the quality and effectiveness of COVID-19 surveillance, including genomic surveillance**.

“Currently, 40 out of the 47 Member States (85%) in the African Region have in-country capabilities for genomic sequencing and 46 Member States (98%) are sharing their genetic sequence data through a publicly accessible database. The Region has established a coordinated mechanism to sustain and strengthen these gains and has set up three centres of excellence for genomic surveillance, developed standardized guidance documents, offered capacity building for Ministries of Health’s personnel and set up laboratory infrastructure for routine pathogen genomic surveillance, including wastewater surveillance.”

Dr Nicksy Gumedé-Moelets
Regional Virologist, WHO/AFRO

Highlights from stories shared by countries in the meeting

Ethiopia

Genomic sequencing capabilities were established during the pandemic and the data generated continues to support public health decision-making for both COVID-19 and other disease priority areas, such as antimicrobial resistance using a One Health approach. Ethiopia however still needs to address various challenges to improve capacity for and quality of sequencing, among which: the small number of functioning laboratories, shortage of laboratory supplies, and the lack of sufficient bioinformatics capacities to analyze and interpret the sequencing data for timely action.

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Key figures (as of September 2022)

✦ WHO-led UN Crisis Management Team coordinating 23 UN entities across nine areas of work

📖 OpenWHO totaled 7.1 million enrolments for online courses available in 65 national and local languages, including 46 courses dedicated to the COVID-19 response

📊 951 million tests delivered via ACT-A

👤 239 GOARN deployments conducted to support COVID-19 pandemic response

💉 12 613 484 608 vaccine doses have been administered as of 13 September 2022

👤 4 908 532 010 persons fully vaccinated as of 13 September 2022

👤 5 361 962 048 persons vaccinated with at least one dose as of 13 September 2022

✓ 35.5 million online data analysed between 15 August - 14 September 2022 by WHO as part of social listening and infodemic management support to Member States

* COVAX has shipped over 1.13 billion vaccines to 146 participants as of 16 September 2022
* See Gavi's [COVAX updates](#) for the latest COVAX vaccine roll-out data

For the latest data and information, including trends and current incidence, see the [WHO COVID-19 Dashboard](#) and [Situation Reports](#)

From the field

2

“Genomic surveillance has played an important role in informing the response to COVID-19 in Ethiopia. A five-year National Strategy to guide the coordination and implementation of surveillance activities for SARS-CoV-2 and other pathogens between 2022 and 2026 is being developed.”

Kebede Shtaye
Epidemiologist/Public Health Specialist, WHO Country Office for Ethiopia

Democratic Republic of Congo

Leveraging the genomic sequencing capacities built during the Ebola outbreak in 2018, the Democratic Republic of the Congo swiftly triggered sequencing for SARS-CoV-2 after the first case was reported. Since then, the country's Regional Reference Laboratory has also been sequencing SARS-CoV-2 samples from four countries (Chad, Cameroon, the Central African Republic and the Republic of the Congo), with support from WHO and other partners. This sequencing capacity is now being used for other national priority diseases such as monkeypox, polio, measles, malaria, cholera, and yersinia pestis.

“The Democratic Republic of Congo was one of the first countries in the world to share sequences for SARS-CoV-2 on the Global Initiative on Sharing Avian Influenza Data (GISAID). The first sequence was publicly published on 25 March 2020, two weeks after the first case was reported. We are committed to strengthening existing sequencing capabilities and introducing genomic environmental monitoring activities in the near future.”

Dr Justus Nsio
Epidemiologist, Ministry of Health, Democratic Republic of the Congo

Nigeria

Nigeria's genomic sequencing capacities has been built across diverse public and private sectors institutions, including the National Public Health Institute and academic and research centres, to help inform the response to COVID-19. Since the beginning of the pandemic, Nigeria has shared over 7,000 sequences on the Global Initiative on Sharing Avian Influenza Data (GISAID).

“The sequencing capability built during the COVID-19 pandemic presents an opportunity for us to strengthen pathogen genomic surveillance for other priority pathogens in the country. We are committed to strengthening coordination, human capacities and infrastructure for genomic surveillance.”

Dr Abubakar Jafiya
Epidemiologist, Nigeria Centre for Disease Control, Nigeria

South Africa

South Africa has built world-class capacities for quality and timely genomic surveillance of SARS-CoV-2 and other pathogens with pandemic and epidemic potential, exemplified by the establishment in May 2020 of the [Network for Genomic Surveillance in South Africa](#), two months after the report of the first COVID-19 case. To sustain and strengthen the gains made, the country is committed to mobilize domestic resources, strengthen the workforce and improve access to tools for pathogen sequencing in South Africa and other African countries.

“Through a robust collaborative mechanism, South Africa has sequenced and shared more than 44 700 SARS-CoV-2 samples representative of all regions and ages on a publicly accessible database. We have built significant pathogen surveillance capacity for SARS-CoV-2 and other pathogens, and have integrated genomic surveillance into the broader public health surveillance system.”

Dr Patrick Devanand
National Professional Officer, Emergency Preparedness and Response, WHO Country Office for South Africa

Outputs from the meeting and reflections from countries on the role of genomic surveillance during the COVID-19 pandemic and other public health emergencies will enable the Region to plan effectively and integrate pathogen surveillance into the broader public health architecture. In line with the recently launched [Global Genomic Surveillance Strategy for Pathogens with Pandemic and Epidemic Potential 2022-2032](#), AFRO launched its [Transforming African Surveillance Systems](#) flagship project, which aims to enhance surveillance through strengthened pathogen genomic sequencing and will integrate conclusions and lessons learned from the August meeting.

Advocacy videos

1. What is genomic surveillance?

2. Why is genomic surveillance important?

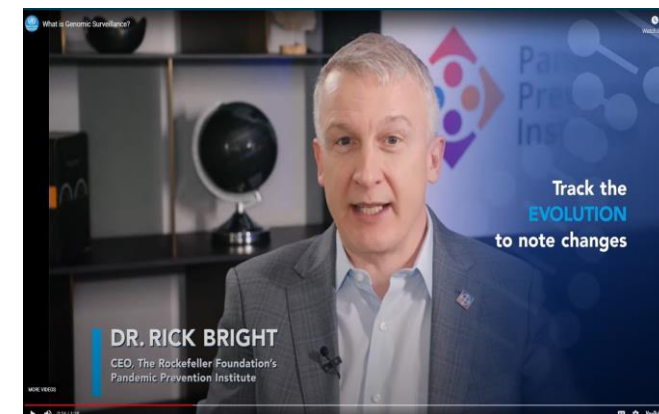


#ICYMI: @WHO published a new global genomic surveillance strategy for pathogens with epidemic and pandemic potential. Watch to learn more about why genomic surveillance is so critical for pandemic prevention.

@Chikwe_I @SCBriand @DrMikeRyan @RickABright @CDCgov @FINDdx @DrTedros



10:48 AM · Jul 26, 2022 · Twitter for Mac



Stories from the field: share your highlights

Genomic surveillance assessment mission in Lesotho

28 March 2022

Maseru – A multidisciplinary team of four experts from WHO-AFRO, the South African National Bioinformatics Institute, and the National Institute for Communicable Diseases (NICD South Africa) has arrived in Lesotho on a mission to assess the country's readiness to launch the implementation of pathogen genomic surveillance, starting with SARS-CoV 2 genomic surveillance. This follows an earlier mission in December 2021 to conduct a countrywide situational analysis.

The mission will examine SARS-CoV-2 genomic surveillance capacities and provide technical guidance based on WHO's recommendations notably on laboratory tools, sampling strategies and epidemiological reporting on COVID-19 indicators with joint Epi-Lab variant prevalence investigation.

"There is need for pathogen genomic sequencing currently in Lesotho as it will be a fundamental tool in contributing to relevant data for strategic response to COVID-19 in the country" – said Dr. Maile, Incident Management Systems Manager for the Ministry of Health of Lesotho. "We warmly welcome the team to Lesotho and look forward to their findings and recommendations".



Click image to enlarge

Jamaica Equipped to Identify International COVID-19 Variants

24 Jun 2021



Jamaica's fight against the coronavirus pandemic received a boost in the form of 6000 Polymerase Chain Reaction (PCR) tests to identify Variants of Concern of COVID-19 (VoC). The medical testing supplies were procured by the Pan American Health Organization/ World Health Organization as it ramps up support in the region to identify, isolate and understand the circulation of new strains of the virus.

Polymerase Chain Reaction (PCR) testing is a cornerstone in the identification of COVID-19 in patients. The introduction of PCR tests for VoC will allow detection of known international variants circulating in other countries, enabling local authorities to make informed decisions to protect the public.

For more country and regional stories, see WHO's strategy website: [here](#)

Thank you

Acknowledging:

- Member States, partner agencies, and WHO regional and country offices
- Gina Samaan and Lisa Carter (HQ Strategy Secretariat) for inputs

For more information or to engage:

- Email pathogenomics@who.int
- See www.who.int/initiatives/genomic-surveillance-strategy