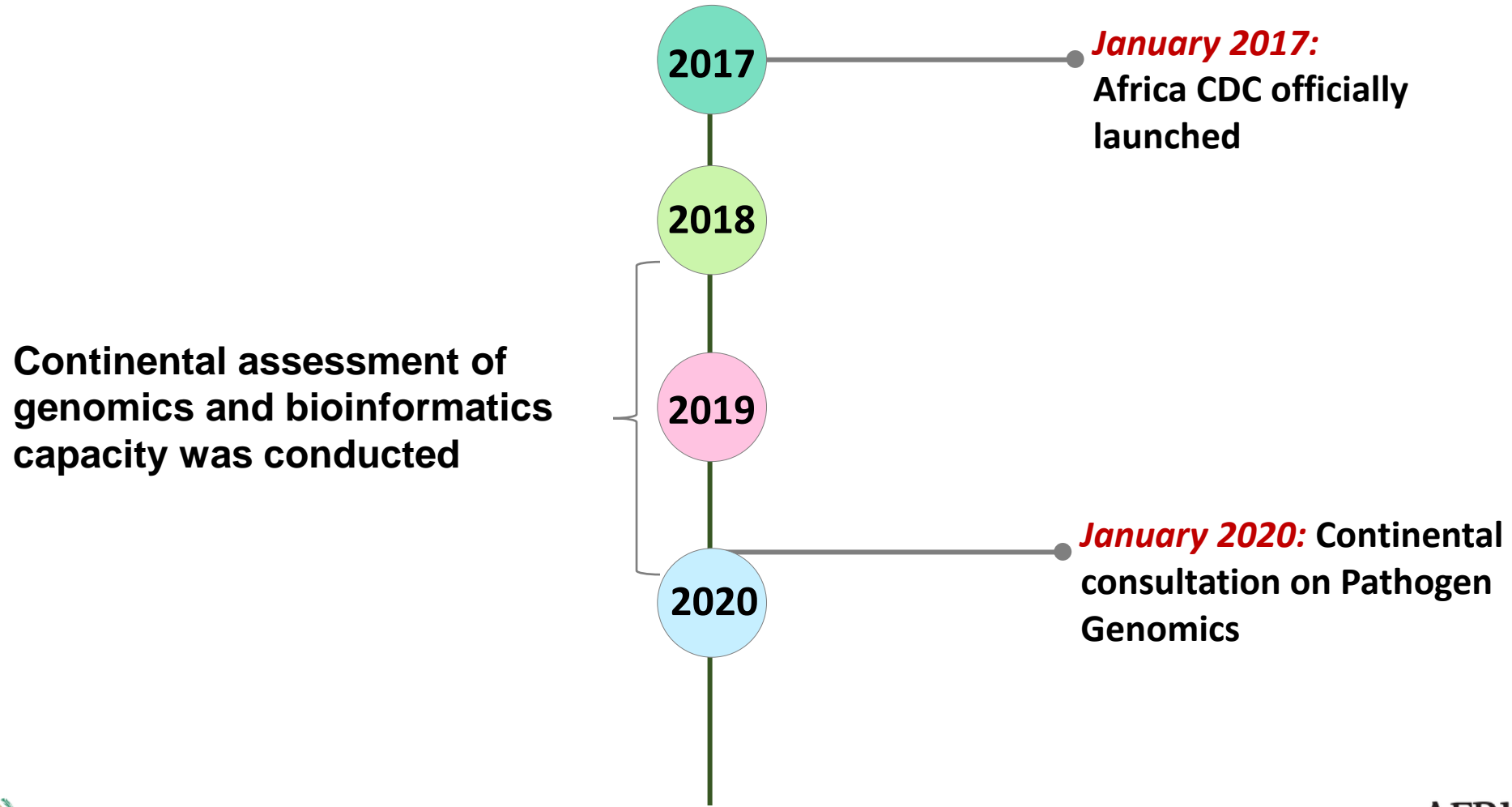


OUTLINE

- **Public Health Pathogen Genomics at the Africa CDC**
- **SARS-CoV-2 sequencing in Africa**
- **Summary and way forward**

PUBLIC HEALTH PATHOGEN GENOMICS AT THE AFRICA CDC



PUBLIC HEALTH PATHOGEN GENOMICS AT THE AFRICA CDC

2017

January 2017:
Africa CDC officially
launched

2018

2019

November 2019: Africa
CDC Institute of Pathogen
Genomics launched

2020

2021

**Continental assessment of
genomics and bioinformatics
capacity was conducted**

THE LANCET
Infectious Diseases

Genomic-informed pathogen surveillance in Africa:
opportunities and challenges
Seth C Inzaule, PhD · Sofonias K Tessema, PhD · Yewew Kebede, MD · Ahmed E Ogbwell Ourma, PhD ·
John N Nkengasong, PhD

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2019

November 2019: Africa
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Genomics launched

2020

COVID-19 Pandemic

August 2020:

Accelerating genomics-based surveillance for COVID-19
response in Africa

Sofonias K Tessema · Seth C Inzaule · Alan Christoffels · Yewew Kebede · Tulio de Oliveira
Ahmed E Ogwell Ouma · Christian T Happi · John N Nkengasong · Show less

2021

October 2020:
Africa PGI launched



Africa Pathogen Genomics Initiative




Strengthening Laboratory Networks and Surveillance Systems

In Partnership with:





KEY COMPONENTS OF THE AFRICA PGI

1. Strengthening Africa CDC Institute of Pathogen Genomics

-  Leadership, coordination, and resource mobilization
-  Enabling mechanisms, policies and guidelines
-  Pathogen genomics community of practice (PathoGENCoP) and technical working groups


2. African Pathogen Genomics and Bioinformatics Network

-  Building a continent-wide functional and operational network
-  Capacity building with NGS & data infrastructure in at least 20 NPHIs

3. Data architecture and systems

-  Data analyses, interpretations, utilization and sharing

4. NGS Academy

-  Workforce development in genomics, bioinformatics, and genomic epidemiology

5. Implementation of high-impact genomic-use cases

-  Use-cases that will have a high impact on major infectious diseases in Africa

AFRICA PATHOGEN GENOMICS INITIATIVE | THE OPPORaTUNITY

1

Strengthen prevention, preparedness, and response to emerging and re-emerging diseases



COVID-19



Ebola Virus Disease



Lassa fever and others



2

Improve disease surveillance to guide the control and elimination of NTDs and endemic diseases



HIV



Malaria



TB



Cholera and others



3

Prevent and combat antimicrobial resistance (AMR)



Antibiotics



Antivirals and other drugs



4

Catalyze research and innovation



Vaccines

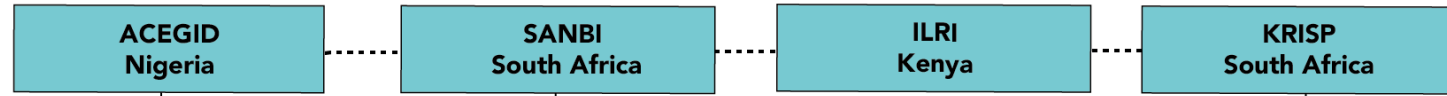


Diagnostics and therapeutics design



AFRICA CDC AND WHO AFRO COVID-19 SEQUENCING NETWORK

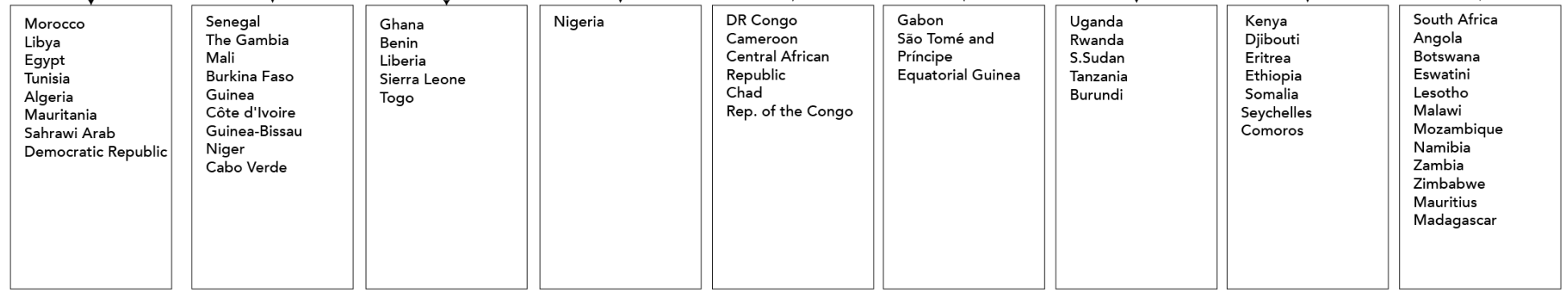
Specialized Genomics and Bioinformatics Centers (SGBC)



Regional Sequencing Hubs

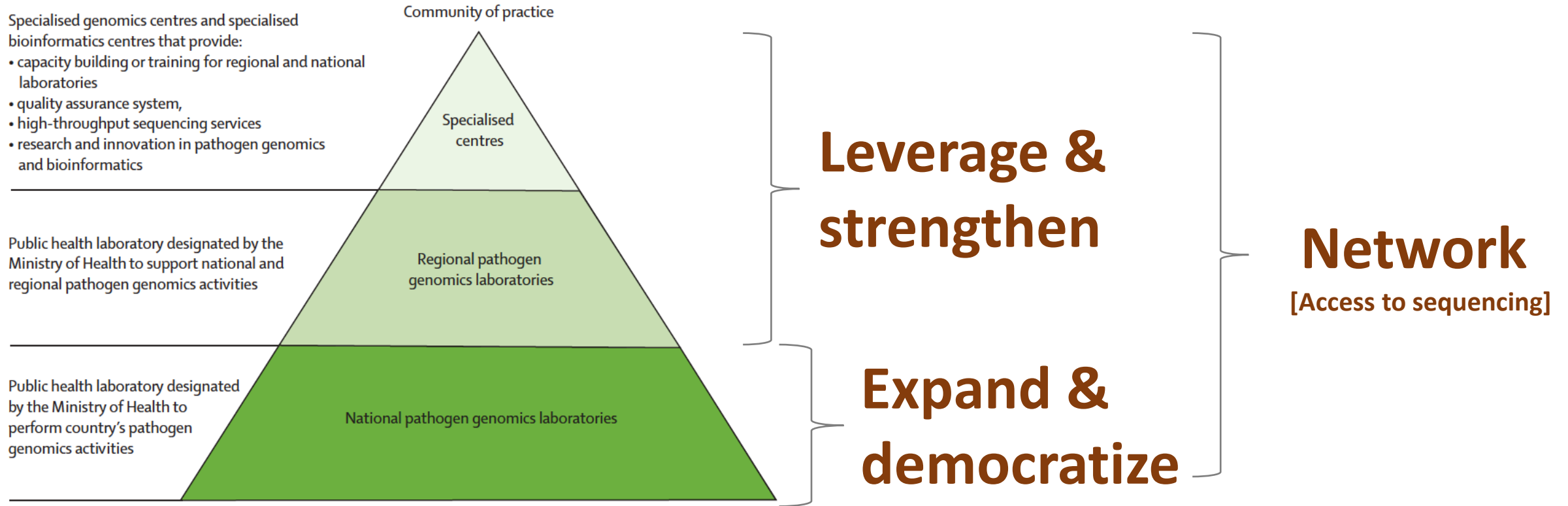


National Sequencing Labs

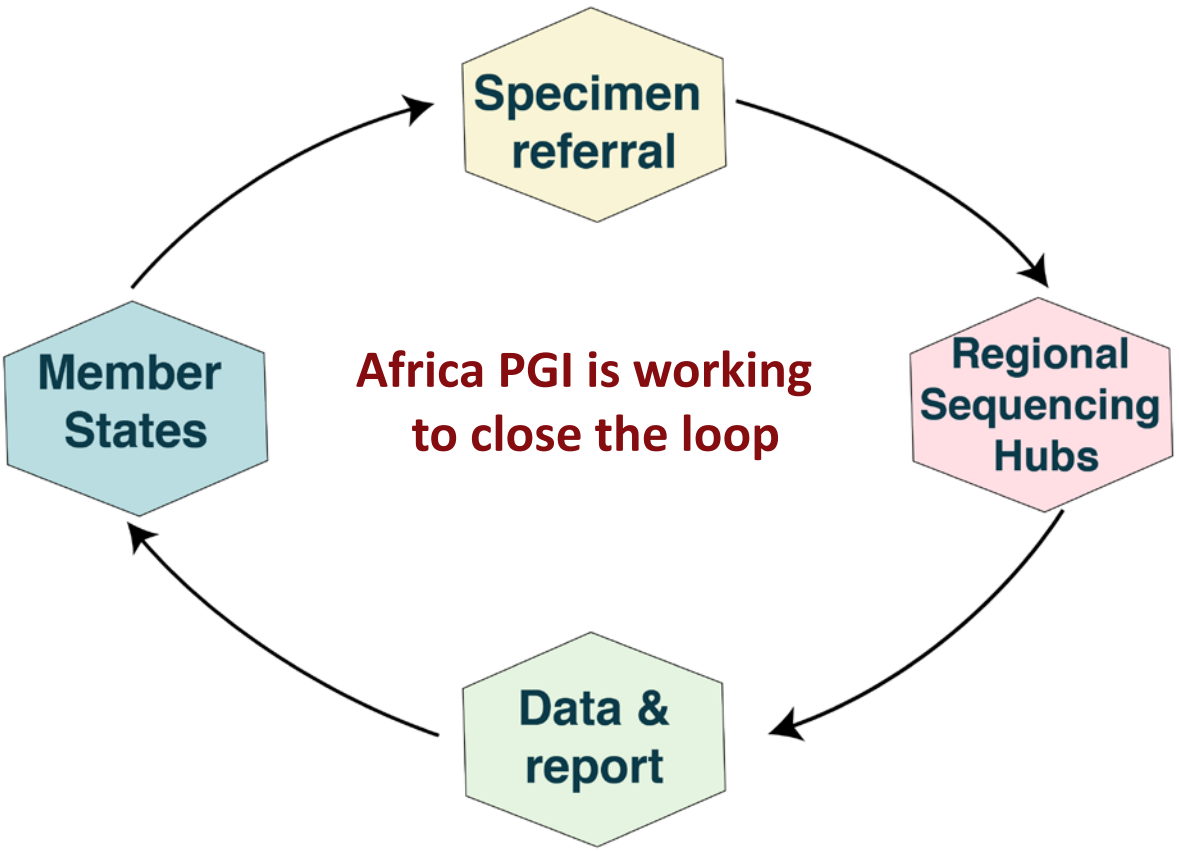


Target: 50,000 genomes by December 2021

AFRICA PGI | PATHOGEN GENOMICS NETWORK



AFRICA PGI | PATHOGEN GENOMICS NETWORK

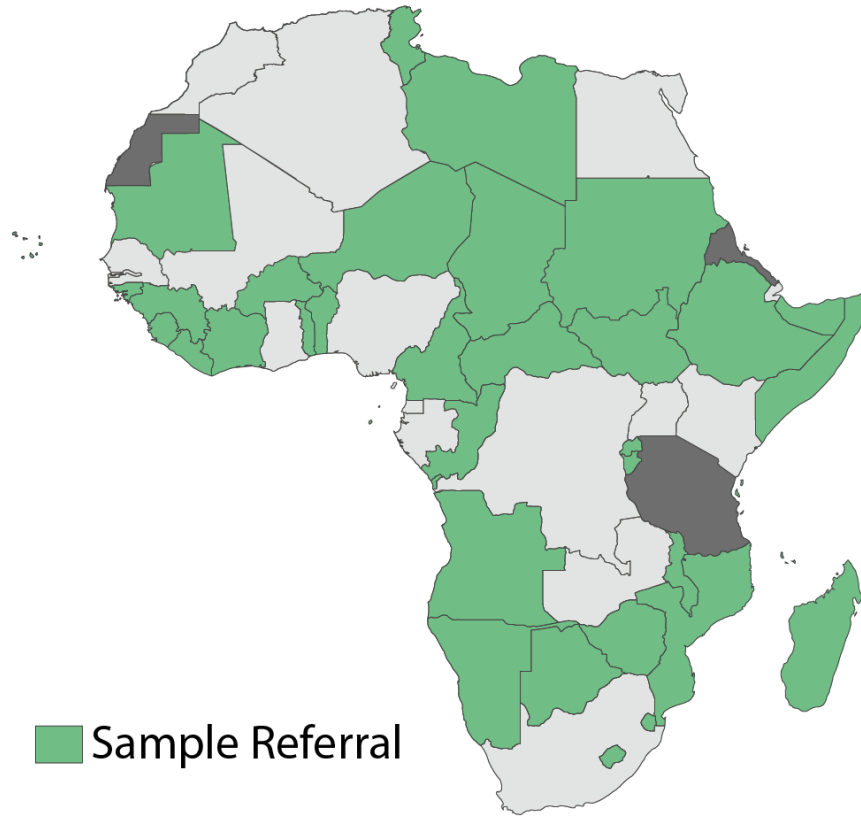


AFRICA PGI SAMPLE REFERRAL NETWORK | STATISTICS

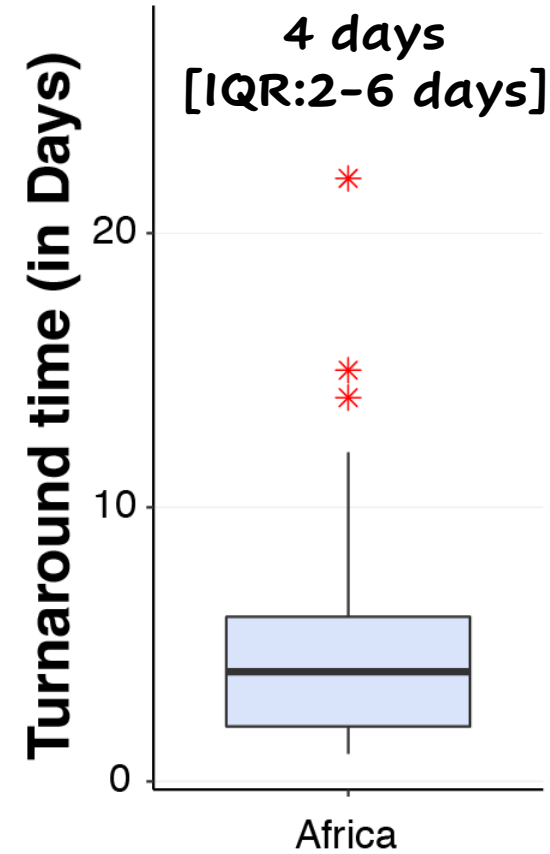
>21,000
Samples referred

36
Countries sending samples

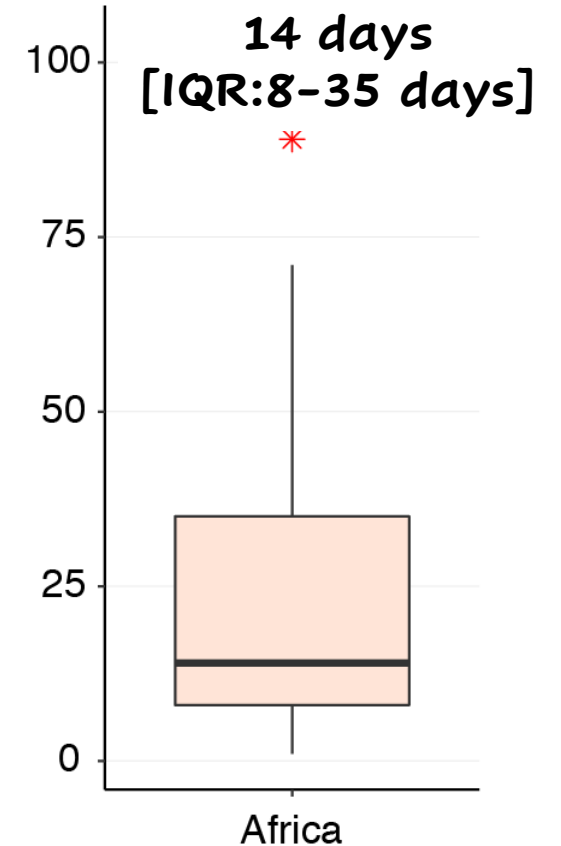
36
Countries
VOCs detected



Transit

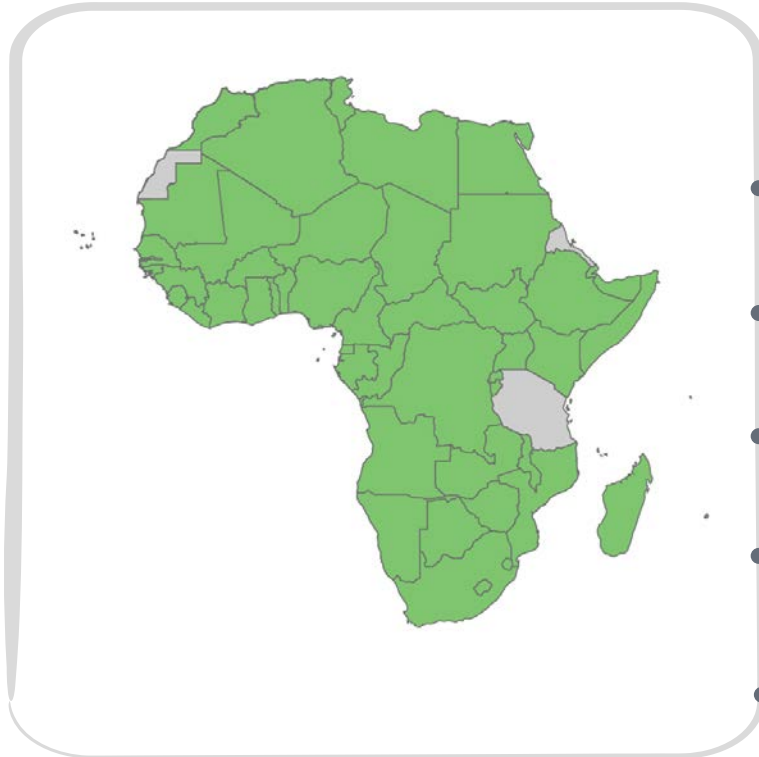


Seq. results



AFRICA PGI SARS-COV-2 SEQUENCING | STATISTICS

November 2021



>51,000 – total sequences – from **52 countries**

~0.6% of over **8.4 million** COVID-19 cases sequenced

258 SARS-CoV-2 WGS being added daily from Africa

27 MS on average have routine sequencing capacity

48 MS are reporting at least one of the VOCs

AFRICA PGI SUPPORT FOR REGIONAL HUBS | LEVERAGE AND STRENGTHEN CAPACITY

10

GridIONs & NextSeq2000s*

10

MiSeqs & MinIONs

25,152

Sequencing reagents
(March/April)**

52,100

Sequencing reagents (Aug – Dec)**

1.7M

Subaward

Pasteur Institute in Morocco

Pasteur Institute in Dakar

NMIMR

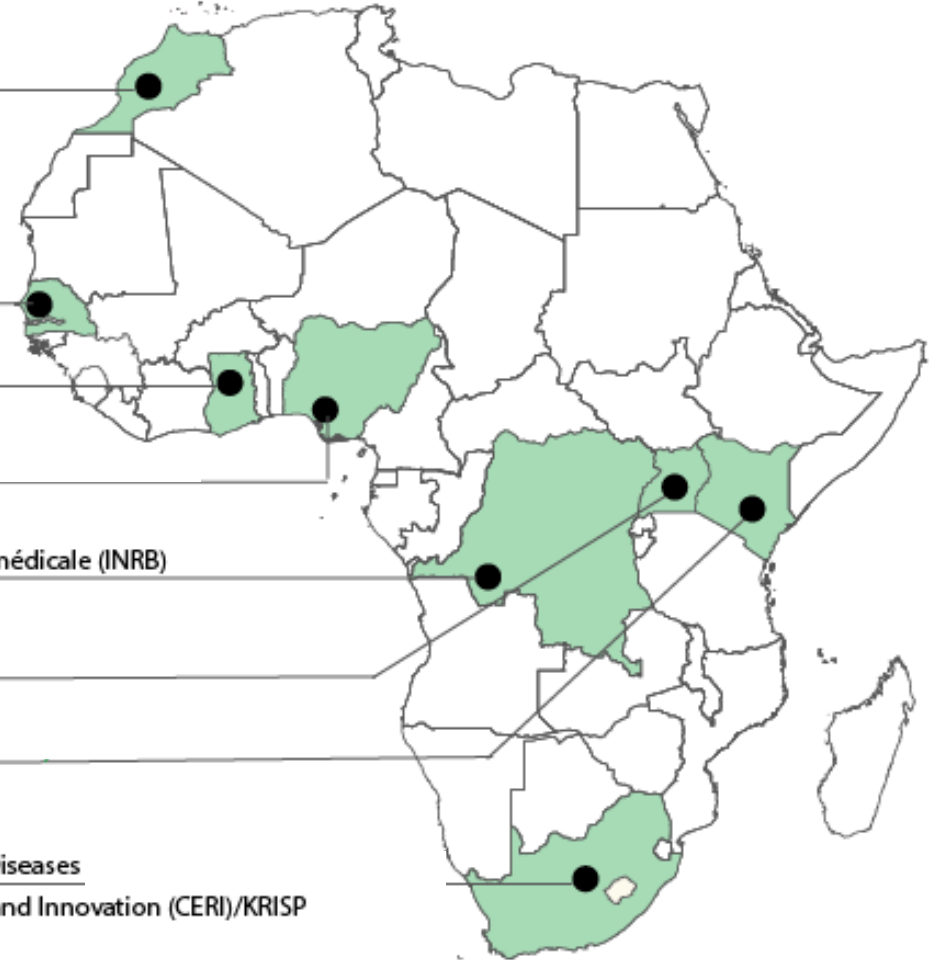
Nigeria CDC
ACEGID

Institut National de la Recherche Biomédicale (INRB)

UVRI, Uganda

KEMRI Wellcome Trust
ILRI

National Institute for Communicable Diseases
KRISP/ Centre for Epidemic Response and Innovation (CERI)/KRISP



AFRICA PGI SUPPORT FOR NATIONAL LABS | EXPAND AND DEMOCRATIZE

Since March 2020:

18

Countries

15

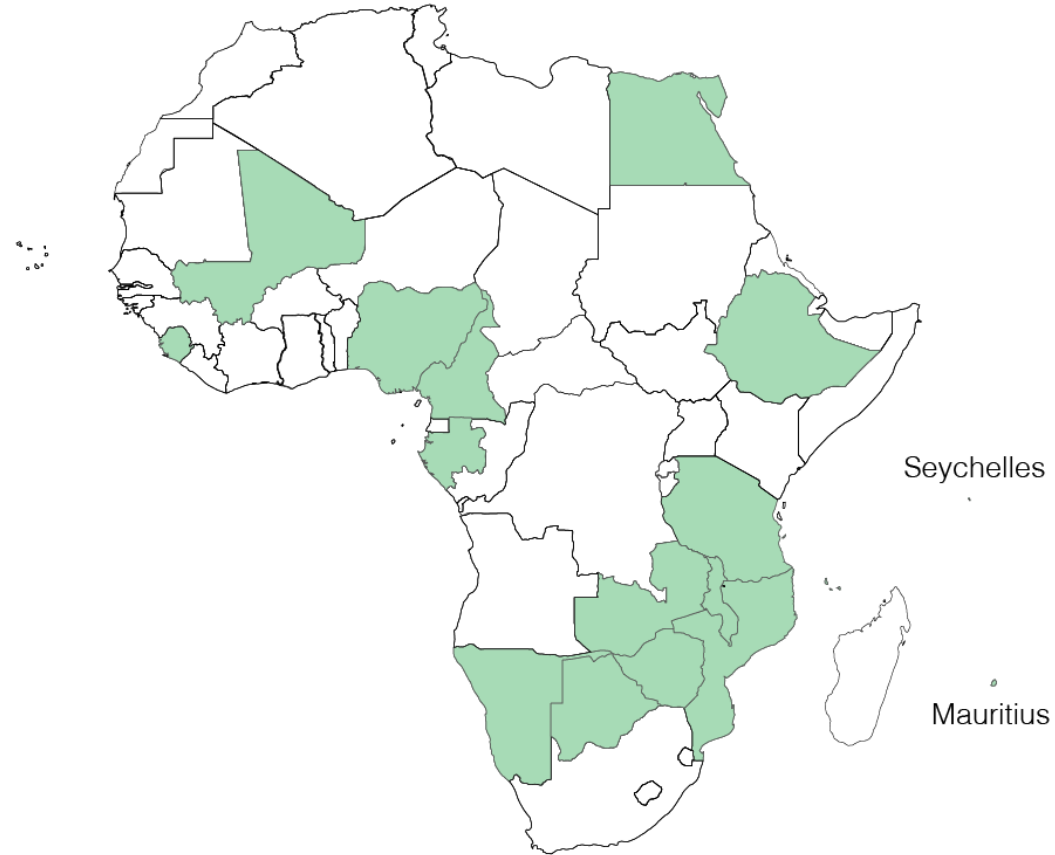
Portable equipment (MinION,
MiSeq, & MiniSeq)

7,776

Sequencing reagents

Training

and technical support



AFRICA PGI REGIONAL HUBS | LEVERAGE AND STRENGTHEN CAPACITY

Africa PGI trainings:

JUNE

ACEGID, Nigeria

16 candidates from
12 AU Member States



JULY

**NGS Academy
(Virtual)**

Virtual training on
SARS-CoV-2 Sequencing

OCT

**NGS Academy
(Virtual)**

Virtual training on
Bioinformatics

OCT

IPD, Senegal

15 candidates from
14 AU Member States

NOV

CERI, South Africa

23 candidates from
15 AU Member States



AFRICA PGI | CHALLENGES AND THE WAY FORWARD

- **Limited capacity and throughput -> Turn around time** from collection to data sharing
- Lengthy process for approvals, MTA, import and export permits
 - Optimization of the sample referral network
- Sampling strategy for optimal use of capacity and limited resources
- Quality assurance of wet and dry lab
- Standardization of data analyses, reporting and timely data sharing
- **Planning for other use-cases** – including genomic surveillance for emerging and re-emerging pathogens



INAUGURAL **ONE HEALTH** CONFERENCE

1 - 3 November 2021

THANK YOU

Sofonias Tessema

sofoniast@Africa-union.org