Democratizing Pathogen Genomics for Disease Surveillance

ASLM2021 Special Session 1

Co-conveners

- **Nicksy Gumede-Moeletsi,** WHO-AFRO
- **Alan Christoffels,** Africa CDC

Summary

Infectious diseases pose a significant threat to health, especially in Africa, and this is further augmented by an unpredictable rise in emerging and re-emerging infections. Notwithstanding the current COVID-19 pandemic, as recent as 6 August 2021, the Ministry of Health of Guinea informed the WHO of a confirmed case of Marburg virus disease (MVD) in Guéckédou Prefecture, Nzérékoré Region, south-western Guinea. These disease outbreaks reinforce the need for heightened disease surveillance.

High-income countries have incorporated the use of next-generation sequencing (NGS) methods for pathogen genomics in disease surveillance systems, thereby allowing for timely and in-depth pathogen characterization and leading to targeted effective control of disease threats. On the other hand, routine NGS use in Africa is limited. However, as of September 2020, the WHO and Africa CDC have launched a network of laboratories to reinforce genome sequencing of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that causes COVID-19, in Africa. Twelve specialized and regional reference laboratories in the network have been providing sequencing, data analysis and other technical support services to the countries where they are located as well as to neighbouring countries and countries in their sub-regions. Pertinent to the rollout plan has been an acceleration of resource mobilisation to equip key public health institutions with NGS equipment and accompanying resources to strengthen COVID-19 surveillance. With an anticipated sequencing of 50,000 SARS-COV-2 genomes before the end of 2021, there has been extensive engagement about data management infrastructure to support general data governance, security, and sharing of access to protocols. There is widespread agreement that such a trusted platform for routine pathogen data management is essential for timely and coordinated public health responses. To make NGS a success story for public health, some key questions need to be addressed:

- How can genomic data be taken up by national and regional public health or infectious disease control authorities for timely, impactful and precise public health or clinical actions?
- What use cases should be prioritised to address the various health emergencies at the national and regional level in the context of limited resources?

- Can stakeholders, manufacturers and other actors in the private sector contribute to the sustainability and relevance of NGS?

Session Objectives

This session will review the current COVID-19 response in Africa. We will discuss how pathogen genomics can be developed to support disease response for an average of 140 outbreaks annually in Africa.

Session Programme

Presenter & Affiliation	Title
Nicksy Gumede Moeletsi (WHO-AFRO) **Alan Christoffels** (Africa CDC)	Welcome, introduction and opening remarks
Prof Christian Happi (Redeemers University, Nigeria)	Pathogen genomics for public health in Africa: perspectives on outbreak response and AMR control
Prof Amadou Sall (Institute Pasteur, Senegal)	How to ensure the uptake of results for a swift precision public health action or sustainability of pathogen genomics
Prof Iruka Okeke (Ibadan University)	How pathogen genomics for AMR can directly change the clinical management of bacteriology infections
Vanessa Moeder (Illumina)	NGS as a foundational tool for infectious disease surveillance and management
James Brayer (ONT)	Clinical applications for disease outbreaks.
Dr Gavin Cloherty (Abbott)	Diagnostics to support disease outbreaks
All session participants	Question/Answer panel discussion