Pathogen Genomics and Antimicrobial Resistance

A Pan-African Ecosystem for Knowledge Sharing, Leadership, and Innovation in AMR and pathogen genomics.

This document provides a framework to guide the development of a collaboratively agreed Terms of Reference (ToR) for the Community of Practice: AMR & Pathogen surveillance.

1. Background

Antimicrobial resistance (AMR) is a growing public health threat in Africa and globally, driven by complex interactions between humans, animals, plants, and the environment. The rapid evolution and spread of resistant pathogens limit treatment options, undermine food security, and threaten sustainable development. While genomics, bioinformatics, and data science offer powerful tools to identify resistance mutations, understand resistance mechanisms and guide interventions, efforts across the continent remain fragmented. Laboratories, researchers, public health systems, and agricultural stakeholders often work in isolation, with limited access to shared standards, expertise, and resources. Strengthening networks, improving data practices, and building African-led innovation are essential to turn fragmented knowledge into actionable solutions for prevention,diagnostics, stewardship, and policy.

2. Goal

To establish a pan-African, connected ecosystem for AMR and pathogen genomics that consolidates expertise, strengthens knowledge exchange, skills development, and collaboration, and supports evidence-based interventions across human, animal, plant, and environmental health sectors. Embedded within the African Bioinformatics Institute (ABI),

The Community of Practice (CoP) will leverage genomics, molecular biology, bioinformatics, and data science with epidemiological and omics data to better understand AMR mechanisms, transmission pathways, and drivers of resistance. It will connect professionals and networks to share best practices in diagnostics, AMR stewardship , and targeted interventions. The CoP will also address environmental and climate-related factors influencing AMR, while fostering African-led innovation and leadership. By enabling

scientists to co-design and implement context-specific, globally relevant solutions, the CoP aims to strengthen AMR prevention and control efforts through collaboration and shared resources.

3. Purpose

The CoP aims to connect multidisciplinary professionals and networks across Africa – spanning research, public health, clinical care, veterinary science, agriculture, environmental health, and climate expertise – to support planning, generation, analysis, and integration of genomic and AMR-related data. It will harmonise standards and approaches, facilitate collaborative research and innovation, and strengthen training, career development, and professional education to produce actionable knowledge. By doing so, it will transform fragmented efforts into coordinated, evidence-based solutions that address AMR at the molecular, clinical, agricultural, environmental, and population levels.

4. Objectives
- Promote best practices and harmonisation in genomics, bioinformatics, and data science by developing,disseminating, and supporting adoption of shared standards, guidelines, computational tools, and frameworks for AMR and pathogen data across laboratories and sectors.
- Map and connect the AMR genomics and data science landscape, identifying networks, stakeholders, resources, needs, and gaps to enable coordination, reduce duplication, and strengthen cross-sector partnerships.
- Build technical skills, career pathways, and leadership in genomics and bioinformatics through training,mentorship, and professional development, enabling African scientists and practitioners to grow as innovators and global solution providers.
- Facilitate knowledge exchange and collaborative platforms focused on genomics, bioinformatics, and data science, creating opportunities for sharing expertise, tools, datasets, and analytical methods to accelerate collective action against AMR.

5. Scope of Work

Define what the group will focus on, including both what is and isn't included in its remit.

Inclusions

- Mapping existing AMR research, genomics, bioinformatics, surveillance, training initiatives, networks, and leadership to identify gaps and opportunities across sectors.
- Developing and promoting best practice for data generation, analysis and integration, including computational tools, bioinformatics workflows, and governance standards for interoperable high-quality data.

- Fostering multi-sectoral collaborations through knowledge exchange,innovation pipelines and joint initiatives that leverage genomics and data science.
- Building sustainable capacity by coordinating training, mentorship, and leadership development programmes in genomics, bioinformatics, and data analytics.
- Creating platforms for visibility and engagement through forums, webinars, and workshops that showcase African-led expertise and strengthen global partnerships.
- Connecting communities to resources by signposting expertise, datasets, infrastructure, computational platforms, and funding to support long-term
- Continental leadership and global contribution in AMR and pathogen genomics.

Exclusions

- Direct funding or grants for individual projects or organisations.
- Accreditation of training programmes (unless explicitly mandated).
- Acting as a primary data repository or custodian (focus is on quality frameworks, research integration, and connectivity).

6. Membership and Participation

Eligibility

Membership is voluntary and open to individuals with relevant expertise or a demonstrated interest in antimicrobial resistance (AMR) and pathogen genomics. This includes *academics, practitioners, trainers, and representatives* from institutions or programs working in related fields. External experts may also be invited to participate or contribute on a needs basis.

Attendance Policy

Participation in the CoP is voluntary; however, consistent engagement is encouraged to foster collaboration and continuity. Members with attendance below 50% over a six-month period may be contacted to discuss their ongoing involvement and capacity to contribute meaningfully to the CoP's objectives.

Meeting Frequency

Monthly virtual meetings will take place on the first Wednesday of each month at 16:00–17:00 Central Africa time (CAT).

7. Roles and Responsibilities

Chair/Co-Chairs

- Facilitate meetings and discussions.

- Set agendas and track progress toward objectives.
- Represent the CoP to any relevant oversight committees or partners.

Secretariat

- Support administrative needs such as scheduling, minute-taking, and follow-ups.
- Maintain documentation and disseminate key materials.
- May be filled voluntarily on a rotational basis (e.g., every 6 months).

Members

- Contribute actively to discussions and deliverables.
- Volunteer for tasks and participate in assigned working groups.
- Communicate availability and progress on tasks.

8. Governance and Decision-Making

The CoP will be governed through inclusive, transparent, and participatory processes to foster collective ownership and accountability.

Decision-Making Principles

Consensus first: Wherever feasible, the group will aim to reach consensus to promote collaboration and commitment.

Majority Voting: If consensus is not achievable, decisions will be made by simple majority vote (50%+1) among *active* members present via virtual attendance.

Advisory Recommendations: When needed, an advisory panel of experienced members or external experts may provide non-binding strategic input to guide decisions.

Conflict and Disagreements

- Disagreements will first be addressed through open discussion and mediated by the Chair or Secretariat.
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- Members are encouraged to voice concerns respectfully and seek compromise.
- If informal resolutions fail, a neutral facilitator may be invited to mediate.
- Documentation of dissenting views will be maintained to ensure transparency.

Escalation Procedures

- If decisions are persistently blocked or polarized: The matter will be escalated to a Designated Advisory Group for review and recommendations.
- Alternatively, a vote by all members (including asynchronous or online voting if needed) may be conducted to reach a binding resolution.

9. Review and Adaptation

Governance procedures will be reviewed annually to ensure they remain effective and aligned with CoP's goals.

10. Deliverables & Timeline

Deliverable	Start date (Month;Year)	End date (Month; Year)
Contact and invite 25 organisations to invite to showcase pathogen genomic work across Africa in flash talks/seminars/worksh ops	August 2025	August 2026
Hold between 5 and 10 zoom webinars in a pan-African timezone inclusive time to showcase above work	November 2025	August 2026
Develop a straightforward and easy to maintain online presence such as a website, blog, library/bibliography publicising and detailing existing resources/practices and publications	October 2025	March 2025
Describe and document the work of 5-10 organisations and bodies online	March 2026	August 2026
Assemble a writing task force to scope the African bioinformatic scene for pathogen genomics and AMR in a published document that is initially published on bioRxiv and led and published by a task force of the AMR CoP	March 2026	August 2026