

Building sustainable models: resources, expertise, professional skills development

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Course roadmap

Sun 7 May
Introduction Day



Mon 8 May
**Day 1
Capacity Building**



Tue 9 May
Day 2
**Specimen and
Sequencing**



Wed 10 May
Day 3
**Data Tools and
Pipelines**



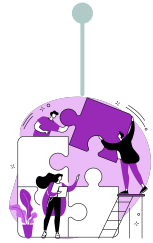
Thu 11 May
Day 4
**Frameworks,
Guidelines, and
Decision-making**



Fri 12 May
Day 5
**Projects Review and
Action Planning**



**Next steps and
Beyond**



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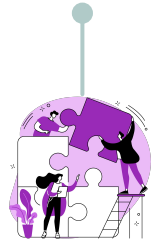
**Frameworks, Guidelines,
and Decision-making**



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Next steps and Beyond



Ethics and data sharing
Sustainability
Communication

Session objectives

- Sustainability in the context of pathogen genomics
- Approaches to sustainability in Africa
- Role of stakeholders in implementing sustainable practices

Session outcome

At the end of this session we will outline recommendations for sustainability in implementing pathogen genomics in Africa

What is sustainability?

The ability to maintain or support a process continuously over time

<https://www.investopedia.com/terms/s/sustainability.asp>

- Programs, initiatives and actions aimed at the preservation of a particular resource

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Sustainable development

- Meeting the needs of the present without compromising the ability of future generations to meet their own needs

United Nations Brundtland Commission (1987)

- Broadly describes present-day beneficial policies, projects and investments
- Integrated approach that considers environmental concerns and economic development

<https://www.un.org/en/academic-impact/sustainability>

https://www.who.int/health-topics/sustainable-development#tab=tab_1

Sustainability in the context of pathogen genomics

- **Infrastructure**
 - Sequencing capacity
 - Increased access to sequencing machines
 - Computational infrastructure
- **Skilled workforce**
 - Molecular biologists, bioinformaticians, etc.
 - Training programmes and mentorship
- **Community of experts**
 - “Lack of enduring experts”
- **Lab EQA programmes**
 - Enforcing and implementing quality standards

Sustainability in the context of pathogen genomics

- Core sequencing hubs/centers
 - Referral networks
 - Standardized protocols
- Policies and regulatory frameworks
- Improving supply chains
 - Addressing logistical challenges
- Leadership and coordination
 - E.g. Africa CDC (Africa PGI)
 - Promote equitable access to genomics

- Resource mobilization
 - Spearheading public-private support initiatives
- Monitoring and evaluation
- Resource mobilization
 - Long term sustainable investments
 - Funding
 - Partnerships with industry
- Multinational collaboration and capacity building
 - Promoting regional initiatives

What is sustainability?

Group activity:

1. What does it mean for pathogen genomics in Africa?
2. How will genomics benefit healthcare, research, communities, economies in the next 5 years, 10 years?

Consider technical, science, benefits to community

Approaches to genomics sustainability in Africa

- Transformation of bacteriology reference labs into genomics-led services
 - Phasing out of classical lab methods - only using WGS approaches
 - Operating classical laboratory methods concurrently with WGS?
- Centralised high throughput sequencing laboratory services
 - ISO accreditation of sequencing core facilities
- Traditional phenotypic assays metrics not as easily applicable to bioinformatic pipelines
- Business and capital planning
 - Reduction in lab staff
- Changes in workflows and analytical procedures

Question 1:

Leveraging existing systems:

What are the opportunities for leveraging existing public health and genomics initiatives to strengthen implement pathogen genomics and surveillance?

(Notes: existing platforms for surveillance, research consortia, geopolitical environments e.g. Africa CDC)

Question 2:

Funding:

- Where does funding come from?
- What strategies are effective in sourcing funding?
- What are some experiences (positive and negative in sourcing funding for genomics in public health?
- (**Notes:** Global Fund - recording of Africa CDC webinar and notes, Global fund is national labs only, not academic)

Question 3:

Skills:

How can training and professional skills development be improved towards developing sustainable workforce?

(Notes: Training programmes short courses vs e.g. masters programmes or other standard training programmes; training others, Train the trainer; leadership development, grant and financial management)

Question 4:

Research:

What are gaps and opportunities in research which could inform better practices?

(**Notes:** quality management, data sharing models which support sustainability, implementation research)

Question 5:

Role of stakeholders:

What is the role of stakeholders in ensuring sustainability?

(Notes: funders, companies, academic institutes, ministries, global collaborators esp. from higher income countries)

Question 6:

Resilience:

What place does resilience have in building capacity sustainably?

Consider the process in its entirety:

- (i) leveraging existing systems
- (ii) grant-writing, budgeting
- (iii) professional development
and so on

What kind of approach and mindset builds resilience?

How does institutional culture build or diminish resilience?

Which group norms or leadership practices favour resilience?

Developing resilient genomic surveillance processes, teams, communities

“The effectiveness of a resilient infrastructure or enterprise depends upon its ability to anticipate, absorb, adapt to and/or rapidly recover from a potentially disruptive event.”

The Four R's of Resilience

Robustness:

The ability to maintain critical functions in the face of a crisis

- ◆ Strength/ability to withstand pressure
- ◆ Built-in functional substitution/back-ups

Resourcefulness:

The ability to effectively respond to and manage a crisis, as it unfolds

Planning during peace times, and clear communication of the plan are key

Redundancy:

Maintaining reserves which can be accessed easily, to respond to unexpected changes

For example, having more than one member of a team who can carry out a particular function

Rapid recovery:

The ability to return to normal operations quickly and efficiently after a disruption

Carefully designed contingency plans are vital