Exploring the Potential of Emerging Health Technologies in Tackling Health Challenges in Africa during and post COVID-19 Pandemic: The Role of Parliamentarians

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Health Remains a Major Challenge in Africa

Preventable diseases & conditions still causing many deaths

Health systems remain weak

COVID-19 has compounded the situation
There is therefore no better time to talk about the potential of new health technologies in changing the persisting poor status of health on the continent.

Emerging health technologies with potential to drastically change the status of health in Africa:

- Gene drives for Malaria elimination
- mRNA vaccines, RNAi technology
- Artificial intelligence
- Use of drones in healthcare
- Synthetic biology

AUDA-NEPAD Priority Health Technologies:

- "Omics" technologies (genomics, transcriptomics, proteomics, & metabolomics)
- E-Health solutions
- Artificial intelligence
- Use of drones
- Geospatial modelling
- Additive manufacturing
However, there are various issues undermining the development and/or testing of emerging health technologies:

- Limited involvement/participation of Africans in technology development
- Limited knowledge among key stakeholders & the public
- Opposition to the development of some of the technologies
- Limited priority & investments in these technologies by African governments
Platform for Dialogue and Action on Health Technologies in Africa
An African-driven platform to facilitate informed, objective, transparent, open & balanced discussions on development and use of transformative tools and technologies to address key health challenges in SSA.

**Purpose**

Expand spaces for Africans to meaningfully engage & shape conversations on the need, design, development & use of emerging health technologies.
Platform works at both national & regional levels, through multi-pronged engagement approaches & tools targeting...
Expected Outcomes of the Platform

**Primary outcome**

- Improved policy and regulatory frameworks on the development and use of transformative technologies and tools for tackling health challenges at national and regional levels in Africa.

**Intermediate Outcomes**

1. Increased use of the evidence on transformative health technologies & tools by decision makers & other stakeholders at regional & National level.

2. Strengthened champions to promote development & use of transformative technologies for tackling health challenges at regional & national levels.

3. Strengthened capacity of African institutions in conducting advocacy on health TTs at regional & national level.
Levels of Engagement

**Target Stakeholders and their Multi-Directional Linkages/Influences**

**Continental level**
- **Sub-Saharan African Region**
  - Policy Actors: AUDA-NPAD, Africa CDC, WHO Afro, Network of African Parliamentary Committees on Health (NEAPACoH), etc.
  - Scientists: Research Consortia, Networks of Scientists & Ethicists (vary depending on technology)
  - CSOs
  - Media (networks of science journalists; networks of health journalists, etc.)
  - Private Sector (e.g. networks of manufacturers)

**Sub-regional level**
- **East African Region**
  - Policy Actors: EAC Health Programme, EAC Health Research Commission
  - Scientists & ethicists
  - CSOs: CHReAD, WACI-Health
  - Media
  - Private Sector: EA Network of Manufacturers, EA Healthcare Federation

- **West African Region**
  - Policy Actors: WAHO
  - Scientists & ethicists
  - CSOs: WATHI, Speak Up Africa
  - Media
  - Private Sector

- **Other Sub-Regions**
  - Policy actors: Health programmes at SADC & ECCAS
  - Scientists & ethicists
  - CSOs: WACI-Health, SATAC
  - Media
  - Private Sector

**National level**
- **Uganda**
  - Policy Actors: Regulatory bodies, MoH, Parliament committee on health, Min. of STI, etc.
  - Scientists & ethicists
  - CSOs
  - Media: journalist networks
  - Private Sector

- **Burkina Faso**
  - Policy Actors: Office of the President, Regulatory bodies, MoH, Parliament committee on health, Min. of STI, etc.
  - Scientists & ethicists
  - CSOs
  - Media: journalist networks
  - Private Sector

- **Additional Countries in later years**
  - Policy Actors
  - Scientists & ethicists
  - CSOs
  - Media
  - Private Sector

**Activities across the different levels**
- Build & nurture mutual partnerships to jointly convene regular dialogues on priority transformative health technologies
- Undertake reviews & analyses to inform or stimulate efforts on health technologies (at continental, sub-regional, & national levels); widely disseminate as evidence products (factsheets, evidence briefs, videos, etc.)
- Nurture & support champions for health technologies (drawn from the political space, academia, civil society, media, etc.)
- Strengthen & expand supportive CSO advocacy on health technologies
- Media engagement for increased media coverage of health technologies (develop media capacity, run media awards, regular media sessions, etc.)
- Web portal for information sharing & discussions on health technologies in Africa
- Social media engagement through online influencers
Our recent study revealed various ongoing efforts to develop and/or test emerging health technologies:

- Gene drives for Malaria elimination
- Genome editing
- Synthetic biology
- Data science/data analytics - e.g. digital certificate for COVID-19
- Monoclonal antibodies
- Artificial intelligence
- Micro-grids
- Block-chains
- Nextgen batteries

But, information is not readily available on ongoing research on emerging health technologies in Africa.
**Some of the tools being developed for Malaria Control & Elimination**

<table>
<thead>
<tr>
<th>Type of Technology</th>
<th>State of Research</th>
<th>Stakeholders and locations</th>
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<tbody>
<tr>
<td>Gene drive mosquitoes</td>
<td>Lab trials</td>
<td>Target Malaria; Burkina Faso, Mali, Ghana and Uganda</td>
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<tr>
<td>Ivermectin drug</td>
<td>Lab trials</td>
<td>Burkina Faso, Senegal, Liberia</td>
</tr>
<tr>
<td>Attractive toxic sugar-baits (ATSB)</td>
<td>Field Trials</td>
<td>KEMRI/CDC/ICIPE; Mali</td>
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<tr>
<td>Malaria vaccines</td>
<td>R21 at clinical trials</td>
<td>Oxford Biomedical Research Centre; Burkina Faso</td>
</tr>
<tr>
<td>Sterile insect technology</td>
<td>Lab Trials</td>
<td>South Africa; Wits Research Institute for Malaria</td>
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<tr>
<td>Biocontrol/larvicide control</td>
<td>Not known</td>
<td>Zimbabwe, Tanzania and Rwanda</td>
</tr>
<tr>
<td>Use of drones in larvicide control</td>
<td>Field Trials in rice fields</td>
<td>Rwanda</td>
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Gene drives for Malaria control is one of the priority technologies for the Platform.

In 2017, AU committed to invest in development & regulation of gene-drive technology for Malaria control.

In 2018, AUDA-NEPAD recommended actions to operationalize the AU recommendation, incl:

- Establishment of a network of Africa-based scientists to self-regulate, share information, & peer-review ongoing field-testing on the continent
- African countries to develop needed legal & policy framework & guidelines for regulation
- Experts to model the potential risks of gene drive technology on the environment
- Increased advocacy & proactive involvement of policymakers & private sector in the development of gene drive technology
Gene drives for malaria control is one of the priority technologies for the Platform.

A gene drive is a tool that effects certain genetic changes in a population.

For Malaria control/elimination, the tool targets Malaria-transmitting mosquitoes, modifying them so that they are either unable to transmit the disease or reproduce.

The modification is combined with a gene drive - a process that favors the biased inheritance of certain genes from generation to generation.

Eventually, the gene drive eliminates Malaria-transmitting mosquitoes.
There is ongoing research in 4 countries in Africa that plans to test gene drive mosquitoes for malaria elimination:

- Mali
- Burkina Faso
- Ghana
- Uganda
Phases of Gene Drives Research for Malaria Control

Pathway for malaria vector control via Gene Drive

1. **Lab testing**
   - Transgenic lines bearing these genetic constructs produced and tested in small cages inside the lab
   - Assessed safety

2. **Confined small-scale field releases**
   - Physically confined
   - Geographically isolated
   - Assessed entomological outcomes

3. **Open small-scale field releases**
   - Assessed disease impact
   - Malaria incidence

4. **Large-scale field releases**
   - Deploymen
   - Village

Towards Malaria Elimination 2030

Small-scale laboratory studies for efficacy and safety testing under appropriate containment conditions and operating procedures

Confined testing under a more natural setting but under conditions that limit release into the environment

Large-scale releases in the environment to study epidemiological efficacy of the released mosquitoes

Policy and Regulatory Issues relating to Gene Drives for Malaria Elimination

- Lack of precedent to inform development of regulatory guidelines
- Some countries, like Uganda, have no legal framework to enable progress on gene drive research
- How to govern the technology – e.g. implications for trans-boundary effects
  - Need for regional harmonization of regulatory guidelines & procedures
- Need to build capacity on the continent on the gene drives technology
What role should Parliamentarians play in these ongoing efforts to develop, test & deploy emerging health technologies in Africa?

1. Engage health research institutions to understand ongoing research on emerging health technologies
2. Ensure allocation of resources by their governments for the development, testing & deployment of emerging health technologies
3. Undertake legal reforms needed to facilitate research on emerging health technologies
4. Advocate for prioritization of research & investments in emerging health technologies
5. Sensitize constituents on the value of emerging health technologies
Participate in policy dialogues on emerging health technologies

Request for analyses of evidence to inform their efforts in enabling research on emerging health technologies

Access resources & participate in online discussions through the Platform’s web portal
THANK YOU!

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