Can we contain disease outbreaks, cost?

Malawi Centre of Epidemiological and Mathematical Analysis (MACEMA)

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Aren’t these grand challenges for advances in LLMs?

Data?  Skill?  Tooling?  Infrastructure?
Malawi Centre of Epidemiological and Mathematical Analysis (MACEMA)

- Formed in Dec 2022

- **Vision**
  - To effectively use mathematical and statistical modelling in improving health in Malawi and beyond

- **Goals**
  - Improve surveillance systems for infectious diseases in Malawi and beyond
  - Develop an early warning system
  - Give policy directions on outbreak management

- **Outcomes**
  - High quality data platforms on infectious diseases in Malawi
  - Running surveillance and warning systems
  - Policy briefs and engagement documentations
<table>
<thead>
<tr>
<th>S/N</th>
<th>Name</th>
<th>Education Background</th>
<th>Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nicholas S. Adam</td>
<td>PhD Cand, MSc, BSc (Biostatistics, Mathematics)</td>
<td>Modelling Boko Haram effects on Child Health indicators in Nigeria and Poliomyelitis modelling in Malawi</td>
</tr>
<tr>
<td>2</td>
<td>Grace Wezzie Banda</td>
<td>PhD Cand, MSc, BSc (Mathematics)</td>
<td>Developing Surveillance Mathematical Model for Diarrhoea</td>
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<td>Analysis of Social Media on Information about Malaria Elimination Efforts</td>
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<td>3</td>
<td>Ruth Vellemu</td>
<td>MSc, Bsc (Biostatistics, Mathematics)</td>
<td>Cluster-level intervention strategy for malaria in children aged 6-59 months in urban areas in Malawi: A geospatial modelling study</td>
</tr>
<tr>
<td>4</td>
<td>Paul Kaseka</td>
<td>MSc, BSc(Nursing)</td>
<td>Investigating the Significance of Malaria Microscopy on Negative Rapid Diagnostic Test Results of First Visit Malaria Suspects (not received LA within 30 days) in Malawi: An Evaluative Study of the Existence of Non plasmodium Species and Competence of Non laboratory Personnel on Point of Care Testing</td>
</tr>
<tr>
<td>5</td>
<td>Jeremot Masoambeta</td>
<td>Msc, BSc, BEd, Dip.Bed (Biostatistics, Mathematics)</td>
<td>Developing Surveillance Mathematical Model for Diarrhoea</td>
</tr>
<tr>
<td>6</td>
<td>Wongani Nyondo</td>
<td>MSc, BSc(Epidemiology, computer Science)</td>
<td>Has polio vaccination sufficiently eliminated poliomyelitis in Malawi after vaccination campaign?</td>
</tr>
<tr>
<td>7</td>
<td>Yolam Cosmas Kameme</td>
<td>MBBS, BSc, Dip.clin(Medical Science)</td>
<td>A simulation study forecasting an end to ongoing cholera epidemic in Dowa District, Malawi. What can we do better?</td>
</tr>
<tr>
<td>8</td>
<td>Masuzgo Pojogo</td>
<td>MSc, BSc (Epidemiology, Nursing)</td>
<td>Analysis of Social Media on Information about Malaria Elimination Efforts</td>
</tr>
<tr>
<td>9</td>
<td>Hope Gausi</td>
<td>BSc (Computer Science)</td>
<td>Support developing a website for information sharing and visibility on malaria and diarrhoea work</td>
</tr>
<tr>
<td>10</td>
<td>Andrew Mbewe</td>
<td>Dip. ICT, Cert. Educ</td>
<td>Support developing a website for information sharing and visibility on malaria and diarrhoea work and administrative works</td>
</tr>
</tbody>
</table>
Source of inspiration

- Inspired by works done by the following existing centres and research projects among others
  
  ✓ South Africa Centre of Epidemiology and Mathematical Analysis (SACEMA)
  ✓ Urban Malaria Project, Northwestern Malaria Modelling Lab (North Western University, USA)
  ✓ Drakes Lab, Odum School of Ecology, University of Georgia, USA
  ✓ Infectious Disease Epidemiological Modelling Unit (IDEMU-Mak), Makerere University
  ✓ Centre of Epidemiology and Mathematical Analysis (CEMA), University of Nairobi

- Centers and research labs
  - Offering scientific mentorship on some running projects
  - Offering financial support for running of the centre
  - Offered short trainings and PhDs mentoring for MACEMA members
  - Negotiating for collaborations
Thematic areas

- Diarhoreal diseases
- Urban Malaria

Other disease currently working on

- Polio
Our needs

- Finances: $3.5 million for 5 years
  - Funding for the aligned activities in MACEMA 5 years implementation plan
    - Enhancement for human capacity (MSc & PhD)
    - Research dissemination activities (publication, conference attendance etc)

- Working collaborations

- Mentorship (website development, scientific mentorship and trainings)
Special thanks

Bill & Melinda Gates Foundation

Urban Malaria Project

Sacema

Drake Lab
Laboratory of Population Dynamics