

GLOBAL
INSTITUTE FOR
DISEASE
ELIMINATION



CEMA 
Center for Epidemiological
Modelling and Analysis



FROM DATA TO ACTION MODELING FOR BETTER **DECISION-MAKING** IN DISEASE ELIMINATION

Global Institute for Disease Elimination (GLIDE) &
Center for Epidemiological Modelling and Analysis (CEMA)

Injaz Fellowship Webinar Series

October 8, 2025

Summary of the Webinar

On Wednesday October 8th, 2025, the Global Institute for Disease Elimination (GLIDE) and the Center for Epidemiological Modelling and Analysis (CEMA) jointly hosted a webinar titled: **“From Data to Action: Modelling for Better Decision-Making in Disease Elimination”**. Delivered as part of GLIDE’s Injaz Fellowship webinar series, the session brought together over 150 participants to explore how data and mathematical modeling are informing strategies for disease elimination—with case studies on malaria and schistosomiasis.

The event featured **Dr. Peter Macharia**, Geospatial Health Scientist at the Institute of Tropical Medicine, Antwerp, who presented a malaria-focused case study using geostatistical methods and **Dr. Mutono Nyamai**, Senior Research Fellow at CEMA, who presented a mathematical modelling case study on schistosomiasis elimination in Kenya.

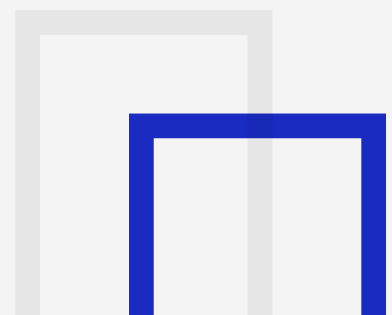
This was followed by an engaging Q&A session that addressed challenges in integrating data sources, model sensitivity, and the path to sustainability in modelling-driven programs.

Why this Collaboration Matters

GLIDE and CEMA are two organizations committed to strengthening capacity and ensuring that the next generation of global health leaders is equipped to address global health challenges. The session served to underscore the ensuring that data leads to action—recognizing that health data and modeling are essential tools to accelerate the elimination of infectious diseases such as malaria and NTDs. Quality data guide decision-making, helping identify hotspots, track progress, and allocate resources effectively, while modeling tests scenarios and informs strategic adjustments to ensure programs remain adaptive and evidence-driven on the path to elimination.

Discussion Highlights

Professor Thumbi Mwangi, Co-founder and Co-director of CEMA, and Dr. Ngozi Erundu, Technical Director at GLIDE, kicked off the webinar by framing modeling as an indispensable tool for targeting interventions, optimizing resource allocation, and strengthening surveillance to prevent disease reintroduction. Professor Thumbi positioned modeling as a core component of effective program planning, and Dr. Ngozi concluded by emphasizing that modelers can help us “move from data to insight, and from insight to action,” underscoring their critical role in bridging research and operational policy.



Expert Insights

Building on this foundation, the subsequent presentations translated these principles into applied examples.

1. Dr. Peter Macharia: Applying Geostatistical Methods in Global Health: A Malaria-Focused Case Study

Dr. Macharia's presentation focused on the use of model-based geostatistics (MBG) to map malaria prevalence and inform intervention targeting.

He emphasized that as countries move toward elimination, the question shifts from whether to act to where, and national averages are no longer sufficient for decision-making. Programmes need to understand where transmission persists so they can target interventions and allocate resources efficiently.

No single data source can provide this insight. Large household surveys such as the DHS are reliable but infrequent and too broad to guide sub-national targeting. Routine health facility data is more timely but captures only those who seek care and varies widely in quality across settings. By combining multiple data sources, such as Demographic and Health surveys (DHS), Malaria Indicator Surveys (MIS), school surveys, routine health data, geostatistical approaches can fill gaps and generate fine-scale prevalence maps that can address gaps and limitations in national survey data. Dr. Macharia's case study from Burkina Faso illustrated how these maps move beyond national averages to provide actionable information for programme planning and prioritization. The maps can also help distinguish areas of ongoing transmission from those approaching elimination and allow programmes to test alternative strategies to inform resource allocation.

However, progress is constrained by persistent challenges, including data quality limitations, reductions in survey funding (particularly for DHS), and limited modelling capacity within countries. Sustaining and accelerating gains toward elimination will therefore depend on stronger routine surveillance systems and analytical capacity that is built and maintained nationally.

Core message: Elimination requires precision that is supported by stronger data systems and country-owned analytical, modelling capacity.

2. Dr. Mutono Nyamai: Epidemiological Models to Support Planning and Implementation of Kenya's Schistosomiasis Elimination Plan

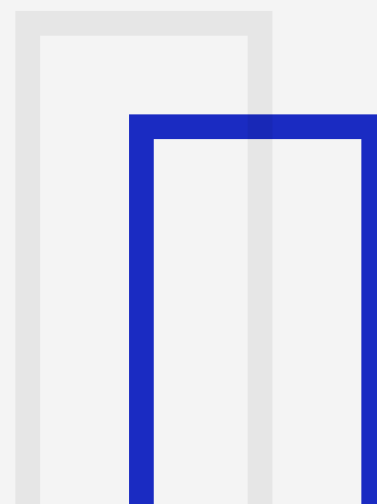
Dr. Mutono's presentation illustrated how epidemiological modeling can support the evaluation and optimization of Mass Drug Administration (MDA) strategies within Kenya's Breaking Transmission Strategy, highlighting the practical value of modeling for program decision-making.

Her analysis offered lessons that extend well beyond Kenya. She highlighted that blanket, uniform national strategies will always underperform where disease burden is unevenly distributed. In Kenya, she demonstrated substantial differences between coastal and western regions, underscoring the demand for geographically differentiated responses and for programs to tailor interventions accordingly.

For targeted interventions, Dr. Mutono emphasized how effective elimination is less about developing new tools and more about using existing ones more strategically. Current efforts rely on mass drug administration (MDA) with praziquantel, complemented by WASH interventions, snail control, and behaviour change, with MDA remaining the cornerstone of schistosomiasis control. Modelling does not replace this foundation of programmatic knowledge but rather it tests the assumptions behind it: are the right populations being reached, at the right frequency, and at sufficient intensity to interrupt transmission? In Kenya's case, the findings were clear: the existing tools are appropriate but the strategy required recalibration.

Dr. Mutono's analysis assessed whether the current MDA-focused strategy is sufficient to reach elimination targets and compared it with an optimized strategy involving targeted, twice-yearly treatment in high-prevalence areas and reduction of the "never-treated" population. Under a business-as-usual scenario, elimination was projected to be achieved in approximately 20 years. The optimized strategy shortens this timeline to around 16 years while reducing overall costs by approximately %63. This represents more than an incremental improvement; it reflects a fundamentally more efficient and cost-effective strategy identified through scenario based-modeling.

Core message: Elimination will depend not only on the availability of effective tools & delivery platforms, but on using them strategically — with modelling to support targeted delivery, reach missed populations, and optimize programs to achieve faster and more cost-effective, sustainable impact.



Enduring Challenges and Questions

During the interactive Q&A sessions, participants and presenters highlighted cross-cutting challenges related to data use, modeling, and implementation in both malaria and NTD control contexts.

Challenge 01

Diagnostics not designed for low-transmission settings

Current detection tools — including rapid diagnostic tests (RDTs) and microscopy — become less sensitive as transmission declines, making accurate measurement more difficult at the stage when precision matters most. Validation data on their performance in near-elimination settings also remains limited, which directly constrains what models can estimate and what programmes can act on.

Challenge 02

Data gaps constrain modeling and planning

Spatio-temporal modeling approaches can help interpolate missing data, particularly in settings with uneven surveillance coverage, but there are limits to what any model can compensate for when underlying data is weak and fragmented.

Challenge 03

Community behavior is under-modelled & under-represented

Transmission is shaped by treatment uptake, exposure, and daily practices, yet these factors are rarely captured in modeling or planning. This may result in models overestimating intervention impact.

Together, these challenges highlight a common constraint: when underlying data are incomplete, imprecise, or do not capture behavioral realities, model estimates become less reliable and their usefulness for programme decision-making is diminished.

Key Takeaways: What We Learned

- **Data is the binding constraint on modeling impact:** Models are only as robust as the data that inform them. Investment in data systems is not a prerequisite that can be deferred.
- **Modeling shifts programmes from reactive to adaptive:** Scenario based modeling enables programs to prospectively evaluate alternate strategies and transforms decision making from experience based to evidence-driven.
- **Models must earn their place in decision-making:** For modeling to bridge the gap between research and action, outputs must be interpretable, credible, and responsive to the questions that programme managers are actually asking. Country ownership and national integration strengthens resilience, and continuity beyond donor funding cycle and ultimately determine whether modeling insights translate into sustained programmatic change or remain unused.
- **People and partnerships enable data-to-action:** Translation from analytical insights to programmatic decisions depends on sustained and strong collaboration between modelers, policy makers, and communities where data is collected and interventions are delivered.
- **The economics of elimination cannot be an afterthought:** Economic modeling is vital to justify investments, prioritize interventions, and guide difficult resource allocation decisions within constrained health budgets, making it as integral to elimination planning as the epidemiological evidence itself.

In closing, speakers and participants reaffirmed that the journey from data to action is built on shared learning, innovation, and sustained collaboration. Progress toward elimination will depend not only on better models, but on our collective ability to use them, together, to drive informed, equitable, and lasting impact.

