

Simplifying malaria stratification in Kenya for country-led intervention mapping

Background

James Kiarie is passionate about how information can empower his team to target limited resources to reduce malaria in Kenya. As the data manager in Kenya's National Malaria Control Program (NMCP), James knew his colleagues across Kenya's counties spent significant effort collecting data but it was not being fully utilized to target malaria interventions. He had seen how malaria stratification, classifying areas according to the risk of malaria, could leverage complex analysis of existing data to set priorities and target prevention efforts in the areas where they are most needed. However, stratification analysis required advanced statistical modeling experience to produce risk maps to guide malaria prevention and control planning.

James and his colleagues needed support to be able to independently conduct stratification analyses. Historically, stratification analysis relied on intensive support from donors and international institutions, leaving NMCP staff and local partners out of a critical part of the process. Recognizing the limited availability and quality of routine data as well as lack of local capacity to apply complex models over time, USAID's flagship health information system and data use program, Country Health Information Systems and Data Use (CHISU), developed a user-friendly stratification tool that leverages the open-source software JAMOVI to analyze routine HMIS data. This novel approach does



Donal Bizanzo, CHISU Team, provides support to a workshop participant to use the JAMOVI stratification module. Photo Credit: JSI

not require complex modeling, allowing NMCP staff to perform malaria stratification independent of donor support.

Steps Taken

CHISU partnered with the NMCP to organize two workshops introducing the novel stratification method. Using routine data from Kenya's National Health Information System, trainees participated in a process to select the most relevant variables to prioritize indicators for the new stratification process.

Following the workshop, CHISU provided technical support to the NMCP using training videos to guide production of the initial risk map based on the variables selected in the workshop. They used an ad-hoc stratification mapping tool created by the CHISU team leveraging the capacity of JAMOVl to create a module to provide tools to perform ad-hoc analyses. The JAMOVl stratification tool provides a simple analytical interface to produce malaria stratification maps merging several routine DHIS2 malaria indicators (e.g. incidence, reported cases, test positivity rate) merged with environmental data (temperature, rainfall, land cover). The stratification module implements a simple and statistically robust non-modeling approach already implemented in other USAID projects in Tanzania and Thailand.

"It was a consultative process," Kiarie said. "I liked that it was country-led. In the past, we provided data and they gave us a risk map we couldn't even defend. Now we can discuss and provide feedback."

CHISU and NMCP hosted a second workshop in October 2024 to train 40 county NMCP staff on the new stratification method. Participants practiced the variable selection, learned how to use the JAMOVl stratification module, and reached consensus on a revised malaria risk map for Kenya.



Participants discuss stratification at the workshop.
Photo Credit: JSI

Results

The previous stratification map primarily drew on malaria prevalence based on non-routine survey data analyzed through complex modeling methods, while the new map draws on adjusted malaria incidence data and several key indicators that NMCP staff adjusted for treatment-seeking behavior, resulting in more precise information for decision making.

“Since this process utilizes routine data, data quality reviews are important,” Kiarie said. “KHIS data quality has improved to the point where Kenya can now trust the incidence data so the new map tells a better story and demonstrates the true malaria burden in Kenya.”

Kenya’s previous risk map used five strata including malaria-free zones, but, after analyses done using the JAMOVI stratification tool, they moved to six strata to ensure more effective intervention coverage at the county level.

“Initially we had five strata and we didn’t think it was giving the right picture so we increased to six,” Kiarie explained. “The entire team feels this is the map that we’re going with. We feel comfortable using these maps for intervention mapping and are confident we will be providing the right interventions to the right communities.”

James’ close involvement in the process improved his data use skills, primarily his ability to apply GIS mapping for malaria prevention and control planning. “Now I really understand how to run the map through GIS without the tedious process of importing data,” he said.

Next Steps

Prompted by the simplicity of the analysis, the NMCP plans to leverage James’ newly acquired skills to train additional NMCP staff who will include the new stratification method in the next data management training at the county level. “We are planning to do micro-stratification at the county level.” Kiarie explained. “This method is easier for the counties to follow so they can do the stratification themselves.” The revised maps will also be included in the Kenya Malaria Indicator Survey and the new Kenya Malaria Strategy.

Including countries in the process and simplifying data analysis process is improving confidence in their data and reducing reliance on support from external partners.



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