Implementing reactive malaria surveillance in low transmission areas: Insights from Mozambique

The project

Surveillance needs to be responsive to all transmission intensities to effectively work as a malaria intervention. With support from the Bill & Melinda Gates Foundation, Malaria Consortium is collaborating closely with the National Malaria Control Programme (NMCP), Centro de Investigação em Saúde de Manhiça (CISM), Clinton Health Access Initiative (CHAI) and Goodbye Malaria to implement the project Strengthening Malaria Surveillance for Data-driven Decision-making in Mozambique. With this project, we aim to improve surveillance in low-transmission areas in the country.[1]

Through REACT — the project's operational research component led by CISM — we assessed the feasibility of including reactive surveillance activities in malaria programming in Magude and Matutuíne districts, areas of low malaria transmission and incidence in Maputo province.

The findings on the intervention's feasibility, impact, acceptability and cost-effectiveness will inform a future scale-up of reactive surveillance approaches in Mozambique.

Background

While Mozambique remains one of the main contributors to malaria cases globally,[2] certain districts in the south show very low transmission. To reach elimination in these areas, malaria programmes need to ensure that all potential cases are accurately diagnosed and that all confirmed cases are effectively treated.

The World Health Organization (WHO) recommends implementing reactive surveillance activities to achieve this goal. Through case detection and case and foci investigation,[3] implementers are able to design targeted, local responses to the remaining pockets of transmission.

Approach

Using the REACT online individual case-based reporting system — which collects data about diagnosed malaria cases — health staff identified malaria hotspots in real-time. To contain the spread of infections, our trained surveillance volunteers visited each index case's household (i.e. the first identified case) within 72 hours after the case was confirmed and classified as local or imported; this allowed volunteers to treat all eligible household members with the antimalarial dihydroartemisinin-piperaquine. The study also established a standard operating procedure to ensure swift outbreak investigation and response.

Entomological investigations allowed us to tailor vector control interventions to the context of each local hotspot, taking into account mosquito biting and resting behaviours, breeding sites and vector susceptibility to insecticides.

Lastly, we examined health professionals' capacity to implement the required activities and evaluated the intervention's acceptability and cost-effectiveness.

Lessons learnt

- Initial surveillance volunteer training and start-up activities made up most of the intervention's costs.
- Once operational, maintaining the reactive surveillance system proved to be feasible and relatively inexpensive.
- Reactive surveillance approaches require training volunteers who are solely focused on surveillance. Initially, we had tasked community health workers with reactive surveillance activities, but this was unfeasible as it added to their already busy workload, particularly during peak malaria season or in conjunction with other outbreaks, such as COVID-19.
- Recruiting young people as surveillance volunteers led to a high turnover, as many of them aspired to greater social and financial ambitions than the standard volunteer allowance.
- Aligning new data sets with existing modules in the integrated malaria information storage system (iMISS)[4] proved time intensive. To ensure activities started on time, project partners developed a parallel reporting system. CISM will integrate the data into the iMISS once case investigation modules are operational.
- While local authorities successfully identified an outbreak in Magude district, the subsequent investigation was delayed, highlighting the need to further streamline outbreak investigation and response procedures going forward.
- Continuously strengthening health technicians' capacity for early case detection and reporting was crucial at all levels, including training on conducting malaria rapid diagnostic tests, correctly using data collection tools, and performing data analysis and quality assurance.
- An unreliable electricity supply prevented Chicutso, Mahel, Moine and Panjane health facilities from keeping their tablets charged. Where necessary, we provided solar chargers to remedy this issue.
- In addition to bicycles, surveillance volunteers required motorbikes and cars in some areas in Matutuíne to carry out their field activities. We provided two motorbikes for household visits.

Recommendations

- Design reactive surveillance systems that can remain operational with limited funding. Key healthcare staff at all levels need to be consulted during the development phase to ensure long-term sustainability and the timely alignment of modules.
- Coordinate with community leaders to recruit surveillance volunteers with specific profiles to avoid a high turnover. Recruiters should consider candidates who show genuine interest in volunteering and who can combine the required tasks with other income activities. This may increase the likelihood that they will volunteer long term.
- Refine outbreak investigation and response procedures to ensure outbreaks are promptly investigated and controlled in a cost-effective manner.
- Strengthen capacity for case and foci investigations, and ensure that index cases are identified and validated swiftly to allow for prompt action.
- Provide solar chargers to health facilities where public electricity supply is unreliable and ensure that registration tools, such as tablets, are always charged.
- Allocate sufficient funds to transportation to ensure smooth implementation of field activities.

References

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Contact: info@malariaconsortium.org

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