



Malaria surveillance system performance in Mozambique: a comprehensive assessment

Background

Despite recent reductions in morbidity and mortality, malaria remains the largest public health problem in Mozambique, accounting for 29 percent of all hospital deaths and 42 percent of deaths among children under five.^[1]

Mozambique is making significant efforts to reduce its malaria burden nationwide and has set specific elimination goals for its southern provinces. Malaria control and elimination is particularly complex in Mozambique due to the varied transmission dynamics and endemicity across the territory, both between and within provincial boundaries. Thus, tailored packages of interventions are required for different areas of the country.

In July 2017, a major milestone was achieved: the development of a National Malaria Surveillance Roadmap. This outlines the core elements of a surveillance system for malaria elimination, recognising that malaria transmission rates range from very low to high across the country.

To activate responses that are relevant to local needs, it is essential to have a comprehensive malaria

information and surveillance system that collects key eco-epidemiological data to regularly update malaria transmission stratification and inform the deployment of interventions.

Objectives

This countrywide malaria surveillance assessment aimed to quantify the national malaria information system's (MIS) performance to date and to identify key bottlenecks that have hindered better performance through:

- measuring data quality (timeliness, completeness and accuracy) at different levels of the system (e.g. community, health facility (HF) and district)
- measuring the level of information use for decision making at HF and district levels
- identifying the contextual factors (i.e. technical, behavioural and organisational) that influence MIS performance at the different levels
- providing actionable recommendations to strengthen the MIS' performance.

Purpose

In order to make informed decisions on resource allocation and track progress towards disease control and elimination goals, national malaria control programmes (NMCPs) need performing MIS' that are capable of providing valid, reliable and timely data.

In Mozambique, the current MIS' performance is not yet optimal and a range of factors are likely contributing to this underperformance including: the quality of data; decision makers' use of the information provided; and the enabling organisational, technical and behavioural environment.

As southern Mozambique moves towards malaria elimination, it will be essential for policy makers to understand and address the major blockages in the current MIS; this will not only improve the system's performance, but should also enable more informed decision making.

Thus, building on findings from a surveillance system review conducted in 2016, this 2018 countrywide malaria surveillance assessment provides a comprehensive analysis of the root causes of MIS issues at all levels, identifies and measures specific challenges faced, and outlines actionable recommendations for strengthening and upgrading the current malaria surveillance system.

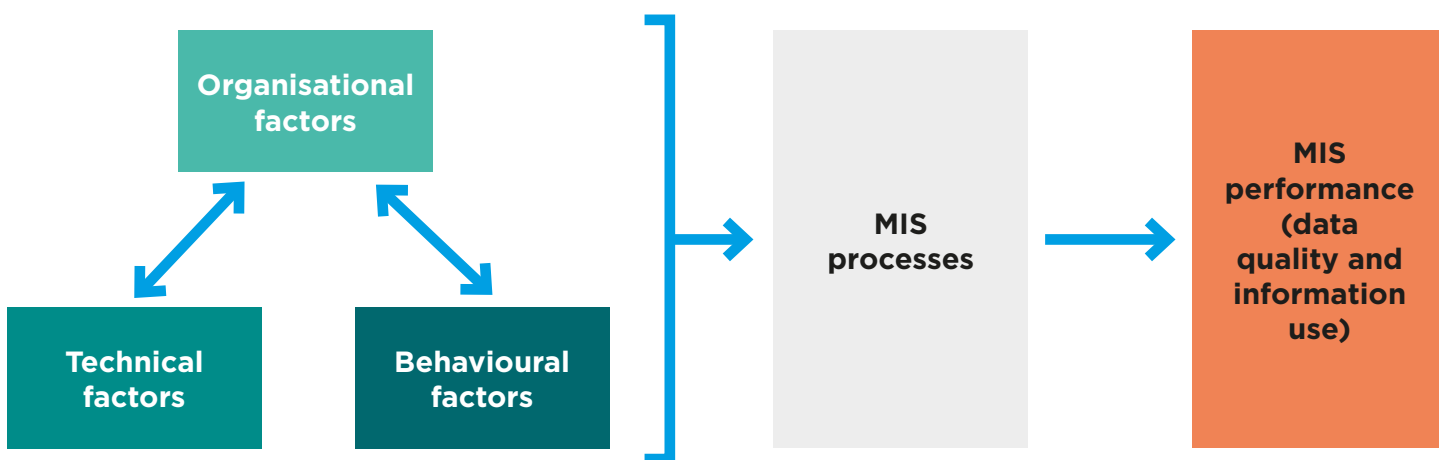
Methods

In July 2018, an observational, cross-sectional survey – combining quantitative and qualitative components – was conducted in 15 randomly selected districts across eight of Mozambique's 11 provinces.

Data collection tools were based on previously-conducted Performance of Routine Information System Management (PRISM) assessments, and adapted to the Mozambican context. As illustrated in figure 1, they aimed to measure five essential MIS components: 1) overall system performance, determined by the quality of data produced and its effective use by the different levels of the health service; and 2-5) the behavioural, organisational and technical interrelated factors that influence MIS processes.

Trained teams collected data from key informants (e.g. community health workers (CHWs), district malaria focal points, etc.), using paper forms that were tailored to the various levels at which participants were operating (i.e. province, district, HF and community) and entered this into Microsoft Excel databases. A total of 159 forms – six at provincial, 15 at district, 80 at HF, and 58 at CHW levels – were analysed in Excel for simple calculations and in STATA version 13.1 for calculating mean scores, proportions, and respective ranges.

Figure 1: Five components for assessing malaria surveillance systems*



*Adapted from: MEASURE Evaluation, 2011^[2]

Key findings

System performance

While data completeness^[i] was found to be robust (96 and 90 percent at community and HF levels respectively), timeliness^[ii] was problematic, particularly at the community level; only 42 percent of CHWs' reports were submitted in a timely fashion in the past three months, in part due to recurrent stock-outs of reporting forms. Data accuracy was found to be weak, with frequent discrepancies noted between the data recorded in registers and in monthly reports; variance between the two data sources ranged from 22 to 97 percent at community level and reached 700 percent at HF level in southern Mozambique. Therefore, urgent action—including improved training and supervision—is required at all levels to address these data quality issues.

Behavioural factors

The culture of information and motivation was measured using a Likert scale.^[iii] Overall, a large majority of respondents from all levels reported being motivated to execute data-related activities and felt that the health service was promoting a culture of information (78 percent). Motivation scores were the lowest at district level, potentially indicating an overburden with data management responsibilities at this level.

Interestingly, respondents' capacity to perform basic data analyses and interpretation was found to be higher (during testing) than their self-reported capacity: 70 compared to 56 percent at HF level, and 89 compared to 63 percent at district level.

Organisational factors

Critical training gaps were evident at both the community and HF levels. Only a third (36 percent) of CHWs reported having been trained on data management in the past six months, and a similar proportion (34 percent) of HF staff interviewed said they had ever received training on malaria data management.

Supervision was also found to be weak. While nearly three-quarters (74 percent) of CHWs interviewed had received a supervision visit in the previous three months, only 42 percent recalled the quality of their data having

been reviewed. Over the same time period, only half of HFs were found to have received any supervision and data quality checks had only been conducted during 27 percent of those visits.

Technical factors

While the complexity of forms does not appear to have been an issue for health service providers, frequent stock-outs of forms had contributed to challenges in ensuring timely and accuracy of reporting. Additionally, HFs' handling of data was found to be very limited as they are not yet benefitting from access to the internet and computers.

Information system processes

Problems were noted at the data transmission stage; systems for filing reports at HF and district levels were lacking, and limited data processing and analysis was taking place at HF level. This may be in part due to the fact that less than 34 percent of interviewed HF staff had been trained on malaria data management in the past six months, and/or may reflect the observed lack of availability of registers at all levels.

i. The proportion of required data elements in monthly reports that have been completed.

ii. The proportion of reports that have been submitted on time (as defined by the NMCP) at each level.

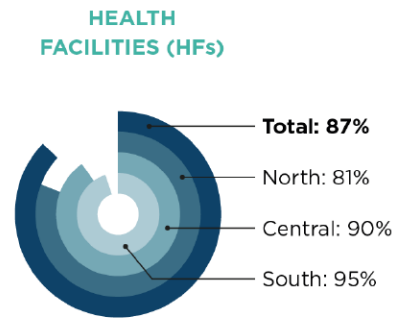
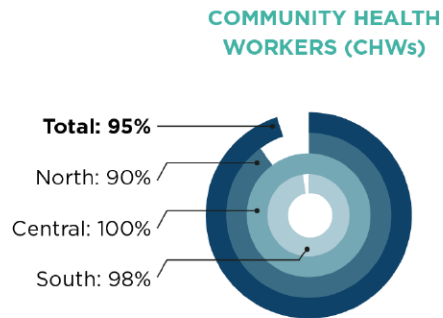
iii. This was a five point scale that enabled respondents to express the extent to which they agreed or disagreed with certain statements.

National malaria surveillance system assesment (2018)

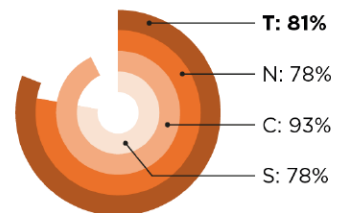
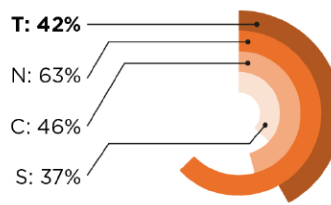
On average in Mozambique...



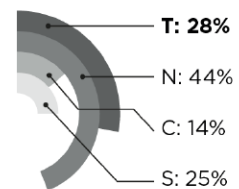
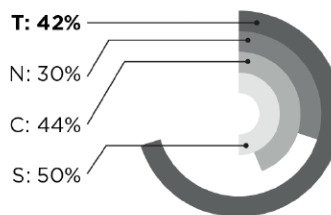
% of required data elements in the monthly reports **completed**



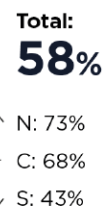
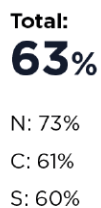
% of reports submitted **on time**



% of **data verified** in the past three months



% of children under five confirmed **positive for malaria** via rapid diagnostic tests (mRDTs)

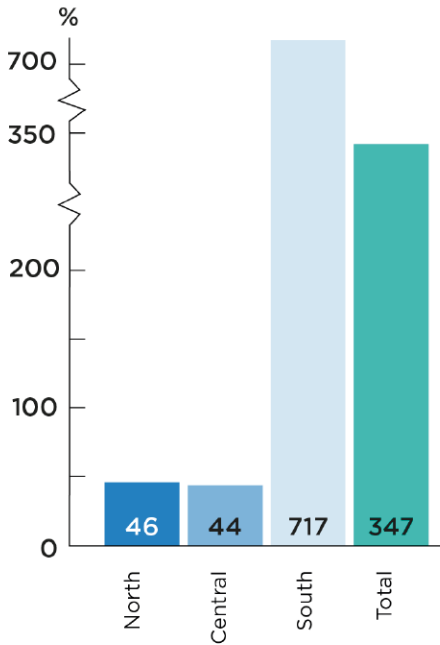




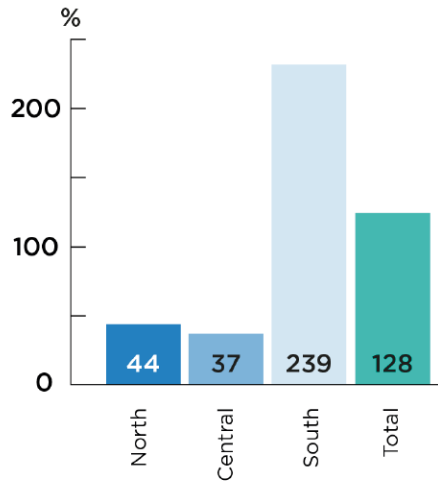
ACCURACY

Percentage error is the difference between the monthly reports and the registers compared to the registers expressed in a percent format. A higher value indicates greater error.

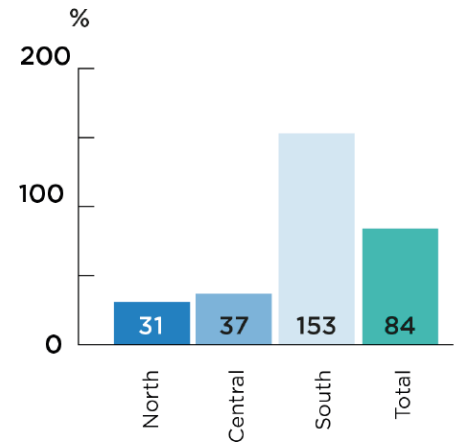
Percent error in health facilities' reports on the number of:



children under five who underwent an mRDT

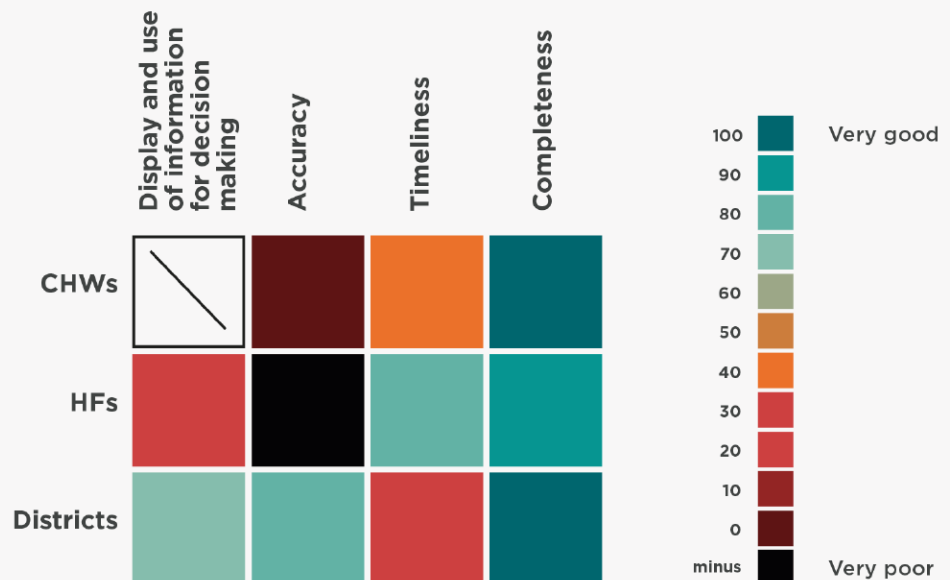


children under five confirmed positive for malaria by an mRDT



malaria positive children under five who received artemisinin-based therapy

This heat map summarises the performance of Mozambique's national malaria surveillance system (measured through its data quality components and the use of data for decision making)



Recommendations

Access to timely and reliable data is crucial for malaria surveillance. As Mozambique moves towards malaria elimination, significant investment is required to strengthen its surveillance system. Indeed, this countrywide malaria surveillance assessment highlighted key gaps and challenges, which point to the need to undertake the following at all levels of the MIS:

- **Prioritise enforcement of data quality checks:** Routine data quality assessment activities, coupled with effective capacity building interpreting and using data for decision making, are required to fill the gaps present in the system and progressively improve overall data quality.
- **Nurture the use of information:** Training on data management is necessary, and will build on health staff's existing motivation to carry out data analysis activities. It will also enable more effective decision making at lower levels, as refined data becomes increasingly available to inform the tailoring of activities/interventions.
- **Provide and enforce simple and clear technical guidelines for data management:** These should highlight the basic data management activities that need to be completed regularly, specifically detailing the key actions that lower levels of the system (i.e. district and HF) should undertake in light of the monthly or weekly findings generated by regular data analysis.



Head of the Quissimajulo health facility being interviewed during the surveillance assessment, August 2018.

Table 1: Priority recommendations for each level of Mozambique’s health system

	Priority recommendations		
Key components	District level	Health facility level	Community level
MIS performance	<p>Improve data quality at all levels so that it reaches an acceptable percent error in two years’ time. This could be achieved by conducting dedicated and routine data quality checks, building the capacity of all those who handle data (e.g. CHWs, HF staff and district staff), and implementing and routine monitoring.</p> <p>Increase data use for decision making by aiming for 75 percent of all HFs and districts to be conducting basic data analysis and identifying actions on a monthly basis, in two years’ time.</p>		
MIS processes	<p>Develop and introduce standard operational procedures for data collection, analysis and reporting.</p>	<p>Commence conducting at least basic analysis of malaria cases (e.g. a chart or graphic) once a month.</p> <p>Enforce the use of daily summaries to facilitate counting of cases and reduce discrepancies between registers and monthly reports.</p>	
Behavioural factors	<p>Clearly formalise where responsibilities for district-level activities on malaria surveillance (i.e. data management, analysis and actions) lie.</p>		
Organisational factors		<p>Train CHWs and HF staff in reporting, analysing and using data so that at least 80 percent are able to manage malaria data.</p> <p>Improve data quality and use by ensuring that at least 80 percent of staff are being supervised on a quarterly basis.</p>	
Technical factors		<p>Improve data completeness and timeliness by strengthening planning and rolling out a supply system for data forms that results in less than 10 percent of CHWs and HFs reporting stock-outs in the previous three months at the next assessment. Such a system could make use of the Ministry of Health’s existing distribution chains.</p>	
		<p>Conduct a needs assessment of priority IT tools (e.g. computers, the internet, etc.).</p> <p>Develop and implement a procurement and distribution plan for these items, prioritising HFs in low and very low transmission areas.</p>	

Moving towards malaria elimination by strengthening surveillance in Mozambique

This project aims to support Mozambique's NMCP to develop a malaria surveillance strengthening plan that will guide countrywide implementation of effective interventions (tailored to all transmission strata in the country) and, thus, support the regional malaria elimination agenda.

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References

1. Ministry of Health, Mozambique. National Malaria Control Plan: 2017-2022. Maputo: Mozambique; 2017.
2. MESAURE Evaluation. Tools for Data Demand and Use in the Health Sector: Performance of Routine Information Systems Management (PRISM) Tools. 2011. Available at: <https://www.measureevaluation.org/resources/publications/ms-11-46-d>.

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