

STRENGTHENING HEALTH MANAGEMENT INFORMATION SYSTEMS TO IMPROVE MALARIA DECISION-MAKING

TECHNICAL BRIEF

Mozambique Integrated Malaria Program (IMaP)



Analyst looks at information in a database. Photo by Chemonics International, Inc.

Malaria is one of Mozambique's most pressing public health challenges, accounting for 26% of outpatient visits and 10% of total hospitalized patients in 2020, according to the Mozambican Government. Limited use of data for decision-making in the Sistema de Informação de Saúde para Monitoria e Avaliação (SIS-MA) has been one of the barriers to reducing malaria morbidity, mortality, and parasitemia.

Since 2017, the USAID Mozambique Integrated Malaria Program (IMaP) has strengthened the quality of routinely collected data, increased use of SIS-MA, and advanced data-informed decision-making for malaria services. These activities have bolstered the capacity of provincial and district stakeholders and improved data quality, data use, facility supervision, and malaria outcomes (see Exhibit I). Using a customized district-wide monthly data bulletin, health officials can leverage experiences with IMaP to further strengthen a culture of data use at the health facility, district, and provincial levels.

Existing Challenges to SIS-MA Data Use for Decision-Making

IMaP assessed data practices in supported provinces early in the program and established that provinces and districts did not use SIS-MA to systematically analyze malaria program data. Some health facilities never accessed SIS-MA despite having received the required access credentials, and provincial staff lacked internet connectivity and authorization to manage the system. Additionally, the SIS-MA interface operated slowly and lacked a system for validating monthly malaria summary forms. Health system staff were generally unable to address data quality, conduct data cleaning and management, or use SIS-MA tools like pivot tables, district dashboards, or data quality logic checks due to capacity issues.

These issues made it challenging for district and provincial staff to analyze malaria data indicators and accurately plan malaria services. For example, district and provincial staff implemented a supervision system to ensure that health facilities followed malaria protocols, like testing febrile cases for malaria, correctly prescribing injectable artesunate, following rapid diagnostic test instructions, and maintaining proper records. Because of poor data quality in SIS-MA, district staff were unable to identify facilities with the greatest need based on malaria indicators and therefore unable to target supervision support to those facilities.



A healthcare worker posts an informational poster on malaria prevention. Photo by Chemonics International, Inc.

Mozambique Integrated Malaria Program (IMaP) PROJECT DETAILS

DURATION

November 2017 –
October 2022

LIFE OF PROJECT FUNDING

\$23,797,392

GEOGRAPHIC FOCUS

Zambézia, Nampula, Cabo Delgado, and Tete provinces

PRIME CONTRACTOR

Chemonics International, Inc.

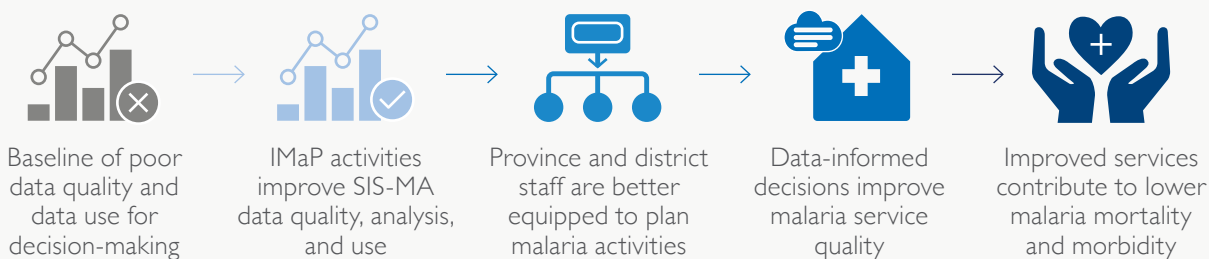
PARTNER ORGANIZATIONS

FHI 360

Vanderbilt University Medical Center (VUMC) / Friends in Global Health

* The Sistema de Informação de Saúde para Monitoria e Avaliação (SIS-MA), Mozambique's national health management information system (HMIS), supports data collection and analysis for decision-making.

Exhibit I. Progress in Data Use for Malaria Decision-Making in Mozambique



IMaP's Data-Strengthening Approach

Data quality tools and resources

IMaP addressed and supported the development of stronger national malaria policies and guidelines focusing on SIS-MA data reporting, analysis, and use. IMaP coordinated with the National Malaria Control Program (NMCP) to develop a data quality assessment (DQA) tool in 2018 that included two main components: 1) assessment of data management and reporting systems, and 2) data verification at the facility and district level. IMaP incorporated the DQA tool into the Integrated Supervision Manual for Malaria Programs that it developed with the NMCP and Ministry of Health in 2019 to ensure that supervisory visits to district and health facilities routinely addressed data quality.

A key role of supervisors was to ensure malaria data for decision-making was routinely collected and monitored via regular data audits. The IMaP team took an innovative approach as there was a severely limited number of staff available to complete these audits. The project trained monitoring and evaluation personnel on how to complete a comprehensive data audit and to audit data from health facilities and districts not under their jurisdiction to eliminate bias. This approach was extremely successful in raising the quality of malaria data.

Data capacity strengthening

To ensure sustainability of data improvements, IMaP consistently collaborated with provincial and district staff to strengthen their capacity to use and maintain SIS-MA. In 2019, IMaP collaborated with provincial health directorates (DPS) to train 839 district staff responsible for SIS-MA administration on data quality and management. From 2019 to 2022, IMaP continued to coach these staff and conduct on-the-job training with other healthcare workers responsible for data, like district malaria focal points and maternal and child health nurses, to address data quality challenges at different levels. During this period, the project facilitated the modification of malaria indicators in SIS-MA and the integration of additional validation rules to ensure the system captured high-quality malaria data.

IMaP's training prepared staff in the target provinces to better support their counterparts in data quality, cleaning, and analysis. This led to reduced data discrepancies and improved timeliness, quality, and data submission rates. Across all four provinces, the rate of timely and complete data in SIS-MA increased from 68.5% in 2017 (before IMaP) to 93% in 2022 (see Exhibit 2, next page). In terms of data accuracy, DQAs found that data discrepancies between SIS-MA summary reports and hard-copy registration books decreased from 65% in 2019 to 11% in 2022 (see

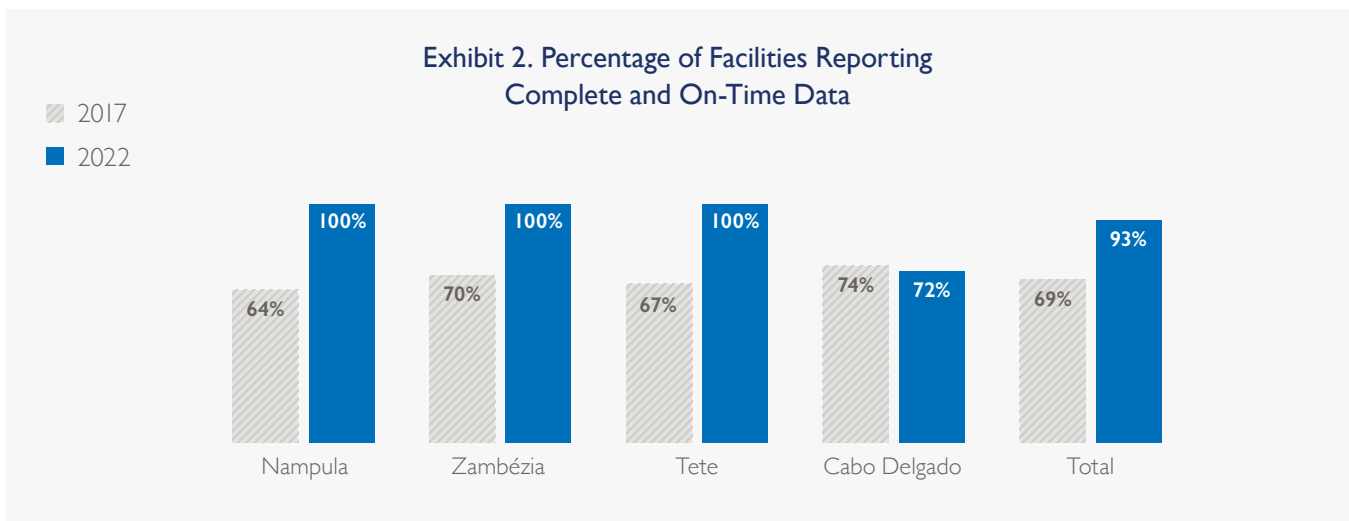


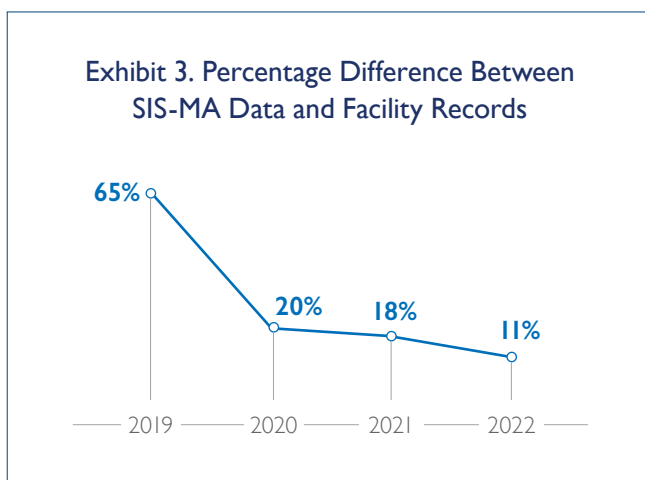
Exhibit 3). This level of consistency is an important aspect of ensuring data quality.

IMaP also supported the NMCP technically and logistically on the rollout of Integrated Malaria Information Storage Systems (iMISS) supervision visits to improve digital malaria data collection in all four target provinces. IMaP teams encouraged DPS to use the iMISS platform for malaria data collection during these visits to ensure real-time data availability for decision-making. IMaP regularly supported central-level supportive supervision visits to improve use of iMISS.

Support for data analysis and use

IMaP supported data analysis by training and mentoring district and province staff to use dashboards in SIS-MA; analyze malaria indicator performance; verify that results were achieved in line with quality standards and incorporate data into monthly planning discussions; and produce provincial monthly bulletins. This support was in part provided during monthly reviews of health data, which shifted to virtual discussions during the COVID-19 pandemic. These sessions identified discrepancies in data and prioritized activities at district and health facility levels, such as supervision visits for health facilities that reported the highest number of malaria deaths and the lowest percentage of malaria tests (see box, next page). District staff now have skills to bring graphs and tables produced in SIS-MA to these discussions to ensure that decisions are evidence based.

For health facilities with poor data quality, IMaP implemented monthly district data discussions, which helped improve data quality over time. After transitioning to virtual discussions in 2020 due to COVID-19, they expanded participation to include the district medical chief, malaria district focal point, and the *estatistical distrital nucleos* representative



(i.e., district level statistician). On a monthly basis, IMaP worked closely with DPS staff to analyze and provide feedback to revise and correct data; this was done through WhatsApp and email to guarantee that all districts received their feedback in a timely manner to allow for changes to be input before the end of the SIS-MA data entry period. IMaP also supported the production and printing of monthly feedback bulletins for use by district-level staff and decision-makers.

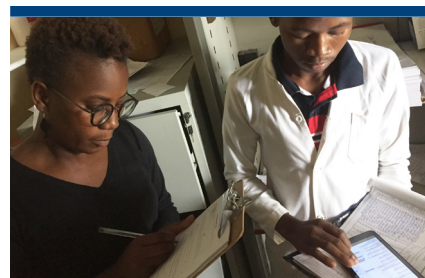
To further strengthen data use for decision-making, IMaP organized one-day data analysis and visualization meetings every quarter for provincial staff to share issues and solutions from district data discussions with a broader audience.

Accomplishments

- Supported the rollout of iMISS and reviewed initial data early during Year 5 of the project, which facilitated a national training to promote understanding and use of iMISS.
- Strengthened the quality of malaria data in SIS-MA and continued to introduce additional validation rules.
- Supported DPS in monthly virtual data discussions and monthly provincial-level health bulletins as venues to provide feedback on revising malaria data.
- In partnership with the NMCP, developed a DQA tool that helped districts and health facilities address issues of data quality.
- Trained over 800 healthcare workers responsible for data on SIS-MA data quality and management and continued supporting them through on-the-job training.
- Contributed to reduced data discrepancies — from 65% in 2019 to 11% in 2022 — and improved the quality and timeliness of submitted data — from 69% in 2017 to 93% in 2022 — across all four focus provinces.

Conclusions and Recommendations

By strengthening the generation of quality data and ensuring that it is used for decision-making, health officials have made significant progress on malaria in Nampula, Zambézia, Tete, and Cabo Delgado — from equipping more than 800 healthcare workers with the knowledge and skills to efficiently collect and analyze malaria data to ensuring more timely and accurate data is being utilized for decision-making. IMaP found that by bringing together healthcare workers from multiple districts to malaria discussion sessions, participants greatly benefited from sharing



During a supportive supervision visit, a technician and supervisor review program data. Photo by Chemonics International, Inc.

Data for Decision-Making in Practice

Gino Gonçalves, a malaria focal point based in Nampula City, has experienced how IMaP activities have improved recording, collecting, compiling, and submitting monthly statistics in all districts. Routine DQA results also show improvements in data quality. Gonçalves reports that the combination of these improvements ensures that decisions in Nampula Province are guided by data.

For example, the province now ensures that supervisory visits are conducted in multiple facilities in all districts, ensuring proper monitoring of the program's operation at health facilities. The data helps secure availability of program resources, including medicines, mosquito nets, and registration tools, overcoming the problem of constant inventory shortfalls. Mosquito nets are now allocated quarterly in districts based on supervision data to prevent shortages.



A healthcare worker talks with community members about malaria treatment and prevention in rural Mozambique. Photo by ALCY MEDIA.

the challenges they experienced and solutions that worked (or did not work). By expanding the geographic scope of these sessions, IMaP facilitated more widespread peer learning on key technical issues, such as best practices for data collection and management and overcoming process issues. Furthermore, monthly data discussions and the regular circulation of monthly provincial level health bulletins provided provincial- and district-level staff with important feedback on the availability of program resources, including vital medicines, mosquito nets, and registration tools, further strengthening decision-making capabilities. However, additional approaches are still required to continue addressing poor data quality, limited data analysis capabilities, and expanded data use across Mozambique.

IMaP recommends that the NMCP continue to invest in the functionality and use of SIS-MA and iMISS by:

- Including logic checks and alerts in SIS-MA and iMISS data entry forms with malaria variables.
- Incorporating analysis of DQA results in quarterly data analysis meetings.
- Ensuring that clinical staff have access to SIS-MA for data analysis and visualization.
- Continuing to produce monthly data feedback bulletins for districts.
- Continuing to engage provincial teams in iMISS use for data entry and by decision-makers based on supervision visits and on-the-job training.