Assessment of the Zimbabwe Assistance Program in Malaria

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Abbreviations

ACT	artemisinin-based combination therapy
ANC	antenatal care
CAC	community action cycle
CD	continuous distribution
CHW	community health worker
CI	confidence interval
CM	case management
D4I	Data for Impact
DHIS2	District Health Information Software, version 2
DHMT	district health management team
EHT	environmental health technician
EVI	enhanced vegetation index
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
HCC	health center committee
IP	implementing partner
IPTp	intermittent preventive treatment of malaria in pregnancy
IRS	indoor residual spraying
ITN	insecticide-treated net
ITS	interrupted time series
KI	key informant
LLIN	long-lasting insecticide-treated net
M&E	monitoring and evaluation
MOHCC	Ministry of Health and Child Care
NMCP	National Malaria Control Program
PHMT	provincial health management team
PMI	United States President's Malaria Initiative
RDT	rapid diagnostic test
RHC	rural health center
RR	relative risk
SBCC	social and behavior change communication
SME	surveillance, monitoring, and evaluation
SP	sulfadoxine pyrimethamine

USAID	United States Agency for International Development
VHW	village health worker
ZAPIM	Zimbabwe Assistance Program in Malaria

Abstract

The Zimbabwe Assistance Program in Malaria (ZAPIM), a United States President's Malaria Initiative (PMI)-funded project in Zimbabwe, supports the Ministry of Health and Child Care (MOHCC) through the National Malaria Control Program (NMCP) to provide comprehensive malaria prevention and treatment services to Zimbabweans, with the goal of reducing malaria morbidity and mortality.

Zimbabwe has significantly reduced malaria mortality and morbidity through the continuous distribution (CD) of long-lasting insecticide-treated nets (LLINs), indoor residual spraying (IRS), good quality of care, and other key interventions that have achieved and sustained high coverage in many parts of the country.

Data for Impact (D4I) sought to document the current status of malaria management practices and progress that the project has made since its inception with an assessment to address these questions:

- What are the trends in malaria intervention coverage in ZAPIM and non-ZAPIM districts?
- What are the trends in malaria morbidity and mortality in ZAPIM and non-ZAPIM districts?
- What is the capacity of the NMCP and the districts to manage and implement various malaria interventions in ZAPIM and non-ZAPIM districts?
- What are the facilitators of and barriers to planned achievements by the ZAPIM project?

The assessment used a mixed-methods approach comprising a document review, secondary data analysis, key informant (KI) interviews, health facility assessments, and an organizational capacity assessment.

Overall, the assessment confirmed good coverage of malaria control interventions and significant declines in malaria incidence and mortality. A continued, focused investment on malaria control is recommended to sustain the gains made and address some of the gaps identified during the assessment.

Executive Summary

This report presents the results of the assessment of the Zimbabwe Assistance Program in Malaria (ZAPIM), a project funded by the U.S. President's Malaria Initiative (PMI) in Zimbabwe. ZAPIM supports the Ministry of Health and Child Care (MOHCC) through the National Malaria Control Program (NMCP) to provide comprehensive malaria prevention and treatment services to Zimbabweans, with the goal of reducing malaria morbidity and mortality. Data for Impact (D4I), a five-year project funded by the United States Agency for International Development (USAID), conducted the assessment.

Purpose of the Assessment

The purpose of the assessment was to document the current status of malaria management practices and progress made by the ZAPIM project since its inception. The results of the assessment will inform the NMCP, PMI, the ZAPIM implementation team, and malaria implementing partners (IPs) in Zimbabwe about the status of malaria control practices, identify gaps, and provide recommendations for future implementation.

Assessment Questions

The assessment aimed to answer the following evaluation questions:

- What are the trends in malaria intervention coverage in ZAPIM and non-ZAPIM districts?
- What are the trends in malaria morbidity and mortality in ZAPIM and non-ZAPIM districts?
- What is the capacity of the NMCP and the districts to manage and implement various malaria interventions in ZAPIM and non-ZAPIM districts?
- What are the facilitators of and barriers to achievements by the ZAPIM project?

Assessment Design

The assessment used a mixed-methods approach comprising a document review, secondary data analysis, key informant (KI) interviews, health facility assessments, and an organizational capacity assessment.

A total of 50 KIs were interviewed, from the national level to the district level, to assess perceptions of the successes and challenges to the implementation of malaria interventions. The assessment team also examined the quality of care for malaria patients by conducting health facility assessments, which consisted of health worker interviews, client exit interviews, and inventory data on commodities and infrastructure. The final sample included 51 primary health facilities, plus nine referral hospitals, for a total of 60 facilities. The assessment team completed 173 health worker interviews—which included 46 community health worker (CHW) interviews—and 504 client exit interviews.

The secondary data analysis included an interrupted time series (ITS) comparison between ZAPIM and non-ZAPIM districts to observe the change in malaria incidence over the study period. Additional ITS analyses assessed the effects of the implementation of the continuous distribution (CD) of long-lasting insecticide-treated nets (LLINs) on incidence and case management (CM) on case fatality.

Key Findings

Trends for Malaria Program Indicators

Overall, the malaria burden decreased in Zimbabwe between 2014 and 2018, with a spike observed in 2017. Through the CD of LLINs, indoor residual spraying (IRS), and other key interventions that achieved and sustained high coverage in many parts of the country, Zimbabwe significantly reduced the number of malaria cases. The country now has 28 districts in the pre-elimination stage.

ITS analyses revealed that both ZAPIM and non-ZAPIM districts achieved significant declines in incidence over the study period. ZAPIM districts experienced significantly larger declines in incidence over the study period compared with non-ZAPIM districts. It should be noted, however, that non-ZAPIM districts had significantly lower baseline incidence than did ZAPIM districts and, for that reason, achieving incidence declines in these districts may have been more difficult.

Effects of LLIN CD and Case Management

ITS analyses exploring the effects of LLIN CD on incidence revealed a significant reduction following the implementation of LLIN CD, preventing an estimated 69,005 total cases during the study period. A similar analysis on community and clinical CM revealed that the implementation of ZAPIM-led clinical CM resulted in a significant reduction in case fatality, preventing 158 deaths during the study period.

Quality of Malaria Care

The health facility assessments showed a high availability of commodities and high adherence to CM practices. Nearly all facilities included in the assessment had staff trained in malaria CM. Facility readiness to provide quality outpatient malaria care was equally high.

Implementation Capacity of Provincial and District Health Management Teams

Overall, the implementation capacity was consistent in both provincial health management teams (PHMTs) and district health management teams (DHMTs). The officials reported adequate capacity across malaria technical areas. However, strengthening capacity related to gender and the regulation of malaria commodities is needed.

Facilitators of and Barriers to Achievements

The facilitators and barriers to malaria control achievements were derived from the KIs, who included officials from the MOHCC at national, provincial, and district levels; PMI Zimbabwe; ZAPIM; and key malaria control implementers in Zimbabwe.

- The facilitators of malaria control included: strong governance structures at all levels; strategic leadership and effective teamwork; clear implementation strategy and guidelines; increased community involvement in malaria control; increased health worker capacity in malaria control interventions; and financial and technical support from donors.

The barriers to malaria control achievements included: limited resources for malaria programming; logistics and

supply chain challenges; sociocultural, religious, and lifestyle barriers; limited funding for social and behavior change communication (SBCC); limited focus on surveillance, monitoring, and evaluation (SME); and operational challenges.

Conclusion

Overall, the assessment found good coverage of malaria control interventions and significant declines in malaria incidence and mortality. A continued focused investment in malaria control will sustain the gains already made and address some of the gaps identified by the assessment.

Recommendations

Recommendations made by the assessment team and the country's malaria stakeholders are general ones that need to be addressed not only by PMI and PMI implementing partners, but also by the NMCP and malaria stakeholders in the country. They are as follows:

- Continue the current approach to control, at least in medium- to high-burden districts, but revisit when more complete incidence and mortality data from 2019 and from part of 2020 are available to determine whether the downward trend continues. If new 2019 and 2020 data suggest that progress has stagnated, control strategies should be revisited. In particular, the dynamic ward-level "either-or" approach to LLIN and IRS is economically understandable but not optimal for achieving maximum benefit. —*NMCP coordination*

- As a strong component of the overall control strategy, the system for the CD of LLINs should be well maintained and supplies should be a priority. It would be helpful to know if demand on the LLIN CD system increases with time after the last mass distribution. These data could help assess the ideal duration between mass distributions and would further strengthen the system. —*NMCP coordination*

- Increase the focus of supportive supervision visits on observation and feedback, making sure that providers are giving patient education appropriately. —*NMCP coordination with PMI implementing partner (IP) support*

- Strong coordination and good governance structures were highlighted as a key success factor. There is need for continued support for coordination activities, including technical working groups and stakeholders' involvement in project work planning, to ensure that programmatic gains and improvements in malaria control are not eroded. —*NMCP coordination with PMI IP support for funding and technical assistance*

- Implement a full spectrum of malaria interventions, including SBCC and community-based initiatives, in the selected districts or areas. —*PMI IPs under the guidance of the NMCP*

- Strengthen program management, especially logistics and commodity supply chain management, to minimize the disruption of activity implementation and service delivery. —*PMI funding working with PMI IPs and NMCP*

- Strengthen gender-sensitive programming in malaria. If not already required, programs should conduct gender analyses during design phases to identify and plan how to address gender-related factors affecting exposure, prevention, and treatment. —*PMI IPs* Strengthen mechanisms to generate evidence, such as formative and operations research, and generate disaggregated data for evidence-based and targeted

programming, communication, and decision making– *NMCP coordination with PMI funding*

- Increase the focus on malaria surveillance as a core malaria intervention with clear project support–*NMCP coordination with PMI funding*

- Conduct further analysis of the malaria in pregnancy data at the ward level; this will provide a better understanding of the quality of malaria in pregnancy care. –*PMI IPs with NMCP coordination*

Background

Country Profile

Location and Weather

Zimbabwe is a landlocked country located in southern Africa and bordered by Zambia, Mozambique, South Africa, Botswana, and Namibia. It is divided administratively into 10 provinces: Bulawayo Metropolitan, Harare Metropolitan, Mashonaland Central, Mashonaland East, Mashonaland West, Manicaland, Masvingo, Matabeleland North, Matabeleland South, and Midlands. Each province is divided into districts, which are further divided into wards.

Zimbabwe is geographically diverse. The Mafungabusa plateau (average elevation about 1,300 meters) covers most of the central area. Around this plateau, the surrounding elevations gradually decrease, with varying ranges between 1,200 meters above sea level to 600 meters above sea level. The differences in altitude are correlated with diverse climates. The central highlands experience the greatest rainfall, with the lower regions receiving the least rainfall. Zimbabwe has a tropical climate, with the hottest temperatures from September through October, followed by warm and wet weather in November through April, and cold and dry weather in May through August.

Healthcare System

The Ministry of Health and Child Care (MOHCC) has pledged to improve the quality of life for Zimbabweans. The National Health Strategy 2016–2020 emphasizes equity and quality of health through the strengthening of priority health programs and improved service delivery (MOHCC, 2016a). The healthcare system uses a primary health care structure. It has several service delivery platforms, including primary, secondary, tertiary, and quaternary facilities. The majority (88%) of health facilities are primary health facilities and provide a basic level of care (MOHCC, 2016b). More complicated cases are referred to the next level of facilities. The physical presence of health service delivery components in the country, or the "general service availability index score," was recently analyzed in a service readiness assessment for which Zimbabwe achieved a score of 42 percent (MOHCC, 2016b). The healthcare system has been challenged by dwindling funding, leading to a reduction in the availability of commodities and skilled health professionals. These combined deficits have resulted in the limited availability of services, especially in rural areas.

Malaria Epidemiology

The majority (98%) of the malaria parasites found in Zimbabwe are *Plasmodium falciparum,* with *P. ovale*, *P. vivax*, and *P. malariae* making up the rest. The primary vector is *Anopheles arabiensis*. Transmission across the country is heterogenous, with three different transmission zones based on altitude. The areas of the north and south closest to sea level experience perennial transmission and are considered to have moderate to high malaria transmission. The majority (88%) of malaria endemic districts are composed of these lowland areas. Areas of the north and south with mid-level altitudes have seasonal transmission, and the high areas across the center of the country have relatively low or no malaria transmission. The peak transmission season occurs from mid-November until May, during the warm and wet season. Transmission drops during June through August, with the colder temperatures. Dry conditions restrict mosquito breeding and transmission during September and October.

Around 45 percent to 50 percent of the population is at risk for developing malaria. Most cases (83%) occur in three provinces: Manicaland, Mashonaland East, and Mashonaland Central. Malaria incidence has decreased, from 136 cases per 1,000 population in 2000 to 19 cases per 1,000 population in 2018. Table 1 outlines some important milestones achieved in malaria control in Zimbabwe over the past four years.

Table 1. Key milestones in malaria control in Zimbabwe, 2015–2019

Year	Description
• 2015	• Demographic and Health Survey conducted • Insecticide-treated net (ITN) mop-up campaign conducted • Guidelines for Management of Malaria in Zimbabwe developed • Pre-elimination capacity assessments conducted • National malaria case management (CM) audit conducted • District Health Information Software, Version 2 (DHIS2) Tracker instituted • ZAPIM cooperative agreement awarded by USAID Zimbabwe to Abt Associates and its partners, and work to support the NMCP initiated • 13 districts transitioned from control to elimination, bringing the total of elimination districts to 20
• 2016	• Zimbabwe National Malaria Strategic Plan 2016–2020 developed (to include elimination) • Malaria Communication Strategy (2016–2020) developed • Insecticide Resistance Monitoring and Management Plan for Malaria Vectors in Zimbabwe (2016–2020) developed • Focal person assigned to the Malaria Elimination in Southern Africa (Elimination 8) • Malaria Indicator Survey completed • ITN mass distribution conducted • Malaria stratification map updated
• 2017	• SBCC strategy 2016–2020 developed and finalized (with a focus on special populations and SBCC by malaria stratification) • Routine distribution of ITNs piloted in Mbire District

Year	Description
	• Installation of an entomological officer at the NMCP attempted • National Malaria Elimination: Foci Investigation and Response Guidelines finalized
• 2018	• Transitioned from indoor residual spraying (IRS) to ITNs in 13 districts • CD of ITNs for areas not covered by IRS expanded • End-use verification approach revised • Eight districts transitioned from control to elimination, bringing the total to 28 districts
• 2019	• Antenatal care (ANC) and intermittent preventive treatment in pregnancy (IPTp) policies updated to recommend eight ANC contacts with pregnant women • Malaria Surveillance, Monitoring, and Evaluation Plan 2008–2013 revised • Epidemic Preparedness and Response Guidelines revised • ZAPIM project was assessed during the time of the Zimbabwe malaria mid-term review

Overview of PMI in Zimbabwe

The United States President's Malaria Initiative (PMI) was created in 2005 as an effort to reduce malaria-related mortality by 50 percent across 15 high-burden countries in sub-Saharan Africa by 2020 (PMI, 2019). USAID provided limited support to Zimbabwe through funding and technical assistance to conduct emergency IRS in 2009 and an emergency procurement of artemisinin-based combination therapy (ACT) in 2011. In fiscal year 2011, Zimbabwe became a PMI country, with full implementation of program activities beginning in 2012. PMI supports an array of malaria prevention and treatment activities, including the procurement and distribution of commodities (long-lasting insecticide-treated nets [LLINs], rapid diagnostic tests [RDTs], ACT, and sulfadoxine pyrimethamine [SP] for pregnant women), support for IRS in high-burden areas, and training of healthcare workers in malaria CM.

Overview of ZAPIM

In 2015, PMI Zimbabwe awarded the five-year ZAPIM cooperative agreement to Abt Associates and its partners: Save the Children, Jhpiego, and the Liverpool School of Tropical Medicine. ZAPIM supports the MOHCC and the NMCP in providing comprehensive malaria prevention and treatment services to Zimbabweans, with the goal of reducing malaria morbidity and mortality. The project has five main focus areas: malaria CM and malaria in pregnancy, LLINs, SBCC, operational research and monitoring and evaluation (M&E), and malaria studies, specifically therapeutic efficacy.

ZAPIM is implemented in three provinces—Mashonaland Central, Mashonaland East, and Matabeleland North—and across 15 districts. Mashonaland Central and Mashonaland East Provinces were chosen because they had the highest

incidence of malaria as of 2014. Matabeleland North Province sits in an area between pre-elimination districts and control districts, and has a combination of high-prevalence activities and pre-elimination activities. The targeted districts border each other, which simplifies logistics for activity implementation (Figure 1). The NMCP limited the number of targeted provinces, which has allowed ZAPIM to establish close working relationships with provincial health executives.

Figure 1. ZAPIM targeted provinces and districts (areas outlined in blue are ZAPIM districts)
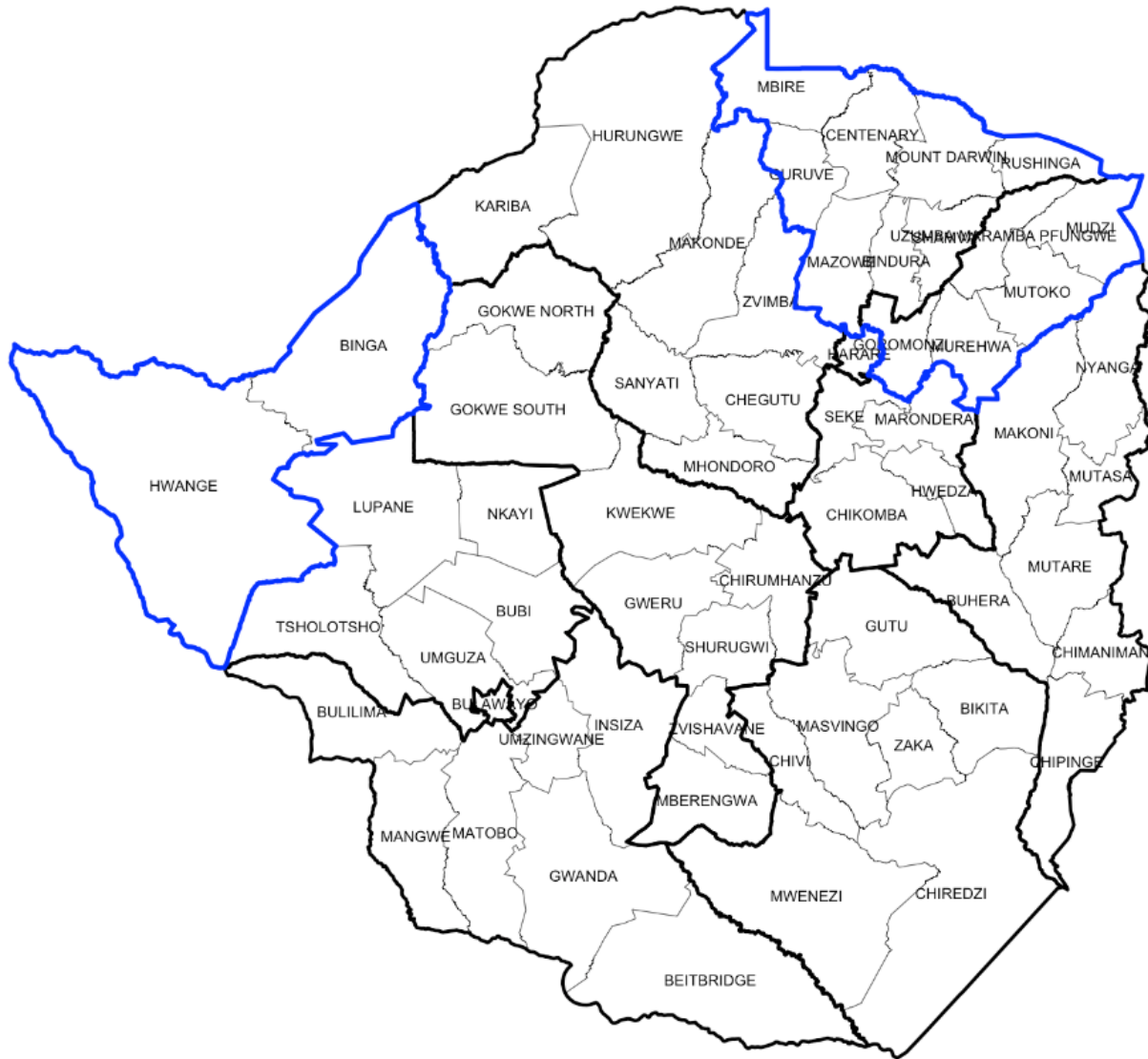
Key ZAPIM project activities implemented during 2015 to 2018 are presented in Table 2.

Table 2. Key ZAPIM activities, 2015–2018

Year	Interventions	Support to the NMCP	Training
1	• Distributed 573,950 LLINs to 10 districts in Mashonaland Central and Mashonaland East Provinces. • Routinely distributed 31,750 LLINs in four pilot districts.	• Supported the national SBCC subcommittee meeting. • Supported World Malaria Day commemorations in the three provinces. • Supported 26 malaria cluster sensitization meetings of the Health Center Committees in 11 districts. • Supported the ongoing endline survey of routine LLIN distribution. • Conducted household registration in all targeted districts. • Held two death audit meetings (Mashonaland East and Mashonaland Central) with attendees from all 15 districts. • Continued the net durability study begun by Population Services International. • Supported the Zimbabwe Malaria Indicator Survey.	• Trained 744 healthcare workers in CM and malaria in pregnancy (411 from Mashonaland Central, 236 from Mashonaland East, and 97 from Matabeleland North). • Trained 152 healthcare workers in medicine management. • Trained 319 LLIN distribution supervisors. • Trained 1,039 LLIN distributors. • Trained 10 district staff in the DHIS2.

Year	Interventions	Support to the NMCP	Training
2	Distributed 53,477 LLINs in 10 districts	• Supported the development of the National Malaria Strategic Plan 2016–2020. • Supported the Southern Africa Development Community and World Malaria Day. • Supported the ongoing endline survey of routine LLIN distribution.	• Trained 361 facility-based healthcare workers in malaria CM and malaria in pregnancy. • Trained 590 community health workers (CHWs) in malaria CM. • Trained 250 health personnel in the CD of LLINs. • Trained 49 healthcare workers in Mashonaland Central and Mashonaland East on M&E.
3	• Launched a pilot malaria clinical mentorship program in five districts (Binga, Hwange, Mbire, Murehwa, and Mutoko). • Matabeleland North Province held two death audit meetings and Mashonaland Central Province held one death audit meeting. • Introduced a pull system for ordering nets for CD by district health facilities. • Developed standard operating procedures for LLIN aeration to address the challenge of itchiness among net users.	• Supported the CM subcommittee meeting that reviewed the malaria treatment guidelines to allow ACT and parenteral artesunate in children weighing less than 5 kg. • ZAPIM SBCC lead took over as chair for the SBCC subcommittee. • Supported post-training follow-up visits and conducted supportive supervision to healthcare workers and village health workers (VHWs). • Conducted three supportive supervision visits to 36 health facilities in Matabeleland North and	• Trained 3,045 healthcare workers and 319 VHWs in CM and malaria in pregnancy. • Sent text message reminders to trained healthcare workers post-training to reinforce key messages from the training. • Used the Training System Monitoring and Reporting Tool (TrainSMART) for real-time monitoring of training gaps and to avoid duplicate training.

Year	Interventions	Support to the NMCP	Training
	• Conducted data collection for the 24-month net durability study; ZAPIM and NMCP staff trained data collectors, analyzed data, and developed the report. • Developed the Chikunda Malaria Audio Book for the hard-to-reach Doma community of Chapoto Ward in Mbire District. • Launched Zapim's Act Together phase. Conducted community action cycle (CAC) Act Together capacity assessments in 67 health center committees (HCCs), and trained 11 HCCs on the phase in Mutoko. Extended the community action cycle (CAC) approach to Binga and Hwange Districts of Matabeleland North, where ward health teams are conducting implementation. Ten CAC trainers were trained in the two districts. • Conducted a case drug consumption survey to explore the factors responsible for the observed discrepancy between malaria cases and ACTs consumed. • Conducted an assessment of the drivers of continuing transmission of malaria in	Mashonaland East Provinces. Staff carried out supportive supervision to 59 VHWs and 11 VHW peer supervisors in Mashonaland Central. Supported four district VHW review meetings. • Supported malaria death audit meetings in Matabeleland North Province (two meetings) and Mashonaland Central Province (one meeting). Mashonaland East Province will hold one meeting in the first quarter of Year 4. • Supported World Malaria Day and the launch of the Chikunda malaria audio book. • Supported the revision of the Malaria Epidemic Preparedness and Response Guidelines and the development of a new Malaria M&E Plan for the National Malaria Strategic Plan 2016–2020. • Supported four clinics in Mbire District to hold community advocacy meetings with traditional leaders to enlist their support in community	• Trained 22 malaria clinical mentors from five districts.

Year	Interventions	Support to the NMCP	Training
	Angwa Ward in Mbire District. - Distributed 114,132 LLINs in 11 districts through CD. - Distributed 4,000 nets in Binga, Beitbridge, and Chipinge Districts in response to malaria outbreaks. - Distributed 11,000 nets in four outbreak-prone wards in Hwedza District. - Conducted data quality audits at 47 health facilities and held quarterly provincial malaria review meetings.	engagements in malaria prevention.	

Assessment Methods

Intent of the Assessment

The results of the assessment are intended to inform NMCP, PMI, Global Fund, and ZAPIM programming and implementation strategies, and to generate evidence that malaria IPs in Zimbabwe can use to strengthen malaria control practices and implementation and to address gaps and recommendations. This report focuses on the situational analysis and provides descriptive, cross-sectional information.

Framework

The assessment used a before-and-after design of ZAPIM districts and non-ZAPIM districts. Key outcomes included coverage of key interventions, and morbidity and mortality. These outcomes were measured at baseline (2015–2016) and endline (2018–2019) in ZAPIM districts and in non-ZAPIM districts (Figure 2). The project was awarded in 2015, but activities did not fully start until 2016. Therefore, we used the period before 2016 as a "baseline." By "endline," we are referring to the right truncate of the assessment period, which occurs one year before the expected end of the project. The assessment therefore illustrates progress made by the project as of 2019. The health facility assessments and qualitative interviews were used to complement other secondary data and were done in the ZAPIM districts only.

Figure 2. ZAPIM assessment framework
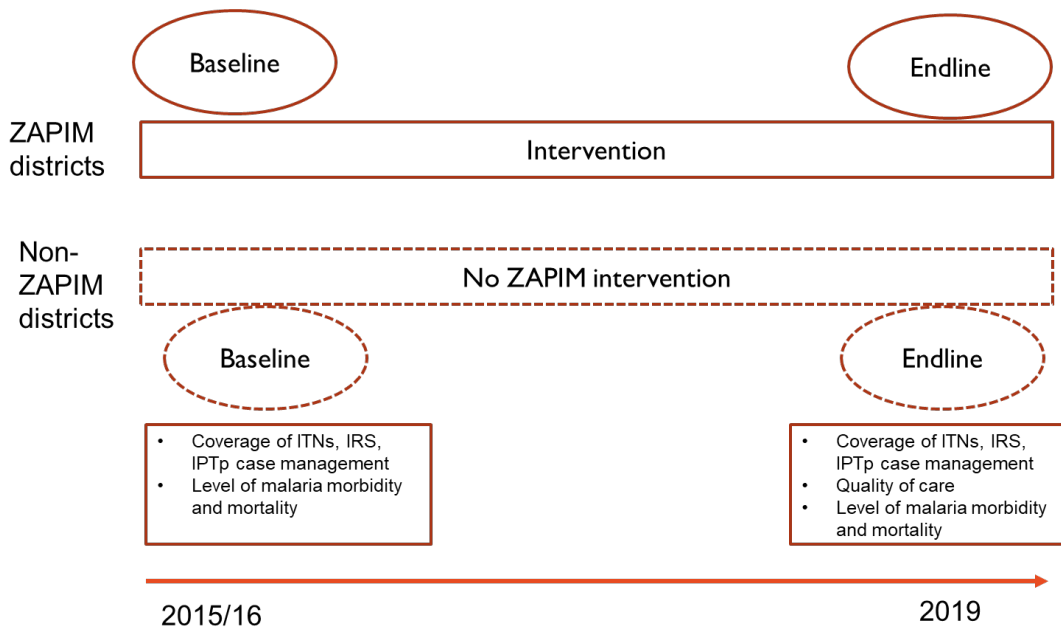
IPTp=intermittent preventive treatment in pregnancy

Impact Model

Figure 3 shows the theoretical framework used to guide the development of the assessment questions and indicators. The theory builds on the project's results framework given in the ZAPIM M&E plan, which foresaw that ZAPIM

would provide training to ensure that key malaria control interventions were available and ready for use. ZAPIM also intended to support health systems to obtain adequate financing, human resources, and data. These inputs and processes were expected to lead to the outputs of improved availability of malaria prevention and treatment tools and services, plus improved CM practices. This availability, in turn, was hypothesized to yield improved coverage and use of key malaria control interventions that were expected to decrease malaria morbidity and mortality rates.

Figure 3. Impact model

Inputs	Process	Output	Outcome	Impact
• Resources available • Policy, strategy documents in place	• Service providers trained • Guidelines revised • Commodities purchased and distributed • SMS reminders sent	• Malaria services and commodities available • Quality malaria services • Health system strengthened	Coverage of key malaria indicators increased	Malaria morbidity and mortality reduced

Assessment Design

The assessment aimed to answer the following evaluation questions:

- What are the trends in malaria intervention coverage in ZAPIM and non-ZAPIM districts?
- What are the trends in malaria morbidity and mortality in ZAPIM and non-ZAPIM districts?
- What is the capacity of the NMCP and districts to manage and implement various malaria interventions in ZAPIM and non-ZAPIM districts?
- What are the facilitators of and barriers to achievements by the ZAPIM project?

Assessment Approach

The assessment used a mixed-methods approach consisting of secondary data collation, primary data collection, document review, secondary data analysis of existing survey and routine health facility data, and an organizational capacity assessment.

Document Review

The assessment team conducted a document review of key strategic information to capture the context of malaria control in Zimbabwe and the implementation of the ZAPIM project. The document review collated reports, policy and strategy documents, and project workplans. The key documents (Appendix A) were provided by the NMCP, PMI Zimbabwe, and the ZAPIM project.

Secondary Data

The assessment team conducted secondary data analysis of routine health information, the Demographic and Health Survey, the Malaria Indicator Survey, and program activity data to assess coverage of key malaria interventions and trends over time in malaria morbidity and mortality. Data sources for secondary data analysis included routine surveillance data, intervention timelines, population data, and environmental data. Except for the environmental

data, secondary data were acquired through key informant (KI) interviews. Routine surveillance data were pulled from the DHIS2. These data included monthly counts of incident cases and deaths per district from 2014 through 2018. District-level timelines of intervention implementation were construed from multiple data sources. Timelines for CD of LLINs were drawn from ZAPIM quarterly reports, and timelines for the mass distribution of LLINs and for IRS were drawn from NMCP annual vector control reports. Clinical and community CM timelines were pulled from the TrainSMART database and were available for ZAPIM districts only. Population data for 2014 to 2018 were taken from 2012 national census projections. Environmental data included elevation, rainfall, and enhanced vegetation index (EVI) data. Elevation data were taken from the Shuttle Radar Topography Mission database. Monthly rainfall from January 2014 to December 2018 was extracted from the Climate Hazards Group InfraRed Precipitation with Station data database. EVI data from January 2014 to December 2018 were downloaded from https://earthdata.nasa.gov.

Key Informant Interviews

The assessment team interviewed KIs from the MOHCC, ranging from the national level to the district level, and from key malaria stakeholders working in the country. The purpose of the interviews was to assess perceptions of the successes of and challenges to the implementation of malaria interventions. The KIs were purposefully selected in collaboration with the NMCP and PMI Zimbabwe. The interviews were guided by an open-ended questionnaire designed to reveal information on how the project could better engage with key players to optimize processes and outputs for better impact (Appendix B). The interviews were taped when the KIs consented. The recordings supplemented the notes taken by the M-Consulting Group team lead. The qualitative component enabled the identification, examination, and contextualization of challenges and successes experienced by ZAPIM and malaria control interventions. It also provided opportunities to capture the perspectives of key malaria stakeholders and to generate evidence complementing the assessment's quantitative component and enhancing the clarity and interpretation of the quantitative data.

Health Facility Assessments

The assessment team conducted health facility assessments to examine the quality of care for malaria patients at the facility level. The facility assessments comprised health worker interviews, client exit interviews, and inventory data on commodities and infrastructure. Purposeful sampling was done, in collaboration with the provincial directors of health and the ZAPIM data manager, among facilities that had reported malaria cases in the four weeks before the assessment. At the facility, we interviewed the health worker in charge and one additional health worker available at the time of the field work. For the client exit interview, screening was done for all outpatients to identify those who had presented with fever or had come for an ANC visit. After obtaining consent, we interviewed those who met the criteria. The validated tools (Appendix B) were converted to digital data collection tools for tablets. The field supervisors uploaded data every day from the tablets to a central database after performing consistency checks.

Organizational Capacity Assessment

The assessment team interviewed provincial health management team (PHMT) and district health management team (DHMT) representatives using an organizational capacity assessment tool adapted from tools previously used in malaria implementation assessments in Nigeria and Uganda under MEASURE Evaluation. The organizational capacity assessment was designed to examine competencies in leadership, technical areas, data analysis and use, and general management (see Appendix B).

Data for Impact (D4I) contracted a local research firm, M-Consulting Group, which had experience conducting previous assessments, to support the data collection in-county. The assessment fieldwork in Zimbabwe began on August 30, 2019 and lasted approximately three weeks. The data collection was conducted in English, Shona, and Ndebele, depending on which language was suitable for the participants. The assessment team members in Zimbabwe comprised the D4I project coordinator, one local team leader, one local project coordinator, six field coordinators (five females and one male), 14 research assistants (ten females and four males), and one statistics expert. Each team had members who were fluent in the local languages. Supervisors conducted data quality checks and supervised field operations, supported by the project management team. The D4I project coordinator oversaw the three-day assessment training and fieldwork and was supported by the local team leader and local project coordinator. The training covered an overview of the assessment, the assessment tools, use of tablets, interview techniques, and research ethics. The D4I project coordinator visited some districts at the beginning of the assessment fieldwork to observe the interviews, identify and correct mistakes, and provide feedback and guidance for improvement. Supervisors undertook spot checks to verify the information and ensure that the interviews were conducted in adherence to professional standards. The assessment team supervisors conducted field editing on the tablets to review every completed questionnaire on the same day of data collection—checking for adequate completion of all fields and any missing data. The interviewers were required to make corrections or return for a re-interview, if necessary. Debriefing sessions were conducted to ensure that the field teams shared insights with supervisors to improve data collection processes.

Data Management and Analysis

Quantitative Data

Secondary Data

Interrupted time series (ITS) analysis on the secondary data, using mixed-effects Poisson regression models, were fit to compare change over time in incidence between ZAPIM and non-ZAPIM districts and to assess the outcomes of interventions implemented during the ZAPIM project in ZAPIM districts.

The outcome for this model was monthly incident cases. This model included a random intercept for a district and a random slope for log-transformed rainfall per km^2, lagging by three months. Fixed effects included a month index for time trend, a binary variable identifying a district as a ZAPIM or a non-ZAPIM location, an interaction term for month index and ZAPIM district identifier and the offset for population size.

The intervention effects assessed were the implementation of CD of LLINs (LLIN CD) and the implementation of community and clinical CM training. We could not estimate the effect of annual mass distribution of LLINs and IRS spraying because of three issues pertaining to the spatial distribution of the two interventions: (1) the difference in spatial units between the available data (district-level) and implementation of interventions (ward-level); (2) the systematic lack of spatial overlap in interventions across wards; and (3) incomplete coverage of the spatial union of both interventions within districts. Moreover, pre-intervention routine surveillance data were not available.

Two mixed-effects regression models were built to estimate intervention effects, both with Poisson distributed outcomes and a random intercept for district. The first model estimated the change in the incidence rate at the time

of implementation of the LLIN CD. The outcome for this model was monthly incident cases. This model included random slopes for log-transformed rainfall per km², lagged by three months, and a month index for the linear time trend. Fixed effects included the LLIN CD intervention term, the month index for the average time trend over districts, and the offset for population size.

The second model estimated the change in the case-fatality rate at the time of the implementation of the CM training. The outcome for this model was yearly counts of malaria deaths. This model included a random slope for the year index for the linear time trend. Fixed effects included a term for community CM, a term for clinical CM, the year index for the average time trend over the districts, and the offset for incident cases.

Facility Assessment Data and Organizational Capacity Assessment

The assessment survey used electronic data collection forms, which were cleared through quality control procedures, and the completed electronic questionnaires were forwarded to a secure cloud-based database. The forms were entered by a trained field team (interviewers) using a KoBoToolbox software customized for the assessment survey. The statistics specialist worked directly with the research team to ensure that the assessment survey data entry program was thoroughly tested and matched the assessment survey forms. The D4I project coordinator and the local team leader reviewed the data entry program to ensure that only valid data ranges were allowed for each question, that the customized program had checks for questionnaire logic (e.g., skips and filters), and that any data inconsistencies were flagged. M-Consulting Group, the local subcontractor, submitted the dataset to D4I for quality review. The final data review enabled the analysis to take place after the cleaned dataset was made available by the local firm. The quantitative data were collected and collated; each individual question was examined. The data were analyzed in Stata 15 and Microsoft Excel 2016.

Qualitative Data

KI interview data were transcribed verbatim and translated from local languages. The transcripts were coded in NVivo 12 software. Data coding involved thematic analysis, or thematically categorizing and organizing the content of the transcripts. Identifying themes was the first step. An iterative process was used to develop the codebook and specific codes, informed by the objectives of the assessment and the KI interview guide. The themes identified were categorized as either facilitators or barriers to malaria control. Quotes that reflected the different findings were reviewed and those that best illustrated the interpretation were chosen. The D4I project coordinator and two M-Consulting Group qualitative analysts conducted the pilot coding exercise and the final qualitative analysis. They communicated regularly during the analysis to ensure consistency in coding and analyzing the content and emerging themes, and to interpret and triangulate the findings. Any differences in interpretation were discussed and resolved by the team.

Ethical Considerations

The assessment received non-research determination from ICF's Institutional Review Board, and the MOHCC provided approval to conduct the assessment in the country. Every effort was made to protect the confidentiality and identity of participating individuals and facilities—the importance of this step was emphasized during the training of data collection staff. For data safety and confidentiality, access to all databases was restricted to key project team members. The results are presented only in general blocks without personal or facility identifiers. We took care to use general terms to describe interviewees who participated in small groups, to protect their identity.

Results

Description of the Sample

Key Informant Interviews

A total of 50 KIs were interviewed; 42 interviews were conducted in person, and eight were conducted by phone, due to scheduling conflicts. Table 3 summarizes the KIs interviewed.

Table 3. Final list of KIs

Organization	Planned Interviews	Completed Interviews
National MOHCC and NMCP	8	5
Province MOHCC	6	4
District MOHCC	27	24
PMI	3	3
ZAPIM	5	8
Other malaria-related projects	7	6
Total	56	50

Health Facility Survey

The final sample of health facilities covered during the primary data collection process was 51 primary health facilities plus nine referral hospitals, for a total of 60 facilities visited. The assessment team completed 173 health worker interviews, which included 46 CHW interviews, and 504 client exit interviews (Table 4). Overall, 64.7 percent of the health worker interviewees were female, and 35.3 percent were male. Of the client interviewees, 71.2 percent were female, and 28.8 percent were male. A list of the facilities visited is provided in Appendix C.

Table 4. Summary of health facilities assessed

Facility audit	N (%)	Health worker interviews	N (%)	Exit interviews	N (%)
Facility type		**Facility type**		**Facility type**	
Clinic	29 (48.3)	Clinic	83 (48)	Clinic	206 (40.9)
RHC	22 (36.7)	RHC	66 (38.1)	RHC	197 (39.1)
Hospital	9 (15)	Hospital	24 (13.9)	Hospital	101 (20)
Total	**60**	**Total**	**173**	**Total**	**504**
Availability of ANC servicers		**Sex**		**Sex**	
No	1 (1.7)	Female	112 (64.7)	Female	359 (71.2)
Yes	59 (98.3)	Male	61 (35.3)	Male	145 (28.8)
Total	**60**	**Total**	**173**	**Total**	**504**
Number of health staff		**Number of health staff**		**Reason for visit**	
1 to 2	1 (1.7)	Non-clinician	9 (5.2)	ANC	202 (40.1)
3 to 5	14 (23.3)	Clinician	104 (60.2)	Fever, <15	135 (26.8)
6 to 10	32 (53.3)	EHT	14 (8.1)	Fever, 15+	167 (33.1)
11+	13 (21.7)	CHW	46 (26.6)	**Total**	**504**
Total	**60**	**Total**	**173**		

ANC=antenatal care, EHT=environmental health technician, RHC=rural health center

Trends for Malaria Program Indicators

Coverage of Vector Control Interventions

Vector control in Zimbabwe consists mainly of IRS and LLINs. LLIN distribution and IRS are targeted on a ward-by-ward basis. Wards consistently reporting two to four malaria cases per 1,000 population for two to four years receive LLINs, and wards reporting five or more malaria cases per 1,000 population receive IRS. IRS is not supported by ZAPIM. A PMI partner, VectorLink, currently supports spraying in Mudzi and Mutoko districts, and in two wards where ZAPIM supports other interventions. All other IRS is supported by the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund).

Continuous Distribution of LLINs

The CD of LLINs consists of distribution through the Expanded Program on Immunization, ANC clinics, and VHWs. The LLIN CD program was piloted in four districts in northern Zimbabwe, starting in 2014. At the inception of ZAPIM, the project took over the LLIN CD pilot. In 2017 and 2018, CD was rolled out nationwide to the majority of LLIN-targeted wards (Figure 4).

Figure 4. LLIN CD, 2013–2018
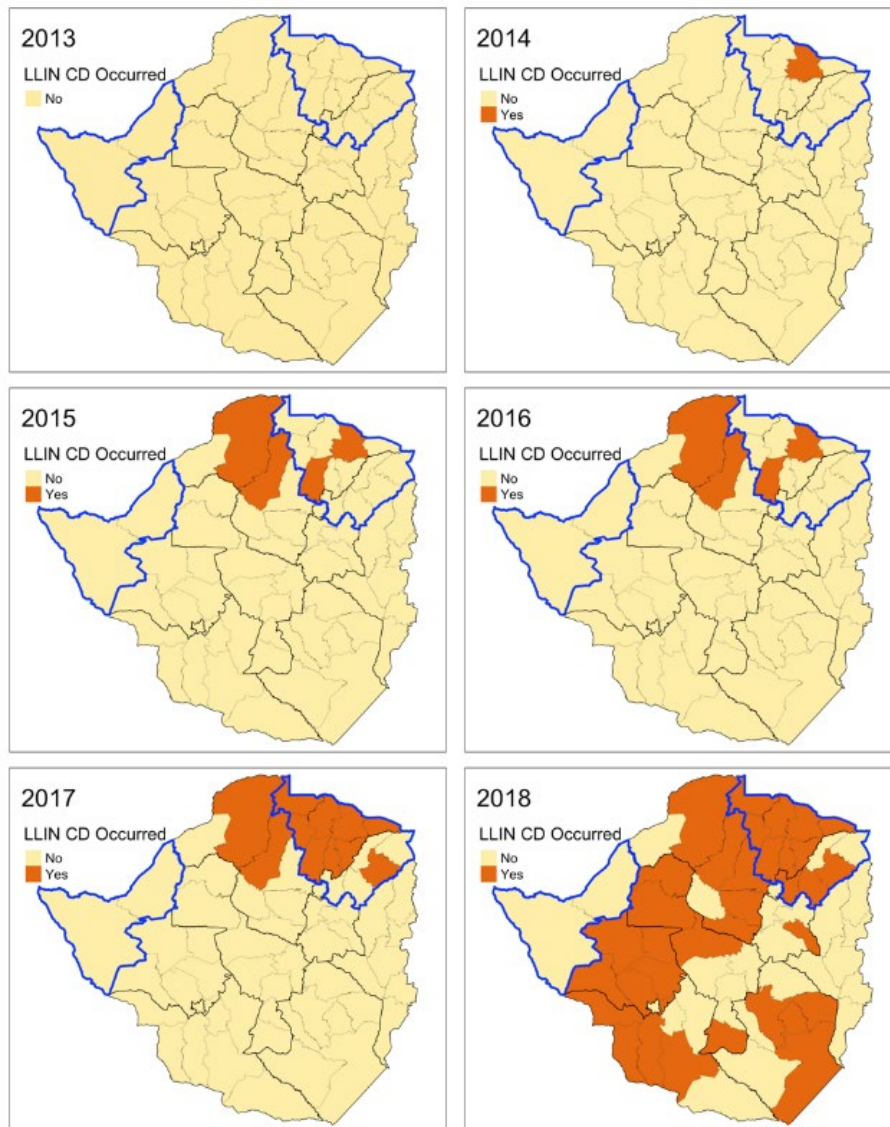
One ZAPIM KI described the motivation behind CD as follows:

> … *the issue of the country wanting to maintain universal coverage and that can be only attained if you have a continuous distribution system or a routine distribution system. So as ZAPIM, we spearheaded the continuous distribution of mosquito nets in the country from 2017 up to now.* —Key informant

During the LLIN CD pilot in 2016, there was one round of school-based distribution in which students from Hurungwe, Makonde, Mazowe, and Mount Darwin received nets to bring home (Figure 5).

Figure 5. Continuous LLIN distribution in schools, 2016
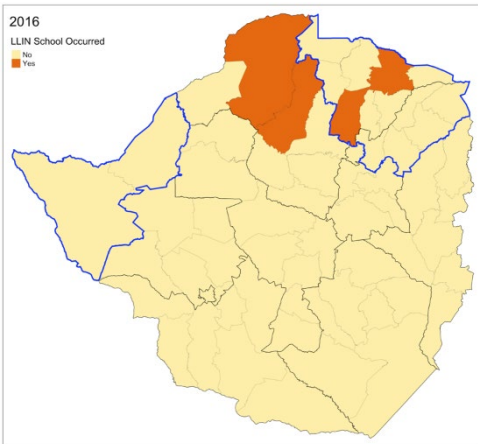
LLIN Mass Distribution

Mass distribution of LLINs occurs nearly annually, typically during the months of May through August. It targets wards reporting two to four cases per 1,000 population that have not received nets in three or more years (Figure 6).

Figure 6. LLIN mass distribution, 2013–2018*
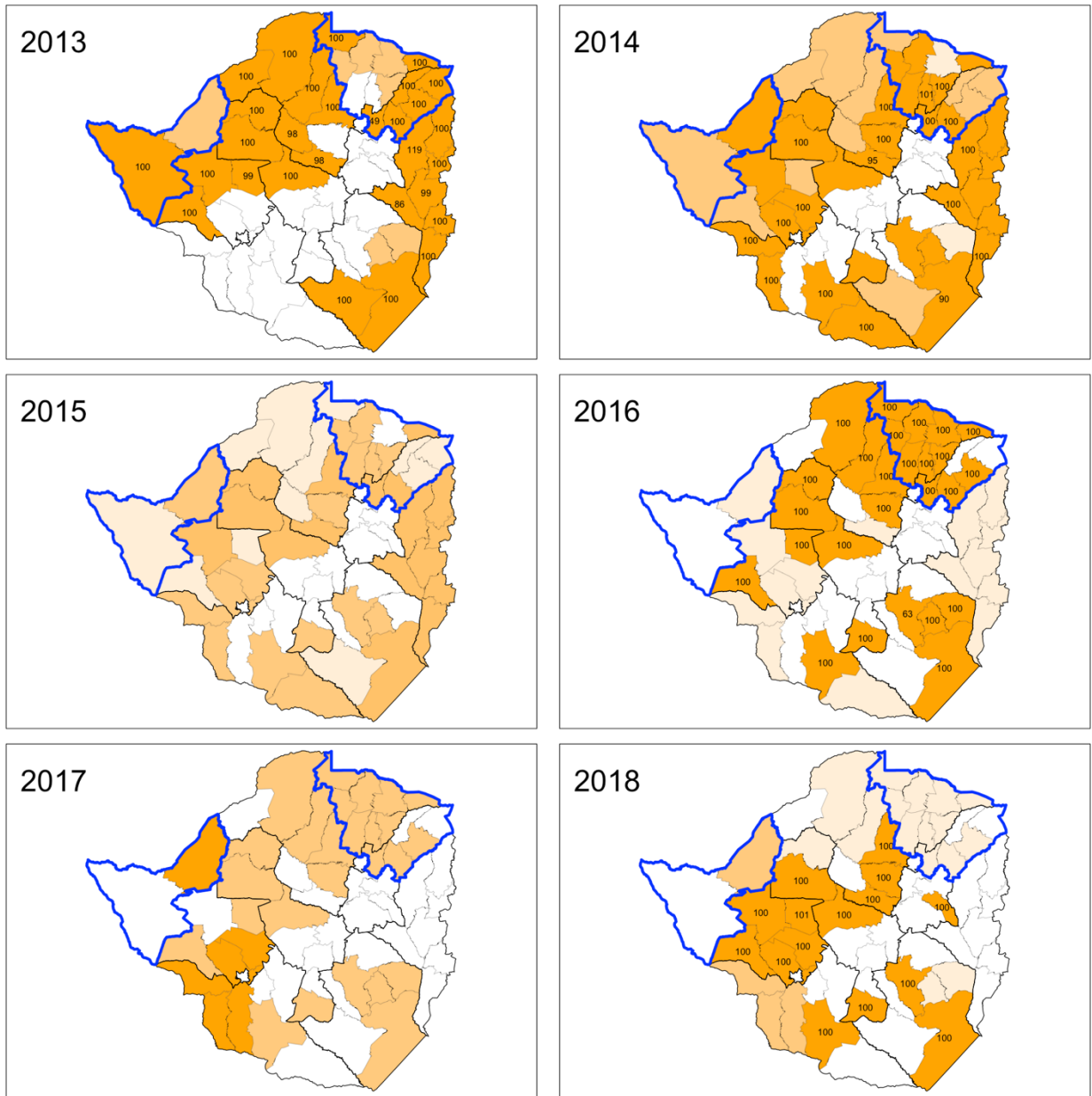
*Dark orange: LLIN mass distribution was conducted that year. The numbers displayed in the districts represent the percentage coverage of nets for that year's targeted distribution. Medium orange: Mass distribution was conducted in the previous year. Light orange: Mass distribution was conducted two years prior. The numbers indicate distribution coverage, when and where available.

Coverage of IRS

IRS is targeted in wards reporting five or more cases per 1,000 population. It occurs annually, typically during the months of October through December. Targeted room coverage is typically high, except in ZAPIM districts in 2016, when lower than usual coverage was reported (Figure 7).

Figure 7. IRS coverage, 2013–2018*
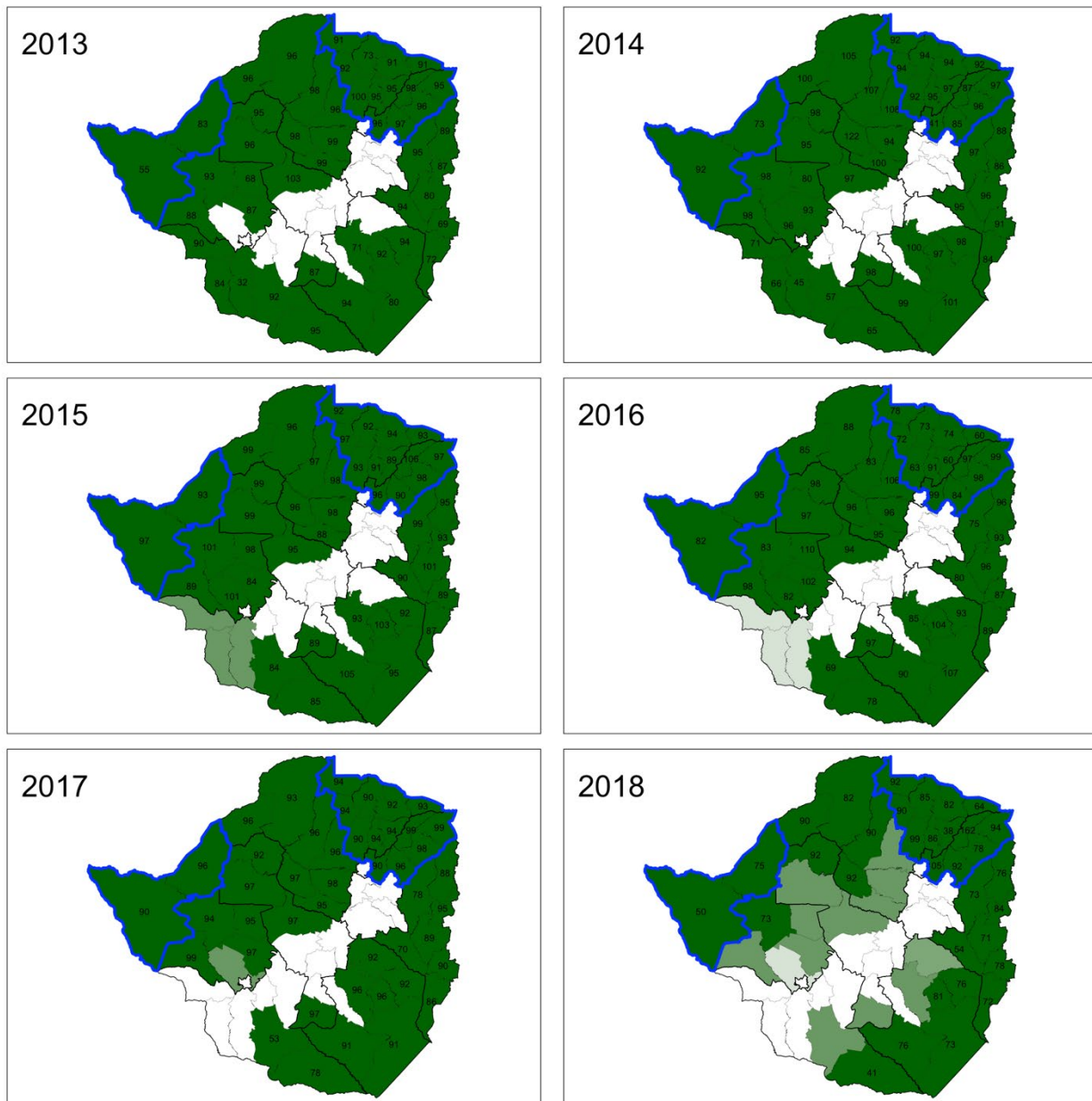
*Dark green indicates that IRS was conducted in that year. Medium green indicates that IRS was conducted in the previous year. Light green indicates that IRS was conducted in the two years prior. The numbers displayed in the districts represent the percentage coverage.

Coverage of CM Training

ZAPIM support for CM is through the training of CHWs and clinical staff. ZAPIM conducted clinical staff training in all ZAPIM districts beginning in 2016 (Figure 8).

As of 2019, a total of 1,872 health facility workers had been trained in malaria CM, with ZAPIM supporting 1,592 (85%) of the training.

Figure 8. Malaria CM training for clinical staff, 2015–2018*
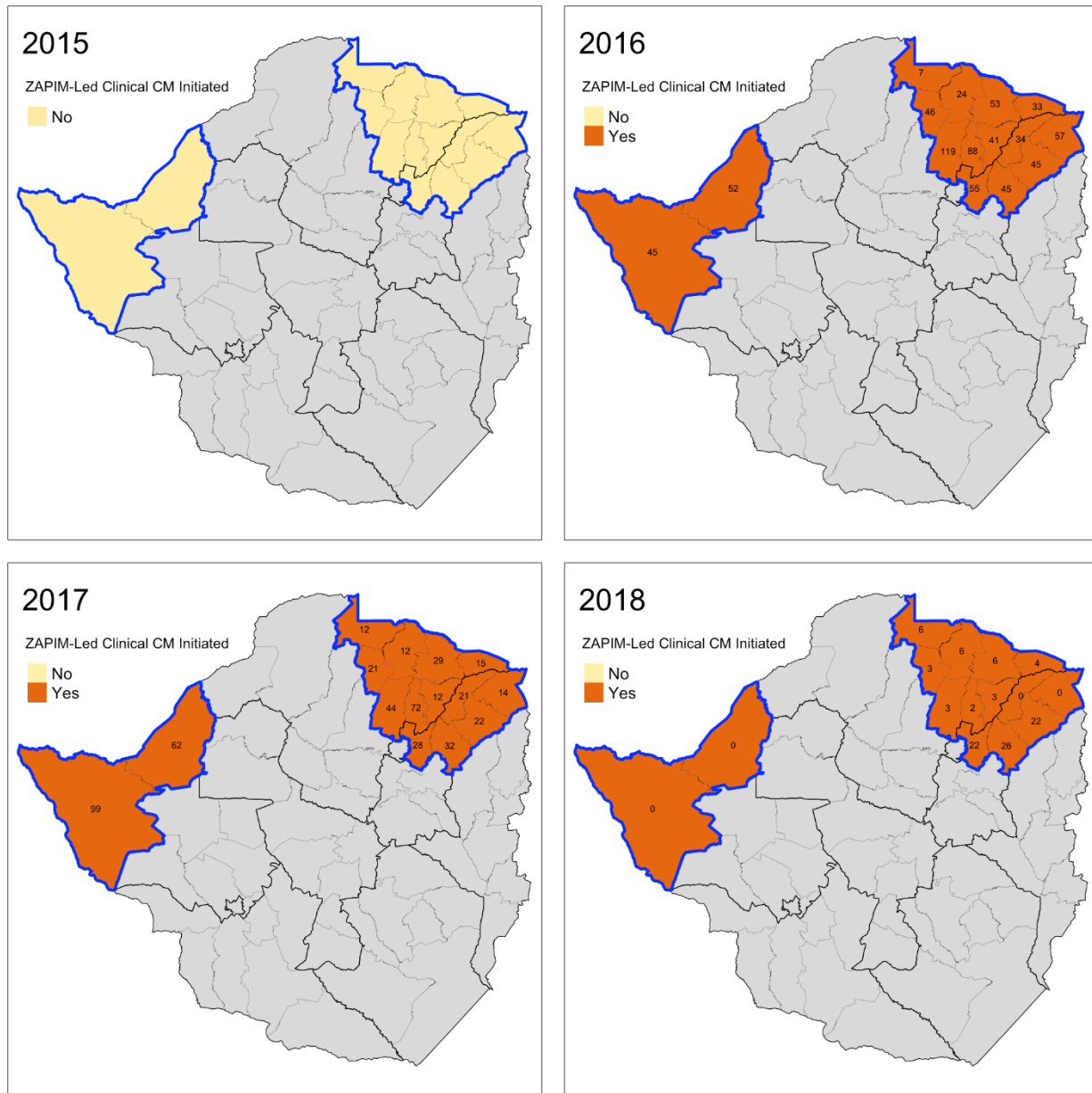
*The numbers indicate the number of clinical staff newly trained by ZAPIM in that year.

ZAPIM conducted CM training for VHWs in nine ZAPIM districts in 2017 and expanded to 11 districts in 2018 (Figure 9). To date, a total of 1,185 VHWs have been trained with ZAPIM support. KIs highlighted the importance of this training for diagnosis and treatment. The following quote expresses the value of the training:

> … *We have village health workers who are trained to diagnose and treat malaria… the VHWs are supposed to treat uncomplicated malaria at* [the] *community level, in the village, and, if the village health worker identifies a complicated malaria case, he should refer to the primary health facility.* —Key informant

Figure 9. Malaria CM training under ZAPIM support for VHWs, 2017–2018*
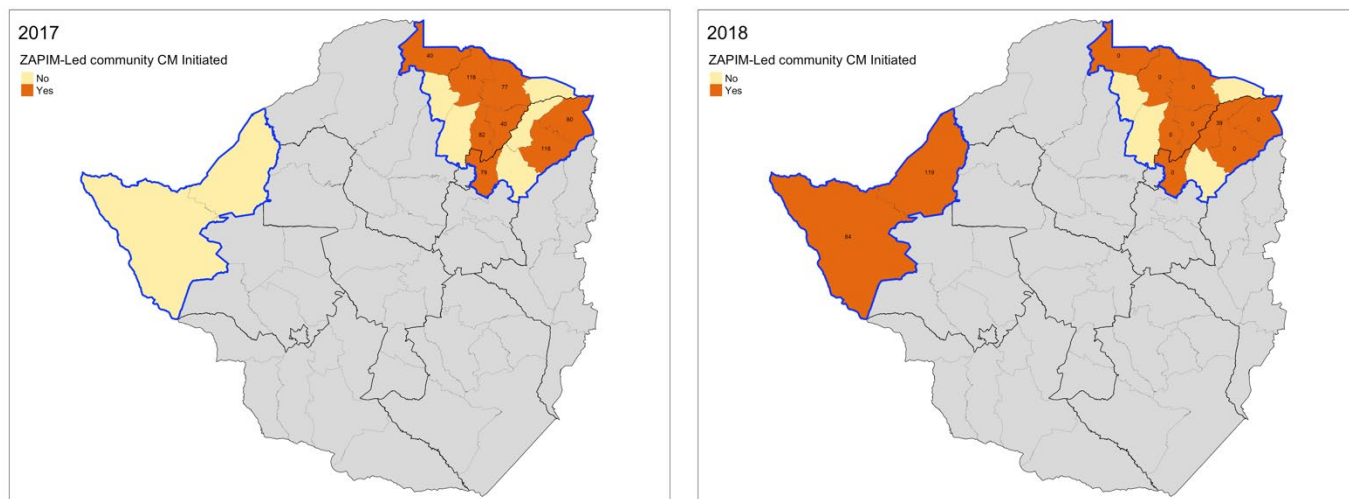
* Numbers indicate the number of VHWs newly trained by ZAPIM in that year.

Burden of Malaria

Morbidity

Malaria incidence in ZAPIM districts dropped dramatically between 2014 and 2016 (Figure 10). A large resurgence occurred in 2017, and then incidence decreased to below 2016 levels in 2018.

Figure 10. Malaria incidence, 2014–2018, ZAPIM districts
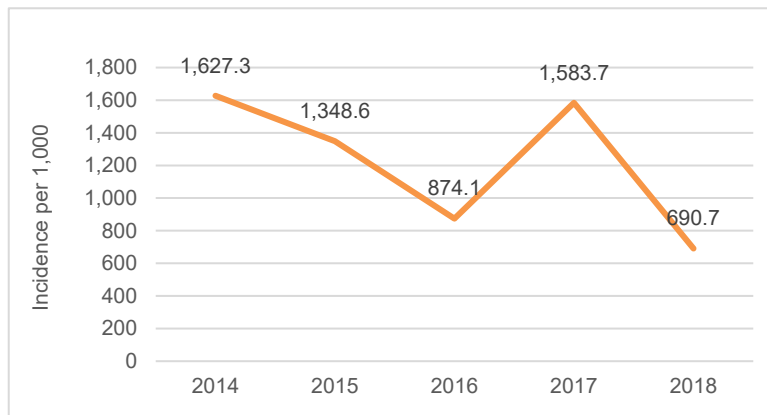
Mortality

Deaths attributed to malaria in ZAPIM districts decreased drastically between 2014 and 2016 (Figure 11). The downward trend was interrupted by the high incidence observed in 2017.

Figure 11. Malaria death rate, 2014–2018, ZAPIM districts
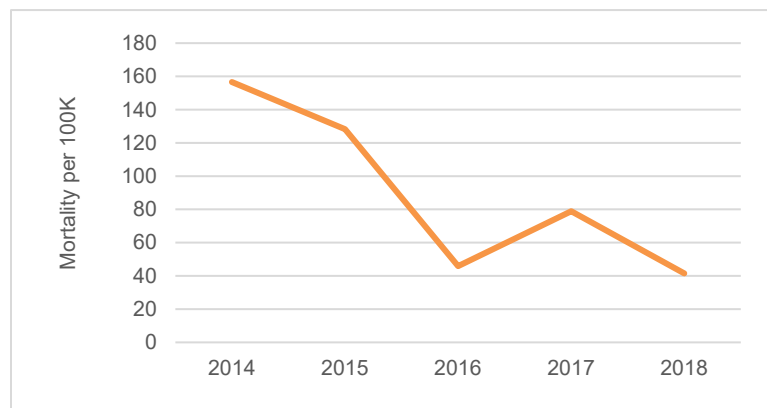
Malaria Case Fatality (Deaths per Confirmed Case)

Case fatality in ZAPIM districts decreased by almost one-half between 2015 and 2016 (Figure 12). The reversal in the downward trend for deaths in 2017 was not as drastic as that observed for incidence.

Figure 12. Malaria case fatality, 2014–2018, ZAPIM districts
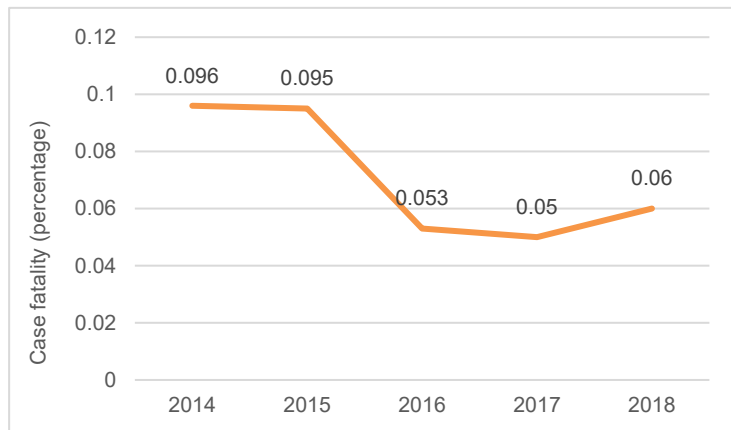
The differences observed in the malaria burden were seen across provinces and districts, as described by a KI:

> … *Morbidity and mortality trends are coming down. Of course, we do have a lot of transmission, which is now centered at the border districts. Most of our provinces, Manicaland, Mash East, Masvingo, part of Masvingo, have got districts that share borders with Mozambique, and those are our high transmission districts. Otherwise, most of our burden* [is in] *the central and the Southern region—they have really gone down. And we also do have some wards* [and] *districts which do not have transmission at the moment, and we are now working in 28 districts in elimination, which means our trends are coming down.* —Key informant

Contextual Factors

Total rainfall in ZAPIM districts and the Southern Africa region as a whole was unusually high in 2017, compared with other years (Figure 13). Comparing the rainfall and malaria cases suggests an association between increased rainfall and an increase in malaria cases following high rainfall.

Figure 13. Total rainfall, 2014–2018, ZAPIM districts
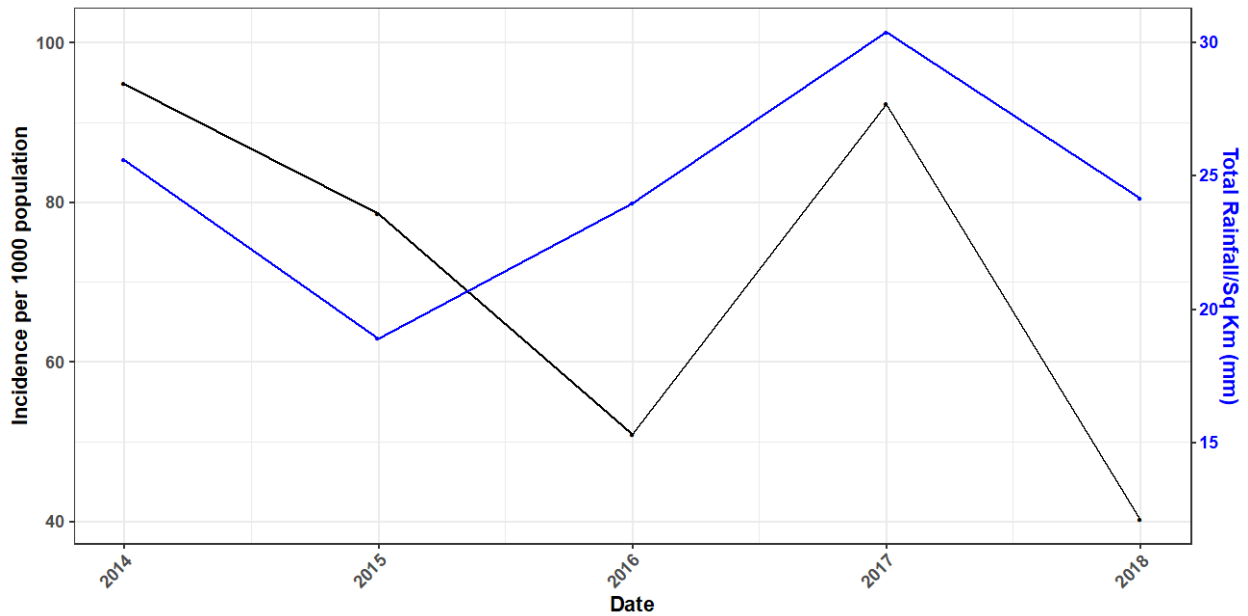
Regression Model

Incidence Over Time: ZAPIM Versus Non-ZAPIM

In an ITS model, adjusted for rainfall, incidence in ZAPIM districts fell more rapidly than in non-ZAPIM districts (Figure 14; p=0.0215). Incidence at the beginning of 2014 was nine times higher in ZAPIM districts than in non-ZAPIM districts (95% confidence interval [CI]:326). The decrease in incidence in ZAPIM districts was 39 percent each year thereafter, between 2014 and 2018 (95% CI: 2550), whereas incidence in non-ZAPIM districts fell by 30 percent per year (95% CI: 1939).

Figure 14. Model of predicted incidence between ZAPIM and non-ZAPIM districts
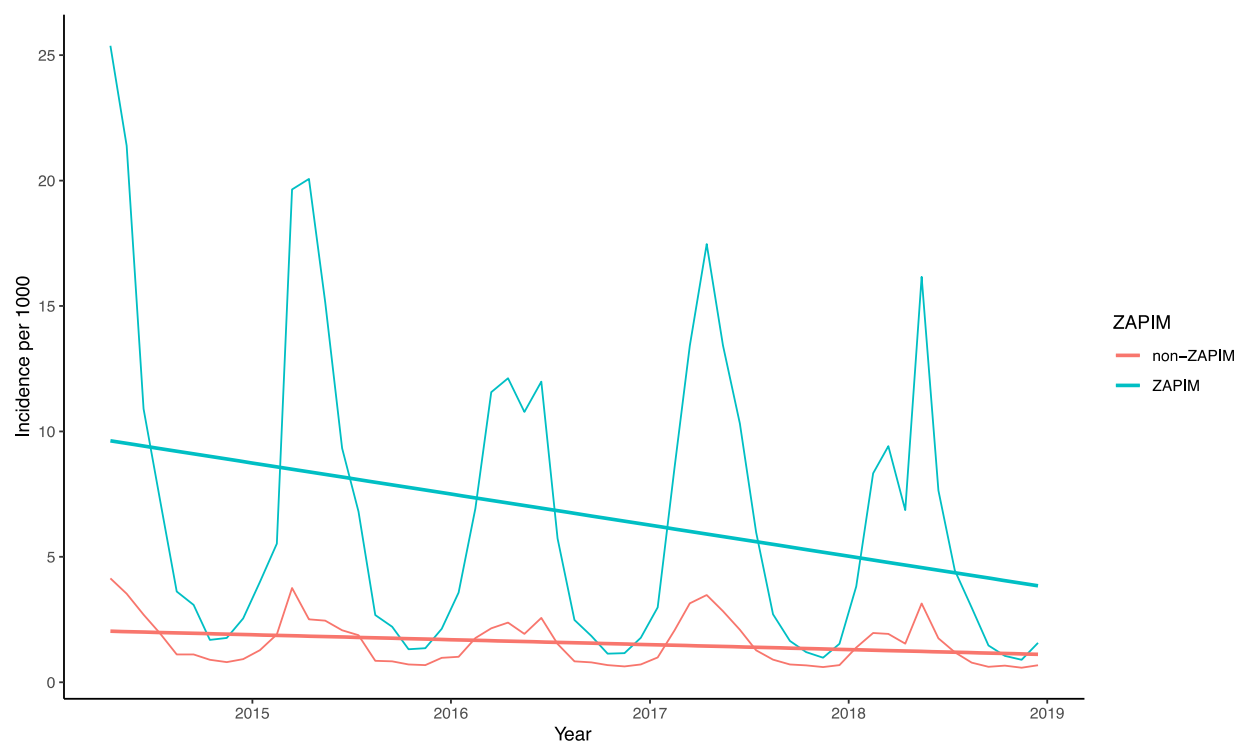
Intervention Effects

The ITS model showed that the implementation of LLIN CD was associated with a 32 percent average reduction in the incidence rate (RR: 0.683, 95% CI: 0.676, 0.690). The results also showed that the intervention was associated with a total of 69,005 fewer cases, a reduction of 8.1 percent, less than what was predicted during this study period in the absence of LLIN CD.

The implementation of clinical CM training was associated with a 40 percent reduction in case fatality (RR: 0.596; 95% CI: 0.469, 0.758)—an estimated 158 deaths averted from 2014 through 2018. Community CM training was not associated with a change in case fatality (RR: 1.087; 95% CI: 0.813, 1.429).

Quality of Malaria Care

Management of Uncomplicated Malaria

The assessment of facility readiness to provide malaria CM was based on the full package of services available for the management of uncomplicated malaria. This package comprises treatment guidelines, at least one staff person trained in CM, and the availability of RDTs and ACTs. Most facilities reported at least one health worker having undergone malaria training (Figure 15).

KIs said that the training at health facilities was to ensure that health workers had relevant knowledge:

> *We are really trying to cover all our facilities by making sure* [that] *they are well informed on malaria, and that's why we conduct workshops and trainings where people are taught about malaria.* —Key informant

All 127 health workers interviewed at the facility level (81 female and 46 male) reported being trained on malaria. All 46 CHWs (31 women and 15 men) reported being trained. (Figure 15 provides additional details on the training received.)

Malaria treatment guidelines were available at 96.7 percent of the facilities (data not shown). Ninety-eight percent of the facilities had at least one ACT band weight available (Figure 16). Overall, 88.3 percent of the facilities showed "readiness" to manage uncomplicated malaria (data not shown).

Figure 14. Proportion of ZAPIM district health facilities with staff trained in malaria technical areas
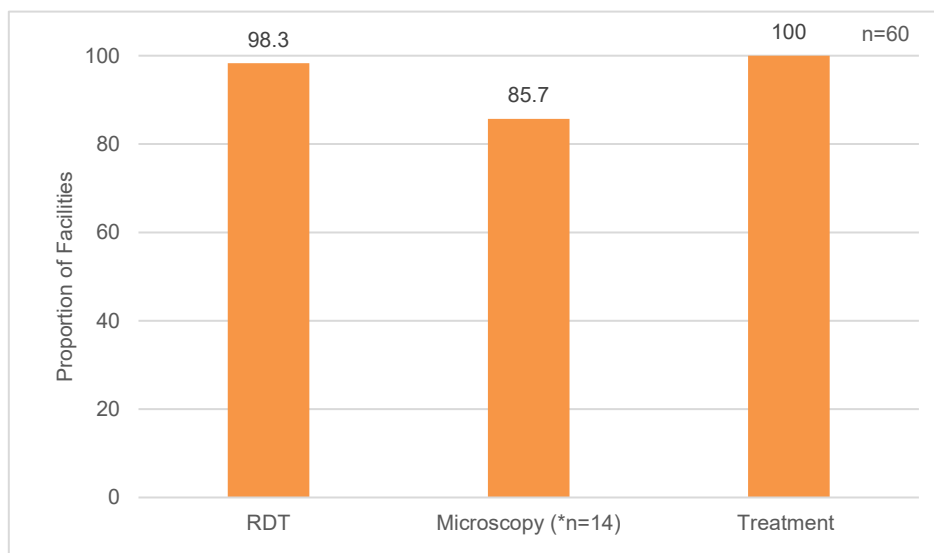
Note: Microscopy training analysis was limited to facilities that reported having a laboratory.

Figure 15. Proportion of ZAPIM district health facilities with malaria CM commodities available (n=60)
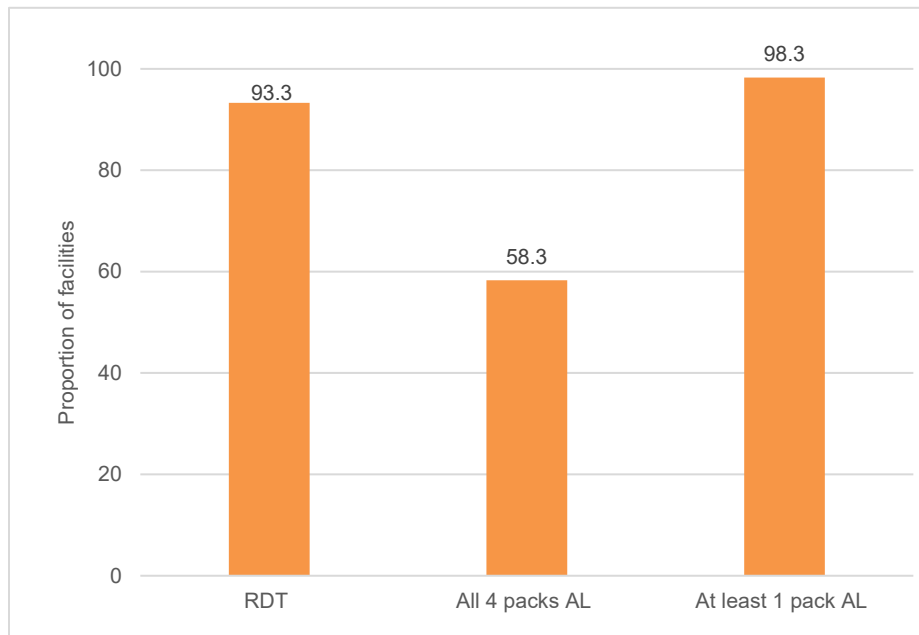
KIs identified stockouts of all four packs of ACTs as an issue:

> *For commodities, we have some clinics that get stockouts of RDTs and we have to use clinical diagnosis. This poses M&E challenges though because then, the data are not correct. Also, the drug supply is not very good..* —Key informant

Adherence to CM guidelines was high. Correct CM was defined as a fever case undergoing testing for malaria, a positive malaria case receiving ACT, and a negative malaria case not receiving ACT. Of the 294 exit interview cases presenting with fever, 243 (83%) reported having received a diagnostic test (RDT or microscopy). Eighty one of the 243 cases tested positive for malaria and, among those that tested positive, 76 (93.8%) correctly received ACT. Among those that tested negative, 154 cases (98.1%) did not receive ACT (Figure 17).

Figure 16. Proportion of ZAPIM district patients who received correct malaria CM
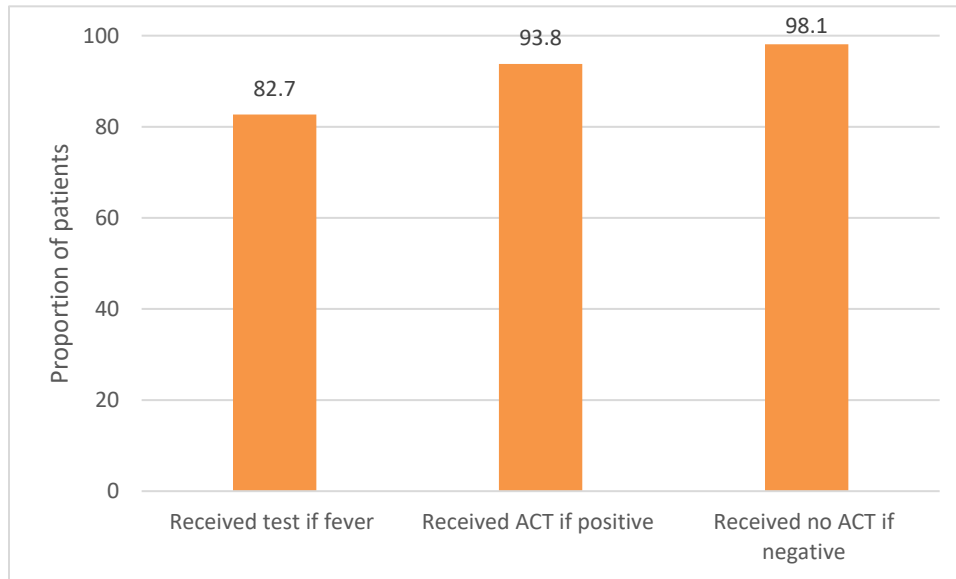
Prevention of Malaria in Pregnancy

Facility readiness to provide prevention of malaria in pregnancy meant that the health facility had malaria in pregnancy guidelines available, at least one staff person trained on malaria in pregnancy, and the availability of sulfadoxine pyrimethamine (SP) and ITNs. Ninety-six percent of facilities reported at least one health worker having undergone training for malaria in pregnancy (data not shown). Malaria guidelines were available at 87 percent of the facilities. Seventy-seven percent of the facilities had SP in stock and 41.5 percent had ITNs in stock (Figure 18). Overall, 67.9 percent of the facilities showed readiness to provide malaria in pregnancy care (data not shown).

Figure 17. Proportion of ZAPIM district health facilities with key malaria in pregnancy commodities available (n=53)
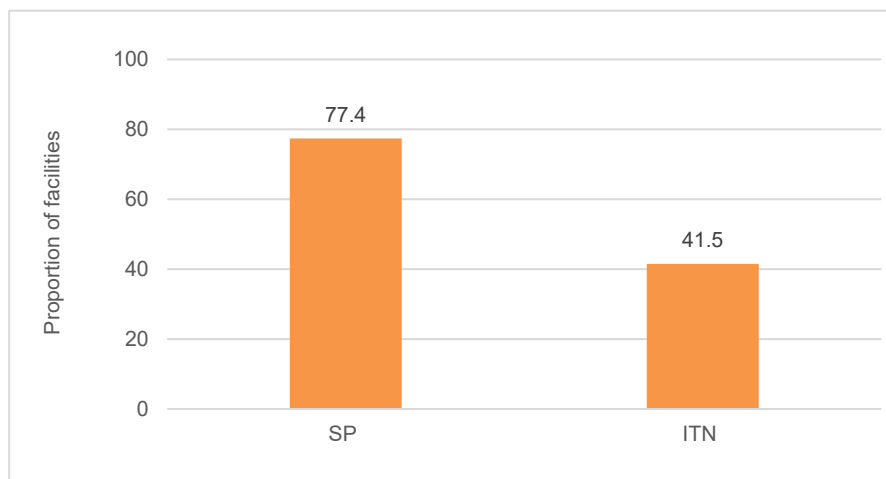
Figure 19 summarizes adherence to the malaria in pregnancy guidelines based on reports from client exit interviews. Out of 183 ANC clients interviewed, 113 (61.7%) received SP. Of those who received SP, 82 (73 %) completed directly observed therapy (data not shown). Among the 183 ANC clients interviewed, 14 clients (7.7%) and 82 clients (44.8%) reported receiving LLINs and advice on LLIN use, respectively (Figure 19).

Figure 18. Proportion of ANC clients who received preventive malaria care, ZAPIM districts
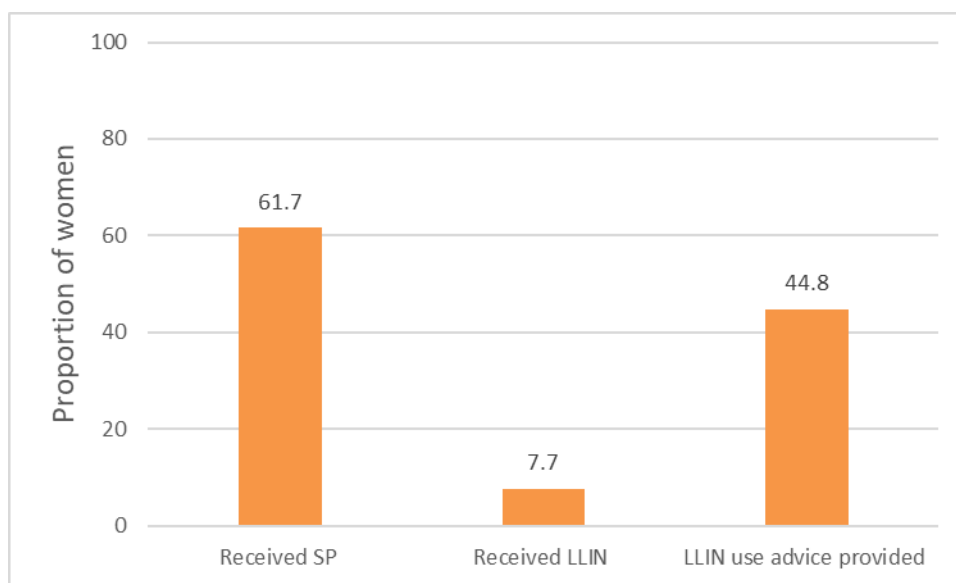
In contrast to the client exit interview data, some KIs stated that the coverage of IPTp was above eighty percent:

> *The last intervention that we need to talk about is intermittent preventive therapy in pregnancy, which we also give in 26 high-burden districts. In these districts, pregnant women get SP [when] they go for ANC services. According to the audit—the last one was for 2015—it was performing above 80 percent and it was then revised to now talk about three doses—at least three; it used to be at least two but now it's talking about at least three doses—and we have an*

audit that was carried out August to September. Indications are that, again, it is performing very well so I don't have the absolute figure as yet, but I think it's the draft I saw seeming like its above 80, I think. —Key informant

Supportive Supervision

Supportive supervision at health facilities was high, with 85.7 percent of health workers reporting receiving a supervisory visit in the six months before the assessment (data not shown). Of this supportive supervision, 83.3 percent of the visits included a review of the use of antimalarials (Figure 20). Of the 78 health workers supervised, 54 were female and 24 were male.

Figure 20. Proportion of clinicians who received supervisory visits with specific elements in the past six months, ZAPIM districts
(n=78)
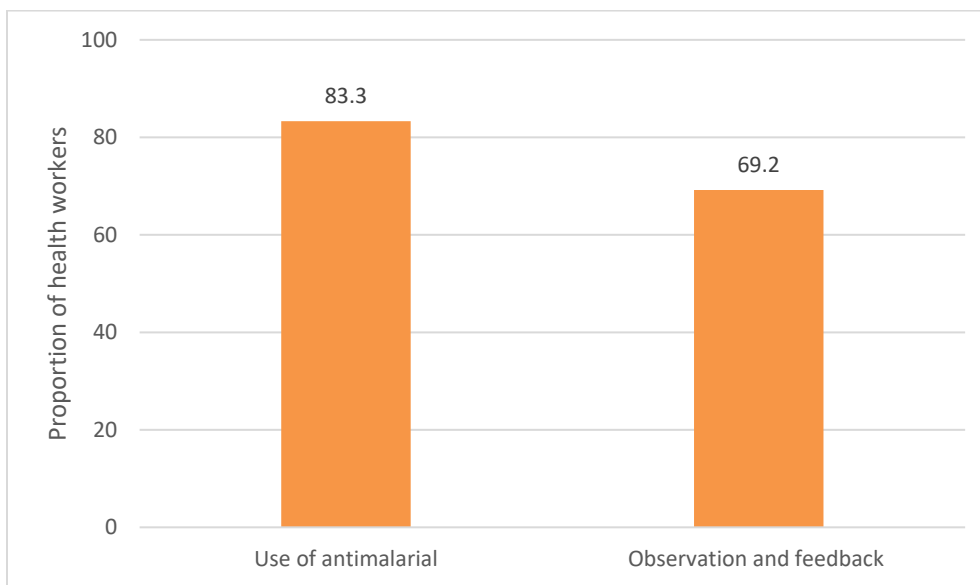
Supportive supervision for CHWs was slightly lower: 78.3 percent reported receiving a supervisory visit in the six months before the assessment versus 85.7 percent of health workers. Most supervision visits (83.3%) included a review of the use of antimalarials (Figure 21). Of the 36 CHWs supervised, 24 were female.

Figure 21. Proportion of CHWs who received supervisory visits with specific elements in the past six months, ZAPIM districts

n=36
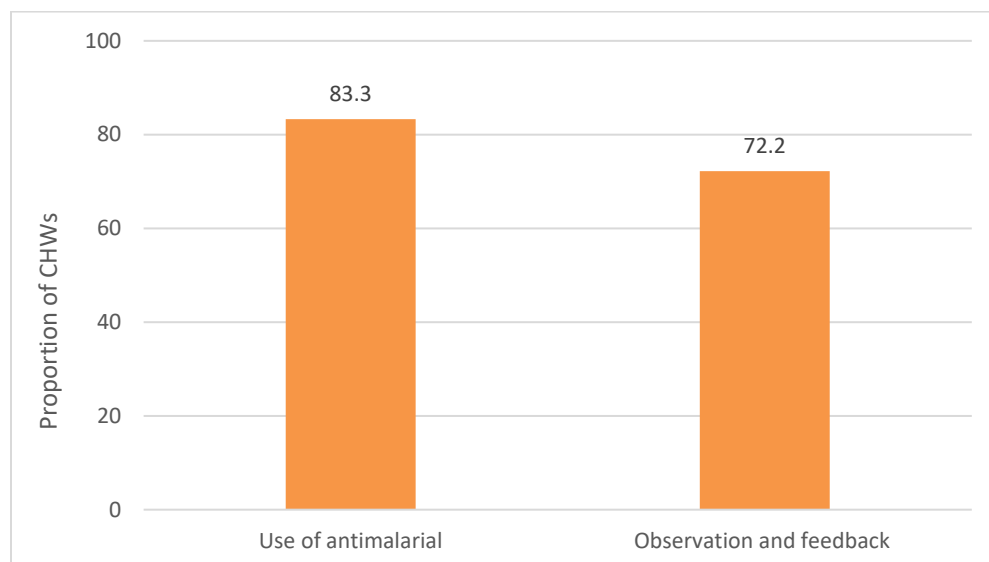
Implementation Capacity of PHMTs and DHMTs

For the organizational capacity assessment component of the study, PHMT and DHMT representatives were asked to rate in-house capacity across malaria technical areas as "adequate," "marginal," or "inadequate."

PHMT officials reported adequate capacity across the malaria technical areas, especially in capacity development; advocacy, communication, and social mobilization; and in disease surveillance and response. Deficits in capacity (defined as below 80% adequate) were reported in the areas of gender, technical interventions, curative, regulation of malaria commodities capacity, and operational research (Figure 22).

Figure 22. Self-reported in-house capacity among PHMTs
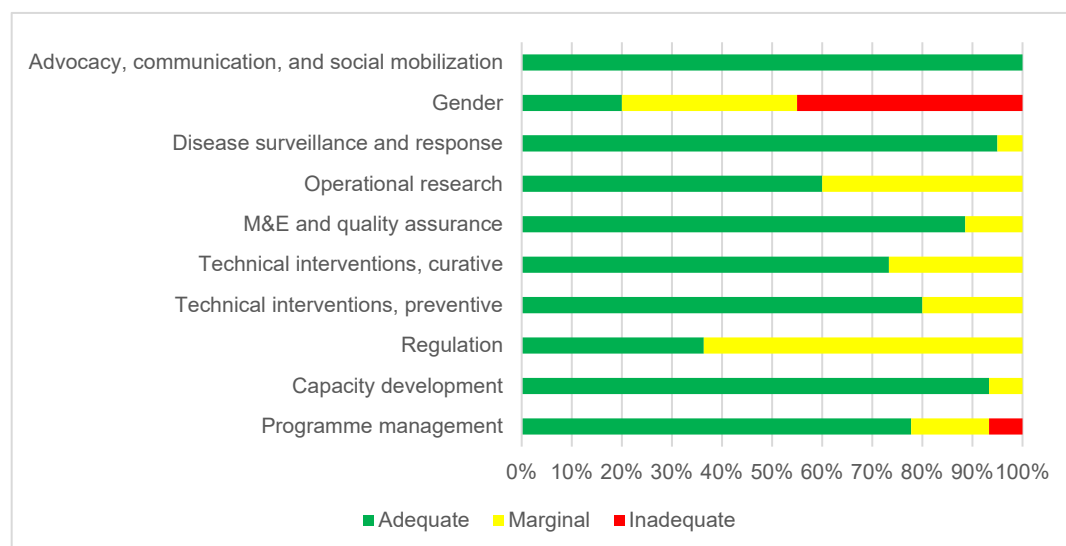
The DHMTs reported adequate capacity in capacity development; advocacy, communication, and social mobilization; M&E and quality assurance; and disease surveillance and response (Figure 23).

Figure 23. Self-reported in-house capacity among DHMTs
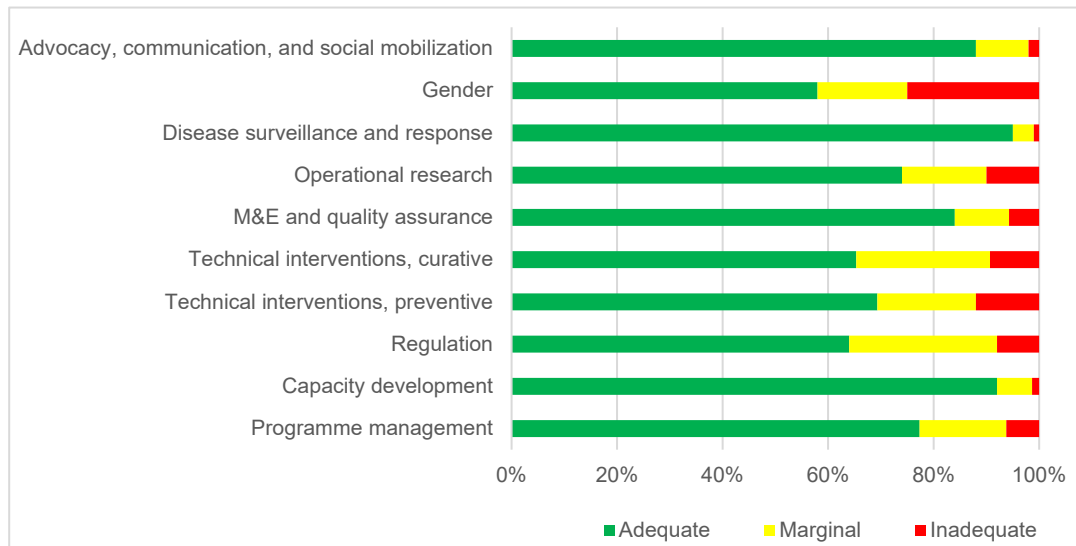
Facilitators and Barriers to Implementation

Facilitators of Achievements

KIs reported the following facilitators of the achievement of malaria control in Zimbabwe.

Strong Governance Structures and Reporting at All Levels

The MOHCC has a well-structured health governance structure at the national, provincial, and district levels that administers all malaria control programming in the country through existing structures. At the community level, health center committees work with the DHMTs and PHMTs, which are also linked to the NMCP through the MOHCC. With this governance structure, the health system has the capacity for malaria control programming and has been able to channel resources—such as the PMI support through ZAPIM—to malaria control, with significant success. This was overwhelmingly reported by KIs. For example:

> … Yes, I think we have a **well-structured national malaria program** and a **well-structured health system** in general from the **national level down to the community level** and that does facilitate coverage of interventions. —Key informant

> … the Ministry of Health has a solid network. Like 100 percent of the work that we do is actually done **using the ministry structures,** from village health workers to EHTs [environmental health technicians] and nurses… —Key informant

> … it's committed **DHMTs** and well-trained nurses and committed nurses and EHTs; committed support from the **DHMT** and the **province**… —Key informant

> I can't quote the exact numbers but…in the last 10 to 15 years the cases have dropped …tenfold… there are not many countries that can point to their success to say we have dropped this much and I think a lot of it is just [that] the overall capacity here for malaria programming and malaria interventions is quite high. —Key informant

KIs also noted the importance of reporting and feedback mechanisms as a facilitator of malaria control. The MOHCC has reporting and feedback systems in place that are relevant to malaria control, especially the DHIS2 and the weekly disease surveillance data. As one KI noted:

> The DHIS tool—that's the core of everything. If we don't have that system we could not be talking of any malaria as it were, we wouldn't know where we are and we wouldn't really be informed where we want to go. So, the DHIS tool is the primary routine database that we use because it provides us the information that talks to all our indicators for malaria in terms of morbidity and mortality. —Key informant

Strategic Leadership and Effective Teamwork

The presence of a well-structured and coordinated NMCP has helped the country achieve its goals. The majority of KIs praised the NMCP and its directorate for creating an environment conducive to the implementation of malaria control interventions. The health system also has committed and dedicated staff working under difficult conditions and doing their best with the resources they have. The directorate of the NMCP has fostered coordination and

collaboration between government and partners. Linkages from the national level to the community level through existing MOHCC structures have facilitated effective malaria programming in the country. The NMCP leadership was central to ZAPIM, with the NMCP director acting as the focal link with the project and the government. The following KI comments illustrate this perceived strategic leadership and effective teamwork:

> … [we] *are lucky* [in] *Zimbabwe, we've got a very steady and very* **good director for the National Malaria Control Program** *and I think he is very focused, and he knows what he wants. That's a very good plus. And what he did was that he managed to get* **a good team of provincial epidemiologists** [PEDCOs]. *So, there is no group of public health professionals in government that are* [as] *united and work together as the PEDCOs.* —Key informant

> … **the leadership of the NMCP** *is quite good in coordinating the activities, bringing the partners together, and putting the strategies together and seeing* [it] *through* [that] *the strategies* [are] *implemented…* —Key informant

> … *the dedication of the staff,* **the leadership of the NMCP,** *and just the* **input of staff and input by donors.** *Everyone is very dedicated and …all these things have come together to improve vector control and the ability to treat cases quickly, so transmission has really declined remarkably…* —Key informant

Clear Implementation Strategy and Guidelines

The NMCP's malaria strategy, policy, and guidelines provided the ZAPIM with guidance for activity implementation. KIs reported that Zimbabwe has invested in developing guidelines and strategic documents to direct the implementation of malaria prevention and control activities. As one KI reported, there are:

> … **well-laid out guidelines,** *which help to ensure that there is standardization of approaches in terms of vector control, case management, and social and behavior change. There are guiding documents that are* **used across all levels, and also by different partners** *to ensure uniformity in the implementation of activities…* —Key informant

The KIs often reported that the country also had a clear policy and strategic direction, which facilitated the achievement of successes in malaria programming.

> … *I think it was due to very* **clear policy and strategy** *direction,* [with which] **you would prioritize what works for your environment**… —Key informant

Increased Community Involvement in Malaria Control

The KIs also mentioned that strong political will existed at all levels of government, among traditional leaders, and in the community.

> … *We can also make mention of the* **positive behavior and attitude of the community.** *They have become receptive to knowledge on malaria and the interventions that are being carried out…* —Key informant

> … *at the* **community level,** *I think generally there is* **political will.** *Generally, in terms of the* **community leadership** *that we usually work with. This is very, very supportive. There is high commitment and that's a big plus…* —Key informant

Zimbabwe did not previously have a culture of bed net use, but there has been a shift, an increased demand for nets, and improved use of them, especially in communities where previously there had been abuse and misuse of nets or religious objections to using nets, as described by some KIs.

> … *like we indicated, where we had the misuse of nets, I think people are really beginning to appreciate the importance of nets.* —Key informant

> … *we didn't have a culture of net use before but now people are demanding* [them]. —Key informant

> *The same applies to the nets … unlike in the past because we used to have some religious, you know, objectors. And, you know they are beginning to open up.* —Key informant

CACs were highlighted as some of the successful aspects of the ZAPIM. Participants also noted that although the CAC program was good, there were still gaps because it was currently being implemented in only a few areas, as one KI stated:

> *They are doing some community engagements* [through] *the* **community action cycle**. *I think it's good, but the coverage is very limited, it's very low coverage so the impact will not be seen. Where you have got maybe 30 clinics in a district and maybe they are covering like* [only] *five or 10 clinics, so the impact will not be seen. But it's a very good program.* —Key informant

Increased Health Worker Capacity in Malaria Control Intervention

Having well-trained health workers was also highlighted as a major facilitator of the achievements made in malaria control. In particular, the KIs perceived that rigorous training of environmental health teams in IRS, and CM training for nurses had increased health worker capacity for malaria control.

> …. *and also, that we have managed to have* **most of the staff trained in malaria management.** *We still have major challenges, yes, but I think with adequate support we can do more…* —Key informant

> … *having* **well-trained staff,** *it's really helpful, for example, in IRS … they are thoroughly trained … they know what they are doing, and they are really* **supported by qualified environmental health technicians** *who are trained in IRS…* —Key informant

KIs often noted that on-the-job CM training and follow-up supportive supervision for nurses had been key, as noted by the following KI:

> … *for health workers as well as for case management, they are well-trained.* **There are nurses who have been qualified, and they are also trained onsite and they are followed up**… —Key informant

Financial and Technical Support from Donors

Most KIs identified the contributions of donors and partners as facilitators of the success of the fight against malaria. Malaria programming in Zimbabwe was almost entirely donor-funded and supported by partners who assisted through different interventions.

… also not forgetting the **role played by our donors.** *As l mentioned, most of our activities are donor-funded. So, the fact we have been able to get those funds to ensure that we achieve those activities has been very helpful in making sure we achieve our goals.* —Key informant

… I can categorically say **that without ZAPIM, the malaria clinical mentorship** *that is now being done in ZAPIM-supported provinces and non-ZAPIM-supported provinces would not have been scaled to this level. But because of the* **technical assistance** *through the ZAPIM personnel, the dedication in developing guides and everything, it's one area that I can see has got ZAPIM's name on it. That program has ZAPIM's name on it.* —Key informant

I think the National Malaria Control Program has done a lot with support from PMI and with support from PMI implementing partners, a lot has been achieved. I think we have seen a reduction in malaria cases, [in] *incidence, the admissions and so forth related to malaria, I think the program has been a huge success but I think more investment is needed as we go toward elimination.* —Key informant

Barriers to Achievements

Several contextual factors have hindered and continue to hinder the achievement of malaria control in Zimbabwe. Finding ways to address them is essential to the achievement of planned goals. This section describes the barriers to malaria program implementation.

Limited Resources for Malaria Programming

One of the barriers that the KIs highlighted was inadequate or limited resources for malaria control. Most participants mentioned that the funding was sometimes inadequate and often failed to fully address the need. The few available resources were often spread over a long period of time for several programming areas across the country, which could result in limited impact. Some participants suggested that greater impact could be seen if ZAPIM and other malaria resources were not spread so thin but, rather, concentrated in an area for maximum impact.

… sometimes, if you're going to **put limited funds** *and* **spread them over a long period of time,** *it doesn't really give much benefit* [rather] *than giving one big chunk at once and make sure that it achieves what it is meant to achieve to cover all the existing gaps as quickly as possible.* —Key informant

… **Resources are not enough.** *So, we have certain interventions that are in the malaria strategic plan and the Ministry of Health, especially through the NMCP, implement those interventions. But because of limited resources, it becomes very difficult to implement them…* —Key informant

… I sometimes feel like if we just had the money we needed and there was economic stability that this program [NMCP] *could be making even more progress.* —Key informant

Logistics and Supply Chain Challenges

The KI interviews and facility assessments highlighted that most facilities had malaria commodities, but they were available in limited stocks, especially ACTs and RDTs. Issues with coordination and quantification were identified. There were examples of districts experiencing marked shortages in commodities and stockouts, delays in shipments, and incorrect forecasting, which resulted in surpluses in some districts and shortages in others.

*… Yes, one of those would be in terms of **timely delivery;** the supply chain has always been a challenge. I am not condemning or taking any credit away from the hard work, but it is always a challenge, no matter where you are. So, when you start **having stockouts** when you have a **malaria problem—that is a problem.** Yet we do not have RDTs or drugs for treatment or even chemicals that are supposed to be used for spraying to prevent malaria; maybe they arrive late. This has happened from time to time…* —Key informant*

Where stocks were low or unavailable at the facility level, CHWs were not given commodities for community diagnosis and treatment. In some districts, facilities had no RDT kits, and patients with malaria symptoms were not tested and were either referred to another facility or treated clinically. –Key informant

"So, it doesn't necessarily mean that we don't have the money or the resources to procure what we need and bring it in, but getting it in the country when we need it sometimes is challenging. So sometimes there is, you know, sometimes in the past few years a couple of times there have been challenges with ACTs being short and it's not because we don't have [them], *it's not because we didn't project well or we didn't set aside funding for it, it's because we **ordered the ACTs but they are just not coming fast enough**… I think the bigger problem is making sure that when you do have those things appropriately stocked at the central level,* [you should ensure] *that the system for distributing to the points where they are needed is appropriate…* —Key informant*

*So, you can say, well, we want insecticides by a certain time, and there's time when the government in the last few years has had to spray late because they **just don't have insecticides on time**. Some of that is internal to the government in Zimbabwe, some of it is the Global Fund's **poor procurement mechanism**, and PMI is not immune to this either. You ask manufacturers to produce something and send it by certain time and they just don't.* —Key informant*

*… some of the **commodities actually expire at a certain facility when the other facility doesn't have*** [those] *commodities. So, I think that probably at the district level, it's something that has to be well coordinated.* —Key informant*

Commodity shortages were attributed to logistics and supply chain management issues. Facilities explored ways of managing these challenges, as highlighted by some KIs:

Sometimes it's a situation where some areas are over-stocked while others are under-stocked. Bulawayo and Harare can have a huge lack of a particular item while Mash West has an excess and are using it. So, we have had to step in and move things around. And sometimes when malaria season comes, people get fed up with the system and how things work, and you find them loading up commodities and using their own trucks to transport commodities. This is because malaria is seasonal, and we have a short time to respond and get things done. —Key informant*

For commodities, we have some clinics that have stockouts of RDTs and we have to use clinical diagnosis. This poses M&E challenges though because then, the data are not correct. Also, the drug supply is not very good. Last time we had to reposition drugs in some areas because there are some combinations of the formulations in short supply. In some cases, for example, we end up giving the paediatric formulation to adults. —Key informant*

Sociocultural, Religious, and Lifestyle Barriers

In some areas, personal beliefs and attitudes, and sociocultural and religious issues presented challenges to achieving high intervention coverage, as highlighted by this KI:

*We spent so many millions buying nets, but you find nets, sometimes, are not used. The **culture of use is very sporadic,** so we don't get the maximum impact we are supposed to generate because of attitudinal, sociocultural, and religious issues. There are myths and misconceptions out there…* —Key informant

Such myths, misconceptions, and negative attitudes affected demand for nets and resulted in the misuse or abuse of nets.

"These are the nets that have been recently distributed. They [community members] *cut them, they cut strips from the nets. That's fencing for a garden. This one is actually for drying vegetables. That one they were making goat ropes, and they will tell you 'we don't want those nets, we told you we don't want those nets, we are not going to use them so we can go on and use them to tie our goats.' Yes, they will tell you 'we are actually using them.'* —Key informant

In terms of IRS, KIs reported that some people refused to have their homes sprayed for personal or cultural and religious beliefs:

The main challenge we face is the fact that not everyone wants their homes sprayed. Some people complain that the chemicals smell so they will not be able to breathe and also that it does not help, therefore they do not allow the spraying team to come into their house. —Key informant

Also, the beliefs that people have. Some believe that their ancestors are not in agreement with the whole spraying of their homes. So, when it is started, they refuse that their homes be sprayed. —Key informant

… we also have low acceptance of IRS due to religion, especially in Centenary in the Hoya area and in Rushinga. The community says our ancestors stay here with us so you cannot spray this place. —Key informant

Some objections to IRS were also highlighted in areas where there were tobacco farmers. Farmers feared contamination of their crops with DDT because tobacco buyers would not buy any tobacco with traces of DDT.

We have had issues with changes in chemicals. We have been using DDT but there is a challenge there with the tobacco farmers. Tobacco is stored in some of the rooms that we would have sprayed and if their tobacco is contaminated with DDT, the buyers say that they will not buy it. Hence in some communities, there has been a decrease in the spraying coverage… Like I mentioned earlier, those messages being spread about tobacco are anti-IRS and work against our progress. —Key informant

Although IRS coverage was high in some districts, the socioeconomic activities and lifestyles of the people in those areas created challenges for malaria prevention. Participants highlighted that there were many outdoor activities that exposed people to malaria infection, whereas the malaria interventions were indoor prevention focused. One KI described this issue in the context of a study looking at transmission:

The place we need to work on is outdoor biting prevention…We did a study up in Angwa ward in Mbire district not specifically looking at outdoor biting but also looking at persistent transmission… the traditional preventive measures and case management interventions are well scaled up, yet we still have more malaria than we would like to see, maybe not [more than we] *expect,* [but more] *than we would like to see. So, what's driving that? The answer is predominantly that we can give people IRS, we can get them LLINs, but those are indoors prevention measures that only work when you*

are at home. So, if you are outdoors in the evenings, you are guarding your crops or you are doing whatever, you are still going to get bitten… —Key informant

Other KIs described communities along the border with Mozambique that left their sprayed homes and migrated to Mozambique for agricultural activities:

*In terms of coverage, I can say that IRS is 94 percent and above, but when you look at **the behaviour of the communities,** some go and undertake agricultural activities in Mozambique, especially those living along the borders. Although we say they are protected, they are not, because these are mobile communities, which need another intervention to protect them wherever they go…* —Key informant

KIs also reported large communities living along the Mazowe River that engaged in stream bank gardens and artisanal gold panning. Community members tended to leave their sprayed homes in the villages and settled in temporary shelters along the riverbanks, where they had no access to malaria control interventions. In other areas, people slept outside in temporary shelters to guard their crops from wild animals.

We also have gold panners as well who settle along major rivers doing gold panning, so those people are also exposed to malaria. —Key informant

Moreover, in some areas, the temperatures were so hot that people were forced to sleep outside their sprayed homes.

Limited Funding for SBCC

KIs reported that available, limited resources were often allocated for the main interventions (IRS and LLIN distribution). Very limited funding was allocated for SBCC activities that support these main interventions. This created a huge gap in current malaria control programming.

*…. there are no funds dedicated to SBCC activities. Before people use the nets, there are procedures that have to be followed… **The only way to communicate that is through the SBCC activities, but for malaria net distribution, there is zero budget**… So, we use that money to cover programming for SBCC, but in the event that we don't have those resources, then it means that **we will just be giving nets to the people without SBCC**…* —Key informant

Good coverage of net distribution can be achieved, but without SBCC, the proper net use percentages may not be high. When nets are distributed, the community needs to be educated about the importance of their use, educated on proper net use, and how to care for the nets. Respondents also reported that in some communities, there was still a lack of knowledge about the causes of malaria, and this affected care-seeking behavior among groups of people in the community.

*… I think we are **short-changing the community on SBCC.** I'm sure they could be doing better than what we are doing if we really take all our communities on board, everybody understanding what is happening…* —Key informant

… when it comes to the Doma people [it's] also [the lack of] knowledge of the disease. Take, for example, some of them do not know that malaria is caused by mosquitos, they actually attribute it to something else, so that also plays a role.

And SBCC is not being funded well. So, in other words, we are only reaching just a few people in each particular area due to resource constraints. So, it is an issue. —Key informant

Limited Focus on Surveillance, Monitoring and Evaluation (SME)

KIs highlighted the need to strengthen disease surveillance and build the capacity of DHMTs to interpret and use DHIS2 data for malaria control. KIs also highlighted the need for dedicated surveillance for malaria programming as a core intervention, in addition to the national disease surveillance system already in place.

So, there are no regular weekly disease surveillance meetings that are in place. It's just when one health information officer reports in and identifies a clinic in an outbreak, then they start telling others. But there is no collective approach to looking at the data. And even at the provincial level, we wait for a district to identify an outbreak. But what we should be doing is to have a weekly disease bulletin, which we are not producing—although the national level is producing a weekly disease bulletin that they also share with us. —Key informant

*…. The districts themselves have not institutionalized this concept of **data verification.** Like, this is our data, are we really reporting the actual truth, is this the **correct data?** So, that's another thematic area or intervention. In fact, if you look at the malaria global technical strategy, **surveillance has become a core intervention.** We think of spraying and nets as core interventions, but when we focus on elimination, surveillance is now a core intervention. So, issues to do with data are now very important. But the **support there is limited**. We are not as aggressive as when we are looking at spraying and nets, yet now the strategy is saying this is now a core intervention…* —Key informant

Although data quality was high in terms of relevance, completeness (complete submission and reporting of all data from all facilities), timeliness, and accuracy, KIs stated that there were still some gaps.

Timeliness, that's fine, relevance, that's good, but in terms of completeness, in most cases, continuous distribution data are not that complete because sometimes you record without having data from 10 or 15 facilities. So, in that case, at the national level, that is not complete, and you will not be able to make decisions that should be made from that data. —Key informant

Maybe the quality has been a challenge… So, in the manual systems there are several data quality issues that come from maybe human error, or maybe counting errors and something like that. Yes, there are some challenges when you verify it maybe with the first documents and verify it with other alternative registers or source documents. —Key informant

Operational Challenges

Delays in resource allocation and the disbursement of funds resulted in delays in starting interventions and, consequently, failure to meet set targets for intervention coverage. The economic environment in Zimbabwe and shortages of commodities, such as fuel, also created challenges for the achievement of high intervention coverage for malaria control.

*… **Late disbursement of funds,** because we start late. If we start late, then it means that we are going to have challenges with the rains. If you tell people that you are coming and they take out their belongings, then it rains, they put back their belongings, and it leads to a vicious cycle…* —Key informant

… We need to be ready; **we need to start our IRS on time.** *We need to be able to identify areas that have got outbreaks before it's too late, because it all has bearing on how much the malaria is going to spread in a community. If you get in late, obviously by the time you start spraying, some people are dead, and many others are infected with malaria. So that's something that we really need to work on…* —Key informant

Synthesis of Key Findings

Malaria Program Indicators

Overall, the distribution data have shown there is good coverage of interventions. Further analysis of the population-based indicators would provide a better picture. The indicators for morbidity and mortality in ZAPIM districts decreased over the study period, except for the numbers in 2017 that were higher than expected. Additional analysis of the incidence and mortality data for 2019 will help clarify whether the decrease observed between 2014 and 2016 has resumed, stalled, or reversed after the interruption observed in 2017. Interrupted time series analysis revealed that both ZAPIM and non-ZAPIM districts achieved significant declines in incidence over the study period, and that ZAPIM districts experienced significantly larger relative declines in incidence over the study period compared with non-ZAPIM districts. It should be noted, however, that non-ZAPIM districts had a significantly lower baseline incidence than did ZAPIM districts—therefore, achieving declines in incidence in these districts may have been more difficult.

Effects of LLIN CD and CM

ITS analyses exploring the effects of LLIN CD on incidence revealed a significant reduction, preventing an estimated 69,005 total cases during the study period. A similar analysis of community and clinical CM revealed that the implementation of ZAPIM-led clinical CM was associated with a significant reduction in case-fatality, preventing 158 deaths during the study period.

Quality of Care

The facility assessment showed that health facility readiness to provide quality malaria care was relatively good. On the day of the assessment, the availability of commodities was good. However, during the interviews, some malaria stakeholders noted challenges with logistical and programmatic implementation that need to be addressed. A review of the logistic management information, which was beyond the scope of this assessment, will provide additional information on the commodities situation. Only 70 percent of the supportive supervision visits included observation and feedback; additional attention should be paid to this, making sure that providers are providing patient education appropriately. Further analysis of the malaria in pregnancy data at the ward level, instead of at the district level, will provide a better understanding of the quality of malaria in pregnancy care because the services differ by ward.

Implementation Capacity

Adequate capacity exists across most technical areas. The capacity and preparedness to implement key malaria interventions were slightly lower at the district level compared with the provincial level. Additional capacity strengthening is required in some topics, such as gender, operations research, and commodity regulation.

Facilitators and Barriers

The KIs shared their observations on the facilitators of and barriers to the implementation of the malaria interventions. Where the program has had success, the factors that have facilitated achievements need to be

reinforced to sustain the gains made. Key to this is coordinated support for malaria implementation, clear implementation strategy and guidelines, and continued investment in capacity building of health workers.

Multiple sociocultural, religious, and lifestyle barriers affected the uptake of key interventions These issues can be addressed through SBCC interventions and continued community engagement, especially during IRS and LLIN mass campaigns.

The assessment also identified barriers concerning the commodity supply chain and surveillance data. These problems can be addressed as part of the wider health system strengthening efforts.

Gender

Gender plays a role in the risk of malaria, access to services, and health staff training opportunities. However, the secondary data were not sex-disaggregated and, therefore, gender analyses were limited in scope. The health facility assessments showed that more females than males participated in CM training at both the facility and community levels. The qualitative component highlighted that some activities that put people at risk for malaria infection were agricultural activities and gold panning along the rivers. It is possible that one gender may be more likely to perform these activities and thus that group would have a higher risk of malaria infection. It is important to consider how gender norms may affect who performs activities that carry a greater risk of malaria exposure. Analysis of sex-disaggregated data from the routine health information system would provide a better understanding of the gendered patterns of malaria morbidity and mortality in the country.

Limitations and Challenges in the Assessment

Although the assessment design was robust, it had some limitations and challenges.

Lack of baseline data and comparison: No baseline was conducted at the beginning of the project in 2015, which made it difficult to compare the status of quality of care before and after project implementation. The assessment was restricted to the three provinces where ZAPIM is being implemented and, therefore, a comparison with non-ZAPIM areas was not possible. The Global Fund is also very active in non-ZAPIM districts but also somewhat active in ZAPIM districts and, therefore, any observed changes cannot be solely attributed to ZAPIM.

Logistics and transportation constraints: The assessment team experienced challenges in accessing some sampled health facilities due to difficult road conditions and the inaccessibility of some areas. Traveling to some health facilities took several hours and slightly affected data collection at some sites.

Constraints to organizational assessment data: We do not have data to explain why technical capacity was more limited at the district level compared with the provincial level.

Validity and reliability of self-reported data: Most of the data collected were through self-reporting. This has its own limitations, including the possibility of omission, inaccurate information, and social-desirability bias.

Secondary data: Quality indicators for routine surveillance data, such as the percentage of facilities reporting, were unavailable for the vast majority of the study period. There were no methods written for the calculation of IRS and LLIN distribution coverage estimates that were reported in quarterly and annual reports. The core malaria intervention package (IRS and mass distribution of LLINs) is implemented at the ward level, but only the district-level data were provided for use in this report. This lack of data from the appropriate level precluded the ability to make any assessments about the effects of these interventions on malaria indicators.

Recommendations

The assessment found good coverage of malaria control interventions; availability of commodities; facility readiness to provide malaria services; adherence to CM guidelines; and good capacity, ability, and preparedness to implement key malaria interventions. It also found significant declines in malaria incidence and mortality. In light of the evidence and identified gaps, the assessment team, with input from malaria stakeholders recommend the following and *indicate where responsibility should lie*:

- Continue the current approach to control, at least in medium- to high-burden districts, but revisit when more complete incidence and mortality data from 2019 and from some of 2020 are available to determine whether the downward trend continues. If new 2019 and 2020 data suggest that progress has stagnated, control strategies should be revisited. In particular, the dynamic ward-level "either-or" approach to LLIN and IRS is economically understandable but not optimal for achieving maximum benefit. —*NMCP coordination*

- As a strong component of the overall control strategy, the system for the CD of LLINs should be well maintained and supplies should be a priority. It would be helpful to know if demand on the LLIN CD system increases with time after the last mass distribution. These data could help assess the ideal duration between mass distributions and would further strengthen the system. —*NMCP coordination*

- Increase the focus of supportive supervision visits on observation and feedback, making sure that providers are giving patient education appropriately. —*NMCP coordination with PMI implementing partner (IP) support*

- Strong coordination and good governance structures were highlighted as a key success factor. There is need for continued support for coordination activities, including technical working groups and stakeholders' involvement in project work planning, to ensure that programmatic gains and improvements in malaria control are not eroded. —*NMCP coordination with PMI IP support for funding and technical assistance*

- Implement a full spectrum of malaria interventions, including SBCC and community-based initiatives, in the selected districts or areas. —*PMI IPs under the guidance of the NMCP*

- Strengthen program management, especially logistics and commodity supply chain management, to minimize the disruption of activity implementation and service delivery. —*PMI funding working with PMI IPs and NMCP*

- Strengthen gender-sensitive programming in malaria. If not already required, programs should conduct gender analyses during design phases to identify and plan how to address gender-related factors affecting exposure, prevention, and treatment —*PMI IPs*

- Strengthen mechanisms to generate evidence, such as formative and operations research, and generate disaggregated data for evidence-based and targeted programming, communication, and decision making (see additional SME recommendations) — *NMCP coordination with PMI funding*

- Increase the focus on malaria surveillance as a core malaria intervention with clear project support (see - additional SME recommendations). —*NMCP coordination with PMI funding*

- Conduct further analysis of the malaria in pregnancy data at the ward level; this will provide a better understanding of the quality of malaria in pregnancy care. *—PMI IPs with NMCP coordination*

In addition, the team makes these general SME recommendations:

- Create and maintain a data repository containing at least the following components: (1) facility-level data for malaria indicators; (2) any relevant intervention coverage data, including rollout timelines for specific wards and districts; (3) environmental data, such as rainfall, EVI, and land cover classification; (4) ward-level population data from the census; and (5) facility-level quality of reporting indicator data.

    o Maintenance of the data repository could be the responsibility of a select one or few people, with wider access on a read-only basis.

    o If this database were well maintained and if capacity existed, weekly or monthly situation reports, tailored to program needs, could be automatically or semi-automatically generated and delivered.

    o If a maintained repository is not feasible, there should at least be one person employed who has access to these data and the capacity to pull them on an as-needed basis.

- Foster capacity to appropriately aggregate facility-level data to the ward, district, and provincial levels using spatial statistics, accounting for population distribution across wards, districts, and provinces.

- Foster capacity for basic skills in data management, analysis, and geographic information systems in preferred statistical software packages (preferably R and QGIS, because they are free and well maintained).

Appendix A. Document Review

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Appendix B. ZAPIM Assessment Consent Forms and Questionnaires

1. Key Informant Interview

<u>Verbal Consent</u>

I am [Name of the interviewer] working for [Name of the research firm] in partnership with D4I to conduct a Malaria Assessment of the PMI funded ZAPIM project in Zimbabwe. ZAPIM aimed to support the Ministry of Health and Child Care (MOHCC), National Malaria Control Program (NMCP) in providing comprehensive malaria prevention and treatment services to Zimbabweans, with the goal of reducing malaria morbidity and mortality. As part of the assessment, it is important for us to understand the context of malaria implementation. That is, we'd like to know how the malaria control interventions have unfolded since 2015 and know more about all the other factors which may affect malaria prevention, diagnosis and treatment. These may include different malaria control activities, other important developments in the health sector, or more general social, economic or political events. We will be asking you to share your views, experiences and opinions on these issues. We will also be interviewing other individuals, including malaria representatives at the National, Province, District, and health facility levels.

The interview with you should take approximately 60 minutes. The interviews will be recorded using a digital recorder (if you consent to be recorded) to supplement the interviewer's notes. The information will be used for the assessment only. No one other than the research team will be allowed to hear or read the record of the interview. We will not disclose your identity, and your name will not be mentioned during the interview or included in the transcript or any reports of the assessment.

Participation in this interview is voluntary. You are free to decide if you want to take part or not. You can refuse to answer any specific questions or stop the interview at any time. If you choose not to answer a question, stop the interview or even not participate at all in the interview there will not be any adverse consequences for you.

Do you have any questions for me? Do I have your permission to continue with the interview?

Signature of Interviewer: _____ Date: _____
(Indicates respondent's willingness to participate)
Interviewer's name: _____ Time: _____
(please print name)

2. Health Worker Interview and facility inventory

Information Sheet & Consent Form for Health Worker Interview

Why are we conducting this research?

Hello. I work for the (Name of research firm). My team is conducting a study to determine the quality of care for malaria. The results will be used to improve the availability and quality of malaria diagnosis and treatment in Zimbabwe. Specifically, we hope that this conversation with you will contribute to the assessment of the PMI ZAPIM project, which is completing its project work in three provinces, Matabeleland North, Mashonaland Central and Mashonaland East. I would like to ask you a number of questions about your role at this facility. In addition, I would like to ask your permission to see the malaria commodities available in this facility.

How long will the interview take?

The interview with you should take approximately 35 minutes, depending on the number of commodities you have in stock.

Are there any disadvantages or advantages involved in taking part?

There are no individual benefits to taking part, but in answering our questions, you will help us improve our understanding of how to increase the availability of malaria diagnosis and treatment services for the benefit of everyone living in Zimbabwe. Unfortunately, we are not in a position to assist with financial or other problems that we come across, nor can we provide commodities for your facility or buy any commodities from your facility.

However, we hope that you will participate since your views are important for the study and the results from the study will improve the availability of malaria commodities and services.

Who will have access to the information I give?

We are not here to inspect your business and no information about this specific facility will be passed on to the regulatory authorities. We will not share individual information about you or other participants with anyone beyond our research team. Instead, the knowledge gained from this research will be shared in summary form, without revealing individuals' identities with organizations or individuals that will find the information useful in improving availability of malarial treatment.

What will happen if I refuse to participate?

Participation in this study is voluntary. You are free to decide if you want to take part or not. If you do agree, you can change your mind at any time. You can refuse to answer any specific questions or stop the interview at any time. If you chose not to answer a question, stop the interview or even not participate at all in the study, it will not affect your working conditions today or in the future.

What if I have any questions?

If you have any questions, you can ask them now or later. If you wish to ask questions later, you may contact any of the following:

<<Name and contact details of (Research Firm) Project Coordinator>

<<Name and contact details of the Ministry of Health/NMCP Manager>>

<u>Verbal Consent</u>

Verbal consent is required for all interviews and should be witnessed by a member of the research team.

I certify that I have followed the information sheet to explain this study to the participant, from (facility name), and that s/he understands the nature and the purpose of the study and consents to participate in the study. S/he has been given an opportunity to ask questions which have been answered satisfactorily.

⌐ *please tick* The interviewee agrees to be interviewed

Signature of Interviewer: _____   Date ____

Interviewer's name: _____   Time:

-

The provider should now be given an information sheet to keep

3. Client exit interview

<u>Verbal consent form for clients aged 18 and above</u>

Good morning/afternoon, I am   . I am representing
the (Name of Firm). We are conducting a study of health facilities in Zimbabwe to generate
information that will be used by the Government to understand better the services this facility offers
and would like to ask you some questions about your experiences here today. This will be a short
interview lasting about 10 minutes or less. Please know that whether you decide to allow this
interview or not is completely voluntary and will not affect services you receive during any future visit
to this facility. You may refuse to answer any question you are not comfortable with, and you may
stop the interview at any time.

Information from this interview may be provided to researchers for analyses, but your name will not
be asked or recorded, so your responses will be anonymous and completely confidential.

Signature of Interviewer: Date:

_____

(Indicates respondent's willingness to participate)

Interviewer's name: Time:

_____

(please print name)

Do you have any questions for me? Do I have your permission to continue with the interview?

<u>Verbal consent form for caretaker of child – under age 15</u>

Good morning/afternoon, I am   . I am representing the (Name of Firm). We are conducting a study
of health facilities in Zimbabwe to generate information that will be used by the Government to
understand better the services this facility offers and would like to ask you some questions about your
experiences bringing this child to the health facility today. This will be a short interview lasting about 10
minutes or less. Please know that whether you decide to allow this interview or not is completely
voluntary and will not affect services you or this child receive during any future visit to this facility. You
may refuse to answer any question you are not comfortable with, and you may stop the interview at any
time.

Information from this interview may be provided to researchers for analyses, but your or the child's name will not be asked or recorded, so your responses will be anonymous and completely confidential.

Do you have any questions for me? Do I have your permission to continue with the interview?

Signature of Interviewer: **Date:**

(Indicates caretaker's willingness to participate)

Interviewer's name: **Time:**

(please print name)

Verbal consent form for caretaker of minor ages 15-17

Good morning/afternoon, I am_____. I am representing the (Name of Firm). We are conducting a study of health facilities in Zimbabwe to generate information that will be used by the Government to understand better the services this facility offers and would like to ask you if we can ask this minor about his/her experiences at the health facility today. It will be a short interview lasting about 10 minutes or less. Please know that whether this minor decides to allow this interview or not is completely voluntary and will not affect the services you or this minor receives during any future visit to this facility. He/she may refuse to answer any question you are not comfortable with and may stop the interview at any time.

Information from this interview may be provided to researchers for analyses, but your or the minor's name will not be asked or recorded, so the responses will be anonymous and completely confidential.

Do you have any questions for me? Do I have your permission to ask the minor for permission to conduct the interview?

Signature of Interviewer: **Date:**

(Indicates caretaker's approval to ask the minor's permission to be interviewed)

Interviewer's name: **Time:**

(please print name)

Interview Guide for Key Informant Interview

To begin with, can you tell me a bit about your role in malaria control?

Context of malaria control

1. What is the current malaria situation in the Country?

Additional prompts:

- What are the trends in malaria intervention coverage?

- What are the trends in morbidity and mortality?

- What malaria programs are working in the Country?

2. Have any important malaria control interventions started or stopped in the last year?

Additional prompts:

These could involve roll out of ITNs, change in diagnostics, change in first-line drug, house spraying, advocacy, communication, and social mobilization, etc.?

3. Have there been any important weather events or change in weather patterns that could have affected the malaria disease burden or malaria control interventions in the last 3 years?

Additional prompt:

For example, floods, droughts, etc.

Leadership and governance

1. Have there been any important changes in implementation of pharmaceutical regulation that have affected malaria control?

Additional prompt:

For example, change in prescription only status of certain antimalarials, ban of certain products, crack downs on illegal outlets, etc.

2. What can you tell me about joint planning, supportive supervision and management with other health programs?

Additional prompt:

Participation in provincial and district planning processes for malaria control

How is malaria included in other relevant health programs? How often are these meetings?

Collaboration and coordination between ZAPIM and other partners in malaria control.

What can you tell me about integration of ZAPIM activities into the NMCP workplans?

3. Please describe linkages you know of between community, district, provincial, and national systems that are relevant for malaria control.

Health financing

1. Have there been any changes to the amount of funding received for malaria control in the last 3 years?

Additional prompt:

From international sources? From national sources?

2. What can you tell me about integration of malaria into National budgets and workplans?

Human resources

1. Overall, what is your impression of existing Human Resource Capacity for malaria staff?

Additional prompt:

Are there sufficient numbers of staff, from facility to national level? Are staff appropriate trained? Are staff appropriate equipped and supported to conduct their roles?

Commodities

1. Have there been changes in the availability of malaria commodities in public health facilities in the last 3 years?

2. What is your impression of the supply chain management for malaria commodities? What are the key challenges?

3. What is your impression of the information system in place to monitor malaria commodities?

4. How would you describe the quality of laboratory services for malaria?

Additional prompt:

Availability and functionality of equipment (Microscopes), Reagents, Blood Slides

Service delivery

1. What quality control mechanisms or assessments related to malaria case management are in place/ have been conducted?

Additional prompts if yes:

- When were they?

- What did they entail?

- Who was involved?

- What was the funding source?

- What were the findings?

- Can you share the final report or any related materials with me?

- Were there any challenges conducting the assessment?

Information, data, and research

1. How do you use routine health information data (DHIS 2/IDSR) in your work for malaria control?

Additional prompt:

- To provide examples of data use for decision making

2. Overall, what is your impression of the quality of HMIS data on malaria in this country?

Additional prompt:

- Data quality includes the dimensions of relevance, completeness, accuracy, and timeliness., Are all facilities reporting on DHIS 2 platform? Including private sector facilities?

3. Is there collaboration in research being conducted by ZAPIM, independent research organizations, including universities, and the National Malaria Control Program?

Additional prompt:

- Therapeutic efficacy studies? Operational Research

Recommendations

1. Are there specific factors that help support coverage of malaria control interventions in the Country?

Additional prompts:

- What is this country biggest success in terms of malaria control?

- What are you most proud of related to malaria control?

- What do you attribute theses success to?

    - Further prompt: Some examples could be management support, partnerships, champions, SBCC, financing, human resources, training, information management, infrastructure development

2. What are the factors that hinder high coverage of malaria control interventions?

Additional prompts:

- If you could change the ZAPIM project design to improve malaria control programming, what would you prioritize?

- Are there ideas you would like to implement to improve malaria control in your district?

- Accessibility, availability, affordability, acceptability

3. Is there anything else you'd like to tell me about these topics?

Thank you for taking the time to speak with me today. I appreciate your effort to strengthen malaria prevention, diagnosis, and treatment in Zimbabwe and would be happy to reconnect with you once the findings of this activity are ready.

- Interview Guide for Health Worker Interview

Facility Identification	
Province	
District	
Name of Hospital	
Date of interview	I__I__I/I__I__I/2019
Name interviewer and code	Name:
	Code: I__I__I__I
TO BE COMPLETED BY THE INTERVIEWER	
Health worker initials	I__I__I
Health worker sex	Yes: I__I No: I_I
Healthcare worker's age (years):	I__I__I
Health worker role	Medical officer: I__I__I__I Clinical officer: I__I__I__I Enrolled Nurse: I__I__I__I Enrolled Midwife: I__I_I__I Registered Nurse: I__I_I__I Registered Midwife: I__I__I__I Nursing Assistant: I__I_I__I Lab technologist: I__I__I_I Lab technician: I__I__I__I Lab Assistant: I__I__I__I Microscopist: I__I__I__I HMIS Focal Person/Record officer: I__I_I__I Health educator/Assistant: I__I__I__I

	Family planning counsellor: I__I_____I__I Community based Village Health Worker: I__I_____I _____I

Section 1: Training	
How many years of health professional training do you have?	I__I__I Skip for CVHW
How many years ago did you get your last degree, diploma or certificate?	I__I__I Skip for CVHW
How many years of experience do you have caring for patients?	I__I__I
In the past 6 months, have you received training on Rapid Diagnostic Testing?	Yes:I__I No:I_I
In the past 6 months, have you received training on microscopy?	Yes:I__I No:I_I Skip for CVHW
In the past 6 months, have you received training on treatment of uncomplicated malaria?	Yes:I__I No:I_I
In the past 6 months, have you received training on treatment of severe malaria?	Yes:I__I No:I_I
In the past 6 months, have you received training on IPTp?	Yes:I__I No:I_I

Section 2: Guidelines	
Instructions: For each of the following questions, check and see if each item is present at the facility today.	
Do you have access to a copy of the most recent national Malaria treatment guidelines?	Yes, observed: I_I Yes, not observed: I_I No: I_I
What year were they created?	I__I__I__I__I
Do you have access to a copy of the national malaria RDT Guidelines or other reference materials on RDTs?	Yes, observed: I_I Yes, not observed: I_I No: I_I
What year were they created?	I__I__I__I__I
Do you have access to a copy of the dosing schedule for ACT?	Yes, observed: I_I Yes, not observed: I_I No: I_I
What year were they created?	I__I__I__I__I

Section 3: Supervision	
How many supervisory/Mentorship visits did you have in the last 6 months?	I__I__I
Did any of these supervisory/Mentorship visits include appropriate use of antimalarial?	Yes: I_I No: I_I
Did any of these supervisory/Mentorship visits include observation of patient consultations?	Yes: I_I No: I_I
Did any of these supervisory/Mentorship visits include observation of patient consultations and feedback?	Yes: I_I No: I_I

Section 4: SMS reminders	
How often have you received text messages with key content areas and quiz questions from ZAPIM post training?	Never_____ Once_____

	Twice_____
	Thrice _____
	More than Thrice _____

- Inventory guide

-

Facility Identification	
Province	
District	
Name of Hospital	
Date of visit	I__I__I/I__I__I/2017
Name data collator and code	Name: Code: I__I__I__I
Time data collation began	

TO BE COMPLETED BY THE SUPERVISOR: DETAILED FACILITY INFORMATION

Names of hospitals that the facility refers to	
Number of health facility staff in total	Medical officer: I__I__I__I Clinical officer: I__I__I__II Enrolled Nurse: I__I__I__I Enrolled Midwife: I__I__I__I Registered Nurse: I__I__I__I Registered Midwife: I__I__I__I Nursing Assistant: I__I_I__I Lab technologist: I__I__I_I Lab technician: I__I__I__I Lab Assistant: I__I__I__I Microscopist: I__I__I__I HMIS Focal Person/Record officer: I__I_I__I

	Health educator/Assistant: I__I I__I
	Family planning counsellor: I__I I__I
Does the facility offer antenatal care services?	Yes: I_I No: I_I

TO BE COMPLETED BY THE SUPERVISOR:
Observation of Malaria Case Management Commodities and Tools at Facilities:
Instructions: For each of the following questions, check and see if each item is present at the facility today.

Does the facility have malaria Rapid Diagnostic Tests (RDTs)? available?	Yes, observed: I_I Yes, not observed: I_I No: I_I
Does the facility have all 4 ACT bands available?	Yes, observed: I_I Yes, not observed: I_I No: I_I
Does the facility have at least 1 band of ACT available?	Yes, observed: I_I Yes, not observed: I_I No: I_I

Does the facility have Sulfadoxine-Pyrimethamine (SP) available?	Yes, observed: I_I Yes, not observed: I_I No: I_I
Does the facility have long-lasting insecticidal nets (LLINs) or insecticide-treated nets (ITNs) available?	Yes, observed: I_I Yes, not observed: I_I No: I_I
Does the facility have a laboratory?	Yes, observed: I_I Yes, not observed: I_I No: I_I
Does the facility have a functional microscope?	Yes, observed: I_I Yes, not observed: I_I No: I_I
Does the facility have the national malaria treatment guidelines available?	Yes, observed: I_I Yes, not observed: I_I No: I_I
Does the facility have the Malaria in Pregnancy (IPTp) Protocol / Guideline available?	Yes, observed: I_I Yes, not observed: I_I No: I_I
PLEASE ASK: Does the facility have personnel trained in using RDTs for diagnosing malaria?	Yes: I__I No: I_I
PLEASE ASK: Does the facility have personnel trained in microscopy for diagnosing malaria on the current guidelines (2015)?	Yes: I__I No: I_I
PLEASE ASK: Does the facility have at least one health worker trained in malaria treatment	Yes: I__I No: I_I
PLEASE ASK: Does the facility have at least one health worker trained in malaria in pregnancy?	Yes: I__I No: I_I
PLEASE ASK: In most cases in this facility, is it the same health care worker who sees the patient who does the Rapid Diagnostic Test (RDT) or is it someone else?	Yes, the same health care worker that sees the patient usually does the RDT: I_I No, the RDT is usually done by the laboratory technician: I_I No, the RDT is usually done by a different health care worker. I_I We do not do/have RDTs here. I_I
PLEASE ASK: How many CVHWs are attached to the health facility?	I__I___I_____I
PLEASE ASK: How many CVHWs are trained in malaria testing and treating?	I__I___I_____I

PLEASE ASK: How often are CVHWs supervised	I__I I_____I
PLEASE ASK: Who conducts the supervision of CVHWs?	I__I Environmental health technicians I__I Peers I__I health facility staff
PLEASE ASK: How often do CVHWs report and are re-supplied RDTs/Drugs	I__I monthly I__I Quarterly

- Client Exit Interview Guide

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- PRE-SCREENING SECTION FOR CLIENTS EXITING THE HEALTH FACILITY

AS A CLIENT LEAVES THE HEALTH FACILITY, APPROACH THE USER AND SAY:

Hello. I work for the M-Consulting-Group. We are conducting a short survey today with clients leaving the health facility to understand better the services the facility offers. Before I give you more information about this survey, can I please ask you a few questions to determine which part of the questionnaire to ask you?

IF CLIENT DISAGREES, THANK CLIENT AND END INTERVIEW.

IF CLIENT AGREES:

1. DETERMINE WHO THE CLIENT IS:

1a. Did you come to the health facility today to see a health care worker for

yourself? 1b. Did you come to the health facility today to see a health care

worker for this child?

2. DETERMINE THE AGE OF THE CLIENT:

2a. May I know your age please?

(If client is under 18 and there is no care giver present to give consent, end the interview and thank the client)

If the respondent does not know his/her age, ask: Do you have a patient card with you today? If yes, according to the card, what is the client's date of birth?

If no card or no date of birth on the card, do the **observation**:

Look at the person. Does the person look **at least 18 years of age**? YES or NO.

If yes, proceed with the interview. If no or the interviewer is not sure thank respondent and end the interview and thank respondent.

2b. May I know the age of this child?

If the respondent does not know his/her age, do the **observation**:

Look at the child. Is it possible that this child is between 15 and 17 years of age? No, because this child looks younger than 15. If so, proceed to section 1C.

Yes, this child could be between 15 and 17 years of age. If so, proceed to section 1A if child is female and 1B if child is male.

3. NOTE THE SEX OF THE CLIENT

BASED ON THE SEX AND AGE OF THE CLIENT, PROCEED TO THE APPROPRIATE
SCREENING SECTION: SECTION 1A: FOR FEMALE CLIENT AGES 15 AND ABOVE.

SECTION 1B: FOR MALE CLIENTS AGES 15 AND
ABOVE. SECTION 1C: FOR CARETAKER OF A
CHILD.

SCREENING SECTION

Section 1A: Screening Questions for Female Client (Ages 15 and above)			
No.	**Questions**	**Coding Classification**	**Go To**
101.	Why did you come to the health facility today? **IF ANC VISIT:** ASK FOLLOWING QUESTION. **IF FEVER:** PROCEED WITH OBTAINING VERBAL CONSENT AND GO TO SECTION 3. **IF ANY OTHER REASON:** THANK CLIENT AND END INTERVIEW	ANC VISIT ……………1 FEVER ……………… 2 OTHER REASON …. 8	
102.	How many months pregnant are you? **IF 4 MONTHS OR MORE:** PROCEED WITH OBTAINING VERBAL CONSENT AND GO TO SECTION 2. **IF LESS THAN 4 MONTHS:** THANK CLIENT AND END INTERVIEW. **IF DON'T KNOW:** ASK FOLLOWING QUESTION.	# OF MONTHS _____ DON'T KNOW………95	
103.	Do you have an ANC card with you today? **IF YES**: ASK TO SEE THE ANC CARD **IF NO:** THANK CLIENT AND END INTERVIEW	YES ……………………1 NO ……………………2	

104.	IF THE CLIENT HAS AN ANC CARD/BOOK, WHAT WAS THE DATE OF HER LAST MENSTRUAL PERIOD?	DATE OF LAST PERIOD: __/_/____	
	OR IF THE DATE OF THE LAST MENSTRUAL PERIOD IS NOT AVAILABLE, SEE EXPECTED DATE OF DELIVERY (EDD). IF EDD IS NOT AVAILABLE, THANK CLIENT AND END INTERVIEW.	EXPECTED DATE OF DELIVERY: __/_/____	
	ENTER THE DATE. SEE RESULTS IN MONTHS.		
	IF 4 MONTHS OR MORE: PROCEED WITH OBTAINING VERBAL CONSENT AND GO TO SECTION 2.		
	IF LESS THAN 4 MONTHS: THANK CLIENT AND END INTERVIEW.		

Section 1B: Screening Questions for Male Client (Ages 15 and above)			
No.	Questions	Coding Classification	Go To
101.	Why did you come to the health facility today? **IF FEVER:** PROCEED WITH OBTAINING VERBAL CONSENT AND GO TO SECTION 3. **IF ANY OTHER REASON:** THANK CLIENT AND END INTERVIEW	FEVER ……………. 2 OTHER REASON …. 8	

Section 1C: Screening Questions for Caretaker of Child (Under Age 15)			
No.	Questions	Coding Classification	Go To
101.	Why did you bring this child to the health facility today? **IF FEVER:** PROCEED WITH OBTAINING VERBAL CONSENT AND GO TO SECTION 4. **IF ANY OTHER REASON:** THANK CLIENT AND END INTERVIEW	FEVER ……………… 1 OTHER REASON …. 8	

QUESTIONNAIRE SECTIONS 2 – 4 (FOR AFTER SCREENING AND OBTAINING VERBAL CONSENT)

Section 2: For Females in the Second or Third Trimester of Pregnancy who Came for ANC Visit (Ages 15 and above)			
No.	Questions	Coding Classification	Go To
200.	RECORD THE TIME THE INTERVIEW STARTED		
201.	During this visit, did a health worker give you three white tablets to prevent you from getting malaria?	YES …………………… 1 NO………………………2	203
202.	Were you asked to swallow the three white tablets while still in the facility and in the presence of a health worker?	YES …………………… 1 NO………………………2	
203.	How many times in your pregnancy so far has a health worker given you three white tablets to take in front of him/her to prevent you from getting malaria?	ONCE…………………1 TWICE…………………2 THREE TIMES ………3 FOUR OR MORE	

		TIMES.....................4 NEVER...................8 DON'T KNOW.........95	
204.	During this visit, did a health worker advise you to sleep under a mosquito net that has been treated with an insecticide?	YES .... 1 NO.........................2	
205.	During this visit, did a health worker offer you a mosquito net that has been treated with an insecticide free of charge?	YES .... 1 NO.........................2	
206.	Do you have an ANC card with you today? IF YES: ASK TO SEE THE CARD/BOOK	YES ....1 NO 2	209
207.	IF THE CLIENT HAS AN ANC CARD, DOES THE CARD INDICATE IF THE CLIENT HAS RECEIVED IPT? IF YES, INDICATE THE NUMBER OF DOSES.	YES, 1 DOSE .... 1 YES, 2 DOSES........... 2 YES, 3 DOSES........... 3 YES, 4 DOSES........... 4 NO 5	
208.	ACCORDING TO THE CARD, WHAT IS THE CLIENT'S DATE OF BIRTH?	DAY_____ MONTH_____ YEAR_____ NOT AVAILABLE 95	
209.	How old were you at your last birthday?	AGE IN YEARS _____ DON'T KNOW 95	
210	What is your Religion?	TRADITIONAL ....1 ROMAN CATHOLIC 2 PROTESTANT_____ 3	

		PENTECOSTAL _____4	
		APOSTOLIC SECT…. 5	
		OTHER CHRISTIAN . 6	
		MUSLIM_____7	
		NONE_____8	
		OTHER (SPECIFY)_____ 96	
211.	Have you ever attended school?	YES …………………1 NO…………………… 2	213
212.	What is the highest level of school you attended: primary, secondary, higher?	PRIMARY ……………1 SECONDARY ………. 2 HIGHER …………….. 3	
213.	Do you know how to read or how to write in any language?	YES, READ AND WRITE..1 YES, READ ONLY …………………2 NO ………………….. 3	
214.	How long does it take for you to <u>walk</u> to this health facility from your place of residence? IF RESPONDENT DOESN'T PROVIDE TIME IN MINUTES, READ OUT RESPONSE OPTIONS. IF RESPONDENTS SAYS HE/SHE COMES BY A TYPE OF TRANSPORTATION, ASK TO ESTIMATE TIME OF WALKING TO FACILITY.	0 to 15 minutes………………1 15 to 30 minutes …………… 2 30 minutes to one hour…..3 More than one hour ………. 4 DON'T KNOW …………. 95	
215	How would you rate your experience with the service at this facility today?	Very unsatisfied ………………1 Fairly unsatisfied …………… 2 Neither unsatisfied nor satisfied ……………………… 3 Fairly satisfied………………..4	

		Very satisfied……………… 5	
	Thank you very much for taking the time to answer my questions. Once again, any information you have given will be kept completely confidential. Have a good day!		
216.	RECORD THE TIME THE INTERVIEW ENDED		
	Interviewer's comments:		

Section 3: For Clients who came to Health Facility because of Fever (Ages 15 and above)			
No.	**Questions**	**Coding Classification**	**Go To**
300.	RECORD THE TIME THE INTERVIEW STARTED		
301.	NOTE THE SEX OF THE CLIENT.	FEMALE…………………1 MALE ………………….2	
302.	During the visit today, were you asked to have a blood test?	YES …………………………. 1 NO ……………………………2	308
303.	Did you have a blood test done?	YES ………………………… 1 NO ……………………………2	305

Section 3: For Clients who came to Health Facility because of Fever (Ages 15 and above)			
No.	**Questions**	**Coding Classification**	**Go To**
304.	Why did you not have a blood test done?	_____ _____ _____ _____	308
305.	Were you told the result of the blood test that was done?	YES .... 1 NO 2	308
306.	What was the result?	POSITVE FOR MALARIA…..1 NEGATIVE FOR MALARIA..2 DON'T KNOW 95	
307.	How long did you wait to get the result of the test?	LESS THAN 15 MINUTES….1 BETWEEN 15 MINUTES AND ONE HOUR.............2 BETWEEN ONE HOUR AND TWO HOURS ....3 MORE THAN TWO HOURS..........................4 DON'T KNOW 95	

Section 3: For Clients who came to Health Facility because of Fever (Ages 15 and above)			
No.	Questions	Coding Classification	Go To
308.	Did the health worker give or prescribe any medicines for you to take at home?	YES, GAVE MEDS ………… 1 YES, GAVE PRESCRIPTION.2 YES, GAVE MEDS AND PRESCRIPTION ………….. 3 NO ………………………… 4	310
309.	ASK TO SEE ALL MEDICATIONS AND ANY PRESCRIPTIONS THAT THE CLIENT RECEIVED. SELECT ALL THAT IS SHOWN.	SAW RECOMMENDED ACTs (AL) …………………………1 SAW OTHER ACTs (e.g) ………………………… 2 SAW OTHER MEDICINES…3 SAW PRESCRIPTION …….4	
310.	Do you have a patient card/book with you today? IF YES: ASK TO SEE THE CARD/BOOK	YES …………………… 1 NO …………………… 2	312
311.	ACCORDING TO THE CARD, WHAT IS THE CLIENT'S DATE OF BIRTH?	DAY_____ MONTH_____ YEAR_____ NOT AVAILABLE ………95	

312.	How old were you at your last birthday?	AGE IN YEARS _____ DON'T KNOW …….. 95	
313	What is your religion?	TRADITIONAL…….. 1 ROMAN CATHOLIC 2 PROTESTANT_____3	

		PENTECOSTAL _____4	
		APOSTOLIC SECT … 5	
		OTHER CHRISTIAN . 6	
		MUSLIM 7	
		NONE_____8	
		OTHER (SPECIFY)_____ 96	
314.	Have you ever attended school?	YES ……………………1	
		NO …………………… 2	316
315.	What is the highest level of school you attended: primary, secondary, higher?	PRIMARY ……………. 1	
		SECONDARY………. 2	
		HIGHER…………….3	
316.	Do you know how to read or how to write in any language?	YES, READ AND WRITE..1 YES, READ ONLY ……………………2	
		NO………………………. 3	
317.	How long does it take for you to <u>walk</u> to this health facility from your place of residence? IF RESPONDENT DOESN'T PROVIDE TIME IN MINUTES, READ OUT RESPONSE OPTIONS. IF RESPONDENTS SAYS HE/SHE COMES BY A TYPE OF TRANSPORTATION, ASK TO ESTIMATE TIME OF WALKING TO FACILITY.	0 to 15 minutes……………1	
		15 to 30 minutes …………… 2	
		30 minutes to one hour…..3 More than one hour ……….. 4	
		DON'T KNOW …………. 95	
318.	How would you rate your experience with the service at this facility today?	Very unsatisfied ……………1	
		Fairly unsatisfied …………… 2	
		Neither unsatisfied nor satisfied …………………………… 3	

		Fairly satisfied……………….4
		Very satisfied………………. 5
	Thank you very much for taking the time to answer my questions. Once again, any information you have given will be kept completely confidential. Have a good day!	
319.	RECORD THE TIME THE INTERVIEW ENDED	. .
	Interviewer's comments:	

Section 4: For Caretaker with Child (Under Age 15) who came to Health Facility because of Fever

No.	Questions	Coding Classification	Go To
400.	RECORD THE TIME THE INTERVIEW STARTED	. .	
401.	NOTE THE SEX OF THE CHILD.	FEMALE …………………… 1 MALE ……………………… 2	
402.	During the visit today, was this child asked to have a blood test?	YES………………………… 1 NO ………………………… 2	408
403.	Did this child have a blood test done?	YES………………………… 1 NO ………………………… 2	405
404.	Why did this child not have a blood test done?	_____ _____	

			___408
405.	Were you told the result of the blood test that was done?	YES............................... 1 NO 2	▭ 408
406.	What was the result?	POSITVE FOR MALARIA . 1 NEGATIVE FOR MALARIA.2 DON'T KNOW......................... 95	
407.	How long did you wait to get the result of the test?	LESS THAN 15 MINUTES.1 BETWEEN 15 MINUTES AND ONE HOUR… 2 BETWEEN ONE HOUR AND TWO HOURS................ 3 MORE THAN TWO HOURS ....4 DON'T KNOW............95	
408.	Did the health worker give or prescribe any medicines for this child for you to take at home?	YES, GAVE MEDS.......... 1 YES, GAVE PRESCRIPTION .... 2 YES, GAVE MEDS AND PRESCRIPTION .... 3 NO 4	▭ 410
409.	ASK TO SEE ALL MEDICATIONS AND ANY PRESCRIPTIONS THAT THE CLIENT RECEIVED. SELECT ALL THAT IS SHOWN.	SAW RECOMMENDED ACTs (AL)............................... 1 SAW OTHER ACTs	

		(e.g.)…………………………2 SAW OTHER MEDICINES…3 SAW PRESCRIPTION……. 4	
410.	Do you have a patient card/book for this child with you today? IF YES: ASK TO SEE THE CARD/BOOK	YES……………………1 NO …………………….2	412
411.	ACCORDING TO THE CARD, WHAT IS THE CHILD'S DATE OF BIRTH?	DAY_____ MONTH_____ YEAR_____ NOT AVAILABLE …….. 95	
412.	What month and year was this child born?	MONTH_____ DON'T KNOW MONTH…95 YEAR_____ DON'T KNOW YEAR…9995	
413.	How old was this child at his/her last birthday? IF CHILD IS UNDER 5, SKIP TO **417.** IF CAREGIVER DOESN'T KNOW AGE OF CHILD, LOOK AT THE CHILD: DOES THE CHILD LOOK YOUNGER THAN 5 YEARS OF AGE? IF YES, SKIP TO **417**. IF NO, GO TO **414**.	AGE IN YEARS CHILD IS UNDER ONE ……0 DON'T KNOW……………… 95	
414.	Has this child ever attended school? (Western school)	YES……………………. 1 NO …………………….2	416
415.	What is the highest level of school this child has attended?	PRESCHOOL………… 0 PRIMARY………………1 SECONDARY ………… 2	▶ ▶

416.	Does this child know how to read or to write in any language?	YES, READ AND WRITE...1 YES, READ ONLY .... 2 NO 3	
417.	How long does it take for you to <u>walk</u> to this health facility from the child's place of residence? IF RESPONDENT DOESN'T PROVIDE TIME IN MINUTES, READ OUT RESPONSE OPTIONS. IF RESPONDENTS SAYS THE CHILD COMES BY A TYPE OF TRANSPORTATION, ASK TO ESTIMATE TIME OF **WALKING** TO FACILITY.	0 to 15 minutes ....1 15 to 30 minutes................2 30 minutes to one hour.....3 More than one hour............4 DON'T KNOW..............95	
418.	How would you rate your experience with the service at this facility today?	Very unsatisfied................. 1 Fairly unsatisfied................2 Neither unsatisfied nor satisfied...........................3 Fairly satisfied .... 4 Very satisfied 5	
	Thank you very much for taking the time to answer my questions. Once again, any information you have given will be kept completely confidential. Have a good day!		
419.	RECORD THE TIME THE INTERVIEW ENDED:		
	Interviewer's comments:		

Facility Identification	
Province	

District	
Name of Health Facility	
Date of Interview	I__I__I/I__I__I/2019
Name Interviewer and code	Name:
	Code: I__I__I__I
Signature of Interviewer	

Interview Guide for Capacity Assessment: Provincial and District Health teams

Name of Province/District_____

Technical Capacity Scoring Key

1 = Adequate – at least an understanding of the issue/concept/skill plus evidence that has been used in

practice

2 = Marginal understanding of the issue/concept/skill without evidence that has been used in practice or limited understanding of the issue/concept/skill but some evidence that has been used in practice

3 = Inadequate – limited understanding of the issue/concept/skill and little or no evidence that has been used in practice

---

1   Province/District in-house capacity for **Programme Management**

	1	2	3
Partnership development and coordination	☐	☐	☐
Programme planning	☐	☐	☐
Fund-raising/resource mobilisation	☐	☐	☐
Programme coordination/integration (including iCCM, IMCI)			

	☐	☐	☐
Programme implementation	☐	☐	☐
Conduct malaria situational analysis	☐	☐	☐
Conduct malaria gap analysis	☐	☐	☐
Budget management	☐	☐	☐
Knowledge management	☐	☐	☐

2   Province/District in-house capacity for **Capacity Development**

	1	2	3
Planning and implementation of Needs Assessment	☐	☐	☐
Planning of Training Programmes	☐	☐	☐
Delivery of Training Programmes	☐	☐	☐
Implementation of malaria supportive supervision	☐	☐	☐
Implementation of integrated supportive supervision	☐	☐	☐

Implementation of on the job capacity building, mentorship, and clinical audit

☐	☐	☐

3   Province/District in-house capacity for **Regulation**

	1	2	3

Collaboration with Provincial drug inspector/Medicines Control Officer on regulation and quality of supplies

☐	☐	☐

4   Province/District in-house capacity for **Technical interventions, preventive**

	1	2	3
Plan detailed delivery of interventions (eg. Mass LLIN distribution)	☐	☐	☐
Implement intervention strategies	☐	☐	☐

Management of continuous LLIN distribution	☐	☐	☐

5 Province/District in-house capacity for **Technical interventions, curative**

	1	2	3
Plan detailed delivery of interventions	☐	☐	☐
Implement intervention strategies	☐	☐	☐
Implement laboratory quality assurance	☐	☐	☐

6 Province/District in-house capacity for **Monitoring & Evaluation /Quality Assurance**

	1	2	3
Quality control and quality assurance	☐	☐	☐
Use of data management systems	☐	☐	☐
Data collection (recordkeeping)	☐	☐	☐
Data reporting	☐	☐	☐
Data analysis	☐	☐	☐
Data dissemination and use	☐	☐	☐
Integration of private-sector data	☐	☐	☐

7 Province/District in-house capacity for **Disease Surveillance and Response**

	1	2	3
Management of surveillance systems (early warning and early detection systems)	☐	☐	☐
Participate in surveillance	☐	☐	☐
Coordination with national team	☐	☐	☐
Notification, reporting, and feedback	☐	☐	☐

8 Province/District in-house capacity for **Gender**

	1	2	3
Understanding gender-related barriers to malaria services	☐	☐	☐
Engagement of woman-owned CSOs	☐	☐	☐
Gender mainstreaming in program interventions	☐	☐	☐
Use of sex-aggregated and gender sensitive data	☐	☐	☐

9 Province/District in-house capacity for **Advocacy, Communication, and Social Mobilization**

	1	2	3
Plan for and implement intervention strategies	☐	☐	☐
Package and disseminate strategic information	☐	☐	☐
Translate findings into learning	☐	☐	☐
Develop and maintain partnerships	☐	☐	☐

10 Other skills that members of the District team feel they require to perform their tasks better?

_____

Appendix C. List of Facilities Visited

Provinces	Districts	Facility
Mashonaland Central	Bindura	Bindura Hospital
Mashonaland Central	Bindura	Chiriseri
Mashonaland Central	Bindura	Foothills
Mashonaland Central	Bindura	Chiveso
Mashonaland Central	Bindura	Manhenge
Mashonaland Central	Bindura	Rusununguko
Mashonaland Central	Bindura	Katanya
Mashonaland Central	Bindura	Nyava
Mashonaland Central	Bindura	Rutope
Mashonaland Central	Centenary	Chawarura
Mashonaland Central	Centenary	David Nelson Clinic
Mashonaland Central	Centenary	St Alberts Hospital
Mashonaland Central	Centenary	Chadereka
Mashonaland Central	Centenary	Dambakurima
Mashonaland Central	Centenary	Hoya
Mashonaland Central	Centenary	Machaya
Mashonaland Central	Centenary	Muzarabani
Mashonaland Central	Mount_Darwin	Dotito
Mashonaland Central	Mount_Darwin	Mt Darwin Hospital
Mashonaland Central	Mount_Darwin	Nyamahobogo
Mashonaland Central	Mount_Darwin	Bandimba
Mashonaland Central	Mount_Darwin	Kamutsenzere
Mashonaland Central	Mount_Darwin	Mukumbura
Mashonaland Central	Mount_Darwin	Nembire
Mashonaland Central	Mount_Darwin	Pachanza
Mashonaland Central	Mount_Darwin	Pfunyanguwo

Provinces	Districts	Facility
Mashonaland East	Chikomba	Nhangabwe Clinic
Mashonaland East	Chikomba	Rutanhira Clinic
Mashonaland East	Chikomba	Sadza District Hospital
Mashonaland East	Mudzi	Chimukoko RHC
Mashonaland East	Mudzi	Chingamuka Clinic
Mashonaland East	Mudzi	Kondo RHC
Mashonaland East	Mudzi	Kotwa Clinic
Mashonaland East	Mudzi	Kotwa District Hospital
Mashonaland East	Mudzi	Masarakufa RHC
Mashonaland East	Mudzi	Mavhurazi Clinic
Mashonaland East	Mudzi	Dendera Clinic
Mashonaland East	Mudzi	Gozi RHC
Mashonaland East	Mudzi	Nyahuku Clinic
Mashonaland East	Mudzi	Nyamande Clinic
Mashonaland East	Mudzi	St_Pius Clinic
Mashonaland East	Seke	Zhakata RHC
Mashonaland East	Seke	Epworth_Mission_Clinic
Mashonaland East	Seke	Beatrice Rural Hospital
Mashonaland East	Ump	Mutawatawa District Hospital
Mashonaland East	Ump	Borera Clinic
Mashonaland East	Ump	Chitsungo Clinic
Mashonaland East	Ump	Dindi Clinic
Mashonaland East	Ump	Kafura RHC
Mashonaland East	Ump	Maramba Clinic
Mashonaland East	Ump	Nyakasoro Clinic
Mashonaland East	Ump	Nyanzou Clinic
Mashonaland East	Ump	Sowa RHC

Provinces	Districts	Facility
Mashonaland East	Ump	Tsokodeka Clinic
Matabeleland North	Binga	Binga Hospital
Matabeleland North	Binga	Siabuzuba Satellite Clinic
Matabeleland North	Binga	Siansundu RHC
Matabeleland North	Hwange	Victoria Falls
Matabeleland North	Hwange	Mwemba RHC
Matabeleland North	Hwange	Sibinda RHC

Appendix D. Conflict of Interest Forms

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Agneta Mbithi
Title	Malaria Surveillance, M&E Specialist
Organization	ICF
Evaluation Position?	☑ Team Leader ☐ Team member
Evaluation Award Number *(contract or other instrument)*	7200AA18LA00008
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Zimbabwe Assistance Program In Malaria
I have real or potential conflicts of interest to disclose.	☐ Yes ☑ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* *1. Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* *2. Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* *3. Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* *4. Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* *5. Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* *6. Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	
Date	3/27/2020

Disclosure of Conflict of Interest for USAID Evaluation Team Members

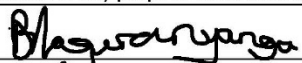| Name	Andrew Andrada
Title	Surveillance, Monitoring, and Evaluation Specialist
Organization	ICF
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	**7200AA18LA00008**
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Zimbabwe Assistance Program in Malaria
I have real or potential conflicts of interest to disclose.	☐ Yes ■ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* 1. *Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* 2. *Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* 3. *Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* 4. *Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* 5. *Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* 6. *Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	
Date	March 26, 2020

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Dr Brian Maguranyanga
Title	Director
Organization	M-Consulting Group (M-Care Enterprises Pvt Ltd)
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	700AA18LA008
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Zimbabwe Assistance Program in Malaria (ZAPIM)
I have real or potential conflicts of interest to disclose.	☐ Yes ■ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* *1. Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* *2. Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* *3. Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* *4. Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* *5. Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* *6. Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	*Maguranyanga*
Date	26 March 2020

Disclosure of Conflict of Interest for USAID Evaluation Team Members

Name	Yazoume Ye
Title	Vice President, Malaria Surveillance and Research
Organization	ICF
Evaluation Position?	☐ Team Leader ■ Team member
Evaluation Award Number *(contract or other instrument)*	**7200AA18LA00008**
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	Zimbabwe Assistance Program in Malaria
I have real or potential conflicts of interest to disclose.	☐ Yes ■ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* 1. *Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* 2. *Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* 3. *Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* 4. *Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* 5. *Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* 6. *Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

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Signature	*Yazoume Ye*
Date	27/03/2020

PROTOCOL

Data for Impact
Zimbabwe Malaria Assessment

SUBMITTED: June 17, 2019

Table of Contents

ABBREVIATIONS

ACT	Artemisinin-based combination therapy
CHW	Community Health Worker
D4I	Data for Impact
DHMT	District Health Management Team
DHS	Demographic and Health Surveys
IPTp	Intermittent preventive treatment of malaria in pregnancy
IRB	Institutional review board
IRS	Indoor residual spraying
ITN	Insecticide treated net
MERG	Monitoring and Evaluation Reference Group
MIS	Malaria Indicator Survey
MoHCC	Ministry of Health and Child Care
NMCP	National Malaria Control Program
PMI	United States President's Malaria Initiative
RBM	Roll Back Malaria
RDT	Rapid diagnostic test
RHIS	Routine Health Information System
SBCC	Social behavior change communication
ZAPIM	Zimbabwe Assistance Program in Malaria

EXECUTIVE SUMMARY

Background and Objectives

The United States President's Malaria Initiative (PMI) /Zimbabwe awarded a five-year Zimbabwe Assistance Program in Malaria (ZAPIM) cooperative agreement to Abt Associates and its partners Save the Children, Jhpiego, and the Liverpool School of Tropical Medicine (LSTM) in 2015. ZAPIM aimed to support the Ministry of Health and Child Care (MoHCC), National Malaria Control Program (NMCP) in providing comprehensive malaria prevention and treatment services to Zimbabweans, with the goal of reducing malaria morbidity and mortality. The project had five main areas of focus: Malaria case management/ Malaria in Pregnancy (MIP), LLINs, social and behavior change and communication (SBCC), operations research (OR) and monitoring and evaluation (M&E), and malaria studies – specifically therapeutic efficacy. The NMCP and the U.S. Agency for International Development (USAID)/Zimbabwe require sound guidance on appropriate strategies to build capacity within the NMCP and as to what packages of interventions are appropriate for Zimbabwe as the country moves towards malaria elimination. Specific questions of the assessment include: 1) What are the trends in malaria intervention coverage? 2) What are the trends in malaria morbidity and mortality? 3) What is the NMCP's capacity to manage and implement various malaria interventions? 4) What are the facilitators and barriers to achievement by ZAPIM project?

Methods and Tools

The assessment will use a mixed-methods approach, consisting of secondary data collation, primary data collection, document review, and secondary data analysis of existing survey and routine health facility data, and an organizational capacity assessment.

Document review: D4I will review key strategic information and documents to capture the context of malaria control in Zimbabwe. Information to be extracted will include key milestones of the ZAPIM malaria intervention program, including changes in policies, in Zimbabwe, with a focus on the ZAPIM districts, in the past 3 years.

Secondary data analysis: D4I will conduct secondary data analysis of malaria indicator survey (MIS) 2016, demographic health survey (DHS) 2015, and modeled routine health information system (RHIS) data to assess trends in coverage of key malaria interventions and malaria morbidity. The team will analyze differences of these indicators between districts when data granularity allows. In addition to population-based surveys, D4I will review and analyze data from RHIS and health facility assessments to assess variation between districts and regions in quality of malaria services at facility, human resources, and availability of malaria care services and commodities, in addition to assessing trends in morbidity and potentially, mortality.

Key informant interviews: D4I will target 64 key informants from the MoHCC, ranging from the central level to the service delivery point, and key malaria partners. The key informant interviews will help document and assess perceptions of the functionality and challenges of the health care delivery system, with a focus on malaria.

Facility assessment: D4I will conduct a facility assessment to examine the quality of care for malaria patients at the facility level. The assessment will comprise (1) health worker interviews (with both facility-based professionals and community health workers (CHW) to assess capacity and quality of care; (2) inventory data on commodities and infrastructure to assess facility readiness; and (3) client exit interviews to assess perceived quality of care and confirm case management practices. A sample will provide descriptive results for each region and allow comparison between ZAPIM districts and non-ZAPIM districts. The sample will comprise 114 health facilities including primary health facilities and referral hospitals.

Organizational capacity assessment: D4I will conduct an organizational capacity assessment to document strengths and weaknesses in the capacity, ability, and preparedness of the NMCP and district health teams to implement the package of key malaria interventions. An adapted capacity assessment tool will address various dimensions of capacity—organizational, technical, and behavioral—to provide an overall approach to documenting staff capacity to implement the national malaria strategy.

Project Management: D4I will hire a local subcontractor for support on the ground. For successful implementation of the assessment, D4I will engage with key stakeholders throughout the process. D4I will also collaborate with the NMCP, district health teams, ZAPIM and PMI country team. The assessment will be implemented from May 2019 to September 2019. The final report will provide guidance to PMI on the appropriate strategies to build capacity within the NMCP and as to what packages of interventions are appropriate for Zimbabwe.

1. BACKGROUND

The United States President's Malaria Initiative (PMI) was created in 2005 as a five-year initiative to reduce malaria-related mortality by 50% across 15 high-burden countries in sub-Saharan Africa by 2020 (www.pmi.gov/about). In fiscal year (FY) 2011, Zimbabwe became a PMI country, with full implementation beginning that same year. PMI supports an array of malaria prevention and treatment activities, including procurement and distribution of commodities (long-lasting insecticidal nets [LLIN], rapid diagnostic tests, artemisinin combined treatment, Sulphadoxine-Pyrimethamine for pregnant women); support for indoor residual spraying (IRS) in high-burden areas; and training of health care workers in malaria case management.

PMI/Zimbabwe awarded a five-year Zimbabwe Assistance Program in Malaria (ZAPIM) cooperative agreement to Abt Associates and its partners Save the Children, Jhpiego, and the Liverpool School of Tropical Medicine (LSTM) in 2015. ZAPIM aimed to support the National Malaria Control Program (NMCP) to provide comprehensive malaria prevention and treatment services to Zimbabweans, with the goal of reducing malaria morbidity and mortality. The project had five main areas of focus: Malaria case management/ malaria in pregnancy (MIP), LLINs, social and behavior change and communication (SBCC), operations research (OR) and monitoring and evaluation (M&E), and malaria studies – specifically therapeutic efficacy. The project works in three provinces and 15 target districts.

The NMCP and USAID/Zimbabwe require sound guidance on appropriate strategies to build capacity within the malaria control program and as to what packages of interventions are appropriate for Zimbabwe as the country moves towards malaria elimination. USAID/Zimbabwe of the extent to which ZAPIM has achieved its outcomes and identify the factors that facilitated or hindered the achievement. The assessment will also include an examination of the NMCP's current capacity to manage and implement various malaria interventions, identifying areas of strengths and weakness has requested that D4I, a USAID-funded cooperative agreement, conduct a formal assessment.

2. OVERALL ASSESSMENT DESIGN

2.1 Evaluation design

The evaluation will use a before and after design with comparison of ZAPIM districts and non-ZAPIM district. Key outcomes include coverage of key interventions, and morbidity and mortality and will be measured at baseline (2015/2016) and endline 2019) in both ZAPIM districts and non-ZAPIM district (Figure 1). The project was awarded in 2015 but activities did not start fully until 2016 therefore we will use 2016 as a baseline. By "endline", we are referring to the right truncate of our assessment period, which is one year before the expected end of the project. Therefore, what we will be measuring will be more of a reflection of the progress made by the project as of 2019. Comparison districts will be matched with intervention districts, with regard to key indicators on population (size, density) and health service coverage (ratio: population/health facility, population/health professional). Complementary health facility assessment and qualitative interviews will be used to complement other secondary data.

Figure 19: Evaluation design
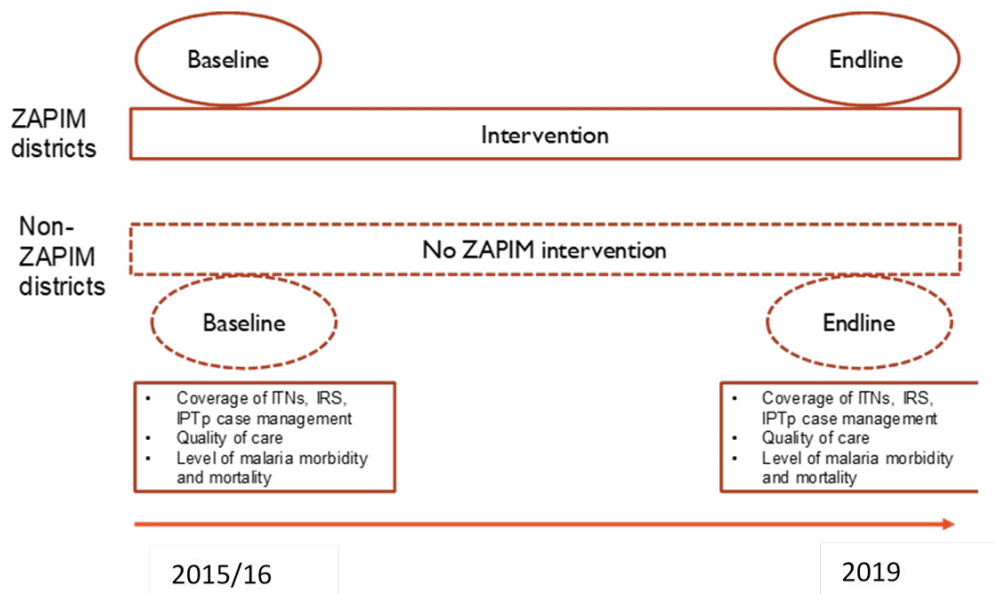
2.2 Impact model

The theoretical framework used to guide the development of the assessment questions and indicators is shown in Figure 2. The theory builds on the project results framework listed in the ZAPIM M&E plan, which foresees that ZAPIM will provide key malaria control interventions (ITNs, IRS, IPTp, rapid diagnostic tests [RDTs], microscopy, ACTs) and associated trainings to ensure that commodities and case management tools are available and ready to be used. ZAPIM also intends to strengthen health systems to obtain adequate financing, human resources, and data. These inputs and processes are intended to lead to the outputs of improved availability of malaria prevention and treatment tools and services, improved case management practices. This, in turn, is hypothesized to yield improved coverage and use of key malaria control interventions, which ultimately is expected to decrease malaria morbidity and mortality rates.

Figure 20: Impact Model
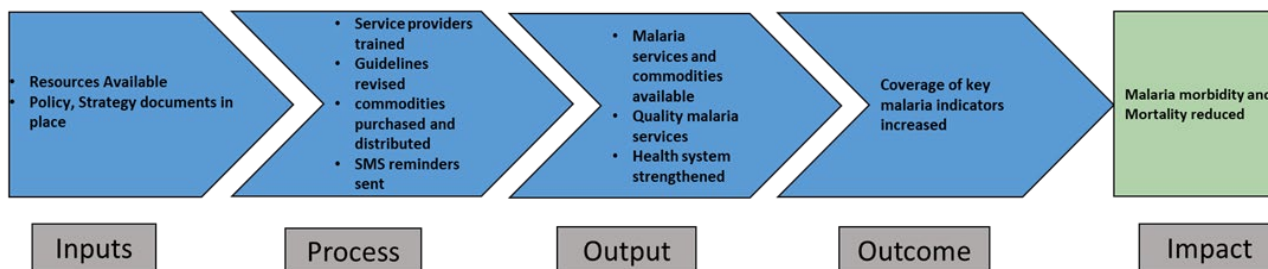
2.3 Assessment questions and indicators

The assessment seeks to answer the following evaluation questions:

1. What are the trends in malaria intervention coverage in ZAPIM and non-ZAPIM districts?

2. What are the trends in malaria morbidity and mortality in ZAPIM and non-ZAPIM districts?

3. What is the NMCP's and District's capacity to manage and implement various malaria interventions in ZAPIM and non-ZAPIM districts?

4. What are the facilitators and barriers to achievement by ZAPIM project?

The recommended indicators are summarized in the Design Matrix (Table 1). These indicators will be reviewed further with the in-country team to make any necessary revisions prior to the start of the assessment.

Table 5: Design Matrix

Assessment questions	Indicator / Performance Measure (information needed to answer the question)	Data Source	Data Analysis Plan
Question 1. What are the trends in malaria intervention coverage?	Proportion of population with access to ITN in the household	MIS 2016, DHS 2015 – RHIS – estimate	Trend over time, including model estimate: ZAPIM vs. non-ZAPIM districts
	Proportion receiving an ACT, among children under five years old with fever in the last two weeks who received any antimalarial drugs	MIS 2016, DHS 2015 -RHIS – estimate	Trend over time, including model estimate: ZAPIM vs. non- ZAPIM districts
	Proportion of women who received 3 or plus doses of IPTp for malaria during ANC visits during their last pregnancy	MIS 2016, DHS 2015-RHIS – estimate	Trend over time, including model estimate: ZAPIM vs. non- ZAPIM districts
Question 2. What are the trends in malaria morbidity and mortality?	Malaria test positivity rate	RHIS 2015-2018	Monthly trends over time, ZAPIM vs. non-ZAPIM Districts
	Total number of malaria related death	RHIS 2015-2018	Trend over time among under five, ZAPIM vs. non- ZAPIM districts
	Malaria Case fatality	RHIS 2015-2018	Trend over time among under five, ZAPIM vs. non-ZAPIM districts
Question 3. What is the NMCP's and District's capacity to manage and implement various malaria interventions?	Proportion of district plans and budgets that integrate malaria	Document review	ZAPIM vs. non-ZAPIM districts
	Budget allocated for procurement of items and community and outreach activities	Document review	ZAPIM vs. non-ZAPIM districts
	Availability of malaria strategic plan	Document review	ZAPIM vs. non-ZAPIM districts
	Number of meetings of working group or advisory group on malaria in the last year	Document review	ZAPIM vs. non-ZAPIM districts
	Number of partners involved in working group or advisory group	Document review	ZAPIM vs. non-ZAPIM districts

Assessment questions	Indicator / Performance Measure (information needed to answer the question)	Data Source	Data Analysis Plan
	Proportion of monthly facility reports completed in full and on time	RHIS	ZAPIM vs. non-ZAPIM districts
	Proportion of health facilities (HF) with treatment guidelines readily available	Facility assessment	ZAPIM vs. non-ZAPIM districts
	Proportion of districts reporting monthly numbers of suspected malaria cases, number of cases receiving diagnostic test, and number of confirmed malaria cases	RHIS	ZAPIM vs. non-ZAPIM districts
Question 4. What are the facilitators and barriers to achievement by ZAPIM project?	Percentage of HF with staff/ CHW trained in malaria-related technical areas	Facility assessment	By district and facility type
	Percentage of HF with staff trained in referral protocol for severe cases	Facility assessment (Health Care Worker (HCW) interview)	By district and HCW type
	Proportion of children under five with fever who received a diagnostic test for malaria (RDT or microscopy)	Facility assessment (client exit interview)	By district and facility type (including community)
	Proportion of children under five who tested positive who received ACT	Facility assessment (client exit interviews)	By district and facility type (including community)
	Proportion of children under five who tested negative who did not receive ACT	Facility assessment (client exit interview)	By district and facility type (including community)
	Ratio of cases treated to ACTs used	RHIS	By month, district, and facility type (including community)
	Proportion receiving a first-line antimalarial drug, among children under five years old with a diagnosis of malaria who received any antimalarial drug at outpatient department	RHIS	Monthly trends
	Average user satisfaction score	Facility assessment (client exit interview)	ANOVA from Likert scale
	Leadership and governance	Key Informant Interviews	Content analysis for themes
	Health financing	Key Informant Interviews	Content analysis for themes

Assessment questions	Indicator / Performance Measure (information needed to answer the question)	Data Source	Data Analysis Plan
	Human resources	Key Informant Interviews	Content analysis for themes
	Commodities	Key Informant Interviews	Content analysis for themes
	Service delivery	Key Informant Interviews	Content analysis for themes
	Information, data, and research	Key Informant Interviews	Content analysis for themes

2.4 Assessment methods

The assessment will use a mixed-methods approach, consisting of secondary data collation, primary data collection, document review, and secondary data analysis of existing survey and routine health facility data, and an organizational capacity assessment.

2.4.1 Document Review

D4I will conduct a document review of key strategic information to capture the context of malaria control in Zimbabwe during the implementation of ZAPIM. Information extracted will include key milestones of malaria intervention program in Zimbabwe, with a focus on ZAPIM districts. USAID/Zimbabwe will provide available documents, and D4I will engage other key stakeholders to identify additional relevant reports, policy and strategy documents, and operational plans produced at the national and subnational levels to ensure that all useful materials are captured. Once the review has begun, we will assess interim findings for gaps and areas requiring further exploration and resources to meet the assessment objectives and to answer the assessment questions.

The documents will include, but not be limited to the following:

- ZAPIM Work Plans

- ZAPIM Activity Monitoring, Evaluation, and Learning Plan

- ZAPIM Annual reports

- PMI/Zimbabwe Malaria Operational Plans

- Notes from PMI/Zimbabwe partner roundtable discussion on the Zimbabwe NMCP and partners capacity needs and sustainability, 2018

- NMCP Strategic Plan (2016-2020)

- Zimbabwe Malaria Communications Strategy

- Zimbabwe Surveillance, Monitoring and Evaluation Plan

- Zimbabwe Epidemic Preparedness and Response Guidelines

- Zimbabwe Malaria Case and Commodities Gap Assessment

- Angwa Ward Assessment of Drivers and Barriers of Malaria Transmission

- Other PMI partner project documents from VectorLink, Mhuri/Imuli and its predecessor Maternal and Child Health Integrated Program (MCHIP), Africa University Lab and Insectary in Mutare, Zimbabwe, and the Global Health Supply Chain Program – Procurement and Supply Management (GHSC-PSM) project

- World Health Organization Malaria strategy and guidance documents on control and elimination strategies

All documents and data sources will be collated in a database that will serve as a bibliography for the document review and secondary data analysis.

2.4.2 Secondary Data Analysis

D4I will conduct secondary data analysis of MIS 2016, DHS 2015, and modeled RHIS data to assess trends in coverage of key malaria interventions and malaria morbidity (Table 1). Where data is not available, we will model the RHIS data to help provide additional information that will measure impact. D4I will analyze differences of these indicators between districts when data granularity allows. D4I will use routine data available to assess trends over time in morbidity by looking at malaria test positivity rates among children under the age of five who were tested by RDT or microscopy and case fatality, disaggregated by district and background characteristics.

In addition to population-based surveys, D4I will also review and analyze facility- based data from RHIS and previous health facility assessments to assess variation between districts and regions in quality of malaria care (case management and malaria in pregnancy), human resources, and availability of malaria care services and commodities.

2.4.3 Key Informant Interviews

D4I will interview key informants from the MoHCC ranging from the national level to the service delivery point. These key informant interviews will help document and assess perceptions of the functionally and challenges of the health care delivery system. Key informants will be selected in consultation with USAID/Zimbabwe, based on what is needed to address the assessment questions and a comprehensive list of potential key informants.

Table 6: Anticipated key informants

Level	Department	Officers	Number
• National	• MoHCC	• Principal Director Preventive Services • Principal Director Policy and Planning	• Not more than 2
	• NMCP	• Director of malaria program • Lead of each strategy (vector control, case organization, SBCC,) • M&E unit lead	• 6
• Regional	• Mashonaland East • Mashonaland Central • Matabeleland North	• Provincial Health Executive • Malaria focal point •	• 6
• District	• Sample of 14 districts	• District Health Executive • Malaria focal point • Medical superintendent for district hospitals	• 28

Level	Department	Officers	Number
• Partners	• PMI	• Resident Advisor USAID • Resident Advisor /CDC	• 2
	• ZAPIM	• Chief of Party • Technical Director • Project M&E Manager • Project component leads	• 5
• Other Malaria related project:	• Maternal and Child Health Integrated Program (MCHIP) • Population Services International (PSI)/Strengthening Private Sector Support Project • Abt/AIRS Project • Africa University • Plan International • GHSC-PSM Project • Clinton Health Access Initiative (CHAI)	• Chief of Party for each project	• 7
Total			64

D4I will obtain verbal consent from key informants (Annex 6.1). To provide introductory information for the interview, selected key informants will complete a form prior to the interview to document the key informant's role and responsibilities in the health care system and connection with ZAPIM. During the interview, theD4I will use an interview guide comprising open-ended questions and probes covering areas of interest to the assessment (Annex 6.1). D4I will conduct in-person interviews; however, telephone interviews will be considered if in-person interviews are not possible for some key informants. The interviews will be recorded using a digital recorder (if consented by the interviewee) to supplement the interviewer's notes if further detail or clarification are needed. The content analysis process will be aligned with the assessment questions and used to contextualize and understand the findings from the quantitative data.

2.4.4 Health Facility Assessment

D4I, in partnership with a local subcontractor will conduct a facility assessment to understand the quality of care for malaria patients. This will not be a comprehensive health facility assessment, i.e., it will not include an assessment of data quality, but it will include (1) health worker interviews; (2) client exit interviews; and (3) inventory data on commodities and infrastructures (Table 3). The facility assessment will collect information based on the guidance ("Using facility-based data for malaria program monitoring and evaluation") and tools ("Using health facility surveys to measure progress in malaria case management") developed by RBM MERG.

Table 7: Components of Facility Assessment

Component and Purpose	Tools and Responsibility	Sampling
Health worker interview: understand case management practices	Questionnaire adapted from RBM MERG for field implementation	Simple random sample of all health workers present in the facility who see malaria suspect patients (about two health workers per facility), plus simple random sample of CHWs associated with each facility (about two CHWs per facility)
Client exit interview: understand perceived quality of care	Questionnaire adapted from RBM MERG for field implementation	Simple random sample of patients all ages (about 5 clients per facility)
Inventory: assess facility readiness and availability and management of malaria commodities	Forms adapted from RBM MERG module; protocol for field implementation	All facilities in sample

Tools

D4I will use the previously validated tools referred to above. Prior to use, these tools will be reviewed by USAID/Zimbabwe and NMCP to ensure appropriate adaptation for the Zimbabwe context and ZAPIM objectives.

- Key informant interviews guide
- Health worker interview guide with information and consent form
- Client exit interview guide and information and consent form
- Inventory guide

Sampling

The secondary data analysis will cover all the ZAPIM districts and non-ZAPIM districts. The primary data collection will involve purposeful sampling to provide representative results for each region and allow comparison between ZAPIM districts and non-ZAPIM districts. The intervention districts will be randomly selected from ZAPIM regions. The non-intervention districts will be selected in the same province as the intervention districts. We will sample 100 primary health facilities, an estimated 5 percent of the 1,848 facilities in the country (ZSARA, 2015). Seventy-five of the facilities will be in the ZAPIM intervention districts and the remaining in the non-ZAPIM districts. To boost this sample, we will include the main referral facility in each district, for an additional 14 facilities. At each facility two health worker (HW) and one (CHW) will be sampled. Five clients at each facility will be sampled for the client exit interview. A summary of the sampling is provided on table 5.

Table 8: Sample for health facility assessment

Region	Intervention Coverage	Districts Selected	Primary Health Facilities	Referral hospital	HW interviews	CHW interviews	Client exit interviews
Mashonaland Central	Intervention Districts	4	35	4	78	39	195
	Non-Intervention Districts	0	0	0	0	0	0
Mashonaland East	Intervention Districts	4	25	4	58	29	145
	Non-Intervention Districts	2	13	2	30	15	45
Matabeleland North	Intervention Districts	2	10	2	24	12	60
	Non-Intervention Districts	2	12	2	28	14	28
Total		14	100	14	228	114	570

Preparation for fieldwork

D4I will organize fieldwork logistics, including recruiting field teams; announcing to the district authorities the purpose and schedule of the study; working out a schedule and route for visits; and briefing each facility team about how to prepare for data collection. D4I will organize a training for field teams on the data collection tools and procedures. The data collection team will be composed of one supervisor, two data collectors, and one driver. The two data collectors will complete the health worker interviews, inventory, and client interviews with support from the supervisor. Depending on distances between selected facilities, an estimated 7 − 10 teams will be needed to cover all the facilities. The teams will target two facility visits per day.

Data collection and collation

Health worker interview: The field team will interview HWs at the selected facilities to assess their technical knowledge and practices in malaria prevention and case management. The interview guide (Annex 6.2) will cover professional qualifications, years of employment, number of patients treated per day in the week preceding the interview, training received, support supervision received, access to current treatment guidelines, and adherence to the guidelines. After obtaining verbal consent (Annex 6.2), two health workers at the health facility will be interviewed. In addition, field teams will interview two CHWs who report to the selected health facility. The CHWs will ask to meet the field team at the health center for the interview.

Inventory (Readiness of health facility to provide service): Field teams will use the inventory module (Annex 6.3) to collect information on the availability of health care services and the readiness of health facilities to provide quality services to clients with a focus on malaria. This will provide a comprehensive picture of the strengths and weaknesses of the service delivery environment for each assessed service. Field teams will also collect information on infrastructure, equipment, human resources and skills, supervision, training, and treatment guidelines and document stock of RDTs, ACTs, and other commodities necessary for malaria diagnosis and treatment.

Client exit interview (Perceived quality of care): Interviews will be conducted with clients who came to the facility with a fever or pregnant women in the second or third trimester who came for antenatal care (ANC). If the client with a fever is a child, the interview will be conducted with the parent or guardian who brought the child to the facility. The interviews will be conducted by using a short survey questionnaire (Annex 6.4) that includes demographic information, history of current illness, and recall of the clinical exam performed by the health provider. The recall portion will look for case management highlights, such as whether or not temperature was measured, whether the patient was asked about history of fever, whether any laboratory tests were requested and performed, whether any diagnosis was made, what treatment was prescribed, and what instructions were given for the treatment.

Survey data quality assurance

D4I will closely monitor fieldwork and data to ensure adherence to standard operating procedures and to troubleshoot problems. After collecting data in each facility, interviewers and supervisors will review. Field teams will also debrief after each facility visit to discuss challenges, brainstorm and share solutions, and prepare for the next day. Supervisors will be required to perform 5% cross-check of data collected during fieldwork. They are also expected to write short minutes from these debriefs and share salient points with the activity lead, who will look for patterns and answer outstanding questions.

2.4.5 Organizational Capacity Assessment

D4I will lead a mixed-methods organizational capacity assessment to document strengths and weaknesses in the capacity, ability, and preparedness of NMCP and DHMTs to implement the package of key malaria

interventions. A capacity assessment tool for the NMCP and DHMTs (Annex 6.5) will address various dimensions of capacity—organizational, technical, and behavioral—to provide an overall approach to documenting staff capacity to implement the national malaria strategy. The tool to be used will be adapted from tools previously used in malaria implementation assessment in Nigeria and Uganda. First, as part of the document review process, D4I will synthesize relevant documents and literature addressing 1) current status of the NMCP and malaria control activities; 2) existing documentation on organizational capacity and 3) existing documentation about gaps in capacity.

D4I will also conduct semi-structured interviews with a sample of malaria professionals and decision makers at the national, regional, and district levels. These professionals must possess adequate resources, skills, and experience to plan, organize, and supervise malaria activities in the country. NMCP and DHMT staff will be interviewed using an individual assessment tool to assess competencies in leadership, technical competencies, data analysis and use, and general management competencies. A list of interviewees will be determined in conjunction with PMI; however, the final number of interviews will depend on saturation of information.

Interview questions will also examine how teams work together, available opportunities for training, perceived challenges and needs, and both personal and institutional goals. The NMCP and DHMTs will be evaluated on main capacity areas as prioritized by PMI and the NMCP; examples of capacity areas are organizational, human capacity, partnership and governance, national planning, costed work plans, advocacy and communications, routine monitoring, and data demand and use.

2.5 Data management and analysis

The data collected and extracted for evaluation will be organized and well documented in a web based database. Data from the health facility assessment will be transferred daily from tablets to field supervisors' laptops, where a quality control program will be run to verify data inconsistencies. The identified errors will be reported to the interviewers on the same day for verification and correction. After verification and correction, supervisors will transfer the data to a central database using a secure file transfer protocol for final cleaning and export to STATA for analysis. The interview notes and transcripts will be managed in a Microsoft Word file. For data security and confidentiality, access to the database will be password protected and limited to members of the assessment team.

2.6 Interpretation of results and reporting writing

The results from the assessment will first be examined for each individual question. The observed result for a given indicator will be interpreted considering the implementation process and contextual data that will be collected. After critically assessing individual baseline assessment questions, D4I will then assess the cross-cutting issues for all assessment questions before arriving at any conclusion. An In-country workshop to present and validate preliminary findings will be conducted before finalization of the assessment report.

The final assessment report will go through internal technical and editorial reviews before it is finalized and sent to USAID. D4I will also make sure comments from USAID on documents produced by the team are thoroughly addressed in a revised version and will provide point-by-point responses to each comment. The final report will provide guidance to PMI on the appropriate strategies to build capacity within the NMCP and as to what packages of interventions are appropriate for Zimbabwe.

3. ETHICAL CONSIDERATIONS

D4I will submit the assessment's protocol to the approval of the Institutional Ethic Review Board (IRB) of ICF and the National Ethics Committee of Zimbabwe prior to the start of the assessment. The assessment is designed to gather information to improve malaria programs. Given the nature of the assessment, D4I will submit, through the NMCP, a request for expedited ethical approval. In addition, informed consent (see information and consent sheet Annex 6.1,6.3) will be obtained prior to any interview with the participants. A copy of the information and consent sheet will be given to the respondents. The information and consent sheet will include an introduction, the purpose of the study, the interview process, the risks and benefits for the participants, a statement that the data collected is confidential and that participation is voluntary, and contact information in case the participants have any questions or concerns. Participants will be able to withdraw from the interview at any time if they wish and are not obliged to answer questions they do not wish. All efforts will be made to protect the confidentiality and identity of the participants and facilities. The results will be presented in an aggregated manner without identifying respondents, resource persons, and health facility.

4. PROJECT MANAGEMENT

4.1 Team structure

D4I will hire a local subcontractor who will be responsible for the facility assessment component. D4I will be responsible for ensuring that subcontractor collects the data as per the defined protocol by providing technical support and supervision and will liaise directly with USAID/Zimbabwe to collect contextual malaria information, key documents, and progress on the ZAPIM implementation process.

4.2 Communication strategy

D4I will be in regular contact with Christie Billingsley at USAID/Zimbabwe to provide updates in line with timelines. The activity lead will communicate regularly with the local subcontractor to ensure that data collection and retrieval takes place as planned and to discuss challenges. In addition to email exchanges, there will be weekly conference calls. The contact points in the assessment team are summarized in table 6 below.

Table 9: Points of Contact

Contact point	Role	Copied
Christie Billingsley	USAID Activity Manager	Peter Troell ; Regis Magauzi
Erin Luben	D4I Deputy Director	Heidi Reynolds, Jessica Fehringer
Agneta Mbithi	Activity Lead – Qualitative Analysis	Yazoume Ye, Cristina de la Torre
Joshua Yukich	Quantitative Analysis	Logan Stuck

5. TIMELINE

The activity is expected to run from April 2019 to September 2019. The timeline presented below is illustrative since meeting some of the targets depends on the availability of in-country IRBs, Secondary data sources, key informants, and stakeholders.

Table 10: Benchmarks

Benchmark	Expected Completion*
Draft study protocol submitted	June 2019
Travel to Zimbabwe for initial quantitative data collection	July 2019
Qualitative data collection started	July 2019
Quantitative data compiled	August 2019
Qualitative analysis completed	September 2019
Quantitative analysis completed	September 2019
In-country workshop to present and validate preliminary findings	September 2019
Report drafted	September 2019

Appendix F. Staff Biographies

Agneta Mbithi, MBChB, MSc., Malaria SME Specialist with MEASURE Evaluation providing technical backstop to Kenya, Sierra Leone, and Liberia. She has more than 12 years' experience working in the Kenyan health sector. She has worked as a medical officer and as an epidemiologist with the Ministry of Health in the NMCP in Kenya. Dr Mbithi has served as the MEASURE Evaluation Resident Advisor in Kenya and regional backstop for Liberia, Kenya, and Sierra Leone. She has experience in many aspects of disease surveillance and monitoring and evaluation practices, including disease outbreak investigations, development and implementation of the national malaria monitoring and evaluation plans, the coordination of national population-based surveys and evaluating the impact of health interventions like the evaluation of impact of malaria interventions on child mortality in Kenya. She holds a master's degree in applied epidemiology and a medical degree from University of Nairobi.

Andrew Andrada is SME Specialist with MEASURE Evaluation. He has more than five years of experience in malaria epidemiology and surveillance, monitoring, and evaluation (SME). He currently provides SME technical assistance through the PMI Measure Malaria project and previously with the USAID MEASURE Evaluation project. Mr. Andrada has research experience developing impact evaluation frameworks for national malaria control programs and assessing national malaria strategic plans. Mr. Andrada has also conducted trainings and managed national surveys in sub-Saharan Africa and South Asia.

Yazoume Ye, PhD, MSc., is a Vice President, Malaria Surveillance and Research at ICF and has extensive experience in health program evaluation. He provides technical leadership for the MEASURE Evaluation malaria portfolio, and is responsible for the multi-agency evaluation of the impact of malaria control efforts initiated by the U.S. President's Malaria Initiative (PMI). He is directly involved in regional malaria M&E trainings, both Anglophone and Francophone. In collaboration with the Roll Back Malaria (RBM) Partnership Monitoring and Evaluation Reference Group, he has worked on the development of frameworks and tools for malaria M&E, and has provided malaria M&E-related technical support in sub-Saharan Africa countries. Dr. Ye previously served as deputy director for the Independent Evaluation of Phase 1 of the Affordable Medicines Facility-malaria (AMFm), awarded by the Global Fund. Dr. Ye is a grounded statistical analyst and has a good understanding of malaria indicators and reporting system. He has published articles in peer-review journals and presented at numerous international meeting and conferences, primarily on topics related to malaria epidemiology.

Dr. Brian Maguranyanga is a Director of Research and Advisory Services at M-Care Enterprises (t/a M-Consulting Group), and Lead Consultant in key projects. Dr Maguranyanga is a sociologist with experience in strategy, communication for development (C4D), social and operational research, and sustainable development. He has served as a consultant to UN agencies (UNICEF, UNFPA, ILO, and UNDP), Ministry of Health and Child Care, and a number of international organizations including ICF International, Oxfam, Elizabeth Glaser Pediatric AIDS Foundation, World Wildlife Fund, and IUCN Eastern and Southern Africa. Dr Maguranyanga has supported ICF International in evaluating USAID-funded programs in Zimbabwe, and the U.S. President's Malaria Initiative Zimbabwe Assistance Program in Malaria (ZAPIM). He has more than 12 years of research, consulting, and strategy development, and conducted research in social dimensions of public health, social and gender-based violence, healthcare seeking behaviors of religious groups in Zimbabwe, and sexual and reproductive health and rights. He holds a PhD (University of Michigan), MA Sociology (University of the Witwatersrand), BSc Honors in Sociology and Diploma in Social Work (University of Zimbabwe). He was a recipient of the following awards, Africa Fellowship (Centre for Afro-American & African Studies, University of Michigan), Interdisciplinary Committee on Organizational Studies (ICOS) Grant (University of Michigan Business School), Ford Foundation Individual Grant (Ford Foundation), South African Initiative Office Grant and Moody Fellowship (Centre for Afro-American & African Studies, University of Michigan), Dean's Discretionary Fellowship (Rackham Graduate School, University of Michigan), University Council Postgraduate Scholarship: (University of the Witwatersrand), Postgraduate Merit Award (University of the Witwatersrand), and the University of Zimbabwe Book Prize for academic excellence.
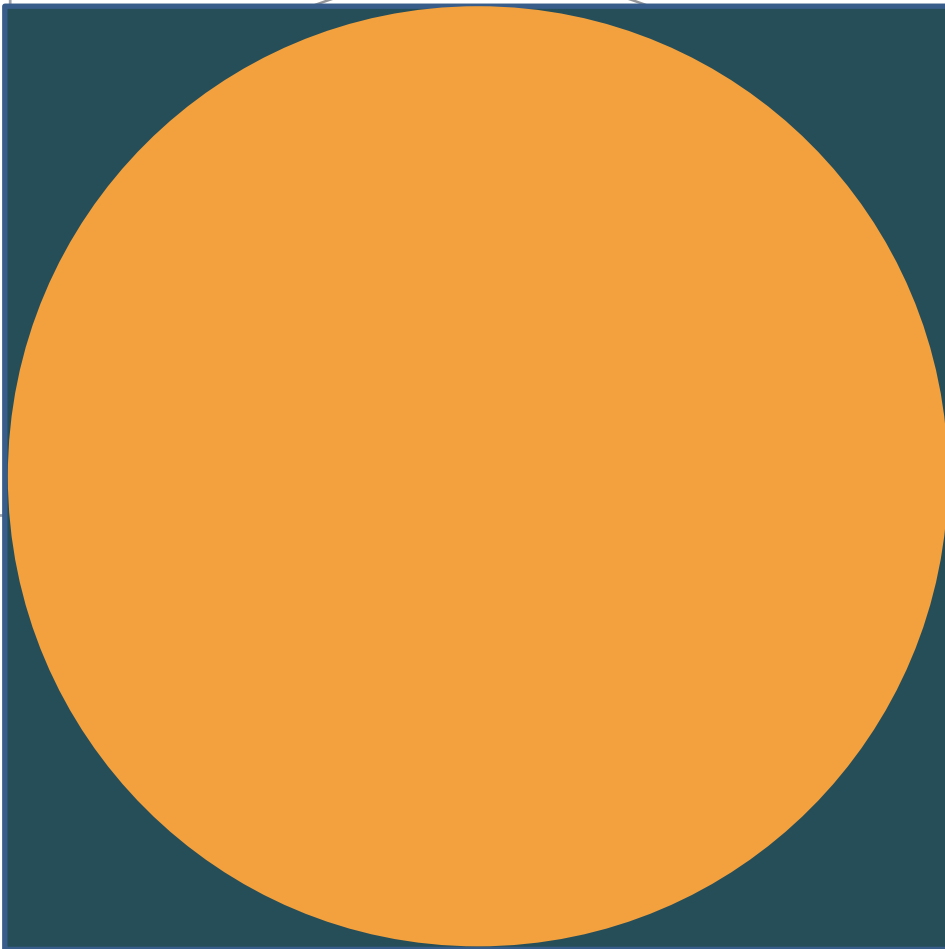
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