



Final project report: Strengthening community-based malaria prevention and surveillance interventions in Southern Nations, Nationalities and Peoples' Region, Ethiopia

Established in 2003, Malaria Consortium is one of the world's leading non-profit organisations specialising in the prevention, control and treatment of malaria and other communicable diseases among vulnerable populations. Our mission is to save lives and improve health in Africa and Asia through evidence-based programmes that combat targeted diseases and promote universal health coverage.

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Abbreviations

API	annual parasite incidence
BoFED	Bureau of Finance and Economic Development
CC	community conversations
CCE	community conversation enhancement
CD	community dialogue
DBoFED	District Bureau of Finance and Economic Development
DEO	district education office
DHIS2	District Health Information System
DHO	district health office
eCHIS	Electronic Community Health Information System
EM	environmental management
FMoH	Federal Ministry of Health
HDA	Health Development Army/Health Development Army volunteer
HEP	Health Extension Program
HEW	health extension worker
HMIS	health management information system
HW	health worker
iCCM	integrated community case management
ICIMS	integrated community-based interventions for malaria services (previous James Percy Foundation funded Malaria Consortium project)
IMNCI	integrated management of newborn and childhood illnesses
IRS	indoor residual spraying
LLIN	long-lasting insecticidal nets
NTD	neglected tropical disease
PPE	personal protective equipment
PHCU	primary healthcare unit
QI	quality improvement
RDT	rapid diagnostic test

RHB	Regional Health Bureau
RM	role model
SBCC	social and behaviour change communication
SNNPR	Southern Nations, Nationalities and Peoples' Region
USAID/PMI	United States Agency for International Development/President's Malaria Initiative
WHO	World Health Organization
ZBoFED	Zonal Bureau of Finance and Economic Development
ZHD	zonal health department

1 Project overview

1.1 Project summary

The project's goal was to contribute to the sustained reduction of malaria morbidity and the severity of the disease in Boloso Sore and Damot Sore districts of Wolaita zone in the Southern Nations, Nationalities and Peoples' Region (SNNPR). The project aimed to strengthen the management and technical capacity of the primary healthcare units (PHCUs) to maintain high coverage and the use of high-impact anti-malaria interventions. In addition, the project sought to move towards malaria pre-elimination by implementing proven vector control interventions including community-based indoor residual spraying (IRS) operations, continuous long-lasting insecticidal net (LLIN) distribution and larvicidal control. The project also aimed to improve malaria care-seeking behaviour and household practices at the community level in relation to the effective use of anti-malaria interventions. This was done through radio communication and school club activities to educate teachers and children on anti-malaria interventions. In addition, the project worked to strengthen the health system's capacity for outbreak detection and response, malaria surveillance and the use of data for decision-making. Activities to improve reporting, build surveillance dashboards and train health and district staff to interpret the data, and use it to make informed decisions, were conducted. In conclusion, the project has been a success, having achieved the objectives and the overall goal of reducing malaria morbidity and severity in the Boloso Sore and Damot Sore districts. Malaria annual parasite incidence (API) has declined in both districts — Boloso Sore reached its target API of 5.6 (cases per 1,000 people) and Damot Sore exceeded its target of 19.7 to achieve an API of 7.0. Communities in project-supported districts demonstrated significant improvement in their knowledge relating to malaria. Surveillance and response have improved in the project districts with increased reporting, along with health extension workers (HEWs) and health facility staff having an increased capacity to conduct healthcare and monitor responses. These improvements will allow project districts to continue reducing malaria morbidity and severity to aid Ethiopia in achieving malaria elimination.

Major highlights: Project achievements in year 1–4

- A reduction of the API target per 1,000 population has been achieved in both districts. API dropped from 15.6 (baseline) to 5.6 in Boloso Sore, and from the 29.7 (baseline) to 7.0 in Damot Sore
- Overall, 92.3 percent of people now recognise fever as a main symptom of malaria; 91 percent identify mosquitoes as the cause of malaria; and 85 percent know that LLNs are a preventive measure for malaria. Together, these data demonstrate significant improvement in communities' knowledge of malaria in project-supported districts, and that the targets were achieved
- Surveillance and response have improved in the project districts. The proportion of health facilities reporting complete, timely and quality data improved from 76 percent at baseline to 82 percent in year 1, and reached 100 percent in year 4
- Visualisation dashboards were developed and district staff were trained to interpret the data leading to a 100 percent improvement in reporting rates. These staff should now be able to identify malaria upsurges more easily and react to make informed decisions quicker, preventing the further spread of malaria
- New media equipment was procured and distributed to school principals and teachers who were trained to use this equipment to develop audio anti-malaria messaging. This has enhanced school club activities, which seek to educate children and deliver key anti-malaria messages on the proper use of LLNs, as well as the importance of early care-seeking behaviour, proper antimalarial drug use, and cooperating during IRS activities and environmental management campaigns.

1.2 Problem

Coverage and utilisation of vector control interventions was found to be low. A baseline community survey conducted in May 2019 showed low coverage of LLIN ownership (60 percent), low access to LLINs (41 percent) and very low use of LLINs (16 percent) in Boloso Sore and Damot Sore districts. The survey showed that IRS coverage (households sprayed) was 12 percent and overall protection by IRS and/or LLINs was 62 percent in the region. The baseline survey also showed knowledge gaps in basic malaria prevention and control methods in the target districts: only 75 percent of the respondents had heard about malaria; 71 percent knew that malaria is transmitted by mosquitoes; 60 percent recognised fever as a symptom of malaria; and 55 percent knew LLINs can prevent malaria.

The Health Management Information System (HMIS) data from Boloso Sore and Damot Sore districts showed that the proportion of epidemics contained within two weeks of onset was 81 percent. The proportion of health facilities reporting complete, timely and quality data (with core indicators) was 76 percent.

1.3 Communities reached

During the project's implementation period, a total of 324,849 people, including 50,710 children under five residing in Boloso Sore and Damot Sore benefitted from project activities, as well as reduced malaria morbidity and severity as measured by API. In the project's final year, the API reduced from a baseline of 15.6 to 5.6 in Boloso Sore, and from 29.7 to 7.0 in Damot Sore.

The community has benefitted from a total of 432 radio messages focusing on malaria prevention and control aired by local FM radios in the Wolaita language. Communities in the project districts also benefitted from a total of 144 COVID-19 focused radio spot messages aired by local FM radios in the Wolaita language. Contracted local FM radios have the potential to cover an estimated 2.1 million people residing in Wolaita zone, including the population of Boloso Sore and Damot Sore.

Overall, 73 schools have benefitted from the training provided to teachers and principals. They received mini-media equipment and solar panels that have helped to establish/strengthen school clubs. Health workers (HWs), HEWs and health managers from 13 health centres, 55 health posts, two district health offices (DHOs) and the zonal health department (ZHD) in Wolaita benefitted from capacity strengthening training that focused on activities including vector control, social and behaviour change communication (SBCC), malaria surveillance and malaria elimination.

1.4 Efforts by other organisations or the government to address the same problem(s) in the target area

The project complements the Ethiopian Federal Ministry of Health's (FMOH) malaria control interventions, which aim to enhance the capacity of the health system at all levels (community,

health facility and district) through an integrated approach to ensure that high impact anti-malaria interventions are maintained and used.

The government has been implementing malaria control interventions in the target areas, including IRS of households with insecticide, and diagnosis and treatment at facility and community levels.

1.5 Our presence

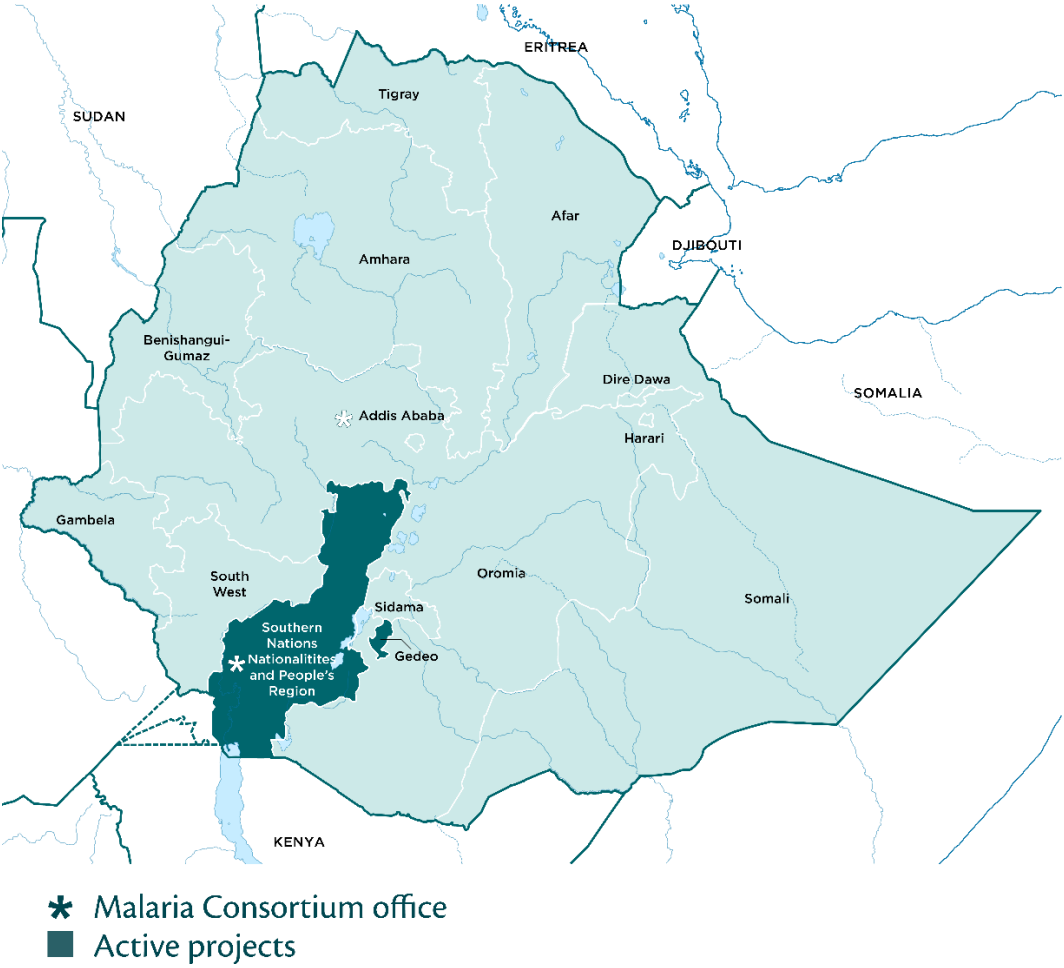


Figure 01: Map showing Boloso Sore and Damot Sore districts in Wolaita zone, SNNPR

During the implementation of the project, Malaria Consortium implemented various other projects in SNNPR (see Figure 01). This includes the project, Improving Neglected Tropical Disease (NTD) Services and Integrating into Primary Healthcare in SNNPR, Ethiopia, which was implemented from December 2019 to January 2022 with funding from UK Aid.¹ In addition, the Prevention, Diagnosis and Management of Podoconiosis in Ethiopia project was conducted from December 2019 to January

¹ Malaria Consortium. Improving neglected tropical disease (NTD) services and integrating into primary healthcare. London: Malaria Consortium; 2021. Available from: www.malariaconsortium.org/media-downloads/1335/.

2022 and was funded through Malaria Consortium's internal research fund.² Commissioned by President's Malaria Initiative/VectorLink, Malaria Consortium has supported the development of the Insecticide Resistance Management Plan Ethiopia 2021–2025, to be used by the FMOH.³

In addition, Malaria Consortium has started implementing three other projects. The first seeks to determine the burden of malaria and long-term complications following SARS-CoV-2 infection (otherwise referred to as COVID-19) and to assess healthcare pathways for the management of fever and other long-term complications following SARS-CoV-2 — the project duration is eighteen months, from May 2022 up to October 2023.⁴ The second project focuses on the pneumonia response in Ethiopia through the development of a pneumonia control strategy from March 2022 to February 2023.⁵ Finally, the Strengthening Community-based Podoconiosis Prevention and Control in Ethiopia project will run for three years, from November 2022 to October 2025.⁶ Furthermore, Malaria Consortium are providing technical support on the reference measurement of respiratory rate for the Unitaid-funded PATH project, Tools for Integrated Management of Childhood Illness, from September 2022 to August 2023.

In summary, Malaria Consortium remains a frontline partner providing technical advisory support to the FMOH, serving as Permanent Secretary to the Malaria Technical Advisory Committee. Malaria Consortium also served for two terms (eight years) as a member of the Country Coordinating Mechanism of Ethiopia and a representative of the malaria community. Malaria Consortium has played a lead role in establishing the Coalition Against Malaria in Ethiopia and has provided effective services for the coordination of World Malaria Day from 2007 to 2022.

² Malaria Consortium. Prevention, diagnosis and management of podoconiosis. London: Malaria Consortium; 2020. Available from: www.malariaconsortium.org/media-downloads/1338/

³ Malaria Consortium. PMI VectorLink: Integrated malaria vector control. London: Malaria Consortium; 2019. Available from: www.malariaconsortium.org/resources/publications/1246/pmi-vectorlink-integrated-malaria-vector-control.

⁴ Malaria Consortium. Determining the malaria burden and long-term complications following SARS-CoV-2 infection. London: Malaria Consortium; 2022. Available from: www.malariaconsortium.org/resources/publications/1598/determining-the-malaria-burden-and-long-term-complications-following-sars-cov-2-infection.

⁵ Malaria Consortium. Strengthening the pneumonia response in Ethiopia. London: Malaria Consortium; 2022. Available from: www.malariaconsortium.org/resources/publications/1591/strengthening-the-pneumonia-response-in-ethiopia-developing-an-action-plan-for-the-integrated-management-of-newborn-and-childhood-illnesses.

⁶ Malaria Consortium. Happy Feet: Community-based podoconiosis prevention and control in Ethiopia. London: Malaria Consortium; 2022. Available from: <https://www.malariaconsortium.org/resources/publications/1666/happy-feet-community-based-podoconiosis-prevention-and-control-in-ethiopia>.

1.6 Partners and stakeholders

Partner/stakeholder	Relationship update
SNPPR Bureau of Finance and Economic Development	<ul style="list-style-type: none"> Facilitated mid and terminal evaluation of the project Proactively involved in supportive supervision activities.
Southern Nations, Nationalities and Peoples' Regional Health Bureau (SNNP-RHB)	<ul style="list-style-type: none"> Participated in implementation of project activities Proactively involved in joint supportive supervision activities Participated in terminal evaluation of the project.
Wolaita ZHD	<ul style="list-style-type: none"> Actively collaborated and supported timely implementation of project activities Proactively involved in joint supportive supervision activities Participated in terminal evaluation of the project.
Project DHOs	<ul style="list-style-type: none"> Facilitated implementation of project activities Actively collaborated and supported timely implementation of project activities Proactively involved in joint supportive supervision activities.

2 Evaluation table

2.1 Overall Goal

Goal: This project will contribute to the sustained reduction of malaria morbidity and the severity of the disease within specific geographical areas of Boloso Sore and Damot Sore districts of Wolaita zone in SNNPR.

The goal was measured by reducing the API per 1,000 population. Prior to the project start, the API was 15.6 in Boloso Sore and 29.7 in Damot Sore. The target was to reduce the API to 5.6 in Boloso Sore, which was achieved, and to 19.7 in Damot Sore, which was exceeded, reaching an API of 7.0.

2.2 Objectives

Objectives/activities	Indicators	Baseline	Target	Measured outcome/output	Measurement data/activity data	Status
Objective 1: Strengthen integrated vector management to reduce malaria transmission and prevent malaria outbreaks	Annual parasite incidence (API) per 1,000 population	15.6 (Bolosore); 29.7 (Damot Sore)	5.6 (Bolosore); 19.7 (Damot Sore)	Year 1: 26 in Boloso Sore and 26 in Damot Sore Year 2: 6.7 in Boloso Sore and 10.7 in Damot Sore Year 3: 5.6 in Boloso Sore and 6.7 in Damot Sore Year 4: 5.6 in Boloso Sore and 7.0 in Damot Sore	Data taken from District Health Information System (DHIS2) annually	Achieved
	Proportion of households in the indoor residual spraying (IRS) targeted areas that received IRS within the last 12 months	12%	30%	Year 1: 19% of households in targeted areas were covered with IRS conducted in May 2019 Year 2: 28% of households in targeted areas were covered with IRS conducted in December 2020 Year 3: 17.8% of households from targeted areas of Damot Sore and 21.4% in Boloso Sore were covered with IRS conducted in September 2021 Year 4: 28% of households in targeted areas were covered with IRS	The corresponding baseline figure for this indicator updated in line with the Baseline Community Survey conducted in May 2019 District health office (DHO) IRS report received on an annual basis	Nearly achieved
	Proportion of population at risk sleeping under long-lasting insecticidal nets (LLINs) or living in a	62%	90%–100%	64% population at risk slept under LLINs or living in a house sprayed by IRS in the previous 12 months	The corresponding baseline figure for this indicator updated in line with the	Partially achieved

	house sprayed by IRS in the previous 12 months			Shortage of insecticide is one of the reasons for not achieving target IRS coverage	Baseline Community Survey conducted in May 2019 Endline data from survey report in August 2022	
	Proportion of population who slept under an LLIN the previous night	16%	40%	36% population slept under LLINs the previous night The main reasons for not sleeping under LLINs were: LLINs could get dirty, no suitable housing structure and there were no mosquitoes	The corresponding baseline figure for this indicator updated in line with the Baseline Community Survey conducted in May 2019	Nearly achieved
	Proportion of population with access to an LLIN in their household	41%	80%–100%	72% population have access to LLINs in their household Procurement and distribution delays for LLINs due to COVID-19 pandemic are the reason for not achieving the target fully	The corresponding baseline figure for this indicator updated in line with the Baseline Community Survey conducted in May 2019	Partially achieved
	Proportion of <i>kebeles</i> in malaria-endemic areas implementing larval control during malaria transmission seasons	39%	100%	100% of <i>kebeles</i> had been implementing larval control in both districts	2017/2018 health management information system (HMIS) report used to update baseline Findings from mapping exercise used to update the target figure for this indicator Supportive supervision conducted annually	Achieved

<p>Objective 2: Improve malaria care-seeking behaviour and household practices through use of targeted and multi-level social and behaviour change communication (SBCC) approaches</p>	Proportion of people who recognise fever as a main symptom of malaria	60%	90%–100%	92.3% people recognise fever as a main symptom of malaria	<p>The corresponding baseline figure for this indicator updated in line with the Baseline Community Survey conducted in May 2019</p> <p>The corresponding endline figure for this indicator from survey report</p> <p>Endline data from survey report in August 2022</p>	Achieved
	Proportion of people who name mosquitoes as the cause of malaria	71%	90%–100%	91% of people name mosquitoes as the cause of malaria	<p>The corresponding baseline figure for this indicator updated in line with the Baseline Community Survey conducted in May 2019</p> <p>Endline data from survey report in August 2022</p>	Achieved
	Proportion of people who know LLLN as a preventive measure for malaria	55%	90%–100%	85% of people know LLLN as a preventive measure for malaria	<p>The corresponding baseline figure for this indicator updated in line with the Baseline Community Survey conducted in May 2019</p> <p>Endline data from survey report in August 2022</p>	Partially achieved
	Proportion of people who recall hearing or seeing any malaria messaging	75%	90%–100%	100% of people recall hearing or seeing any malaria messaging	<p>The corresponding baseline figure for this indicator updated in line with the</p>	Achieved

					Baseline Community Survey conducted in May 2019 Endline data from survey report in August 2022	
Objective 3: Support surveillance and response	Proportion of detected malaria epidemics that are responded to appropriately per the national guidelines	81%	90%–100%	No epidemic occurred during the implementation of the project, so it is not applicable to measure in this time	HMIS data taken in May 2019 were used to update the corresponding baseline figure for this indicator HMIS report received annually	Achieved
	Percentage of health facilities reporting complete, timely and quality data (with core indicators)	76%	90%–100%	Year 1: 82% of health facilities reporting complete, timely and quality data Year 2: 87% of health facilities reporting complete, timely and quality data Year 3: 95% of health facilities reporting complete, timely and quality data Year 4: 100% of health facilities reporting complete, timely and quality data	HMIS data taken in May 2019 were used to update the corresponding baseline figure for this indicator	Achieved

3 Project implementation

3.1 Planned and implemented activities

Activity 1.1.1: Conduct rapid assessment for inventory of spray pumps and spray parts (year 1)

A rapid assessment was conducted to assess the availability and functionality of spray pumps and spray parts in Boloso Sore and Damot Sore districts from 25th to 29th March 2019. This activity was integrated with activity 1.2.1 and activity 2.3.1. The assessment team comprised of one zonal malaria focal person, two district malaria focal persons and one Malaria Consortium staff member. Institutions visited during the assessment included: Wolaita Zone Health Department (ZHD), the project district health offices (DHOs) and district education offices (DEOs). The assessment revealed that there was a total of 63 functional spray pumps (32 in Boloso Sore and 31 in Damot Sore) and 96 non-functional spray pumps (68 in Boloso Sore and 28 in Damot Sore) that required either major repairs or minor maintenance services. The assessment visit was also used as a platform to deliver the project document endorsed by the Southern Nations, Nationalities and Peoples' Region (SNNPR) Bureau of Finance and Economic Development (BoFED) and engage key project stakeholders, including ZHD and DHOs, as well as to obtain buy-in for the implementation of project activities.

Activity 1.1.2: Maintain damaged spray pumps using experienced technicians (years 1–4)

Maintenance and repair of spray pumps were conducted in each project year to support spray operations. The technicians also provided on-site orientation to malaria district staff on pump maintenance basics. In year 1, six experienced technicians were recruited for spray pump repair services from 20th to 31st May 2019. Major repairs were carried out on 48 spray pumps (36 in Boloso Sore and 12 in Damot Sore) and minor maintenance service was done on 44 spray pumps (32 in Boloso Sore and 12 Damot Sore) in year 2. In year 3, a total of 41 spray pumps (24 in Boloso Sore and 17 in Damot Sore) were maintained and repaired in January 2022. In year 4, a total of 64 spray pumps were maintained and repaired in July 2022.

Activity 1.1.3: Train health extension workers on planning, implementation and monitoring of indoor residual spraying operations (year 1)

Training on community-based IRS planning, implementation and monitoring was provided to 34 HEWs selected from 17 *kebeles* targeted for IRS (10 from Boloso Sore and seven from Damot Sore). The training was conducted in Areka town, Boloso Sore district, from 5th to 7th July 2019 and was delivered by three experienced professionals with expertise on vector control — one from the Regional Health Bureau (RHB) and two from the regional Malaria Control Professionals Association. The training contained both theoretical and practical training sessions on spray techniques. The purpose of the training was for HEWs to become more directly involved in supervising IRS spray teams and mobilising the community for better community acceptance of, and participation in, IRS.

Activity 1.1.4: Train district health managers on indoor residual spraying planning and monitoring (year 1)

Training on IRS planning and monitoring was conducted for 26 district managers (two per 10 health centres targeted for IRS, two from each district and two from Wolaita zone) from 12th to 14th July 2019. The training was delivered by three experienced professionals with expertise on vector control (one from the RHB and two from the regional Malaria Control Professionals Association). The participants developed detailed action plans, including schedules for supervision, mobilisation and spray implementation.

Activity 1.1.5: Train district storekeepers and store managers on warehouse management of insecticides, spray pumps and other indoor residual spraying equipment (year 1)

Training was provided to 16 district staff (six district storekeepers, four store supervisors and six store assistants) on warehouse management, including stock management, storage of insecticides, spray pumps and other IRS equipment. The training was conducted in Areka town, Boloso Sore district from 19th to 21st July 2019. The training was delivered by three experienced professionals with expertise on vector control (one from the RHB and two from the regional Malaria Control Professionals Association). The purpose of the training is for *kebele*/district stores to be properly managed to ensure the distribution and tracking of supplies and materials at the operation sites.

Activity 1.1.6: Conduct supportive supervision on indoor residual spraying planning and implementation (years 1–4)

During implementation of the project, this supportive supervision activity has been done yearly. In years 1–4, a joint supportive supervision visit was conducted in both project districts to discuss IRS preparations that the DHOs were undertaking. Following discussions with DHOs, the joint team learnt that in year 1, May 2019, both districts had covered seven *kebeles* with IRS in total, and in year 2, both districts had covered 10 *kebeles* between November and December 2020. During the discussion with the DHOs, the supervisory team found that both districts experienced a shortage of insecticides to cover targeted *kebeles* in the reporting period.

The team also visited households that had received IRS to check households' practices on replastering, repainting or washing the sprayed walls or surfaces. Almost all households that had received IRS during May 2019 and January 2021 kept sprayed walls unpainted and/or unplastered. The last joint supervision on IRS planning and implementation was conducted in August 2022, with the participation of one malaria officer from RHB, one malaria officer from ZHD and two malaria focal persons from the two project DHOs. During the visit, spraying operations at villages in the target districts were observed. Household leaders were asked about their views on the importance of spraying and future actions to keep the chemical active. The supervisory team observed that IRS operations were of high technical quality and that villagers demonstrated good knowledge and high acceptance of IRS.

Activity 1.1.7: Post-spray review meeting (year 1–4)

In each year of the project, a post-spray review meeting was organised that involved a total of 36 participants including 17 HEWs, 10 health managers from health centres, six malaria officers from the two project DHOs, two malaria officers from Wolaita zone ZHD and one malaria officer from the RHB. The meetings were used to discuss and plan the achievements of IRS operations.

Activity 1.1.8: Procurement and distribution of personal protective equipment for spray operatives (new activity)

A shortage of personal protective equipment (PPE) for spray operators was one of the challenges/gaps raised by DHOs during the year 1 post-spray meetings. Spray operators must be provided with adequate materials to protect themselves from insecticides during spray operations. PPE was procured and distributed to DHOs for use by 68 spray operators (44 in Boloso Sore and 24 in Damot Sore). PPE packages for each spray operator included long-sleeved overalls, helmets or waterproof hats, goggles, masks, rubber gloves, boots and raincoats.

Activity 1.1.9: Build soak pits to manage effluent waste insecticide during indoor residual spraying operations (year 4)

Although IRS operations are being carried out in project districts, there are no soak pits to handle the insecticide-contaminated wastewater produced by IRS operations. To mitigate the above-mentioned issue, the project hired a consultant to identify potential locations for the construction of soak pits in both districts. Legama *kebele* in Boloso Sore and Hanchucho *kebele* in Damot Sore were selected as construction sites by the consultant, and design work was completed as well. Following the produced design, construction professionals were contracted to build the soak pits under supervision of the consultant, ZHD and DHO officers. The two soak pits were completed, keeping to high standards, and officially handed over to the project districts and ZHD for districts' future use. To enhance the functionality of the soak pits, 14 plastic barrels with metal ring caps, 20 water buckets, 12 measuring jugs and two scaling cylinders were procured and donated for each district.

Activity 1.2.1: Conduct rapid assessment on long-lasting insecticidal net coverage and gaps (year 1)

A rapid assessment on programmatic long-lasting insecticidal net (LLIN) coverage and LLIN replacement needs in the target areas was conducted (integrated with activity 1.1.1 and activity 2.3.1). A total of 115,900 LLINs were distributed in Boloso Sore and 70,400 LLINs in Damot Sore between 2015 and 2018.

Activity 1.2.2: Conduct a consultative meeting on continuous LLIN distribution model (year 1)

A two-day consultative workshop was conducted on the continuous distribution model from 27th to 28th July 2019. The workshop was facilitated by the SNNP-RHB and a total of 20 participants participated in the workshop (one per health centre, four *woreda* health offices, two ZHDs, and one RHB). Implementation of guidelines and tools on the continuous distribution model at district and

kebele levels, such as LLIN monitoring forms, LLIN distribution planning forms and microplanning templates were produced in the local language for use at the health post level.

Activity 1.2.3: Train health extension workers on continuous long-lasting insecticidal nets distribution model (year 1)

A two-day training on the continuous LLIN distribution model, including planning, implementation and monitoring, was provided to a total of 126 participants (120 HEWs, four *woreda* health offices and two ZHDs). The trainings were conducted in four rounds from 3rd to 25th August 2019, with an average of 30 participants per session. The training was provided by one experienced trainer with expertise on vector control. As per the recommendation of the heads of the DHOs, all the training sessions were conducted during the weekends so as not to interrupt community service delivery.

Activity 1.2.4: Conduct district-based micro-planning exercises on long-lasting insecticidal nets (year 1–4)

In all project implementation years, a two-day district-based annual micro-planning exercise was conducted. In years 1 and 2, the exercise was conducted in Areka town in the Boloso Sore district on 18th and 19th January 2020, and 16th and 17th January 2021, respectively. The micro-planning aimed to improve the forecasting and distribution of LLINs and other malaria commodities such as antimalarial drugs, rapid diagnostic tests (RDTs) and insecticides. In year 1, a total of 59 participants including two DHO staff, 55 HEWs, one staff member from the ZHD and one from the RHB attended the micro-planning. In year 2, a total of 59 participants including four DHOs, 52 HEWs, two ZHDs and one RHB attended the micro-planning. In years 3 and 4, a two-day micro-planning workshop was conducted on 8th and 9th February 2022 and 15th and 16th August 2022 in Sodo town, Wolaita zone. The workshops were undertaken to improve LLIN forecasting and distribution, as well as other malaria commodities like antimalarial medications, RDTs and insecticides. They were attended by 59 people, including four employees from across DHOs, 52 HEWs, two staff members from the ZHD and one worker from the RHB.

Activity 1.2.5: Conduct supportive supervision on continuous long-lasting insecticidal net distribution (year 1–4)

During the implementation years of the project, supportive supervision on continuous LLIN distribution was conducted by integration with major activity 3.1 and major activity 3.3. In year 1, the visit was conducted in August 2019, focusing on post-training follow-up of LLINs and a review of plans, including registration of LLIN coverage by households, households without functional LLINs, households with children under five, households with pregnant women, and LLIN needs. A joint supervisory team including the RHB, BoFED, ZHD and DHOs conducted supervision at the household level in November 2019. The supervisory team found that households were receiving advice from the Health Development Army (HDA) on how to use, wash and hang LLINs. The supervisory team also noted that there was a shortage of LLINs. In year 2 of the project, supportive supervision visits were conducted from 11th to 15th January 2021 and integrated with other activities. During the visit, the team observed that the distribution of LLINs was done in March 2020 as part of continuous distribution. In year 3,

supervision was conducted in the month of November 2021 and in-person visits were made to 18 *kebeles* and 40 families across both districts. During the visit, the supervisory team observed that the community was using the LLINs that had been provided in March 2020 as part of the continual distribution programme. In year 4, this supportive supervision activity was conducted in July 2022 with the active participation of the RHB, BoFED, ZHD and DHOs. As per the original plan, activity 3.3 was also done in integration during the supportive supervision. The supervisory team found out that in the first three years 22,737 LLINs were distributed in Damot Sore, 103,762 LLINs were distributed in the last 12 months and distribution registry books were all in complete format. At most households visited, the team observed that community members had good knowledge about the use of LLINs.

Activity 1.3.1: Conduct identification and mapping of breeding sites (year 1)

Mosquito breeding site identification and mapping was conducted in Boloso Sore from 10th to 17th December 2019 and Damot Sore from 24th to 26th December 2019 in a total of 39 malaria-endemic *kebeles* (32 in Boloso Sore and seven in Damot Sore) by external consultants. A total of 141 permanent breeding sites were identified in both districts (111 in Boloso Sore and 30 in Damot Sore). The permanent breeding sites included rivers (intermittent during the dry season), ponds, swamps, streams and irrigation canals.

Activity 1.3.2: Train the Health Development Army to identify breeding sites (year 1)

Training on the identification of breeding sites was conducted for a total of 290 HDA leaders drawn from Boloso Sore and Damot Sore districts. The training was conducted in Areka town in Boloso Sore from 9th to 17th December 2020 in seven continuous rounds, each with an average of 41 participants attending one day's training. The training was provided by four trainers (one from the RHB, one from Wolaita ZHD and two from each of the project area DHOs) who have experience in vector control. The training focused on the lifecycle and characteristics of mosquitoes, identifying mosquito breeding sites, proper handling and application of larvicide, and how to mobilise the community for environmental management (EM). The training was supported by practical sessions where every participant was able to observe and identify different stages of larvae, favourable mosquito breeding water bodies and EM methods.

Activity 1.3.3: Organise annual malaria campaigns on environmental management activities (year 1–4)

An annual malaria campaign with the aim of identifying and undertaking EM activities was organised for five days in years 1 and 2. In year 1 the campaign was conducted from 20th to 24th January 2020 and two staff from Wolaita ZHD, four staff from the DHO and 58 HDAs from both project districts coordinated and led the annual campaign. In year 2 the campaign was conducted from 21st to 26th January 2021 and a total of 59 coordinators and supervisors drawn from DHOs and health centres facilitated the activity by mobilising the community through various networks and HEWs.

In year 3, with the help of community members, an annual malaria campaign was held from 20th to 25th December 2021 with the goal of carrying out EM operations on identified breeding locations. Overall, 220 HDA leaders, four DHO staff, 13 health centre supervisors and 52 HEWs participated in the

coordination and facilitation of community members from both districts to carry out EM activities in their respective villages. A total of 38,253 community members participated in the campaign, which was held in 20 *kebeles* in Damot Sore and 32 *kebeles* in Boloso Sore. The DHOs provided and distributed larvicide, and spraying was conducted on permanent breeding grounds. Environmental modification efforts were carried out on temporary breeding sites by community members who actively participated. During the campaign, there were also activities to raise awareness about malaria prevention and control.

In year 4, 3,420 people in Boloso Sore and 6,607 people in Damot Sore were mobilised and involved in EM campaign activities from 24th to 29th May 2022. A total of 44 *kebeles* were covered in the campaign; permanent mosquito breeding sites were controlled with Abate chemical and temporary breeding sites were filled or flushed by the community. During the campaign, there were also activities to raise awareness about malaria prevention and control. The campaign was proactively coordinated by HDA leaders, HEWs and health extension supervisors in both project districts.

Activity 1.3.4: Procure and deliver spraying equipment for primary healthcare units (year 1)

In year 1, it was planned to procure and distribute 20 sets of spraying equipment (10 per district) for larval control. However, immediately after this project started the districts received adequate larvicide spraying equipment from the government. Therefore, the decision was made not to procure spray pumps for larval control.

Activity 1.3.5: Treat permanent breeding sites with temephos (year 1–4)

In year 1, weekly temephos spraying was conducted in 113 permanent breeding sites in both districts in this reporting period. A shortage of temephos, which was supposed to be supplied by the government, limited efforts to strengthen larval control on permanent breeding sites in both districts. In year 2, larval control on permanent breeding sites was conducted from 21st to 26th January 2021 in both districts. In total, 34 breeding sites from Damot Sore and 107 breeding sites from Boloso Sore were covered with this activity.

In year 3, temephos spraying was conducted in 154 permanent breeding sites in both districts in this reporting period. Larval control on permanent breeding sites was conducted from 20th to 25th December 2021 in both districts, in line with the annual malaria campaign. In year four, larvicidal control activity was conducted from 24th to 29th May 2022 alongside the EM campaign. In total, 154 permanent mosquito breeding sites in Boloso Sore and Damot Sore were controlled with Abate chemical, respectively.

Activity 1.3.6 Conduct supportive supervision to primary healthcare units on larvicidal control and environmental management (year 1–4)

Larvicidal control and EM supervision has been conducted on a yearly basis by a team consisting of one Malaria Consortium staff, one member from the RHB, one zonal malaria focal person and two district malaria focal persons. The supervision was conducted on a yearly basis coinciding with the annual malaria campaign organised by the project in collaboration with the ZHD and project DHOs. The

supervisory team supported coordination of HEWs, HDA leaders and HEW supervisors to mobilise the community for the EM campaign, and provide technical support on identification of mosquito breeding sites, larvicide spray on permanent breeding site and community awareness.

Activity 2.1.1: Adopt training manual on community conversation/community dialogue approaches (year 2)

The community conversation (CC) guidelines developed under the integrated community-based interventions for malaria services (ICIMS) project were adopted and prepared for production. A total of 120 copies of the CC implementation guideline were printed and distributed for HEWs' use.

Activity 2.1.2: Train on community conversation/community dialogue approaches for health extension workers in Damot Sore (year 2)

A two-day training of 78 HEWs was conducted in Areka, Wolaita in January 2021 to equip HEWs with skill of implementing and monitoring CC on malaria at village level. During the training, the Community Conversation Enhancement (CCE) for Malaria guidelines and its contents were well discussed by SNNP-RHB trainers and trainees to have a better understanding of the concepts of CCE and its methodology, how to plan and conduct CCE and how to engage community members in sessions actively.

Activity 2.1.3: Conduct refresher training on community conversation/community dialogue approaches for health extension workers in Boloso Sore (year 2)

42 HEWs attended the refresher training organised for HEWs who were trained during ICIMS project on community conversation/community dialogue (CD) approaches in January 2021. During the two-day training sessions, topics focusing on building the capacity of HEWs on CC/CD approaches and related topics, including the definition of CCE, and implementation and follow-up skills were covered. There was active participation from the trainees. During the training a COVID-19 infection prevention guide was used so that training sessions were organised to have a limited number of participants in room (15–20 participants per room), rooms were ventilated and spacious, safe distance between participants were maintained, hand sanitisers were used and each participant was provided with facemasks.

Activity 2.1.4: Conduct community engagement using community conversations/community dialogue approaches

Community engagement using CC approaches at village level was fully started in year 3. Community gatherings in year 2 were affected by COVID-19 transmissions. Both Boloso Sore and Damot Sore districts, trained HEWs, in collaboration with HDA leaders and they implemented CC activities at various villages by organising informal meetings. CC activities were conducted at 35 *kebeles* in Boloso Sore and 20 *kebeles* in Damot Sore. During the meetings, CC sessions were conducted to identify problems caused by malaria and to promote preventive methods and early care-seeking behaviour. Implementation of this activity has contributed hugely to improving the proper utilisation of LLINs, as well as cooperation with IRS technicians and the willingness to spray houses during IRS campaigns. During the project implementation period, a supportive supervision team comprised of implementing partners observed CC sessions being conducted at village levels and noticed that there was some

interruption during the first couple of months after COVID-19 occurred. However, the implementation of sessions resumed, taking high precautions to prevent the spread of the disease. As most of the sessions were taking place outdoors, mainly in compounds of health posts of *kebele* offices, it was easier to make seating arrangements within proper distance to avoid close contact.

Activity 2.1.5: Conduct supportive supervision on community conversation/community dialogue approaches to health extension workers

To monitor and support the implementation of CCE activities by trained HEWs at the village level, supervisory visits were conducted by a team from across the RHB, ZHD and DHOs in integration with LLIN supportive supervisions in August and November 2021. During the visits, 20 *kebeles* from Boloso Sore and Damo Sore districts were visited. The visits showed that HEWs had been facilitating CCE sessions at the village level with cooperation from the HDA. In most villages, sessions were being held bi-monthly using guidelines provided by Malaria Consortium. Inadequate participation among community members and supportive supervisors from health centres and DHOs were raised as challenges by the HEWs. During the visits, the need to strengthen supportive supervision from health centres and DHOs on CCE was discussed with the DHO. In year 4, this supportive supervision activity was conducted in July 2022 with the active participation of RHB, BoFED, ZHD and DHOs. This supervision was integrated with activity 1.2.5.

In year 2, as community engagement using CC approaches at village level was not fully started due to COVID-19 transmission and supportive supervision was not conducted during the period.

Activity 2.2.1: Develop/adopt radio spot on key malaria messages (year 1)

Five radio spots developed from the former ICIMS project, funded by James Percy Foundation, were adopted. Key messages included the proper use of LLINs, IRS in-house preparation and readiness, EM, signs and symptoms of malaria and the importance of seeking early medical care for diagnosis and adherence to prescribed treatment. The radio spot also included messages focused on generating demand for malaria services.

Activity 2.2.2: Contract local radio FM station to broadcast malaria messages (year 1–4)

In year 1 of the project, Malaria Consortium contracted Fana Broadcasting Corporate Wolaita FM station to broadcast malaria messages for a period of 12 months. In year 2 and year 3, Wogeta FM station was contracted to air anti-malaria messages in Wolaita language for a period of 12 months. The same station was contracted to air for a period six months in year 4. Wogeta FM radio was selected because they offered a reasonable price while covering a similar range of geography and population.

Activity 2.2.3: Broadcast radio messages on malaria prevention and control (year 1–4)

A total of 432 radio spots on malaria messages were broadcasted in Wolaita language during the three and half years the project period. In total, 120 radio spots were broadcast in year 1 using Fana FM radio. 90 were broadcast in year 2, followed by 144 in year 3 and 78 in year 4 using Wogeta FM radios. The messages are broadcast three times a week on Wednesdays and Thursdays during primetime slots

on Wogeta FM station. The local FM stations have a wide geographical coverage across the Wolaita zone.

Activity 2.3.1: Conduct rapid assessment on school clubs and mini-media clubs in Damot Sore (year 1)

A rapid assessment on school clubs and mini-media clubs was conducted in 47 schools in Damot Sore district (integrated with activity 1.1.1 and activity 1.2.1). Schools in Damot Sore districts had health clubs primarily focusing on personal hygiene and environmental sanitation. However, none of the schools had mini-media materials. The presence of active school clubs and willingness of the DEO to be engaged in this project was used as an excellent platform to establish anti-malaria clubs in the 47 schools. The assessment also showed that 19 schools were connected to the power grid, 11 schools were awaiting power installation and the remaining 17 schools did not have direct access to electricity.

Activity 2.3.2: Procure and distribute media equipment to schools in Damot Sore (year 1)

Media equipment, comprising of an amplifier with USB system, mountable horn speakers, wired microphone and speaker wire, were distributed to a total of 47 anti-malaria school clubs (42 primary and five secondary) schools in Damot Sore. The media equipment distribution was carried out by the project coordinator and induction meetings were held in parallel with school leaders to discuss the project's objectives, as well as the use of mini media devices and their safety.

Activity 2.3.3: Provide training to school principals and teachers on the use of the equipment in Damot Sore (year 1)

A two-day training on mini-media usage and troubleshooting was provided to 94 school principals and teachers drawn from 47 schools (two per school) in Damot Sore district. The training was conducted in three rounds from 4th to 9th November 2019 in Areka town. The training was provided by two experienced media trainers. The training covered information about malaria, its transmission and preventive methods. It also covered how to establish anti-malaria school clubs involving students and teachers, running school clubs using annual, quarterly and weekly plans, using the implementation guidelines provided by Malaria Consortium and how to use the mini-media equipment safely.

Activity 2.3.4: Procure and distribute solar panels to schools in Damot Sore (year 1)

Solar power energy systems (comprising solar panel, charger controller and batteries, inverter, light bulbs, and other accessories) were procured, distributed and installed in 18 selected schools from 4th to 9th November 2019. Schools without access to electricity were given priority to allow them to run mini-media devices and to power light bulbs at schools during evenings. The distribution and installation were conducted by the supplier and functionality of the systems and components was checked in the presence of DEO representatives and school officials. These solar power energy systems offer an added value of helping to promote adult learning classes in the evening, including basic literacy and numeracy skills, health and agricultural practices and other life skills.

Activity 2.3.5: Print and distribute school club guidelines to schools in Damot Sore (year 1)

A total of 141 school club guidelines, which had been developed under the ICIMS project, were printed, and distributed to 47 schools in Damot Sore. Three copies were provided to each school. The project opted to replace the tape recorder with a dual port USB flash drive. An updated mini-media user manual that addressed the device changes was printed and distributed for 47 schools.

Activity 2.3.6: Provide audio messages to schools in Damot Sore

A total of 47 USB sticks were procured and distributed to schools. Key anti-malaria messages on proper utilisation of LLINs, promotion of early care-seeking behaviour and proper anti-malaria drug use, and cooperating during IRS activities and EM campaigns were recorded in the Wolaita language and distributed to schools by loading the audio files on dual port USB flash drive.

Activity 2.3.7: Provide refresher training to school principals and teachers on the use of the mini-media equipment in Boloso Sore

A two-day refresher training on mini-media usage and troubleshooting was provided to 52 school principals and teachers drawn from 26 schools based in Boloso Sore district. The school clubs were established during the implementation of the ICIMS project 2014–2017. The anti-malaria school club implementation guidelines and general malaria practices were discussed by the trainers to increase trainees' knowledge and their skills to manage school club activities, as well as use the mini-media materials in a safe manner. The training was held at Areka town on 25th to 29th January 2021 in two rounds.

Activity 2.3.8: Conduct supportive supervision of new schools and 26 schools supported under the previous integrated community-based interventions for malaria services project

A total of five rounds of supportive supervision activity were conducted in 73 schools from year 2 of the project until year 4. The first one was conducted in January 2020 to monitor and support the establishment of anti-malaria school clubs and the use of mini-media equipment. A structured checklist was used for this purpose. During the supervision, it was observed that established anti-malaria school clubs in the new schools were delivering malaria messages to their school community using microphones.

In year 2, schools supported by the project were visited in November 2020. In year 3, the supervision was conducted for a total of 24 days in June and July 2021 and in October and November 2022. Technical support was provided on school club activity implementation and the use of mini-media materials. In year 4, a supportive supervision visit was conducted from 7th to 15th April 2022. The visit included direct participation from DEOs from Boloso Sore and Damot Sore. During the visit, the utilisation of mini-media devices and the implementation of anti-malaria clubs were observed. During the visit, the team learnt that the schools experienced a schedule change that took place to prevent the transmission of COVID-19. This caused an obstacle to the club's activities, as students were coming to school on different shifts. As such organising meetings and running programmes were affected. In addition, power interruption and staff turnover are challenges faced by some schools. To mitigate

issues, recommendations were forwarded to schools such as conducting regular in-house training sessions on school club implementation guidelines to club member teachers and students to ensure continuity of activities and procuring used car battery systems to power amplifiers and speakers when power was unavailable from the main line. The team observed school clubs documenting their activities as per the plan made.

Activity 2.3.9: Conduct performance review meeting on school club activities with school principals and teachers (year 3–4)

Performance review meetings on school club activities were conducted in year 1 and year 4 from 26th to 27th November 2021 and from 28th to 29th June 2022, respectively. The review meeting was conducted over two days with a total of 78 participants including 73 school principals/teachers, one Wolaita ZHD malaria officer, two DHOs, two members of DEO staff. A project coordinator and one RHB malaria officer facilitated the review meeting. During the review meeting, the overall implementation of school club activities, findings from supportive supervision visits and best practices were discussed. Each school also actively participated in a planning exercise session to design activities to strengthen school club activities.

Activity 2.4.1: Develop a qualitative study protocol on the role model approach (year 1)

In year 1, an experienced, international consultant was recruited and supported the design and development of a pilot study protocol.

Activity 2.4.2: Obtain ethical clearance from Southern Nations, Nationalities and Peoples' Regional Bureau of Health (year 2)

The study protocol for the role model (RM) pilot was submitted to the RHB and ethical approval was received by 6th November 2020.

Activity 2.4.3: Conduct data collection, analysis and report writing

In year 2, a qualitative study aimed to explore the normative behaviours around malaria prevention and control was carried out in Boloso Sore and Damot Sore districts of Wolaita zone. Two health centres, one from each district, were selected and two *kebeles* were identified from the catchment areas of each health centre for the study. In the qualitative study, 24 focus group discussions (FGDs) were carried out to understand the normative behaviours around malaria prevention and control. A total of 28 in-depth interviews (IDIs) were conducted to identify the potential RMs. The qualitative assessment provided the opportunity to carry out a three-day interactive RM mobilisation process in each *kebele*. A purposive sampling technique was used to select the participants based on their availability, special knowledge, interest, and willingness to participate in the qualitative study. A total of 140 community members participated in the study. Eight data collectors who speak Wolaita language and have experience in qualitative data collection were recruited and trained on data collection tools and methods from 9th to 11th February 2022. The training was conducted by the study consultant and supported by the project coordinator using the Zoom platform, as the consultant was not able to travel due to the COVID-19 pandemic.

The qualitative assessment provided an opportunity to implement the RM interactive process with the communities which helped identify the uncommon but beneficial practices of RM individuals in each *kebele*. The study reflects the need to develop a well-informed and context-specific SBCC strategy to address the long prevailing misperceptions about the causes of malaria and promote behavioural changes to increase the uptake of LLINs and IRS. Interpersonal communication is the most preferred and trusted channel of health information; therefore, social and behaviour change communication (SBCC) should use tools and approaches that are built on interpersonal communication and engage community volunteers as a vehicle of communication for the RM approach.

Activity 2.4.4: Conduct role model approach in selected *kebeles* of the project

Implementation of RM approach started in February 2021 at four selected *kebeles* (two *kebeles* from Boloso Sore and two *kebeles* from Damot Sore districts) with training of HEWs, HDAs, RM volunteers, *kebele* administration and religious leaders who were selected for the study. At each *kebele* eight RM volunteers were identified. During this training, RM volunteers prepared a plan for the monthly and bi-monthly activities, including meetings at selected villages and site visits in their respective villages with the expectation that they would implement these activities.

Two one-day review meetings were organised, one in June and the other in November 2021. These meetings included participation from RM team members in each *kebele* to monitor the progress of RM implementation. In the review meetings, it was reported that RM teams were implementing RM activities as per their plan. RM teams were implementing RM meetings with villagers to educate community members on how they can keep their families and themselves healthy by following malaria prevention methods. In addition, they were conducting house-to-house visits to observe family's LLIN utilisation practices and teach community members about EM activities during social gatherings.

Competition workshops, aiming to promote good health practices at village level, were organised three times in each RM pilot *kebele* with participation from community members. These workshops took place in August and November 2021 and January 2022. In each *kebele*, more than 30 participants attended the workshop sessions. RM volunteers presented artwork such as drawings, poems, plays and songs. Participants of the workshop who were drawn from villages selected the best artwork, and winners were awarded at the event. Regular meetings and workshops were conducted as per the plan and HEWs were in charge of facilitating the events at village level.

A study aimed to assess the feasibility and acceptability of the RM approach for malaria prevention and management was conducted in year 3. The study protocol was developed by an international consultant and data collection was implemented in four *kebeles* of Boloso Sore and Damot Sore districts. This study employed qualitative methods, including 24 IDIs and 20 FGDs, guided by topic guides. In total, 129 participants were purposively sampled across two districts and four *kebeles*, which included HEWs, Had, RMs (mothers, fathers and pregnant women), community members with children under the age of five and pregnant women. IDIs and FGDs were audio recorded and transcribed verbatim. The data was coded line-by-line manually and a content analysis approach was adopted. The findings indicated that a RM approach was perceived by the majority of participants to be a new, positive, acceptable and appropriate method for mobilising and empowering communities to implement and promote malaria prevention and management practices.

Activity 2.4.5: Disseminate the findings of the study

Results of the RM study were presented at the projects annual review meeting in August 2022. Implementation methodology of the RM process and findings from the qualitative study conducted after 12 months of piloting at the four selected *kebeles* in both districts were presented to an audience comprised of RHB, ZHD, DHOs and facilities. As highlighted in the findings, cascading the RM practice at other *kebeles* was recommended to bring about behavioural change among community members.

Activity 2.5.1: Provide training for HWs on malaria communication to enable them to support health extension workers on malaria communication activities (year 4)

In year 4, training on malaria communication was provided over three days for a total of 33 HWs. This included 26 HWs from 13 health centres (two from each health centre), four malaria officers from two DHOs, two malaria officers from Wolaita ZHD and one malaria officer from RHB. The training was coordinated by the project coordinator and provided by two malaria communication consultants. The training was conducted to equip HWs with basic knowledge of SBCC interventions, introduce HWs to innovative SBCC intervention models and enable *woreda* health offices to coordinate and monitor SBCC implementation for the elimination of malaria.

Activity 2.5.2: Provide training on malaria communication for local mass media outlets (year 4)

In year 4, a three-day training was provided for 20 journalists and communication officers drawn from Wolaita zone and project districts local media outlets (FM radios, newspapers and magazines). The training was coordinated by Malaria Consortium staff and provided by two malaria communication consultants. The training was organised to introduce and equip media professionals and managers with basic and innovative SBCC intervention models and to create an opportunity for collaboration between the media, government communication and the ZHD on strengthening SBCC implementation for malaria elimination.

Activity 3.1.1: Develop/adopt training manual on outbreak detection and response (year 2)

To train HEWs on outbreak detection and response, a training manual was adopted and developed by a senior malaria expert. The manual was produced in a simplified format for ease of use by HEWs.

Activity 3.1.2: Train health extension workers on outbreak detection and response including the use of an epidemic monitoring chart (year 2)

In year 2, 120 HEWs from both project districts attended training sessions arranged in four rounds from 17th September to 1st October 2020. Each round of training sessions lasted for three days. The training was designed to equip HEWs with better skills to detect outbreaks and respond following the standards set by the FMOH. Practical sessions on the use of an epidemic monitoring chart were conducted to increase utilisation of the chart in health posts.

Activity 3.1.3: Print and distribute epidemic monitoring charts to health posts

The printing cost associated with the epidemic monitoring charts increased at an unexpected rate and was beyond the budgeted amount. To fill the funding gap, Malaria Consortium received charts produced by RHB and distributed them to health posts. The distributed charts are fit for use for five years.

Activity 3.1.4: Conduct supportive supervision on outbreak detection, response and outbreak preparedness plan

During year one of the project, a joint supportive supervision was conducted in four health facilities of the project districts from 28th to 30th August 2019. The supervisory team representing the RHB, Wolaita ZHD, DHOs from both districts, Malaria Consortium and BoFED. The team provided post-training follow-up of LLINs and community IRS. They also provided on-site support to HWs on the use of epidemic monitoring charts. The supervision visit to the target districts was also used to update baseline figures for activities under major activity 2.1, major activity 3.1, and major activity 3.3. In addition, a joint supervisory team visited health centres and health posts in January and February 2020 in two rounds. A skills gap was observed among HEWs on the proper use of the epidemic monitoring chart and the supervisory team provided on-the-spot support for the HEWs. The supervisory team also noted that no epidemic occurred in this reporting period. In year 2 supportive supervision visits were done in four health posts and the team observed that utilisation of the epidemic monitoring chart has increased as compared to the previous year. In year 3, this activity was conducted in June 2021 and in January 2022. During the visits 10 health posts and eight health centres were covered. In year 4, the supervision was conducted in November 2021 and July 2022 and 10 health centres and 20 health posts were visited by the supervisory team.

Activity 3.2.1: Develop and set up surveillance dashboard at district health offices

DHIS2-based malaria surveillance dashboard was developed by a professional from the RHB. The dashboard is designed to follow up antimalarials and other supply stockouts, as well as monitor campaigns such as LLIN distribution and IRS activities including coverage, number of positive cases by species and other important indicators that would show the status of malaria at catchments and districts. A total of 13 desktop computers and two laptops were procured and donated to 13 health centres and DHOs to support their surveillance activity. The developed dashboard was set up on all devices distributed to facilities to materialise functionality of the system and help health centre heads, district office heads and malaria focal persons planning and use of malaria data for decision-making.

Activity 3.2.2: Train district malaria focal persons on surveillance dashboard and use of malaria data for decision making

A training course was organised in collaboration with RHB on the utilisation of the malaria dashboard and DHIS2 including the basics of information technology (IT) over the course of five days. The training was attended by a total of 19 staff. This included one from each of the 13 health centres, two per each

DHO and two from the ZHD. Practical sessions were conducted to ensure the usability of the system and also to test the functionality of the system on the donated computers.

Activity 3.2.3: Train the Health Development Army to detect and report suspected malaria cases to health facility (year 1)

Training on using a community-based surveillance system was provided for a total of 290 HDAs drawn from Boloso Sore and Damot Sore. The training was conducted in Areka town, Boloso Sore district, from 9th to 17th December 2020. It was carried out in seven consecutive rounds, integrated with training on the identification of breeding sites (activity 1.3.2). The training focused on signs and symptoms of malaria and referring suspected malaria cases to the health facility.

Activity 3.2.4: Organise annual quality improvement meetings using the Model for Improvement and Kaizen approaches to support malaria surveillance activities at primary healthcare units (year 1–3)

For the three years of the project a two-day workshop was organised on yearly bases on Kaizen approaches (the government-preferred quality improvement tools) to enhance the quality of service delivery at the facility level. In year 1, the workshop was organised from 30th to 31st January 2020, at Areka town, Boloso Sore district. The workshop sought to improve the capacity of HWs and HEWs on continued quality improvement for the malaria surveillance system. A total of 86 participants, which included 56 HEWs, 24 HWs, four staff from DHOs and two staff from Wolaita ZHDs, attended the workshop. The workshop was also conducted in years 2 and 3 of the project (in February 2021 and February 2022, respectively). A total of 86 participants from health posts, health centres, DHOs and the ZHD attended each workshop.

Activity 3.2.5: Conduct supportive supervision to primary healthcare units to effectively collect, analyse and use malaria data for decision-making (year 1–4)

Integrated with activity 3.1.4., district-based monthly malaria data were collected and support was provided for health centres and health posts on how to analyse and use data for decision-making. This activity was done annually and various data, organised by DHOs and health facilities, were collected.

Activity 3.2.6: Procure and distribute computers for district health offices and health centres (year 2)

A malaria surveillance dashboard was developed by an external consultant (activity 3.2.1). The surveillance dashboard is intended to be used primarily by malaria focal persons at DHOs and health managers at health centres to monitor key programmatic indicators. Malaria focal persons and health managers were trained on using the surveillance dashboard and the use of malaria data for decision-making (activity 3.2.2). However, project DHOs and health centres had no computers to use the surveillance dashboard. To address this gap, the project procured and distributed 13 computers (one for each 13 health centres) and two laptops (one for each project DHO).

Activity 3.2.7: Conduct *Plasmodium vivax* malaria data collection and analysis from health facilities of project districts

With the aim of determining relative distribution of *P. vivax* and its trend in the districts, health facility-based data collection was conducted from 12 health centres in Boloso Sore and Damot Sore (see Figure 02). The malaria data over three years (2011, 2012 and 2013 as per the Ethiopian calendar) from 12 health centres in Boloso Sore and Damot Sore indicated that *P. falciparum* was the dominant species (75 percent) while *P. vivax* contributed for 25 percent.

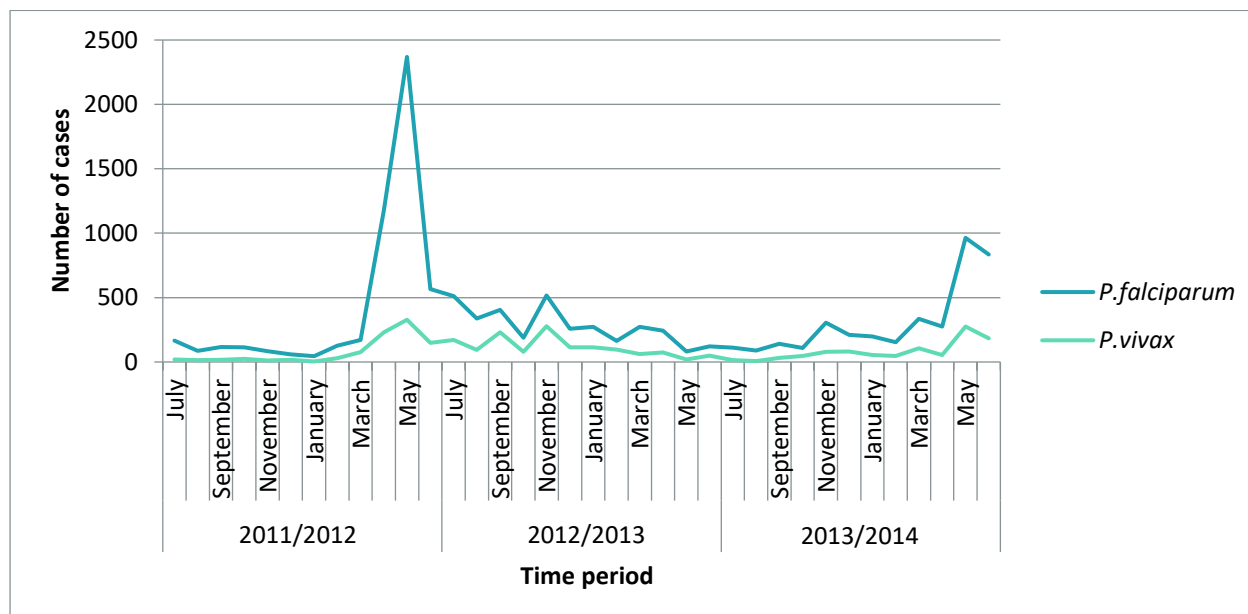


Figure 02: Relative Plasmodium species distribution trend over three years in Boloso Sore and Damot Sore

Activity 3.2.8: Supportive supervision on the use of surveillance dashboard at health centres and district health offices

A team comprised of the ZHD Health Information Technology Directorate, Boloso Sore and Damot Sore districts health information technology units and Malaria Consortium, conducted a supportive supervision visit for five days in June 2022. Eight health centres in Boloso Sore district, five health centres in Damot Sore district and DHOs were visited to enhance monitoring of malaria indicators through the use of the malaria surveillance dashboard. The team also observed that the status of computers donated to the facilities and offices and users gave feedback on the utilisation of the surveillance dashboard. The supervisory team noted that most of the facilities have gained a lot from the training they attended which was organised by Malaria Consortium in February 2021. They reported being able to get various visualisation of malaria data periodically and were able to follow up on shortages and gaps in the completeness of campaigns such as IRS work. They also highlighted that they could keep various data in electronic format to produce reports easily. The major issue faced by most facilities was the interruption of electricity.

Activity 3.3.1: Adopt/develop training manual on electronic community health system/activity 3.3.2: Train health extension workers on electronic community health system/activity 3.3.3: Conduct supportive supervision to health extension workers to enable them to properly implement electronic community health system (integrated with 3.1.4 & 3.2.5)

All three above activities (3.3.1, 3.3.2 and 3.3.3) were due to commence after the government had completed their piloting of the electronic community health system (eCHIS) platform. Unfortunately, the government was delayed and had not completed this activity in time for the project to implement the related activities within the timeframe. Therefore, after discussions with the James Percy Foundation, it was decided to cancel these activities and replaced them with the following:

- Activity 3.2.8: Supportive supervision on use of surveillance dashboard at health centres and district health offices
- Activity 3.4.1: Training of health workers on malaria case and foci investigation and classification
- Activity 3.4.2: Training of health extension workers on malaria case and foci investigation and classification
- Activity 3.5.1: Orientation workshop on Malaria Elimination Roadmap for health extension workers and health workers.

Major Activity 3.4: Training of health extension workers and health workers on case and foci investigation and classification

The National Malaria Elimination Strategic plan in Ethiopia has given high priority to transform malaria surveillance into a core intervention due to its pivotal role in malaria elimination. Malaria case and foci investigation and classification are among the new practices introduced to strengthen surveillance in areas with API between zero and 10 (low/very low transmission risk). This requires a strong surveillance system to detect cases or determine residual transmission in a community. As API for malaria in Boloso Sore and Damot Sore has reduced to below 10, building the capacity of HWs and HEWs to conduct case and foci investigation and classification was found to be important.

Activity 3.4.1: Training of health workers on malaria case and foci investigation and classification

A total of 110 HEWs drawn from health posts in Boloso Sore and Damot Sore districts, attended a training course, focusing on malaria case and foci investigation, and classification for three days. The objective of the training was to familiarise them with the tools and methodology used. To evaluate participants' knowledge, pre- and post-tests were conducted.

Activity 3.4.2: Training of health extension workers on malaria case and foci investigation and classification

Training of HWs on malaria case and foci investigation was conducted in Sodo town from 18th to 22nd July 2022. Attendance of HWs was drawn from health centres in Boloso Sore and Damot Sore districts. The training was provided by senior malaria experts and participants were evaluated through pre- and post-tests given during the start and end of the session. Training was organised for health professionals in the Malaria Consortium Ethiopia project areas, Boloso Sore and Damot Sore districts, to familiarise them with the tools and methodology used in the malaria elimination initiative, with a focus on malaria case and foci investigation.

Major activity 3.5: Orientation of health extension workers and health works on the Malaria Elimination Roadmap

The Malaria Elimination Roadmap was one of the documents developed to support malaria elimination in Ethiopia. The document was developed to provide guidance on the phased approaches and recommendations to be followed during malaria elimination. It was intended to be used by actors at different levels of the health system, as a guiding document in the planning, monitoring and implementation of anti-malarial interventions in the context of malaria elimination.

Activity 3.5.1: Conduct orientation workshop on the Malaria Elimination Roadmap for health extension workers and health workers

Aiming to orient different phases of malaria elimination including malaria interventions, SBCC, and planning and monitoring, the orientation workshop on the Malaria Elimination Roadmap was conducted from 18th to 26th June 2022 in Sodo town. In total, 110 HEWs and 32 HWs drawn from health facilities in Boloso Sore and Damot Sore districts attended the orientation workshop organised by Malaria Consortium and led by malaria officers from SNNP-RHB and Wolaita zone who received national level training for trainers. The sessions were conducted in two rounds and each group attended the workshop for two days. The workshop was organised for health professionals and HEWs in the Malaria Consortium Ethiopia project area districts to familiarise them with the Ethiopian Malaria Elimination Road map so that they could contribute to the malaria elimination initiative.

Major activity 4.1: Internal activity

Major activity 4.1 was an internal activity and has not been presented in the project outputs.

Activity 4.2.1: Conduct baseline survey (year 1)

A baseline assessment was conducted in May 2019 to assess malaria prevention, SBCC and surveillance in Boloso Sore and Damot Sore districts of Wolaita zone and SNNPR, as well as to generate baseline data for the proposed activities of the project (survey report provided).

Activity 4.2.2: Facilitate mid-term evaluation of the project by the government

The mid-term evaluation of the project was conducted. A lead role was taken by the regional BoFED and was supported by the RHB, ZHD and ZBoFED. The team discussed the project activities conducted over the past 24 months. Implementing partners reflected their views about the partnership and benefits of the project. The evaluation team also interviewed implementing partners at zonal level and received feedback on the queries raised.

Activity 4.2.3: Facilitate terminal evaluation of the project by the government

Terminal evaluation of the project was conducted. A lead role was taken by the regional BoFED and was supported by the RHB, ZHD and ZBoFED. The evaluation team found credible evidence to say that the project was cost-effective and that best practices achieved with the allocated resources.

Activity 4.2.4: Conduct endline survey

In year 4 of the project, an endline survey was conducted in July and August 2022 in Boloso Sore and Damot Sore to monitor changes in malaria intervention indicators. Malaria Consortium commissioned the endline survey by hiring a local consultant. The findings were used to update selected indicators in the evaluation table.

Activity 4.3.1: Identify learning questions to be answered by the project to add to the knowledge base on malaria control and management in the region (year 1)

Three learning questions were identified:

- What are the opportunities and challenges of implementing community-based IRS?
- Can the existing community structures, such as health extension programmes (HEP) and HDA, be used to improve case detection and malaria surveillance?
- Can a RM approach be used to improve malaria service uptake in Ethiopian settings?

These learning questions were captured in Malaria Consortium's learning capturing tool with support from the Senior Learning Specialist based in the UK.

Activity 4.3.2: Conduct annual programme review meeting to review project performance and share knowledge and experiences gained to stakeholders and beneficiaries

During the implementation of the project each year, two-day annual review meetings were organised to assess project progress and share lessons learnt with stakeholders and beneficiaries. In year 1, the annual review meeting was conducted from 26th to 27th February 2020 at Areka town. The meeting was attended by 55 HEWs, 12 HWs, four DHOs, three ZHD staff and one regional member of staff. During the meeting, past activities of the project were reviewed, and DHOs presented activities implemented with the support of the project. HEWs and HWs who received capacity-building training on various topics, e.g. quality improvements (QI), IRS and CCE were requested to share their knowledge with others working at their facilities. In addition, the ZHD requested participants make a better use of systems established by the project e.g., school clubs and mini-media. Similar annual review meetings

were organised in year 2 and year 3 in February 2021 and February 2022, respectively. The final annual review meeting was conducted in August 2022.

Activity 4.3.3: Produce one project brief, two learning briefs and four success stories and share on Malaria Consortium's website (year 1–4)

In year 1, the External Relations Team, based in the UK, developed a project brief outlining the project's overview, objectives and activities and shared this document on Malaria Consortium's website.⁷ In addition, two success stories were documented through a field visit at project DHOs, health centres, health posts and the Wolaita ZHDs.⁸ In year 2, one learning brief focusing on challenges and opportunities of community-based IRS was published, and a success story focusing on the impact of malaria prevention radio messages was also published on Malaria Consortium's website.^{9,10} In year 3, a learning brief entitled Supporting Surveillance, Outbreak Detection and Response was developed by interviewing the HEWs, HWs, HDA members and malaria focal person at DHOs using a semi-structured discussion guide. The learning brief was published on Malaria Consortium's website.¹¹ In year 4, a learning brief was produced based on RM implementation activity and published on Malaria Consortium's website.¹² In addition, a success story on the use of the malaria surveillance dashboard was produced, based on users' reflections.

Activity 4.3.4: Produce case studies and impact assessments for sharing with the donor and stakeholders

During the implementation of the project, a total of three case studies and impact assessments have been published and shared with stakeholders. In year 2, two case studies focusing on the impact of outbreak detection and response training for HEWs and on the engagement of implementing partners were developed and shared on Malaria Consortium's website.^{13,14} In year 4, the development and

⁷Malaria Consortium. Strengthening community-based malaria prevention and surveillance interventions. London: Malaria Consortium; 2019. Available from: www.malariaconsortium.org/media-downloads/1245/

⁸Malaria Consortium. Training health extension workers to provide community-based malaria prevention. London: Malaria Consortium; 2020. Available from: www.malariaconsortium.org/media-downloads/1327/

⁹ Malaria Consortium. Working with communities to prevent the spread of malaria. London: Malaria Consortium; 2020. Available from: www.malariaconsortium.org/media-downloads/1328/

¹⁰ Malaria Consortium. Educating communities on malaria and COVID-19 prevention through radio messages. London: Malaria Consortium; 2021. Available from: www.malariaconsortium.org/resources/publications/1424/educating-communities-on-malaria-and-covid-19-prevention-through-radio-messages

¹¹Malaria Consortium. Supporting surveillance, outbreak detection and response. London: Malaria Consortium; 2022. Available from: www.malariaconsortium.org/media-downloads/1648/

¹² Malaria Consortium. Using the role model approach to improve malaria prevention and control: Lessons from Ethiopia. London: Malaria Consortium; 2022. Available from: www.malariaconsortium.org/resources/publications/1608/using-the-role-model-approach-to-improve-malaria-prevention-and-control-lessons-from-ethiopia

¹³Malaria Consortium. Training health extension workers in Ethiopia to provide community-based malaria prevention. London: Malaria Consortium; 2020. Available from: www.malariaconsortium.org/resources/publications/1327/training-health-extension-workers-in-ethiopia-to-provide-community-based-malaria-prevention

¹⁴ Malaria Consortium. Strengthen community-based malaria services through improved planning and engagement across the health system. London: Malaria Consortium; 2021. Available from: <https://www.malariaconsortium.org/resources/publications/1425/strengthen-community-based-malaria-services-through-improved-planning-and-engagement-across-the-health-system>

production of infographics were conducted to highlight and showcase milestones from the project and its major activities.

Activity 4.3.5: Attend a national meeting to share learning from the project (year 1–4)

Throughout the implementation of the project, various national and regional events were attended by the project coordinator. Malaria Consortium was designated by the FMOH to coordinate the celebration of the 2019 World Malaria Day under the theme of ‘Zero Malaria Starts with Me’ in Dire Dawa.¹⁵ The project coordinator attended World Malaria Day and also provided technical support on social mobilisation activities to the ad hoc campaign team conducting road shows in Dire Dawa. In addition, the project coordinator attended an annual review meeting organised by SNNP-RHB for three days in October 2019, as well as the National Malaria Programme review meeting in 2021 and the malaria elimination national review meeting in 2022. The project staff also supported the commemoration of World Malaria Day in Adama town in April 2022.

Activity 5.1.1: Broadcasting key radio messages on COVID-19 prevention (year 2)

Wogeta FM station was contracted to broadcast COVID-19 awareness creation and prevention messages for three consecutive months. Messages prepared in Wolaita language were provided by the ZHD. Airing of messages took place during the last week of August 2020 to the end of November 2020. A total of 144 messages were aired during the three-month airing contract. The radio messages focused on what COVID-19 is, how it is transmitted, preventive methods, what to do when suspecting cases are observed, how to report cases and the contact details of the area’s hotline telephone number.

Activity 5.1.2: Procurement and distribution of masks and gloves for district health offices (year 2)

To protect HWs and HEWs from COVID-19 infection, gloves and face masks were procured and distributed. 2,200 face masks and 188 boxes of gloves were purchased and distributed to be used by health professionals (medical doctors, health officers, nurses, midwives, laboratory technicians, HEWs and other staff at health facilities and offices).

¹⁵ Zero Malaria Starts with Me. Ethiopia becomes the 10th African nation to join Zero Malaria Starts with Me Movement. [2019 October 3; cited 2022 January 10]. Available from: www.zeromalaria.africa/news/ethiopia-becomes-10th-african-nation-join-zero-malaria-starts-me-movement

3.2 Challenges from year 1 to year 4

Challenge	Impact	Lessons learned/solutions
FMoH delays to the pilot and launch of the disease prevention component of the eCHIS module	Implementation of eCHIS training for HEWs couldn't be conducted as planned by the project and the budget allocated for this was repurposed in discussion with James Percy Foundation to implement other activities	Include definite activities in the project plan
Shortage and untimely supply of insecticide for project districts; insecticide supposed to be made available by FMoH	There were delays in the implementation of IRS which affected coverage of IRS in project districts	Integrated vector management and conduct engagement with FMoH, RHB, ZHD and DHOs to give high attention to IRS implementation
Competing priority government programmes e.g., national campaigns	Competing priority government programmes e.g., national campaigns, affected the implementation of project activities in a timely manner	Conduct continuous engagement and collaboration with all levels of government partners in both the planning and implementation of project activities
COVID-19 transmission and related government restrictions to organise meetings, trainings, etc.	Delay in implementation of year 2 project activities as organising meetings, trainings and travel were restricted due to COVID-19	Year 2 activities which did not require travel or gatherings were rescheduled and brought forward until the restriction eased and MC staff and implementing partners had been following WHO/FMoH guidelines related with COVID-19

4 Conclusion

4.1 Highlights, strong points to maintain, best practices to adopt

The project has been a big success and has achieved the objectives and overall goal in reducing malaria morbidity and severity of the disease in Boloso Sore and Damot Sore districts. Malaria API has reduced to 5.6 in Boloso Sore and 7.0 in Damot Sore from a baseline of 15.6 and 29.7 respectively. The knowledge of communities in project-supported districts demonstrates significant improvement. Overall, 92.3 percent of people know fever as a main symptom of malaria, 91 percent of people identify mosquitoes as the cause of malaria and 85 percent know that LLLNs are a preventive measure for malaria. Surveillance and response have also improved in the project districts; the proportion of health

facilities reporting complete, timely and quality data has improved from 76 percent at baseline to 82 percent in year 1, to 100 percent in year 4. Additionally, district health staff now have a dashboard and the required skills to identify malaria upsurges to be able to react quickly and reduce the burden of malaria. A key driver of the success of the project was our partnership with the government and the active involvement of government bodies. Stakeholders from the RHB to lower-level health authorities were among the enablers that supported the successful implementation of the project activities. The project carried out joint planning with all responsible government bodies to ensure maximum cooperation and reviewed progress on a regular basis.

The project continued to be implemented during the COVID-19 pandemic. A COVID-19 guidance plan was devised and was continuously updated in line with FMOH/WHO guidance on COVID-19 to ensure activities could continue in a safe manner. The project also supported the response to COVID-19 transmission by purchasing and distributing face masks and gloves to health professionals and broadcasting 144 radio spots on COVID-19 prevention.

Annual performance, post-IRS spray meetings and school club activity performance review meetings were among the means used to involve implementing partners. These also provided opportunities to discuss and review performance, identify gaps, generate learnings and discuss solutions for continuous improvement.

Knowledge, learnings and best practices from the project were shared with stakeholders and communities through the publication outputs produced. These were discussed at annual programme review meetings and shared at national review meetings, as well as uploaded to Malaria Consortium's website. These publications included: one project brief, three learning briefs, four success stories, two case studies and one infographic.

The project has strengthened integrated vector management through the distribution of LLINs, increasing IRS within communities, conducting larvicidal control and EM, and training HDA members to identify breeding sites. All of which have contributed to reducing malaria transmission and preventing malaria outbreaks.

Ethiopia is moving into a state of malaria elimination, and a key objective of Ethiopia's National Malaria Elimination Strategy is to have a system that generates 100 percent evidence to make decisions. This is because being able to monitor and react quickly to any malaria upsurges is one of the key methods to enable Ethiopia to continue the downward trend in the burden of malaria. Through this project, dashboards were created to visually portray the data in a way that was not only pleasing to the eye, but easy and quick to interpret, making it more efficient to make informed decisions. Through training the HDA on reporting and by conducting supportive supervision at PHCUs, the project was able to achieve 100 percent reporting quality data on time, enabling the districts to generate 100 percent evidence.

Though activities 3.3.1, 3.3.2 and 3.3.3 — which were designed to introduce the HEWs to the eCHIS platform — could not be implemented due to the FMOH not having completed the pilot of this system, the project adapted to build the foundations for HEWs to use the eCHIS. One of the replacements was in regard to surveillance and training health centre and district staff to interpret the data coming through on the dashboards.

With Ethiopia harnessing the power of technology and moving towards the eCHIS instead of the current paper-based reporting system, there will soon be a greater volume of data available to regional, district and government stakeholders in real-time. Maintaining the quality and timeliness of the data being inputted into the eCHIS is essential. Failure to do so would risk decisions being made based on incorrect or delayed data. Through this project, staff were trained to interpret surveillance data. However, it will be paramount that health staff and district staff maintain their dashboards and continue building their health team's capacity to analyse and interpret data to ensure they are able to make the best use of the eCHIS when it is introduced. This eCHIS system will not only aid in identifying malaria upsurges, but it will also provide data for other communicable diseases that affect young children, enabling them to react quickly and save more children's lives.

4.2 Sustainability

The project was designed in a consultative meeting with the health offices of Boloso Sore and Damot Sore, Wolaita ZHD and SNNP-RHB. This helped to identify the main gaps and constraints in the implementation and delivery of malaria prevention and control activities, and to come up with proposed interventions for the project districts. Project activity implementation started after the project proposal was reviewed and approved by the SNNP-BoFED and a memorandum of understanding had been entered into between Malaria Consortium and BoFED. Project activities were implemented with the active involvement of government implementing partners at all levels to ensure activities were conducted in line with government priorities.

To achieve sustainability, the project has been working closely with regional and lower-level health authorities including HWs, HEWs and malaria programme managers. These staff have received capacity-strengthening trainings on targeted and multi-level SBCC approaches, surveillance and response, and integrated vector management. The provision of computers and of training on how to develop dashboards for HWs will have a long-lasting effect on malaria surveillance.

The project targeted children in schools as key change-makers. By educating them early on preventive measures for malaria, there is a higher chance that they will adopt these positive behaviours and continue them into adulthood (such as sleeping under an LLIN) and influence other family members to adopt such behaviours too. In schools, school club activities were strengthened/established, mini-media materials and school club implementation manuals were provided and capacity-strengthening training was given to a total of 73 schools and school teachers in both Boloso Sore and Damot Sore. All recipients stated that they would continue with school club activities.

The project worked with the government to strengthen their vector control management strategies, such as LLIN distribution and IRS. Given that the project was designed to work with the government, rather than to carry out vector control activities on behalf of the FMOH, these key malaria preventive activities will continue after the project has been completed. While there may still be some gaps now that the project has ended, the key activities will continue.

Capacity strengthening trainings provided to HEWs on the CC implementation manual that was developed and distributed, and trainings for HDAs on the identification and management of breeding

sites, will have long-lasting effects on the involvement of the community in malaria prevention and control activities.

Ethiopia is moving into a position of malaria elimination. One of the activities conducted in this project was to orient and hold workshops for HEWs and HWs in the project districts on the FMOH roadmap to achieve malaria elimination. This has provided the districts with a clear understanding of what is required from them, along with the aims and objectives they need to achieve, as set out by the FMOH. It is reassuring that, due to the work conducted in this project, both Boloso Sore and Damot Sore are in a good position to achieve the objectives stated in the Elimination Strategic Plan. The objectives are to achieve an API under 10 (which both districts have already achieved), conduct cases or foci investigation (which this project provided training on) and to maintain surveillance of malaria. Thanks to reporting having improved to 100 percent, dashboards being developed and training on interpreting the data to identify upsurges being conducted, both districts are well-equipped to meet these objectives.

5 What is next: Gaps

Activity 3.3.1, 3.3.2 and 3.3.3 were designed to introduce the HEWs to the e-CHIS platform. Unfortunately, the FMOH had not yet finished piloting the eCHIS system and as such these activities could not be conducted. The eCHIS is a high priority for the Ethiopian government. It is the digitised version of the paper-based CHIS, one of the backbones of Ethiopia's highly successful HEP. The content is now digitised into a mobile platform for use by HEWs around the country. The mobile platform and the corresponding mobile clinical referral application, for use by HWs at health centres, will promote access to and utilisation of data about community service delivery within the HEP, supporting HEWs in their responsibilities and equipping decision makers with relevant, high-quality data for advancing the health system in Ethiopia. The proposed eCHIS was envisioned to improve quality of care, follow-up and referrals through ensuring adherence to treatment protocols as a job aid and to improve data quality by capturing data in real-time at the point of care. This will assist HEWs to collect, analyse, use data and automate data sharing and reporting of critical health indicators as a data reporting tool. Through eCHIS web portal access, users at the national, regional, zonal, *woreda* and health centre levels can track the progress and performance of the programme, resulting in improved monitoring, supervision and resource availability.

The eCHIS has four programmatic modules implemented on a rolling basis, including a module on integrated management of newborn and childhood illnesses (IMNCI). The eCHIS implementation is challenged by shortages of tablets, poor internet and electricity connectivity/access, and outdated training in tools and systems. Digital literacy is a barrier to HEW digital health capacity, with older HEWs more resistant to new tools due to concerns about losing data. Technical support is centralised and managed by the FMOH, creating gaps in support for digital applications.

At present the Ethiopian government hopes to roll out the eCHIS, though they need additional technical support to overcome the challenges of building the capacity of HEWs and community health

services to adopt the eCHIS, and for relevant stakeholders to use the data being produced to make informed decisions. Building on the achievements of the James Percy Foundation project — particularly around capacity strengthening of HEWs, improvement of reporting to 100 percent, development of surveillance dashboards and the training conducted for HWs and district staff on interpreting the data to react to malaria upsurges, along with our experience with the pneumonia strategy project working on the IMNCI action plan — Malaria Consortium has the expertise and experience to support the government to roll out the eCHIS while sustaining the improvements in access and quality of integrated community case management (iCCM) services. Malaria Consortium would be able to train and conduct SBCC activities to encourage uptake from HEWs and further train health facilities and district staff to analyse and interpret the data from the eCHIS system, which would lead to enhanced child health outcomes that will have an impact on reducing under-five morbidity and mortality in Boloso Sore and Damot Sore districts, and in Halaba zone in SNNPR. Malaria Consortium as an organisation also has experience in implementing digital community health tools to improve iCCM in Mozambique, Uganda and Nigeria.

Appendix

Appendix 1: Project activities, targets and timelines

Objectives/activities	Indicators	Baseline	Target	Measured outcome/output	Measurement data/activity data	Status
Major activity 1.1: Support community-based indoor residual spraying (IRS) operations	Number of <i>kebeles</i> implementing community-based IRS	0	17	Year 1: 7 <i>kebeles</i> conducted-community based IRS Year 2: 10 <i>kebeles</i> implemented community-based IRS Year 3: 8 <i>kebeles</i> implemented community-based IRS Year 4: 10 <i>kebeles</i> implemented community-based IRS	Community-based IRS reports from year 1 up to year 4	Partially achieved
Activity 1.1.1: Conduct rapid assessment for inventory of spray pumps and spray parts (integrated with 1.2.1 and 2.3.1)	Rapid assessment conducted (yes/no)	0	Yes	Rapid assessment conducted so target has been met	Assessment conducted in March 2019	Achieved
Activity 1.1.2: Maintain damaged spray pumps using experienced technicians — 159 spray pumps in total	Number of spray pumps maintained	0	99	A total of 296 spray pumps maintained in 4 years Year 1: 92 spray pumps maintained Year 2: 99 spray pumps (50 Boloso Sore, 49 Damot Sore)	Maintenance report received annually	Achieved

				<p>were maintained and repaired</p> <p>Year 3: 41 spray pumps (24 Boloso Sore, 17 Damot Sore) were maintained and repaired</p> <p>Year 4: 64 Spray pumps were maintained and repaired</p>		
Activity 1.1.3: Train health extension workers (HEWs) on planning, implementation and monitoring of IRS operations	Number of HEWs trained on IRS	0	34	34 HEWs trained on IRS (20 from Boloso Sore and 14 from Damot Sore)	IRS training report in July 2019	Achieved
Activity 1.1.4: Train district health managers on IRS planning and monitoring	Number of district health managers trained on IRS	0	26	26 district managers trained on IRS	IRS training report in July 2019	Achieved
Activity 1.1.5: Train district storekeepers and store managers on warehouse management of insecticides, spray pumps and other IRS equipment	Number of storekeepers and store managers trained	0	12	16 storekeepers and store managers trained on IRS	IRS training report in July 2019	Achieved
Activity 1.1.6: Conduct supportive supervision on IRS planning and implementation	Number of supportive supervisions conducted	0	4	4 rounds of supportive supervision on IRS were done each year from year 1 to 4 with participation of the Regional Health Bureau (RHB), zonal health department (ZHD), district	Supervision report year 1–4	Achieved

				health offices (DHOs) and Malaria Consortium		
Activity 1.1.7: Post-spray review meeting	Number of post-IRS meetings conducted	0	4	4 post-spray review meetings conducted annually, years 1–4, with participation of 10 health workers (HWs), 17 HEWs, 2 ZHDs, 1 RHB and 6 DHOs.	Meeting reports prepared annually	Achieved
Activity 1.1.8: Procurement and distribution of personal protective equipment (PPE) for spray operatives	Number of PPE packages distributed	0	68	68 PPE packages distributed in year 2	Distribution report in October 2020	Achieved
Activity 1.1.9: Build soak pit for management of insecticide wastewater	Number of soak pits built in IRS targeted kebeles	0	6	Only 2 soak pits were built at selected sites of both districts due to high inflation rate in building materials and contractor costs	Progress report August 2022	Partly achieved
Major activity 1.2: Support planning and distribution of LLINs	Number of health posts implementing continuous LLIN distribution model	0	55	55 health posts were supported to implement continuous LLIN distribution model	Progress reports	Achieved
Activity 1.2.1: Conduct rapid assessment on LLINs coverage and gaps (integrated with 1.1.1 & 2.3.1)	Rapid assessment conducted (yes/no)	0	Yes	A rapid assessment on LLINs coverage and gaps conducted with Activity 1.1.1	Assessment report in March 2019	Achieved

Activity 1.2.2: Conduct a consultative meeting on continuous LLIN distribution model	Consultative meeting on continuous LLIN distribution model conducted (yes/no)	0	Yes	A consultative meeting on continuous LLIN conducted	20 participants attended the workshop Data taken from report in July 2019	Achieved
Activity 1.2.3: Train HEWs on continuous LLINs model	Number of HEWs trained on continuous LLINs model	0	126	126 primary healthcare unit (PHCU) workers (120 HEWs, 4 <i>woreda</i> health officers and 2 ZHDs) trained on continuous LLINs model	Data taken from training report in August 2019	Achieved
Activity 1.2.4: Conduct district-based micro-planning exercise on LLINs	Number of micro-planning exercises conducted	0	4	A district-based microplanning workshop was conducted each year, with participation of 55 HEWs, 2 DHOs, 1 ZHD and 1 RHB In total 4 workshops were conducted over the lifetime of the project	Workshop report prepared annually	Achieved
Activity 1.2.5: Conduct supportive supervision on continuous LLINs distribution	Number of supportive supervisions conducted	0	7	A total of 7 rounds of supportive supervision (2 rounds in each year for years 1–3, and 1 round in year 4) were conducted at the health facility and household level in both districts during the	Reports received annually	Achieved

				implementation of the project		
Major activity 1.3: Support larvicidal control and environmental management (EM)	Number of breeding sites controlled through larvicide and/or EM	100 (permanent)	141 for each year (permanent)	Year 1: 113 (80%) permanent breeding sites treated with temephos Year 2: 141 (100%) permanent breeding sites treated with temephos Year 3: 154 (109%) permanent breeding sites treated with temephos Year 4: 154 (109%) permanent breeding sites treated with temephos	Filed report received annually	Achieved
Activity 1.3.1: Conduct identification and mapping of breeding sites	Number of breeding sites mapped	N/A	N/A	Mapping was conducted on 141 permanent breeding sites (111 in Boloso Sore, 30 in Damot Sore) identified in 39 malaria-endemic <i>kebeles</i> across both districts, so targets were achieved	Baseline and target are not applicable to measure	Achieved
Activity 1.3.2: Train Health Development Army (HDA) members to identify breeding sites	Number of HDA members trained on identifying breeding sites	0	290	290 HDA leaders drawn from Boloso Sore and Damot Sore districts trained on identifying breeding sites	Training report in December 2019	Achieved
Activity 1.3.3: Organise annual malaria campaigns on EM activities	Number of malaria campaigns conducted on EM	0	4	A total of 4 campaigns were conducted. The EM campaign took place annually, with the	Campaign reports	Achieved

				participation of 220 HDA leaders and 38,253 community members, facilitated by HEWs and HWs	prepared annually	
Activity 1.3.4: Procure and delivery spraying equipment for PHCU	Number of spraying equipment for PHCU procured and distributed	0	20	As both DHOs received adequate larvicide spraying equipment from RHB after this project started, procurement and delivery of the equipment was not conducted	Progress report	Not applicable
Activity 1.3.5: Treat permanent breeding sites with temephos	Number of permanent breeding sites treated with temephos	100	141 for each year	Year 1: 113 (80%) permanent breeding sites treated with temephos Year 2: 141 (100%) permanent breeding sites were treated with temephos Year 3: 154 (109%) permanent breeding sites were treated with temephos Year 4: 154 (109%) permanent breeding sites were treated with temephos	Campaign report annually	Achieved
Activity 1.3.6: Conduct supportive supervision to PHCUs on larvicidal control and EM	Number of supportive supervisions conducted	0	4	4 supportive supervision visits were made each year to sites where environmental control and management activities were conducted	Supervision report annually	Achieved

Major activity 2.1: Community mobilisation (using the existing Health Extension Programme [HEP] and HDA platforms)	Number of <i>kebeles</i> with community conversations/community dialogue (CC/CD) approaches implemented	38	53	55 <i>kebeles</i> implemented CC for malaria	Baseline target updated in line with supervision report in August 2019 Supportive supervision reports prepared annually	Achieved
Activity 2.1.1: Adopt training manual on CC/CD approaches and HDA pictorial tools	Training manual on CC/CD developed (yes/no)	0	Yes	CC/CD enhancement guideline adopted and produced — 120 copies distributed for use by HEWs	Training report in January 2021	Achieved
Activity 2.1.2: Train on CC/CD approaches and HDA pictorial tools for HEWs in Damot Sore	Number of HEWs trained on CC/CD approaches and HDA pictorial tools	0	78	78 HEWs were trained on CC/CD approaches — trainees attended a 2-day training	Training report in January 2021	Achieved
Activity 2.1.3: Conduct refresher training on CC/CD approaches for HEWs in Boloso Sore	Number of HEWs who received refresher training on CC/CD approaches and HDA pictorial tools	0	42	42 HEWs attended the refresher training on CC/CD approaches — HEWs attended a 2-day training	Training report in January 2021	Achieved

Activity 2.1.4: Conduct community engagement using CC/CD approaches and HDA pictorial tools	Number of community mobilisation activities conducted	38	53	This activity was implemented at 53 <i>kebele</i> levels and was led by HEWs	Baseline target updated in line with supervision report in August 2019 Supportive supervision report in 2021	Achieved
Activity 2.1.5: Conduct supportive supervision on CC/CD approaches to HEWs (integrated with 2.3.8)	Number of supportive supervisions conducted	0	4	3 rounds of supportive supervision visits (2 rounds in year 3 and 1 round in year 4) were conducted at village level	Supportive supervision report in year 3 and 4	Partly achieved
Major activity 2.2: Local radio messaging	Number of radio messages broadcast	0	432	A total of 432 radio messages were broadcast — 120 in year 1, 90 in year 2, 144 in year 3 and 78 in year 4	Radio logs	Achieved
Activity 2.2.1: Develop/adopt radio spot on key malaria message	Radio spot developed (yes/no)	0	Yes	Radio spot on key malaria messages adopted from the integrated community-based interventions for malaria services project — target for this reporting period has been met	Data taken from adopted radio spots in July 2020	Achieved

Activity 2.2.2: Contract local radio FM station to broadcast malaria messages	Contractual agreement entered (yes/no)	0	Yes	Contractual agreement with local FM radios renewed each year. In year 1 contractual agreement was signed with Fana FM and in years 2–4 contract was signed with Wogeta Local FM	Data taken from memorandum of understanding signed	Achieved
Activity 2.2.3: Broadcast radio messages on malaria prevention and control	Number of radio messages broadcasted	0	432	A total of 432 radio messages aired from year 1 to year 4	Data taken from Wogeta and Fana FM	Achieved
Major activity 2.3: Establish/strengthen school clubs	Number of schools provided with mini-media materials	26	73	Mini-media materials provided for a total of 73 schools in both project districts	Supervision report in November 2019	Achieved
Activity 2.3.1: Conduct rapid assessment on school clubs and mini-media clubs in Damot Sore	Rapid assessment conducted (yes/no)	0	Yes	A rapid assessment on school clubs and mini-media clubs (conducted with activity 1.1.1 and activity 1.2.1) was conducted — the target has been met	Data taken from assessment report in March 2019	Achieved
Activity 2.3.2: Procure and distribute media equipment to schools in Damot Sore	Number of media equipment sets procured and distributed	0	47	Media equipment was procured and distributed for 47 schools in Damot Sore	Distribution report in November 2019	Achieved

Activity 2.3.3: Provide training to school principals and teachers on the use of media equipment in Damot Sore	Number of school principals and teachers trained on the use of media equipment	0	94	Training on the use of media equipment was provided for 94 school principals and teachers	Training report in November 2019	Achieved
Activity 2.3.4: Procure and distribute solar panels to schools in Damot Sore	Number of solar panels procured and distributed	0	18	Solar power energy systems were procured and distributed for 18 schools in Damot Sore	Distribution report in November 2019	Achieved
Activity 2.3.5: Print and distribute school club guidelines to schools in Damot Sore	Number of school club guidelines printed and distributed	0	141	141 school club guidelines printed and distributed for 47 schools in Damot Sore	Distribution report in November 2019	Achieved
Activity 2.3.6: Provide audio messages to schools in Damot Sore	Number of schools provided with audio messages	0	47	47 USB drives were procured, and audio messages/files copied for distribution to schools for their use	Progress report	Achieved
Activity 2.3.7: Provide refresher training to school principals and teachers on the use of the equipment in Boloso Sore	Number of school principals and teachers who received refresher training on the use of media equipment	0	52	26 principals and 26 teachers attended a refresher training for 2-days	Training report in January 2021	Achieved
Activity 2.3.8: Conduct supportive supervision to new schools and the 26 schools supported under the previous integrated	Number of supportive supervisions conducted	0	5	5 rounds of supportive supervision visits conducted to schools supported by the project	Reports prepared annually	Achieved

community-based interventions for malaria services project						
Activity 2.3.9: Conduct performance review meeting on school club activities with principals, RHB, ZHD, DHOs and the district education office (DEO)	Number of performance review meetings conducted	0	2	2 school club performance review meetings were conducted in years 3 and 4 with participation from 73 principals, 1 RHB, 1 ZHD, 2 DHOs and 2 DEOs over 2-days on 26–27 November 2021	Proceeding report in November 2021 and June 2022	Achieved
Major activity 2.4: Pilot the feasibility of the role model (RM) approach in selected areas of the project sites	Number of <i>kebeles</i> piloted for this new approach	0	4	Piloting of RM was completed at the selected 4 <i>kebeles</i> (2 in each district)	Progress report	Achieved
Activity 2.4.1: Develop a qualitative study protocol on the RM approach	Study protocol developed (yes/no)	0	Yes	Qualitative RM study protocol developed by the recruited consultant	Study protocol in February 2020	Achieved
Activity 2.4.2: Obtain ethical clearance from SNNP-RBH	Ethical clearance obtained (yes/no)	0	Yes	Ethical approval received from RHB	Progress report	Achieved
Activity 2.4.3: Conduct data collection, analysis and report writing	Data collection, analysis and report writing conducted (yes/no)	0	Yes	Formative data collection was conducted by data collectors Data analysis, study report and RM implementation	Progress report	Achieved

				<p>guide were prepared by the recruited consultant</p> <p>Data collection to evaluate feasibility and acceptability of RM piloting was conducted in February 2022</p>		
Activity 2.4.4: Conduct RM approach in selected <i>kebeles</i> of the project	Number of <i>kebeles</i> implementing RM approach	0	Yes	<p>Piloting of RM conducted at the selected 4 <i>kebeles</i> (2 in Boloso Sore and 2 in Damot Sore)</p> <p>Progress review meetings with the RM teams</p> <p>RM volunteers' competition workshops</p> <p>All of the above were conducted in this reporting period</p>	Progress report	Achieved
Activity 2.4.5: Disseminate the findings of the study	Study findings disseminated (yes/no)	0	Yes	Study findings presented on annual review meeting of the project	Proceedings report in August 2022	Achieved
Activity 2.5.1: Provide training for HWs on malaria communication	Number of HWs trained on malaria communication	0	33	Training attended by 33 HWs drawn from both districts and conducted over 3 days	Training report in July 2022	Achieved

Activity 2.5.2: Provide training on malaria communication for local media outlets	Number of journalists and communication officers trained	0	20	Training attended by 20 journalists and media managers drawn from zonal media and district offices	Training report in July 2022	Achieved
Major activity 3.1: Support outbreak detection and response	Number of health posts using epidemic monitoring chart	44	55	55 health posts have been exercising the epidemic monitoring chart for our break detection	Baseline target updated in line with supervision report in August 2019	Achieve
Activity 3.1.1: Develop/adopt training manual on outbreak detection and response	Training manual developed (yes/no)	0	Yes	Manual adopted and developed	Training manual in August 2020	Achieved
Activity 3.1.2: Train HEWs on outbreak detection and response including the use of the epidemic monitoring chart	Number of HEWs trained on outbreak detection	0	120	120 HEWs attended a 3-day training on outbreak detection and response	Training report in October 2020	Achieved
Activity 3.1.3: Print and distribute epidemic monitoring charts to health posts	Number of epidemic monitoring charts printed and distributed to health posts	0	110	A sufficient number of charts were printed and distributed by the regional government and health posts at both districts		Partially met
Activity 3.1.4: Conduct supportive supervision on outbreak detection, response and the	Number of supportive supervisions conducted	0	11	A total of 11 rounds of supportive supervision were conducted (3 rounds in each	Supportive supervision report	Achieved

outbreak preparedness plan (integrated with 3.2.5 & 3.3.3)				year during years 1–3 and 2 rounds in year 4) and onsite technical assistance was provided to HEWs	prepared annually	
Major activity 3.2: Support surveillance at PHCU and community level	Number of districts using surveillance dashboard	0	2	2 project DHOs and 13 health centres have been using the surveillance dashboard	Supervision report in year 4	Achieved
Activity 3.2.1: Develop and set up surveillance dashboard at DHOs	Surveillance dashboard developed and set up (yes/no)	0	Yes	Surveillance dashboard setup was done on new computers procured to be used by health facilities and DHOs	Consultant's report in February 2021	Achieved
Activity 3.2.2: Train district malaria focal persons on the surveillance dashboard and the use of malaria data for decision-making	Number of district malaria focal persons trained on surveillance dashboard use and the use of malaria data for decision making	0	19	19 trainees drawn from health centres, DHOs and ZHD attended training sessions	Training report in February 2021	Achieved
Activity 3.2.3: Train HDAs to detect and report suspected malaria cases to health facilities	Number of HDAs trained on community surveillance	0	192	290 HDA leaders were trained on the detection and reporting of suspected malaria cases to health facilities (integrated with activity 1.3.2)	Training report in December 2019	Achieved
Activity 3.2.4: Organise annual quality improvement (QI) meetings using the Model for Improvement and Kaizen	Number of QI meetings conducted	0	3	A total of 3 QI workshops were conducted each year during years 1–3 with attendance of 55 HEWs, 24	Workshop report prepared annually	Achieved

approaches to support malaria surveillance activities at PHCU				HWs, 6 DHOs and 1 ZHD in February 2022		
Activity 3.2.5: Conduct supportive supervision to PHCU to effectively collect, organise, analyse and use malaria data for decision making (integrated with 3.1.4 & 3.3.3)	Number of supportive supervisions conducted	0	11	A total of 11 rounds of supportive supervision were conducted (3 rounds in each year during years 1–3 and 2 rounds in year 4) and onsite technical assistance was provided to HEWs (integrated with 3.1.4 & 3.3.3)	Supportive supervision reports	Achieved
Activity 3.2.7: Conduct <i>Plasmodium vivax</i> malaria data collection and analysis from health facilities of project districts	Number of health facilities where <i>P.vivax</i> data were collected	0	All	<i>P.vivax</i> data were collected from 12 health centres	Data collection report	Achieved
Activity 3.2.8: Supportive supervision on the use of the surveillance dashboard at health centres and DHOs	Number of health facilities and DHOs which received supportive supervision on the use of the surveillance dashboard	NA	15	13 health facilities and 2 DHOs were supervised	Supervision report	Achieved
Activity 3.3: Support the Federal Ministry of Health (FMoH) rollout of electronic community health information systems (eCHIS) for malaria surveillance and use of data for decision-making	Number of health posts with eCHIS	0	55	These activities were dependent on the FMoH completing their pilot of the eCHIS system, for the project to then distribute tablets and train HEW on the system. However, the FMoH had not completed their piloting of the eCHIS		Not applicable

Activity 3.3.1: Adopt/develop training manual on eCHIS	Training manual on eCHIS developed (yes/no)	0	Yes	platform in time for the project to carry out the related activities within the timeframe of the project. Therefore, these activities were cancelled and replaced with alternative activities: <ul style="list-style-type: none"> • 3.2.8 Supportive supervision on the use of the surveillance dashboard at health centres and DHOs • 3.4.1 Training of HWs on malaria case and foci investigation and classification • 3.4.2 Training of HEWs on malaria case and foci investigation • 3.5.1: Orientation of HEWs and HWs on the Malaria Elimination Roadmap 		Not applicable
Activity 3.3.2: Train HEWs on eCHIS	Number of HEWs trained on eCHIS	0	120			Not applicable
Activity 3.3.3: Conduct supportive supervision to HEWs to enable them to properly implement eCHIS (integrated with 3.1.4 & 3.2.5)	Number of supportive supervisions conducted	0	5			Not applicable
Major activity 3.4: Training of HEWs and HWs on case and foci investigation and classification:						
Activity 3.4.1: Training of HWs on malaria case and foci investigation and classification	Number of HWs trained on case and foci identification and classifications	NA	32 HWs	32 HWs trained on case and foci identification and classifications	Training report	Achieved
Activity 3.4.2: Training of HEWs on malaria case and foci investigation and classification	Number of HEWs trained on case and foci identification and classifications	NA	110 HEWs	110 HEWs trained on case and foci identification and classifications	Training report	Achieved

Major activity 3.5: Orientation of HEWs and HWs on Malaria Elimination Roadmap						
Activity 3.5.1 Orientation workshop on Malaria Elimination Roadmap for HEWs and HWs	Number of HWs and HEWs attended orientation workshop on National Malaria Elimination Roadmap	NA	110 HEWs and 32 HWs	110 HEWs and 32 HWs attended National Malaria Elimination Roadmap workshop	Workshop report	Achieved
Major activity 4.1: An internal activity not relevant to the project's final outputs						
Major activity 4.2: Assessment of overall achievement in terms of impact, outcome and objectives						
Activity 4.2.1: Conduct baseline survey	Baseline survey conducted (yes/no)	0	Yes	Baseline community survey conducted in year 1	Data taken from survey report in June 2019	Achieved
Activity 4.2.2: Facilitate mid-term evaluation of the project by the government	Mid-term evaluation conducted (yes/no)	0	Yes	Mid-term evaluation was conducted in February 2021 with participation of Bureau of Finance and Economic Development (BoFED), RHB and Zonal Bureau of Finance	Mid-term evaluation report in March 2021	Achieved

				and Economic Development (ZBoFED)		
Activity 4.2.3: Facilitate terminal evaluation of the project by the government	Terminal evaluation conducted (yes/no)	0	Yes	Terminal evaluation of the project was conducted in August 2022 with participation of BoFED, RHB, ZHD, ZBoFED, DHOs and District Bureau of Finance and Economic Development (DBoFED)	Terminal evaluation report in August 2022	Achieved
Activity 4.2.4: Conduct endline survey	Endline survey conducted (Yes/No)	0	Yes	Endline survey was conducted in July-August 2022 and report a report was produced	Survey report in August 2022	Achieved
Activity 4.3.1: Identify learning questions to be answered by the project that will add to the knowledge base on malaria control in the region	Number of learning questions identified and addressed during the course of the project (monitored/adjusted throughout the years of implementation)	2	2	3 learning questions on IRS, RMs and surveillance were identified	Data taken from the learning capturing tool in April 2019	Achieved
Activity 4.3.2: Conduct annual programme review meeting to review project performance and share knowledge and experiences gained to stakeholders and beneficiaries	Number of annual programme review meetings conducted	0	4	Four annual review meetings were conducted with participation from 55 HEWs, 12 HWs, 4DHOS, 2 ZHD and 1 RHB in February 2022	Meeting report in February 2022 Meeting report in August 2022	Achieved

<p>Activity 4.3.3: Produce one project brief, two learning briefs and four success stories and share on Malaria Consortium's website and other external platforms</p>	<p>Number of project briefs, learning briefs and success stories produced</p>	<p>0</p>	<p>7</p>	<p>A total of 8 publication outputs were produced (1 project brief, 3 learning briefs and 4 success stories)</p> <p>Year 1: 1 project brief and 2 success stories developed</p> <p>Year 2: 1 learning brief produced</p> <p>Year 3: 1 learning brief produced and published on MC website in Year 3</p> <p>Year 4: 1 learning brief and 1 success story were produced</p>	<p>Production uploaded on MC website</p> <p>Annually</p>	<p>Achieved</p>
<p>Activity 4.3.4: Produce case studies and impact assessments for sharing with the donor and stakeholders</p>	<p>Number of case studies and impact infographics produced</p>	<p>0</p>	<p>4</p>	<p>2 cases studies and 1 infographic were produced and published on MC website</p>	<p>Production uploaded on MC website</p>	<p>Achieved</p>
<p>Activity 4.3.5: Attend national meetings to share learning from the project</p>	<p>Number of national meetings attended at which a presentation and/or poster was presented</p>	<p>0</p>	<p>4</p>	<p>During implementation of the project, the project coordinator attended 2 national review meetings organised by FMOH</p>	<p>Reports prepared annually</p>	<p>Achieved</p>

Activity 5.1.1: Broadcast key radio messages on COVID-19 prevention	Number of radio spots aired on COVID-19 prevention	NA	288	288 COVID-19 prevention and awareness messages were aired on local FM station	Media Log	Achieved
Activity 5.1.2: Procurement and distribution of masks and gloves for districts health offices	Number of face masks and gloves procured and distributed	NA		2200 face masks and 188 boxes of gloves were purchased and distributed in year 2 to be used by health professionals		Achieved

