



Implementing a community-based approach to indoor residual spraying to improve acceptance, cost-effectiveness and efficiency

Lessons learnt from Ethiopia

Key learning

- Health extension workers' (HEWs) community mobilisation efforts prior to the implementation of indoor residual spraying (IRS) support community acceptance of IRS.
- Community-based IRS offers an excellent platform to promote integrated vector control management approaches.
- Targeted community-based efforts can be integrated effectively into the primary healthcare system, facilitated by strong HEW leadership.



Elfnesh Goa and Mebrat Haile, HEWs at Shayamba health post, Damot Sore

Background

In Ethiopia, malaria poses a significant threat to public health, with an estimated 52 percent of the population at risk of malaria infection.^[1] While the country has made impressive gains in reducing morbidity and mortality over the past decade — between 2016 and 2019, the number of confirmed malaria cases decreased by 47 percent and malaria-related deaths decreased by 58 percent^[1] — malaria remains a challenge in high-burden areas. The Southern Nations Nationalities and Peoples' Region (SNNPR) has one of the highest malaria burdens in the country, accounting for 18 percent of total malaria cases reported nationally in 2019/2020.^[2]

The Ministry of Health recommends campaign-based, targeted IRS as a key strategy for malaria prevention, control and elimination in Ethiopia and an effective intervention for high-burden areas.^[1] Historically, IRS campaigns in the country have functioned as centralised operations: district health offices and zonal health departments are directly responsible for all campaign planning, implementation and monitoring. In a community-based approach, however, HEWs play a core role in IRS planning, supervision and overall leadership of spray teams within their *kebeles* (the lowest administrative units). In this model, district health offices offer support in terms of planning, operational costs, supervision, and supplying insecticides and spray pumps to *kebeles*.

Community-based IRS aims to increase community participation in and acceptance of IRS; to reduce insecticide use for unintended purposes (e.g. agricultural pest control); to lower campaign costs and improve sustainability; and to achieve increased IRS coverage. This approach offers an effective and efficient alternative to centralised operations, which can be costly and logistically complex.

Project activities

Between March 2019 and February 2021, Malaria Consortium supported the implementation of a community-based IRS campaign in the districts of Boloso Sore and Damot Sore in Wolaita zone. This campaign was part of the [Strengthening Community-based Malaria Prevention and Surveillance Interventions in SNNPR](#) project, supported by the James Percy Foundation. Working with governments at all levels — including regional, zonal and district levels — we sought to cover 30 percent of households annually with IRS in campaign districts.

To facilitate implementation, we:

- trained 34 HEWs and 26 district health managers in IRS planning, implementation and monitoring
- trained 16 store keepers and supervisors in stock management and storage of insecticides and spray pumps
- conducted spray pump maintenance in two consecutive years prior to the IRS spray campaign
- provided supportive supervision, together with the district health office (DHO), regional health bureau and zonal health departments
- carried out post-spray review meetings to identify campaign challenges and to devise appropriate action plans
- supplied spray operators with personal protective equipment (PPE).

Results

In year one and year two, respectively, 19 and 28 percent of households were sprayed with IRS. Though these were below our annual target as a result of insecticide shortages, overall acceptance of the campaign improved. HEWs observed that awareness raising and community education have increased knowledge on IRS within the community.

Lessons learnt

- Because HEWs are closer to the community than anyone else, they are ideally placed to conduct mobilisation activities and build trust between communities. Through door-to-door visits, HEWs raised awareness about the benefits and importance of IRS in advance of the campaign, and clarified possible misconceptions about the chemicals being used. They also collaborated with *kebele* leaders and Health Development Army networks (community-based networks of women that link primary health care units with the community) to disseminate information. While acceptance of IRS among community members remains a challenge, these activities encouraged greater overall acceptance. After seeing its benefits among their neighbours, households also showed a greater willingness to cooperate with spray operators (SOPs).
- HEWs were able to use the IRS campaign to promote the uptake of vector control methods other than IRS. In the course of conducting household visits with SOPs, HEWs observed the inappropriate use of long lasting insecticidal nets (LLINs). HEWs used their campaign visits to share knowledge with households not only on the value of IRS, but also on the correct use of LLINs and their effectiveness in reducing exposure to malaria.
- In a community-based approach, HEWs lead IRS operations within their *kebeles*, coordinating schedules, quantifying insecticides, supervising SOPs and mobilising communities — unlike typical centralised structures, where DHO supervisors are responsible for these activities. Throughout the campaign, HEWs effectively managed SOP teams and monitored the quality of spraying. They also monitored which households had been sprayed (or had refused IRS), which allowed for more accurate deployment of insecticide stocks. As team leaders, they played a key role in facilitating the ongoing flow of information between SOPs on the ground and the district health centres, collecting and reporting timely and accurate data to the next level of the health system. This approach highlighted that HEWs' leadership facilitated effective integration of community-based IRS into the primary health care system — most notably the national Health Extension Programme.

- HEWs' profound knowledge of the communities in which they work — including the number and location of households — allows them to better quantify the insecticides needed for IRS coverage in their *kebeles*. In this way, they can effectively support DHO efforts to target insecticides to *kebeles* with the highest malaria burden. HEWs and district governments used post-spray meetings to identify and respond to logistical challenges. In year one, for instance, a shortage of PPE for SOPs was highlighted. With support from the James Percy Foundation, we were able to procure and distribute 68 sets of PPE to project districts — including long-sleeved overalls, rubber boots, long rubber gloves, goggles, helmets and masks.
- SOPs were primarily recruited from the communities in which they carried out IRS and received comprehensive training. This was more cost-effective than locating technicians from other areas — a common feature of centralised campaigns — as they did not require transport or camping facilities. Moreover, HEWs' careful leadership and monitoring of IRS operations and spray quality resulted in a decrease in insecticide misuse (i.e. for crop pest control) among SOPs. More targeted oversight within teams, along with community recruitment, have improved campaign cost-effectiveness overall.

No	Data Elements	conversion factor	Number	Remember
1.	Total population		211,145	
2.	Estimated No of HHS	4.9	43,094	
3.	Male population	49.5%	105,045	
4.	Female population	50.5%	106,100	
5.	Estimated No of live births	3.46%	7306	
6.	No of surviving infants	3.19%	6736	
7.	Under 2 yrs children	5.18	10,937	
8.	Under 3 yrs children	8.31	17,546	
9.	Under 5 yrs children	15.61	32,960	
10.	6-59 mths children	13.94	29,434	
11.	24-59 mths children	10.43	22,022	
12.	Under 15 years age group	14.87	31,075	
13.	15-59 yrs age group	18.27	38,690	
14.	15-49 yrs age group	23.3	49,197	
15.	Estimated No of pregnant women	3.46	7306	
16.	Estimated No Non pregnant women	19.84	41,891	
17.	Estimated No of delivery	3.46	7306	
18.	Estimated No of PMTCT	3.46	7306	
19.	Percentage of Females 9 yrs Old	4.6	9713	

Population estimates are used to target resources to campaign districts, DHO, Boloso Sore



HEWs typically deliver healthcare interventions from *kebele* health posts, like the one pictured here in Legama, Boloso Sore

Recommendations

We recommend the following for governments, implementing districts and DHOs to consider, based on the learnings captured in this campaign:

1. Consider adopting a community-based IRS approach for timely, cost-effective and focal **malaria outbreak responses**.
2. Conduct further **operational research** to determine the scale-up potential of the community-based IRS approach in similar settings.
3. Prioritise the **capacity development** of HEWs, through comprehensive training, to take on a leadership role in IRS operations; to use, repair and maintain spray pumps; and to capture and report data accurately.
4. Facilitate **HEW involvement** in community-based IRS campaigns from the planning stage — HEWs' knowledge of the communities in which they work is invaluable in accurately targeting IRS to where it is most needed, most efficiently.
5. Establish **regular meetings** with the regional health bureau and HEWs to coordinate the timely delivery of insecticides and PPE stocks to target *kebeles*.

References

1. Federal Ministry of Health Ethiopia (FMOH). Ethiopia Malaria Elimination Strategic Plan (2021–2025). Addis Ababa, FMOH Ethiopia, 2020. Available from: <http://www.moh.gov.et/ejcc/sites/default/files/2020-09/Ethiopia%20Malaria%20Elimination%20Strategic%20Plan%202021-2025-Agust%2031.pdf>
2. FMOH Ethiopia. Annual Health Performance Report. 2012 EFY (2019/2020). Addis Ababa, FMOH Ethiopia, 2020. Available from: http://www.moh.gov.et/ejcc/sites/default/files/2020-11/Annual_Performance_Report_2012%282019_2020%29.pdf

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Cover image: Tajew Gezahegn, a spray operator, undergoes training to carry out IRS in Bose Doche, Ethiopia

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