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Systematic Review

Involvement of community health workers in the fight against vector-borne diseases: systematic review of malaria interventions

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ABSTRACT

Vector-borne diseases remain a major public health challenge in sub-Saharan Africa. Community health workers (CHWs) play a key role in vector control through community-based interventions. This systematic review examines CHWs involvement in malaria-related vector control programs and identifies factors influencing their effective integration and performance. A systematic review was conducted in accordance with PRISMA guidelines by searching eight electronic databases (PubMed, Scopus, Embase, Web of Science, the Cochrane Library, CINAHL, African Journals Online [AJOL], and Cairn). Qualitative, quantitative, mixed-methods studies, and documentary reports published between 2015 and 2025 were included. Methodological quality was assessed using the mixed methods appraisal tool (MMAT), 2018 version. Out of 999 records identified, 27 studies were included. CHWs were involved in integrated community case management (rapid diagnosis, treatment, and referral), community surveillance, and prevention activities (mosquito-net distribution, health education, seasonal chemoprevention, and social mobilization). These studies reported improved access to diagnosis, reduced consultations at health centers, greater community adherence, and improved surveillance data quality. Facilitating factors included training, supervision, and logistical support, whereas barriers included low motivation, supply breakdowns, lack of an institutional framework, and reliance on external funding. CHWs play a central role in malaria-related vector control programs in Africa. Strengthening their institutional integration, supervision, motivation, and supply systems is essential to maximize their contribution and sustain impact.

Keywords: Vector-borne diseases, Community health workers, Malaria

INTRODUCTION

Vector-borne diseases (VBD) remain a major public health challenge in sub-Saharan Africa.[1] Their persistence is driven by environmental, climatic, and socio-economic factors that favor vector proliferation and population exposure, particularly in rural and underserved areas.[2,3] These continue to place a heavy burden on health systems across the continent.[1]

Vector control is an effective control strategy that requires not only biomedical interventions but also strong community engagement.[4] In this context, community health workers (CHWs) play a strategic role in improving access to health services, promoting preventive behaviors, and supporting the implementation of community-based interventions.[4,5] Their proximity to households, cultural familiarity, and understanding of local contexts enhance the acceptability of public health actions, and strengthening the link between communities and formal health systems.[5]

However, the involvement of CHWs in vector control programs differs across African countries. Variations in training, supervision, remuneration and institutional recognition strongly influence the way in which these agents are integrated into national strategies.[6,7] Inadequate support systems, weak governance frameworks, and inconsistent incentives may affect CHWs' motivation, performance, and the sustainability of community-based interventions.[8,9]

Although many studies have explored CHWs' participation in malaria-related vector control activities, the available evidence remains fragmented across settings and intervention models.[4,6] A comprehensive synthesis is therefore needed to better understand how CHWs contribute to vector control efforts, particularly in relation to malaria. This systematic review aims to analyze the ways in which CHWs are involved in vector control programs in Africa, focusing on malaria-related interventions, and to identify key factors influencing their effective integration.

METHODS

This systematic review was conducted in accordance with the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines. The review protocol was prospectively registered in the PROSPERO database under the registration number CRD420251121074. To refine the research question and enhance the transparency of the methodological approach, the PICO(S) framework was applied as follows: the population of interest included CHWs; the intervention focused on the participation or involvement of CHWs in vector control interventions; no comparison group was applicable; the outcomes of interest encompassed the forms and levels of CHW involvement, integration modalities, barriers and facilitating factors, as well as documented results or impacts; and the setting was limited to studies conducted in African countries.

Eligibility criteria

Studies were eligible for inclusion if they were published between January 2015 and December 2025 and written in English or French. We considered empirical studies employing qualitative, quantitative, or mixed-methods designs, in addition to documentary reviews and technical reports. Only publications examining the role or involvement of CHWs in malaria control interventions in African settings were retained.

Information sources and search strategy

A systematic literature search was conducted across eight electronic databases: PubMed, Scopus, Embase, Web of Science, the Cochrane Library, CINAHL, African Journals Online (AJOL), and Cairn. Search strategies were adapted to each database using relevant keywords and MeSH terms. The main search strings included combinations of "Community Health Workers" OR "Community Health Workers" [MeSH] AND "Malaria" AND "Africa".

Study selection process

The study selection process was conducted rigorously and independently. Two reviewers independently screened all identified records, with disagreements resolved by a third reviewer. All retrieved references were exported in RIS format and imported into Zotero for duplicate removal; the deduplicated database was then transferred to AbstractR for screening.

Selection occurred in two phases. First, titles and abstracts were screened to identify potentially eligible studies. Second, full-text articles were assessed to confirm eligibility based on predefined inclusion criteria. Only studies meeting all criteria were retained for data extraction.

Data extraction

Two reviewers independently screened the titles and abstracts of identified studies for eligibility according to the predefined inclusion criteria. Any disagreements were resolved through discussion, with the involvement of a third reviewer when necessary. The same two reviewers then conducted full-text screening of eligible articles.

Data from the included studies were extracted using a standardized Microsoft Excel data extraction form. The extraction sheet captured key study characteristics, including first author and country, year of publication, title, objectives, study design, study population, and main results. All eligible studies were synthesized using a narrative approach, allowing for the integration and interpretation of findings across heterogeneous study designs.

Evaluation of the quality of studies

The methodological quality of included studies was evaluated using the mixed methods appraisal tool (MMAT), version 2018. The evaluation followed three steps. First, two screening questions (S1–S2) were used to assess the clarity of the research questions and the adequacy of the collected data; studies that did not meet these criteria were excluded from further appraisal. Second, studies were classified according to their methodological design. Third, five design-specific criteria (C1–C5) were applied to assess methodological rigor, data collection and analysis quality, interpretative coherence, and, for mixed-methods studies, integration quality. Each criterion was rated as yes, no, cannot tell (CT), or Don't

know. Assessments were conducted independently by two reviewers, with disagreements resolved by consensus or a third reviewer. Results were presented without calculating an overall score, in accordance with MMAT recommendations.

RESULTS

Study selection

The systematic search strategy identified 999 articles. After eliminating duplicates, 769 articles were retained for initial title and abstract review. Following this first selection, 108 articles were evaluated in full text according to the inclusion criteria. Studies published outside the 2015-2025 period, or not directly addressing CHWs' involvement in vector control, were excluded. Finally, 27 articles were deemed eligible and included in the synthesis of results. The extraction procedure is illustrated in Figure 1.

Characteristics of included studies

Table 1 describes the studies included in this review. The twenty-seven studies selected cover a wide range of African contexts: Kenya (7), Nigeria (2), Zambia (3), Burkina Faso (1), Malawi (2), Uganda (1), Ethiopia (2), Benin (1), Mozambique (1), Sierra Leone (1), and 6 multicenter studies involving several African countries.

The methodologies employed were diverse: 7 quantitative studies, 17 qualitative studies with systematic qualitative reviews and 4 mixed studies. The study populations mainly consisted of CHWs, volunteers, supervisors, households, and key informants from ministries and NGOs. The analyses were mostly descriptive and thematic; some studies used regression models or tests of concordance.

Strategies for the involvement of community health workers in vector control programs

The analysis of selected articles highlights a range of strategies for involving CHWs in vector-borne disease control programs implemented in Africa from 2015 to 2025.

Integrated management of community cases (iCCM/CCMm)

The most documented strategy is the integration of CHWs into community malaria case management through the test–treat–refer approach. CHWs perform RDTs, administer ACTs, and refer severe cases.[10,16,21,24,29] This strategy improved access to care in rural areas, increased case detection, and reduced the need for health facility consultations.[26]

Home interventions and community monitoring

CHWs conduct home visits and post-treatment follow-up, reducing care-seeking delays, improving treatment adherence, and strengthening community trust.[20,25,26]

Community prevention and seasonal chemoprevention (SMC/PMC)

CHWs support SMC/PMC delivery, bed nets distribution, and prevention messaging, playing a key role in community adherence to malaria prevention strategies.[20,26,28]

Social mobilization, communication and community engagement

CHWs act as key intermediaries between communities and health services, delivering health education, improving health literacy, and promoting early care-seeking for febrile illnesses.[11,13,25,33]

Community monitoring and data reporting

CHW involvement in community monitoring through HMIS/DHIS2 strengthens epidemiological surveillance and early detection.[26,27,31]

Training, supervision and motivation of the CHWs

Training, supportive supervision, feedback, incentives, and quality improvement mechanisms sustain CHW motivation and performance, including digital tools and coaching approaches.[14,17,28,32,34,35]

Outcomes or effects attributed to the involvement of community health workers in these programs

Included studies report significant findings on the involvement of CHWs in vector control programs in Africa. The observed effects are divided into several levels.

Health outcomes

CHWs' interventions improved access to early diagnosis and treatment, contributing to a reduced severe malaria cases and mortality, a reduced pediatric malaria incidence, and improved treatment adherence through seasonal chemoprevention.[14,20,21,26,33,34]

Behavioural and social outcomes

The use of CHWs in primary care has increased. Improved community knowledge of transmission, prevention, treatment adherence, and appropriate care-seeking behaviors.[27,33] There is a strengthening of the bond of trust between the community and health structures, the reduction of distrust towards modern diagnostic and treatment means.[23,24,35]

CHWs emerged as trusted change agents, strengthening social legitimacy, community trust, and adherence to public health programs.[23,25] CHW recognition enhanced collaboration between communities, local authorities, and health services.[35]

Table 1: Description of the studies included in the review.

S. no.	First author and country	Year	Title	Objectives	Study design	Study population	Results
1	Druetz et al, Burkina Faso[9]	2015	Do community health workers perceive mechanisms associated with the success of community case management of malaria? A qualitative study from Burkina Faso	The objectives of this panel study are to: assess the extent to which CHWs are used by caregivers of sick children over a three-year period after the introduction of CCMm; and determine what influences their health-seeking practices.	Longitudinal panel study (2011-2013), annual survey in transmission season	Households in two health districts of Burkina Faso, Kaya and Zorgho	Utilization of CHWs increased with distance from health facilities and recent household visits by CHWs. Care-seeking through CHWs was higher in Kaya than in Zorgho and increased during the 2012–2013 period, coinciding with a national ACT shortage.
2	Adeoti et al, Nigeria[10]	2020	The fidelity of implementation of recommended care for children with malaria by community health workers in Nigeria	To evaluate fidelity to recommended malaria case management protocols delivered by CHWs and factors associated with performance.	Quantitative implementation study.	Thirty-five CHWs trained in home-based malaria management for children under five.	Overall adherence to malaria management protocols and ACT use was acceptable; however, post-treatment counselling performance remained low.
3	Agu et al, Nigeria[11]	2021	Knowledge of malaria control and attitudes towards community involvement among female community volunteers: effect of capacity building in a rural community, Southeast Nigeria	To assess the effect of capacity-building on malaria knowledge and attitudes toward community involvement among female volunteers.	Pre- and post-intervention study.	Twenty-nine female community volunteers.	Training led to significant improvements in knowledge of malaria symptoms, prevention and treatment, and strengthened positive attitudes toward community involvement and case referral.
4	Altaras et al, Uganda[12]	2017	Integrated community case management in a peri-urban setting: a qualitative evaluation in Wakiso District, Uganda	To explore perceptions of caregivers and VHT members regarding the value and effectiveness of iCCM in peri-urban settings.	Qualitative descriptive evaluation.	VHTs, caregivers, health supervisors and local officials.	iCCM was perceived as improving rapid and free access to treatment and contributing to reduced child mortality. CHWs were valued for availability and adherence to protocols, while drug stock-outs were identified as a major constraint.
5	Boakye et al, Kenya[13]	2018	Challenges of achieving sustainable community health services for community case management of malaria	To explore factors influencing the sustainability of community case management of malaria.	Qualitative cross-sectional study.	CHWs, caregivers of children under five, clinicians and public health officials.	Sustainability of CCMm was constrained by inadequate logistical support, insufficient remuneration, and limited health system backing.
6	Chikaphupha et al, Malawi[14]	2016	Motivation of health surveillance assistants in Malawi: a qualitative study	To identify factors influencing the motivation	Qualitative study	HSAs, health managers and	Motivation was driven by recognition, community support and incentives, while demotivation was

Continued.

S. no.	First author and country	Year	Title	Objectives	Study design	Study population	Results
				and performance of health surveillance assistants.		community members.	associated with high workload, limited supervision and organizational constraints.
7	Chilundo et al, Mozambique[15]	2015	Relaunch of the official community health worker programme in Mozambique: is there a sustainable basis for iCCM policy?	To assess whether the national CHW program presents conditions conducive to sustainable iCCM implementation.	Qualitative case study	Policymakers, donors, NGOs and program documents.	Strong political commitment was reported; however, sustainability was challenged by donor dependence, unclear statutory integration and geographical inequities.
8	Chipukuma et al, Zambia[16]	2020	Evaluating fidelity of community health worker roles in malaria prevention and control programs in Livingstone District, Zambia-A bottleneck analysis	To evaluate fidelity of CHW roles in malaria prevention and control programmes.	Mixed-methods cross-sectional study.	Thirty-four CHWs and 464 community members.	Overall role fidelity was low, particularly for RDT screening and health education. Key limiting factors included inadequate supervision, reporting gaps, supply shortages and insufficient remuneration.
9	Davis et al, sub-Saharan African[17]	2024	Documenting community health worker compensation schemes and their perceived effectiveness in seven sub-Saharan African Countries: A qualitative study	To document CHW compensation schemes and assess perceived effectiveness.	Qualitative study	Key informants across seven countries.	Regular and predictable remuneration was perceived as effective, whereas volunteer-based schemes were viewed as less sustainable. Strong government leadership and coordination were identified as critical for long-term effectiveness.
10	Boakye et al, Kenya[18]	2021	Needs assessment of community health workers to enhance efficient delivery of their services for community case management of malaria in Kenya	To identify the needs of CHWs to enhance sustainability and efficiency of community case management of malaria.	Qualitative study	CHWs, caregivers of children, and clinicians.	CHWs reported needs for regular refresher training, adequate remuneration, and essential logistical support (e.g. gloves, RDTs, transport, mobile phones) to ensure effective CCMm delivery.
11	Strachan et al, Mozambique and Uganda[19]	2015	Using theory and formative research to design interventions to improve community health worker motivation, retention and performance in Mozambique and Uganda	To identify key theoretical dimensions for designing interventions to improve CHW motivation, retention and performance.	Literature review combined with formative qualitative research.	Ministry of Health staff, CHWs, supervisors, NGOs, community leaders, and caregivers.	Social identity theory emerged as a relevant framework, emphasizing shared experience, feedback mechanisms, and a sense of belonging as critical drivers of CHW motivation and retention.
12	Faye et al, Benin[20]	2024	Field testing of user-friendly perennial malaria chemoprevention packaging	To assess perceptions of malaria, perennial malaria chemoprevention (PMC)	Qualitative non-interventional	Health authorities, healthcare	PMC was widely perceived as beneficial for child health. Caregivers valued CHWs' trusted

Continued.

S. no.	First author and country	Year	Title	Objectives	Study design	Study population	Results
			in Benin, Côte d'Ivoire and Mozambique	tools, and the potential role of CHWs in PMC implementation.	observational study.	workers, CHWs and caregivers.	status, while health authorities tended to favor clinical delivery of PMC by professional health staff.
13	Getachew et al, Ethiopia[21]	2021	Health extension workers' perceived health system context and health post preparedness to provide services: a cross- sectional study in four Ethiopian regions	To assess health extension workers' perceived health system context and health post readiness to provide services.	Cross-sectional study	152 health posts and health extension workers.	High scores were observed for community engagement, work culture and leadership, while organizational resources and access to knowledge sources scored low. The overall service readiness index was 59%.
14	Ishizumi et al, Sierra Leone[22]	2021	Community Health Workers' Experiences in Strengthening the Uptake of Childhood Immunization and Malaria Prevention Services in Urban Sierra Leone	To explore CHWs' experiences in promoting childhood immunization and malaria prevention in an urban setting.	Exploratory qualitative evaluation.	CHWs	Motivation was linked to pride, recognition and perceived personal benefits. Barriers included workload, competing responsibilities, and health system and community-level constraints, highlighting the need for additional support.
15	Jegede et al, Burkina Faso, Nigeria, and Uganda[23]	2016	Assessing Acceptability of a Diagnostic and Malaria Treatment Package Delivered by Community Health Workers in Malaria-Endemic Settings of Burkina Faso, Nigeria, and Uganda	To assess acceptability of malaria diagnosis and treatment delivered by CHWs using RDTs, ACTs and rectal artesunate.	Qualitative study	Caregivers of sick children, community leaders and health workers.	CHW-delivered malaria services were widely accepted. CHWs were perceived as accessible and effective, although concerns were raised regarding the sustainability of financial and non-financial incentives.
16	Johansson, sub-Saharan Africa[24]	2016	Beyond 'test and treat' malaria diagnosis for improved pediatric fever management in sub-Saharan Africa	To examine malaria diagnostic practices and determinants across sub-Saharan Africa.	Mixed-methods analysis of national surveys.	Households and health facilities.	Diagnostic testing uptake remained low with notable inequities. Non-adherence to malaria treatment guidelines was influenced by RDT perceptions, system constraints and provider–client interactions.
17	Kaunda-Khangamwa et al, Malawi[25]	2019	The role of health animators in malaria control: a qualitative study of the health animator (HA) approach within the Majete malaria project (MMP) in Chikwawa District, Malawi	To explore the role of health animators in malaria control and their influence on community knowledge, attitudes and practices.	Qualitative study	Community members and key informants.	Health animators enhanced community sensitization and engagement. Effects on practices were mixed, with health services playing a complementary role in malaria response.

Continued.

S. no.	First author and country	Year	Title	Objectives	Study design	Study population	Results
18	Larsen et al, Zambia[26]	2017	Shifting the burden or expanding access to care? Assessing malaria trends following scale-up of community health worker malaria case management and reactive case detection	To assess malaria trends following scale-up of CHW-led malaria case management and reactive case detection.	Quantitative time-series analysis.	Routine health facility data from the National Malaria Elimination Center (2010–2013).	Community-based screening and treatment by CHWs were associated with increased malaria case detection and reduced attendance at health facilities.
19	Lohfeld et al, Zambia[27]	2016	A qualitative review of implementer perceptions of the national community-level malaria surveillance system in Southern Province, Zambia	To explore implementers' perceptions of the national community-level malaria surveillance system.	Qualitative study.	CHWs, supervisors and district officials from nine rural health posts.	The system was perceived to improve access to malaria services and reduce cases. Key barriers included limited access, insufficient CHWs and inconsistent supply chains.
20	Lokossou et al, Benin[28]	2019	Do quality improvement teams contribute to the performance of community health workers in Benin?	To assess whether quality improvement teams contribute to CHW performance and selected maternal and child health indicators.	Mixed-methods study (quantitative trend analysis + qualitative inquiry).	Routine CHW activity reports and health information system data; interviews with CHWs, supervisors and community delegates.	Quality improvement teams were associated with marked improvements in CHW functioning and performance indicators over time, and stakeholders reported that supportive accompaniment contributed to improved implementation.
21	Marita et al, Kenya[29]	2021	Determinants of quality in home-based management of malaria by community health volunteers in rural Kenya	To identify determinants of service quality in home-based community case management of malaria.	Cross-sectional survey (observation + interviews).	Community health volunteers providing routine services	Approximately two-thirds of CHWs provided quality services. Higher quality was associated with supportive supervision and the availability of malaria commodities (AL and RDTs), while stock-outs were linked to poorer performance.
22	Marita et al, Kenya[30]	2022	Implementation of community case management of malaria in malaria endemic counties of western Kenya: are community health volunteers up to the task in diagnosing malaria?	To evaluate CHW performance in conducting RDTs and assess agreement with laboratory personnel.	Cross-sectional evaluation (observational component).	Community health volunteers observed in practice; comparison with tests performed by qualified personnel.	CHWs achieved very high agreement with laboratory personnel ($\kappa \approx 0.89$), with high sensitivity and specificity, suggesting strong diagnostic performance when adequately trained
23	Otambo et al, Kenya[31]	2023	Community case management of malaria in Western Kenya:	To assess CHW performance in active	Cross-sectional community surveys with	CHWs conducting ACD activities and community	CHWs treated RDT-positive febrile cases appropriately and referred RDT-negative cases for further care.

Continued.

S. no.	First author and country	Year	Title	Objectives	Study design	Study population	Results
			performance of community health volunteers in active malaria case surveillance	malaria case detection and management.	active case detection (ACD).	members assessed during surveys.	Performance indicators varied by CHW characteristics (e.g., training/qualification), and referral practices differed by sex in the analysis.
24	Nsibande et al, Ethiopia[32]	2018	Approaches and strategies used in the training and supervision of Health Extension Workers (HEWs) delivering integrated community case management (iCCM) of childhood illness in Ethiopia: a qualitative rapid appraisal	To explore training and supervision strategies for HEWs delivering iCCM.	Qualitative rapid appraisal.	Ministry actors, partners and health workers involved in iCCM implementation.	Training commonly followed a cascade "train-the-trainer" approach supported by implementing partners. Continuous supportive supervision and regular review meetings were described as important for sustaining performance and motivation
25	Owek et al, Kenya[33]	2017	Community perceptions and attitudes on malaria case management and the role of community health workers	To examine community perceptions and attitudes toward CHW-delivered malaria case management.	Qualitative cross-sectional study	Mothers/caregivers of children under five and key community stakeholders	Perceptions were largely positive, emphasizing improved access and appreciation of CHW services and health education. Reported concerns included doubts from some clinicians, confidentiality issues, and mistrust linked to inconsistent messaging
26	Sanou et al, Multicountry[34]	2016	Motivation of Community Health Workers in Diagnosing, Treating, and Referring Sick Young Children in a Multicountry Study	To identify factors influencing CHW motivation and retention in diagnosing, treating and referring sick children.	Mixed-methods multicountry study	CHWs and stakeholders across three countries	Motivation was supported by community recognition and opportunities for training and supervision, whereas insufficient income and workload-especially during peak malaria or agricultural seasons-were major threats to retention.
27	Winn et al, Kenya[35]	2018	Motivation and satisfaction among community health workers administering rapid diagnostic tests for malaria in Western Kenya	To assess motivation and satisfaction among CHWs administering malaria RDTs and identify associated factors	Quantitative study nested within a community-based diagnostic program	CHWs administering RDTs.	CHWs frequently reported strong intrinsic motivation to help their communities, while community misunderstanding of CHW roles and testing was a recurring challenge. Perceived community appreciation was associated with higher satisfaction

Organizational and systemic outcomes

CHW involvement reduced workload in primary health facilities and improved service continuity in remote or insecure settings.[12,16,26] It also strengthened community-based surveillance and reporting.[22,33] While enhancing inter-level coordination through quality improvement teams and formative supervision.[28,32]

Motivation, performance and sustainability outcome

Regular incentives and public recognition increased CHW motivation and retention.[14,17,34,35] Stable incentive schemes reduced attrition while continuous training and supervision sustainably improved clinical skills and quality of care.[17,28,32] Social incentives and community recognition supported sustained performance contributing to equitable care coverage in rural and hard-to-reach areas.[14,26,34,35]

Drivers and obstacles related to the effective integration of community health workers into these programs

Studies highlight multiple factors that influence CHW performance and integration, serving as either facilitators or barriers depending on national resources and governance contexts.

Facilitating factors

Factors facilitating CHWs' integration operate at individual, community, and organizational levels. Intrinsic motivation, driven by community trust and recognition, significantly enhence supports CHW retention and commitment.[34,35]

Continuous training and supportive supervision enhance protocol compliance and skills development.[25,32]

Local recruitment with community leader support strengthens CHW legitimacy and trust.[12,13,33]

Adequate logistics expand coverage, while digital tools improve supervision, data transmission, and team responsiveness.[26,31]

Limiting factors

Several studies report that the lack of formal CHW status and heterogeneous compensation schemes undermine motivation, while reliance on external funding limits program sustainability.[13,17] Supply shortages reduce program credibility, inadequate supervision affects protocol compliance, and volunteer-based models with irregular incentives hinder long-term sustainability.[13,14,21,34]

Outcome of the study quality assessment

Methodological quality was assessed using the MMAT, 2018. The tool evaluated research question clarity, methodological relevance, data quality, bias consideration, and consistency of interpretation across qualitative, quantitative, and mixed-methods studies, rating them as yes, no, or CT. Table 2 summarizes assessments for all 27 included studies.

Table 2: Presentation of the evaluation results with the MMAT.

S. no.	First author and country	Type of study MMAT	S1	S2	C1	C2	C3	C4	C5
1	Druetz et al, Burkina Faso[9]	Non-randomized quantitative (panel)	Yes	Yes	Yes	Yes	CT	Yes	Yes
2	Adeoti et al, Nigeria[10]	Qualitative	Yes	Yes	CT	Yes	CT	Yes	CT
3	Agu et al, Nigeria[11]	Qualitative	Yes	Yes	CT	Yes	CT	Yes	Yes
4	Altaras et al, Ugeta[12]	Qualitative	Yes	Yes	Yes	Yes	Yes	Yes	CT
5	Boakye et al, Kenya[13]	Qualitative	Yes	Yes	Yes	CT	Yes	Yes	CT
6	Chikaphupha et al, Malawi[14]	Qualitative	Yes	Yes	Yes	Yes	Yes	Yes	CT
7	Chilundo et al, Mozambique[15]	Qualitative	Yes	Yes	Yes	Yes	Yes	Yes	CT
8	Chipukuma et al, Zambia[16]	Mixed concomitant	Yes	Yes	Yes	CT	Yes	CT	CT
9	Davis et al, sub-Saharan African[17]	Qualitative	Yes	Yes	Yes	Yes	Yes	Yes	CT
10	Boakye et al, Kenya[18]	Qualitative	Yes	Yes	Yes	Yes	Yes	Yes	CT
11	Strachan et al, Mozambique and Uganda[19]	Qualitative	Yes	Yes	Yes	Yes	Yes	Yes	CT
12	Faye et al, in Benin, Côte d'Ivoire and Mozambique[20]	Qualitative	Yes	Yes	Yes	Yes	CT	Yes	Yes
13	Getachew et al, Ethiopia[21]	Non-randomized quantitative	Yes	Yes	Yes	Yes	CT	Yes	Yes
14	Ishizumi et al, Sierra Leone[22]	Qualitative	Yes	Yes	Yes	Yes	Yes	Yes	CT
15	Jegede et al, Burkina Faso, Nigeria, and Uganda[23]	Qualitative	Yes	Yes	Yes	Yes	Yes	Yes	CT

Continued.

S. no.	First author and country	Type of study MMAT	S1	S2	C1	C2	C3	C4	C5
16	Johansson, sub-Saharan Africa[24]	Mixed	Yes	Yes	Yes	CT	Yes	CT	CT
17	Kaunda-Khangamwa et al, Malawi[25]	Qualitative	Yes	Yes	Yes	Yes	Yes	Yes	CT
18	Larsen et al, Zambia[26]	Non-randomized quantitative	Yes	Yes	Yes	Yes	CT	Yes	Yes
19	Lohfeld et al, Zambia[27]	Qualitative	Yes	Yes	Yes	Yes	Yes	Yes	CT
20	Lokossou et al, Benin[28]	Mixed	Yes	Yes	Yes	Yes	Yes	CT	CT
21	Marita et al, Kenya[29]	Non-randomized quantitative	Yes	Yes	Yes	Yes	Yes	Yes	Yes
22	Marita et al, Kenya[30]	Non-randomized quantitative	Yes	Yes	CT	Yes	CT	Yes	Yes
23	Otambo et al, Kenya[31]	Non-randomized quantitative	Yes	Yes	CT	Yes	CT	Yes	Yes
24	Nsibete et al, Ethiopia[32]	Qualitative	Yes	Yes	Yes	CT	Yes	Yes	CT
25	Owek et al, Kenya[33]	Qualitative	Yes	Yes	Yes	Yes	Yes	Yes	CT
26	Sanou et al, Multicountry[34]	Mixed	Yes	Yes	Yes	CT	Yes	CT	CT
27	Winn et al, Kenya[35]	Non-randomized quantitative	Yes	Yes	CT	Yes	CT	Yes	Yes

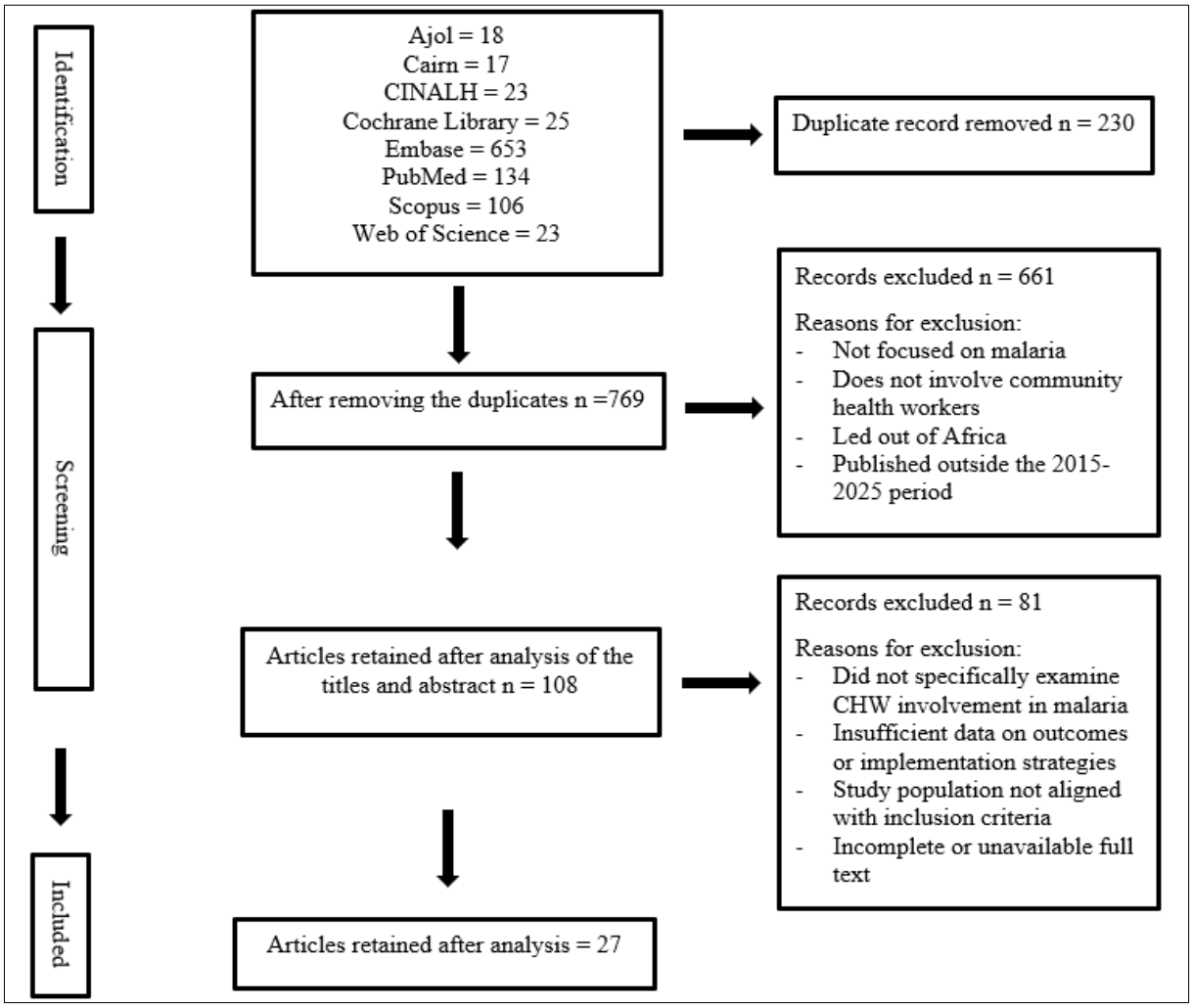

Figure 1: Flow chart for the selection of included studies.

DISCUSSION

Consolidating the results achieved

This systematic review analyzed 27 studies published between 2015 and 2025 examining the involvement of CHWs in VBD control programs in Africa. Most studies, largely conducted in Kenya, focused on malaria control and documented diverse modalities of CHW involvement, their involvement on health outcomes, and the determinants influencing their performance and integration into health systems.

The findings show a strong predominance of interventions centered on integrated community case management (iCCM/CCMm) of malaria following the test–treat–refer approach.[12,32] Overall, results consistently indicate improvements in malaria diagnosis, treatment, and prevention coverage, translating into reduced morbidity and mortality, particularly among children under five. Beyond clinical outcomes, CHW involvement contributed to strengthened trust between communities and health services, improved treatment adherence, and enhanced equity in access to primary care.[10,24] At the organizational level, several studies reported reduced workloads in health facilities, improved community surveillance, and better quality of data reported to health information systems.[26] Facilitating factors included continuous training, supportive supervision, intrinsic motivation, community recognition, and local authority support, while barriers included lack of formal CHW status, dependence on external funding, weak supervision, and shortages of medical inputs, which undermined program sustainability.[17]

Interpretation and implication of the results

Strategies for the involvement of community health workers in vector control programs

In this review, the most frequently reported strategy is the integration of CHWs into integrated malaria case management at the community level, according to the 'test-treat-refer' approach.[32] Evidence shows that CHWs trained in rapid diagnostic testing and ACT treatment protocols provided first-line care within communities, with performance sometimes comparable to frontline healthcare professionals.[10,32] Several factors explain these findings. First, CHWs reside within the communities they serve, often in remote or rural areas where access to health facilities is limited. This geographical proximity reduces delays in care-seeking and allows earlier treatment of febrile episodes, thereby limiting progression to severe disease.[33] Second, CHWs share sociocultural characteristics with the populations they serve, which promotes trust, acceptance of RDTs, and adherence to treatment.[20,23] Finally, simplified clinical algorithms and visual decision-support tools contribute to standardized practices and reduced diagnostic errors.[10,12]

These results are consistent with other research that have reported reductions in child mortality and improvements in equitable access to primary care when CHWs are formally integrated into health systems. Together, these findings confirm that extending community-based care through CHWs is not merely a response to workforce shortages but a strategic approach to improving equity in access to care.[36,37] However, sustainability requires formal inclusion of CHWs in national health policies, standardized and certified training curricula, and regular formative supervision, potentially supported by digital tools.[38]

Outcome attributed to the involvement of community health workers in vector control programs

The included studies indicate that CHW involvement in community malaria management is associated with reductions in severe cases, shorter consultation delays, and, in some contexts, decreased malaria-related mortality.[12] Increases in cases diagnosed and treated at the community level were accompanied by reductions in late presentations to referral health facilities. These improvements are explained by several mechanisms. First, the availability of RDTs and antimalarial treatments at the community level enables immediate care without the financial or transportation barriers associated with facility-based services.[31] Second, CHWs' proximity to households encourages early care-seeking and faster identification of warning signs, particularly among children under five.[33] Third, combining curative care with preventive activities, such as chemoprevention and bed net promotion, contributes to reducing infection and reinfection risks.[20]

Similarly, evidence from Africa and Asia confirms that community-based seasonal malaria chemoprevention reduces febrile episodes when coverage is high and implementation quality is ensured.

From a public health perspective, these results highlight several implications. First, community-based interventions should be considered a core component of national malaria control strategies in settings with limited access to health services. Second, CHW effectiveness depends heavily on the consistent availability of supplies and quality supervision; stock-outs or inadequate oversight can rapidly negate observed gains.[34] Third, sustained reductions in morbidity and mortality require strong functional integration between community-based services and formal health systems.

Beyond clinical outcomes, the improvements in community knowledge and preventive practices are associated with CHWs' involvement. In areas where training and awareness activities were implemented, communities demonstrated improved recognition of danger signs, earlier consultation, and more consistent use of preventive measures such as insecticide-treated nets among vulnerable groups.[39]

These effects are partly explained by CHWs' use of local communication channels, which make health messages more accessible than mass media campaigns, and their ability to adapt messages to local beliefs and cultural contexts. Their regular presence within communities fosters trust and facilitates gradual behavior change.[40]

Consequently, CHWs work not only as service providers but also as social intermediaries between households and health systems, especially in areas where there is mistrust of formal services.

Strengthening their communication skills and including them in national health promotion strategies may further amplify these indirect effects.

Factors influencing the effective involvement of CHWs in vector control programs

The studies analyzed consistently show that CHWs' motivation is a major determinant of their performance and retention.[28] In many settings, CHWs reported being motivated by altruism and recognition from households and local leaders.[14,21,33,34] However, this intrinsic motivation is fragile when financial incentives are irregular, professional status is unclear, and career prospects are absent.[15,23] CHWs often devote significant time to community activities at the expense of income-generating work, creating tensions between voluntary commitment and economic needs. Additionally, assuming substantial responsibilities without formal recognition can lead to symbolic devaluation and reduced long-term engagement. The absence of career progression opportunities further limits long-term retention.

Evidence from program reviews shows that volunteer-based models relying on irregular incentives often experience high dropout rates.[16,23] Conversely, settings where CHWs have official status, regular pay, and clear career pathways report greater stability and performance. These findings suggest that CHW motivation cannot rely solely on community engagement and social recognition, despite their importance. Sustainable vector control programs require hybrid incentive models combining regular financial compensation, social recognition, and opportunities for training and professional development to prevent attrition and preserve program gains.

Limitations

This systematic review has several limitations. Most included investigations were cross-sectional or qualitative, limiting causal inference regarding the relationship between CHW involvement and the study outcomes. The heterogeneity of indicators used to measure performance, motivation, coverage, and quality of care also constrained direct comparisons across studies. Finally, despite efforts to include diverse sources, grey literature and programmatic reports remained underrepresented due to limited accessibility.

CONCLUSION

This systematic review emphasizes the crucial role of CHWs in fighting vector-borne diseases in Africa by improving access to diagnosis, community care, prevention, and local surveillance. Their contribution enhances health equity and continuity of care, especially in rural and hard-to-reach areas. However, their performance is heavily influenced by structural factors such as training, supervision, availability of inputs, motivation, and the institutional framework, which vary depending on the context.

Despite their strategic importance, many challenges remain: shortage of inputs, lack of clear status, irregular incentives, dependence on external funding, and still limited monitoring and evaluation mechanisms.

To better optimize the role of CHWs, more research is needed to thoroughly identify, in our contexts, the factors that influence their effective integration. This work will help develop operational models tailored to local realities and guide policies that are more coherent, sustainable, and responsive to community needs.

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