Community Health Worker Literature Review:

Demand Generation

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PMI | U.S. PRESIDENT'S MALARIA INITIATIVE

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CDC

Breakthrough ACTION FOR SOCIAL & BEHAVIOR CHANGE

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Acronyms

ACT	Artemisinin-based combination therapy
ASHA	Accredited social health activist
CHW	Community health worker
HEW	Health extension worker
iCCM	Integrated community case management
IFAS	Iron and folic acid supplementation
IPC	Interpersonal communication
MeSH	Medical subject heading
MNCH	Maternal, newborn, and child health
PECADOM	Prise en charge à domicile
PMI	US President's Malaria Initiative
PMTCT	Prevention of mother-to-child transmission of HIV
ProACT	Proactive community treatment
ProCCM	Proactive community case management
RDT	Rapid diagnostic test
SBC	Social and behavior change
SMS	Short message service
USAID	US Agency for International Development
WHO	World Health Organization

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Background

Community health workers (CHWs) play essential roles in malaria control, in maternal, neonatal, and child health (MNCH), and in nutrition, particularly in hard-to-reach areas (Perry et al., 2021). They provide social support, important health information, and in some cases, integrated case management and preventive services to their communities. They also play an important role in social and behavior change (SBC) activities that increase the practice and maintenance of healthy behaviors in the communities they serve (Schaaf et al., 2020). Skilled, equipped, and motivated CHWs contribute significantly to the fight against malaria and improve equity in access to health services and information among the most underserved populations.

However, CHWs encounter various challenges in engaging communities and generating demand for their services. Data from Malaria Indicators Surveys published between 2016 and 2021 (see Table 1) show that CHWs provided advice or treatment for only a small percentage of children under the age of 5 with a fever in the two weeks preceding the surveys. Among the 19 surveys containing indicators for CHW service utilization as a source of care-seeking, 8 had a percentage lower than 1%, 10 had a percentage between 1% and 10%, and only the 2017 Rwanda survey had a higher percentage of 32.7%. In addition to Rwanda, three other countries had a percentage over 8%: Togo in 2017 with 9.2%, Uganda in 2018–2019 with 8.4%, and Mali in 2021 with 8.2%. The countries with the lowest percentages (less than 0.3%) included Ghana in 2016 with 0.2% and Kenya in 2020 with 0.1%.

TABLE 1: COMMUNITY HEALTH WORKER SERVICE UTILIZATION DATA FROM MALARIA INDICATORS SURVEYS 2016–2021 IN DESCENDING ORDER

1. Rwanda (2017): 32.7%
2. Togo (2017): 9.2%
3. Uganda (2018-2019): 8.4%
4. Mali (2021): 8.2%
5. Madagascar (2016): 7.0%
6. Sierra Leone (2016): 5.7%
7. Malawi (2017): 5.2%
8. Guinea (2021): 4.9%
9. Papua New Guinea (2019–2020): 4.0%
10. Mozambique (2018): 3.9%
11. Gambia (2017): 1.5%
12. Burkina Faso (2017–2018): 0.8%
13. Liberia (2016): 0.7%
14. Senegal (2020–2021): 0.6%
15. Ghana (2019): 0.4%
16. South Sudan (2017): 0.3%
17. Tanzania (2017): 0.3%
18. Ghana (2016): 0.2%
19. Kenya (2020): 0.1%

Source: https://www.malariasurveys.org/

Not all communities are served by CHWs, and not all CHWs are trained and equipped to provide the same services across countries or regions within a country. Community members with access to CHWs may not fully understand when and where to consult a CHW or the extent of services and advice CHWs offer. Even when this awareness exists, the value of consulting a CHW may not be evident to community members. They may avoid CHWs because they have negative perceptions of the quality of care provided, because they prefer to seek advice from traditional healers, or because they do not see CHWs as an extension of the health system. Strategies for demand generation to increase utilization of CHW

services is an under-investigated area requiring a better understanding of factors influencing the utilization of services provided by CHWs and interventions to increase demand for and utilization of CHW services.

It is also critical to understand factors affecting community perceptions of health services provided by CHWs. For example, client trust in CHWs, which includes health care competence and respectful communication, as well as availability of commodities and perceptions of availability of commodities, are key for improving community health systems' quality and equity (Sripad et al., 2021). In addition, a thorough understanding of behavioral interventions (e.g., community health talks, home visits, community health days) that positively impact interactions between CHWs and the community is needed to strengthen these linkages.

To inform strategic implementation approaches for service delivery and demand generation at the community level, the U.S. President's Malaria Initiative commissioned a literature review. The primary goal of this literature review was to better understand the factors influencing utilization of services provided by CHWs and identify interventions that successfully increased demand for and utilization of CHW services. The Breakthrough ACTION team led the literature review activity in close consultation with the U.S. President's Malaria Initiative staff members.

Objective and Research Questions

The objective of the literature review was to examine the factors influencing the demand for and utilization of CHWs. To that end, we sought to answer the following three research questions:

1. What are the drivers behind community members' awareness and utilization of CHW services?
2. How do availability and quality of service provision by CHWs, in turn, affect demand for services? We approached this question from two perspectives:
    - Objective measures of readiness and quality (e.g., numbers of trained CHWs, stock availability, CHW coverage area)
    - Community perceptions of readiness and quality
3. What are effective behavioral interventions and health system quality-improvement interventions to increase the utilization of CHW services by community members?

Methods

Search strategy

We used several systematic review approaches to ensure the high quality and relevancy of findings, including developing and using extensive search concepts and pre-specified eligibility criteria. Literature was drawn from multiple sources. For peer-reviewed journal articles, we used the bibliographic databases CINAHL, Embase, PsycINFO, and Pubmed. We also searched gray literature, such as technical

and program evaluation reports, using relevant online resource sites, including USAID's Development Experience Clearinghouse, WHO's Institutional Repository for Information Sharing, the Compass for SBC, and the Malaria Evidence Database.

We applied and tested various Boolean operations and medical subject heading (MeSH) to develop the core search strategy (see Annex 1), and adjusted to each source as needed. The search strategy included the following four concepts:

1. Malaria and other related health fields, including MNCH and nutrition
2. CHWs
3. Drivers of CHW utilization (e.g., use, access, care-seeking, and demand for CHW services)
4. Malaria-endemic countries, including Asia, Latin America, the Caribbean, and sub-Saharan Africa

The literature search was conducted in mid-May 2022. The search criteria included papers published since 2010 and written in English. Identified records were then retrieved and organized in a spreadsheet using Microsoft Excel. We also consulted subject matter experts to obtain recently published articles during the drafting of this literature review.

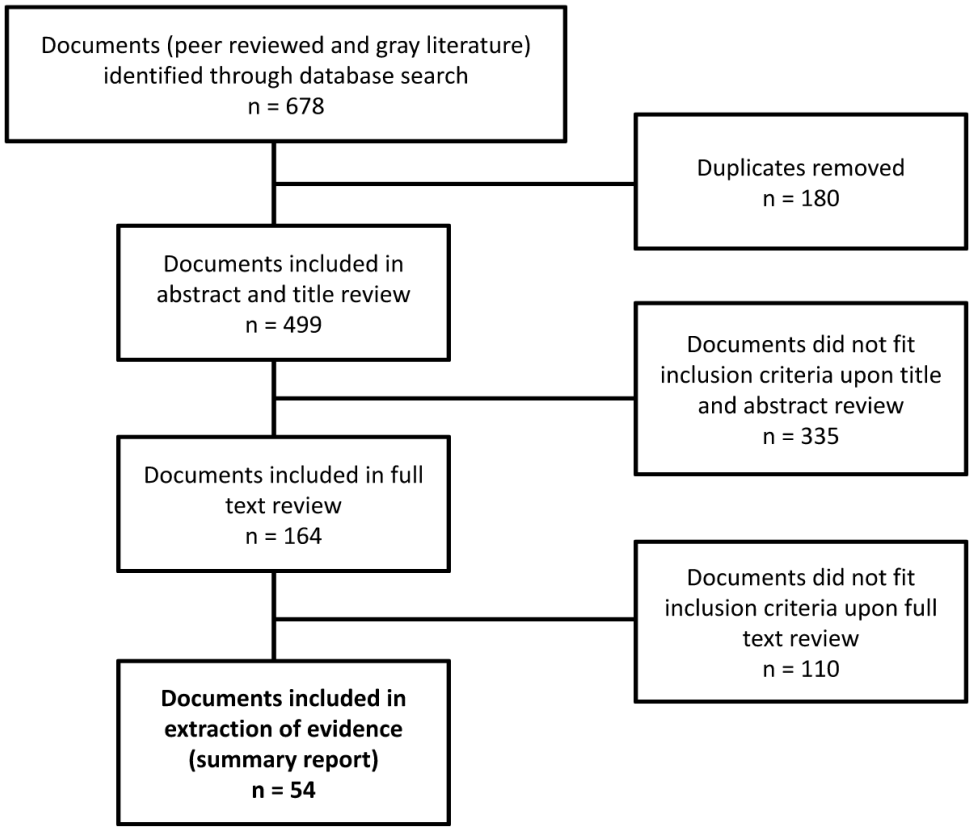
Eligibility criteria

Articles from the databases were screened for inclusion, beginning with the title and abstract.
Articles whose titles or abstracts did not fit the search criteria were removed. In addition, commentaries and opinion papers that did not present any concrete research findings were excluded.
Articles that passed the preliminary title and abstract screening were further screened via a full-text review. Papers were included only if they met the following content requirements:

- Drivers of CHW service utilization and non-utilization, both structural and interpersonal
- Community perceptions and understanding of CHWs and their services, available commodities, and quality of care
- Structural factors affecting availability and access to CHW services
- Effective behavioral interventions and health system quality-improvement interventions to increase the utilization of CHW services by community members

Out of 678 identified documents, 54 met the criteria for analysis. Figure 1 illustrates the search and selection process.

Figure 1: Document Flow Diagram



Analysis and synthesis

To analyze trends, we coded each selected article into various categories:

- Project/activity location
- Intervention focus
- Study methods and approaches
- Outcome of interests
- Drivers of utilization and non-utilization of CHWs
- Inclusion of an intervention intended to improve the outcomes of interest

We then organized excerpts from the papers into a document to synthesize notable themes manually.

Results

Description of papers reviewed and included

In this section, we describe the characteristics and trends observed in the 54 papers reviewed and included in the literature review. See the article characteristics tables in Annex 2 for more details.

Document types

The data presented in this report came from published peer-reviewed articles (n=51) and USAID program implementation evaluation reports (n=3). Publication dates ranged from 2010 to 2022. Most content was published from 2014 to 2020, with the most publications in 2018 (n=8), followed by 2016 (n=6).

Intervention focus

Out of 54 included papers, 36 (66%) examined interventions related to malaria care and treatment as part of the whole CHW service package: 17 assessed integrated community case management (iCCM), 15 looked at malaria case management, and 4 evaluated proactive community case management (ProCCM). Other articles examined related health topics such as MNCH (n=17) and nutrition (n=1).

Geographic focus

A variety of countries and regions were represented in our sample literature. Nearly all (n=53) articles focused on one country, with only one covering two countries. The most frequently mentioned countries were Ethiopia (n=9) and Kenya (n=6), followed by Uganda (n=4). The remaining countries (in alphabetical order by region below) were included in fewer than four studies.

- Sub-Saharan Africa: Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Gambia, Ghana, Madagascar, Mali, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, and Zambia
- Asia/Oceania: Cambodia, Nepal, Papua New Guinea, Philippines, and Vietnam
- Latin America and the Caribbean: Peru

Research methods

Most papers in our sample used qualitative methods (n=21), quantitative (n=18), or mixed methods (n=15). The most commonly used qualitative data collection tools were in-depth interviews and focus group discussions. In contrast, quantitative studies covered a wide variety of data collection methods. A descriptive method was most common (i.e., cross-sectional household surveys or national surveys). Other quantitative methods included cluster-randomized controlled trials, quasi-experimental study, panel study, interrupted time series analysis, and monitoring data derived from home visits, health screening, or service statistics. Many mixed-methods studies combined interviews and focus group discussions with a cross-sectional household survey.

CHW terminology

CHWs are generally defined as "paraprofessionals or lay individuals with an in-depth understanding of the community culture and language [who] have received standardized job-related training of a shorter duration than health professionals, and their primary goal is to provide culturally appropriate health services to the community" (Olaniran et al., 2017, p. 1). This definition was helpful as the common understanding of CHWs in our literature review. However, various terms were used by different papers, often in accordance with the country's own nomenclature.

In many included documents (n=29), "CHW" was the most common term, though most papers did not provide specific definitions or categorizations. A few articles described CHWs as "trained and supervised" or "both full-time and part-time" health workers in the community. Similar terms included "community health volunteer" (n=3), "community health research worker" (n=1), and "female community health volunteer" (n=1). Other variations included "community volunteer" (n=1) and "community-oriented resource person" (n=1). Articles about Ethiopia commonly used "health extension workers (HEWs)" (n=8), and those about India highlighted "accredited social health activist (ASHA)" (n=2) as an equivalent to CHW. Other terms included "village health worker" (n=4), "village health volunteer" (n=1), and "village malaria worker" (n=1). Others included lay health worker (n=1) and relais communautaire (n=1, French version).

Outcome measures and determinants

Out of 54 included documents, most of them (n=25) focused on aspects of CHW service utilization and measured them as intervention outcomes (research question 1). Specifically, the utilization level broadly encompassed multiple categories, including acceptability (perception of acceptance), acceptance (the act of acceptance), access, and use of CHW services for prevention, screening/testing, care, and treatment of illnesses, as well as increases in health knowledge or adoption of health practices promoted by CHWs. Along with CHW service utilization, many studies included additional outcome measures, such as satisfaction with or perceptions of CHWs' performance and service provision quality. Specifically, many formative assessments examined perceptions of CHW services, highlighting key determinants of CHW service utilization and non-utilization, as well as structural, individual, and community demand-side barriers to quality of care and utilization of services.

Nine articles examined various factors associated with "service demand" as outcome measures (research question 2). The demand for CHW services was often used interchangeably with "care-seeking" or "treatment-seeking" behaviors among health service clients, caregivers, and communities. Ten articles provided examples of interventions to increase utilization of CHW services (research question 3). The remaining ten articles focused on two research questions (three on questions 1 and 2 and seven on questions 1 and 3).

Research question 1: What are the factors behind community members' awareness and utilization of CHW services?

The first research question aimed to address factors associated with community members' awareness and utilization of CHW services. Such factors could be facilitators or barriers involving interpersonal and structural elements.

1.1 Interpersonal factors

Our literature review revealed various interpersonal factors that could be facilitators or barriers to CHW service utilization. These factors mainly related to attitudes and feelings (knowledge and awareness,

family and community support, prior choice of other health services) among health clients, primary caregivers, community members, and CHWs themselves.

1.1.1 Attitudes and feelings

Facilitators

At least 14 studies indicated positive attitudes and feelings toward CHWs, such as trust, appreciation, and satisfaction, as facilitators of increased utilization of services provided by CHWs. **Trust** emerged as a critical factor in facilitating CHW service acceptance and utilization. Caregivers who sought care from CHWs instead of facility-based providers in Nigeria, Ghana, and Uganda had positive views of CHWs and a high level of trust in CHWs providing quality service (Al-Mujtaba et al., 2020; Antwi et al., 2016; Mazzi et al., 2019; Oresanya et al., 2019). In Uganda, improved trust and acceptability of CHWs could contribute to utilization of their services and ultimately improve health outcomes (Singh et al., 2015).

In general, **appreciation** of CHWs' work and **satisfaction** with their services (e.g., prompt treatment, counseling on medication adherence, friendliness) could influence community acceptance and utilization of CHW services (Abbey et al., 2015; Dynes et al., 2011; Gebretsadik et al., 2020; USAID/Madagascar, 2014). For example, women who appreciated the behavior of CHWs in Madagascar were 29.2% more likely to use their services, compared to women who reported negative CHW social behaviors (USAID/Madagascar, 2014). In Bangladesh and Uganda, community members often witnessed CHWs' commitment and dedication, and as a result, their positive feelings toward and relationships with CHWs improved (Dynes et al., 2011; Gilmore et al., 2014).

Although many studies' findings supported these trends, they were not universal. For example, according to one study in Uganda, higher satisfaction with CHWs' overall abilities, compared to health facilities, did not always affect service utilization (Miller et al., 2021). Only 60% of respondents rated their most recent episode of iCCM care as "very good" or "excellent," yet 97% planned to seek iCCM care in the future, and over 90% showed confidence in CHWs' abilities across all domains. As the authors noted, the "discrepancy could suggest that respondents were only somewhat satisfied with iCCM care but still preferred it to facility-based care or may reflect an issue with item validity or social desirability bias" (Miller et al., 2021, p. 4).

CHWs also played pivotal roles as "health diplomats." In one study in The Gambia, CHWs served a medical as well as political role in a trial aimed at treating malaria index cases and asymptomatic compound members. CHWs were selected as trial implementers by the community because they were highly regarded as health diplomats with social and political status and trust within the community. The trial indicated that when CHWs were supported in medical, social, and political roles, CHWs were likely to have improved performance, resulting in increased community participation. Findings showed increased CHW utilization, with the percentage of community members answering that they visit a CHW when ill increasing from 40% to 64% (Masunaga et al., 2022).

Several other factors regarding CHWs' **close relationships** with community members, caregivers, and health clients influenced trust in CHWs. For example, studies in Kenya and India found trust, satisfaction,

and positive relationships could be built and strengthened if CHWs **lived in the community** they served and made their services readily available (Shaw et al., 2016a; Taneja et al., 2018). In Nigeria, in addition to **ease of access**, when CHWs were **members of their communities**, patients and caregivers could easily relate to and confide in them (Al-Mujtaba et al., 2020). Finally, in the Philippines, familiarity and trust with CHWs could increase when CHWs stayed in the community and treated people for **many years** (Matsumoto-Takahashi et al., 2021).

Other papers focused on how health service clients and primary caregivers **positively perceived CHWs' behaviors**. For example, in Ethiopia, people were more likely to seek care from CHWs if they showed **compassion**, **empathy**, or **respect** and provided patient-centered services (Higi et al., 2021). In Peru, CHWs who created a warm, understanding, and cooperative atmosphere during home visits were regarded as most effective at delivering health services (Westgard et al., 2018). In Kenya, CHWs were rated more highly than facility-based health workers in communicating with caregivers and establishing trust, and caregivers answered positively when asked about CHWs' **integrity**, **friendliness**, and **support in decision-making** (Shaw et al., 2016a).

At least nine studies examined the link between service utilization and **CHWs' perceived skills, knowledge, and experience** affecting the quality of care and services. In Kenya, caregivers accepted and utilized CHW services when they felt CHWs provided **adequate-quality care** in clinical aspects, in addition to high-quality care in the relationship with their patients by being accessible to them (Shaw et al., 2016a). In addition to CHWs' service quality, their **length of experience**, as most CHWs are known community members, was an essential determinant of caregivers' utilization of CHW services (Hasegawa et al., 2013). In Cambodia, Hasegawa et al. (2013) found that caregivers whose CHWs demonstrated higher service quality were twice as likely to use CHW services than caregivers whose CHWs demonstrated lower service quality (adjusted odds ratio=2.04, p=.046). In their study, CHW service quality was measured using five items: active detection of malaria, diagnosis and treatment, perception of antimalarials, follow-up, and dissemination of preventive measures.

In India, **formal qualification** of CHWs could influence the community's perception of service quality, for example, by having the government certify and promote CHWs; however, government endorsement may not work well in communities with high mistrust of health systems (Taneja et al., 2018). In Sierra Leone, when caregivers reported poor service quality as a barrier to care-seeking at health facilities, they were more likely to seek and receive treatment from a CHW as an alternative and preferred choice for their children (Yansaneh et al., 2016).

One study in Uganda illustrated how CHWs' **increased self-confidence** affected communities' confidence in their service and ultimately increased service utilization. The authors observed that CHWs often did not trust their abilities and worried about not meeting community members' expectations. However, interactions with the community such as early community engagement and non-threatening (to the caregivers) home visits, that created a supportive environment for friendship and supervision, improved CHWs' confidence, ultimately improving community members' trust and acceptance of the

CHWs and their willingness to follow the guidance provided by CHWs during CHW home visits (Singh et al., 2015).

Barriers

In contrast, according to at least seven studies, people did not seek health services from CHWs when they did not trust them. **Poor confidentiality and lack of trust** were identified as key barriers to CHW acceptability in delivering health services; specifically, mistrust increased when community members noticed a lack of professionalism and an inability to maintain privacy and confidentiality (Grant et al., 2017; Mazzi et al., 2019; Oresanya et al., 2019). In Uganda and Ethiopia, **fears of stigma, perceptions of low-quality or inequitable care** (e.g., inequitable participation and inactivity of mothers groups), and **dissatisfaction with CHW services** were associated with decreased utilization of CHW services (Mazzi et al., 2019; Tefera et al., 2014). In Madagascar, it was found that **any pre-existing interpersonal problems** between caregivers/caretakers and CHWs negatively influenced the use of CHW services (USAID/Madagascar, 2014).

1.1.2 Knowledge and awareness

Facilitators

At least 13 studies examined components of knowledge and awareness among health clients and primary caregivers. For example, to utilize CHW services, clients and caregivers had to be aware of **health danger signs and illnesses**, the **importance of health care**, and **the availability and benefit of services** provided by CHWs (Higi et al., 2021; Oresanya et al., 2019).

Barriers

Alternatively, a **lack of knowledge and awareness** of factors such as health signs and symptoms, the importance of care-seeking, and the availability of health services negatively affected CHW service-seeking behaviors among clients and caregivers and prevented people from getting prompt and appropriate health care and treatment. Some **results in knowledge and awareness** of CHW services, health and danger signs, the importance of health care, best practices, and so on indicated they were barriers in some cases and facilitators in others. For example, according to a project evaluation in Madagascar, caregivers who were sensitized about childhood illnesses and the role of CHWs were more likely to take their children to CHWs for medical examination, compared to caregivers who had not heard or received sensitization messages. However, the evaluation also reported that caregivers with good knowledge of their children's illness were 7% less likely to utilize CHW services. The evaluation concluded that knowledge could be associated with self-medication or self-treatment or that caregivers may seek facility-based rather than CHW services because of perceived seriousness of a disease (USAID/Madagascar, 2014).

1.1.3 Family and community support

Facilitators

At least eight studies identified facilitators encompassing awareness and behavior at the community and household levels that substantially contributed to service utilization. For example, in Ethiopia, clients

utilized health services, including CHW services, when their partners, families, and communities supported them in doing so (Higi et al., 2021). A program evaluation in Madagascar found the existence of any form of social support, including financial support from relatives and neighbors or common activities among villagers, resulted in higher utilization of CHW services (USAID/Madagascar, 2014). In Sierra Leone, female-headed households were more likely to consider the CHW an important source of care for children and to have a higher CHW utilization rate, highlighting a notable family and gender-related factor (Yansaneh et al., 2016).

Barriers

Influential family members (e.g., husband or mother-in-law) could contribute to low utilization of services. In India, for example, some influential and elderly family members were found to not support or allow CHW care-seeking among pregnant women regarding delivery care because of negative perceptions of services provided by both CHWs and health facilities; they instead encouraged the use of traditional care (home-based childbirth) (Gupta et al., 2018).

1.1.4 Prior choice of other health services

Facilitators

According to a project evaluation in Madagascar, when CHW services became available, the likelihood of choosing CHWs over a previous service choice was higher among caregivers who previously used public, lower-level health centers or another formal health facility, compared to those who used traditional medicine (USAID/Madagascar, 2014). In contrast, in Benin, another project evaluation indicated that those who previously did not use clinical care services and relied instead on self-medication or traditional healers opted to receive treatments from CHWs when such services became available (USAID/Benin, 2012).

1.2 Structural factors

Our literature review revealed some structural factors in remote and hard-to-reach communities affecting community members' awareness and utilization of CHW services. These factors included distance to CHWs or health facilities, access to infrastructures and related services (e.g., telephone and transportation), and overall income and size of communities. In India, for example, a lack of trust in health providers, including CHWs, often involved factors other than interpersonal aspects, such as previous experience of drug side effects, suspicion about drug quality, and drug stock-outs (Das & Ravindran, 2010).

Facilitators

At least 10 studies explored the linkage between distance and utilization of CHWs. The closer health clients and primary caregivers were to CHWs, the more likely they were to use them, indicating the need for CHWs to be conveniently located to enable easy access (Druetz et al., 2015; Mazzi et al., 2019; Mukanga et al., 2012). In Uganda, CHW services were 81% less likely to be utilized if a household was 1–3 km away from a CHW, compared to those residing within 1 km (Mukanga et al., 2012). Similarly, another study in Uganda by Mazzi et al. (2019) found that households were more likely to utilize CHW

services when they were less than 3 km from a CHW, compared to households more than 3 km from a CHW (adjusted odds ratio=2.1, 95% confidence interval=1.5–4.6, p=.02).

In addition to the distance to the nearest CHW post, distance to the health facility also influenced CHW service utilization. Clients and caregivers who were close (e.g., within a kilometer) to a health facility were less likely to utilize CHWs, compared to those who resided farther away (Mukanga et al., 2012; USAID/Madagascar, 2014). According to Mukanga et al.'s (2012) study in Uganda, households between 1–3 km of a health facility were 72% more likely to utilize CHW services, compared to households within 1 km. In Burkina Faso, household distance to the nearest health center and probability of CHW utilization were significantly associated, with up to 28% of households located more than 5 km from a health center utilizing CHWs (Druetz et al., 2015). In Madagascar, 25% of caretakers within a 30-minute walk to a health facility sought care from a CHW, compared to nearly 39% within a 30–60 minute walk and nearly 45% located more than an hour's walk from a health facility (USAID/Madagascar, 2014). Overall, those living in hard-to-reach communities with no nearby health facilities were more likely to use CHW services over health facility services, as long as CHWs were available and easily accessible. In Ethiopia, in addition to location of and distance to CHWs, availability and access to infrastructures such as telephone services, transportation services, and solar energy systems encouraged utilization of CHWs, who could help link those in critical conditions to other services, such as ambulances and referrals (Higi et al., 2021).

According to one study in Kenya on income and village size, **poverty** affected how people sought CHW services. Specifically, the poorest and poor households showed higher utilization of CHWs, compared to the least poor households, highlighting the limited access of poor households to cost-sharing services practiced at health facilities. The same study found that households in villages with fewer than 200 households had higher CHW utilization rates than those in villages with more than 200 households. As one CHW was allocated per village (each ranging from 23 to 690 households), the findings suggested that CHWs were more highly utilized when they received fewer households (Kisia et al., 2012). Similarly, a project evaluation in Madagascar indicated a tendency for households to reduce their use of CHW services as their revenue improved (USAID/Madagascar, 2014).

Barriers

In addition to distance and location, the utilization of health services, including CHW services, could also be negatively affected by **topographical difficulties, seasonal conditions, and road problems**, which are typical challenges in hard-to-reach communities. In Ethiopia for example, even if CHWs based in health posts could offer free, high-quality services close to rural households, caregivers still faced geographical barriers such as hills, forests, rivers, and poorly maintained paths, all of which become more difficult during rainy and wet seasons (Shaw et al., 2017). Caregivers also noted CHWs' usual unavailability, especially during nights and weekends when urgent treatment might be sought (Shaw et al., 2017). Lack of availability and access to telephone services, transportation, and solar energy systems were identified as barriers (Higi et al., 2021; Shaw et al., 2017). Finally, a study by Puett et al. (2015) found that **community poverty** in Bangladesh constrained utilization and effectiveness of CHW services and

adoption of CHWs' advice and recommended practices among caregivers and families of young children due to limited resources of appropriate foods and medicines.

1.3 Other factors

In addition to both interpersonal and structural factors, eight studies identified other factors that could affect utilization of CHW services, including illness type, implementation stage (i.e., scale-up of a pilot or initial activity), implementation approach (i.e., proactive or passive), and program component (e.g., communication or education activity).

1.3.1 Illness types

One study in Kenya assessed utilization predictors of community health services for children under five (Rogers et al., 2022). Although the study suggested that trained and motivated CHWs may be effective in improving care utilization, overall **predictors of care utilization** depended on the symptoms presented. Specifically, positive associations were found between increased care utilization at the community level for children with fever and male partner attendance at antenatal care visits; as well as between care utilization for respiratory symptoms and caregiver education while negatively associated with larger household size; and between care utilization for diarrhea and having a recent under-five death in the household (Rogers et al., 2022). The ability to identify warning signs was negatively associated with care-seeking, which according to the authors, aligned with other studies showing that fever education reduces clinic visits and increases caretaker confidence in their ability to manage fever at home (Rogers et al., 2022).

Similarly, a USAID/Madagascar (2014) project evaluation showed caretaker knowledge of a child's illness resulted in a 7% lower probability of using the service of CHWs, indicating that knowledge could influence the caretaker to visit a health center, rather than a CHW, especially if caretakers had little confidence in the CHW based on perceived seriousness of a suspected illness or if they medicated their child at home. Moreover, caregivers were more inclined to go to a CHW for malaria than for diarrhea or acute respiratory illness, regardless of the availability of specific treatments (USAID/Madagascar, 2014).

1.3.2 Implementation stages (pilot vs. scale-up)

One study in Burkina Faso explored the effectiveness of scaling up community case management to new areas, including urban and rural areas, and identified several factors explaining why CHWs were rarely used in new locations. According to the study, "issues of **implementation fidelity**, a lack of **adaptation to the local context**, and problems of **acceptability and feasibility** might have undermined the effectiveness of community case management of malaria" (Druetz et al., 2015, p. 1). Even in rural areas, treatment coverage by CHWs was considerably less than previously seen in other trials and pilot projects, confirming the need to evaluate public health interventions under real-world implementation conditions (Druetz et al., 2015).

1.3.3 Implementation approaches (proactive vs. passive)

Studies examining **ProCCM** (e.g., CHWs actively visiting households to find cases) of malaria and common childhood illnesses in Benin, Senegal, and Mali found that the proactive approach might be more effective at increasing CHW utilization than the conventional community-based approach, which requires clients to seek care. ProCCM could increase community access to prompt case detection and treatment, consequently reducing disease progression and mortality (Awide, 2019; Gaye et al., 2020; Johnson et al., 2018).

According to the ProCCM study in Senegal, frequent household visits that proactively offered community case management to those with symptoms were feasible, well-accepted by communities, increased community engagement, and increased the number of patients treated by CHWs (Gaye et al., 2020). This proactive approach was also associated with a decrease in the proportion of community members infected with malaria (Gaye et al., 2020). In the study in Mali, conducted seven years following the launch of a ProCCM model, the intervention areas had an under-five mortality rate of 7/1000 and sustained the lowest rate of under-five mortality in sub-Saharan Africa (Johnson et al., 2018).

1.3.4 Intervention components

CHW interventions, including the ones with proactive approaches, were typically complex with multiple components. Therefore, evidence was insufficient to conclude any isolated effect of a particular intervention. At a minimum, the studies included health promotion, whether explicitly described in the intervention description or not, as a standard component of most CHW packages, as well as education messaging by CHWs at home visits (Dicarlo et al., 2018; Langston et al., 2014; Westgard et al., 2018).

According to one study of the iCCM program in Ghana, having a complementary communication component and disseminating information among target audiences increased utilization of CHW services. Caregivers exposed to the communication intervention were more likely to use CHW services. In addition, using a multimedia approach (e.g., a locally produced video using community members as actors promoting prompt and appropriate care seeking for childhood illnesses) was associated with increased awareness, leading to increased utilization of CHW services (Abbey et al., 2015).

Research question 2: How do availability and quality of service provision by CHWs, in turn, affect demand for services?

The second research question aimed to examine how availability and quality of service provision by CHWs affect demand for CHW services and care- or treatment-seeking behaviors. Service availability and quality were grouped into two broad categories: 1) objective measures of readiness and quality and 2) community perceptions of quality of care.

2.1 Objective measures of readiness and quality

Objective measures used by at least 34 studies included the performance of CHWs as affected by various factors, including training opportunities, quality improvement systems, peer support, and social capital.

In addition, the availability of commodities and services greatly influenced community demand for CHW services.

2.1.1 Improved CHW performance

One study in Rwanda highlighted care-seeking as an outcome of an iCCM project that involved **training of CHWs** on providing household-level health promotion and brought about supervision and reporting mechanisms through CHW **peer support groups** and **quality improvement systems**. This iCCM model resulted in greater improvements in care-seeking than in the rest of the country. Care-seeking from any CHW for fever, diarrhea, or acute respiratory infection or for all three conditions combined increased significantly in the project districts, suggesting that the peer support group model was a valuable sub-level of CHW organization dealt without difficulty and associated with improved CHW performance, supervision, and increased **social capital**. The peer support group model addressed CHW performance factors such as their productivity, reporting, motivation, and coordination (Langston et al., 2014).

Another study in Tanzania explored the acceptability of CHWs administering rapid diagnostic tests (RDTs) and reported a high readiness to accept malaria RDTs among primary caregivers. In particular, the community in this study applied a "seeing is believing" approach. They accepted RDTs after hearing from other community members that CHWs administering the tests **attended training** at district headquarters (and later at local health facilities) or after a direct encounter during practical training at a nearby dispensary or health center. Specifically, community attitudes towards CHWs changed if, before the CHWs started administering RDTs in the villages, members learned that CHWs had attended training and had experiences with CHW services during practical training at local health facilities (Mushi et al., 2016).

Another study, which analyzed health trends in Zambia before and after training CHWs on conducting community case management and reactive case detection to test and treat malaria cases, recorded an increase in confirmed malaria infections after the training. Specifically, an approximate 50% increase in monthly reported malaria infections was found when CHWs administered malaria tests and provided treatment to the community. This increase was likely connected to an improvement in malaria surveillance and access to case management, rather than an increase in malaria transmission, as test positivity rates did not appear to increase during the analysis period (Larsen et al., 2017).

Additionally, one study in Papua New Guinea examined the association between the **social capital** of CHWs and the likelihood of caregivers bringing their children with fever to CHWs (Inoue et al., 2017). In this study, caregivers were more likely to seek CHW services when they lived in a village whose CHWs often talked about their activities with people having positions and roles outside their village. In other words, CHW's social interactions with people outside the village were seen to benefit village residents more than their social interactions inside the village, perhaps because the external relationships signaled the CHWs' skills and experiences, which might be linked to community members' perceptions of CHWs' reliability and trustworthiness.

2.1.2 Availability of commodities and effective treatment

Having the necessary commodities (e.g., **test kits** and **drugs**) and the skills to properly administer them were factors associated with increased CHW care-seeking, service demand, and proper case detection in communities. For example, in one article on iCCM in Zambia, for children who presented with fast or difficult breathing, an increase in care sought from CHWs was noted only in the intervention area where CHWs received training and were supplied with amoxicillin to treat non-severe pneumonia and RDTs to diagnose malaria. In the other intervention area, where CHWs were trained to provide malaria medication to all children with fever and refer children with non-severe pneumonia signs or symptoms to the nearest health facility, no increase was observed. However, the authors noted this could be due to fewer reports of breathing issues during the post-intervention (rainy) period than in the baseline (cold and dry) period (Seidenberg et al., 2012).

In contrast, testing kit and drug stockouts were major risks for sustainability of community-level interventions. Even if CHWs were motivated to provide high-quality services, repeated stockouts could negatively influence the demand for community-based health care (Tine et al., 2013; USAID/Madagascar, 2014).

2.2 Community perception of (or actual) quality of care

This literature review explored health clients' and caregivers' perceptions of the quality of care and availability of CHW services that influenced their care-seeking behaviors and service demand. For example, the USAID/Benin (2012) project evaluated how mothers **perceived** CHWs' quality of care and found that compared to mothers in control areas, where there was little training and limited supervision, mothers in intervention areas, where CHWs were trained and supervised on the correct treatment, had significantly more positive perceptions about community health knowledge and health-seeking. Similarly, according to a study in Côte d'Ivoire, the strongest factors that were positively associated with proper care-seeking from a CHW for a child with fever included the caregivers' perception that prompt care-seeking for fever was the norm and that CHWs were good at treating malaria in children, as well as the positive attitudes towards prompt care-seeking (Kamara et al., 2019).

Negative perceptions were often observed among people who did not use CHW services, suggesting that a lack of actual interactions with CHWs could adversely influence perceptions and service demand among community members (and vice versa). In Ethiopia, for example, among caregivers who did not use CHW services, most reported CHWs were frequently absent from the health post or had unpredictable availability (Shaw et al., 2016b; Shaw et al., 2015). In addition, Paudel et al. (2021) compared full-time, paid CHWs with volunteers in Cambodia and Vietnam and found that those who volunteered their services "often juggled service provision with paid employment and could be perceived as an unreliable service option due to unavailability in remote areas" (p. 11). CHWs were not usually the first point of care in such settings.

Research question 3: What are effective behavioral interventions and health system quality-improvement interventions to increase the utilization of CHW services by community members?

The third question aimed to identify effective behavioral interventions and health system quality improvements to increase utilization of CHW services by community members. Successful interventions typically included both behavioral and health system components, though some studies or interventions highlighted in this section focused on a single component.

3.1 Effects of integrated and comprehensive approaches

Behavioral and health system quality improvement interventions effectively increased community members' utilization of CHW services in many cases. In various programs aimed at strengthening CHW services, both interventions were implemented as part of a comprehensive program. In particular, recent iCCM projects demonstrated programmatic cases effectively using multiple strategies to attain desired outcomes. In this section, we discuss six examples, including four iCCM programs (three focused on introducing iCCM and one on revitalizing iCCM), one nutrition program, and one antenatal care program.

Each intervention applied a unique combination of approaches. The behavioral interventions typically addressed both individual-level (e.g., counseling, household visits) and community-level (e.g., festivals, mass media campaigns) efforts. Training of CHWs and community leaders on the effective use of behavior change communication materials was highlighted as a critical component of behavioral interventions. The health system quality improvement interventions involved providing training and integrating supportive supervision of CHWs by facility-based staff members (e.g., nurses).

1) The iCCM program in Ethiopia (Gebremedhin et al., 2020)

In Ethiopia, a 2-year iCCM intervention focused on revitalizing a program that had produced limited changes, in part due to limited coverage, resource shortages, and worker turnover. The intervention resulted in a significantly positive shift (Gebremedhin et al., 2020). Care-seeking from CHWs providing iCCM services at health posts increased by 17.4 percentage points from a baseline level of 34.1% ($p<.001$). In comparison, care sought from health centers ($p=.420$) and public hospitals ($p=.129$) did not meaningfully shift, and the proportions of caregivers who visited private ($p=.003$) and informal providers ($p<.001$) declined. Caregivers who visited health posts for diarrhea (19.2 percentage points, $p<.001$), fever (15.5 percentage points, $p<.001$), cough (17.8 percentage points, $p<.001$), and cough with respiratory difficulty (17.3 percentage points, $p=.038$) significantly increased. After accounting for extraneous variables, the study observed that care-seeking from iCCM providers nearly doubled (adjusted odds ratio = 2.32: 95% confidence interval 1.88–2.86) over the period. Behavioral interventions included multiple rounds of **community festivals** for iCCM demand creation, conducted quarterly. Additionally, the festivals were used as an opportunity to motivate community-level iCCM actors. The interventions focused on health system quality improvements incorporating **training of CHWs and community leaders** on common childhood illnesses and danger signs and **training of CHW**

supervisors on supportive supervision and mentoring skills to ensure improved and prompt referral to health facilities and adequate pre-referral care as needed.

2) The nutrition program in Kenya aimed at iron and folic acid supplementation (IFAS) for pregnant women (Kamau, 2020)

In Kenya, a nutrition program using CHWs to implement a community-based approach for IFAS successfully increased supplement awareness and utilization. According to a qualitative study by Kamau (2020), the 19 program participants composed of CHWs, nurses, and pregnant women reported increased access and use of both IFAS and antenatal services, leading to a perceived reduction in anemia and better pregnancy outcomes. **Counseling** provided by CHWs improved IFAS knowledge and adherence among pregnant women. The nurses in charge of antenatal clinics were also trained on **supportive supervision** skills to provide such support for CHWs. The increased IFAS utilization led to a main challenge, IFAS stock-outs. All participants agreed on the complementing of the antenatal IFAS distribution with a community-based approach to promote IFAS. For behavioral interventions, CHWs were trained and provided with **information, education, and communication materials,** including **counseling guides, posters, and leaflets**. The CHWs followed up with pregnant women on a weekly basis in their homes, which increased acceptance and uptake of IFAS.

3) The iCCM program in Nigeria (Oresanya et al., 2019)

The introduction of iCCM with demand creation and quality improvement activities improved access to quality life-saving interventions from CHWs in Nigeria (Oresanya et al., 2019). Care-seeking from CHWs increased overall and for each iCCM illness. More specifically, care-seeking from a CHW increased from 78% to 94% for children with fever ($p<.01$), from 72% to 91% for diarrhea cases ($p<.01$), and from 76% to 89% for cases of cough with difficult or fast breathing ($p<.05$). At endline, most caregivers seeking care for childhood illnesses sought a CHW in their communities (84%), rather than a hospital provider (1%) or health center (9%). This finding aligns with the observations that caregivers believed CHWs were trusted providers (94%) who provided quality services (96%). The program included **iCCM and supervision training; equipping** CHWs with respiratory timers, malaria RDTs, medications, and reporting tools; **and ongoing support and supervision of CHWs** to provide iCCM services to their communities in six local government areas. Demand creation activities included **community dialogues, household mobilization, sensitization, and mass media campaigns** for program communities.

4) The iCCM program in India focused on implementation research (Taneja et al., 2018)

Taneja et al. (2018) conducted implementation research on iCCM in India and concluded that trained CHWs (i.e., ASHAs) could effectively treat uncomplicated childhood illnesses and were accepted by the community in this role. Specifically, according to the focus group discussions and in-depth interviews documenting perceptions about CHWs as treatment providers, caregivers considered them easily accessible and attractive sources for treatment in the community. In addition, cross-sectional surveys documented 2-week prevalence of illness and care-seeking practices at baseline and endline and found that one third of pneumonia and one quarter of diarrhea cases at endline were treated by CHWs. The proportions of households that sought care from private providers (mostly unqualified) reduced significantly from baseline to endline (81%–56% for diarrhea, $p<.01$; 78%–48% for pneumonia, $p<.01$).

Community awareness and activities to demand generation of CHW services included **announcements, pamphlets, and posters**. **Supplies of medicines** provided to CHWs and their **supervision** were maintained throughout the 10-month implementation period.

5) The antenatal care program in Rwanda (Ruton et al., 2018)

Using interrupted time series analysis and monthly data routinely reported by public health centers (n=461) between 2012 and 2016, Ruton et al. (2018) examined the impact of **short message service (SMS) messages** on four indicators: completion of four antenatal care visits, deliveries in a health facility, postnatal care visits, and malnutrition screening. More than 45,000 CHWs sent nearly 9.4 million unique SMS messages using RapidSMS, an average of 205 per CHW (median: 166, interquartile range: 110–253). RapidSMS messages provided information to over 2.5 million mothers, suggesting the program was successfully implemented. Combined with additional support of CHWs including **training**, **supervision**, and **equipment provision**, SMS messages increased the use of CHW-provided maternal and child health services. For example, in supported districts, the study found that the RapidSMS program with support of CHWs (as outlined above) was associated with an increase of 0.11 prenatal care visits per 1,000 catchment population (95% confidence interval: 0.033–0.179, p=.007). In contrast, implementing the RapidSMS system without additional support was ineffective, suggesting that mHealth (mobile health) programs without the necessary equipment and health system capacity might be insufficient to increase use of health services.

6) The iCCM program in Rwanda (USAID/Rwanda, 2011)

The USAID/Rwanda (2011) program used a mixed-method approach to evaluate the most significant results for appropriate care-seeking for childhood illness and case management in intervention areas in Rwanda. Communities recognized CHWs as the first line of treatment for children with fever, respiratory symptoms, and diarrhea. Specifically, from 2006 to 2011, appropriate care-seeking for fever in the six intervention districts reached 75%, and appropriate treatment increased from 20% to 43%. These remarkable accomplishments could represent one third of the national gains observed in the results of the Rwanda Demographic Health Surveys from 2006 to 2011. The program included multiple components: support of behavior change communication by **training of trainers and training of CHWs and community leaders** in the use of visual aids for health communication to promote healthy behaviors. Another notable intervention was the organization of different cadres of CHWs into **CHW peer-support and collaboration groups**, who engaged in health promotion efforts through outreach and home visits. Peer motivation, peer support, and peer accountability appeared to be fundamental motivators for CHWs to provide quality service. In addition, the project focused on supervision of CHWs and aimed to strengthen health service delivery through community drug procurement and support of health information systems providing timely data at the local level.

3.2 Effects of behavioral approaches

Six studies highlighted the effects of behavioral interventions using multiple channels or a single medium to communicate SBC messages. Examples highlighted in this section relate to MNCH programs.

3.2.1 Use of multiple channels

1) Trial intervention involving MNCH and prevention of mother-to-child transmission of HIV (PMTCT) in Kenya (Dicarlo et al., 2018)

Dicarlo et al. (2018) assessed ways to overcome behavioral, social, and structural barriers to PMTCT retention and identified **appointment reminders via text and phone calls, follow-up and tracking for missed clinic visits, PMTCT health education at home and during clinic visits, and retention and adherence support and counseling**. CHWs administered all interventions. Overall, qualitative study findings indicated that CHWs found the interventions feasible, acceptable, and well-received by clients, who increased their utilization of CHW services. Specifically, CHWs were critical in supporting mothers in PMTCT services across various behavioral, social, and structural domains, including improved communication and contact, health education, peer support, and patient advocacy and assistance.

2) MNCH behavior change communication interventions in Bangladesh (Rahman et al., 2016)

A qualitative study by Rahman et al. (2016) explored community perceptions of each component of the behavior change communication intervention delivered by CHWs. **Interpersonal communication (IPC)** was seen as an essential aspect of everyday life, and community members appreciated interactions with CHWs. **Printed materials** assisted in comprehension and memorization of messages, mainly when explained by CHWs through IPC. **Narrative enactments and traditional music performances in entertainment education** offered insights into life's challenges and improved memorization of messages. Overall, the study participants stated that the behavior change communication interventions influenced them to make health-promoting decisions and seek MNCH services. The study concluded that future research should identify how best to combine IPC, printed materials, tradition, and culture with social and mass media in different field situations.

3.2.2 Use of single medium or channel

Several studies examined behavioral intervention outcomes using one medium or channel, such as family or community meetings and visuals (e.g., flipcharts) to facilitate IPC.

1) MNCH intervention with family meetings in Ethiopia (Barry et al., 2014)

In Ethiopia, a project used CHWs to conduct prenatal community MNCH **family meetings** to build skills and care-seeking behaviors among pregnant women and family caregivers (Barry et al., 2014) via home visits. These meetings were associated with an increase in women's participation and allowed husbands, mothers-in-law, and other family caregivers to participate. The family meetings involved unique strategies adapted for adult learning and encouraged full participation through discussion, negotiation, and role-playing. Family meetings complemented routine antenatal care by enabling women and family caregivers to engage in topics of self-care and care-seeking, resulting in greater completeness of care and more highly skilled birth care. Specifically, the baseline and endline surveys found that women who attended two or more meetings with family members were over five times more likely to use a skilled provider or CHW, compared to women without antenatal care who attended fewer than two meetings (odds ratio: 5.19; 95% confidence interval 2.88–9.36; p<.001).

2) MNCH intervention with community meetings in Bangladesh (Dynes et al., 2011)
Similarly, in Bangladesh, CHWs were trained to conduct **community meetings** targeting pregnant women and their family members to learn maternal and newborn danger signs and gain life-saving knowledge and skills (Dynes et al., 2011). Participants were very satisfied with the multifaceted approach of **story-telling**, **role-playing**, and "**Take Action Cards**" (pictorial representations of a particular problem on one side with six small pictures of actions to take in response to the problem on the other side) that assisted in their learning for providing emergency first aid at the home level. The evaluation revealed several anecdotal stories about CHWs' successful use of specific life-saving skills, such as nipple stimulation and urine passage for placental delivery, and external bimanual compression and uterine massage for postpartum bleeding. These could lead to improvements on service quality, ultimately resulting in greater use of CHWs.

3) MNCH intervention with visuals to facilitate IPC in Nepal (McPherson et al., 2010)
In Nepal, CHWs were trained to counsel pregnant women and their families using a **flipchart** and a **pictorial booklet** distributed to clients (McPherson et al., 2010). IPC with trusted CHWs was an acceptable primary strategy in Nepal for promoting maternal and newborn care-seeking and related household-level behaviors. The qualitative study found the booklet to be useful and appreciated as part of an effective tool to promote health practices. However, the results could not conclusively state the approach was better or worse than other methods for message dissemination.

4) Malaria intervention with community sensitization in Cameroon (Nsagha et al., 2012)
The malarial management program in Cameroon confirmed the importance of **IPC and community sensitization** (Nsagha et al., 2012). According to the qualitative exploratory study, although radio and television were the current sources of information in the community, the best way to mobilize the community included meetings, churches, schools, and other public gatherings. CHWs and community leaders were found to be the best sensitization agents for community members' positive behavior change related to home management of malaria. As for the sensitization method itself, community members preferred the door-to-door method for IPC. CHWs, including community-based vaccinators, were selected by caregivers as potential distributors of Artemisinin-combination therapy (ACT) because of their experience working in other health-related interventions, thus acquiring the community's confidence.

3.3 Effects of health system quality improvement interventions

1) Malaria and ACT subsidies in Haiti (Prudhomme O'Meara et al., 2018)
One study evaluated the health impact of a strategy targeting ACT subsidies to confirm malaria cases by coupling free diagnostic testing with a diagnosis-dependent ACT subsidy (Prudhomme O'Meara et al., 2018). The CHWs provided free malaria testing in the community using RDTs. Those who tested positive received a voucher to redeem discounted ACT at a retail medicine outlet. The voucher allowed the ACT subsidy to target specifically patients with confirmed malaria infection and incentivized patients to be tested by CHWs before buying a drug. Their results suggest that diagnosis-dependent ACT subsidies and community-based interventions involving the private sector could play an impactful role on diagnostic

testing and population-wide rational use of ACTs. In addition, targeting the ACT subsidy to those with a positive malaria diagnostic test could improve sustainability and reduce costs of retail-sector ACT subsidies.

3.4 Effects of proactive community case management (ProCCM) interventions

1) ProCCM in Mali (Johnson et al., 2018)

A 7-year (2008–2015), interrupted time series study measured early access to care and under-five mortality throughout a ProCCM intervention in periurban Mali (Johnson et al., 2018). The intervention had five key components aiming to improve health system quality: (1) active case detection by CHWs, (2) door-to-door care provided by CHWs, (3) monthly dedicated supervision of CHWs, (4) removal of user fees, and (5) primary care infrastructure improvements and staff capacity building. During the intervention, the rate of early effective antimalarial treatment among children aged 0–59 months more than doubled, from 14.7% in 2008 to 35.3% in 2015 (odd ratio:3.198, p<.0001). The prevalence of febrile illness among children under five years declined from 39.7% at baseline to 22.6% at endline (odds ratio:0.448, p<.0001). Communities where ProCCM was implemented achieved an under-five mortality rate of 7/1000 (Hazard Ratio 0.039, p<.0001), the lowest rate in Sub-Saharan Africa (Johnson et al., 2018).

2) ProCCM in Senegal (Gaye et al., 2020)

In 2008, Senegal's National Malaria Control Program introduced home-based management of malaria, known as "prise en charge à domicile," or the French acronym PECADOM. In 2014, PECADOM Plus was launched. In this proactive model, CHWs conducted weekly household visits, known as sweeps, to identify, test, and treat malaria cases. PECADOM Plus was scaled up to include 708 villages in the country's four highest-transmission regions during the high-transmission season. Over approximately 20 weeks, the number of diagnoses and rate of care-seeking between village sweeps increased. The number of RDTs performed increased by about 104% and the number of positive tests and patients treated with ACT during passive case detection by about 77%. CHWs detected and treated 274% more malaria cases from the prior year to the first year of PECADOM Plus. The authors noted frequent ProCCM to symptomatic community members was "feasible, well-accepted by communities, increased community engagement, increased the number of patients treated by CHWs, and might have decreased the proportion of a community infected with malaria" (Gaye et al., 2020, p. 11).

3) ProCCM in Benin (Awide, 2019)

In Benin in 2018, United States Peace Corps Volunteers piloted a ProActive Community Treatment (ProACT) model in eight villages across two regions. CHWs conducted weekly household visits to identify, test, and treat symptomatic children for malaria. During the three-month pilot, 26 CHWs made weekly visits and tested 1,077 symptomatic children (96% of symptomatic children in the region). In one region, CHWs treated more children through ProACT (658) than passively (307). In another region, CHWs treated slightly more children through a passive approach (335), compared to ProACT (296). The author

concluded that a program like ProACT could increase the number of children tested and treated for malaria by CHWs more than passive malaria case management (Awide, 2019).

4) ProCCM in Madagascar (Ratovoson et al., 2022)

A randomized clinical trial in Madagascar compared the effect of ProCCM to passive iCCM. Based on Senegal's ProCCM model, this trial involved CHWs visiting households every two weeks to identify cases of fever, and test and treat for malaria from March to October 2017. Both the intervention and control arms included passive iCCM, and over 20,000 individuals participated in the endline survey. The intervention arm saw an increase in the number of RDTs (four-fold) and ACTs (three-fold) when compared to iCCM alone in the prior two years. In the intervention arm, malaria prevalence decreased to 5.4% from 8%. In the control arm, prevalence decreased to 5.7% from 6.8%. The authors concluded ProCCM can contribute to improved malaria outcomes in moderate-transmission settings. However, the authors note ProCCM had smaller than anticipated effects. The largest effect on malaria prevalence was seen among children under 14 years (OR = 0.59; 95% CI [0.38–0.91]), a group not usually targeted in iCCM strategies (Ratovoson et al., 2022).

Discussion

Summary of key findings

CHWs have an essential role within the health system, particularly in reaching underserved populations and improving access to health services in hard-to-reach areas. However, their services may be underutilized due to barriers such as a lack of awareness of CHWs as potential sources of care-seeking or when and where to consult a CHW. Furthermore, CHWs may be overlooked because they are inaccurately perceived as less qualified providers when in fact they are trained and qualified to provide their services. CHWs can positively impact and strengthen linkages with the community by building trust and being part of the community. However, the factors that influence utilization of CHW services have not been comprehensively documented. Further investigation is needed to identify the facilitators of and barriers to acceptance and utilization of CHW services, as well as interventions that successfully increased demand for and utilization of these services.

This literature review was conducted by Breakthrough ACTION and the U.S. President's Malaria Initiative to better understand the factors associated with the demand for and utilization of CHW services and further inform strategic implementation approaches for service delivery and demand generation at the community level. The literature review focused on three areas: drivers of community members' awareness and utilization of CHW services; the relationship between CHWs' availability and quality of services and demand for those services; and behavioral and health system quality improvement interventions that effectively increased CHW utilization by community members.

The first research question explored the factors behind community members' awareness and utilization of CHW services, specifically facilitators and barriers in two categories: interpersonal factors and structural factors. Interpersonal elements found to facilitate CHW utilization included trust in CHWs (Al-Mujtaba et al., 2020; Antwi et al., 2016; Mazzi et al., 2019; Oresanya et al., 2019; Singh et al., 2015), as well as appreciation of and satisfaction with CHWs' care and services (Abbey et al., 2015; Dynes et al., 2011; Gebretsadik et al., 2020; USAID/Madagascar, 2014). In contrast, barriers included poor confidentiality and trust (Grant et al., 2017; Mazzi et al., 2019; Oresanya et al., 2019), fears of stigma and dissatisfaction with CHW services due to perceptions of low-quality care (Tefera et al., 2014), and poor attitudes and behaviors of CHWs (Mazzi et al., 2019).

Additional facilitators and barriers were related to knowledge and awareness of CHW services. Awareness about health danger signs, importance of health care, and availability and benefit of CHW services encouraged caregivers to seek care from CHWs (Higi et al., 2021; Oresanya et al., 2019), whereas it was found that a lack of this awareness may negatively affect CHW service-seeking behaviors (Higi et al., 2021). Family and community ties also positively served as facilitators for CHW service utilization. Clients were more likely to use services when family and community members supported it (Higi et al., 2021); however, influential and elderly family members could negatively influence caregivers' care-seeking behaviors if they were not supportive or forbade care from CHWs because of negative perceptions associated with them (Gupta et al., 2018).

Structural factors included issues encountered in remote and hard-to-reach areas (e.g., distance to CHW services). Caregivers were more likely to seek care from a CHW located near them. All studies referenced a distance of less than 5 km, and some found that CHWs within 1 km or 1–3 km were most utilized (Druetz et al., 2015; Mazzi et al., 2019; Mukanga et al., 2012). Distance to health facilities was also a factor. Caregivers in Uganda were less likely to utilize CHWs if they had access to a health facility within 1 km (Mukanga et al., 2012). In Madagascar, 25% of caretakers within a 30-minute walk to a health facility sought care from a CHW, compared to nearly 45% who were more than an hour's walk to a health facility (USAID/Madagascar, 2014). Available infrastructure, such as telephone service, transportation service, and solar energy systems also encouraged CHW utilization (Higi et al., 2021). Other structural barriers included geographic challenges related to area topography, seasonal conditions, and road conditions (Shaw et al., 2017).

The second research question examined the relationship between availability and quality of CHW services and demand for these services. Available commodities such as test kits and drugs were associated with increased demand for CHW services, including iCCM of malaria and non-severe pneumonia in children (Seidenberg et al., 2012). Stockouts were repeatedly observed and negatively influenced demand for CHW services (Tine et al., 2013; USAID/Madagascar, 2014). CHW performance was used to understand their service quality, with one study suggesting that peer support groups and quality improvement systems during CHW training could improve CHW performance and increase care-seeking from CHWs (Langston et al., 2014). Additional factors influencing demand for CHW services

were perceptions of quality of care: positive perceptions (e.g., correct treatment was given, CHWs were good at treating malaria in children) positively impacted care-seeking from a CHW (USAID/Benin, 2012; Kamara et al., 2019), whereas negative perceptions (e.g., unavailability and uncertainty of CHW services) adversely influenced the demand for their services (Shaw et al., 2015).

Finally, the third research question focused on effective behavioral and health system quality improvement interventions aimed at increasing utilization of CHW services by community members. Some interventions described both occurring collectively as part of a comprehensive program, whereas others highlighted the effects of either behavioral or health system quality improvement interventions. Integrated interventions included iCCM (Gebremedhin et al., 2020; Oresanya et al., 2019; Taneja et al., 2018; USAID/Rwanda, 2011), nutrition (Kamau, 2020), and antenatal care (Ruton et al., 2018). Behavioral interventions included MNCH programs with CHWs communicating SBC messages through various communication channels, including appointment reminders via text and phone calls, follow-up and tracking of missed clinic visits, health education, adherence and counseling support, IPC with printed materials for instructions, and entertainment education such as narrative enactment and traditional music performances (Dicarlo et al., 2018; Rahman et al., 2016). Other studies also utilized IPC during family and community meetings encouraging participants to engage in discussions, negotiation, and role-playing (Barry et al., 2014; Dynes et al., 2011). Last, Prudhomme O'Meara et al. (2018) assessed a health system quality improvement intervention targeting ACT subsidies for malaria cases confirmed by free diagnostic testing.

In addition to effects on health system quality improvements, this literature review also looked at effects of ProCCM interventions. The proactive approach enabled community members to benefit from CHW visits rather than having to look for their services. Examples of ProCCM interventions included actively detecting and providing care for malaria cases (Johnson et al., 2018) and identifying, testing, and treating malaria cases (Gaye et al., 2020; Awide et al., 2019; Ratovoson et al., 2022). Although the ProCCM interventions identified here focused solely on malaria, the main idea can be used in other settings and explains that such level of care which does not require caregivers to necessarily approach CHW services, enables community access to CHW services as they are brought to their homes.

Analysis of key findings

The results from this literature review support existing evidence regarding trust, community proximity, perceptions of availability of commodities, and effects of behavioral approaches. As an essential element to seek health care in general, trust impacts demand for CHW services. Trust in and satisfaction with CHW services increase demand for their services. It is important to consider CHWs' motivation to provide high-quality services and thus improve community satisfaction. Non-financial incentives can be used as motivators (WHO, 2020). Community proximity, whether physical or emotional, also influences the relationship between providers and the community. Community embeddedness and acceptance are important enablers of CHW program success and are associated with "CHW retention, motivation, performance, accountability, support, and ultimately, the acceptability and uptake of CHW services"

(WHO, 2020, p. 48). A strong connection to the communities served makes the CHW program unique and cultivates community engagement and recognition. For CHW programs to be highly impactful, efforts from communities need to be participatory and sustainable, where communities can choose CHWs and provide spaces for them to work by finding spaces or constructing and maintaining offices for them (Exemplars in Global Health, n.d.). In addition, regular availability of supplies is essential to maintain CHW program effectiveness, productivity, and respect in the community, while the lack of supplies decreases CHWs' motivation (WHO, 2020).

Main takeaways

To better understand the factors behind demand for CHW services and develop and guide interventions to improve the utilization of CHW services among community members, key takeaways from this literature review must be considered. The key findings include positive drivers and negative aspects that influence demand for CHW services. Future approaches should leverage facilitators such as proximity to, familiarity with, and trust in CHWS and improve barriers such as stigma, lack of confidentiality, and lack of commodities. Interventions should focus on ensuring the positive drivers continue to improve the acceptance and utilization of CHW services while also addressing negative factors.

In addition, if CHWs are seen as less qualified providers who are outside the greater health system, efforts to integrate them into the health system should help communities see them as part of the overall system and help other providers at health facilities and health posts to see CHWs as an extension of themselves. This change in perception can improve communities' acceptance of CHW services and improve CHWs' motivation and performance. Finally, when ramping up efforts to integrate CHWs into the overall health system, considerations must be taken in contexts where community members mistrust the health system.

The literature in this review examined multiple interventions to strengthen CHW services, including adding information about health topics during CHW visits and improving client satisfaction, trust, and interest in utilizing CHWs. It is also important to ensure that CHWs are aware of how the community might perceive them based on how they communicate and interact with their clients. For this reason, CHWs must be well supported to continue to learn and practice compassion, empathy, and respect.

Considerations for future interventions

Based on the successes of iCCM interventions, future CHW programs should consider providing some components identified in this literature review in their iCCM programs, in addition to the usual components of CHW programs. Component examples include supportive supervision, SBC materials (e.g., counseling guides, posters, and leaflets), counseling, supply availability, outreach, home visits, community engagement activities, and visual aids to counsel community members to practice healthy behaviors and raise awareness about CHW services. When using digital platforms (e.g., text and phone

calls) or digital databases for CHW programs, feasibility and relevance need to be considered to ensure the intervention will work in the given context.

To sustain and improve CHW utilization, community members must accept and be satisfied with the services provided in addition to improving iCCM programs and CHWs' quality of care. To do this, behavioral and quality improvement are needed to increase awareness and knowledge of the quality of care provided by CHWs. A few strategies to improve such perceptions include the use of close follow-up and support to show communities that CHWs are there to assist them, which can include appointment reminders via text and phone calls, follow-up and tracking of missed clinic visits, health education at home and during clinic visits, IPC during family and community visits and through visuals, as well as retention and adherence support and counseling. An additional area to be considered for future interventions is the environment in which CHWs work and provide support to the communities. Creating a supportive environment for CHWs' emotional well-being and skill improvement (e.g., social capital) is key to maintaining their adequate motivation and performance while strengthening their relationships with supervisors and community members and ensuring services meet quality expectations.

Limitations of the literature review

Most of the articles in this literature review focused on the successes rather than failures of CHW programs. Although some articles discussed barriers and challenges faced by community members in accessing or accepting CHWs or by CHWs in navigating the health system, other missing aspects may have led to decreased demand of CHW services. This literature review thus could have benefited further from examining documented failures to help anticipate and prevent them. In addition, even though this literature review presented a variety of CHW programs in different geographic areas, it is likely that the small-scale qualitative studies provided weak evidence as results were limited to specific contexts. Another limitation of this literature review was response bias, such as social desirability, in that findings from community members and CHWs could have been biased due to a potential to share responses that might be deemed desired by society and by the researchers conducting the studies. It is important to be aware of the contexts in which these studies occurred and to distinguish inaccurate responses from legitimate ones.

Recommendations for future research

This literature review highlights many interesting research findings and areas for future research to explore for a better understanding of factors influencing the utilization of services provided by CHWs and interventions to increase demand for and utilization of these services. More can be learned by further investigating findings of mixed (positive and negative) results and by researching how previous choices in health services in facilities or other locations influence utilization of CHW services. Additional research into official government endorsement, institutionalized payment of CHWs, and effects on utilization of their services is also needed.

Future research also should focus on influences on demand beyond communication-based approaches that have been extensively implemented. For example, research into newer SBC approaches (e.g., human-centered design, design thinking, and behavioral economics) in CHW interventions would ensure that trends and practices stay current. Much of the research reviewed for this literature review evaluated pilots or small-scale interventions. Additional research on scale-up stages or interventions at scale would be beneficial, particularly how to maintain positive outcomes and maximize effectiveness. Additional research into recruiting traditional healers and birth attendants to expand their skills and train them to become CHWs would benefit the field. Last, more research into best practices to build trust and positive attitudes regarding CHWs would supplement similar research regarding health providers at health facilities.

Conclusion

CHWs have been a part of the health system of many developing countries for decades, with varying levels of success. It is clear they play an important role in many communities. Focusing on areas to increase CHW service quality and driving up demand for CHW services are keys to reducing malaria morbidity and mortality on a large scale.

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Annex 1: Literature review search terms

Search terms were identified in consultation with an Informationist from the Johns Hopkins University Welch Library and the U.S. President's Malaria Initiative and extensively tested and refined using PubMed to ensure relevant results. Concepts were developed using Medical Subject Headings (MeSH) and text words (tw). An asterisk (*) was used as needed at the root of search terms to allow for multiple endings. Concepts were searched together.

CONCEPTS	SEARCH TERMS
1. Malaria	"malaria"[Mesh] OR "malaria*"[tw] OR "child health"[Mesh] OR "child health"[tw] OR "maternal health"[Mesh] OR "maternal health"[tw] OR "Diet, Food, and Nutrition"[Mesh] OR "nutrition"[tw]
2. Community Health Workers	"community health workers"[mesh] OR "community health worker*"[tw] OR "community health volunteer*"[tw] OR "health volunteer*"[tw] OR "health promoter*"[tw] OR "village health worker*"[tw] OR "primary health worker*"[tw] OR "rural health worker*"[tw] OR "community health officer*"[tw] OR "health extension worker*"[tw] OR "voluntary health worker*"[tw] OR "volunteer health worker*"[tw] OR "lay health worker*"[tw] OR "community health assistant*"[tw] OR "community health aide"[tw] OR "community health aides"[tw] OR "community volunteer*"[tw] OR "village health volunteer*" [tw] OR "accredited social health activist*"[tw] OR "ASHA worker*"[tw] OR "auxiliary health worker*"[tw] OR "barefoot doctor*"[tw] OR "community health practitioner*"[tw] OR "community health practitioner*"[tw] OR "medical auxiliar*"[tw] OR "women development army"[tw] OR "development army"[tw] OR

<table>
<tr><td></td><td colspan="3">"women development armies"[tw] OR
"development armies"[tw] OR
"village volunteer*"[tw] OR
"health outreach worker*"[tw]</td></tr>
<tr><td>3. Drivers of CHW Utilization</td><td colspan="3">"patient acceptance of health care"[mesh] OR
"patient acceptance of health care"[tw] OR
"health care utilization"[tw] OR
"patient acceptance of healthcare"[tw] OR
"health care seeking behavior"[tw] OR
"health care-seeking behavior"[tw] OR
"health services needs and demand"[mesh] OR
"health services needs and demand"[tw] OR
"demand generation"[tw] OR
"care seeking"[tw] OR
"care-seeking"[tw]</td></tr>
<tr><td>4. Countries</td><td>Sub-Saharan Africa
Angola
Benin
Botswana
Burkina Faso
Burundi
Cabo Verde
Cameroon
Central African Republic
Chad
Congo
Cote d'Ivoire
Ivory Coast
Democratic Republic of the Congo
Djibouti
Equatorial Guinea
Eritrea
Eswatini
Ethiopia
Gabon
Gambia
Ghana
Guinea
Guinea-Bissau
Kenya
Lesotho
Liberia
Malawi
Mali
Mauritania
Mozambique
Namibia
Niger
Nigeria
Rwanda
Sao Tome and Principe
Senegal
Sierra Leone
Somalia
South Africa
South Sudan
Sudan
Tanzania
Togo
Uganda
Zambia
Zimbabwe</td><td>Asia/Oceania
Bangladesh
Cambodia
China
India
Indonesia
Korea
Lao
Malaysia
Myanmar
Nepal
Pakistan
Papua New Guinea
Philippines</td><td>Latin America and the Caribbean
Argentina
Belize
Bolivia
Brazil
Colombia
Costa Rica
Dominican Republic
Ecuador
El Salvador
French Guiana
Guatemala
Guyana
Haiti
Honduras
Mexico
Nicaragua
Panama
Paraguay
Peru
Suriname
Venezuela</td></tr>
<tr><td>Filters:</td><td colspan="3">English; Full Text Available; 2010 to Present; Human</td></tr>
</table>

Annex 2: Article Characteristics

Location	
Location	*Articles*
Bangladesh	3
Benin	2
Burkina Faso	1
Cambodia	1
Cambodia and Vietnam	1
Cameroon	1
Côte d'Ivoire	1
Ethiopia	9
Gambia	1
Ghana	2
India	3
Kenya	6
Madagascar	2
Mali	1
Nepal	1
Nigeria	2
Papua New Guinea	1
Peru	1
Philippines	1
Rwanda	3
Senegal	2
Sierra Leone	1
South Africa	1
Tanzania	1
Uganda	4
Zambia	2

Community Health Worker Terminology	
Community Health Worker Terminology	*Articles*
ASHA: Accredited social health activist	2
CHRW: Community health research worker	1
CHV: Community health volunteer	3
CHW: Community health worker	29
Community volunteer	1
CORP: Community-oriented resource person	1
FCHV: Female community health volunteer	1
HEW: Health extension worker	7
HEW: Health extension worker and TBA: Traditional birth attendant	1
LHW: Lay health worker	1
RC: Relais communautaires	1
VHV: Village health volunteer	1
VHW: Village health worker	4
VMW: Village malaria worker	1