Community Health Workers as 'Boundary Spanners' in Sub-Saharan Africa: A Qualitative Systematic Review

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Plagiarism declaration

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Acronyms

APE: Agentes Polivalentes Elementare

ASM: Animatrice de Sante Maternelle

ASW: Adherence Support Worker

BHW: Boma Health Worker

CBD: Community Based Distributor

CDD: Community Drug Distributor

CHEW: Community Health Extension Worker

CHV: Community Health Volunteer

CHW: Community Health Worker

CNV: Community Nutritional Volunteer

GCHW: General Community Health Worker

HEW: Health Extension Worker

HHP: Home Health Promoter

HRH: Human Resources for Health

HAS: Health Surveillance Assistant

HW: Health Worker

LC: Lay Counsellor

LHW: Lay Health Worker

LMIC: Low- and Middle-Income Country

MM: Mentor Mother

MPH Master of Public Health

PHC: Primary Health Care

SDG: Sustainable Development Goal

SSA: Sub-Saharan Africa

TBA: Traditional Birth Attendant

UHC: Universal Health Coverage

VHT: Village Health Team member

VHW: Village Health Worker

WAJA: (Kiswahili acronym for) Community Health Agent

WHO: World Health Organization

Glossary

Boundary Spanners	Knowledge brokers and intermediaries between systems who engage in relationship building by enabling exchanges between these systems, straddling their boundaries by producing or relaying knowledge and information (Van Meerkerk and Edelenbos, 2020).
Community Health Workers	Paraprofessionals or lay individuals who are close to, or part of, the communities they serve and possess a unique, in-depth knowledge of these communities. They link communities with health systems—and the services therein—in context-specific ways. This cadre receives job-related training that is shorter in duration than that provided to more professional health workers (Olaniran *et al.*, 2017; Perry *et al.*, 2014b).
Embeddedness	The extent to which community health workers (CHWs) are engaged, connected, trusted, accepted, and involved in the local dynamics (including the social and cultural fabric) of communities. As embeddedness requires close, frequent interactions with communities, it is closely tied to geographical and spatial proximity, which encourages physical presence and accessibility (Turinawe *et al.,* 2015; Schneider *et al.,* 2008).
Health System	Organizations, structures, and people whose primary efforts are dedicated to promoting, restoring, or preserving health. Health systems function as social institutions in which transactional processes influence the experiences, roles, and contributions of CHWs, as well as the interconnections and dynamic relationships among them (World Health Organization, 2017; Schneider and Nxumalo, 2017).
Power	A complex relational dynamic that encompasses the ability or capacity to directly or indirectly control or influence the behaviour of others, as well as the outcomes of events or decisions (Gilson *et al.*, 2014)
Responsiveness	Those processes, structures, communications, decisions, and outcomes that reflect health system values in appropriately responding to the needs and expectations of the communities they serve. It involves the use of processes and tools designed to reveal the needs of even the most vulnerable and marginalized service users, who are more likely to rely on health services provided by these systems. The responsiveness of health systems is influenced by an interplay of accountability mechanisms, which act as governance tools that regulate answerability. These mechanisms manifest through the functioning of feedback loops between health systems and the community (external accountability) and within health systems (internal or bureaucratic accountability) (Khan *et al*., 2021).
Scoping Review	A preliminary assessment that systematically maps the literature to identify the size, scope, and extent of available evidence from multiple sources. It also serves to assess the value of undertaking a full systematic review (Arksey and O'Malley, 2005).
Supervision	The activities aimed at observing, correcting, and managing the contributions of healthcare workers to ensure that their work is carried out effectively. Typically, this role is performed by a senior colleague or cadre employed at a more formal or 'higher' level within the health system (Asweto *et al.,* 2016).
Supportive supervision	Monitoring processes that focus on compliance, contribution management, and the outputs of healthcare workers. It is designed not only to strengthen the relationships between supervisors and

	supervisees but also to improve interactions at all levels of the health system. This approach manages and supports contributions through the appropriate and efficient allocation of resources, facilitates bidirectional problem identification and resolution, promotes ongoing personal and professional development, and provides a structured mechanism for communication and feedback (Asweto *et al.,* 2016).
Task Shifting	The strategy of maximizing the available workforce by redistributing tasks to health workers who are less qualified and have received shorter training, thereby optimizing the use of human resources for health (World Health Organization, 2017).
Qualitative Systematic Review	The utilization of systematic qualitative techniques to identify, gather, synthesize, critically evaluate, and integrate secondary data to generate new and insightful explanations.

Source: Author (drawing on and adapting commonly held definitions)

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Community Health Workers as 'Boundary Spanners' in Sub-Saharan Africa: A Qualitative Systematic Review

Target Journal: Health Policy and Planning[1]

Lydia R Davids[2]

Abstract

Community health workers (CHWs) play an essential role in bridging health systems and communities in sub-Saharan Africa (SSA). However, their ability to serve as effective boundary spanners is shaped by multiple, interrelated factors. Understanding these influences is essential for supporting CHWs and enhancing their contributions to health systems.

This qualitative systematic review explores the factors influencing the boundary-spanning roles of CHWs in SSA. The study was conducted in two phases. First, a scoping review mapped the factors affecting CHWs' roles as boundary spanners between communities and health systems in low- and middle-income settings. This mapping led to an analytical framework for the systematic review. The second phase, a qualitative systematic review, aligned with the analytical framework and key terms defined in the scoping phase, delved deeper into understanding the factors influencing CHWs' boundary-spanning roles within the SSA context. The search strategy included English-language peer-reviewed literature and institutional-reviewed reports published from 2013 to 2024.

Of the 1,244 records identified, 43 studies representing 18 countries in SSA were included in the review. Direct references to the intermediary role of CHWs appeared in 36 of the studies while all 43 studies highlighted at least one boundary-spanning role of CHWs—categorized into several groups that emphasize their work in bridging communities and health systems. The findings were synthesized into five thematic areas that highlight the interplay between systems hardware and software influencing CHWs' boundary-spanning roles.

The review highlights the importance of fostering collaborative relationships between CHWs, health systems, and communities, and the impact of underlying power dynamics on health systems' hardware and software, necessitating policies that enhance CHW involvement in decision-making, build trust, and recognize their contributions. These insights are valuable for policymakers, programme managers, and health system leaders aiming to address barriers and optimize CHWs' roles as effective intermediaries in SSA.

[1] See Appendix 8 for Health Policy and Planning's author guidelines.

[2] For the purpose of this thesis, the student is the first and sole author of this systematic review.

Keywords

- Community health workers, boundary spanning, intermediaries, health systems, communities, relationships

Key messages
• Community health workers are essential intermediaries linking formal health systems and communities; however, inadequate system support hinders their bridging roles. • The interactions between health system hardware (policies, governance, financing) and software (trust, power dynamics, values) shape CHWs' ability to carry out their roles. • CHWs require support from both health systems and communities for the full potential of their boundary-spanning roles to be realized. • CHWs navigate complex power relationships within health systems; navigating these dynamics can better support the cadre, improve their legitimacy, and build community trust. • CHWs' voices should be included in decision-making and agenda-setting in policies and programmes.

Introduction

Health systems in sub-Saharan Africa (SSA) currently face an array of challenges, including elevated disease burdens, high mortality rates, and acute constraints in human resources for health (HRH). Progress towards universal health coverage and sustainable development goals—particularly through the re-engineering of primary health care (PHC)—is critically dependent on strengthening HRH (Cometto *et al.*, 2018; Olaniran *et al.*, 2017). These HRH constraints are notably pronounced in SSA (Condo *et al.*, 2014; Kok *et al.*, 2017b). Within this challenging environment, community health workers (CHWs) have been identified as a vital cadre of health providers, especially in low-resource settings (Braun *et al.*, 2013; Theobald *et al.*, 2015).

CHWs play a complex, evolving role in the SSA health landscape, addressing health disparities (Feldhaus *et al.*, 2015; Kok *et al.*, 2017a). As key actors in healthcare delivery, CHWs bridge the gap between communities and health systems (Kok *et al.*, 2017b; Mottiar and Lodge, 2018). Emphasis has been placed on viewing this cadre as integral health system actors rather than as quick-fix solutions (LeBan *et al.*, 2021; Zulu and Perry, 2021).

While recognized as cornerstones of health systems, CHWs' unique insights and contributions are frequently underappreciated (Ahmed *et al.*, 2022). CHWs are essential to strengthening health systems in SSA, particularly through community-based PHC, yet challenges persist in realizing their full potential (Olaniran *et al.*, 2017; Mundeva *et al.*, 2018). Addressing the factors that influence CHW contributions is imperative for developing tailored approaches to support them effectively (Lehmann *et al.*, 2019; Lewin *et al.*, 2021; Olaniran *et al.*, 2022).

Boundary spanners are individuals or organizations who operate across institutional boundaries, facilitating the coordination of activities, information, and knowledge by connecting processes and actors between their 'home' organization and external entities (Van Meerkerk and Edelenbos, 2020).

In low- and middle-income country (LMIC) health systems, CHWs are often recognized as boundary spanners who connect communities with formal health services.

Multiple terms are used interchangeably in the literature—and will be used as such in this study—to denote the linking role played by this cadre. These terms include acting as the 'cultural brokers,' 'intermediaries,' 'links,' 'interfaces,' or 'interconnections' between formal health systems and communities (Theobald *et al.*, 2015; Kok, *et al.*, 2017b). As intermediaries, CHWs navigate complex power dynamics within both formal health systems and communities to enhance community access to services in resource-constrained settings (LeBan *et al.*, 2021). Boundary spanners, whether individuals or organizations, operate across institutional divides to coordinate between their 'home' organization and outside entities and are known for facilitating the flow of information and ideas through relationships (Wallace *et al.*, 2018). Boundary spanners embody a dual nature, and CHWs' contributions in this boundary-spanning capacity remains complex and under-explored in both SSA and health system contexts (Pelletier *et al.*, 2018). While CHWs are recognized for their bridging role within health systems, this concept is rarely applied in research, an area this study seeks to illuminate.

It is important to note that although this study primarily focuses on CHWs, they are not the only cadre operating as boundary spanners between communities and health systems. Other groups, including patient navigators, lay workers, and home-based carers, also fulfil this role, though they are often under-recognized (Magadzire *et al.*, 2014; Wallace *et al.*, 2018). The interactions between CHWs and these other boundary-spanning cadres remain an underexplored area of study.

As boundary spanners, CHWs deliver healthcare services while promoting community access, involvement, and retention in health services and programmes. Their bridging role between communities and health systems encompasses multiple interrelated functions, as summarized in Table 1.

In their role as leaders, CHWs act as community representatives who advocate for community needs and priorities within the health system (LeBan *et al.*, 2014). They also serve as social catalysts, facilitating community participation and addressing determinants of health by drawing on and highlighting community realities and perceptions (Theobald *et al.*, 2015).

As networkers, CHWs enhance collaboration between health systems and communities (Oliver *et al.*, 2015) by linking and influencing interactions and interdependencies between systems as social agents (Theobald *et al.*, 2015). They leverage their unique insights by creating, authorizing, sustaining, and enhancing bidirectional (and often multidirectional) relationships (Herman, 2011; Theobald *et al.*, 2015), and, by building trust, they serve as conduits for relaying community concerns to the healthcare system (Besada *et al.*, 2018).

In their capacity as knowledge brokers, CHWs mediate flows of information by linking communities to contextually appropriate insights derived from evidence-based medicine (Zulliger *et al.*, 2014; Loeliger *et al.*, 2016; Austin-Evelyn *et al.*, 2017) and by managing and relaying policy-related health messages to communities (LeBan *et al.*, 2014). At the same time, they connect health systems to community needs and realities (Zulliger *et al.*, 2014).

Their roles leading, networking, and knowledge brokering are not rigidly defined and often overlap. For example, in their leadership roles, CHWs may also function as networkers who share and translate

knowledge. The complexities of their roles require a nuanced understanding of these functions and the factors that influence them within SSA health systems.

Boundary-spanning roles	Characteristics described in the literature
Leadership	• ***Community representatives***: responsible for representing community needs and priorities in the health system (LeBan *et al.*, 2014) • ***Change agents***: acting as social catalysts facilitating community participation, addressing determinants of health, and advocating for change by drawing on and highlighting community realities and perceptions (Theobald *et al.*, 2015)
Networking	• ***Collaborators****:* negotiating tensions between health systems and communities (Oliver *et al.*, 2015) • ***Intervening social agents:*** linking and influencing the interactions and interdependencies between systems and the people within them (Theobald *et al.*, 2015) • ***Mediators, key informants, and gatekeepers***: meeting needs through unique insights by creating, authorizing, sustaining and enhancing bidirectional (often multidirectional) relationships (Theobald *et al.*, 2015; Herman, 2011)

Knowledge brokering, sharing, and translation	• ***Knowledge brokers:*** mediating flows of information
	  ○ by linking communities with re-interpreted, comprehensible, and contextually appropriate insights derived from evidence-based medicine (Loeliger *et al.*, 2016; Zulliger *et al.*, 2014; Austin-Evelyn *et al.*, 2017)
	• Additionally, this role involves managing policy-related health messages to communities (LeBan *et al.*, 2014)
	  ○ by connecting health systems to community needs and perspectives (Lehmann and Sanders, 2007; Zulliger *et al.*, 2014)
	• ***Knowledge holders:*** CHWs themselves serve as repositories of valuable and unique insights into inter- and intra-health system dynamics, community realities, and patient perspectives (Loeliger *et al.*, 2016; Van Meerkerk and Edelenbos, 2020)

Table 1: Roles and characteristics. Source: Author

This qualitative systematic review explores factors influencing CHWs' roles as boundary spanners between health systems and communities in SSA. While CHWs bridge formal health systems and communities and hold the potential to improve cross-boundary relationships, resource- and knowledge- sharing, their intermediary position often blurs the lines of their roles, responsibilities, relationships, and accountabilities (Kok *et al.*, 2017a; Tulenko *et al.*, 2013). Clarifying these factors is essential for legitimizing CHWs' roles and strengthening their connections with both health systems and communities, while acknowledging the ambiguity they often face (Perry *et al.*, 2014a).

While existing research recognizes the importance of CHWs in health systems, a gap remains in understanding which factors interact with their intermediary functions. This review aims to address that gap by examining the factors influencing CHWs' boundary-spanning roles in SSA. It provides evidence to support and inform policy, practice reforms, and further research by mapping out the

intricacies of their bridging roles and identifying the factors that influence their performance within the multifaceted contexts of the subcontinent.

Methods

To map the factors influencing CHWs' role as boundary spanners in SSA, the study was conducted in two phases carried out solely by the researcher under the guidance of her supervisor: a rapid scoping review followed by a qualitative systematic review.

In the first phase, a scoping review (see Appendix 1) was undertaken to broaden the understanding of the factors impacting CHWs' ability to span the boundaries between communities and health systems in LMICs. The search strategy encompassed English-language, peer-reviewed literature and institutionally reviewed reports from 2013 to 2023, resulting in the collection of approximately 104 studies. One key outcome of this phase was the development of an analytical framework that conceptualizes CHWs as the interface between communities and health systems. This framework categorizes the influencing factors into four main areas: system, programme, contextual, and CHW-related factors, along with various associated subcategories.

The second phase consisted of a qualitative systematic review. In this phase, an electronic search was conducted to map the factors influencing the boundary-spanning roles of CHWs in SSA[3]. The key search terms identified in Phase 1 were piloted, tested, and adapted across multiple databases. The search strategy, using key search terms and related synonyms, focused on three thematic concepts: CHWs, boundary spanning, and health systems (final search terms provided in Appendix 3).

While the scoping review (Phase 1) was necessary to broadly map existing literature to clarify key concepts, terminology, and evidence gaps on CHWs' boundary-spanning roles in LMICs (Davis *et al*., 2009; Levac *et al*., 2010) This qualitative systematic review (Phase 2) builds on these insights by adopting a more rigorous, interpretive synthesis focused in particular on Sub-Saharan Africa. Using a structured search strategy and thematic analysis to examine the factors that shape CHWs' boundary-spanning roles, the review moves beyond mapping evidence to provide deeper, context-sensitive insights that extend the scoping review's findings (Butler *et al*., 2016; Renjith *et al*., 2021).Test search runs were performed, and the terms were refined accordingly. The three thematic areas yielded results related to CHWs as boundary spanners between health systems and communities even without explicitly including this term; when included, the term tended to restrict the search results. The review incorporated peer-reviewed and institutionally reviewed literature from electronic databases that focused on SSA, published between 2013 and 2024, and available in English.

Studies were excluded if they focused on CHWs in high-income countries or non-SSA LMICs, where abstracts or full texts were unavailable, or if healthcare workers were not explicitly described as CHWs (or by synonymous terms). Searches were conducted using electronic databases including EBSCOhost (Africa Wide Information, Academic Search Premier, CINAHL, MEDLINE, SocINDEX), PubMed (MEDLINE), and Scopus (which covers content from both MEDLINE and Embase journals). A

[3] After completing the scoping review (Phase 1), SSA was selected as the focus region for the systematic review. During the scoping review, it became evident that CHWs in this region play a crucial role in the pursuit of universal health coverage (UHC) and the achievement of the sustainable development goals (SDGs). Consequently, the review was adapted to reflect this focus.

complementary search was also carried out using Google and Google Scholar. Supplementary searches were run on organizational resource databases like those of the World Health Organization (WHO) and the World Bank, as well as dissertation/thesis databases and through reference mining of relevant literature. The literature search concluded in January 2024, with refreshers in February 2024 and December 2024 to include articles published up to the end of December 2024.

After selecting texts based on the criteria above, the Critical Appraisal Skills Programme tool (https://casp-uk.net/casp-tools-checklists/) was used to critically appraise the literature, serving as a guide (see guidelines in Appendix 5). As the search yielded large records for study findings related to health systems constraints and facilitators of the cadre, full texts were screened for their relevancy to the boundary-spanning roles of CHWs between communities and health systems. Data was extracted into the analytical table developed during the scoping review phase, with a focus on factors that enable and inhibit CHWs' ability to act as boundary spanners.

A qualitative analysis approach was adopted, involving a cross-cutting thematic analysis of the extracted items. The analytical process included the screening of texts for eligibility, saving all literature in Mendeley Reference Manager, and coding of eligible studies, using both inductive and deductive approaches (see Appendix 6). The themes identified were directly related to the types of factors reported in the study findings and the boundary-spanning roles described.

All relevant data were manually coded by the researcher and captured in Microsoft Excel using a predefined spreadsheet template that captured study characteristics and CHW attributes. The initial coding framework was deductively formed based on the scoping review, which guided the categorization of systemic, programmatic, and contextual factors. Reviewing full texts, inductive coding was applied to capture new and emergent patterns that extended beyond the original framework. This included enabling conditions and disablers, as well as relational factors. Codes were refined into five broader thematic categories, outlined below, as factors supporting CHW effectiveness and barriers to their boundary-spanning roles. This combined process, integrating deductive and inductive approaches ensured both theoretical rigour and sensitivity to context-specific insights within Sub-Saharan African health systems.

Prior to final study selection and inclusion, texts were critically assessed through a quality evaluation process using the CASP Systematic Review Checklist (see Appendix 6). Relevant findings from each study were then extracted into a data extraction sheet, reviewed (see Appendix 2), and recorded in a database. The extracted data was systematically analysed using thematic analysis, identifying key patterns and relationships across systemic, programmatic, and contextual factors. This approach proved particularly effective for investigating the complex social processes and interactions that form part of the factors that enable and inhibit the contributions of CHWs.

Limitations

This review has several limitations that need to be acknowledged. Firstly, only research published in English was included, which may have excluded relevant studies from the sub-region (characterized by multiple languages and dialects). Additionally, the geographical restriction to SSA means that the recommendations and findings may not be applicable to other LMICs.

Although multiple databases were employed in the search strategy, the complex, context-specific, and nuanced nature of CHWs' boundary-spanning roles—combined with varied indexing practices—

means that some relevant articles may not have been captured. Furthermore, while we aimed to identify and categorize the key boundary-spanning roles evident in the reviewed studies, we acknowledge that some roles may not have been explicitly recognized or may overlap with other categories. This is due to the multifaceted nature of boundary-spanning work, which often defies rigid classification. Thus, the key themes presented here are intended to map out the findings rather than provide an exhaustive or definitive taxonomy of boundary-spanning roles or the factors influencing them.

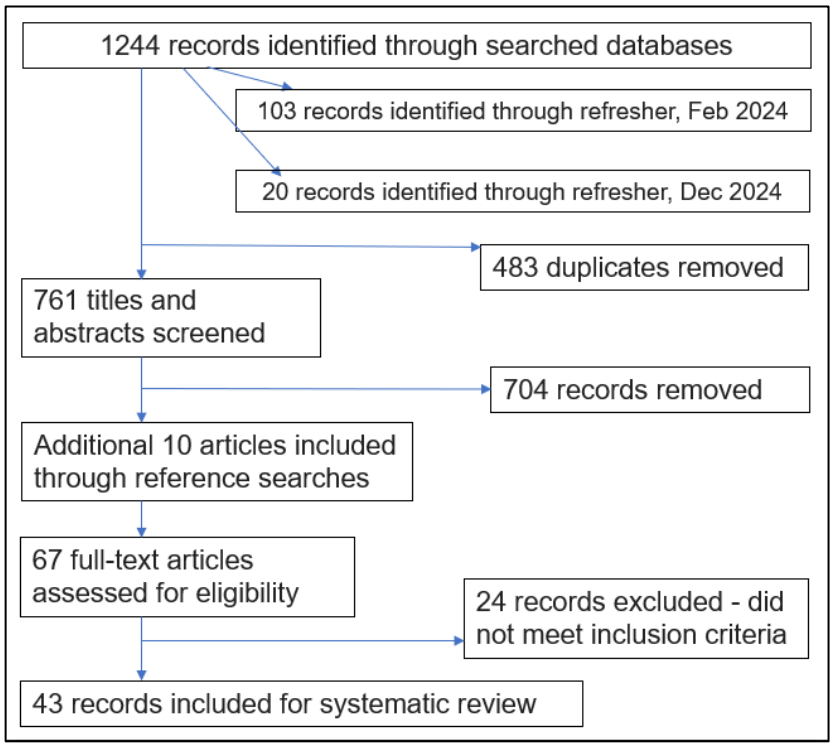

Figure 1: PRISMA

Results

A total of 1,244 titles were identified through an electronic database search spanning 2013 to 2025, including 123 titles from search refreshers conducted in February and December 2024. After removing 483 duplicates, 761 titles and abstracts were screened, of which 704 were removed. An additional 10 articles were included through reference mining searches. A total of 67 full-text articles were subsequently read. The study selection process led to the exclusion of 24 articles that either did not focus on SSA, did not explicitly address the variations of CHWs in SSA as defined in this review, lacked available full texts, or did not meet the quality standards set by the CASP checklist. This process resulted in 43 studies meeting the inclusion criteria (see Figure 1 PRISMA diagram[4]).

Of the 43 articles included in the review, 18 SSA countries were represented: Malawi was featured in 11 of the studies; Ethiopia in 9; Kenya, Mozambique, Uganda, and South Africa were each represented in 8 studies; Rwanda and Sierra Leone in 4 studies each; Liberia and Zambia in 2 studies each; and the

[4] Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram depicting the flow of literature through the different phases of the qualitative systematic review.

Democratic Republic of Congo (DRC), The Gambia, Guinea, Lesotho, Nigeria, South Sudan, Tanzania, and Senegal were each included in 1 study. Most of the articles (41/43) were empirical studies, with 4 being reviews. The distribution of publication dates is shown in Figure 2.

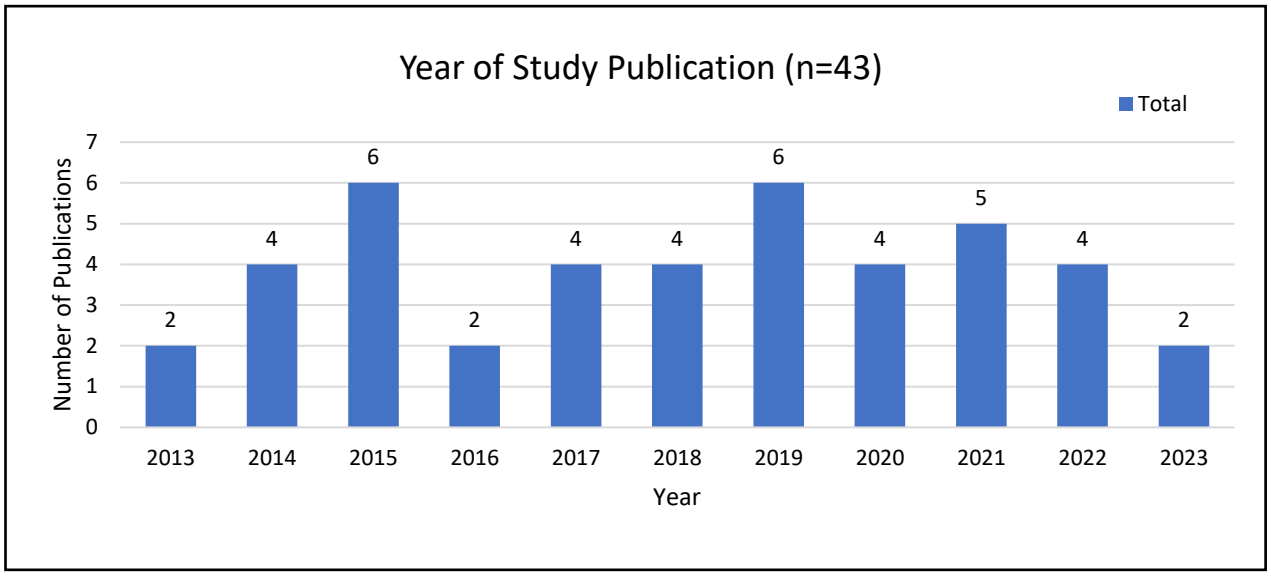

Figure 2: Publication distribution, by year. Source: Author

The most common terms used to refer to CHWs in the included studies were 'CHWs' (10/43 studies) and 'Traditional Birth Attendants' (TBAs) (3/43 studies). Other terms—such as 'Village Health Workers' (VHWs), 'Health Surveillance Assistants' (HSAs), 'Community Health Assistants' (CHAs)—were each mentioned in 2 out of 43 studies. Additional terms are presented in Figure 3.

Generally, the majority of CHWs described in the included studies performed a range of tasks. In 24 of the 43 studies, CHWs provided general health services—including promotion, prevention, and curative PHC. Maternal and child health services were reported in 11/43 studies, while health promotion activities were noted in 4/43 studies. Additionally, roles related to community health, nutrition, and HIV/AIDS prevention were each reported in 2/43 studies. Other tasks, such as integrated health and social care, integrated community case management (iCCM), community-based surveillance and care, and health educational services at the village level, were each mentioned in 1/43 studies. The various names assigned to CHWs for these roles are provided in the accompanying map (see Figure 3).

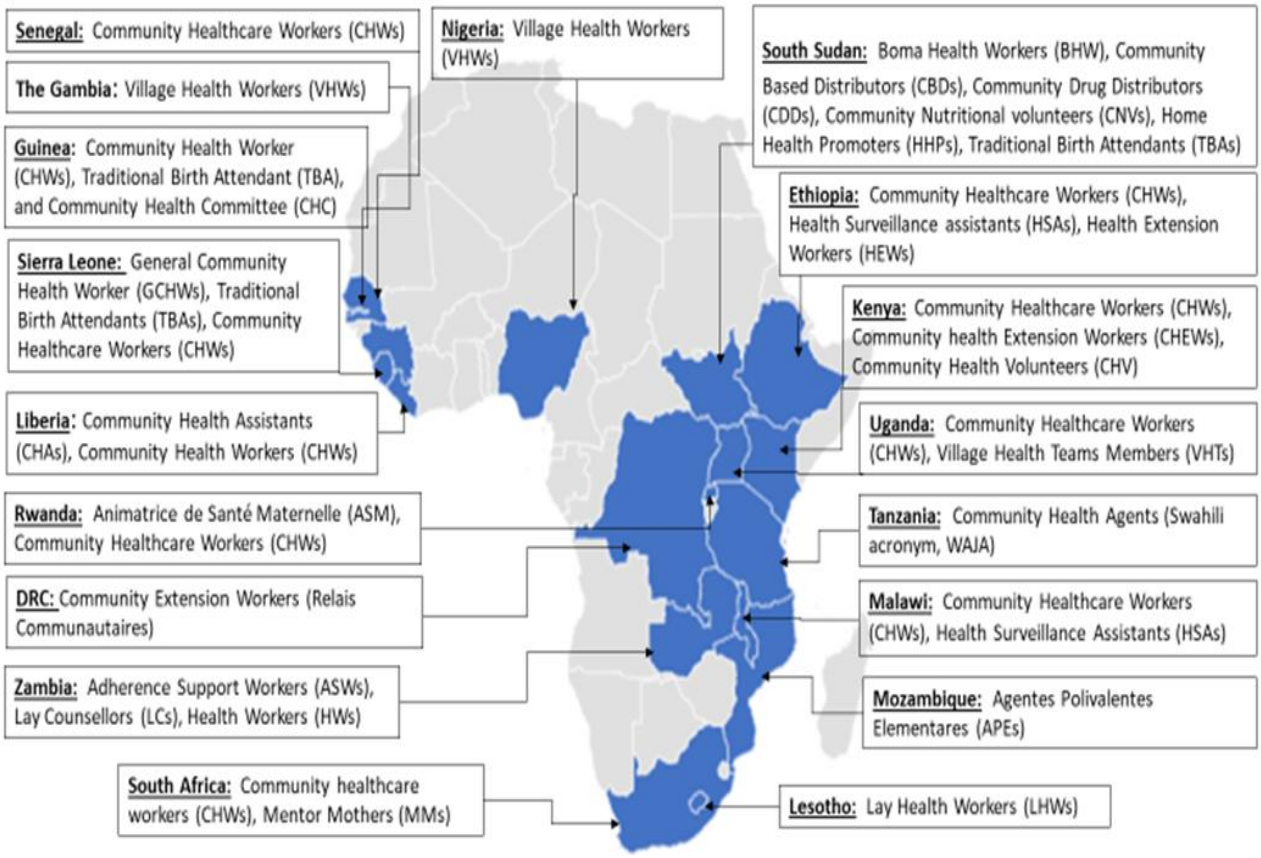

Figure 3: SSA graphical distribution of literature and common terms used by country. Source: Author

None of the studies made a direct reference to CHWs using the exact phrase 'boundary spanners.' However, all the studies highlighted their roles as connectors, intermediaries, and links. Direct references to this intermediary role were made in 36 of the 43 included studies, all of which identified the role of CHWs in bridging the gap between communities and health systems.

CHWs' boundary-spanning roles can be grouped into several categories (see Table 2 below), with some studies highlighting multiple roles. It is important to note that these thematic roles overlap and are interrelated. For example, as community advocates (11/43), CHWs raise awareness about community health needs, promote rights, and ensure community representation. In their role as social capital mobilisers (9/43), CHWs strengthen collective action by engaging communities through local social networks and by leveraging and mobilizing resources to drive health-seeking behaviours.

As cultural brokers (11/43), CHWs use their contextual knowledge and lived experiences to build credibility and trust, translating health messages into culturally relevant information. Acting as emergency responders (11/43), CHWs serve as first responders in crises by linking communities to urgent health services and managing information flows during health emergencies and disaster responses.

In their capacity as health service navigators (17/43), CHWs support healthcare access by coordinating services and helping communities navigate complex health systems. As trust builders (25/43), they foster and maintain robust relationships between communities and health systems. Additionally, as knowledge brokers (22/43), CHWs utilize their embedded knowledge of both community and health systems to facilitate policy execution by connecting policies to local realities.

n/43	Categories of boundary-spanning roles (emerging from reviewed studies)	Boundary-spanning characteristics (linked to Table 1)	Boundary-spanning roles (linked to Table 1)
17	Health Service Navigators	Intervening Social Agents	Networking
		Mediators, Key Informants, and Gatekeepers	Networking
11	Cultural Brokers	Knowledge Brokers	Knowledge brokering, sharing, and translation
		Knowledge Holders	Knowledge brokering, sharing, and translation
11	Community Advocates	Community Representative	Leadership
		Change Agents	Leadership
25	Trust Builders	Collaborators, negotiators	Networking
9	Social Capital Mobilizers	Intervening Social Agents	Networking
22	Knowledge, holders, sharers, and implementers	Negotiators, Knowledge Brokers	Knowledge brokering, sharing, and translation
		Knowledge Holders	Knowledge brokering, sharing, and translation
11	Emergency Responders	Mediators, Key Informants, and Gatekeepers	Networking

Table 2: Categories of boundary-spanning roles identified in the review. Source: Author

Factors influencing CHWs' ability to carry out their boundary-spanning roles

The results have been synthesized into five thematic areas derived from the 43 reviewed studies (see Table 3 for a summary of findings).

Theme 1: Governance, policy, and structural factors influencing CHWs' boundary-spanning roles

This theme examines the governance, policy, and structural factors that shape CHWs' effectiveness as boundary spanners. The findings emphasize how institutional frameworks, accountability mechanisms, and decision-making opportunities critically influence their ability to bridge formal health systems and communities.

Integration of CHWs into national strategies and policies enhances legitimacy and accountability, while clearly defined roles within these strategies underpin recognition and support for the cadre (Kok *et al.*,

2017a; Tuyisenge *et al.*, 2019). While there is a need for comprehensive, well-communicated CHW-related policies, a disjuncture exists between the functions of CHWs as described in various policies; the lack of clarity on how these contributions should be interpreted in practice contributes to confusion over their responsibilities and positions (Oliver *et al.*, 2015;). Government-led CHW policies often lack appropriate community participation, which has detrimentally affected the ability of CHWs to carry out their intermediary roles (Oliver *et al.*, 2015; Closser *et al.*, 2019), with policies frequently failing to recognize the support CHWs require in their domestic roles—particularly for female CHWs striving to remain employed and advance in their positions (Steege *et al.*, 2018). Furthermore, policies governing CHWs' intermediary work are usually loosely interpreted, and available policy guidelines frequently lack standardization and are inadequately developed or implemented at scale (Oliver *et al.*, 2015; Assegaai and Schneider, 2019).

Accountability structures in both communities and formal health systems need to be incorporated into policy and national strategies; however, these structures are often unclear or one-sided, which can impede CHWs' bridging roles (Kok *et al.*, 2017b). CHWs may feel more accountable to their paying institutions than to the communities they serve, leading to community mistrust and impeding their contributions (Kok *et al.*, 2017b). Studies from Ethiopia, Kenya, Malawi, and Mozambique, CHWs' reporting lines are often skewed upward towards the health system rather than downward towards the communities, despite the central focus of CHWs' work being their relationships with communities, downward accountability—from the health sector to the community—has been generally weak in these countries (Kok *et al.*, 2017b), resulting in weakened community ties. Consequently, CHWs often feel more accountable to the health systems, relying on support from health workers, managers, and NGOs through training, supervision, referral mechanisms, and robust monitoring and accountability structures (Kok *et al.*, 2016).

CHWs are often systemically excluded from health governance structures, which impedes their ability to meaningfully contribute to decision-making processes, often seen merely as operational agents, they have limited capacity to advocate for community needs and shape health policies despite their proximity to communities and the valuable insights they gain through their intermediary roles (Nxumalo *et al.*, 2016; Van de Ruit, 2019). CHW insights are seldom incorporated into health systems' priority setting (Kane *et al.*, 2016; Oliver *et al.*, 2015; Schneider and Lehmann, 2016), involving CHWs in decision-making and understanding their perspectives are crucial for their integration and effectiveness in both formal health systems and communities (Kok *et al.*, 2017a; Nxumalo *et al.*, 2016; Singh *et al.*, 2015a). Although CHWs are increasingly expected to resolve health access issues in SSA, their experiences and perspectives—which often highlight critical areas for policy reform—are frequently overlooked (Kane *et al.*, 2016). Recognizing CHWs' insights can reveal how they navigate their roles despite challenges and shed light on the 'meaningfulness' of their work (Kane *et al.*, 2016). Providing CHWs with opportunities to engage in decision-making can empower them and enhance their contributions and programme outcomes (Nxumalo *et al.*, 2016; Kok *et al.*, 2017b).

Several studies underscore the importance of focusing on CHWs' voices. For example, Closser et al. (2019) emphasized the need to prioritize the experiences of CHWs in Ethiopia, arguing that understanding their perspectives is key to improving their integration and effectiveness within health

systems and communities. Similarly, Raven *et al.* (2015) highlighted the importance of understanding CHWs' expectations of their roles, along with the challenges and opportunities they face—particularly for those working as volunteers. In studies from Rwanda, CHWs expressed varied priorities for carrying out their roles effectively, notably emphasizing the need for training and dedicated office space (Niyigena et al., 2022). Findings from Malawi, have drawn attention to the need for a positive relationship between community systems and health systems to strengthen CHWs' individual agency (Smith *et al.*, 2014; Ndambo *et al.*, 2022). Similarly, from studies in Ethiopia, CHWs reported their dissatisfaction with limited opportunities for collaboration and a lack of community feedback regarding their roles (Jackson *et al.*, 2019).

Strategies to support CHWs should enable them to express their needs and perspectives effectively, which is essential for building strong relationships with both the communities they serve and the health systems. This challenge is evident in South Africa, where CHWs often lack self-confidence, doubt their abilities, and struggle with community expectations that prioritize curative over preventative care—factors that may hinder their effectiveness and job satisfaction (Singh *et al.*, 2015a). CHWs are frequently excluded from leadership positions, reinforcing their status as peripheral actors rather than integral members of the health workforce (Mwai *et al.*, 2013; Koroma *et al.*, 2021). As seen in findings from Sierra Leone, where career development strategies have fallen short of the promises made in CHW policy, and career progression is closely linked to enabling the cadre in their bridging roles (Koroma *et al.*, 2021). Addressing these challenges and creating opportunities for CHWs to develop as leaders will require systemic changes, including policies that support work-life balance and promote the advancement of women in health system roles (Steege *et al.*, 2018).

Gender inequities further shape CHWs' status and their ability to function effectively as intermediaries (Koroma *et al.*, 2021). Female CHWs are often underrepresented in decision-making positions and face gendered career constraints (Steege *et al.*, 2018). Moreover, the decision to become a CHW is frequently influenced by prevailing gender norms, with women disproportionately assuming unpaid, informal, and caregiving roles in many SSA countries (Closser *et al.*, 2019). As a result, gender dynamics impact CHWs' roles and relationships within both their communities and the broader health system, ultimately affecting legitimacy and respect of their roles (Raven *et al.*, 2015; Jackson *et al.*, 2019; Steege *et al.*, 2020).

Despite CHWs' potential to empower communities and challenge gender norms, systemic issues within SSA health systems often limit their agency and reinforce existing gender hierarchies (Closser *et al.*, 2019). For example, as seen in evidence from Mozambique, female CHWs—known as Agentes Polivalentes Elementares (APEs)—navigate complex challenges influenced by gendered policies and social factors. This results in marked gender imbalances between male and female APEs, contributing to disparities in service delivery and community engagement (Steege *et al.*, 2020). From findings in Ethiopia, female Health Extension Workers (HEWs) face gender-specific challenges, such as low meeting attendance by men and difficulties in engaging men in health initiatives (Steege *et al.*, 2018; Mamo *et al.*, 2019), illustrating how societal biases constrain CHWs' ability to span boundaries effectively. Similarly, authors have noted in Tanzania and Ghana, gender significantly shapes the experiences and opportunities available to CHWs (Kok *et al.*, 2017b) , with some authors calling for

policy changes to challenge patriarchal decision-making structures (Steege *et al.*, 2020). Overall, the failure of health systems to address gender inequities and empower CHWs reflects broader societal contexts and hinders the full realization of CHWs' boundary spanning roles and potential (Steege *et al.*, 2018).

Theme 2: Community-level dynamics and embeddedness factors influencing CHWs' boundary-spanning roles

This second theme reflects how embeddedness, along with relational and local power dynamics, impacts CHWs' intermediary roles at the community level[5]. The effectiveness and acceptance of CHWs and their programmes are strongly tied to community engagement (Kok *et al.*, 2017a), with embeddedness within communities being a key factor to the cadre's success (Turinawe *et al.*, 2015). However, while embeddedness is essential for CHWs' work, evidence from countries such as Kenya and Mozambique point to concerns about confidentiality and bias, particularly in HIV programmes (Kok *et al.*, 2017b). Similar findings emerged in Uganda, where linking communities to health systems required more than mere proximity to communities; Village Health Teams (VHTs) had to leverage their social capital within communities to effectively perform their health-promoting roles (Musinguzi *et al.*, 2017). Strong community support, and a clear understanding of CHWs' roles are fundamental to sustaining and enhancing their boundary-spanning activities (Kok *et al.*, 2017b).

CHWs often bear the brunt of associations with weak health systems with communities tending to link CHWs closely with the state and its health system. Consequently, as raised by authors, a lack of trust in the government and its health systems is frequently directed at CHWs in countries such as Uganda and South Africa, making it challenging for them to garner the community trust needed to carry out their roles (Nxumalo *et al.*, 2016; Singh *et al.*, 2015a). Similarly, in Malawi, community trust in HSAs is closely intertwined with trust in the broader health system (Kok *et al.*, 2016). Evidence from Guinea, Sierra Leone, and Liberia, suggests that CHWs often encounter mistrust and even hostility from communities due to their association with weak formal health systems. Despite these challenges, during the Ebola crisis the resilience of CHWs' relationships with communities enabled them to effectively fulfil their supportive, linking roles (Miller *et al.*, 2018).

When health systems recognize and actively support the importance of community ties for CHWs' boundary-spanning roles, the cadre is better able to undertake their functions. For example, in Malawi it was found that both CHWs and policymakers recognized that excessive time spent in health facilities can result in neglect of essential community-based tasks (Smith *et al.*, 2014). In Tanzania, Community Health Agents (WAJAs) were seen to play a crucial role in conveying community needs to the formal health system, when the responses to these needs were acknowledged, coordinated, and supported by the health system, WAJAs were better enabled to perform their intermediary roles (Baynes *et al.*, 2017). Building and maintaining trusting relationships is essential for CHWs to link communities and health services effectively (Kok *et al.*, 2017b). Findings from Sierra Leone, the DRC, and Liberia, highlight that establishing and maintaining trust—and minimising community suspicion—proved

[5] See Appendix 7 highlighting communities as an axis for CHW programmes.

critical for CHWs' success in their health service linking roles (Raven *et al.*, 2020). In some settings, long-established close ties between CHWs and communities have helped the cadre carry out bridging roles even when communities harbour distrust towards the health system (Miller *et al.*, 2018).

When community expectations are not well managed or are misaligned with the actual functions of CHWs, their ability to bridge communities and health systems can be significantly impeded. In Kenya, evidence indicates that CHVs who were unable to meet misplaced community expectations for tangible support experienced strained relationships with community members, ultimately resulting in CHV attrition (Ogutu *et al.*, 2023). Similarly, in Uganda, poor incentive structures and the inability of CHWs to meet community expectations have eroded trust, thereby restricting their effectiveness (Musinguzi *et al.*, 2017). Evidence from Kenya details community demands for financial and material support have placed additional burdens on CHWs in their efforts to connect health systems and communities (Ogutu *et al.*, 2023). Likewise, in Uganda, CHWs, working as VHTs, are sometimes perceived as enforcers of health system priorities—a role akin to policing—which strains their relationships with community members (Musinguzi *et al.*, 2017). Similar perceptions have been reported in Kenya (Oliver *et al.*, 2015), and in South Africa, where CHWs frequently cite a lack of respect from communities, which undermines their ability to span boundaries effectively (Van de Ruit, 2019). Factors such as community expectations regarding CHWs' task composition, prioritization, and supervision—as well as the availability of resources (discussed in detail below)—are key determinants of community perceptions (Kok *et al.*, 2017b; Singh *et al.*, 2015a). Effectively translating health messages into culturally relevant formats remains a core function of CHWs, ensuring that information aligns with local norms and values (Singh *et al.*, 2015a; Tuyisenge *et al.*, 2019). As seen in a study from Ethiopia, for example, where the perceived effectiveness of HEWs enhanced their community standing and recognition (Jackson *et al.*, 2019). CHWs collaborate with community members and other stakeholders to address health issues; studies (e.g., Oliver *et al.*, 2015) have highlighted how effective data collection coupled with trust fosters strong community engagement. Moreover, supportive supervision and active community collaboration—emphasized by Kok *et al.* (2018) and Mamo *et al.* (2019)—are critical for creating an enabling environment for CHWs' community-facing roles.

There are conflicting views and a need for greater clarity on how the process of empowerment benefits CHWs in their communities, beyond their individual roles. Communities themselves influence the power dynamics that enable or restrict CHWs' roles. Selection processes, which can legitimize and empower CHWs, are often overshadowed by decisions made by local leaders (Kok *et al.*, 2017a) In Uganda, for instance, evidence shows that local leaders' power grabs have undermined community preferences, adversely affecting the legitimacy and effectiveness of CHWs (Turinawe *et al.*, 2015). Although CHWs may not have formal authority at the community level, their unique position as trusted intermediaries grant them a degree of influence over health-related behaviours and decisions (Laurenzi *et al.*, 2021; Steege *et al.*, 2020; Murphy *et al.*, 2021). This influence is evident in The Gambia, where despite being positioned at "the bottom of the hierarchical health system", VHTs exercised significant political and decision-making power within their communities (Masunaga *et al.*, 2022) leveraging their intermediary position.

Theme 3: Formal health system-level integration factors influencing CHWs' boundary-spanning roles

This theme examines how formal health system structures and power dynamics influence CHWs' ability to navigate relationships, hierarchies, and bureaucratic barriers. Strong health systems are essential for supporting effective CHWs, whereas weak systems lead to poor integration[6] and insufficient support. Inadequate integration into health systems often results in a lack of support for CHWs, which in turn compromises the legitimacy and credibility of both the CHWs and their programmes within communities (Nxumalo *et al.*, 2016).

CHWs were frequently described as operating on the peripheries of formal health systems (Kok *et al.*, 2017b). In this marginal position, they face bureaucratic and hierarchical challenges within formal health systems and healthcare teams, often being viewed as occupying the "lowest rung of the system" (Anstey Watkins *et al.*, 2021). In Ethiopia, studies highlighted that CHWs experienced notable disempowerment at the lowest tiers of the health bureaucracy, which contributed to their overall sense of marginalization (Kane *et al.*, 2016; Closser *et al.*, 2019). Similarly, in findings from Uganda and Mozambique, feeling valued, supported, and connected to the health system was imperative for the effective functioning of CHWs (Strachan *et al.*, 2015). Supporting and integrating CHWs into health systems requires strategic relationships and coordinated efforts between health systems and communities, as seen during the Ebola outbreak response, weak links between CHWs and the formal health system—and between the health system and communities—significantly inhibited the CHWs' ability to span boundaries effectively (Miller *et al.*, 2018).

Relationships between CHWs and other health system actors have a notable impact on their linking role. In studies from Uganda, for example, healthcare workers viewed VHTs as a distraction designed to mask the government's shortcomings in service provision, thereby undermining CHWs' boundary-spanning roles (Musinguzi *et al.*, 2017). In Sierra Leone, CHWs felt disrespected, poorly supported, and excluded from meaningful engagement with health facilities, which strained their overall effectiveness (Raven *et al.*, 2020). Findings from Kenya, detail negative attitudes from healthcare workers towards Community Health Volunteers (CHVs) and community members resulting in strained communications between CHVs and health facility staff. In some instances, CHVs even lost community trust, adversely affecting referral processes between communities and health facilities and diminishing the cadres' ability to span both systems (Ogutu *et al.*, 2023). When referrals from CHWs were rejected or ignored by health facilities, it further undermined the relationships between CHWs and communities and weakened the credibility of their linking roles (Ludwick *et al.*, 2018).

Conversely, CHWs' intermediary capabilities were bolstered when they received acceptance and recognition from health workers, which facilitated their integration into the broader health system. Assegaai and Schneider (2022) highlight the importance of collaborative relationships within health systems, particularly between CHWs and other health workers. Trust emerged as a critical factor in these interactions. In studies from South Africa, CHWs' contributions were often neither trusted nor recognized by healthcare workers, undermining communication and the overall treatment of the cadre

[6] Integration can be understood as the process of embedding a CHW programme into the core activities of a health system, including incorporating CHWs into key components such as service delivery, workforce management, information systems, the procurement and distribution of medical supplies, financial management, and governance structures.

(Anstey Watkins *et al.*, 2021). In Ethiopia, Kenya, Malawi, and Mozambique, evidence shows that trusting relationships between CHWs and their supervisors were shown to significantly improve performance and confidence (Kok *et al.*, 2018). In this context, workplace trust—that is, trust in the broader health system's credibility—directly influenced interpersonal trust between CHWs and other system actors, thereby impacting CHW performance (Assegaai and Schneider, 2022). A lack of such trusting relationships further exacerbated challenges, as seen in South Africa, where limited training and support reflected the restrictive influence of health system power over CHWs (Assegaai and Schneider, 2022).

Theme 4: Programme implementation and workplace factors influencing CHWs' boundary-spanning roles

Weak programme implementation has been identified as a significant barrier to CHWs' effectiveness (Nxumalo *et al.*, 2016). This theme highlights key programme implementation factors—including recruitment and selection, supervision, training, workload, role clarity, resource allocation, and operational barriers—that affect CHWs' ability to span boundaries.

The recruitment and selection processes for CHWs, which often take place at the periphery of health systems, are key to the cadre's acceptance, effectiveness, and integration (Kok *et al.*, 2017b). Selection criteria within SSA vary, often require CHWs to possess a certain level of education, local knowledge, and personal attributes that foster respect and trust within communities (Kok *et al.*, 2017b; Singh *et al.*, 2015a). Involving communities in identifying and recruiting CHWs is essential for legitimizing their roles and building strong relationships across the boundaries they span (Singh *et al.*, 2015a; Turinawe *et al.*, 2015). In Uganda, community-based selection and support contributed to programme success (Turinawe *et al.*, 2015). Similarly, in South Sudan's Basic Health Initiative (BHI), which aims to establish trained, full-time, salaried CHWs known as Boma Health Workers (BHW), community participation is encouraged during selection to increase their ownership, trust, and the sustainability of CHW-implemented health services, thereby supporting the cadre's spanning role within communities (Lutwama *et al.*, 2021).

CHWs require continuous and context-specific training (Nxumalo *et al.*, 2016; Kok *et al.*, 2017b) that is specialized to equip them to perform their bridging roles effectively. It is essential that such training is implemented equitably to avoid disadvantaging the cadre (Steege *et al.*, 2018). For example, in Malawi, authors suggest that training and capacity building initiatives should be designed to build and sustain positive relationships between communities and health facility staff, thereby strengthening support for CHWs' intermediary role (Ndambo *et al.*, 2022). In studies from Sierra Leone and Uganda, training has been shown to significantly enhance CHWs' relationships with formal health systems (Mercader *et al.*, 2014; Kallon *et al.*, 2023). Moreover, incorporating specific messages about CHWs' roles as bridges between communities and health systems into training curricula has been highlighted as an important strategy (Kane *et al.*, 2016).

Training should encompass a broad spectrum—not only enhancing technical skills but also developing cultural competencies and addressing the unique needs of this diverse group, which is crucial for their role as cultural brokers (Condo *et al.*, 2014). Such training should be participatory, incorporating CHWs' own contributions to best support their capabilities (Theobald *et al.*, 2015; Zulliger *et al.*, 2014). A lack

of effective, appropriate, and ongoing training hinders CHWs' ability to deliver services (Condo *et al.*, 2014; Assegaai and Schneider, 2019). Moreover, when training is not conducted equitably, it negatively affects the cadre; inequitable training and support within CHW teams can result in conflicts and reduced overall effectiveness (Mercader *et al.*, 2014).

Continuous training is essential for maintaining and improving the knowledge and competencies required for CHWs to effectively perform their intermediary roles (Mbachu *et al.*, 2022; Ndambo *et al.*, 2022). However, in Mozambique, evidence reveals the extended duration of training for APEs has posed challenges to CHWs' ability to manage their domestic duties (Steege *et al.*, 2018). Additionally, training focus areas may shift over time based on evolving roles and service needs—as seen during the Ebola outbreak and COVID-19 pandemic—when training significantly enhanced CHWs' effectiveness in their boundary-spanning roles (Raven *et al.*, 2020). Kallon *et al.* (2023) emphasized the necessity of robust training not only for pandemic response but also for enhancing routine service delivery and building community resilience.

Unclear roles with loosely defined responsibilities in both communities and formal health systems, combined with heavy workloads, pose significant challenges to the CHWs' boundary spanning contributions and supervision (Condo *et al.*, 2014). This ambiguity leads to overwork and tensions in community relationships, forcing CHWs to balance their duties with personal activities—often resulting in conflicts and jeopardizing other income-generating opportunities (Raven *et al.*, 2015).

In studies from Rwanda, for example, CHWs face challenges due to heavy workloads which impact both the sustainability and quality of care they provide (Condo *et al.*, 2014). Workload challenges worsened during health crises such as the Ebola outbreak, when CHWs frequently took on additional tasks without formal direction or compensation (Miller *et al.*, 2018). Similarly, during the COVID-19 pandemic, increased workloads affected not only their capacity as boundary spanners but also their personal responsibilities (Miller *et al.*, 2018; Niyigena *et al.*, 2022). Workload and role clarity are critical factors that significantly influence CHWs' ability to carry out their roles in communities (Condo *et al.*, 2014; Kok *et al.*, 2017b; Laurenzi *et al.*, 2021). Laurenzi *et al.* (2021) emphasized the importance of a manageable workload and clear role definitions in CHW programmes. Such clarity helps manage community expectations and ensures that CHWs can balance their professional and personal capacities, thereby maintaining effective and sustainable CHW–community relationships (Kok and Muula, 2013; Condo *et al.*, 2014; Laurenzi *et al.*, 2021; Koroma *et al.*, 2021).

Studies from Zambia, Malawi, and Sierra Leone, show a lack of role clarity negatively impacted the relationships between CHWs and health systems (Mwai *et al.*, 2013; Smith *et al.*, 2014; Kallon *et al.*, 2023). In Malawi, for instance, the need for a revised job description for HSAs was emphasized to improve worker satisfaction and adaptability in response to evolving health priorities, while in Sierra Leone, clear role definitions were essential to support CHWs during health crises (Smith *et al.*, 2014; Kallon *et al.*, 2023). Policymakers and HSAs in Malawi agreed that an ever-increasing workload overburdened CHWs and detracted from their community roles (Smith *et al.*, 2014). Overall, well-defined roles for CHWs are crucial for their effective intermediary functioning within health systems (Mwai *et al.*, 2013).

The diversity and inconsistencies in the implementation of supervision practices create significant barriers to CHWs' effectiveness within the subregion (Assegaai and Schneider, 2019; Oliver *et al.*,

2015). Although supportive supervision is crucial for enhancing the cadres' linking capabilities, bureaucratic influences and inadequate management training for supervisors often limit its effectiveness (Raven *et al.*, 2015).

Evidence from Ethiopia, Kenya, Malawi, and Mozambique, identify strong supervision as a contributor to CHW legitimacy by boosting motivation and performance (Ndima *et al.*, 2015; Kok *et al.*, 2018). Supervision should be context-sensitive and empowering, considering CHWs' varied roles, community needs, and the capacities of supervisors (Assegaai and Schneider, 2019; Raven *et al.*, 2015). Conversely, a lack of effective supervision has been repeatedly highlighted as a significant issue inhibiting the cadre's roles and contributions (Miller *et al.*, 2018; Jackson *et al.*, 2019).

Supervision of CHWs typically involves multiple actors, with supervisors usually being affiliated with health systems or governmental bodies (Smith *et al.*, 2014; Kok *et al.*, 2017b; Raven *et al.*, 2020; Ogutu *et al.*, 2023). For instance, from studies in Zambia, the quality and frequency of supervision varied and were influenced by the physical proximity of supervisors; even with regular supervision, its quality often depended on how well supervisors understood the CHWs' roles (Phiri *et al.*, 2017). In Malawi, authors note supervisors did not always receive appropriate training for HSA tasks, which impeded their ability to effectively oversee the bridging role of the cadre (Smith *et al.*, 2014). Supportive supervision is critical for enhancing CHWs' confidence, trust, and acceptance in the community. This layer of institutional support strengthens relationships and facilitates the integration of CHWs into health systems in the subregion (Kok *et al.*, 2017b; Murphy *et al.*, 2021; Strachan *et al.*, 2015). Providing appropriate support for supervisors also fosters constructive interactions between CHWs and healthcare workers (Ludwick *et al.*, 2018), while routine, participatory, and constructive supervision helps alleviate occupational burdens (Laurenzi *et al.*, 2021; Kok *et al.*, 2018).

However, challenges remain. In Mozambique, irregular and demotivating supervision has been reported (Ndima *et al.*, 2015); in Malawi, the absence of regular supervision has been noted (Kok and Muula, 2013); and in South Africa, a general lack of supervision has inhibited CHWs' efficacy and community integration (Naidoo *et al.*, 2019). CHWs require supervision that is supportive, evolves with CHW programme development, and addresses the cadre's context-specific needs (Kok *et al.*, 2018).

Communities—often excluded from supervisory roles—can play a vital role in enhancing the legitimacy and effectiveness of CHWs when they are involved (Raven *et al.*, 2015). Studies from Mozambique and Tanzania, reported multi-tiered supervision models that include both community and health facility-based oversight have enhanced CHWs' credibility (Ndima *et al.*, 2015; Baynes *et al.*, 2017). While community governance in supervision in Mozambique only partially addresses the needs, it underscores the necessity for more robust support structures (Ndima *et al.*, 2015). In contrast, in South Sudan and South Africa, authors note that community leader involvement has been seen as effective support that facilitates CHWs' bridging roles (Assegaai and Schneider, 2019; Lutwama *et al.*, 2021).

CHWs often face significant challenges due to inadequate access to necessary supplies and resources, despite policy-level commitments at the programme level (Oliver et al., 2015). Adequate resources and logistical support—including supplies, medication, and transportation—are essential for the cadre's ability to carry out their linking roles effectively (Raven *et al.*, 2020). Resource limitations not only jeopardize CHWs' health and safety but also damage their reputation, credibility, and the trust

they build in their roles, thereby limiting their ability to perform boundary-spanning tasks (Kok *et al.*, 2017b; Miller et al., 2018; Raven et al., 2020).

Insufficient resources for supervision activities in Mozambique have led to administrative burdens (Ndima *et al*., 2015). In studies from South Africa, Sierra Leone, and Malawi, lack of transportation has presented a significant barrier to CHWs' boundary-spanning roles (Naidoo et al., 2019; Kok et al., 2013; Koroma et al., 2021). Although mobile technologies in resource-limited settings have offered new avenues for support, enhancing CHWs' performance and connectivity with communities and health systems, these technologies also introduce challenges such as gendered access and difficulties in adhering to guidelines without adequate support (Steege et al., 2018).

During the COVID-19 pandemic, CHWs faced a critical shortage of personal protective equipment and necessary tools, which not only impeded their bridging functions but also increased health risks for the cadre (Chengo et al., 2022; Kallon et al., 2023). Frequent out-of-stock and a persistent lack of supplies have negatively impacted CHWs' ability to provide health services during crises, as evidenced during both the Ebola outbreak (Miller et al., 2018) and the COVID-19 lockdown (Niyigena et al., 2022). In Kenya, the lack of resources—including personal protective and hygiene equipment—was reported as a key factor inhibiting CHVs from carrying out their tasks (Ogutu et al., 2023). Similarly, in South Africa, Sierra Leone, and Ethiopia, authors identify limited supplies and inadequate facilities as compromising CHWs' capacity to respond to community needs and implement health system directives (Strachan *et al.*, 2015; Nxumalo *et al*., 2016; Mamo *et al.*, 2019).

When CHWs are unable to meet community needs due to resource constraints, trust and respect for their roles suffer, ultimately undermining the effectiveness and acceptance of CHW programmes (Oliver *et al.*, 2015). In contrast, adequate and appropriate logistical and resource support can improve the acceptability and credibility of CHWs, helping them to maintain strong relationships with both communities and health systems. This was evident in Nigeria, where resources provided VHWs with a sense of identity, belonging, and confidence to meet community needs (Mbachu *et al.*, 2022). Addressing these issues requires collective action and tailored resource allocation that suits the unique roles of CHWs (Oliver *et al.*, 2015).

Unlike system-wide workforce policies that apply uniformly across the health sector, CHW incentive structures vary widely both between and within countries, even across programmes within the same country (Singh *et al.*, 2015; Van de Ruit, 2019; Koroma *et al.*, 2021; Chengo *et al.*, 2022). Although there is no clear consensus on the most effective incentive structures for CHWs, the primary goals are to enhance job retention, satisfaction, and motivation (Singh *et al.*, 2015a; Van de Ruit, 2019; Koroma *et al.*, 2021; Chengo *et al.*, 2022).

Financial incentives are widely recognized as crucial, especially for CHWs who undertake multiple tasks or work long hours, as these incentives are closely linked to their motivation (Akintola and Chikoko, 2016; Kok *et al.*, 2017b; Maes and Kalofonos, 2013). Non-financial incentives—such as recognition, career advancement opportunities, and improved status within both the community and health system—also play a significant role in motivating CHWs in their intermediary roles (Kok *et al.*, 2017a).

In studies from Ethiopia, female HEWs face challenges with incentive structures. They are sometimes assigned additional tasks without adequate compensation, partly because programmes tend to favour employing female CHWs due to male CHWs demanding higher wages, this situation creates challenges

for HEWs who must balance frontline community engagement with inadequate remuneration (Closser *et al.*, 2019). Similarly, in Sierra Leone, evidence shows minimal stipends and unfair payment practices have adversely impacted the cadre's contribution (Koroma *et al.*, 2021). In South Africa and Sierra Leone, several authors have emphasized the need for adequate pay to enable CHWs to operate effectively in their roles (Laurenzi *et al.*, 2021; Kallon *et al.*, 2023). Mwai *et al.* (2013) suggested that health authorities should lead efforts to develop appropriate remuneration strategies for CHWs.

In Sierra Leone and Liberia, delays in remuneration were found to have forced CHWs to use their own funds to carry out their intermediary roles—often in contexts of widespread poverty (Raven *et al.*, 2020). In Nigeria, authors indicate that monetary incentives for CHWs have been shown not only to motivate CHWs but also to empower them by granting a degree of financial independence and decision-making power (Mbachu *et al.*, 2022).

Linked to the concept of incentives, motivational factors play an essential role in CHW's ability to contribute fully in their linking roles. These factors are often intertwined with elements such as trust, respect, recognition, supportive supervision, teamwork, autonomy, communication, and resource availability (Kok *et al.*, 2017a).

An example is seen in Rwanda, where CHWs were motivated by the recognition and respect they received from their communities (Condo *et al.*, 2014). Similarly, in Nigeria, acceptance, trust, and support from the community were seen as essential enablers for the success of VHW programmes, fostering confidence, a sense of acceptance, and professional identity among the cadre (Mbachu *et al.*, 2022). Findings from Kenya, reveal appreciation, recognition, and respect to be powerful motivators for CHVs, enabling them to continue in their volunteer roles (Ogutu *et al.*, 2023).

In contrast, studies from Sierra Leone, identified mistrust and suspicion towards CHWs in Ebola-stricken areas to adversely affected CHWs' motivation and performance, despite the potential for community recognition to serve as a motivator (Koroma *et al.*, 2021). In Uganda, when CHWs became alienated from their communities, their motivation declined and attrition increased—highlighting how critical community feedback and support are for sustaining CHWs' bridging roles (Strachan *et al.*, 2015), with CHWs who felt connected to both the health system and their communities being more motivated and validated in their ability to carry out their roles (Strachan *et al.*, 2015).

Theme 5. Contextual factors influencing CHWs' boundary-spanning roles

This theme examines how broader contextual factors—including sociopolitical dynamics, fragile and conflict-affected settings—shape CHWs' roles as boundary spanners.

Context not only defines CHWs' contributions and programme functionality but also influences their relationships with both communities and health systems (Kane et al., 2016; Kok et al., 2017b; Laurenzi et al., 2021). The identities of CHWs are deeply embedded in societal, historical, economic, and environmental contexts, as well as in health system policies (Steege *et al.*, 2018; Lutwama *et al.*, 2021; Kok *et al.*, 2017a). These contextual factors can sometimes impede the cadre's role as intermediary.

Historical context plays a significant role in how CHWs are perceived within health systems and communities (Singh *et al.*, 2015a). For example, in Rwanda, CHWs were pivotal in uniting communities and rebuilding trust in a post-conflict environment, thereby supporting the sustainability of health systems through their linking roles (Tuyisenge *et al.*, 2019). In Uganda, however, historical government

mistrust—stemming from colonial associations—has led to enduring community scepticism towards government-supported CHWs, even when these workers are selected from within the communities themselves (Singh *et al.*, 2015a). This historical mistrust continues to affect how communities perceive and interact with CHWs, potentially impacting the effectiveness of their linking roles (Singh *et al.*, 2015a).

CHWs often work in economically disadvantaged communities and may experience the same societal and economic inequities, marginalization, and needs as the communities they serve (Van de Ruit, 2019; Raven *et al.*, 2020; Anstey Watkins *et al.*, 2021). The financial strain from the obligations they feel to support these communities further affects the cadre's own socio-economic status (Tuyisenge *et al.*, 2019). Studies from Kenya showed that broader societal and economic factors—such as poverty and safety concerns—shape CHVs bridging roles (Ogutu *et al.*, 2023). In fragile settings like Sierra Leone, the DRC, and Liberia, health systems depend heavily on CHWs; however, broader societal influences including limited education and literacy levels indirectly affect how CHWs are selected and trained (Raven *et al.*, 2020). Although CHWs are typically tasked with addressing social determinants of health, their ability to empower communities and tackle these determinants is often hampered by insufficient societal and political commitment, especially when resources are scarce (Closser *et al.*, 2019). This situation underscores the need for intersectoral and multi-level support to address the economic determinants that impact CHWs' ability to form links between communities and the formal health system (Nxumalo *et al.*, 2016).

Key Themes (factors influencing boundary-spanning roles)	Main findings
Governance, policy, and structural factors	National strategies that formally integrate CHWs enhance their legitimacy as boundary spanners.
	Policy gaps and weak standardization result in ambiguity about CHWs' bridging positions, causing misalignment between expectations and roles.
	Top-down governance limits CHWs' autonomy as intermediaries and inhibits their ability to meet community needs.
	CHWs' accountability is often skewed (upwards) toward health institutions rather than the communities they serve, weakening their legitimacy.
	Exclusion from decision-making processes prevents CHWs from informing and advocating for health system changes (missing opportunities to improve their boundary-spanning effectiveness).
	Weak policy implementation and inconsistent support structures reduce CHWs' ability to sustain relationships between health systems and communities.
	Gender biases in policy and workforce structures limit female CHWs' ability to serve as empowered connectors.
Community-level dynamics and embeddedness factors	CHWs' effectiveness as intermediaries is linked to their embeddedness in communities but can cause confidentiality challenges in sensitive health areas impacting CHWs' ability to act as trusted boundary spanners.
	CHWs' success relies on social capital, but they face credibility issues when communities associate them with weak or underperforming health systems.
	Health system support strengthens CHWs' legitimacy, but if misaligned with community perceptions, it may inhibit their ability to navigate boundaries.
	Misaligned community expectations about CHWs' roles can create role strain, reducing their ability to act as effective health system liaisons.
	Power imbalances between systems and within communities influence CHWs roles
	Long-standing trust between CHWs and communities enables them to bridge gaps even in crisis situations, such as during epidemics.
	A lack of community involvement in CHW oversight weakens their accountability as intermediaries, limiting their influence at a community-level.
Formal health system-level integration factors	CHWs occupy peripheral positions in health systems, limiting their ability to act as intermediaries.
	Weak integration within formal health structures leads to inadequate institutional support.

	Negative perceptions from other healthcare workers create institutional resistance, reducing CHWs' effectiveness in linking health services and communities.
	Recognition and support by formal health actors improve CHWs' ability to function as connectors between frontline services and communities.
	Ineffective referral systems and fragmented communication disrupt CHWs' ability to act as functional boundary spanners.
	Workplace trust and structured supervision enhance CHWs' legitimacy, enabling them to more effectively translate health system goals at community levels.
	Weak health system support hinders CHWs' abilities to facilitate crisis-response coordination.
Programme implementation and workplace factors i	Recruitment and selection processes influence CHWs' credibility; community-driven selection enhances trust and legitimacy.
	Ongoing, context-specific training enhances CHWs' ability to bridge knowledge gaps between health workers and community members.
	Role ambiguity and increasing workloads create tensions between CHWs' institutional expectations and their on-the-ground community roles.
	Financial incentives affect retention, but non-financial recognition (community respect, training, career growth) enhances their commitment as boundary spanners.
	Poorly structured supervision limits CHWs' ability to function as intermediaries and maintain authority in both community and institutional settings. Supportive, participatory supervision models increase CHWs' confidence and capacity to mediate effectively between multiple stakeholders.
	Clear role definitions improve CHWs' effectiveness in balancing institutional demands with community needs.
	Resource shortages (medicines, transportation, protective equipment) reduce CHWs' ability to act as reliable links between healthcare providers and patients.
Contextual factors	Historical mistrust in government health systems affects CHWs' ability to function as effective connectors.
	Economic hardships and job insecurity make it difficult for CHWs to sustain their bridging roles over time.
	CHWs working in fragile and conflict-affected settings face heightened risks, logistical challenges, and security constraints.
	Systemic inequities and lack of institutional backing undermine CHWs' ability to create meaningful, long-term connections between sectors.
	CHWs often share the socio-economic struggles of the populations they serve, affecting their ability to maintain boundaries as intermediaries.

Table 3: Summary of main findings. Source: Author

Discussion

This review synthesized evidence on the complex interplay of factors influencing CHWs' roles as boundary spanners. These factors are categorized into themes related to governance, policy, and structural issues; community and formal health system-level dynamics; programme implementation; and broader contextual influences. CHWs are an evolving and heterogeneous cadre, and the factors that enable or inhibit their ability to contribute fully reflect both the diversity of the cadre and the evolving nature of CHW-related policies and programmes. Rather than being binary or clear-cut, these factors influence CHWs in varied and nuanced ways.

Hardware-software interactions influencing CHWs boundary-spanning roles

The identified enablers and barriers suggest that dynamic interplays between health system software and hardware influence the cadre's ability to carry out their intermediary roles. Hardware is understood as the tangible building blocks of health systems (in this review, the structural processes and operational programmatic components), while software includes ideas, interest, norms, and values (in this review, this refers to relationship dynamics and inherent power dynamics; Gilson *et al.*, 2012). Ultimately, whether factors enable or inhibit CHWs' ability to act as boundary spanners depends on the interactions between systems' hardware and software.

Health systems—and the policies and values they embody—often provide the foundation for CHWs' ability to carry out their roles (Kok *et al.*, 2015a). Well-designed policy and programmes contribute to CHW role clarity and optimal functioning by fostering trusting relationships. In contrast, poorly designed programmes that conflict with local interests or expectations, or that ignore contextual issues such as gendered practices, can undermine CHW contributions by eroding these trusting relationships, leading to demotivation and weak overall connections (Kok *et al.*, 2017b). Clear mandates, institutional support, and robust policy backing promote recognition, integration, and stronger relationships (LeBan *et al.*, 2014; Kok *et al.*, 2015b). In Kenya and Uganda, unclear policies have resulted in low CHW retention, role ambiguity, and weak accountability structures (Musinguzi *et al.*, 2017; Chengo *et al.*, 2022). Lessons from Bangladesh demonstrate that CHWs under the Bangladesh Rural Advancement Committee (BRAC) model benefited from strong institutional support and recognition, which enhanced their legitimacy, authority, and integration within the health system (Ahmed *et al.*, 2022).

Effective selection strategies are key enablers that promote successful CHW programmes by fostering strong relationships through trust, respect, and by legitimizing and supporting their position (Olaniran *et al.*, 2017; Schleiff *et al.*, 2021). This enables CHWs to perform their roles and garner system-wide support, thereby bolstering their influence and ability to navigate both communities and health systems (Olaniran *et al.*, 2017; Sabo *et al.*, 2017; Ahmed *et al.*, 2022). Similarly, adequate resources and logistical support enhance the cadre's ability to span boundaries, strengthening trust within both communities and health systems. Conversely, struggles in accessing necessary resources undermine their linking roles (Cometto *et al.*, 2018).

Financial and non-financial incentives are closely linked to CHWs' motivation, accountability, and performance, but they can be potentially exploitative when a focus on sustainability is overlooked (Kok *et al.*, 2017a; Besada *et al.*, 2018; Closser *et al.*, 2019). To support CHWs as effective boundary spanners, incentives should foster trusting relationships and ensure accountability to both the institutions and the communities they serve (Kok *et al.*, 2017a). In Sierra Leone, delays in CHW

payments forced workers to self-finance service delivery, undermining their ability as intermediaries, weakening CHWs' commitment, and eroding trust both in government and communities (Koroma *et al.*, 2021). CHWs' motivation and retention are heavily influenced by both financial and non-financial incentives (Closser *et al.*, 2019; Koroma *et al.*, 2021). In Rwanda, CHWs were more motivated when recognized through non-financial incentives, such as community recognition and social status (Condo *et al.*, 2014). Similarly, in Nigeria, trust and respect from communities reinforced CHWs' commitment and effectiveness (Mbachu *et al.*, 2022). To sustain CHW motivation, governments must ensure structured career pathways and fair remuneration models that balance economic security with professional growth opportunities (Mwai *et al.*, 2013; Kok *et al.*, 2017a).

Role and task allocation can reinforce exploitative dynamics of the cadre in their boundary-spanning role, limiting capacity, particularly when tasks are assigned without CHWs' input (Mundeva *et al.*, 2018). The scope and definitions of what work CHWs 'do' is evolving, with blurred boundaries and a constant expansion in the breadth of tasks, including shifted tasks (Smith *et al.*, 2014; Daniels *et al.*, 2015). CHWs also often take on additional roles beyond their designated scope in response to community needs. However, CHWs' ability to effectively span boundaries is strengthened when their roles are clearly defined, respected, and supported by both the community and the formal health system (LeBan *et al.*, 2021).

Supervision influences CHWs' autonomy, credibility, and system integration. Effective supervision supports CHWs' ability to bridge health systems and communities, yet many of the existing supervisory models emphasize hierarchical control rather than supportive relationships (Kok *et al.*, 2018; Ludwick *et al.*, 2018), with top-down approaches often leading to CHW demotivation and attrition (Nxumalo *et al.*, 2016). When communities observe CHWs being supervised, it adds to the CHWs' legitimacy and strengthens relationships with communities (Kok *et al.*, 2017b). Lessons from Uganda and Mozambique show that relational supervision approaches empower CHWs and improve job satisfaction and retention (Strachan *et al.*, 2015).

CHWs' ability to span boundaries is strengthened by supportive accountability frameworks (Kok *et al.*, 2017b; Tuyisenge *et al.*, 2019). However, from the results, a key question remains: Who should CHWs be most accountable to—the community, the formal health system, or both? Lessons from India's Accredited Social Health Activist (ASHA) programme show that CHWs' credibility and legitimacy are enhanced by dual accountability, to both the health system and communities (Singh *et al.*, 2015b; Scott *et al.*, 2018).

Power asymmetries influencing CHWs' boundary-spanning roles

As social actors, CHWs rely on trusting relationships, which, while theoretically achieved at an interpersonal level, are also shaped by programme design (Kok *et al.*, 2017b). Power and relationships emerge as cross-cutting themes influencing CHWs' ability to span boundaries. Strong relationships with both community and formal health system actors are significant enablers of CHWs' effectiveness (Theobald *et al.*, 2015 Sabo *et al.*, 2017; Mundeva *et al.*, 2018). Power dynamics are key factors influencing these relationships, as CHWs in their boundary-spanning roles must navigate power structures within and between formal health and community systems (Turinawe *et al.*, 2015; Kok *et al.*, 2017a; Anstey Watkins *et al.*, 2021; Assegaai and Schneider, 2022). In SSA, social and gendered hierarchies significantly impact their performance and advocacy capabilities (Kok *et al.*, 2017a; Steege *et al.*, 2018).

Empowerment—both the empowerment of CHWs in their roles and their responsibility to empower the communities they serve—was a subtheme that emerged (Turinawe *et al.*, 2015; Kane *et al.*, 2016; Kok *et al.*, 2018; Steege *et al.*, 2018, 2020; Closser *et al.*, 2019). While CHWs' roles can be seen as empowering, particularly for women (Steege *et al.*, 2018), the concept is nuanced in their intermediary roles as they face a fragile balance between empowerment and exploitation (Closser *et al.*, 2019), with CHWs often feeling disempowered in their roles advocating for themselves or the communities they represent (Condo *et al.*, 2014; Nxumalo *et al.*, 2016; Closser *et al.*, 2019). Kane *et al.* (2016) stress that for CHWs to empower communities, they must first feel empowered themselves. Lessons can be drawn from Brazil's Family Health Strategy (FHS), which shows how CHWs' role formalization and institutional recognition empower them by supporting credibility, decision-making power, and their ability to bridge communities and formal health systems.

Health system responsiveness is essential in enabling CHWs to navigate relational and power dynamics, build trust, enhance accountability, and support effective CHW contributions (Theobald *et al.*, 2015; Asweto *et al.*, 2016; Kok *et al.*, 2017b). In Uganda, the shortcomings of VHTs as linking agents are embedded within power relations that partly stem from hierarchical healthcare systems that place the community at the bottom of the ladder (Musinguzi *et al.*, 2017). Similarly, in South Africa, CHWs are depicted as occupying the bottom rung of health system hierarchical power relations, which limits their agency and boundary-spanning abilities (Anstey Watkins *et al.*, 2021). Addressing gendered power dynamics is essential for empowering CHWs and supporting their ability to navigate intermediary roles and system relationships, with a gender-sensitive approach to programme design potentially enabling CHWs' effectiveness (Theobald *et al.*, 2015; Steege *et al.*, 2020).

Recommendations for decision- and policymakers

CHWs require adequate bi-system support—from communities and health systems—to effectively carry out their boundary-spanning roles. Their contributions have often been constrained by inadequate support from health systems, as highlighted during the COVID-19 pandemic (Kallon *et al.*, 2023). While the cadre continues to contribute to health system goals throughout the subcontinent, they can be even more effective when appropriately enabled and supported. Rather than being viewed as a remedy for weak health systems, CHWs are better supported when both their current and potential contributions, as well as the limitations of their contributions, are adequately acknowledged, thereby engendering appropriate responses to support their unique role and position as intermediaries (Theobald *et al.*, 2015; Kok *et al.*, 2017a).

Strong health systems should provide a foundation for CHWs to thrive in their boundary-spanning roles rather than the cadre being seen as a panacea for weak health systems (Schneider *et al.*, 2008; Naimoli *et al.*, 2015). Their effectiveness hinges on feeling empowered and supported within enabling environments (Kok *et al.*, 2017a). To fully realize CHWs' boundary-spanning potential, support from all levels of the health system is essential (Theobald *et al.*, 2015). This requires a comprehensive approach that effectively integrates CHW programmes into health systems by acknowledging system actors, their relationships, and the structural/hardware factors at play (Kok *et al.*, 2017b; Schneider and Lehmann, 2016).

Effective integration of CHWs into well-functioning health systems involves both horizontal integration into health teams and facilities and vertical integration into the core activities of health systems

(Nxumalo *et al.* 2016; Murphy *et al.* 2020). Thus, like other cadres located within the formal health system, CHWs require a supportive and coordinated work environment to be effective. This environment should include clearly drawn roles and lines of accountability, full acknowledgement and recognition of their unique insights and contributions, and an appropriate response to their needs (Campbell and Scott, 2011; Raven *et al.*, 2015; Nxumalo *et al.*, 2016; Kok *et al.*, 2017b).

To optimize CHWs' unique intermediary role, health systems should prioritize strategic relationships and coordinated efforts between communities and formal health systems (Naimoli *et al.*, 2015). Investments in CHW programmes should include support and capacity development through training, supportive supervision, logistical support, and fair labour practices—including appropriate incentives, structured career paths, and stronger facilitation of their relationships with other cadres (Campbell and Scott, 2011; Perry *et al.*, 2014b). CHWs also require responsive health systems to successfully perform their roles and carry out required tasks (Glenton *et al.*, 2021). Health systems should provide the necessary tools, resources, and mechanisms that strengthen both internal and external accountability structures, with health system responsiveness empowering CHWs (Singh *et al.*, 2015b; Turinawe *et al.*, 2015). Strengthening accountability structures within health systems and between formal health systems and communities can enhance CHWs' effectiveness in bridging these boundaries. Further research is needed to explore how responsiveness and accountability mechanisms can be optimized (Khan *et al.*, 2021; Sutherns and Olivier, 2021). Without acknowledging contextual factors, the relational frameworks that govern accountability structures may be overlooked and underestimated (Kok *et al.*, 2017b).

CHWs require support from communities to effectively conduct their boundary-spanning roles. However, CHW embeddedness and relationships with communities vary across the subcontinent. While CHWs are seen as a medium for community representation, agency, and empowerment (Kok *et al.*, 2017a), proximity alone does not guarantee community embeddedness, acceptance, or support (LeBan *et al.*, 2014; Turinawe *et al.*, 2015). Without community support, CHWs struggle to function as intermediaries, which negatively impacts both their morale and effectiveness (Turinawe *et al.*, 2015). The extent to which CHWs leverage support from communities and the accountability mechanisms within communities and between communities and health systems (regarding the intermediary role of the cadre) remains under-documented in the subcontinent. However, evidence suggests that strong community support enhances programme success, legitimizes CHWs, and boosts their confidence (Singh *et al.*, 2015b; Baynes *et al.*, 2017). When communities are included in CHW programme design and implementation, they are more likely to be accepting and supportive of the cadre (Turinawe *et al.*, 2015). For CHWs to be effective and motivated, both they and the communities they support must be included in decision-making processes (Glenton *et al.*, 2021). Thus, CHWs' ability to contribute fully as boundary spanners is influenced by the support they receive across boundaries. Weak support by either health systems or communities can impede CHWs' work, with support across boundaries having ripple effects on relationships. Coordinated and collaborative efforts between formal health systems and communities are therefore essential (Naimoli *et al.*, 2015; Kok *et al.*, 2017b; Mundeva *et al.*, 2018; LeBan *et al.*, 2021).

The findings of this review illustrate that CHWs' effectiveness in their boundary-spanning roles hinges on their ability to navigate relational and power dynamics, which serve as the capital that enables them to lead, negotiate, collaborate, and mediate across systems (Pelletier *et al.*, 2018). This relational

role needs to be recognized to effectively support the cadre. The factors present within both community relationships and formal health bureaucracies have inherent strengths and tensions that can either enable or constrain CHWs' effectiveness and the quality of their relationships across these boundaries (LeBan *et al.*, 2021). The role of relationship-building in CHWs' intermediary functions is also observed in other LMICs, where the cadre mobilizes social capital to legitimize their roles (Kane *et al.*, 2021). As boundary spanners, CHWs are situated within a complex web of inter- and intra-boundary micro-politics (Pelletier *et al.*, 2018), which requires a nuanced understanding and deep engagement (LeBan *et al.*, 2021). CHWs' roles are shaped by "transactional social processes" unfolding at both the community and health system levels (Kok *et al.*, 2017a). Whether or not relational roles are formally conveyed as expectations for their intermediary functions, social mobilization remains a core competency and reality in CHWs' daily work (Oliver *et al.*, 2015). Given the highly interpersonal, social, and emotional nature of CHWs' work, failure to provide the flexibility needed to perform their bridging roles, integrate the scope of their current activities, and streamline expectations may lead to burnout, ultimately undermining CHWs' contributions, motivation, trust, and overall personal and professional well-being (Condo *et al.*, 2014; Mundeva *et al.*, 2018).

People are at the heart of health systems, and their interactions reflect entrenched power dynamics. Establishing people-centred health systems inherently challenges existing power imbalances (Sheikh *et al.*, 2014). How power shapes CHWs' ability to span boundaries varies by context, and health system responsiveness can potentially shift these dynamics, interrupting hierarchical structures (Kane *et al.*, 2016; Mundeva *et al.*, 2018; Steege *et al.*, 2018) The collaborative nature of the boundary-spanning work occurs in environments where power within relationships is more contested and dispersed, as opposed to traditional bureaucracies where power and authority, and control are more centralized (Williams, 2022). In contrast, relationships within communities tend to be less hierarchical than those in formal bureaucracies, featuring more horizontal power structures (Schneider and Lehmann, 2016). These dynamics add a layer of complexity to CHWs' intermediary roles, and addressing this complexity is necessary to explore the factors that shape CHWs' boundary spanning (Schneider & Lehmann, 2016; Theobald *et al.*, 2016; Steege *et al.*, 2018). Although CHWs are often described as being powerless within health system bureaucracies, they are, in fact, influential actors and, if adequately supported in their roles, have the potential to emerge as powerful influences in both communities and on the front line of health systems (Kane *et al.*, 2021).

Agenda for future research

The role of CHWs in improving health outcomes has been well established. The challenge now lies in how this recognized potential can be realized (Oliver *et al.*, 2015). Addressing this question requires more profound insights from the perspectives and experiences of the cadre themselves. Evidence gaps revealed through this review align with previous studies, highlighting the lack of opportunity CHWs have to leverage their embedded knowledge in health system decision-making and priority setting (Oliver *et al.*, 2015). Both communities and CHWs remain underrepresented (Asweto *et al.*, 2016), potentially restricting health systems' ability to respond to the cadre's needs. Focusing on the experiences and perspectives of CHWs may help to identify key areas for policy reform and reveal contradictions that highlight critical yet often neglected areas (Asweto *et al.*, 2016).

The relative absence of CHWs' voices in the literature may reflect underlying power dynamics inherent not only in communities and health systems but also in research agendas, where CHW insights remain underexplored (Musoke *et al.*, 2022). Without opportunities to contribute to decision-making, the breadth of CHWs' activities will remain unrecognized, obstructing efforts to identify support mechanisms and strategies for improving their effectiveness in goals setting (Loeliger *et al.*, 2016). Despite the recognition of CHWs' contributions, evidence on their lived experiences and challenges—particularly in LMICs—remains limited (George *et al.*, 2015; Kane *et al.*, 2016; Austin-Evelyn *et al.*, 2017). Providing CHWs with more opportunities to engage in health system priority setting and to contribute their embodied knowledge could enhance their role as boundary spanners by illuminating barriers and enablers that might otherwise remain hidden. Findings from this review indicate that CHWs recognize their intermediary role and are actively seeking more support to fulfil these roles effectively.

The following potential research question is proposed: "How do CHWs leverage community support, and what accountability mechanisms shape their boundary-spanning roles in SSA?" Building on the evidence gaps identified in this review, further research is needed to explore the extent to which the cadre is provided opportunities to share their knowledge and views—particularly regarding the challenges and opportunities they face in programme decision-making and within community and health system priority settings (Perry *et al.*, 2014b; Oliver *et al.*, 2015). A method that has remained relatively underexplored in health policy and systems research is participatory policy analysis, which could be used to "identify and define policy problems, analyse them, and provide recommendations for future action"(Sapkota *et al.*, 2024). A participatory research approach may provide a valuable framework for addressing this question, as it encourages systematic inquiry through collaboration with CHWs, thereby providing a platform for their experiences and expertise to inform policy development (Seward *et al.*, 2021).

Conclusion

This review reveals that CHWs in SSA play a pivotal role as intermediaries in complex healthcare systems, bridging the gap between communities and formal healthcare providers. CHWs' boundary-spanning role places them in an intermediary position that necessitates trusting relationships with both communities and health sector actors. Successful boundary spanning by CHWs is contingent on how well they navigate relationships and power dynamics between actors across these boundaries, which shape the factors influencing their effectiveness. The interaction of system hardware and software is instrumental in shaping these dynamics. Health systems must adopt participatory, co-developed interventions that avoid bureaucratic exclusion and integrate CHWs and communities into decision-making processes. Context-sensitive approaches are crucial for programme sustainability, with transformative and inclusive strategies holding the potential to shift current power dynamics and encourage CHWs' representation in health system leadership, where they can leverage their unique intermediary insights.

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Appendix 1: Part A from research protocol approved through the DRC

Factors Influencing Community Health Workers' Contribution at the Interface of Health Systems and Communities in LMICS

Introduction

Health systems in low -and middle-income countries (LMICs) face a high burden of disease, mortality, and continued human resources for health (HRH) constraints, with the most critical shortages found in Africa and South Asia (Kok *et al*., 2016; Masis *et al*., 2021). Achieving universal health coverage (UHC) goals, including the re-engineering of Primary Health Care (PHC)[7] and achieving health-related Sustainable Development Goal (SDG) targets, require prioritizing well-supported HRH (Cometto *et al*., 2018; Garg *et al*., 2022). This prioritisation includes an investment in frontline healthcare teams who bear the burden of health service delivery in low-resource settings (Braun *et al*., 2013; Theobald *et al*., 2015). Among these frontline healthcare teams in LMIC settings, the non-physician majority, including Community Health Workers (CHWs)[8], hold great a potential to support the strengthening of health systems (Schneider *et al*., 2008; Smith *et al*., 2014).

CHWs are increasingly being recognized for their role in health initiatives addressing health disparities and the social and contextual determinants of health (Condo *et al*., 2014; Feldhaus *et al*., 2015; Asweto *et al*., 2016; Kok *et al*., 2017a). Considering their potential, CHWs are no longer viewed as a quick-fix solution, but instead, a cadre for sustained investment in health system strengthening (Naimoli *et al*., 2015; Schneider *et al*., 2018). Despite renewed enthusiasm for the cadre and CHW programs within health systems, historical challenges continue to hinder their effectiveness (Mundeva *et al.*, 2018). Despite their significant contributions to Health systems in LMICs, CHWs continue to be undervalued, marginalised, and disempowered in their positions (Musoke *et al*., 2022).

The cadre are uniquely positioned to help strengthen health systems by 'bridging' the gaps in current system functioning and service delivery, particularly at a community level and within PHC[9] frameworks (Asweto *et al*., 2016; Olaniran *et al*., 2017). Through their bridging and intermediary role as 'boundary spanners' (more on this term below), CHWs link health systems and communities, contributing to potential improvements in health access and coverage (Theobald *et al*., 2015). Recognising the importance of this cadre, governments have focused on integrating CHW programmes more

[7] Primary Health Care is understood as the most cost-effective approach to deliver health interventions aimed at achieving HS goals and targets.
[8] There are varied types of CHWs, this is unpacked in more detail below.

effectively within health systems to improve community-level service delivery (Singh *et al*., 2013; Asweto *et al*., 2016). For this contribution to be fully recognised, the scope of the cadres' potential contribution needs to be acknowledged (Ahmed *et al.*, 2022). For CHWs to fulfil their potential as boundary spanners, health systems must provide support to this cadre by addressing those factors that impede their roles (Lewin *et al.*, 2021; Garg *et al.*, 2022; Olaniran *et al.*, 2022).

Literature Review

A rapid scoping review was conducted to map the existing evidence on the challenges facing CHWs' ability to contribute to health system goals in their roles as 'boundary spanners' in LMICs. By identifying factors influencing CHWs' contributions, the review aimed to enhance understandings of how health systems can provide appropriate, relevant, and responsive support to CHW cadres in LMICs (see methodology Phase 1 below).

Despite a dynamic history marked by their evolving roles in addressing health systems priorities, CHWs' integration into health systems presents a paradox. Although CHWs are increasingly recognised as the cornerstone of HRH in their roles by making a critical contribution, with many LMICs formalising CHW programmes and policies (Schneider *et al*., 2017;Mirzoev *et al*., 2021), debates persist regarding CHW's roles and scope of work, highlighting a gap between current practices and the potential effectiveness of the cadre (Kok, Ormel, *et al*., 2017; Cometto *et al*., 2018). This paradox is further accentuated by the question of whether CHWs are the lackeys of overburdened health systems or their liberators, underscoring the need to reassess how the cadre is supported and valued, ensuring they are enabled to realise their full potential without being hindered by systemic constraints (Schaaf *et al.*, 2018). The recent World Health Organization (WHO) guideline on health policy and system support to optimize community health worker programmes, offers hope for leveraging CHWs' full potential, but the success of the implementation of this guidance hinges on learning from past frustrations and ensuring contextually appropriate support for the cadre (Cometto *et al.*, 2018; Hodgins *et al.*, 2021).

CHW characteristics in LMICs

Community-based cadres includes both informal and formal workers, with informal workers making up the majority in most LMICs having a range of types of this informal cadre (Sudhinaraset *et al.*, 2013; Karuga *et al.*, 2019). The diverse array of the Close to Community Health Workers and the scope of experiences among the cadre makes it necessary to focus on specific experiences, such as those of CHWs, for this review.

Community health workers, emersed within program settings, operate at the forefront of health systems, engaging actively in service delivery at both community and facility levels. Due to their direct

and continuous involvement in communities, the cadre possesses a unique understanding of local needs (Sudhinaraset *et al.*, 2013). CHWs are a diverse cadre, with different names and roles depending on the local context (Kok, Kea, *et al*., 2015). The term CHWs has become an umbrella term used to group diverse categories and definitions of community-based health workers, who differ by role and contexts, both globally and between LMICs and other countries (Closser *et al*., 2019; Lehmann *et al*., 2019; Musoke *et al*., 2022). While there is significant diversity among CHWs within and between LMICs; in many LMICs, CHWs are primarily female (Theobald *et al*., 2015), without any tertiary education, and over 30 years old (Raven *et al*., 2015; Closser *et al*., 2019). However there are exceptions, such as Ghana where CHWs are more likely to be male (Raven *et al*., 2015) A multitude of complex factors influence not only who becomes and remains a CHW but also shape their experiences and responsibilities (Raven *et al*.,).These include factors such as CHWs demographics *(*gender, age, education level), local contexts (including historical contexts and social and behavioural practices), experiences of, and relationships with, the health system and local government, as well as a plethora of intra and interpersonal dynamics (Kok, Kea, *et al*., 2015).The diverse names (Table 1 provides examples) reflect the blurred roles and multiple heterogeneities of categories CHWs are referred to in LMICs (Kok *et al*., 2015a). For this review, the term 'CHW' is used to depict health workers who are situated at community level (Kok *et al*., 2015a; Ahmed *et al*., 2022)., often providing services outside of health facilities or at peripheral facilities (Kok *et al*., 2015b; Cometto *et al*., 2018), who have received some training (less than two years) but have not yet received formalised training that would render them health professionals (Olaniran *et al*., 2017).

Country	Commonly utilised term
Bangladesh	**'Shasthya Shebikas'**
Bolivia	**'Manzaneras'**
Brazil	**Agente Comunitário de Saúde**
Ethiopia	**Community Drug Distributors (CDDs)**
	Health Extension Workers (HEWs)
Ghana	**Community-Based Surveillance Volunteers (CBSVs)**
Guinea	**Community Based Distributors (CBDs)**
India	**Accredited Social Health Activists (ASHAs)**
	Community Based Distributors (CBDs)
Indonesia	**Community Facilitators (CFs)**
Iran	**'Behvarz'**
Kenya	**Community Health Volunteers (CHVs)**
Madagascar	**Agents Communautaires (ACs)/ Agents Communautaires Nutri (ACNs)**
	Community Based Distributors (CBDs)
Malawi	**Health Surveillance Assistants (HSAs)**

Mozambique	**Agentes Polivalentes Elementares (APEs),**
Multiple LMICs	**Community Health Workers (CHWs)**
	Lay counsellors
	Lay Health Workers (LHWs) (as synonym of CHWs)
	Traditional Birth Attendants (TBAs)
Myanmar	**Maternal Health Workers (MHWs)**
Nigeria	**Community Health Officers (CHOs), Community Health Extension Workers (CHEW)**
Pakistan	**Lady health workers**
South Africa	**Community home-based care workers**
	Lay Health Workers (LHWs)
Tanzania	**Peer educators**
Uganda	**Community Antiretroviral therapy and Tuberculosis Treatment Supporters (CATTS)**
	Community Medicine Distributors (CMDs)
	Community Reproductive Health Workers (CRHWs)
	Community Volunteer Workers (CVWs)
Zambia	**Adherence Support Workers (ASWs)**
Zimbabwe	**Care Facilitators (CFs)/Village Health Workers**

Table 4: Non-exhaustive list for names used for CHWs in LMICs (Kok, Kea, et al., 2015) expanded from literature review findings

CHWs as 'boundary spanners'

CHWs are thought to serve as essential linchpins between health systems and communities (Sudhinaraset *et al.*, 2013). They are deeply embedded within communities, enabling them to uniquely understand intra-community dynamics and needs while serving as the first point of contact between these communities and the health systems. This dual nature positions CHWs as crucial agents in carrying out the priorities of health systems within communities, thereby creating structured links between these two entities (Herman, 2011; Kok *et al.*, 2017a). Their unique position forms a distinct 'CHW subsystem', where CHWs operate at the intersection of these two systems navigating this interplay in complex and context-specific ways (Schneider *et al*., 2016).

While the concept of boundary-spanning has been studied extensively in high-income countries, there appears to be only limited attention in LMIC settings or in health systems contexts (Pelletier *et al*., 2018a). Boundary[10] spanners, whether individuals or organizations, operate across organizational and institutional boundaries, facilitating coordination between their 'home' organization and external entities (Meerkerk, 2020). In LMICs, community boundary spanners, like CHWs, are thought to play a

[10] 'Boundaries', understood as symbolic and social divides that distinguish groups and define the limits of their operations within the peripheries of organizational, institutional, social, and community play a crucial role in shaping the work of boundary-spanning actors (Wallace, Farmer, and McCosker, 2018).

vital role in bridging organizations and communities, advancing organizational goals while promoting community development by facilitating the flow of information and ideas through relationships (Wallace *et al.*, 2018). However, CHWs are not the only cadre functioning as boundary spanners; other informal actors, such as patient navigators, lay workers, and home-based carers, also operate in this capacity, though their role is also poorly recognized, especially in terms of their interactions with CHWs (Magadzire *et al.*, 2014; Wallace *et al.*, 2018).

In their proximity to communities, CHWs are referred to as being either the 'lowest rung' cadre in the formal health system (as an extension of the services of this system) or as primarily community members who bridge health systems (Besada *et al*., 2018; Mundeva *et al*., 2018). CHWs are often seen as the "grassroots" agents of community engagement in health systems, increasing service provision and health outcomes within the communities they serve (Asweto *et al.*, 2016). By definition, CHWs are immersed in the communities they serve. When part of a well-functioning health system, CHWs are able to tailor health messages, health system strategies, and services to meet the local communities' realities (Herman, 2011; LeBan *et al.*, 2014). They are uniquely positioned to navigate sociocultural boundaries to connect with the most marginalised and hard-to-reach community members (Wallace, Farmer, and McCosker, 2018). CHWs, therefore, act as "essential intermediaries" (Mundeva *et al.*, 2018) between communities and the formal health system. While the term 'boundary spanner' is seldom used in literature, terms related to the cadre's bridging role[11] often describes CHWs as 'cultural brokers' and 'intermediaries' (Kok, Ormel, *et al*., 2017; Condo *et al*., 2014; Mundeva *et al*., 2018), acting as the 'links', 'linkages' (Herman, 2011;) or 'interfaces' (Theobald *et al*., 2015) and 'connectors' between the health systems and communities, straddling the boundaries between these two systems by relaying knowledge and information (Wallace, Farmer and McCosker, 2019). For this review, these terms will be used interchangeably, as they capture the multidimensional and dynamic nature of CHWs' boundary-spanning contributions and emphasize the role of linking systems and the actors therein.

In LMICs, CHWs take roles as either specialists or generalists and perform a range of biomedical and social tasks at both a community level and (less so) facility-based settings, linking activities between these boundaries. CHWs carry out diverse roles, from lay or volunteer to professionalised, generalist to specialist, or biomedical to social, influenced by the context of LMICs (Hodgins *et al.*, 2021). The boundary-spanning roles of CHWs encompass both tangible and intangible roles, often performed simultaneously, as they are interlinked. The tangible health-related roles and the intangible social-relational roles are intertwined and feed into each other in ways that are difficult to separate, as CHWs

not only share and disseminate information but also actively mediate, translate, and adapt messages as needed (Meerkerk, 2020). As mentioned, CHW's contributions as boundary spanners is complex and under-studied in LMIC settings (Pelletier *et al*., 2018). Whether CHWs perform primarily specialist or generalist, tangible or social roles, they need to be adequately supported in these roles to optimally contribute as boundary spanners (Campbell *et al*., 2011). Support for the cadre must include recognition and respect for the diverse factors they navigate and should appropriately reflect the complexities of the boundaries they span (Sheikh *et al.*, 2016).

Factors influencing CHWs' contribution as boundary spanners

The demanding nature of CHWs' roles, coupled with limited support and unrealistic expectations has the potential to lead to exploitative practices (Mundeva *et al.*, 2018). To perform optimally, CHWs need a clear understanding of their roles, the boundaries they navigate, and accountability structures (where these are situated and how they should be prioritized) (Mwai *et al*., 2013). As boundary spanners, CHWs' potential contributions are influenced by both enablers (supportive factors) and barriers (restrictive factors). It is important to highlight that the factors are neither binary nor mutually exclusive, and factors may function as both 'enabling' or 'restrictive'. These factors are interconnected, are continuously evolving, and intersect uniquely, highlighting the complexity of the environment in which CHWs operate, necessitating the need for a flexible and adaptive approach when supporting the cadre (Kok *et al.*, 2017b).

Relationship-building is central to boundary-spanning functions in health systems (Sheikh *et al.*, 2016). For CHWs, strong relationships reciprocate levels of acceptance, investment, and levels of engagement between the cadre and either side of the boundaries they span Schneider et al., 2008; Turinawe *et al*., 2015; Agarwal *et al*., 2019). CHWs perceived statuses are constructed through the process of navigating relationships within and between communities and health systems (Perry *et al*., 2014a; Schneider and Lehmann, 2016). The relationship-bound identities of CHWs are exemplified by the case of CHWs referring patients to a health facility if the facility does not provide a reliable service, the efforts of the CHWs are rendered ineffective and the cadre lose credibility (Perry *et al.*, 2014a). However, when relationships between CHWs and health systems are strong, CHWs can effectively link communities to these systems, which positions them as credible resources for communities and health systems, strengthening the respect and legitimacy of their work and programmes they support (Perry *et al.*, 2014a).

In addition to building relationships, CHWs, as boundary spanners, must develop and enact social-relational competencies, which are essential for navigating the complexities of their intermediary roles, as the core role of boundary spanners is to form "effective relational and interpersonal

competencies" (Williams, 2002). These competencies encompass the ability to translate information and disseminate knowledge, develop and maintain inter and intra-boundary relationships, coordinate and negotiate collaboration, and mediate and facilitate cross-boundary interactions through "the threefold distinction of cognitive, social, and emotional" competencies (Meerkerk, 2020). Community-facing roles of CHWs comprise of a host of socially oriented tasks, requiring not only medically competent but social and relationally competent CHWs, who are keenly aware of the political and social-cultural realities of the communities they serve (Campbell and Scott, 2011; LeBan *et al.*, 2014). While some individuals possess a better aptitude for these roles and while learning these social-emotional competencies are complex, these qualities can be developed through training (Meerkerk, 2020). These interpersonal competencies are essential for boundary spanners, as they help to facilitate trust, empathy, and respect, as well as to make sense of the dynamics of relationships, structures, and processes to facilitate "problem-solving on the ground" (Williams, 2002), allowing for interactions that strengthen relationships.

Mapping system factors impacting CHWs' ability to carry out their boundary-spanning roles

Health systems comprise more formal and vertical bureaucracies than those relationships found in community systems, which are based on trust and social relationships, both, however, operate as social systems that facilitate CHWs' ability to network and build reciprocal partnerships (Schneider and Lehmann, 2016).

The primary roles and functions of CHWs, are focused on a community level, where the managed expectations of both communities and CHWS are imperative (Campbell and Scott, 2011; Perry *et al*., 2014a; Turinawe *et al*., 2015). CHWs' relationships with communities vary, and it is not always discernible who the cadre is primarily accountable to in their roles, health systems or communities, they are often seen as agents of chiefly representing the embodiment of community 'empowerment' (Kok *et al.*, 2017b).

Community embeddedness is essential to the success of CHWs (Agarwal *et al.*, 2019). However, embeddedness is difficult to measure, compare, or study because communities are heterogeneous, comprising complex and context-specific social relations and political interests. Embeddedness increases community acceptance of CHWs and associated programmes and initiatives and influences the CHWs experiences and contributions (particularly of socially oriented tasks), retention, and overall programme success (Schneider et al., 2008; Agarwal *et al*., 2019). However, residing or being close to communities does not guarantee embeddedness or community trust, acceptance, and support for the cadre (LeBan *et al*., 2014; Singh et al, 2015a; Turinawe *et al*., 2015). Various factors linked to the

broader context, including programme and policy specifics, influence and facilitate CHWs' embeddedness and their ability to perform their intermediary roles (Kok, Ormel, *et al*., 2017).

CHWs engage in numerous complex relationships within health systems and healthcare teams (LeBan, Kok, and Perry, 2021),often embedded in bureaucratic, hierarchical, and paternalistic relationships (Campbell and Scott, 2011). The asymmetric power relationships between these entities often position CHWS at the "bottom" of these health bureaucracies (Maes *et al.*, 2015). Integration into health systems can be understood as the process of incorporating CHWs and related programmes into the core activities of a health system, including service delivery, workforce, information, medical supplies, finance, and governance (Mupara *et al.*, 2023). Lack of integration and support by health systems compromises CHWS legitimacy, credibility, and capacity to address community needs effectively (Dusabe *et al.*, 2015; Nxumalo *et al.*, 2016; Agarwal *et al.*, 2019) and may link to exploitative practices and undervalued work of CHWs (Perry *et al.*, 2014a; Mundeva *et al.*, 2018). CHWs have often been excluded from the formal health system, stemming from the perceptions that they operate as peripheral actors, at the outermost fringe of formal health systems (Singh *et al*., 2013; Perry *et al*., 2014a; Asweto *et al*., 2016).

Governments, alongside health systems, play a crucial role in advancing political pressure to secure necessary funding, policies, and regulations for CHW programmes (Perry *et al*., 2014b) and fostering enabling environments (Afzal *et al*., 2021). Strong leadership is required from the government sector to synchronize national policies and frameworks for CHW programmes, creating synergies among global, national, and district-level CHW supporters (Tulenko *et al.*, 2013). Weak government support in many LMICs has led to underfunded and demotivated CHWs (Schneider and Lehmann, 2016), while strong political backing (as seen in Afghanistan, Brazil, and Ethiopia) enhances CHW programs effectiveness(Afzal *et al*., 2021). While CHWs programmes advance when they are integrated into the broader community engagement or mobilisation process (LeBan *et al.*, 2014), government-led CHW policies often lack meaningful community participation, undermining the critical role communities play in the realization of successful implementation of health policies and programmes (Oliver *et al*., 2015; Singh et al., 2015a; Schneider & Lehmann, 2016). This lack of engagement exacerbates power imbalances within health systems, often leaving communities feeling disempowered (Oliver *et al*., 2015; Singh *et al*., 2015a). The disjuncture between how CHW roles are outlined in policies and how they are interpreted in practice adds to confusion about their responsibilities and positions within and between systems (Oliver *et al*., 2015; Agarwal *et al*., 2019). This lack of clarity in CHW-related policy leads to overwhelming workloads (discussed in detail below) and limits the flexibility the cadre requires to perform their boundary-spanning functions (Clarke *et al.*, 2008; Schneider *et al.*, 2008).

Inconsistent and inadequate government support further impacts CHWs' attitudes and contributions in their intermediary roles (Aberese-Ako *et al.*, 2014).

Responsiveness and accountability within health systems

Health systems can better support CHWs by recognizing both their current and potential contributions while implementing appropriate responses to enhance their unique position (Dahn *et al*., 2015; Theobald *et al*., 2015; Kok, Ormel *et al*., 2017; Khan *et al*., 2021).

Responsiveness is a key goal in delivering equitable, relevant health services, especially for vulnerable populations. Feedback loops[12] in accountability represent channels or pathways for information and other forms of connection between the actors involved, particularly between those served and those with decision-making authority over how a system functions (Khan *et al.*, 2021). Accountability and feedback loops often represented in this mechanism embody power relations, and imbalances in accountability flows may signify power imbalances (Schaaf *et al.*, 2018).

CHWs, as intermediaries, navigate both forms of accountability but are often caught in unclear structures, highlighting the need for further exploration to ensure they are adequately supported (Dahn *et al*., 2015; Kok, Ormel, *et al*., 2017). CHWs are frequently caught in the crosshairs of unclear accountability structures (often due to a lack of clarity regarding delineating power structures between and within these systems) (Doherty, 2000). By strengthening accountability structures, CHWs can more effectively bridge the gaps between communities and health systems, fostering better health outcomes, as they require well-functioning and responsive health systems to successfully perform their roles and carry out required tasks (Glenton *et al*., 2021). Mechanisms and tools that improve responsiveness may be linked to strengthening internal and external accountability structures. Similarly, facilitating accountability structures within health systems and between health systems and communities could enable CHWs to support this cadre as they operate within and between these boundaries. There is a need to explore the body of evidence on how issues on responsiveness and the associated accountability mechanism should be leveraged in health systems (Khan *et al.*, 2021; Sutherns *et al*., 2021). Contextual factors must be considered to further understand how accountability structures impact CHW, failure to do so may result in overlooking and underestimating relational frameworks that often govern these structures (Kok *et al.*, 2017b).

[12] External feedback loops channel needs, expectations, and experiences from communities—representing health services users or the citizens, public, or patients of this catch-all phrase—to health systems. How responsiveness is leveraged in this loop depends on whether health system's responses to their feedback impact decision-making in ways the community (Khan *et al.*, 2021). While existing literature often focuses on external accountability, internal accountability (the bureaucratic feedback loops between the expectations and responses of various actors within health systems) and the interaction between internal and external forms of accountability have not received the same level of attention in literature and governance (Cleary *et al.*, 2013)

Mapping CHW Programme implementation and design factors

Current findings suggest that the programme factors that impact the contribution of CHWs (and their subsequent boundary-spanning roles) in LMICs include recruitment and selection methods, appropriate and supportive supervision, opportunities for career development, appropriate and ongoing training, adequate incentives (remuneration or non-financial), a proper definition of workload and role definition and appropriate logistic and resource support (Tulenko *et al*., 2013; Kok *et al*., 2013; Cometto *et al*., 2018).

CHWs have traditionally been recruited and selected where they are positioned, at the periphery of health systems (Tulenko *et al.*, 2013). However, poorly implemented recruitment and selection strategies can lead to high attrition rates, limit the ability of CHWs to perform their roles and generate a lack of community support and recognition (Campbell and Scott, 2011; Schleiff *et al*., 2021). The cadre are recruited based on their ability to form and maintain trusting relationships with communities (Campbell *et al*., 2011; Maes *et al*., 2013). However, the recruitment process (and its subsequent effects on the retention and contributions of CHWs) is complex and specific to the context, personal histories, motivations, and values of the CHWs themselves and their relationships with various actors across both boundaries; health systems, and communities (Maes *et al*., 2013). As selection processes usually rely on more formal processes guided by health system policies this hinders the potential for community input needed to best support CHWs in the duality of their roles (Agarwal *et al.*, 2019).

Supervision is another key factor influencing CHW effectiveness in their boundary-spanning roles. The definitions and implementation of supervision remain diverse with quality, outcomes, methods, implementation, and support for supervisory practice vary considerably in practice (Oliver *et al*., 2015; Westgate *et al*., 2021) often lacking standardization and consistency in LMICs (Assegaai *et al*., 2019).. Supportive supervision, a form of supervision exercised in a more responsive and connected way strengthening relationships, is widely recognized as essential for enhancing CHW motivation and performance (Kok, Broerse *et al*., 2017). The health system primarily provides supervision of CHWs through more formalised cadres, where interactions between supervisors and CHWs usually occur within health facilities (Asweto *et al.*, 2016; Schriver *et al.*, 2017), these supervisory environments are often embedded in bureaucratic relationships (Raven *et al*., 2015a). CHWs are at risk of receiving inadequate support, which diminishes their ability to carry out their intermediary roles effectively (Campbell *et al*., 2011; Schriver *et al.*, 2017). There are instances where CHWs are supervised by other (formal) CHWs who have been promoted to supervisory positions; the details of whether these supervisory relationships can better support CHWs in their boundary-spanning roles are lacking in the literature require further development (Akintola *et al*., 2016; Seutloali *et al*., 2018). An overlap

between factors is seen in instances where CHWs report to multiple superiors- with social interactions between the cadre and their supervisors impacting relationships (discussed above) and trust (elaborated on below) that can have knock-on effects on their motivation in their roles (Westgate *et al*., 2021). Introducing dedicated supervision focusing exclusively on CHW oversight, as seen in some LMICs, has shown promise in improving program outcomes (Westgate *et al.*, 2021). Some authors argue that ongoing in-service supervisory training is necessary for CHWs and their supervisors, communities, and other cadres of health professionals with whom CHWs work (Schleiff *et al.*, 2021). While communities may perform certain types of supportive and management functions of CHWs, community members and leaders have largely been excluded from roles in the supervision of CHWs (Raven *et al*., 2015a). There are instances where health facilities resist engaging communities in decision-making processes (Lehmann *et al*., 2004); it is unclear how this impacts the linking roles of the cadre. Adding a set of community actors to the supervision of CHWs, may add to the complexity of and potential challenges of the outcomes of these relationships (Raven *et al*., 2015a; Schriver *et al*., 2017). However, the involvement of communities through supervision can improve the frequency and consistency of supervision contacts and CHWs' legitimacy and accountability to communities, supporting CHW contributions (Lunsford *et al*., 2015; Asweto *et al*., 2016).

Career development opportunities for CHWs are often limited, with opportunities for career progression often being gendered experiences, as female CHWs face gender-based barriers to leadership positions in health systems (Dhatt *et al*., 2017; Steege *et al*., 2018). Addressing gender inequality in career development and leadership roles better support female CHWs and promote a more inclusive health system (Newman, 2014; Steege *et al*., 2018), as many, predominantly female, CHWs lack a clear pathway for career progression, which can inhibit these boundary spanners' ability to influence strategic-level decisions such as priority setting, resource allocation, and planning (Kane *et al.*, 2016). Career advancement opportunities enable CHWs to contribute more effectively to health systems (Tulenko *et al.*, 2013). Linked to the concept of career progression is that of training as a factor influencing the role and contributions of the cadre. Ongoing and context-specific training is essential as the cadre's roles and scope of tasks continue to expand and change; CHWs require training aligned with the professionalism and skills needed for their position to reach their full potential (Schleiff *et al*., 2021). While no standardised approaches to CHWs' training programme features guarantee CHWs' success (Campbell and Scott, 2011), some factors have brought favourable outcomes, such as continuous, multiple refresher and advancement training and an agreed upon, shared, and accredited curriculum (Campbell and Scott, 2011; Besada *et al.*, 2018). What suitably constitutes where, how, when, and for how long training is for CHWs to best support their intermediary roles vary according to context and programme and requires an appropriate response (Lehmann and Sanders, 2007; Raven

et al., 2015). Training should be comprehensive and tailored to the unique needs of CHWs within their specific contexts, while also acknowledging the cultural competencies they bring to their roles (Besada *et al*., 2018; Schleiff *et al*., 2021). Although it is necessary to address gaps in knowledge and the skill base for CHWs to carry out their boundary-spanning duties effectively, CHWs are a heterogenous cadre, and there are varying responses to and needs for training, which often act as an incentive for becoming CHWs and remain in these linking roles (Schleiff *et al.*, 2021).

With evidence showing that policymakers and programmes must consider providing financial and non-financial incentives, adequate incentives are essential to improve the cadre's retention and contribution (Asweto *et al*., 2016). However, there is no conclusive evidence on which types of incentives prove most effective, and while most aim at CHW retention, incentive structures vary across LMICs (Campbell *et al*., 2011; Kok *et al*., 2017a; Agarwal *et al*., 2019). Various studies support financial incentives for CHWs, particularly when they perform multiple and extended tasks across communities and health systems(Maes *et al*., 2013; Kok, Broerse *et al*., 2017). Financial compensation is often inadequate, with many CHWs earning less than a living wage, which can demotivate CHWs and lead to high turnover rates (World Health Organization. Regional office for Africa, 2017). Failure to adequately compensate CHWs, who often represent marginalised members of impoverished communities, could further disempower and exploit their intermediary roles (World Health Organization. Regional Office for Africa, 2017; Besada *et al*., 2018). For example, three cadres of CHWs in India encountered increased workloads due to their COVID-related responsibilities; new roles were linked to poor financial compensation (Dhaliwal *et al.*, 2021). Efforts should be focused and intentional, supporting guidelines highlighted by the WHO that financial incentives need to be distributed fairly and consistently, ensuring that CHWs receive a financial package that reflects the workload demands and time committed to CHW-related roles (Cometto *et al.*, 2018). Non-financial incentives include improving status, recognition, and respect in communities and official status in the health system (preferential access and free or reduced costs for health care); name tags, uniforms, and other forms of recognition, opportunities for career advancement, (Austin-Evelyn *et al*., 2017; Kok, Broerse *et al*., 2017) support the recognition of CHWs' contributions and can also play a significant role in motivating CHWs without pay (Austin-Evelyn *et al.*, 2017; Yoon *et al.*, 2019). Meaningful incentives for CHWs are "multidimensional" and "something that changes over time" (Colvin *et al*., 2021). In their bridging roles, both types of incentives must be contextually appropriate and aligned with the demands placed on CHWs, ensuring that they reflect the time and effort required for their roles linking systems (Cometto *et al.*, 2018). CHWs frequently make financial and personal investments beyond their formal roles, thus relying on institutional support to respond to the needs of the communities they serve in their linking roles (Nxumalo *et al*., 2016; Ahmed *et al*., 2022).

Clear definitions and understandings of the actual roles of CHWs has been emphasized to best enable and support them in their role as connectors (Tsolekile *et al.*, 2014). The roles of the cadre within and between LMICs and even within individual countries are multifarious and continue to evolve (Afzal *et al*., 2021; Hodgins *et al*., 2021; Neto *et al*., 2021). CHWs perform roles often aligned with their education, training, remuneration, and context (Kok, Broerse *et al*., 2017). These roles are often carried out in a community-based context or divided between the community and health facilities and seldom being solely facility-based (Kok *et al.*, 2017a; Besada *et al.*, 2018). A better understanding of the CHW's roles needs to be explored to better characterise the resources and skills required to perform these roles and outline the factors that support an enabling environment for the cadre (Glenton, Javadi, and Perry, 2021). Role clarity is essential in preventing confusion about expectations, which can lead to stress and reduced job satisfaction (Loeliger *et al.*, 2016; Mundeva *et al.*, 2018). It is also important to acknowledge and include in their intermediary roles, that CHWs feel compelled to conduct to appropriately respond to communities' needs, which may not be formally included in their scope of practice (Kok, Ormel *et al.,* 2017a; Asweto *et al.,* 2016). CHWs often feel overwhelmed by workloads in the intermediary roles (Mundeva *et al.,* 2018), as they often take on the burden as boundary spanners of managing the expectations of both communities and health sectors (Kok, Vallieres *et al*., 2018) To manage CHWs workload, some LMICs have opted for splitting tasks within the cadre by training, compensation, or incentives based on workload and gender (Leon *et al.*, 2015; Glenton *et al.*, 2021; Niyigena *et al.*, 2022). However, these strategies must be carefully designed and monitored to ensure that they do not further complicate role expectations (Leon *et al.*, 2015; Asweto *et al.*, 2016).

Finally, logistic support and access to necessary resources are crucial for enabling CHWs to perform their boundary-spanning roles effectively, as CHWs often face significant barriers, such as a lack of transportation, inadequate supplies, or insufficient equipment, which limit their ability to provide services (Brunie *et al.*, 2014). Examples of this were seen during the COVID-19 pandemic, where CHWs in India and SSA struggled to perform intermediary their roles due to a lack of personal protective equipment, placing both CHWs and their communities at increased risk (Ballard *et al.*, 2020; Dhaliwal *et al.*, 2021). Deploying CHWs without the necessary supplies, coupled with an often-unclear scope and expanding workload, is not only inefficacious but also compromises the credibility of CHWs and, at times, their health (Loeliger *et al.*, 2016). Ensuring that CHWs have access to logistical support, such as mobile technology and transportation, will not only support their contributions but also enhance their credibility within their communities (Braun *et al.*, 2013; Perry *et al.*, 2014a).

Mapping Contextual Factors Influencing the boundary-spanning contributions of CHWs in LMICs

The boundary-spanning capabilities of CHWs are deeply influenced by contextual factors which shape relationships within both communities and health systems and impacting the cadre's experiences (Kok *et al*., 2017a; Kane *et al*., 2020). Social, economic, and health system contexts often intersect to undermine how CHWs' contributions are recognised (Kane *et al*., 2020). Socio-economic determinants, societal norms, and historical contexts set preconditions that influence health system and policies (Hay *et al.*, 2019), which can either facilitate or inhibit the CHWs' roles (Kok, Kane *et al*., 2015; Schneider and Lehmann, 2016)**.** However, research on CHWs and the programmes that house this cadre, often struggle to account for the breadth and complexity underlying this the influence of contextual factors (Kok, Kane *et al*., 2015; Millington, 2018)**.**

CHWs' contributions, and the boundaries they span are influenced by social-contextual factors such as gendered barriers and religious and cultural practices, which result in contested realities for a cadre that carries out the roles and wields power in the relationships between the community and health systems (Kane *et al*., 2020; Musoke *et al*., 2022). If CHW programmes are adapted to local contexts, this may improve programme outcomes (Kok *et al*., 2017b; Ahmed *et al*., 2022). In some instances, CHWs' services are depended on heavily on fragile contexts where they face the challenges of navigating complex historical contexts (Millington, 2018), which set expectations concerning how CHWs and their activities are perceived by both health systems and communities (Schneider *et al*., 2017).

Inequity, often with deeply entrenched historical roots, must be considered through broader societal processes to address social determinants of health effectively. CHWs cannot be expected to address these determinants as boundary spanners without political and broader societal commitment, as they will continue to be hindered from optimising their contributions as 'community empowerers' and influencers if inequity-related obstacles persist, particularly when they are under-resourced (McCollum *et al.*, 2016).

Gender norms and the subsequent power dynamics that infuse the relationships of CHWs are contextual, and both influence or are influenced by local, national, and global factors. Various authors feel that it is no coincidence that CHWs, who are mostly female, are systematically placed at the "lowest" level of the health systems (as opposed to positions higher in the health system bureaucracy), where cadres are often disempowered by the same political and health system top-down directives that present CHWs as community activists (Schaaf *et al.*, 2018; Closser *et al.*, 2019; Hay *et al.*, 2019). As such, health systems can be viewed as microcosms of broader society, influenced by and influencing practices that may continue to promote gender inequities (Steege *et al*., 2018). While it is agreed that CHWs are uniquely positioned in their intermediary roles to understand gender dynamics and power relations within communities and may potentially help to challenge existing gender norms,

the onus for transformation often falls on this boundary-spanning cadre, which is seen as unethical (Theobald *et al*., 2015; Mundeva *et al*., 2018).

Mapping inter-personal (micro-level factors) influencing CHWs ability to boundary span

The ability of CHWs to carry out the boundary spanning role is influenced not only by the macro factors (system, program, and contextual factors) but by a range of inter-personal (micro-level) dynamics including trust and motivation. The factors influencing CHWs work highlight the complex interplay between individual experiences and broader system and program factors. The distinction between various levels[13] of factors underscores the complex environment which CHWs operate. It is essential to reiterate the point highlighted earlier in this scope that the factors are inextricably linked and multi-dimensional.

Trust, motivation, and voice are integral micro factors for CHWs, shaping their individual and interpersonal dynamics within health systems, influencing their contributions as they span boundaries. These factors operate at the level of individual interactions in their immediate work environment, affecting their day-to-day operations, thus distinguishing them from macro factors that involve broader health system policies, financing, and infrastructure (Groenewegen and Leyland, 2020; Möckli *et al.*, 2021).

Trust[14] enhances CHWs' effectiveness through belief in their reliability by peers, health systems, and communities (Gilson, 2006), while motivation affects job satisfaction and retention, driven by both intrinsic and extrinsic incentives (Brunie *et al.*, 2014). Trust and motivation, or the lack thereof, manifest through various processes, including communication, supervision, support, incentives, and relationships between CHWs and all the actors they interact with (Kok *et al.*, 2017a). The reciprocal interplay shows that motivational factors depend on trust, and trust, in turn, is linked to motivational factors interacting in complex ways to influence health worker contribution and retention(Okello *et al*., 2015; Kok *et al.*, 2017b). This interplay is a common thread that runs throughout the tapestry of

[13] Macro level, while relative, can be understood as the higher, broader level, government, and policy decisions are made, factors impacting health outcomes and contexts. The Micro level, while also relative, is focused on the individual level. Meso levels while not distinguished in this paper are those intermediary factors at an organizational level (Möckli *et al.,* 2021)

[9]Trust is enacted at both personal and system levels. Different types of trust can be displayed differently, depending on the context and motivation behind relationships (Boyne and Dahya, 2002). Building and maintaining trusting relationships through iterative and cyclic relational processes, consolidated with each cycle of interaction and expectations being met, contributes to the history of relationships and reinforces positive solidarity and shared expectations about the dependability of future interactions(Boyne and Dahya, 2002; Singh, Cumming and Negin, 2015). Workplace trust (i.e., trust between a health worker and their colleagues, management, and the employing organisation) is strengthened when the employee believes that the entrusted party will act in their best interest (Singh, Cumming, and Negin, 2015; Kok, Ormel, *et al.,* 2017).

the CHWs' boundary -spanning experiences. Their work requires them to form and maintain trusting relationships with various actors in communities and formal health systems; the complexity of this interplay cannot be fully explored within the scope of this paper. Trust can be built or broken over time through interpersonal behaviours, interactions, organisational practices, and priorities (Gilson, 2006; Kok, Ormel *et al*., 2017). For CHWs, the emphasis on trusting relationships is particularly relevant as their contribution is influenced by the strength of the (trusting) relationships they form as intermediaries between communities and the health sector (Kok, Ormel *et al*., 2017). Trust is built over time through ongoing relational processes that strengthen with repeated interactions, creating a shared history and expectations of reliability (Williams, 2002; Singh *et al*., 2015b). For CHWs, trust serves as the foundation for their boundary-spanning roles, enabling them to navigate the relationships between communities and health systems effectively (Kok, Ormel, *et al*., 2017).

Motivation[15], understood within organisational settings as a "behavioural, affective and cognitive process that influences the willingness of workers to perform their duties, to achieve personal and organizational goals, thus influencing the extent and level of their effectiveness at work" (Okello and Gilson, 2015). Both intrinsic and extrinsic motivators are key enablers of CHW performance. Intrinsic motivation stems from internal values, such as altruism and a sense of responsibility, while extrinsic motivation comes from external recognition, including financial incentives and rewards (Maes *et al*., 2013; Okello *et al*., 2015). Debates continue over whether CHW motivation should be driven primarily by external stimuli, such as trust in the workplace, or by intrinsic commitment (Brunie *et al*., 2014; Closser *et al*., 2019). In reality, a combination of both intrinsic and extrinsic (including financial and non-financial incentives) factors (Box 1) is often required to support sustained motivation among CHWs in their roles (Mpembeni *et al.*, 2015). However, motivation alone is insufficient; CHWs must also be equipped with the necessary skills and support to fully contribute to health system goals when connecting to communities (Kok, Ormel, *et al*., 2017). The heterogeneity, nuanced needs and motivations of the cadre need to be recognised to ensure CHWs remain motivated to perform optimally as boundary spanners (Theobald *et al*., 2015).

Box 1: Factors influencing motivation of CHWS in LMICs

- Work and social relationships among CHWs, between the cadre communities, and within the health systems (other health workers) strongly impact motivation (Colvin *et al.*, 2021).
- A clear understanding of the scope of roles and responsibilities within health systems (Colvin *et al.*, 2021).

[15] Internal motivation usually occurs when internalised values and beliefs (such as religious, moral, ethical, civic duties, or altruism) align with or generate feelings of autonomy, responsibility, competency, or belonging through reciprocally respectful social interactions (Maes and Kalofonos, 2013; Okello and Gilson, 2015). Extrinsic motivation derives from external recognition (such as recognition from those in authority, remuneration, financial and non-financial incentives, rewards, or promotions). These external motivators, in turn, feed into notions of internal motivation through feelings of fulfilment in the job (Okello and Gilson, 2015).

- Opportunities for personal and professional growth in the position (whether or not they receive direct remuneration or obtain technical skills- supporting calls for the professionalisation of the workforce (Colvin *et al.*, 2021).
- Recognition and appreciation of their roles in health systems (Colvin *et al.*, 2021).
- Combination of intrinsic, altruistic factors with fairly administered financial incentives (Colvin *et al.*, 2021).
- Adequate and supportive supervision (Westgate *et al.*, 2021)
- Sustaining CHWs' motivation requires strong health systems that recognise the cadres' contributions, commitment at all levels of health systems, and strong political support (Colvin *et al.*, 2021).

Voice, another micro factor that interplays on a macro level influencing how CHWs navigate and bridge the divide between health systems and communities, refers to the capacity of CHWs to express their opinions, concerns, and suggestions, which is crucial for their engagement and the adaptability of health programmes to meet community needs (Theobald *et al*., 2015). Descriptions of CHWs' experiences in literature seldom focus on the personal perspectives of CHWs and, as a result, often fail to portray their true voice. Kane *et al*. (2016) argue that more attention needs to be given to CHW experiences, focusing on relationships between CHWs and the systems they work with. CHWs are not only agents of and intermediaries between two systems but also independent agents themselves. They have wide-ranging expectations of their role, including anticipated responsibilities, support and compensation, career development, and interaction with the health system and the communities they serve (Raven *et al*., 2015). CHWs feel accountable to communities and recognise that they hold a "privileged social intermediary position" (Kok, Ormel *et al*., 2017). While advocacy and assessing determinants of health inequities may at times be built into the role of CHWs (such as in India's Mitanin Programme), CHWs are often not provided with opportunities to participate in decision-making in national or international structures (Perry *et al.*, 2021; Ahmed *et al.*, 2022). Accredited Social Health Activists (ASHAs) in India conveyed their feelings of loss, frustration, and lack of empowerment in their COVID-19-related roles and the various barriers they faced with limited support; however, it remains unclear how voiced concerns were addressed (Dhaliwal *et al*., 2021). The significance of including CHWs' voices not only to support their role, acknowledge their professional identity and realise their potential as boundary spanners but also may help to engage their insider knowledge of gender, power, and social dynamics, which can inform health system priorities and decision-making (George *et al*., 2015; Kane *et al*., 2016; Mundeva *et al*., 2018). The ability to translate community needs to health systems and communicate institutional goals back to communities, is at the premise of their boundary spanning work yet many CHWs feel disempowered due to the absence of enabling environments, often feeling disrespected and unsupported by 'upper-level' unresponsive health system agents, which hinder their contributions (Kok, Broerse *et al*., 2017).

The success of CHW programmes and the cadre's ability to carry out their intermediary roles are contingent upon an array of factors beyond those related to CHWs themselves (Schneider and Lehmann, 2016). The factors seen to influence CHWs' abilities to link health systems and communities effectively include system, programme, contextual and interpersonal factors, which act as enablers and restrictors of their ability to navigate effectively between systems. This scoping review highlights a need for additional systematic exploration to identify the enablers and restrictors of CHWs boundary spanning roles. Despite recognition of the core roles of the cadre, there remains a dearth in the evidence base that systemically examines CHWs' roles as 'boundary spanners' in SSA. Building upon the scoping review, a systematic review focusing on SSA would grow this evidence base as CHWs in SSA operate in diverse social-cultural and health system contexts throughout the region. Focusing on the sub-region would allow for a more nuanced understanding of the specific unique contexts and the enablers and inhibitors of their boundary-spanning roles, providing potential insights that a broader review including LMICs might overlook. Focusing on SSA may help to address current gaps in the literature. In particular, qualitative reviews, can expand the evidence base potentially lead to more tailored, effective interventions for this cadre (van Ginneken *et al.*, 2010). As SSA includes dynamics that may uniquely influence CHWs, including social, gender, and historical contexts of health systems—this merits a focused study, the findings of which may be particularly relevant to policymakers and program designers in sub-region offering a more context-specific evidence base and practical insights for improving CHW effectiveness and informing future policy interventions in the region.

Proposed Review Question

We propose that a qualitative systematic review study will enable a more in-depth examination of the factors outlined above in the scoping study phase. The proposed systematic review study addresses the question: What factors influence community health workers' roles as 'boundary spanners' between health systems and communities in sub-Saharan Africa?

Review and Objectives

1. To describe the scope of published literature on CHW's roles as 'boundary spanners,' brokers, or intermediaries.

Review Process

This qualitative systematic review will be conducted in two phases: a rapid scoping review followed by a qualitative systematic review (as seen in Figure 1)

Methods

The research question will be answered through a qualitative systematic review in two phases as depicted in the diagram below, phase one being a scoping review (reported above) to identify and operationalize relevant concepts related to CHWs as boundary spanners and the factors influencing this role, and phase two being a qualitative systematic review. This study will therefore provide a evidence map, summarizing available evidence base of factors influencing the boundary spanning roles of CHW.

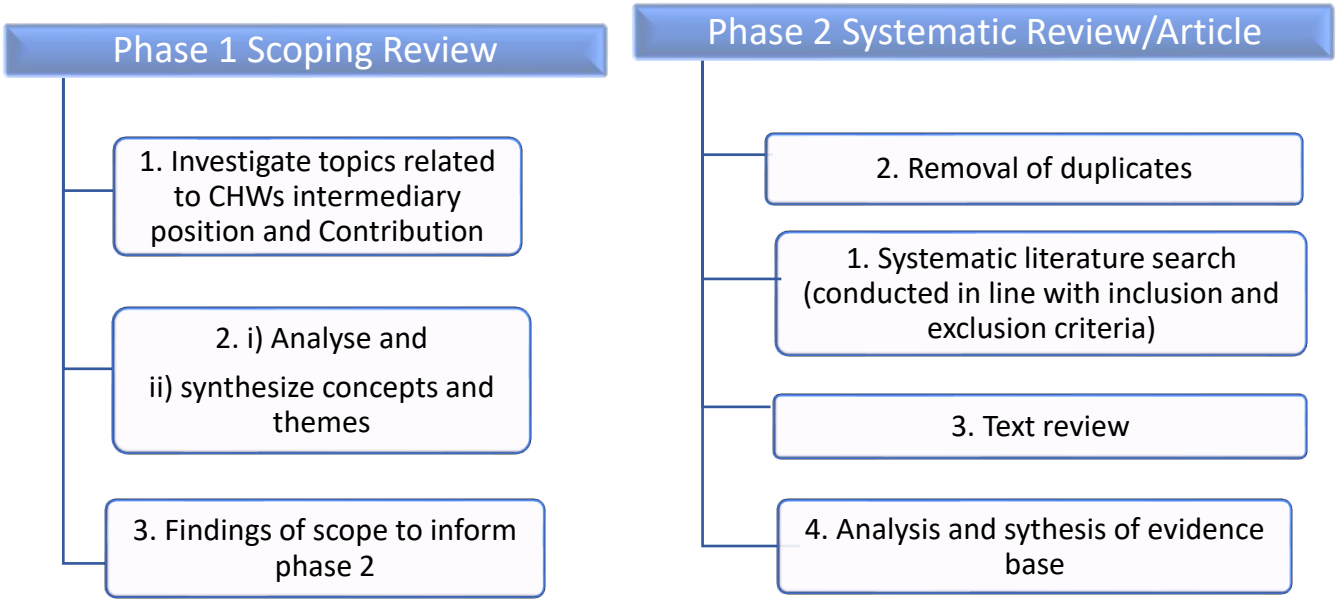

Figure 4. *Review Process. Source ;Author.*

Phase 1: A Scoping Review

Scoping reviews are relevant for topics situated in broad fields of study or where the evidence base is limited, especially when clarification is required on complex concepts (Davis *et al*., 2009; Levac *et al*., 2010). The extensive application of scoping reviews for complex topics proved particularly useful to the review above. Although there is extensive literature on CHWs, CHW-related programmes, and policy, there is relatively limited research that distinctively discusses CHWs as boundary spanners and focuses on enablers and disablers of this role in LMICs. The scoping review (reported in the literature review section above) aimed to map the scope of published and grey literature by seeking to address the following question: to map the existing evidence on the challenges facing CHWs' ability to contribute in their roles as 'boundary spanners' in LMICs[16]

This scoping review scanned and mapped the literature landscape on boundary spanning roles of CHWs in LMICs, helping to identify terminology, key concepts, and definitions, detect potential gaps, and gauge the breadth and depth of available literature (Arksey *et al*., 2005; Brien *et al*., 2010). Key

[16] Please note it is standard format to write this section in the past tense in MPH protocols – as this phase has already been conducted ahead of the protocol finalization.

search terms and related synonyms for CHWs, communities and health systems were used to explore the literature (table 2 below). Purposive hand searches were conducted with related terms that emerged during the scoping review such as variations of terms for CHWs, roles, boundary spanning synonyms, enablers, disablers, and influencing factors (categorized into system, program, contextual and interpersonal). The search included checking the references of included studies.

The review included peer-reviewed and grey literature retrieved from electronic databases including EBSCOhost (Africa Wide Information, Academic Search Premier, CINAHL, MEDLINE, SocINDEX), PubMed (MEDLINE), and Scopus (the contents of both MEDLINE and Embase journals). Google Scholar searches were also conducted, and grey literature – including dissertations or theses, conference proceedings, and reports, and organizational websites such as WHO were included in the search, which was confined to the geographic area of LMICs. The descriptive review provided insight into the scoping objectives by mapping and summarising available review publications, clarifying working definitions, and identifying gaps in the existing literature. It was evident through this scope that various terms and themes have been used to conceptualise and detail CHWs as boundary spanners (albeit seldomly using this terminology), as well as enablers and disablers of their ability to perform boundary-spanning roles. Furthermore, the scoping review also assist in formulating and refining an appropriate research question (Levac *et al*., 2010), the review highlighted that insufficient attention has been given to this topic in Sub-Saharan Africa (SSA). The main outcomes of the scoping review are described in detail above.

Health Systems	"Health system", "Formal health system", "Health service", "Health Workforce", Health personnel", "Health service delivery", "Health service systems", "Health programmes", Governance", "Health workforce", "Medical technology", Vaccine", "Vertical health programmes", "Health systems strengthening", "Health systems performance", "Public health systems", "Health delivery", "Healthcare", Health", "health sector", "Health system", "Health system strengthening", "Health system performance".
Community Health Workers	"Close to community", "Health care worker", "Community health aides", "Village health workers", "Community based health worker", "Community health extension worker"
Communities	"Community Health", "Community systems", "Community health planning", "Community Health services", "Community networks", "Community based care", "community" OR "Communities" OR "Community based" OR "Village" OR "Villages" OR "Frontline".

Table 5: *Examples of key terms used in the scoping review (Source: Author)*

Phase 2: Qualitative Systematic Review

While the scoping review identified key factors influencing CHWs' intermediary roles in LMICs, the focus for the qualitative systematic review will be restricted to SSA for reasons outlined above. The scoping review's findings from Phase 1 will help to inform the data extraction template. The review

question will inform pertinent search terms (as seen in table 3, below), synonyms thereof, and geographical interest, with the literature focusing on countries in the SSA region. An array of combinations of these terms will be assembled and captured for input into various search engines and appropriate databases. To locate relevant literature searched on the following electronic databases will be conducted: EBSCOhost (Africa Wide Information, Academic Search Premier, CINAHL, MEDLINE, SocINDEX), PubMed (MEDLINE), and Scopus (the contents of both MEDLINE and Embase journals), as well as a supplementary searches in Google and Google Scholar. Supplementary searches will also be run on organisational resource databases like the World Health Organization (WHO) and the World Bank, as well as dissertation/thesis databases and by reference mining of relevant literature.

A systemic literature review will further map the existing evidence base of the factors influencing the boundary spanning capabilities of CHWs focusing on SSA. A qualitative exploration, may help to unpack the complex social realities and interpersonal dynamics, including trust, motivation, and gender, which require that quantitative approaches may potentially be missed (Thomas and Harden, 2008). This is an essential approach, as factors affecting CHWs' boundary-spanning roles are intricately linked to the social and cultural realities that differ across the sub-region contexts. A qualitative review offers a comprehensive perspective on these contextual insights (Baum *et al.,* 2006). Additionally, systematic reviews use a defined, rigorous and strategic approach to review and synthesise key evidence from the literature (Renjith *et al.*, 2021). In light of the scoping review's findings, enablers and disablers of CHWs' boundary-spanning roles are suggested to occur within complex social systems. A qualitative systematic review approach will use a descriptive study design to generate a detailed, in-depth description that can provide high-quality and trustworthy recommendations (Butler *et al*., 2016; Renjith *et al*., 2021).

	Search Terms
Health Systems	"Health system", "Formal health system", "Health service", "Health Workforce", Health personnel", "Health service delivery", "Health service systems", "Health programmes", Governance", "Health workforce", "Medical technology", Vaccine", "Vertical health programmes", " Health Systems strengthening", " Health Systems Contribution", "Public Health Systems", "Health delivery", "Healthcare", Health", "health sector", "Health system", "Health system strengthening", "Health system Contribution".
Community Health Workers	"Close to community", "Health care worker", "Community health aides", "Village health workers", "Community based health worker", "Community health extension worker", "Agentes Polivalentes Elementares", "Community Drug Distributors", "Health Extension Workers", "Community Drug Distributors", "Health Extension Workers", "Community Health Volunteers (CHVs)", "Agents Communautaires", "Agents Communautaires Nutrition", "Community Based Distributors", "Health Surveillance Assistants", "Community Health Workers", "Lay counsellors", "Lay Health Workers", "Traditional Birth Attendants", "Community

	Health Officers", "Community Health Extension Workers", "Community home-based care workers", "Lay Health Workers", "Peer educators", "Community Antiretroviral therapy and Tuberculosis Treatment Supporters", "Community Medicine Distributors", "Community Reproductive Health Workers", "Community Volunteer Workers", "Adherence Support Workers", "Care Facilitators", "Village Health Workers"
Community Health Systems	"Community Health", "Community systems", "Community health planning", "Community Health services", "Community networks", "Community based care", "community" OR "Communities" OR "Community based" OR "Village" OR "Villages" OR "Frontline".
Sub-Saharan Africa	Sub-Saharan Africa and Africa South of the Sahara [MeSH] OR "Angola" OR "Benin" OR "Botswana" OR "Burkina Faso" OR "Burundi" OR "Cabo Verde" OR "Cameroon" OR "Cameroun" OR "Canary Islands" OR "Cape Verde" OR "Central Africa" OR "Central African Republic" OR "Chad" OR "Comoros" OR "Congo" OR "Cote d'Ivoire" OR "Democratic Republic of Congo" OR "Djibouti" OR "Eastern Africa" OR "Eritrea" OR "eSwatini" OR "Ethiopia" OR "Gabon" OR "Gambia" OR "Ghana" OR "Guinea" OR "Guinea Bissau" OR "Ivory Coast" OR "Jamahiriya" OR "Kenya" OR "Lesotho" OR "Liberia" OR "Madagascar" OR "Malawi" OR "Mali" OR "Mauritania" OR "Mauritius" OR "Mayotte" OR "Mozambique" OR "Namibia" OR "Niger" OR "Nigeria" OR "Principe" OR "Reunion" OR "Rwanda" OR "Sao Tome" OR "Senegal" OR "Seychelles" OR "Sierra Leone" OR "Saint Helena" OR "Somalia" OR "St Helena" OR "South Africa" OR "Southern Africa" OR "Sudan" OR "Swaziland" OR "Tanzania" OR "Togo" OR "Uganda" OR " Western Africa" OR "Western Sahara" OR "Zaire" OR "Zambia" OR "Zimbabwe".
Boundary Spanners	Intermediaries, translators, broker*, Intermediaries links, advocates, informants, gatekeepers, agents, (at barrier, boundary, frontiers, interface).

***Table 6**. Initial search terms which will be tested and adapted. These terms are only initial and will be tested and adapted in an initial pilot phase before the main searches are run.*

(additional in-paper searches will be conducted for the following terms as to not limit electronic search results)

Roles	Duties, functions, responsibilities, perform, task, function, work.
Enabler(s)/Facilitator (s)	enable*, support*, facilitate*, promote*, encourage,
Disabler(s)/Constraint(s)	Disable*, Hinder*, Barrier* weaken*,constrain*, obstruct*, hurdle, obstacle, hinder, impede.

Inclusion Criteria

The full selection of texts that will be included will be critically assessed through a quality evaluation process using the Critical Appraisal Skills Programme Systematic Review Checklist (Appendix 6) to assist in considering the appropriateness of the research questions, methods, and the findings reported in each study before studies are selected and included.

To be included in the review, the literature needs to:

- Be peer-reviewed journal articles (empirical/reviews and quantitative, qualitative, and mixed method studies), policy briefs, books (including electronic), editorials, comments, and other reliable sources of grey literature such as organisational reports showing some evidence of internal review.

- Be published between 2013 and 2024. These criteria will ensure that the most recent era of CHW-related evidence is systematically reviewed to generate relevant recommendations.
- Be written in or available in the English language.

Exclusion Criteria

Literature will be excluded from the review if:

- Conducted in/focused on CHWs in high-income countries.
- Conducted in LMICs (that do not include the SSA region).
- Health workers are not explicitly described as being CHWs.
- Abstracts are not included/available.
- When full text is not accessible to the researcher.
- No mention of terms referencing the boundary spanning roles (or synonyms thereof) of CHWs, showcase the roles of CHWS role linking communities and health systems.

Data Extraction

The following data extraction table will be applied for the systematic review (see Figure 2). This table will be expanded and adapted in the initial testing phase.

Article Details		Community Health Worker (CHW) Details			Factors Influencing CHW Contributions (constraints/facilitators)			
Year	Title	CHW Type	Position: Specific Boundary spanner/ intermediary position mentioned?	Roles, Responsibilities, and/or contributions mentioned?	System factors	Program factors	Contextual Factors	CHWs factors

Figure 5. *Data Extraction Table. Source; Author*

Data Analysis

Thematic analysis will be employed to interpret patterns, concepts, and themes in the literature. This approach is flexible and useful for synthesising qualitative literature material in a transparent way through various degrees of coding, which in turn qualitatively informs the descriptive analysis of findings, thus generating new and substantively relevant insights (Nowell *et al*., 2017).

Rigor

Eligibility and appropriateness of multiple forms of literature (in efforts to reduce selection and publication bias), quality of the review, and analysis process for phase two (systematic review) will be

developed and assessed through consultation with both the research supervisor and Health Science Faculty librarian at UCT. The researcher will uphold transparency, reproducibility, and trustworthiness through adherence to detailed step-by-step processes and methods with thick descriptions (Nowell *et al.*, 2017). Ethical considerations and actions for presenting trustworthy findings with conscientious efforts towards reflexivity will be prioritised throughout the review process.

From the outset, it is worth mentioning that the primary author has spent seven years of her professional experience embedded in hierarchical bureaucracies of health systems in SSA and has had to navigate dispersed and nuanced power dynamics within and between HS and communities. Many of these years were spent working alongside CHWs (and others close to community health workers) in the Western Cape area of South Africa. Although the researcher has no vested interest beyond contributing to the literature and optimising CHW support, these experiences may inform the lens through which the researcher will review, interpret and analyse literature. Notably, the researcher may be more vigilant in detecting subtle innuendos of relationships that influence the cadres roles. The researcher's primary interest is understanding the factors supporting the cadre's role in the subregion.

Limitations

Only literature available in English will be used, which is an exclusionary practice that could limit the inclusion of and access to vital evidence. This limitation is particularly significant in SSA, where linguistic diversity plays a crucial role. Restricting the review to English literature sources and conducting it in English may exacerbate current disparities in health information access across the sub-continent (Roca, *et al*, 2019). Additionally, a range of CTC workers (other than those formally recognised as CHWs), particularly those who operate predominantly in informal, under recognised roles in communities, may be excluded, further marginalising their voices and experiences in the research. Nonetheless, for the purposes of this review focusing on the boundary-spanning operations of CHWs, it is essential to confirm that the cadres under review operate in both milieus.

Considerations for Future Research

Upon completion, the results of this study will be made available on the open-access repository in thesis format, as supported by the University of Cape Town. The author hopes the article will be submitted for publication in an academic journal. The Health Policy and Systems Division at the University of Cape Town provided bursary support for this research. The results from this study thus aim to contribute to the funding project 'Health Systems Responsiveness in South Africa and Kenya.' The findings from this study may prove relevant to Health Policy and Systems in the sub-region. In such cases, recommendations for future research on CHW programmes and policy in SSA will be made.

Thus, the researcher hopes that the findings from the study will indirectly apply to supporting the cadre of CHWs in SSA and the general public. Other opportunities to disseminate findings to a broader audience will be investigated with the help of the research supervisor and through other forums.

Risks and Benefits

There are no perceived risks to this study. However, this research has the potential to uncover potential shortfalls and tensions in SSA health systems, as well as CHW-related programmes and policies, by shedding light on relational incongruencies, which may reflect underlying values within these systems. As this review is written in English and is academic in nature, those with limited access to such resources may be excluded, particularly those individuals who may see themselves reflected in the relationships focused on in this review but who would not necessarily be equipped to engage in dialogue around the concepts and findings in this study. As a result, this review may benefit some Health System actors more than others.

Ethical Considerations

This literature review will use the public literature sources available to UCT students. Since this study is based on a literature review, no human or animal participants will be directly involved. Therefore, this is a low/no risk study. The protocol will be submitted for approval to The Departmental Research Committee and the Faculty Research Ethics Committee.

Timeline

The various research activities (from the initial review protocol to the submission of a mini-thesis for evaluation purposes) can be seen in Figure 3 below.

Activity	2022	2023	2024												2025				
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Protocol																			
Data Collection																			
Data Extraction and analysis																			
Write up of Jornal Manuscript																			
Thesis Finalization																			
Thesis Submission																			

Figure 6*. Research Activities. Source; Author.*

Budget

All research activities for the qualitative systematic review will be conducted in partial fulfilment of the MPH degree. The author projects minimal costs arising from the study. In March 2021, the author received the HPSD Thesis Support Bursary as financial support towards the completion of her mini-

thesis research project. The HPSD bursary is linked to the project 'Health Systems Responsiveness in South Africa and Kenya.' Any costs reflected on the projected budget are shown in Table 4 below.

Item	Unit	Total Estimate Costs
Pens	4	R20.00
Paper (printing paper and note pad)	2 (1 of each)	R300.00
Printing (2 copies of joint protocol and final article) including binding	2	R2000.00
Incidentals	n/a	R1000.00
Total		**R3320.00**

Table 7. *Budget*

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Appendix 2: Data extraction sheet

Data Extraction Sheet: Article Details				
Authors	**Title**	**SSA Country**	**Type**	**Method**
Assegaai and Schneider., 2021	Factors Associated With Workplace and Interpersonal Trust in the Supervisory System of a Community Health Worker Programme in a Rural South African District	South Africa	Empirical	Qualitative
Baynes et al., 2014	An exploration of the feasibility, acceptability, and effectiveness of professional, multitasked community health workers in Tanzania	Tanzania	Empirical	Mixed Methods
Chengo et al., 2022	A Situation Assessment of Community Health Workers' Preparedness in Supporting Health System Response to COVID-19 in Kenya, Senegal, and Uganda	Kenya, Senegal, and Uganda	Empirical	Mixed Methods
Closser et al., 2019	Does volunteer community health work empower women? Evidence from Ethiopia's Women's Development Army	Ethiopia	Empirical	Mixed Methods
Condo et al., 2014	Rwanda's evolving community health worker system: a qualitative assessment of client and provider perspectives. Human resources for health	Rwanda	Empirical	Qualitative
Jackson et al. 2019	Gender exploitative and gender transformative aspects of employing Health Extension Workers under Ethiopia's Health Extension Program	Ethiopia	Empirical	Mixed Methods
Kallon et al., 2023	From policy to practice: a qualitive study exploring the role of community health workers during the COVID-19 response in Sierra Leone	Sierra Leone	Empirical	Qualitative
Kane et al., 2016	Limits and opportunities to community health worker empowerment: a multi-country comparative study	LMIC (Bangladesh, Ethiopia, Indonesia, Kenya, Malawi, Mozambique)	Empirical	Mixed Methods
Kok et al., 2013	Motivation and job satisfaction of Health Surveillance Assistants in Mwanza, Malawi an explorative study	Malawi	Empirical	Qualitative
Kok et al., 2016	Health surveillance assistants as intermediates between the community and health sector in Malawi: exploring how relationships influence performance	Malawi	Empirical	Qualitative

Data Extraction Sheet: Article Details				
Authors	**Title**	**SSA Country**	**Type**	**Method**
Kok et al., 2017	Optimising the benefits of community health workers' unique position between communities and the health sector: a comparative analysis of factors shaping relationships in four countries. Global Public Health	Ethiopia, Kenya, Malawi and Mozambique	Review	Mixed methods
Kok et al., 2017	Performance of community health workers: situating their intermediary position within complex adaptive health systems	Ethiopia, Kenya, Malawi and Mozambique	Review	Mixed methods
Kok et al., 2018	Does supportive supervision enhance community health worker motivation? A mixed-methods study in four African countries	Ethiopia, Kenya, Malawi and Mozambique	Empirical	Mixed Methods
Koroma et al., 2021	Community health workers' job satisfaction in Ebola-stricken areas of Sierra Leone and its implication for COVID-19 containment: a cross-sectional mixed-methods study	Sierra Leone	Empirical	Mixed Methods
Laurenzi et al., 2020	Balancing roles and blurring boundaries: Community health workers' experiences of navigating the crossroads between personal and professional life in rural South Africa	South Africa	Empirical	Qualitative
Ludwick etal 2018	Supportive supervision and constructive relationships with healthcare workers support CHW performance: Use of a qualitative framework to evaluate CHW programming in Uganda	Uganda	Empirical	Qualitative
Lutwama et al., 2021	An exploratory study of the barriers and facilitators to the implementation of community health worker programmes in conflict-affected South Sudan	South Sudan	Empirical	Qualitative
Mamo et al., 2019	How do community health actors explain their roles? Exploring the roles of community health actors in promoting maternal health services in rural Ethiopia	Ethiopia	Empirical	Qualitative
Masunaga et al 2022	Village health workers as health diplomats: negotiating health and study participation in a malaria elimination trial in The Gambia	The Gambia	Empirical	Qualitative
Mbachu et al., 2022	Village health worker motivation for better performance in a maternal and child health programme in Nigeria: A realist evaluation	Nigeria	Empirical	Mixed Methods

Data Extraction Sheet: Article Details				
Authors	**Title**	**SSA Country**	**Type**	**Method**
Mercader et al., 2014	Drugs for some but not all: Inequity within community health worker teams during introduction of integrated community case management	Uganda	EMpirical	Qualitative
Miller et al_2018	Community health workers during the Ebola outbreak in Guinea, Liberia, and Sierra Leone	Guinea, Liberia, and Sierra Leone	Empirical	Qualitative
Murphy et al., 2020	Community health worker models in South Africa: a qualitative study on policy implementation of the 2018/19 revised framework	South Africa	Empirical	Qualitative
Musinguzi et al.2017	Linking communities to formal health care providers through village health teams in rural Uganda: lessons from linking social capital	Uganda	Empirical	Qualitative
Mwai et al., 2013	Role and outcomes of community health workers in HIV care in sub-Saharan Africa: a systematic review	Multi (Uganda, Kenya, South Africa, Rwanda, Zambia, Ethiopia, Lesotho, Mozambique, Malawi)	Review	Mixed methods
Naidoo et al., 2019	Community healthcare worker response to childhood disorders: Inadequacies and needs	South Africa	Empirical	Qualitative
Ndambo et al. 2022	The role of community health workers in influencing social connectedness using the household model: a qualitative case study from Malawi	Malawi	Empirical	Qualitative
Ndima et al., 2015	Supervision of community health workers in Mozambique: a qualitative study of factors influencing motivation and programme implementation	Mozambique	Empirical	Qualitative
Niyigena et al. 2021	Rwanda's community health workers at the front line: a mixed-method study on perceived needs and challenges for community-based healthcare delivery during COVID-19 pandemic	Rwanda	empirical	Mixed Methods
Nxulmalo et al., 2016	Community health workers, recipients' experiences and constraints to care in South Africa– a pathway to trust	South Africa	Empirical	Qualitative

Data Extraction Sheet: Article Details				
Authors	**Title**	**SSA Country**	**Type**	**Method**
Ogutu et al. 2023	"We are their eyes and ears here on the ground, yet they do not appreciate us"—Factors influencing the performance of Kenyan community health volunteers working in urban informal settlements	Kenya	Empirical	Qualitative
Oliver et al., 2015	What do community health workers have to say about their work, and how can this inform improved programme design?	Kenya	Empirical	Qualitative
Phiri et al. 2017	An exploration of facilitators and challenges in the scale-up of a national, public sector community health worker cadre in Zambia: a qualitative study	Zambia	Empirical	Qualitative
Raven et al. 2020	How should community health workers in fragile contexts be supported: qualitative evidence from Sierra Leone, Liberia and Democratic Republic of Congo	Sierra Leone, Liberia and Democratic Republic of Congo	Empirical	Qualitative
Singh et al., 2015	Acceptability and trust of community health workers offering maternal and newborn health education in rural Uganda	Uganda	Empirical	Qualitative
Smith et al. 2014	Task-shifting and prioritization: a situational analysis examining the role and experiences of community health workers in Malawi	Malawi	Empirical	Qualitative
Steege et al., 2018	'The phone is my boss and my helper' – A gender analysis of an mHealth intervention with Health Extension Workers in Southern Ethiopia	Ethiopia	Empirical	Mixed Methods
Steege et al., 2020	Redressing the gender imbalance: a qualitative analysis of recruitment and retention in Mozambique's community health workforce	Mozambique	Empirical	Qualitative
Strachan et al., 2015	Uganda and Mozambique drawing on behavioural theory and formative research results.	Uganda and Mozambique	Review	Mixed methods
Turinawe et al., 2015	Selection and performance of village health teams (VHTs) in Uganda: lessons from the natural helper model of health promotion	Uganda	Empirical	Qualitative
Tuyisenge et al. 2019	Facilitating equitable community-level access to maternal health services: exploring the experiences of Rwanda's community health workers	Rwanda	Empirical	Qualitative
Van der Ruit, 2019	Unintended Consequences of Community Health Worker Programs in South Africa	South Africa	Empirical	Qualitative

Data Extraction Sheet: Article Details				
Authors	**Title**	**SSA Country**	**Type**	**Method**
Watkins et al. 2021	Community health workers' efforts to build health system trust in marginalised communities: a qualitative study from South Africa	South Africa	Empirical	Qualitative

		Data Extraction Sheet			
Article Details		**Community Health Worker (CHW) Details**			
Authors	**Title**	**CHW Type**	**Position: Specific Boundary spanner/ intermediary position mentioned?**	**Roles, Responsibilities, and/or contributions mentioned?**	**Boundary-spanning Roles**
Assegaai and Schneider., 2022	Factors Associated with Workplace and Interpersonal Trust in the Supervisory System of a Community Health Worker Programme in a Rural South African District	CHWs	intermediaries between communities and the health system, managing relationships.	General Health, promotional, preventive, and curative primary health services	Knowledge Brokers, Sharers and Translators; Trust Builders
Baynes et al., 2017	An exploration of the feasibility, acceptability, and effectiveness of professional, multitasked community health workers in Tanzania	Community Health Agents (Swahili acronym, WAJA)		General Health, promotional, preventive, and curative primary health services including Integrated Community Case Management (iCCM)	Health Service Navigators, Knowledge Brokers, Sharers and Translators
Chengo et al., 2022	A Situation Assessment of Community Health Workers' Preparedness in Supporting Health System Response to COVID-19 in Kenya, Senegal, and Uganda	CHWs	CHWs act as a bridge between health/social care system and communities.	COVID-19 response: promotional, preventive and curative primary health services	Emergency Responders; Knowledge Brokers, Sharers and Translators
Closser et al., 2019	Does volunteer community health work empower women? Evidence from Ethiopia's Women's Development Army	Health Extension Workers (HEWs); CHWs in Women's Development Army (WDA).	n/a	General Health, promotional, preventive, and curative primary health services	Knowledge Brokers, Sharers and Translators; Social Capital Mobilizers
Condo et al., 2014	Rwanda's evolving community health worker system: a qualitative assessment of client and provider perspectives. Human resources for health	Animatrice de Santé Maternelle (ASM)	Serve as Intermediaries between the community and formal health system	Community Health, Nutrition, and HIV/AIDS Prevention	Emergency Responders; Knowledge Brokers, Sharers and Translators

		Data Extraction Sheet			
Article Details		**Community Health Worker (CHW) Details**			
Authors	**Title**	**CHW Type**	**Position: Specific Boundary spanner/ intermediary position mentioned?**	**Roles, Responsibilities, and/or contributions mentioned?**	**Boundary-spanning Roles**
Jackson et al. 2019	Gender exploitative and gender transformative aspects of employing Health Extension Workers under Ethiopia's Health Extension Program	Health Extension Workers (HEWs)	link rural communities with the formal healthcare sector	Maternal and Child health programs: promotional, preventive and curative primary health services	Cultural Brokers; Knowledge Brokers, Sharers and Translators
Kallon et al., 2023	From policy to practice: a qualitive study exploring the role of community health workers during the COVID-19 response in Sierra Leone	CHWs	bridge the gap between local communities and the formal health system	General Health, promotional, preventive and curative primary health services inlcuding COVID-19 response	Emergency Responders; Health Service Navigators; Knowledge Brokers, Sharers and Translators
Kane et al., 2016	Limits and opportunities to community health worker empowerment: a multi-country comparative study	Ethiopia: Health Extension Workers (HEWs); Kenya: Community Health Extension Workers (CHEWs); Malawi: Health Surveillance Assistants (HSAs); Mozambique: Agentes Polivalentes Elementares (APEs)	Being at the interface of the health system and the communities	General Health, promotional, preventive and curative primary health services	Community Advocates; Knowledge Brokers, Sharers and Translators
Kok et al., 2013	Motivation and job satisfaction of Health Surveillance Assistants in Mwanza, Malawi an explorative study	ASA		General Health, promotional, preventive and curative primary health services	Community Advocates; Trust Builders
Kok et al., 2016	Health surveillance assistants as intermediates between the community and health sector in Malawi: exploring how relationships influence performance	Health Surveillance assistants (HSAs)	Intermediary position	General Health, promotional, preventive and curative primary health services	Health Service Navigators; Knowledge Brokers, Sharers and Translators; Trust Builders
Kok et al., 2017	Performance of community health workers: situating their intermediary position within complex adaptive health systems	CHWs	Unique intermediary position/Cultural brokers between the	General Health, promotional, preventive and curative primary health services	Community Advocates, Cultural Brokers, Health Service Navigators

		Data Extraction Sheet			
Article Details		**Community Health Worker (CHW) Details**			
Authors	**Title**	**CHW Type**	**Position: Specific Boundary spanner/ intermediary position mentioned?**	**Roles, Responsibilities, and/or contributions mentioned?**	**Boundary-spanning Roles**
			community and health sector		
Kok et al., 2017	Optimising the benefits of community health workers' unique position between communities and the health sector: a comparative analysis of factors shaping relationships in four countries. Global Public Health	Ethiopia: Health Extension Workers (HEWs); Kenya: Community Health Extension Workers (CHEWs); Malawi: Health Surveillance Assistants (HSAs) Mozambique: Agentes Polivalentes Elementares (APEs)	Unique intermediary position	General Health, promotional, preventive and curative primary health services	Cultural Brokers; Emergency Responders; Trust Builders
Kok et al., 2018	Does supportive supervision enhance community health worker motivation? A mixed-methods study in four African countries	Ethiopia (HEW) Kenya (CHV), Malawi (HAS) and Mozambique (APE)	Intermediary position of CHWs at the interface between the health sector and communities	General Health, promotional, preventive and curative primary health services	Knowledge Brokers, Sharers and Translators; Trust Builders
Koroma et al., 2021	Community health workers' job satisfaction in Ebola-stricken areas of Sierra Leone and its implication for COVID-19 containment: a cross-sectional mixed-methods study	Community based lay health workers Sierra Leone are classified into different categories; among them are General Community Health Workers (GCHWs), Traditional Birth Attendants (TBAs).	Serve as the bridge between the community and public health services	Community-Based Surveillance and Care	Emergency Responders; Trust Builders
Laurenzi et al., 2021	Balancing roles and blurring boundaries: Community health workers' experiences of navigating the crossroads between personal	CHWs (Mentor Mothers (MMs)	Navigate boundaries between formal health systems and communities	Maternal and Child health programs: promotional, preventive and curative primary health services	Cultural Brokers; Trust Builders

		Data Extraction Sheet			
Article Details		**Community Health Worker (CHW) Details**			
Authors	**Title**	**CHW Type**	**Position: Specific Boundary spanner/ intermediary position mentioned?**	**Roles, Responsibilities, and/or contributions mentioned?**	**Boundary-spanning Roles**
	and professional life in rural South Africa				
Ludwick et al., 2018	Supportive supervision and constructive relationships with healthcare workers support CHW performance: Use of a qualitative framework to evaluate CHW programming in Uganda	village health teams (VHTs)	link communities to the formal health service delivery system	Maternal and Child health programs: promotional, preventive and curative primary health services	Health Service Navigators; Knowledge Brokers, Sharers and Translators; Trust Builders
Lutwama et al., 2021	An exploratory study of the barriers and facilitators to the implementation of community health worker programmes in conflict-affected South Sudan	Boma Health Workers (BHWs) Community Based Distributors (CBDs) Community Drug Distributors (CDD) Community Nutritional volunteers (CNVs) Home Health Promoters (HHPs), Traditional Birth Attendants (TBAs) Mother to mother support groups M2MSG)	Bridge the gap between health facilities and communities	General Health, promotional, preventive and curative primary health services	Emergency Responders
Mamo et al., 2019	How do community health actors explain their roles? Exploring the roles of community health actors in promoting maternal health services in rural Ethiopia	Health Extension Workers (HEWs),	Serve as a link between the community and the health system	Maternal and Child health programs: promotional, preventive and curative primary health services	Cultural Brokers; Knowledge Brokers, Sharers and Translators
Masunaga et al 2022	Village health workers as health diplomats: negotiating health and	Village Health Workers (VHWs)	Uniquely serve at interface between under-resourced	General Health, promotional, preventive,	Cultural Brokers; Trust Builders

		Data Extraction Sheet			
Article Details		**Community Health Worker (CHW) Details**			
Authors	**Title**	**CHW Type**	**Position: Specific Boundary spanner/ intermediary position mentioned?**	**Roles, Responsibilities, and/or contributions mentioned?**	**Boundary-spanning Roles**
	study participation in a malaria elimination trial in The Gambia		health systems and the communities, acting as bridges and brokers.	and curative primary health services	
Mbachu et al., 2022	Village health worker motivation for better performance in a maternal and child health programme in Nigeria: A realist evaluation	Nigeria, village health workers (VHWs)	Link communities with formal health service providers,	Maternal and Child health programs: promotional, preventive, and curative primary health services	Community Advocates; Knowledge Brokers, Sharers and Translators; Trust Builders
Mercader et al., 2014	Drugs for some but not all: Inequity within community health worker teams during introduction of integrated community case management	CHWS		Integrated Community Case Management (iCCM)	Community Advocates; Knowledge Brokers, Sharers and Translators
Miller et al., 2018	Community health workers during the Ebola outbreak in Guinea, Liberia, and Sierra Leone	community health worker (CHW), traditional birth attendant (TBA), and community health committee (CHC)		Range of promotional, preventive and curative primary health services including Ebola response	Emergency Responders; Trust Builders
Murphy et al., 2021	Community health worker models in South Africa: a qualitative study on policy implementation of the 2018/19 revised framework	CHWs	Form a bridge between communities and healthcare service provision	General Health, promotional, preventive, and curative primary health services	Community Advocates; Knowledge Brokers, Sharers and Translators; Trust Builders
Musinguzi et al.2017	Linking communities to formal health care providers through village health teams in rural Uganda: lessons from linking social capital	village health teams (VHTS)	link and connect communities with formal health care services.	General Health, promotional, preventive, and curative primary health services	Community Advocates; Trust Builders
Mwai et al., 2013	Role and outcomes of community health workers in HIV care in sub-Saharan Africa: a systematic review	multi	Bridge between the community and health facilities	General Health, promotional, preventive, and curative primary health services	Health Service Navigators; Trust Builders

		Data Extraction Sheet			
Article Details		**Community Health Worker (CHW) Details**			
Authors	**Title**	**CHW Type**	**Position: Specific Boundary spanner/ intermediary position mentioned?**	**Roles, Responsibilities, and/or contributions mentioned?**	**Boundary-spanning Roles**
Naidoo et al., 2019	Community healthcare worker response to childhood disorders: Inadequacies and needs	Community healthcare workers (CHWs)	Link health facilities and communities.	General Health, promotional, preventive and curative primary health services	Health Service Navigators; Social Capital Mobilizers
Ndambo et al. 2022	The role of community health workers in influencing social connectedness using the household model: a qualitative case study from Malawi	health surveillance assistants (HSAs)	Link communities to essential healthcare and social support services	General Health, promotional, preventive and curative primary health services (including child and maternal health and HIVand TB care)	Social Capital Mobilizers; Trust Builders
Ndima et al., 2015	Supervision of community health workers in Mozambique: a qualitative study of factors influencing motivation and programme implementation	Agentes Polivalentes Elementares (APEs)	Roles connecting community and health systems	General Health, promotional, preventive and curative primary health services (attention to child health)	Knowledge Brokers, Sharers and Translators; Social Capital Mobilizers
Niyigena et al. 2022	Rwanda's community health workers at the front line: a mixed-method study on perceived needs and challenges for community-based healthcare delivery during COVID-19 pandemic	Agent de Sante Maternelle (ASM)- female male–female pair known as Binômes	Linking communities to the formal health systems,	General Health, promotional, preventive and curative primary health services	Emergency Responders, Health Service Navigators; Trust Builders
Nxumalo et al., 2016	Community health workers, recipients' experiences and constraints to care in South Africa– a pathway to trust	CHW	Form a link between the formal health system and vulnerable communities	Integrated Health and Social Care	Cultural Brokers; Trust Builders
Ogutu et al. 2023	"We are their eyes and ears here on the ground, yet they do not appreciate us"—Factors influencing	Community health volunteers (CHVs)	Crucial role in linking the community with	Maternal and Child health programs, Integrated Community Case	Community Advocates, Health Service Navigators

		Data Extraction Sheet			
Article Details		**Community Health Worker (CHW) Details**			
Authors	**Title**	**CHW Type**	**Position: Specific Boundary spanner/ intermediary position mentioned?**	**Roles, Responsibilities, and/or contributions mentioned?**	**Boundary-spanning Roles**
	the performance of Kenyan community health volunteers working in urban informal settlements		the formal health system.	Management (iCCM) General Health, promotional, preventive and curative primary health services, HIV and TB care	
Oliver et al., 2015	What do community health workers have to say about their work, and how can this inform improved programme design?	Voluntary CHWs, CHEWs and the CHCs, in two communities in Kenya: one rural community, and one informal settlement.	Links between households and health facilities	General Health, promotional, preventive and curative primary health services	Trust Builders
Phiri et al. 2017	An exploration of facilitators and challenges in the scale-up of a national, public sector community health worker cadre in Zambia: a qualitative study	Community Health Assistants (CHAs)	Play a critical role in bridging the gap between communities and health facilities,	General Health, promotional, preventive and curative primary health services	Health Service Navigators; Knowledge Brokers, Sharers and Translators
Raven et al. 2020	How should community health workers in fragile contexts be supported: qualitative evidence from Sierra Leone, Liberia and Democratic Republic of Congo	CHWs Liberia: Community Health Assistants (CHA) DRC: Community Extension Workers (Relais Communautaires)	CHWs' interface role between communities and health system	Range of promotional, preventive and curative primary health services including Ebola response	Emergency Responders; Trust Builders
Singh et al., 2015	Acceptability and trust of community health workers offering maternal and newborn health education in rural Uganda	CHW		Health Educational Services	Cultural Brokers; Trust Builders
Smith et al., 2014	Task-shifting and prioritization: A situational analysis examining the role and experiences of community health workers in Malawi	HSAs	Form a link between villages and health centres	General Health, promotional, preventive and curative primary health services	Health Service Navigators

Article Details		Data Extraction Sheet Community Health Worker (CHW) Details			
Authors	**Title**	**CHW Type**	**Position: Specific Boundary spanner/ intermediary position mentioned?**	**Roles, Responsibilities, and/or contributions mentioned?**	**Boundary-spanning Roles**
Steege et al., 2020	Redressing the gender imbalance: a qualitative analysis of recruitment and retention in Mozambique's community health workforce	Agentes Polivalentes Elementares (APEs)	Unique interface position between communities and the health system	General Health, promotional, preventive and curative primary health services	Cultural Brokers; Trust Builders
Steege et al., 2018	'The phone is my boss and my helper' – A gender analysis of an mHealth intervention with Health Extension Workers in Southern Ethiopia	Health Extension Workers (HEWs)	At the interface of health systems and communities where, they negotiate a complex range of relationships and power dynamics.	Maternal and Child health programs: promotional, preventive and curative primary health services	Health Service Navigators; Knowledge Brokers, Sharers and Translators
Strachan et al., 2015	Uganda and Mozambique drawing on behavioural theory and formative research results.	In Uganda, CHWs are known as Village Health Team members Mozambique, CHWs are known as Agente Polivalente Elementares (APEs)	Connectedness to both the community and the health system	Maternal and Child health programs: Integrated Community Case Management (iCCM)	Social Capital Mobilizers; Trust Builders
Turinawe et al., 2015	Selection and performance of village health teams (VHTs) in Uganda: lessons from the natural helper model of health promotion	Village Health Teams (VHTs)	Embeddedness in communities and enact community participation on behalf of health systems	General Health, promotional, preventive and curative primary health services	Community Advocates, Health Service Navigators; Social Capital Mobilizers; Trust Builders
Tuyisenge et al. 2019	Facilitating equitable community-level access to maternal health services: exploring the experiences of Rwanda's community health workers	Animatrice de Santé Maternelle (maternal health CHWs)	Linking members of the communities connecting with formal health care system	Maternal and Child health programs: promotional, preventive and curative primary health services	Community Advocates, Cultural Brokers, Health Service Navigators
Van der Ruit, 2019	Unintended Consequences of Community Health Worker Programs in South Africa	CHWs (community health worker)	Play bridging role between patients and	Community Health, Nutrition, and HIV/AIDS	Community Advocates; Trust Builders

		Data Extraction Sheet			
Article Details		**Community Health Worker (CHW) Details**			
Authors	**Title**	**CHW Type**	**Position: Specific Boundary spanner/ intermediary position mentioned?**	**Roles, Responsibilities, and/or contributions mentioned?**	**Boundary-spanning Roles**
			the formal health system	Prevention AND Clinical health services	
Watkins et al. 2021	Community health workers' efforts to build health system trust in marginalised communities: a qualitative study from South Africa	CHWs		General Health, promotional, preventive and curative primary health services including COVID-19 response	Knowledge Brokers, Sharers and Translators; Social Capital Mobilizers; Trust Builders

		Data Extraction Sheet			
Article Details		**Factors Influencing CHW Contributions (constraints/facilitators)**			
Authors	**Title**	**System factors**	**Program factors**	**Contextual Factors**	**CHWs factors**
Assegaai and Schneider., 2021	Factors Associated with Workplace and Interpersonal Trust in the Supervisory System of a Community Health Worker Programme in a Rural South African District		>Supportive supervision		>Trust and motivation
Baynes et al., 2014	An exploration of the feasibility, acceptability, and effectiveness of professional, multitasked community health workers in Tanzania		>Appropriate recruitment and selection>Renumeration and non-financial incentives>Appropriate and ongoing training>Logistical and resource support		>Trust and motivation
Chengo et al., 2022	A Situation Assessment of Community Health Workers' Preparedness in Supporting Health System Response to COVID-19 in Kenya, Senegal, and Uganda		>Clear workload and role definition		
Closser et al., 2019	Does volunteer community health work empower women? Evidence from Ethiopia's Women's Development Army	Government support	>Remuneration and non-financial incentives	>Historical context	
Condo et al., 2014	Rwanda's evolving community health worker system: a qualitative assessment of client and provider	Formal health systems	>Clear workload and role definition>Supportive supervision		

		Data Extraction Sheet			
Article Details		**Factors Influencing CHW Contributions (constraints/facilitators)**			
Authors	**Title**	**System factors**	**Program factors**	**Contextual Factors**	**CHWs factors**
	perspectives. Human resources for health				
Jackson et al. 2019	Gender exploitative and gender transformative aspects of employing Health Extension Workers under Ethiopia's Health Extension Program	Health systems Community Systems	Appropriate and ongoing training >Appropriate recruitment and selection Logistical and resource support >Paths for career development >Supportive supervision >remuneration and non-financial incentives	Gender	CHW Voice
Kallon et al., 2023	From policy to practice: a qualitive study exploring the role of community health workers during the COVID-19 response in Sierra Leone		>Supportive supervision >Clear workload and role definition >Renumeration and non-financial incentives >Logistical and resource support	>Gender context	
Kane et al., 2016	Limits and opportunities to community health worker empowerment: a multi-country comparative study		>Appropriate and ongoing training >Paths for career development		>CHW Voice
Kok et al., 2013	Motivation and job satisfaction of Health Surveillance Assistants in Mwanza, Malawi an explorative study		>Appropriate and ongoing training >Renumeration and non-financial incentives >Clear workload and role definition >Supportive supervision >Logistical and resource support	>Societal and economic context	>Trust and motivation
Kok et al., 2016	Health surveillance assistants as intermediates between the community and health sector in Malawi: exploring how relationships influence performance	Community health systems	>Remuneration and non-financial incentives >supportive supervision		>Trust and motivation >CHW Voice

		Data Extraction Sheet			
Article Details		**Factors Influencing CHW Contributions (constraints/facilitators)**			
Authors	**Title**	**System factors**	**Program factors**	**Contextual Factors**	**CHWs factors**
Kok et al., 2017	Optimising the benefits of community health workers' unique position between communities and the health sector: a comparative analysis of factors shaping relationships in four countries. Global Public Health	Community health systems Formal health systems	>Remuneration and non-financial incentives >Clear workload and role definition >Supportive supervision >Appropriate and ongoing training >Paths for career development	>Societal and economic context >Gender	>Trust and motivation >CHW Voice
Kok et al., 2017	Performance of community health workers: situating their intermediary position within complex adaptive health systems	Community health systems Formal health systems	>Appropriate and ongoing training >Supportive supervision		>Trust and motivation >CHW Voice
Kok et al., 2018	Does supportive supervision enhance community health worker motivation? A mixed-methods study in four African countries		>Supportive supervision		
Koroma et al., 2021	Community health workers' job satisfaction in Ebola-stricken areas of Sierra Leone and its implication for COVID-19 containment: a cross-sectional mixed-methods study		>Clear workload and role definition >Renumeration and non-financial incentives >Paths for career development		>Trust and motivation
Laurenzi et al., 2020	Balancing roles and blurring boundaries: Community health workers' experiences		>Logistical and resource support		>CHW Voices

		Data Extraction Sheet			
Article Details		**Factors Influencing CHW Contributions (constraints/facilitators)**			
Authors	**Title**	**System factors**	**Program factors**	**Contextual Factors**	**CHWs factors**
	of navigating the crossroads between personal and professional life in rural South Africa				
Ludwick et al 2018	Supportive supervision and constructive relationships with healthcare workers support CHW performance: Use of a qualitative framework to evaluate CHW programming in Uganda	Health systems Community systems	>Appropriate and ongoing training>Appropriate recruitment and selection>Supportive supervision		VoiceMotivation and trust
Lutwama et al., 2021	An exploratory study of the barriers and facilitators to the implementation of community health worker programmes in conflict-affected South Sudan	Community health systems Formal health systems	>Supportive supervision >Renumeration and non-financial incentives >Clear workload and role definition >Appropriate and ongoing training	>Historical context	>Trust and motivation
Mamo et al., 2019	How do community health actors explain their roles? Exploring the roles of community health actors in promoting maternal health services in rural Ethiopia	Community health systems Formal health systems	>Clear workload and role definition >Logistical and resource support		
Masunaga et al 2022	Village health workers as health diplomats: negotiating health and study participation in a malaria elimination trial in The Gambia	Health systemsCommunity systems	>Appropriate recruitment and selection>Clear workload and role definition>Paths for career development>Supportive supervision	Societal economic	Trust and motivation

		Data Extraction Sheet			
Article Details		**Factors Influencing CHW Contributions (constraints/facilitators)**			
Authors	**Title**	**System factors**	**Program factors**	**Contextual Factors**	**CHWs factors**
Mbachu et al., 2022	Village health worker motivation for better performance in a maternal and child health programme in Nigeria: A realist evaluation		>Supportive supervision >Clear workload and role definition >Logistical and resource support		>CHW Voices >Trust and motivation
Mercader et al., 2014	Drugs for some but not all: Inequity within community health worker teams during introduction of integrated community case management	Community health systems Formal health systems	>Appropriate recruitment and selection	Societal and economic context	>CHW Voices >Trust and motivation
Miller et al_2018	Community health workers during the Ebola outbreak in Guinea, Liberia, and Sierra Leone	Health systems Community Systems	Appropriate and ongoing training >Appropriate recruitment and selection >Clear workload and role definition Logistical and resource support >Paths for career development >Supportive supervision Remuneration and non-financial incentives	Societal and economic context	Trust and motivation
Murphy et al., 2020	Community health worker models in South Africa: a qualitative study on policy implementation of the 2018/19 revised framework	Community health systems Formal health systems	>Supportive supervision		>CHW Voices
Musinguzi et al.2017	Linking communities to formal health care providers through village health teams in rural Uganda: lessons from linking social capital	Health system Community systems	Appropriate and ongoing training >Appropriate recruitment and selection >Clear workload and role definition >Logistical and resource support >Supportive supervision	Gender	Trust and motivation
Mwai et al., 2013	Role and outcomes of community health workers in		>Clear workload and role definition		

		Data Extraction Sheet			
Article Details		**Factors Influencing CHW Contributions (constraints/facilitators)**			
Authors	**Title**	**System factors**	**Program factors**	**Contextual Factors**	**CHWs factors**
	HIV care in sub-Saharan Africa: a systematic review				
Naidoo et al., 2019	Community healthcare worker response to childhood disorders: Inadequacies and needs		>Appropriate and ongoing training >Supportive supervision		
Ndambo et al. 2022	The role of community health workers in influencing social connectedness using the household model: a qualitative case study from Malawi	Health systems Community systems		Historical	Trust and motivation Voice
Ndima et al., 2015	Supervision of community health workers in Mozambique: a qualitative study of factors influencing motivation and programme implementation	Formal health systems	>Supportive supervision		
Niyigena et al. 2021	Rwanda's community health workers at the front line: a mixed-method study on perceived needs and challenges for community-based healthcare delivery during COVID-19 pandemic		Appropriate and ongoing training >Clear workload and role definition Logistical and resource support >Supportive supervision		voice
Nxulmalo et al., 2016	Community health workers, recipients' experiences and constraints to care in South Africa– a pathway to trust	Community health systems Formal health systems Government support	>Supportive supervision	>Historical context	

		Data Extraction Sheet			
Article Details		**Factors Influencing CHW Contributions (constraints/facilitators)**			
Authors	**Title**	**System factors**	**Program factors**	**Contextual Factors**	**CHWs factors**
Ogutu et al. 2023	"We are their eyes and ears here on the ground, yet they do not appreciate us"—Factors influencing the performance of Kenyan community health volunteers working in urban informal settlements	Health systems Community systems	Appropriate and ongoing training >Appropriate recruitment and selection >Clear workload and role definition Logistical and resource support >Supportive supervision >remuneration and non-financial incentives	Economic and societal	Trust and motivation Voice
Oliver et al., 2015	What do community health workers have to say about their work, and how can this inform improved programme design?	Government support	>Clear workload and role definition >Remuneration and Non-financial incentives >Supportive supervision		
Phiri et al. 2017	An exploration of facilitators and challenges in the scale-up of a national, public sector community health worker cadre in Zambia: a qualitative study	Health systems Community systems	>Logistical and resource support >Supportive supervision		Voice
Raven et al. 2020	How should community health workers in fragile contexts be supported: qualitative evidence from Sierra Leone, Liberia and Democratic Republic of Congo	Health systems Community Systems	Appropriate and ongoing training >Appropriate recruitment and selection Logistical and resource support >Paths for career development >Supportive supervision >remuneration and non-financial incentives	Gender Societal and economic context Historical Context	Trust and motivation
Singh et al., 2015	Acceptability and trust of community health workers offering maternal and	Community health systems	>Supportive supervision >Clear workload and role definition >Appropriate and ongoing training	>Societal and economic context	>Trust and motivation

		Data Extraction Sheet			
Article Details		**Factors Influencing CHW Contributions (constraints/facilitators)**			
Authors	**Title**	**System factors**	**Program factors**	**Contextual Factors**	**CHWs factors**
	newborn health education in rural Uganda				
Smith et al., 2014	Task-shifting and prioritization: A situational analysis examining the role and experiences of community health workers in Malawi		>Clear workload and role definition >Appropriate and ongoing training >Supportive supervision	Historical context	>CHW Voices
Steege et al., 2018	'The phone is my boss and my helper' – A gender analysis of an mHealth intervention with Health Extension Workers in Southern Ethiopia	Formal health systems	>Supportive supervision	>Gender context	>CHW Voices
Steege et al., 2020	Redressing the gender imbalance: a qualitative analysis of recruitment and retention in Mozambique's community health workforce		>Clear workload and role definition >Appropriate recruitment and selection >Paths for career development >Renumeration and non-financial incentives	>Gender context	>CHW Voices
Strachan et al., 2015	Uganda and Mozambique drawing on behavioural theory and formative research results.		>Appropriate recruitment and selection		>Trust and motivation
Turinawe et al., 2015	Selection and performance of village health teams (VHTs) in Uganda: lessons from the natural helper model of health promotion	Community health systems Formal health systems	>Appropriate recruitment and selection		

		Data Extraction Sheet			
Article Details		**Factors Influencing CHW Contributions (constraints/facilitators)**			
Authors	**Title**	**System factors**	**Program factors**	**Contextual Factors**	**CHWs factors**
Tuyisenge et al. 2019	Facilitating equitable community-level access to maternal health services: exploring the experiences of Rwanda's community health workers	Health systems Community systems	Appropriate and ongoing training Logistical and resource support	Historical Societal economic	Voice
Van der Ruit, 2019	Unintended Consequences of Community Health Worker Programs in South Africa	Health systems Community Systems	Appropriate and ongoing training >Appropriate recruitment and selection Logistical and resource support >Paths for career development >Supportive supervision >remuneration and non-financial incentives	Societal and economic context	n/a OR CHW voice
Watkins et al. 2021	Community health workers' efforts to build health system trust in marginalised communities: a qualitative study from South Africa	Health systems Community systems	>Supportive supervision	Societal economic	Trust and motivation CHWs voice

Appendix 3: Final search terms for phase 2

#	Query
S1	(health system or health systems or health services or healthcare) OR (Formal Health System OR Health Service* OR health workforce OR) OR(health system strengthening OR public health system* OR health delivery OR health program* OR healthcare OR health sector OR health system performance OR health governan*)
S2	(community health worker or lay health advisor or lay health workers or lay person or expert by experience or peers) OR (Community based health worker or Community health extension worker or Agentes Polivalentes Elementares or Peer educators or Traditional Birth Attendants or Lay Health Workers or Lay Counsellors or Health Surveillance assistants or Health Extension Workers or Close to community or Health care worker or Community health aides or Village health workers or Community Volunteer Workers or Community Reproductive Health Workers or Community Medicine distributors or Adherence Support Workers or Care Facilitators) OR (Community Anti-retroviral Therapy and Tuberculosis Treatment Supporters or CATTS or Community Based Distributors or Community based surveillance Volunteers or CBSVs or Community Drug distributors or Community Health Volunteers or Community home-based care workers)
S3	(community health system or community health systems) OR (Communit* or Community Health or Community systems or Community health planning or Community Health services or Community networks or Community based care or OR Community based OR Village OR Villages OR Frontline)
S4	(boundary spanner or boundary spanners) ORboundaries or intermediary or Intermediaries or translators or broker* or links or lynchpin bridge or advocates or connect* or informants or gatekeepers or agents or span*
S5	(sub saharan africa or sub-saharan africa or sub sahara or sub-sahara or ssa or africa south of the sahara) OR (Angola OR Benin OR Botswana OR Burkina Faso OR Burundi OR Cabo Verde OR Cameroon OR Cameroun OR Canary Islands OR Cape Verde OR Central Africa OR Central African Republic OR Chad OR Comoros OR Congo OR Cote d'Ivoire OR Democratic Republic of Congo OR Djibouti OR Eastern Africa OR Eritrea OR eSwatini OR Ethiopia OR Gabon OR Gambia OR Ghana OR Guinea OR Guinea Bissau OR Ivory Coast OR Jamahiriya OR Kenya OR Lesotho OR Liberia OR Madagascar OR Malawi OR Mali OR Mauritania OR Mauritius OR Mayotte OR Mozambique OR Namibia OR Niger OR Nigeria OR Principe OR Reunion OR Rwanda OR Sao Tome OR Senegal OR Seychelles OR Sierra Leone OR Saint Helena OR Somalia OR St Helena OR South Africa OR Southern Africa OR Sudan OR Swaziland OR Tanzania OR Togo) OR (Uganda OR Western Africa OR Western Sahara OR Zaire OR Zambia OR Zimbabwe)
S6	S1 AND S2 AND S3 AND S5
S7	S6 OR S6 AND S4

Appendix 4: Search terms for phase 1

Health Systems	"Health system", "Formal health system", "Health service", "Health Workforce", Health personnel", "Health service delivery", "Health service systems", "Health programmes", Governance", "Health workforce", "Medical technology", Vaccine", "Vertical health programmes", "Health systems strengthening", "Health systems performance", "Public health systems", "Health delivery", "Healthcare", Health", "health sector", "Health system", "Health system strengthening", "Health system performance".
Community Health Workers	"Close to community", "Health care worker", "Community health aides", "Village health workers", "Community based health worker", "Community health extension worker"
Communities	"Community Health", "Community systems", "Community health planning", "Community Health services", "Community networks", "Community based care", "community" OR "Communities" OR "Community based" OR "Village" OR "Villages" OR "Frontline".

Appendix 5: CASP Checklist

CASP Checklist: 10 questions to help you make sense of a **Systematic Review**

How to use this appraisal tool: Three broad issues need to be considered when appraising a systematic review study:

- Are the results of the study valid? (Section A)
- What are the results? (Section B)
- Will the results help locally? (Section C)

The 10 questions on the following pages are designed to help you think about these issues systematically. The first two questions are screening questions and can be answered quickly. If the answer to both is "yes", it is worth proceeding with the remaining questions. There is some degree of overlap between the questions, you are asked to record a "yes", "no" or "can't tell" to most of the questions. A number of italicised prompts are given after each question. These are designed to remind you why the question is important. Record your reasons for your answers in the spaces provided.

About: These checklists were designed to be used as educational pedagogic tools, as part of a workshop setting, therefore we do not suggest a scoring system. The core CASP checklists (randomised controlled trial & systematic review) were based on JAMA 'Users' guides to the medical literature 1994 (adapted from Guyatt GH, Sackett DL, and Cook DJ), and piloted with health care practitioners.

For each new checklist, a group of experts were assembled to develop and pilot the checklist and the workshop format with which it would be used. Over the years overall adjustments have been made to the format, but a recent survey of checklist users reiterated that the basic format continues to be useful and appropriate.

Referencing: we recommend using the Harvard style citation, i.e.: *Critical Appraisal Skills Programme (2018). CASP (insert name of checklist i.e. Systematic Review) Checklist. [online] Available at:URL. Accessed: Date Accessed.*

Paper for appraisal and reference:…….

Section A: Are the results of the review valid?

1. Did the review address a clearly focused question?

Yes	
Can't Tell	
No	

HINT: An issue can be 'focused' In terms of
- the population studied
- the intervention given
- the outcome considered

Comments:

2. Did the authors look for the right type of papers?

Yes	
Can't Tell	
No	

HINT: 'The best sort of studies' would
- address the review's question
- have an appropriate study design (usually RCTs for papers evaluating interventions)

Comments:

Is it worth continuing?

3. Do you think all the important, relevant studies were included?

Yes	
Can't Tell	
No	

HINT: Look for
- which bibliographic databases were used
- follow up from reference lists
- personal contact with experts
- unpublished as well as published studies
- non-English language studies

Comments:

4. Did the review's authors do enough to assess quality of the included studies?

Yes	
Can't Tell	
No	

HINT: The authors need to consider the rigour of the studies they have identified. Lack of rigour may affect the studies' results ("All that glisters is not gold" Merchant of Venice – Act II Scene 7)

Comments:

5. If the results of the review have been combined, was it reasonable to do so?

Yes	
Can't Tell	
No	

HINT: Consider whether

- results were similar from study to study
- results of all the included studies are clearly displayed
- results of different studies are similar
- reasons for any variations in results are discussed

Comments:

Section B: What are the results?

6. What are the overall results of the review?

HINT: Consider

- If you are clear about the review's 'bottom line' results
- what these are (numerically if appropriate)
- how were the results expressed (NNT, odds ratio etc.)

Comments:

7. How precise are the results?

HINT: Look at the confidence intervals, if given

Comments:

Section C: Will the results help locally?

8. Can the results be applied to the local population?

Yes	
Can't Tell	
No	

HINT: Consider whether

- the patients covered by the review could be sufficiently different to your population to cause concern
- your local setting is likely to differ much from that of the review

Comments:

9. Were all important outcomes considered?

Yes	
Can't Tell	
No	

HINT: Consider whether

- there is other information you would like to have seen

Comments:

10. Are the benefits worth the harms and costs?

Yes	
Can't Tell	
No	

HINT: Consider

- even if this is not addressed by the review, what do **you** think?

Comments:

Appendix 6 Example of Coding

Coding Approach	Factor Type	Description	Thematic Result Area	Core Theme
Deductive	Systemic Factors	Health system structures, governance, policies, and financing mechanisms that influence CHWs' roles.	Health System Integration	Governance, policy & structural
	Programmatic Factors	CHW program design elements, including recruitment, training, supervision, incentives, and role expectations.	CHW Support Structures	Program Implementation
	Contextual Factors	External sociocultural, economic, and political factors that shape CHWs' legitimacy and effectiveness.	Community Engagement & Context	Contextual Influences
Inductive	Relational Factors	Interpersonal and intrapersonal factors, including CHW motivation, relationships, power dynamics, and social status within health systems and communities.	CHW Agency & Empowerment	Multi
	Enablers	Facilitators that enhance CHWs' ability to act as intermediaries between communities and health systems, including recognition, trust, and supportive relationships.	Factors Supporting CHW Effectiveness	Mutli
	Disablers	Barriers that limit CHW effectiveness, such as unclear roles, resource constraints, lack of recognition, and power imbalances in decision-making.	Challenges to CHW Effectiveness	multi

Coding Approach	Factor Type	Description	Thematic Result Area
Deductive	Systemic Factors	Health system structures, governance, policies, and financing mechanisms that influence CHWs' roles.	Health System Integration
	Programmatic Factors	CHW program design elements, including recruitment, training, supervision, incentives, and role expectations.	CHW Support Structures
	Contextual Factors	External sociocultural, economic, and political factors that shape CHWs' legitimacy and effectiveness.	Community Engagement & Context
Inductive	Relational factors	Interpersonal and intrapersonal factors, including CHW motivation, relationships, and power dynamics.	CHW Agency & Empowerment
	Enablers	Facilitators that enhance CHWs'ability to act as intermediaries between communities and health systems.	Factors Supporting CHW Effectiveness
	Disablers	Barriers that limit CHW effectiveness, such as unclear roles, resource constraints, and lack of recognition.	Challenges to CHW Effectiveness

Appendix 7: Communities Axis of CHW programs (for Phase 1)

Communities: The Axis of CHW Programmes

People-centeredness[17] is often promulgated as the foundation of Health Systems. Authors often highlight that this value should characterize the aims and relationships, as *"* Health Systems should ultimately seek to serve people and society" (Sheikh, Ranson and Gilson, 2014). Community engagement[18] has been seen as a mechanism of laying the foundations for a people-centered approach, directing and aligning Health Systems processes, programmes, and goals towards the needs of "users" while shaping the relationships between health workers and communities. It is often used to empower the "communities" where these health system users come from (Alhassan *et al.*, 2016). Community participation is often viewed as a process, as opposed to an input, running along

[18] People centeredness can be seen as a longitudinal process that increases the connectedness between Health Systems health systems and service users. People Centredness is the recognition that health systems comprise of people (actors), whether these be health workers, employees of various departments and organizations, leadership or citizens.

a continuum from passive engagement with communities to more direct delegations offering transformative power to communities (LeBan et al., 2014; Sheikh, Ranson and Gilson, 2014). Community Health Systems are a subset of broader Health Systems operating within yet distinct from the broader HS and understood as "the set of local actors, relationships, and processes engaged in producing, advocating for, and supporting health in communities and households outside of, but existing in relationship to, formal health structures" (Schneider and Lehmann, 2016). Their intermediary position places CHWs in a situation where they need to uniquely understand the intra-community dynamics and the interventions' appropriateness. Still, they also serve as the communities' initial contact with Health Systems (Kok, Broerse et al., 2017). Formal CHW programmes have been seen as a channel for strengthening CHSs through community capacity building, involvement in decision-making, and encouragement of community self-sufficiency.

Strengthening Community Health Systems is, in turn, seen as essential for health system strengthening (in achieving health system goals and outcomes, including health equity(Tulenko et al., 2013; Condo et al., 2014; Sheikh, Ranson and Gilson, 2014; Dahn et al., 2015; Lunsford et al., 2015; Mundeva et al., 2018). It is argued that formal health systems and local governments use community engagement and CHWs as a means to an end and that the design of programmes and initiatives are not meant to empower the CHWs or communities themselves (Mundeva *et al.*, 2018). The success of CHW programmes in eliciting meaningful community engagement is ultimately dependent on broader national and global strategies and processes for the engagement and mobilisation of these communities, as opposed to the onus being placed solely on CHWS to empower and mobilise the communities they represent or come from (LeBan *et al.*, 2014).

Appendix 8: Instructions for Authors (Health Policy and Planning)

Health Policy and Planning (HPP) is an online open access journal. All articles submitted to the journal after the 1st of January 2024, if accepted, will be published in the journal under an open access CC BY, CC BY NC or CC BY NC ND license immediately upon publication. Please note that earlier content may be published under a different license. You will need to provide funding to pay an open access charge to publish under an open access license.

Health Policy and Planning flipped to fully Open Access on **1st of January 2024**. Content published prior to that date is free to view, and all rights are reserved.

You can arrange payment or referral of Open Access charges using our Author Portal. The open access charges applicable to this journal:

Please note that submission of a paper implies that it reports unpublished work and that it is not under consideration for publication elsewhere. Plagiarism, including duplicate publication of the author's own work, in whole or in part without proper citation is not tolerated by HPP. Submitted manuscripts are screened with iThenticate software, as part of the CrossCheck initiative to detect and prevent plagiarism.

Guidance

Improving chances of publication

Manuscript format and style for all articles

Prior publication guidelines

Types of papers

Submission process

Guidance

Improving chances of publication

As well as the high overall quality required for publication in an international journal, authors should take into consideration:

Addressing HPP's readership: national and international policy makers, practitioners, academics and general readers with a particular interest in health policy issues and debates.

Manuscripts that fail to set out the international debates to which the paper contributes, and to draw out policy lessons and conclusions, are more likely to be rejected, returned to the authors for redrafting prior to being reviewed, or undergo a slower acceptance process.

Economists should note that papers accepted for publication in HPP will consider the broad policy implications of an economic analysis rather than focusing primarily on the methodological or theoretical aspects of the study.

Public health specialists writing about a specific health problem or service should discuss the relevance of the analysis for the broader health system. Those submitting health policy analyses should draw on relevant bodies of theory in their analysis, or justify why they have not, rather than only presenting a narrative based on empirical data.

Primarily focus on one or more low- or middle-income countries.

The editors cannot enter into correspondence about papers considered unsuitable for publication and their decision is final. Neither the editors nor the publishers accept responsibility for the views of authors expressed in their contributions. The editors reserve the right to make amendments to the papers submitted although, whenever possible, they will seek the authors' consent to any significant

changes made. The manuscript will not be returned to authors following submission unless specifically requested.

Should you require any assistance in submitting your article or have any queries, please do not hesitate to contact the editorial office at hpp.editorialoffice@oup.com.

Should your manuscript require any English language editing, we recommend contacting AuthorAid, a free network which provides free mentoring and English-language editing for researchers in low- and middle-income countries.

Manuscript format and style for all articles

Only articles in English are considered for publication.

The journal follows Oxford SCIMED style. Please refer to these requirements when preparing your manuscript. More information on preparing your manuscript is available. Oxford English spelling style should be used consistently throughout your manuscript. (-ize/-ization), except in quotations and in references.

Prepare your manuscript, including tables, using a word processing program and save it as a *.doc, .rtf* or *.ps* file. Use a minimum font size of 11, double-spaced and paginated throughout including references and tables, with margins of at least 2.5 cm. The text should be left justified and not hyphenated.

Authorship: A contributorship statement is required - please note as follows on the Title Page:

Please note there should be a LMIC (lower-middle-income) named author from the region of the paper included in the paper.

If all named authors are from HICs' (high-income countries) please clarify the reason for this on the Title Page under the heading "Authorship".

Please clarify how each author has contributed to the paper. You need to create a list assigning a person's name against the following roles or tasks:

Conception or design of the work

Data collection

Data analysis and interpretation

Drafting the article

Critical revision of the article

Final approval of the version to be submitted - all named authors should approve the paper prior to submission.

Reflexivity Statement:

At *Health Policy and Planning*, we believe in reducing inequities in global health research. We invite you to reflect on the inclusivity within the authors' group for this paper. You may want to consider inclusivity and balance in dimensions such as gender, seniority, regional location, etc when writing this statement.

The Title Page should be uploaded as a separate file type "Title Page" and contain the following information:

Title

Corresponding authors name,address,country,e-mail address, ORCID details

Each authors affiliation and qualification (BSc, MA, PhD...)

Keywords and an abbreviated running title

2-4 Key messages, detailing the main points made in the paper

Reflexivity Statement

A word count of the full article:Word Limits do not include Abstract, References, Figure/Table legends.

Ethical Approval

if no ethical approval was required for the research, please note the reason:

Example A: Ethical approval for this type of study is not required by our institute.

Example B: Ethical approval for this research was waived by the authors institute/s IRB.

Ethical Approval Received-Please note the institute/s which approved the research with reference number.

Original Articles-word limit 6000
Review Articles- word limit 10000
Commentaries: Word limit 1200
How to do...or not to do - word limit 3000
Methodological Musings-word limit 3000
Innovation and practice reports: word limit 2000

Funding/Acknowledgements/Conflicts of interest/Ethical approval should be noted on the title page.

In the acknowledgements, all contributors who do not meet the criteria for authorship should be listed. Sources of funding for research must be explicitly stated, including grant numbers if appropriate. Other financial and material support, specifying the nature of the support, should be acknowledged as well.

Figures should be designed using a well-known software package for standard personal computers. If a figure has been published earlier, acknowledge the original source and submit written permission from the copyright holder to reproduce the material.

Please be aware that the requirements for online submission and for reproduction in the journal are different: (i) for online submission and peer review, please upload your figures separately as low-resolution images (.jpg, .tif, .gif or. eps); (ii) for reproduction in the journal, you will be required after acceptance to supply high-resolution .tif files. Minimum resolutions are 300 d.p.i. for colour or tone images, and 600 d.p.i. for line drawings. We advise that you create your high-resolution images first as these can be easily converted into low-resolution images for online submission.

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Certain image formats such as .jpg and .gif do not have high resolutions, so you may elect to save your figures and insert them as .tif instead.

For useful information on preparing your figures for publication, go to the Digital Art Support page.

All measures should be reported in SI units, followed (where necessary) by the traditional units in parentheses. There are two exceptions: blood pressure should be expressed in mmHg and

haemoglobin in g/dl. For general guidance on the International System of Units, and some useful conversion factors, see 'The SI for the Health Professions' (WHO 1977).

Manuscript file must include text body. Title Page, Figures and Tables should be uploaded separately.

Prior Publication Policy

[Based on a statement developed by a group of editors of journals that publish articles on health, health services, and health policy. Journals currently using this statement include: Health Affairs, Health Services Research, Inquiry, Journal of Health Politics, Policy and Law, Journal of Health Services Research & Policy, Medical Care, and the Milbank Quarterly.]

Background

The policy of the journals subscribing to this statement is to consider for publication only original work that has not previously been published. Questions about what constitutes previous publication are arising with increasing frequency because of the growth of electronic publishing and the increasing number of reports and papers being produced by organizations and agencies. This statement provides guidance on this issue.

There are legitimate reasons why research may be disseminated before submission to a journal. Active communication among researchers about preliminary findings or the circulation of draft reports for discussion and critique contributes to the eventual quality of published work. In addition, organizations that support or carry our research have an understandable interest in disseminating their work. From the perspective of journals, these reasons for dissemination must be balanced against two considerations. The first is the value of the peer review process. The rules against prior publication are intended to add some assurance of the credibility of published research.

Papers are often improved during the peer review process, with findings, conclusions, and recommendations sometimes changed in response to reviewers' comments. The public and policymakers might be confused or misled if there were multiple versions of a paper in the public domain. Second, from a more parochial viewpoint, journal space is limited, and much time and expense are involved in the evaluation, publication, and distribution of journal articles. Journals must make difficult choices about what to include; there is less value in publishing papers that have already been disseminated to their target audiences.

We discuss here several types of dissemination and provide guidelines with respect to the prior publication question. This discussion is essentially an elaboration of two rules, the first emphasizing previous dissemination of the material, the second stressing disclosure.

Rule One: If the material in a paper has already been disseminated to a journal's audience, particularly in a format that appears to be a final product, then it is unlikely that a second version will be worth publishing in the journal.

Rule Two: It is the responsibility of authors to let editors know at the time of submission whether a paper's contents have been previously disseminated in any manner so that the editors can determine whether to proceed with the review process.

Previous Presentations at Meetings

Presentation of a paper at conferences or seminars usually does not jeopardize the possibility of publication.

Working Papers

Dissemination of "working papers" to a limited audience will not ordinarily jeopardize publication. Working paper series are used by many organizations as a means of enabling researchers to obtain critiques from fellow researchers. Working papers covered by this policy are those that are released by the author or an organization rather than by a publisher, are not advertised to the public, and are marked as drafts that are subject to future revision. HPP will not publish papers for which a similar working paper is already available in the public domain.

Internet Postings

Release via the Internet may jeopardize journal publication under some circumstances. Presentation of the work as a final report is a marker of an attempt to reach a wide audience, particularly when combined with efforts to direct traffic to the work (e.g., via links on other sites) and efforts to attract attention (e.g., press releases). In contrast, if a document is posted on the Internet only to facilitate communication among colleagues with the aim of getting feedback, and if there has been no attempt to otherwise attract the attention of journalists, the public, or the broader research community to the document, then this is unlikely to preclude journal publication.
In general, when posting on the Internet serves similar functions as presentation at professional meetings - facilitating the development of papers and the improvement of the research, influencing future revisions, and not constituting a "finished" product - it would not be considered prior publication. On the other hand, when the Web site posting functions as a virtual version of a conventional publication, which may even be copyrighted by the posting organization, the benefit of an additional publication in the journal will be scrutinized carefully.

In cases where there has been little to no exposure at the time that a paper has been submitted to the journal, but the circumstances surrounding the posting make it likely that a high level of exposure (press coverage, etc.) might occur, then the author should remove a posting as a condition for further consideration of the manuscript.
Authors who post papers on a Web site and do not want it to constitute prior publication should also post a disclosure statement such as: "This draft paper is intended for review and comments only. It is not intended for citation, quotation, or other use in any form." This statement should be kept on the Web site throughout the review process and until the paper is actually accepted for publication in a journal. Once accepted, authors should post a message to the effect that: "A revised final version of this paper will appear in (Journal Name), volume, issue." Authors also should include this statement as a header or footer on every page of the paper.

Formal Reports from Foundations, Academic Institutions, Institutes, Trade Associations, and Government Agencies

The dissemination efforts of foundations, government agencies, research institutes, and other organizations that support or carry out research can complement publication in peer-reviewed journals. If publication in one of our peer-reviewed journals is desired, organizational publications should be timed to coincide with or follow journal publication, with appropriate copyright permissions having been obtained. This sequence ensures that the peer-review process will have an opportunity to correct deficiencies of method or presentation.
Formal, published reports that have gone through an editorial process, that have been intended to reach a wide audience, and that are publicized and available to any interested party (whether free or not) usually will not be considered for journal publication. A paper that is based on such a report might be considered for publication if it were sufficiently different in emphasis or intent. In such instances, the author should explain at the time of submission (or before) how the paper differs from the previously released report and why its publication would represent a distinct and important contribution beyond that version.

Policy briefs

If the findings of a piece of research have been published locally (i.e. in a specific country) with the aim of influencing policy debates in that country then even if the brief is available on the web we may consider publishing an article so long as (i) the brief has not had wide circulation outside the country and (ii) the brief is clearly targeted at policy-making audiences, and hence does not include the detailed discussion of methods and perhaps findings that one might expect in a journal article.

Media Publicity

If results reported in a working paper have become widely known as a result of media exposure (or even if the potential for widespread exposure remains during review), and that working paper is readily available to interested readers (e.g., through a Web site), an editorial judgment will be made whether journal publication would be appropriate. Authors can help protect their work from unwanted media exposure by making clear on working drafts, copies presented at conferences, and other versions that it is a draft that has not yet undergone peer review for publication and that findings and conclusions are subject to change. Authors also should request that any "stories" derived from interviews with the media be embargoed until the work is published or released by the publisher (see, for example, Fontanarosa, P.B., and C.D. DeAngelis. 2002. The Importance of the Journal Embargo. Journal of the American Medical Association 288: 748-750). Any accepted manuscript released to the media should contain the statement: "A revised final version of this paper will appear in (Journal Name), volume, issue." Journal policies involving author contact with members of the media may vary, depending on the issue or journal. Thus, authors should check with the editor before speaking with or distributing papers to members of the media.

Importance of Disclosure

In contrast to the editors' decision whether a certain paper has been disseminated too widely to warrant journal publication, there is very little judgment involved in whether an author should disclose previous dissemination. Prior to, or at the time of, submission of a paper that has been disseminated in any of the ways discussed previously, authors should bring this to the attention of the editor so that a determination can be made before the paper goes into the peer-review process. In so doing, authors should describe in what form and how the work was previously disseminated and how the submitted manuscript differs from previously disseminated versions. Editors might be receptive to a modified version of a paper that has been widely disseminated if the submitted version has a different focus (e.g., more emphasis on methods, more sophisticated analytic approach, or discussion of developments that have transpired since the initial dissemination). The key point is to let editors know about any dissemination that will have, or is likely to have, occurred before the journal article is published rather than have it discovered during or after the review or editorial process. As part of the submittal, authors should include copies of other related papers that might be seen as covering the same material.

Failure to disclose could preclude publication in the journal or, if already published, could result in a notice in the journal about the failure and may result in a retraction of the article.

Manuscript Preparation

Page 1: *Title Page* – as above.

Page 2: *Abstract.* The abstract should be prepared in one paragraph, no headings are required. It should describe the purpose, materials and methods, results, and conclusion in a single paragraph no longer than 300 words without line feeds.

Page 3: *Introduction.* The Introduction should state the purpose of the investigation and give a short review of the pertinent literature, and be followed by:

Materials and methods. The Materials and methods section should follow the Introduction and should provide enough information to permit repetition of the experimental work. For particular chemicals or equipment, the name and location of the supplier should be given in parentheses.

Results. The Results section should describe the outcome of the study. Data should be presented as concisely as possible, if appropriate in the form of tables or figures, although very large tables should be avoided.

Discussion. The Discussion should be an interpretation of the results and their significance with reference to work by other authors.

Abbreviations. Non-standard abbreviations should be defined at the first occurrence and introduced only where multiple use is made. Authors should not use abbreviations in headings.

All *measures* should be reported in SI units, followed (where necessary) by the traditional units in parentheses. There are two exceptions: blood pressure should be expressed in mmHg and haemoglobin in g/dl. For general guidance on the International System of Units, and some useful conversion factors, see 'The SI for the Health Professions' (WHO 1977).

References. References must follow the Harvard system and must be cited as follows:

Baker and Watts (1993) found...

In an earlier study (Baker and Watts 1993), it...

Where works by more than two authors are cited, only the first author is named followed by 'et al.' and the year. The reference list must be typed double-spaced in alphabetical order and include the full title of both paper (or chapter) and journal (or book), thus:

Baker S, Watts P. 1993. Paper/chapter title in normal script. Journal/book title in italics *Volume number in bold* : page numbers.

Baker S, Watts P. 1993. Chapter title in normal script. In: Smith B (ed). *Book title in italics*. 2nd edn. Place of publication: Publisher's name, page numbers.

Tables All tables should be on separate pages and accompanied by a title - and footnotes where necessary. The tables should be numbered consecutively using Arabic numerals. Units in which results are expressed should be given in parentheses at the top of each column and not repeated in each line of the table. Ditto signs are not used. Avoid overcrowding the tables and the excessive use of words. The format of tables should be in keeping with that normally used by the journal; in particular, vertical lines, coloured text and shading should not be used. Please be certain that the data given in tables are correct. Tables should be provided as Word or Excel files.

Availability of Data and Materials

Where ethically feasible, *Health Policy and Planning* strongly encourages authors to make all data and software code on which the conclusions of the paper rely available to readers. Authors are required to include a Data Availability Statement in their article. This policy applies to all papers submitted to the journal on or after June 2020.

We suggest that data be presented in the main manuscript or additional supporting files, or deposited in a public repository whenever possible. For information on general repositories for all data types, and a list of recommended repositories by subject area, please see Choosing where to archive your data.

Data Availability Statement

The inclusion of a Data Availability Statement is a requirement for articles published in *Health Policy and Planning*. Data Availability Statements provide a standardised format for readers to understand the availability of data underlying the research results described in the article. The statement may refer to original data generated in the course of the study or to third-party data analysed in the article. The statement should describe and provide means of access, where possible, by linking to the data or providing the required unique identifier.

The Data Availability Statement should be included in the endmatter of your article under the heading 'Data availability'.

More information and examples of Data Availability Statements.

Data and Software Citation

Health Policy and Planning supports the Force 11 Data Citation Principles and the recommendations of the FORCE11 Software Citation Implementation Group. When data and software underlying the research article are available in an online source, authors should include a full citation in their reference list.

For details of the minimum information to be included in data and software citations see the guidance on Citing research data and software.

Preprint policy

Authors retain the right to make an Author's Original Version (preprint) available through various channels, and this does not prevent submission to the journal. For further information see our Online Licensing, Copyright and Permissions policies. If accepted, the authors are required to update the status of any preprint, including your published paper's DOI, as described on our Author Self-Archiving policy page.

Types of papers

Health Policy and Planning welcomes submissions of the following article types:

Original research

Review articles

Methodological musings

Innovation and practice reports

Commentaries

'How to do (or not to do)...' [for example, see Hutton & Baltussen, HPP, 20(4): 252-9] and

'10 best resources' [for example, see David & Haberlen, HPP, 20(4): 260-3].

Original Research

Manuscripts should preferably be a *maximum* of *6,000* words, excluding tables and figures/diagrams.

The manuscript will generally follow through sections: Title page, Abstract (no more than 300 words), Introduction, Methods, Results, Discussion, Conclusion, Acknowledgements, References. However, it

may be appropriate to combine the results and discussion sections in some papers. Tables and Figures should not be placed within the text, rather provided in separate file/s.

For the reporting of statistical analyses please consider the following additional points:

Focus the statistical analysis at the research question.

Provide information about participation and missing data.

As much as possible, describe results using meaningful phrases (e.g., do not say "beta" or "regression coefficient", but "mean change in Y per unit of X"). Provide 95% confidence intervals for estimates.

Report the proportions as *N* (%), not just %.

Report *P* values with 2 digits after the decimal, 3 if <0.01 or near 0.05 (e.g., 0.54, 0.03, 0.007, <0.001, 0.048). Do not report *P* values greater than 0.05 as "NS".

Always include a leading zero before the decimal point (e.g., 0.32 not .32).

Do not report tests statistics (such as chi-2, T, F, etc.)."

For acknowledgements, figures and measures see above.

Review Articles

Manuscripts should preferably be a *maximum of 10,000 words*, excluding tables, figures/diagrams and references.

Reviews may be invited. They generally address recent advances in health policy, health systems and implementation. *Systematic reviews are particularly welcomed,* but may not be appropriate for every topic. If authors are submitting a review article that is not a systematic review then the paper should explain why a systematic review was not feasible/desirable, and the review methods should be described in a way that is as clear and as replicable as possible.

The manuscript will generally follow through sections: Abstract (no more than 300 words), Introduction, Methods, Results, Discussion, Conclusion, References. However, it may be appropriate to combine the results and discussion sections in some papers. Tables and Figures should not be placed within the text, rather provided in separate file/s.

Checklists have been developed for a number of study designs, including randomized controlled trials (CONSORT), systematic reviews (PRISMA), observational studies (STROBE), diagnostic accuracy studies (STARD) and qualitative studies (COREQ, RATS). We recommend authors refer to the EQUATOR Network website for further information on the available reporting guidelines for health research, and the MIBBI Portal for prescriptive checklists for reporting biological and biomedical research where applicable. Authors are requested to make use of these when drafting their manuscript and peer reviewers will also be asked to refer to these checklists when evaluating these studies.

Commentaries

Short commentaries on topical issues in health systems are welcomed - *please email the editorial office prior to submission*. Most such commentaries are commissioned by the editors, but the journal will also consider unsolicited submissions. Commentaries should of broad interest to readers of *Health Policy and Planning*, and while they are not research papers, they should be well substantiated. Manuscripts should preferably be a *maximum of 1,200 words*, excluding tables, figures/diagrams and references.

The manuscript will generally contain a short set of key take-home messages. Tables and Figures should not be placed within the text, rather provided in separate file/s.

How To Do...Or Not To Do

This series is meant to explain how to use a particular research or analytical method (e.g. social network analysis, discrete choice experiment etc.). The research or analytical methods discussed should be well accepted and clearly defined: this category of paper is not meant to address methodological debates but rather to help disseminate and promote the use of well-accepted methodologies.

Manuscripts should preferably be a *maximum of 3,000 words* excluding tables, figures/diagrams and references.

The sections must be arranged as follows: i) Title page, ii) Abstract, iii) Introduction, iv) Body of the paper, and v) References. Main sections should be coordinated by the author, and inserted between Introduction and Reference sessions. Please contact our office before submitting a manuscript in this category.

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10 Best Resources

This 10 best is a series of articles that identify and outline the 10 most useful resources from a range of sources to help facilitate a better understanding of a particular issue in global health.

We often commission these articles but we also hear unsolicited suggestions.

For acknowledgements, figures and measures see Title page.

Methodological Musings

This series is meant to address methodological issues in health policy and systems research, where there is currently a lack of clarity about accepted research methods. This series is intended to support the development of the health policy and systems research field, through supporting methodological discussion.

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Innovation and Practice Reports

These short reports are narratives and/or reflections/experiences from the perspective of health leaders, managers and practitioners operating at the national or sub-national level which focus on innovative approaches to strengthen health systems. They do not need to report a completely new activity or practice but could consider an adaptation or modification to an existing one. Papers should highlight the experience of health system practitioners in taking action to strengthen health systems through innovative activities. These activities might address governance or human resource management approaches, for example, rather than having a health care focus. Other relevant activities include practices to build capacity, develop new partnerships, new approaches to management, or restructuring relationships within health systems implemented at scale with the intention of promoting changes in practice. The innovations should preferably have been implemented for sufficient time to allow authors to demonstrate their potential system benefits, including sustained improvement over time. We encourage authors to think how the experience they report adds to existing work in their own setting, as well as other settings - but this is not essential.

We will not consider clinical and pharmaceutical innovations and practices.

Manuscripts should be a *maximum* of *2,000 words*. The manuscript will generally present the following sections:

Key Messages (2-4 key messages or lessons for consideration in other settings)

Abstract (no more than 300 words)

Introduction – outline the background to and context of the activity or practice: what is it and why does it matter in your health system? Please also clarify how you generated the reflections presented in this report: who was involved, what did you do, what forms of evidence are used?

Implementation –how was the activity or practice developed and implemented? was it adapted over time and if so, how and why? how was it scaled up, and to what level was it scaled?

Achievements/Challenges – what benefits have been seen in the health system? at what scale? What challenges were faced?

Enablers/Constraints –what factors enabled implementation, scale-up and achievements, and what factors constrained them?

Conclusions: what are the key lessons for other health leaders in other settings concerning this activity/practice

References

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Ethics approval

Ethics approval is not required for this type of article, which is intended to allow reflections on innovative approaches to strengthen health systems written by health system leaders and managers working at national or sub-national level.

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