Repositioning Community Health Workers as Boundary Spanners: A Realist-Informed Theory of Change for Integrated People-Centred Care in South Africa

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ABSTRACT

Background: Community Health Workers (CHWs) are central to South Africa's primary health care (PHC) reforms yet remain under-recognised as actors who can coordinate care across sectors. This paper reconceptualises CHWs as boundary spanners and presents a realist-informed Theory of Change (RiToC) to support this shift.

Methods: We conducted a qualitative realist-informed conceptual synthesis, drawing on four interlinked data sources: a realist synthesis of CHW studies from sub-Saharan Africa, a realist evaluation of CHW-household interactions, a realist evaluation of a collaborative governance platform, and a systems-level reframing of the WHO Integrated People-Centred Health Services (IPCHS) framework. Insights were synthesised into a RiToC to guide how CHWs can be supported to perform integrative functions across health, social, and governance systems.

Findings: CHWs already perform relational and coordinative functions that connect communities with clinics, social services, and local governance structures, though these roles are often informal and under-recognised. We identify seven strategic levers to strengthen CHWs' capacity as boundary spanners: layered accountability, shared ownership, equitable resourcing, multisectoral training, professional recognition, adaptive models, and multisectoral integrated tools. The RiToC provides a roadmap for embedding CHWs into PHC reform and multisectoral governance by clarifying enabling conditions and mechanisms that support them as boundary spanners who can deliver IPCHS.

Conclusion: CHWs are already de facto boundary spanners. Unlocking their potential requires redesigning systems and policies to support their roles across sectors. Methodologically, this study advances RiToC as an innovation that combines explanatory depth with practical design, offering a transferable approach for strengthening community health systems in complex settings.

Key Words: Community Health Workers, Realist Evaluation; Realist-informed Theory of Change, Operation Sukuma Sakhe, Integrated People-Centred Health Services; Multisectoral Governance; Intersectoral collaboration; Boundary Spanners

1. Introduction

Strengthening people-centred primary health care (PHC) lies at the centre of South Africa's ongoing health system reform agenda through PHC re-engineering; as well as the National Health Insurance (NHI) scheme, which is positioned as the flagship policy for achieving universal health coverage (UHC) and addressing persistent health inequities (1,2). A central feature of this transformation has been the formalisation and scale-up of Community Health Workers (CHWs) as frontline actors tasked with improving access to essential health services, particularly among underserved and historically disadvantaged communities (3,4). These developments are consistent with global recommendations, including the World Health Organization's Framework on Integrated, People-Centred Health Services (IPCHS). People-centred PHC emphasizes prevention and health promotion; as well as integrated care that is responsive to people's needs and expectations and promotes empowerment and engagement of individuals, families and communities to assume control of their health as participants and beneficiaries (5,6). This calls for health systems that are coordinated across levels and sectors, grounded in communities, and responsive to people's needs, values, and preferences of the people they serve (6).

In line with these global and national priorities, South Africa introduced the Ward-Based Primary Health Care Outreach Team (WBPHCOT) strategy in 2011 as a key implementation platform for PHC re-engineering (7). WBPHCOTs are multidisciplinary teams embedded at a ward level, which comprises of CHWs and team leaders (often enrolled nurses), and linked to primary care facilities. Drawing on the principles of Community-Oriented Primary Care (COPC), the model emphasises community-based diagnosis, preventative and promotive care, and participatory engagement (7,8). CHWs within this model are expected to deliver decentralised and responsive services that address both clinical needs and the broader social determinants of ill-health (9).

Despite this strategic positioning, the employment and institutional conditions under which CHWs operate remain precarious. Many CHWs are engaged through fixed-term contracts or temporary employment schemes, often with limited benefits, inconsistent remuneration, and few opportunities for professional development (10,11). Although national frameworks endorse their formal absorption into the public health system, implementation has been uneven across provinces. Challenges related to supervision,

role clarity, and workplace support persist, undermining both CHW performance and the broader goals of PHC reform (3,12).

These employment-related constraints are further compounded by systemic barriers to integration. Although CHWs are recognised in policy as key actors in delivering people-centred care, they remain poorly positioned to coordinate care across sectors or respond to complex community social needs (13,14). Health and social services often function in siloes, with fragmented referral pathways, weak coordination structures, and limited shared accountability for outcomes (14). CHWs, while physically present in communities, they are frequently excluded from decision-making processes and are seldom equipped with the multisectoral institutional support or recognition required to enable their full contribution to integrated service delivery (15). This persistent misalignment between policy intent and implementation practice limits the transformative potential of community-based care and restricts progress toward integrated, people-centred systems.

These challenges are particularly evident in the underutilisation of intersectoral governance platforms such as Operation Sukuma Sakhe (OSS). Established in KwaZulu-Natal (KZN) as a ward-level, whole-of-government strategy to address the social determinants of health, OSS was envisioned as a means of fostering collaboration between departments and aligning service responses with community needs (16,17). While the platform holds promise for supporting CHWs in navigating complex social issues, its implementation has been uneven. Evidence points to limited participation by key sectors, unclear CHW roles within the platform, and weak accountability mechanisms, all of which diminish its integrative function (18).

Taken together, these implementation gaps point to deeper institutional and structural issues, such as insufficient integration of CHWs into intersectoral systems, inadequate recognition of their bridging roles, and fragmented planning and oversight structures. As South Africa moves toward the full implementation of NHI (2), addressing these weaknesses is critical to realising the equity-oriented vision of IPCHS particularly in underserved and vulnerable communities.

This paper argues that CHWs must be deliberately repositioned as boundary spanners, whose contributions extend beyond basic service provision to include relational, navigational, and connective functions across health and social systems. In

their everyday work, CHWs in KZN link households to multiple services, coordinate care across levels, facilitate trust between communities and institutions, and identify social vulnerabilities that require coordinated responses (18,19). In addition, CHWs have been shown to provide social benefits by facilitating access to food parcels, social grants, and assistance with birth certificates and identity documents (20). Yet these integrative and multisectoral functions that CHWs perform remain poorly defined in formal policy and unsupported by governance, training, and accountability structures.

In addition, while CHWs in KwaZulu-Natal routinely traverse the boundaries between households, health facilities, and governance platforms, their ability to act as connectors is often constrained by the siloed nature of services and the absence of formal authority to mobilise other sectors. We therefore conceptualise CHWs as emergent or constrained boundary spanners, actors who bridge gaps in fragmented systems through relational work and informal coordination, but whose integrative potential is hampered by systemic design features such as the lack of clear CHW intersectoral mandate and role boundaries. Furthermore, we argue that under specific enabling conditions such as being embedded within intersectoral governance platforms, having referral authority, and access to coordination tools, CHWs may also reach their full potential as boundary spanners.

To address these gaps and to theorize or propose CHWs as boundary spanners, this paper aims to develop a Realist-informed Theory of Change. Unlike the standard ToCs that primarily provide a descriptive roadmap of inputs, activities, and outcomes, the realist-informed ToC advances this approach by embedding explanatory mechanisms and contextual contingencies into the causal pathways (21). This element to the realist-informed ToC is provided by the realist approach which emphasizes that outcomes are generated by underlying mechanisms that become activated within specific contexts (22), and in this case, not just by predefined inputs or activities. Therefore, combining these two methodological approaches adds explanatory depth by clarifying not only *what* change is expected, but *how* and *why* it unfolds under specific conditions.

This paper builds on a broader realist programme of research conducted in KwaZulu-Natal, which iteratively developed and refined programme theories on CHW roles

across multiple system levels. These include a realist synthesis of sub-Saharan African evidence on CHWs' roles and functions in delivering integrated, people-centred care, two empirical evaluations in KwaZulu-Natal, and a conceptual reframing of the WHO IPCHS framework. Building on these interlinked phases, this study foregrounds the relational, navigational, and connective functions that CHWs perform within fragmented systems and advances a realist-informed Theory of Change that translates realist findings into actionable pathways for policy and practice.

2. Background

2.1. Policy landscape of CHWs in South Africa

CHWs have long played a critical role in South Africa's health system, serving as a vital link between communities and formal health services (3). Historically, CHWs emerged through locally driven community-based programmes, notably the Pholela Health Centre in the 1940s and later in response to the HIV/AIDS epidemic (23,24). During the post-apartheid era and throughout the HIV/AIDS scale-up, CHWs were primarily organised by non-governmental organisations (NGOs), often working on stipend contracts (25). By 2010, it was estimated that approximately 70,000 CHWs were active across more than 3,000 NGOs, providing home-based care, health education, and HIV/TB support services (26,27).

In recognition of their critical frontline role, national policy has progressively formalised CHWs as part of South Africa's WBPHCOTs, where they are described as "the cornerstone" of the strategy and as a bridge between communities and healthcare service provision (10). However, despite their essential outreach role, CHWs often laboured under constrained conditions (irregular employment status, low pay, scarce supplies) (10). In recognition of this, successive national reforms have formalised CHWs within the public health system. In 2011, the National Department of Health launched a re-engineered primary care strategy modelled on Brazil's CHW programme, establishing Ward-Based Outreach Teams (WBOTs) of 6–10 CHWs linked to local clinics - depending on the clinics' catchment population (10,15). This programme was later renamed the Ward-Based PHC Outreach Teams (WBPHCOTs), which was explicitly aligned with the South Africa's universal health coverage agenda (15).

The 2018 Policy Framework and Strategy for WBPHCOTs further cemented CHWs' formal role. Under that framework, CHWs were embedded in every district, registered in the national health information system, and guided by revised PHC re-engineering guidelines (8). In policy terms, the government has treated CHWs as integral to primary care, with the earlier (2004) National Community Health Worker Policy Framework envisioning CHWs as generalist, stipend-paid workers delivering broad community health services, and more recent plans envision CHWs as salaried members of the health workforce (8,28,29). Furthermore, South African health policy now characterises CHWs not merely as disease-specific outreach teams but as multi-purpose "connectors" in community-oriented PHC (10,15).

In practice, CHWs are explicitly expected to promote continuity of care (e.g. tracing lost patients, linking households to clinics) and to work across social and sectoral boundaries. Research has noted that CHWs often act as boundary spanners, facilitating trust, communication, and referral pathways between marginalised populations and the healthcare system (30). South African policy frameworks and related literature (from the PHC revitalisation to the NHI) envision CHWs as key role-players in the implementation of integrated, people-centred care and the NHI, though putting this into practice remains a challenge (31–34). For example, recent reviews show that, although national policy mandates WBPHCOTs should serve the most vulnerable wards, practical implementation is uneven and frequently hampered by chronic under-funding, weak leadership structures, and fragmented governance arrangements (26,35,36). These limitations hamper CHWs' potential as boundary spanners, relegating them to task-oriented roles.

2.2. Community Health Workers in KwaZulu-Natal and Operation Sukuma Sakhe

KwaZulu-Natal (KZN) has implemented the national CHW re-engineering reforms by adopting the national WBPHCOTs policy under its Provincial Outreach Strategy (8). Each WBPHCOT is led by a primary health care nurse (enrolled nurse or professional nurse) and comprises about six CHWs (often former community caregivers) attached to a local clinic (37). These CHWs conduct routine home visits to assess health status, deliver health education, provide social support, and link households to clinic services (37). They also identify people needing preventive or curative care and refer them

through the health system. Clinic managers and outreach team leaders [(OTL) - enrolled or professional nurse)] provide day-to-day supervision and support, with studies noting that supportive supervision (mentoring/coaching by OTLs) enhances CHW motivation and performance (8,37).

In December 2017, the KZN Department of Health formally launched its ward-based primary health care (PHC) outreach team policy framework, expanding the CHW programme to include more comprehensive, longitudinal support within communities, particularly through the scale-up of HIV-related services (5). By early 2019, the province had approximately 9,573 CHWs working across 557 WBPHCOTs, amounting to roughly one CHW per 1,156 people (38). This exceeded the national guideline of 1:600–1,000 (38), indicating both wide coverage and shortages in certain areas. Until the introduction of the national Policy Framework and Strategy for Ward-Based PHC Outreach Teams, CHWs in KwaZulu-Natal were employed under mixed models, with some contracted through NGOs and others paid directly by the provincial Department of Health (3). More recently, to accelerate integration and improve consistency in employment conditions, the national government has committed to formalising CHW roles within the public sector (39).

According to South Africa's 2030 Human Resources for Health (HRH) Strategy (2020/21–2024/25), national reforms are now focused on strengthening PHC, particularly through community-based programmes delivered via WBPHCOTs, and prioritising rural and underserved wards to advance equity and access (39). The strategy emphasises deliberate workforce investment, formalisation, and expanded training to support this model, positioning CHWs as key actors in realising Universal Health Coverage (UHC) under the National Health Insurance (NHI) system (39). This policy shift reflects growing recognition that fully integrating CHWs into formal health governance structures is essential to enabling their broader role.

2.3. Operation Sukuma Sakhe Intersectoral Structure

Operation Sukuma Sakhe [(OSS), Zulu for "Stand Up and Build")] is KwaZulu-Natal's flagship "war-on-poverty" platform for integrated service delivery. OSS mobilizes ward-level War Rooms, which are multi-sectoral coordination forums chaired by ward councillors to bring together officials from health, social development, education, agriculture and other sectors, along with community representatives (16,17,37). These

War Rooms function as integrated “service delivery engines” where community needs are identified, referred, and actioned (37). OSS assigns a cadre of community fieldworkers to each ward – including government Community Development Workers (CDWs), community caregivers (CCGs), Community Health Workers, agricultural extension officers and others – who use standardized tools (e.g. the OSS Household Profiling Tool) to gather data on vulnerable households (16). This information from households and ward profiling is then fed into War Rooms for discussion. War Room Secretaries maintain service referral registers and ensure that needs raised are assigned to responsible officials. By policy, the fieldworker or stakeholder who identifies a need remains responsible for follow-up until the referral is closed (16). In this way, OSS creates formal platform (war-room meetings, task teams, and tracking registers) to link identified community problems to cross-government solutions.

2.4. Integration of CHWs into OSS Operations

In practice, KZN’s CHWs have been fully integrated as OSS “foot soldiers” at the community level (16,40). CHWs routinely conduct the household profiling that underpins OSS planning. During home visits they use the OSS profiling tools to record the community needs spanning from health and nutrition to housing and social needs. They then bring these cases to the next War Room meeting for joint action (16,40). CHWs also facilitate referrals by linking patients to clinic appointments or social services, then update War Room registers to close the loop (16). In many wards OSS task teams formally include CHWs alongside educators, social workers and police, enabling shared planning for campaigns (e.g. immunization drives, TB/HIV testing) that leverage CHWs’ community trust (37). Through OSS, CHWs coordinate with both health and non-health sectors, helping to ensure that community outreach is embedded within broader community systems and aligned with holistic community needs. This evolving role positions CHWs not merely as service extenders, but as critical connectors within a complex ecosystem of care - an opportunity that this study seizes to make visible, theorise, and strategically support.

2.5. Seizing the Policy Window: Enabling Conditions for Embedding CHWs as Boundary Spanners in KwaZulu-Natal Province

This realist-informed Theory of Change is grounded not only in a growing body of contextualised evidence, but also in a policy environment increasingly conducive to

PHC transformation in KwaZulu-Natal Province. KZN dual infrastructure, comprising WBPHCOTs and the intersectoral Operation Sukuma Sakhe platform offers a unique institutional scaffold for formally repositioning CHWs as boundary spanners within the health system.

Evidence suggests that CHWs in the province already function across household, clinic, and governance interfaces (18,19). Their routine engagement in household profiling, health education, and referrals through WBPHCOTs is complemented by their participation in OSS War Rooms, where they contribute to multisectoral planning and case tracking (18,19). Through these embedded roles, CHWs routinely identify complex social and health needs, broker access to cross-sectoral services, and facilitate feedback loops between communities and government actors (18,19,41). Although frequently under-recognised in formal policy, these integrative practices demonstrate the existing but underleveraged capacity of CHWs to align fragmented systems around the needs of communities. Therefore, this presents a timely opportunity to elevate and institutionalise this boundary spanning and integrative function CHWs and unlock their full potential as connectors, advocates, and enablers of people-centred care.

3. Methods

3.1 Study Design

This study employed a qualitative, realist-informed design as part of a broader, iterative realist programme of research aimed at understanding and optimising the roles and functions of Community Health Workers (CHWs) in delivering integrated, people-centred care. The programme followed a sequential and cumulative design, beginning with a realist synthesis of published literature (31), followed by two empirical realist evaluations conducted in KwaZulu-Natal (18,19), and a subsequent conceptual analysis of the WHO Integrated People-Centred Health Services (IPCHS) framework (42).

Each phase of the programme contributed to the development, testing, and refinement of programme theory, consistent with realist methodology. Rather than representing independent data sources, these components are analytically connected and build on one another to generate progressively refined explanations of how CHWs function across household, community, and governance contexts.

This paper draws on these interlinked phases to develop a Realist-informed Theory of Change (RiToC), representing a theory-building synthesis that integrates empirical and conceptual insights across the programme. The design is therefore explanatory, cumulative, and generative, with the aim of translating mechanism-based understanding into actionable pathways for policy and practice.

3.2 Realist Evaluation and Theory of Change

3.2.1. Realist Evaluation

Realist Evaluation is a theory-driven and explanatory approach to evaluation that aims to uncover not only whether an intervention works, but how it works, for whom, and under what conditions it is most effective (43). Grounded in the principles of scientific realism, this approach recognises that outcomes are not the direct result of interventions alone. Rather, they emerge from the dynamic interplay between the specific contexts in which interventions are implemented and the underlying mechanisms they activate (44). These mechanisms are often hidden or unobservable and are shaped or triggered by various local contexts including social, cultural, and institutional factors to produce outcomes (45). By focusing on these generative processes, realist evaluation provides a valuable framework for understanding how complex interventions operate in diverse settings and offers practical insights for strengthening implementation and scaling efforts (46). Furthermore, unlike conventional evaluations that assume linear cause-effect relationships, realist evaluation embraces complexity making it particularly appropriate for health systems interventions where multiple actors, layers, and dynamic interactions influence outcomes (47). The unit of analysis in realist evaluation is the Context-Mechanism-Outcome Configuration (CMOC), which allows evaluators to construct programme theories that explain recurring but context-sensitive patterns of outcomes (43). In this study, realist evaluation was employed to investigate how CHWs function across household, community, and collaborative governance platforms to deliver integrated, people-centred care.

3.2.2. Theory of Change

Theory of Change (ToC) is a structured and participatory approach to developing programme theory that outlines the causal pathways through which an intervention is expected to achieve its intended outcomes. It begins by identifying the long-term goals

and then works backward to map the necessary preconditions, underlying assumptions, key actors, core activities, and enabling contextual factors required to bring about change (48,49). A ToC can be conceptual or visual and often includes both a narrative and diagrammatic representation of the theory underpinning a programme (48). ToC is widely used in development and health systems research due to its practical utility in strategic planning, stakeholder engagement, implementation design, and the evaluation of complex interventions (50). Unlike logic models, which tend to depict linear progressions, ToCs emphasise the complexity of change and are adaptable to evolving programme realities (51).

In this study, ToC was developed alongside and informed by the findings of the realist synthesis and realist evaluation studies. It served both a synthesis function consolidating insights from literature and empirical data, and a strategic function mapping how CHWs can be supported to function as boundary spanners in people-centred care. The ToC captured causal assumptions and pathways in a form that could be used by policymakers and implementers to guide the adaptive scaling of CHW programmes.

3.2.3. Complementarity of Realist Evaluation and Theory of Change

Although realist evaluation and Theory of Change originate from different traditions, they are increasingly recognised as methodologically complementary in complex health systems research (21). Realist evaluation focuses on understanding causality, while ToC focuses on planning for change. The former asks “what works, for whom, how, and why?”, while the latter asks, “what needs to happen, in what order, and under what conditions, for our goals to be achieved?” (43,48,49).

In this study, the complementarity of these approaches was harnessed to develop a mechanism-sensitive and context-responsive model of CHW system integration. Realist methods uncovered the generative mechanisms that drive CHW performance across different contexts, while the ToC translated these insights into actionable pathways for strengthening CHW roles in policy and practice. Together, the approaches strengthened both the explanatory depth and practical relevance of the study, offering a robust foundation for policy and implementation strategies aimed at achieving integrated, people-centred care through CHWs.

3.3 Data Sources

This study drew on four interrelated components from a single, coherent realist programme of research. These components represent sequential phases of theory development, testing, and refinement, rather than independent studies (Table 1). Each data source contributed a unique perspective on the role of CHWs in delivering integrated, people-centred care, encompassing published literature and empirical fieldwork.

Table 1: Summary of Data Sources Informing the Realist-Informed Theory of Change

#	Data Source	Focus	Contribution to ToC
1	**Realist Synthesis of Published Literature**	36 studies across 14 sub-Saharan African countries examining CHW roles in people-centred care	Generated initial programme theories (IPTs) and 17 refined CMOs; surfaced core mechanisms such as trust, motivation, legitimacy, and adaptive leadership
2	**Realist Evaluation of Household-Level CHW Interactions**	Empirical data from household visits, interviews, and FGDs in rural KwaZulu-Natal	Provided granular insight into CHW–household relationships, informal coordination, relational dynamics, and context-mechanism interactions
3	**Realist Evaluation of the Operation Sukuma Sakhe (OSS) Platform**	Observations and interviews within a ward-level intersectoral governance platform	Revealed system-level barriers and enablers for CHW engagement in multisectoral governance, highlighting gaps in multisectoral role clarity and accountability
4	**Conceptual Reframing of the IPCHS Framework**	Realist-informed systems analysis of IPCHS implementation mechanisms	Identified cross-cutting meta-mechanisms (trust, motivation, and professional legitimacy with institutional support) that underpin integrated, people-centred service delivery

3.3.1. Realist Synthesis of Published Literature

A realist synthesis of 36 peer-reviewed intervention studies from 14 sub-Saharan African countries was conducted to generate initial programme theories (IPTs) regarding CHWs' roles in supporting people-centred care. The literature was purposively sampled for its relevance to the WHO IPCHS framework, with particular focus on CHW roles, community engagement, governance, and intersectoral coordination. Through a realist synthesis approach, 101 context-mechanism-outcome (CMO) configurations were identified and refined into 17 CMOs, highlighting triggered

core mechanisms for the delivery of integrated, people-centred care. The synthesis offered a conceptual foundation for empirical testing and programme theory refinement (31).

3.3.2. Realist Evaluation of Household-Level CHW Interactions

To empirically refine the programme theories from the realist synthesis to a specific country context, a realist evaluation was conducted in five rural communities in KwaZulu-Natal, South Africa. This evaluation focused on CHW practices at the household and community level, with data collected through 15 in-depth case studies involving CHW-observed household visits, interviews with service users, household decision makers, outreach team leaders, and clinic operational managers. Three focus group discussions with CHWs were also held to explore shared experiences. This dataset provided insights into relational dynamics, household-level barriers, role legitimacy, and informal coordination mechanisms shaping CHW performance in routine practice (19).

3.3.3. Realist Evaluation of the Operation Sukuma Sakhe (OSS) Platform

A second realist evaluation was undertaken to examine CHW roles within the Operation Sukuma Sakhe (OSS) platform (a ward-level intersectoral governance structure established in KwaZulu-Natal to facilitate integrated service delivery). The study included non-participant observation of 15 War Room meetings across five wards, document review of OSS operational guidelines, and interviews with War Room leaders (councillors and chairs). This evaluation yielded insights into CHWs' institutional positioning, interdepartmental coordination challenges, CHWs' multisectoral role clarity issues, and accountability gaps in multisectoral settings. It illuminated the system-level conditions under which CHWs are enabled or constrained in fulfilling intersectoral functions (18).

3.3.4. Meta-Mechanisms from Reconceptualising the Integrated, People-Centred Health Services (IPCHS) Framework

The fourth data source was a conceptual analysis that developed a mechanism-sensitive model of the WHO IPCHS framework using a realist approach. Rather than focusing on CHWs as the central object of study, this analysis aimed to understand how the five IPCHS strategies (6) [(1) engaging and empowering people and

communities; (2) strengthening governance and accountability; (3) reorienting the model of care; (4) coordinating services within and across sectors; and (5) creating an enabling environment.] interact in practice and how system-level mechanisms shape the delivery of people-centred care. Drawing on findings from three realist studies, the analysis identified a set of cross-cutting meta-mechanisms that consistently emerged across contexts, system levels, and IPCHS strategies (42). These meta-mechanisms were used analytically in this study to examine how different contexts, inputs, and institutional arrangements either trigger or suppress the causal processes that enable integrated, people-centred service delivery. Although CHWs were used as a lens to explore these dynamics, the model provides broader insights into the alignment and interaction of IPCHS strategies across the health system. Within the ToC, these meta-mechanisms helped structure the causal logic behind CHW performance and integration, ensuring that the theory remains grounded in explanatory evidence while being applicable for implementation and planning.

4. Results

4.1 Summary of Findings from Foundational Realist Studies

Across the four foundational studies, CHWs emerged not only as peripheral service extenders but as relational agents navigating the fault lines of fragmented systems. A synthesis of findings identified three interacting meta-mechanisms such as trust, motivation, and professional legitimacy with institutional backing as core to CHWs' ability to function as boundary spanners (42). These mechanisms were not attributes of individuals, but context-sensitive processes that shaped CHWs' capacity to align services across households, health facilities, and governance structures.

The realist synthesis accentuated a recurring pattern, showing that CHW effectiveness was rarely the result of technical skills alone but depended on whether local conditions activated or suppressed key generative processes. Trust, built through cultural embeddedness, continuity, and perceived confidentiality enabled CHWs to enter homes, attend to sensitive needs, and catalyse care-seeking behaviours. Motivation both intrinsic and socially reinforced was sustained where CHWs received recognition, relational support, and were embedded within functioning teams. Professional legitimacy was enhanced when CHWs were institutionally recognised as system actors through visible support at the community level by professional health workers

(e.g. OTL), integration into facility-based teams (WBPHCOTs), and consistent inclusion in planning and coordination structures such as the OSS War Room (18,19).

These findings were deepened through empirical evaluations. At the household level, trust facilitated disclosure of complex social vulnerabilities, but this relational capital was undermined where referral loops failed, or follow-up was inconsistent. CHWs often acted as informal coordinators, bridging disconnected services through relational work and personal commitment. However, their motivation fluctuated in response to systemic signals such as supervision quality, workload fairness, and role clarity. Where systems failed to respond to CHW-initiated issues, legitimacy eroded, and motivational decline followed (18,19,31).

At the community level through the OSS collaborative governance structures, governance dynamics were critical. Within this platform, CHWs' ability to integrate care across departments hinged on whether their role was institutionally supported and recognised (18). In well-functioning War Rooms, CHWs were treated as credible informants and facilitators of household-responsive planning. In weaker settings, their contributions were instrumentalised without influence, undermining legitimacy, dampening motivation, and isolating them from decision-making processes (18). These settings revealed the structural fragility of CHW integration when not underpinned by institutional design and accountability.

The reconceptualization of the IPCHS framework synthesised these dynamics into a systems-level model, foregrounding the recursive interaction of meta-mechanisms across levels (42). Trust was not a static feature but a dynamic condition that enabled entry and engagement. Motivation operated through relational and institutional cues that either reinforced or depleted CHW agency. Legitimacy was a product of both formal policy recognition and enacted power within system interfaces. These mechanisms interacted through chained configurations, whereby one mechanism enabled the next (e.g., trust enabling access, access enabling problem identification, and legitimacy enabling coordinated response). When aligned, these mechanisms formed reinforcing loops that enabled CHWs to navigate complexity, align actors, and broker integrated responses. When fractured, CHWs reverted to task-bound roles, stripped of systemic function (42).

Together, these findings offer more than evidence of CHW potential; they reveal the causal architecture through which CHWs can act as boundary spanners. This realist-informed process underpins the development of the Theory of Change that follows, ensuring it captures not only intended outcomes but the real-world contingencies, generative mechanisms, and institutional arrangements necessary for systemic transformation.

While Section 4.1 synthesised the explanatory insights across the foundational studies, the findings also prompt a reconsideration of how CHW contributions are framed within health systems thinking. The evidence highlights not only the presence of specific mechanisms but also the broader system dynamics that enable or constrain integrative practice. This points to a gap between how CHWs are typically positioned in policy and how they operate in context. In the next section, we extend the analysis by examining what it would mean in practical, institutional, and governance terms to intentionally support CHWs in roles that go beyond predefined health tasks, toward those that actively shape coordination, alignment, and accountability across sectors.

4.2 Repositioning CHWs as boundary-spanners

CHWs have historically been viewed as the operational arm of the health system, tasked with delivering services such as health promotion, screening, referrals, and household profiling (52,53). While these tasks remain vital, this narrow framing underplays the ways in which CHWs, in practice, already act as integrators bridging the fragmented interfaces between communities, health services, and wider social and governance systems.

Across our studies, CHWs were observed operating far beyond the boundaries of clinical service delivery (18,19). They routinely navigated bureaucratic hurdles to secure social grants for patients, coordinated across departments to address housing or food insecurity, and interpreted both health and social system processes to help households access services. In doing so, they effectively stitched together disconnected parts of the system on behalf of vulnerable individuals. These functions were particularly evident in household and OSS case studies, where CHWs took initiative to liaise with clinic staff, social workers, and ward committees to secure care for chronically ill or socioeconomically marginalised clients (18,19). Often, this

integrative work relied more on local relationships and relational capital than on formal authority or institutional mandate.

At community level, CHWs helped align services across sectors through their engagement in local governance forums (OSS). In some wards, CHWs emerged as the most consistent actors connecting multiple departments including health, social development, education, and municipal services despite lacking formal recognition in OSS protocols as boundary spanners (18). For instance, they flagged complex household cases at OSS “War Room” meetings, mobilised support for follow-up actions, and monitored intersectoral referrals to ensure resolution. Their ability to identify intersecting needs and trigger collective responses positioned them as de facto system navigators. Furthermore, CHWs' embeddedness in communities allowed them to act not only as service deliverers but as conduits of feedback and accountability within the system.

While partially supported by the policy design of the OSS initiative, these practices were primarily driven by the adaptive strategies employed by CHWs to address coordination gaps within fragmented health and social systems. Also, CHWs often went above and beyond their mandated tasks to do this integrative work, yet they often became the invisible glue holding together multiple domains of care. However, the indispensable role that CHWs play within multisectoral platforms such as OSS has often remained unseen or unrecognised. These insights challenge the notion that CHWs are merely the ‘last mile’ of service delivery; rather, they are active “connectors” and boundary spanners whose role provides pragmatic solutions to everyday problems related to services that people and communities encounter. Therefore, this calls for CHWs’ roles to be recognised, resourced, and institutionalised if health system reform is to achieve people-centredness. Table 2 illustrates the conceptual shift from a traditional framing of CHWs as task-oriented service providers to a more expansive view of CHWs as boundary spanners. This reframing highlights their potential to bridge fragmented health and social systems, foster intersectoral collaboration, and promote integrated, people-centred care.

Table 2: Reframing CHWs - From Task-Oriented Agents to Boundary Spanners

Traditional CHW Framing	CHWs as Boundary Spanners
Focused on service delivery tasks (screening, referrals, health promotion)	Navigate and align fragmented health and social systems
Primarily clinical or health-centric role	Operate across health, social, and governance sectors
Viewed as subordinate extension of formal health services	Function as boundary-spanners connecting communities and institutions
Minimal recognition of relational dimensions	Serve as trust-brokers fostering relationships across stakeholders
Limited to implementing protocols and guidelines	Advocate for community needs upward into governance processes
Accountability narrowly defined within health system	Engage in collaborative governance and intersectoral coordination
Fragmented training narrowly focused on health interventions	Trained broadly to focus on health and social interventions

Reframing Policy and Practice

Policy Barrier: CHWs are often positioned narrowly as task-focused service extenders, with limited recognition of their cross-sectoral, boundary-spanning functions.

Evidence: Our findings show that CHWs routinely link services across fragmented health and social systems, liaising with departments, following up on referrals, and translating between households and institutions despite lacking formal authority to do so.

Recommendation:
• Formalise cross-sectoral roles for CHWs within policy frameworks, explicitly recognising their contributions to health, social, and governance systems.
• Define CHW participation in multisectoral structures such as Operation Sukuma Sakhe (OSS), ensuring CHWs are legitimate actors in decision-making spaces.

The following sub-sections present seven strategic levers identified through the triangulation of empirical fieldwork, researcher discussions, and literature synthesis. Collectively, these levers articulate the conditions required to institutionalise CHWs' integrative functions and support their transition from peripheral implementers to core system actors in people-centred primary health care. Drawing on findings from the realist synthesis, two realist evaluations, and the realist informed reconceptualization

of the IPCHS framework, the following seven strategic levers are proposed to support this shift: (1) Build layered accountability; (2) Promote shared ownership across sectors; (3) Resource equitably; (4) Train broadly, not narrowly; (5) Recognise CHWs professionally; (6) Adapt models to local contexts; and (7) develop multisectoral integrated tools. These levers are elaborated in the sections that follow as actionable, evidence-informed priorities for strengthening CHWs' contribution to integrated, people-centred health systems.

4.2.1 Build Layered Accountability

In integrated, people-centred health systems, accountability should be mutual, ensuring that not only do frontline actors answer to system managers, but managers and institutions also remain responsive to the voices and experiences of CHWs and the communities they serve. However, findings across our studies revealed fragmented reporting lines, limited data feedback, and blurred accountability mandates, particularly in multisectoral settings such as the OSS War Room platform (18,19). These gaps not only undermined coordination across levels but also diminished CHWs' motivation and perceived legitimacy.

Within the OSS platform, CHWs were often expected to navigate complex cases and facilitate intersectoral referrals. Yet they lacked effective mechanisms to track referral outcomes or escalate unresolved issues (18). While War Room meetings were held with relative consistency, their effectiveness was often limited by unstructured follow-up processes and the inconsistent attendance of key stakeholders. Although CHWs regularly presented household cases and profiling data, these contributions were frequently met with acknowledgment or "good to know" but little coordinated action, reflecting a gap between information sharing and multisectoral response. Although referral protocols within Operation Sukuma Sakhe (OSS) formally exist, they are often ineffectively actioned, with limited accountability mechanisms or consequences for non-compliance. As a result, CHWs are frequently left without recourse when referrals are ignored or unresolved, diminishing their effectiveness in intersectoral spaces and contributing to prolonged service delays, with some cases remaining open for months or even years (18).

At the facility level, reporting was dominated by compliance-driven metrics with little attention to household-level outcomes or social determinants of health. CHWs

routinely submitted paper-based registers and information from their 2 quire books detailing household visits (how many households they visited in a particular month) and identified cases to their supervisors; however, these submissions often received minimal feedback or follow-up, particularly in clinics where oversight was provided by overburdened Operational Managers (OMs) (18). In contrast, clinics with designated Outreach Team Leaders (OTLs) demonstrated more consistent case follow-up and support, suggesting that supervisory structure and workload distribution play a critical role in enabling CHW effectiveness and sustaining motivation (18). In some cases, CHWs stopped raising issues that they knew would not be acted upon, creating a feedback vacuum that eroded trust, accountability, and performance (18).

Build Layered Accountability

Policy Barrier: Fragmented reporting and unclear accountability loops undermine coordination and CHW motivation.

Evidence: Despite CHWs' critical role in surfacing household needs and facilitating referrals, the absence of layered, bi-directional accountability mechanisms across community, facility, and multisectoral platforms like OSS results in poor follow-up, unresponsive systems, and diminished CHW legitimacy and motivation.

Recommendations:

- Implement digital referral and tracking systems.
- Establish bi-directional accountability loops from household to provincial level.
- Strengthen War Room functioning with clear escalation protocols.

4.2.2 Promote Shared Ownership Across Sectors

Effective integration of services requires that responsibilities for health and social outcomes are jointly held across government sectors (54).Our findings reveal that CHWs often work within systems marked by rigid sectoral boundaries, with limited shared accountability or pooled resources. This fragmentation not only undermines the delivery of people-centred care but places undue burden on CHWs to coordinate across unaligned services (18).

Evidence from the OSS platform highlighted this challenge vividly. Although OSS was designed as a collaborative, ward-level governance structure, the absence of formalised commitments between departments meant that participation was

inconsistent and often tokenistic (18). Many departments sent junior or substitute representatives who lacked authority to make decisions and rarely acted on intersectoral referrals raised by CHWs to War Room meetings. As a result, CHWs' efforts to catalyse multisectoral responses were frequently unsuccessful or delayed due to delegated junior officials having to convey OSS cases to their seniors before being acted upon (18).

Promote Shared Ownership Across Sectors

Policy Barrier: Sectoral silos and the delegation of junior representatives to interdepartmental forums contribute to delayed case resolution, undermining integrated service delivery and effective collaboration across departments

Evidence: Although CHWs are positioned within the health sector, they are expected to perform multisectoral roles without mutual responsibility or ownership from other sectors, resulting in fragmented collaboration, limited accountability, and CHWs bearing the burden of coordinating across unaligned systems.

Recommendations:

- Coordinate the governance of all community worker cadres at ward level to align roles, strengthen intersectoral collaboration, and optimise existing resources
- Define shared key performance indicators for integrated outcomes.
- Formalise collaborative roles through interdepartmental agreements.

4.2.3 Resource Equitably and Clarify Multisectoral Roles

Material and symbolic resourcing play a critical role in shaping CHWs' effectiveness and perceived legitimacy as boundary spanners. Across all data sources, resourcing disparities emerged as a persistent constraint undermining CHW motivation, credibility, and performance. Despite formal commitments to strengthen WBPHCOTs, many CHWs continue to operate with inadequate support, reflecting deeper structural inequalities within the health system (9,55).

Findings from the household-level realist evaluation revealed the toll of under-resourcing on CHWs' ability to navigate complex cases. CHWs often travelled long distances without transport allowances, frequently lacked basic equipment such as gloves, blood pressure machines, sanitizers, and masks and had limited access to mobile communication tools (19). In some instances, rigid protocols required them to first collect referral forms from clinics before initiating referrals, further delaying service delivery. In several cases, they borrowed airtime or used personal phones to

coordinate care, communicate with supervisors, or follow up on social service referrals, efforts that were rarely reimbursed (19). This resource strain contributed to burnout and reduced their capacity to act proactively in cases requiring urgent or intersectoral responses.

From a collaborative governance perspective, CHWs often became demoralised when the cases they raised in War Room meetings were not followed up, supported, or actioned by the relevant sectors. Many of these cases such as those requiring a social worker visit, police intervention, housing support, or assistive devices like wheelchairs remained unresolved for months or even years. The lack of coordinated intersectoral response and resource mobilisation not only undermined the intended purpose of OSS but also contributed to frustration and a sense of powerlessness among CHWs. Additionally, there was ongoing ambiguity regarding the boundaries of CHW reporting responsibilities. Since other departments, such as Social Development and various NGOs had their own community-based cadres. CHWs were at times perceived as overstepping by reporting issues viewed as outside the scope of 'health'. This confusion extended to operational managers (OMs) attending War Room meetings, some of whom questioned the appropriateness of CHW reports on social issues (18). These challenges underscore a critical disjuncture; while CHWs engage households holistically, the current system remains fragmented, with sectoral mandates that inhibit integrated, people-centred response.

Resource Equitably and clarify multisectoral roles

Policy Barrier: Inadequate material resourcing and lack of role clarity across sectors undermine CHWs' credibility and effectiveness as boundary spanners, reinforcing fragmentation and limiting coordinated, people-centred service delivery.

Evidence: CHWs are expected to address complex, multisectoral household needs with minimal material support and unclear role boundaries, resulting in burnout, diminished legitimacy, and unresolved cases, as other sectors often fail to take responsibility or recognize CHWs' contributions beyond the health mandate.

Recommendations:

- Ensure dedicated, cross-sectoral resourcing for CHWs including transport, communication tools, and essential equipment to support their multisectoral work effectively.

4.2.4 Train Broadly, Not Narrowly

Across our data sources, a recurring barrier to CHW being boundary spanners was the limited scope of training curricula, which tend to prioritise biomedical tasks and vertical programme protocols. While clinical competency is essential, CHWs operating in fragmented, multisectoral systems also require skills in systems navigation, problem-solving, communication, and local governance engagement. The lack of such training left CHWs ill-prepared to navigate interdepartmental referrals, escalate household-level issues within governance platforms, or advocate for community-level changes (18,19).

The realist evaluations highlighted that CHWs were often expected to participate in governance structures such as Operation Sukuma Sakhe (OSS) without any formal preparation for these roles. Although CHWs demonstrated a general understanding of War Room operations, many had limited training in navigating institutional processes, articulating household needs in sector-specific language, or how to follow through on intersectoral referrals (18). This mismatch between expectations and capability frequently resulted in poor representation, diminished confidence, and minimal influence within intersectoral governance structures.

Train Broadly, Not Narrowly

Policy Barrier: Training focuses on clinical tasks, neglecting intersectoral coordination, and advocacy.

Evidence: Evidence across all data sources underscored a persistent mismatch between the expanded system-level expectations placed on CHWs and the narrow, clinically focused training they receive, leaving them underprepared to navigate intersectoral systems, governance platforms, and community advocacy spaces.

Recommendations:

- Broaden CHW training to include intersectoral system navigation skills to facilitate better cross-sectoral coordination and referral.
- Introduce orientation on local governance platforms to support CHW participation in structures like Operation Sukuma Sakhe.
- Provide ongoing learning opportunities through mentorship and exposure to multisectoral environments.

4.2.5 Recognise CHWs Professionally

Despite their essential contributions to health systems, CHWs in South Africa continue to operate under conditions that limit their professional identity, status, and influence (56). Most CHWs remain employed on short-term contracts through NGOs or temporary health department arrangements, without standardised remuneration, accreditation, or structured career pathways (57,58). This ambiguity in professional status constrains their authority in community and perpetuates the perception of CHWs as low-skilled volunteers rather than critical health system actors.

Our realist evaluations repeatedly highlighted professional legitimacy as a key mechanism enabling CHW integration into health and collaborative governance platforms (42). When CHWs were perceived as credible and competent by both community members and institutional actors, they were more likely to gain access to decision-making spaces, influence intersectoral responses, and coordinate service delivery within health and across intersectoral platforms (18). However, in the absence of formal recognition, CHWs often struggled to assert themselves, especially within households, where their presence was sometimes contested or disregarded.

Recognise CHWs Professionally

Policy Barrier: CHWs are often informal, underpaid, and lack structured career progression or professional status.

Evidence: Across the data, the absence of professional legitimacy and formal recognition through standardised contracts, accreditation, or defined roles undermined CHWs' credibility and constrained their ability to coordinate care or participate meaningfully across sectors.

Recommendations:

- Formalise CHW employment with standardised contracts, remuneration, and benefits.
- Establish professional recognition systems, including certification and ID badges.
- Create structured career pathways.

4.2.6 Adapt Models to Local Contexts

A consistent insight across the realist evaluations was that CHW interventions cannot be effectively implemented through uniform, top-down models. South Africa's diverse socio-political, infrastructural, and governance contexts require adaptive implementation approaches that account for local dynamics, power structures, and resource configurations (18,19,31). Attempts to standardise CHW roles and structures across provinces have frequently failed to accommodate variations in municipal capacity, intersectoral governance functionality, NGO partnerships, and community norms (3,59,60).

Realist findings revealed that mechanisms such as trust, legitimacy, and motivation were not universally triggered but were contingent upon local contextual features (42). For instance, in communities with active ward councillor engagement and functional War Rooms, CHWs were more easily integrated into intersectoral platforms and could escalate household-level issues more effectively and get feedback (18). In contrast, in areas with weak governance coordination, CHWs were sidelined or would report, and no action would be taken. This heterogeneity underscores the need for implementation models that are flexible, responsive, and grounded in real-time learning.

Adapt Models to Local Contexts

• **Policy Barrier:** Uniform, top-down CHW models do not account for local system realities and governance structures.

• **Evidence:** CHW integration is strongly shaped by local governance dynamics, with standardised models often failing to account for variation in institutional capacity, partnerships, and community contexts.

• **Recommendations:**

- Enable local adaptation of CHW models based on municipal capacity, governance functionality, and community needs.
- Promote flexible implementation guidelines that allow for contextual decision-making and innovation at district and ward levels.
- Invest in real-time learning and feedback systems to support adaptive management and continuous improvement of CHW strategies (e.g. Continuous Quality Improvement and other strategies that embraces iterative learning cycles).

4.2.7 Multisectoral Integrated Tools

Effective system integration requires more than relational coordination, it also depends on the tools and technologies that enable multisectoral planning, tracking, and service alignment (61,62). Yet this research shows that CHWs were often constrained by fragmented documentation systems, inconsistent referral processes, and the absence of interoperable data platforms between sectors. This limits their ability to facilitate timely responses, follow up on referrals, or escalate issues across institutional boundaries (18).

Realist evidence highlighted that CHWs often created informal workarounds to bridge these information gaps, such as using personal notebooks, messaging via WhatsApp groups, or verbal handovers to coordinate with social workers or ward councillors. While these practices demonstrated initiative, they also introduced risks around confidentiality, data loss, and uneven accountability. In OSS War Room settings, the absence of locally shared planning templates and performance dashboards made it difficult to track intersectoral actions or to hold departments accountable for follow-through, further posing a challenge to CHWs' integrative functions. In addition, policy makers may argue that the OSS dashboard exists at the provincial level (63), however, War Rooms at the ward level often lack direct access due to limited internet connectivity and insufficient training on how to navigate these dashboards. Even when accessible, the dashboard typically presents aggregated data that are not sufficiently disaggregated to inform timely, ward-specific decision-making or responsive follow-up.

Multisectoral Integrated Tools

• **Policy Barrier:** Fragmented documentation and data systems limit CHWs' ability to coordinate and track multisectoral services.

• **Evidence:** CHWs resort to informal coordination tools due to lack of interoperable, standardised tools

Recommendations:
- Develop integrated, user-friendly referral and tracking tools.
- Digitise planning templates and case management tools used in OSS.
- Ensure tools are co-designed with the department of health and other sectors and embedded in workflows.

4.3. Realist-Informed Theory of Change

The Theory of Change (ToC) developed in this study was not derived deductively or from a priori assumptions but was shaped inductively and iteratively through a multi-phased realist research process that uncovered key context-mechanism-outcome (CMO) patterns relevant to CHWs' integrative roles. This approach recognises that change in complex systems is neither linear nor uniform but rather unfolds through dynamic interactions between enabling (or constraining) contextual conditions and the activation of underlying mechanisms. In this section, we explain how the specific mechanisms and contexts articulated in Table 3 of the ToC emerged from the empirical and conceptual work that preceded it.

Realist evaluation enabled us to move beyond describing what CHWs do, toward explaining how, why, and under what circumstances they function in the health system and beyond. Mechanisms such as trust, motivation, and professional legitimacy (each context-sensitive) consistently emerged across data sources. For example, trust was not treated as a general disposition but as a relational mechanism triggered in specific contexts; where CHWs shared cultural identity with households, maintained continuity of engagement, and operated with visible institutional backing. In such settings, trust enabled better disclosure of household needs (19).

Motivation emerged where CHWs perceived their work as valued and supported, particularly when accompanied by tangible institutional inputs such as recognition in formal health structures, and access to resources. Conversely, contexts characterised by poor support and accountability fragmentation suppressed this mechanism, resulting in CHW disengagement and passive task fulfilment. These insights were clearly visible in both household-level and OSS evaluations, where CHWs' performance was influenced by the degree of systemic coherence and feedback (18,19,42).

Professional legitimacy was essential in household interactions between CHWs and community members. This legitimacy was enhanced when CHWs were visibly supported by formal health system actors, particularly by outreach team leaders (OTLs) and when their roles were acknowledged by both health professionals and community members (19). Where CHWs lacked legitimacy, as evidenced by poorly defined multisectoral roles and responsibilities within the OSS platform, this hindered

their ability to contribute meaningfully to care coordination, service integration, and follow-up, ultimately undermining their effectiveness as boundary spanners (18).

These findings informed the ToC in several important ways. First, the contexts articulated in the ToC (e.g., formalised CHW roles in multisectoral structures, resourcing with identification tools and transport, ongoing training in advocacy and governance) reflect conditions that our realist studies found to reliably trigger these key mechanisms. Second, the mechanisms in the ToC are framed not as abstract ideals, but as empirically grounded causal processes that explain how CHWs can enable integrated, people-centred care under the right conditions.

This approach aligns with and builds on other efforts to develop realist-informed Theories of Change in complex systems research, where mechanisms act as the connective tissue between inputs, contexts, and outcomes (21). By embedding mechanisms into the causal logic of the ToC, we ensure the model is explanatory, not just descriptive, and sensitive to implementation realities across diverse settings. The realist informed ToC also allowed for the demonstration of “mechanism chaining,” and unpacking of non-linearity that would have been missed by the “tradition” ToC, for example where trust enabled access, access facilitated advocacy, and advocacy reinforced CHW legitimacy, as observed in our evaluations. Furthermore, the realist-informed ToC frames assumptions through “If–Then–What” statements, which explicitly link context (“If”), mechanism (“Then”), and outcome (“What”). This structure not only makes causal pathways visible but also enables them to be theorised, empirically tested, and refined while surfacing underlying causal effects, which the current framing or structure of the traditional ToC is unable to unpack.

In sum, this section bridges the evidence base and the Theory of Change, demonstrating how mechanisms and contexts interact to shape CHW contributions across micro (household and community interactions), meso (facility through OTLs and OMs, and local collaborative governance structures through OSS), and macro (provincial and national policy) system levels. By anchoring the ToC in realist principles and empirical nuance, we present a model that is both actionable and context-responsive, capable of guiding policy implementation in ways that are attuned to local system dynamics (section 4.3.1 and Table 3).

4.3.1 Mapping the Realist-Informed Theory of Change for CHWs as Boundary Spanners

Impact Goal

To strengthen the role of CHWs as boundary spanners who enable the delivery of integrated, people-centred care by bridging communities and institutions, aligning fragmented services, and promoting equity, trust, and accountability within the health system.

Problem Statement

Despite CHWs being positioned in policy as critical enablers of community-oriented primary care, they continue to be narrowly deployed as task-focused health workers. This limits their ability to perform integrative functions across health, social, and governance systems. Fragmented accountability, inadequate resourcing, and weak institutional recognition constrain their potential contribution to health system strengthening.

Assumptions (Framed as *If–Then–What* Statements)

- **If** CHWs are appropriately trained (incl. multisectoral), supported, and formally recognised, **then** they are more likely to function as effective boundary-spanners across households, primary health care facilities, and multisectoral governance platforms, **which means** they can help bridge service gaps and promote more integrated, people-centred care.
- **If** core mechanisms such as trust, motivation, and professional legitimacy are activated through enabling contexts (e.g., supervision, resources, institutional backing), **then** CHWs will demonstrate higher performance, sustained engagement, and more effective intersectoral coordination, **which means** these mechanisms must be deliberately nurtured through policy and system design.
- **If** integrated, people-centred care is to be realised, **then** functional collaboration across sectors, shared accountability structures, and bi-directional feedback loops are essential, **which means** CHWs need to be embedded within governance structures that support joint planning, escalation, and response.

- **If** policy reforms are co-designed with frontline implementers and grounded in realist evidence, **then** they are more likely to be context-sensitive, feasible, and embraced by system actors, **which means** they can improve the sustainability, legitimacy, and impact of CHW programmes at scale.

The following Theory of Change (Table 3 and Figure 1) presents a continuation of the realist-informed ToC, mapping how CHWs can be supported to function as boundary spanners within people-centred primary health care. It outlines the causal pathways through which key inputs, enabling contexts, and triggered mechanisms interact to generate outputs, intermediate outcomes, and long-term system transformation. The model further illustrates how aligned conditions can activate chains of mechanisms that enable the development of resilient, people-centred primary health systems that are responsive to local needs and values.

Table 3: Realist-Informed Theory of Change for CHWs as Boundary Spanners.

Inputs & Activities	Enabling Contexts	Mechanisms Triggered	Outputs	Intermediate Outcomes	Long-Term Outcomes
- Recruitment of CHWs from local communities **- Provision of CHW stipends, uniforms, transport** **- Ongoing supervision and digital tools**	- CHWs embedded in communities *(Micro)* - Formal contracts and structured integration into PHC teams *(Meso)* - Supportive supervisory environment *(Meso)*	**Motivation** (enhanced by recognition, fair compensation, and institutional support)	- Consistent CHW engagement - Improved task follow-through	- Sustained CHW presence and performance - Improved continuity of care	Strengthened community-level service coverage and equity
- CHW training on health promotion, advocacy, and multisectoral system navigation	- Trainings and Curriculum co-designed with multisectoral system actors *(Meso)* - On-the-job learning embedded in War Room and WBPHCOT activities *(Meso)*	**Professional legitimacy** (as CHWs gain formal knowledge and are seen as credible actors)	- Expanded CHW competencies - More effective participation in local governance platforms	- CHWs able to advocate upward and navigate across sectors	Enhanced alignment of health and social services
- Deliberate inclusion of CHWs in OSS and governance platforms	- Formalised multisectoral role descriptions *(Meso)* - Functional accountability structures for CHWs and other sectors in multisectoral forums *(Meso)*	**Legitimacy through multisectoral institutional backing** (CHWs are recognised, valued, supported, and heard)	- CHWs participate in service planning and case escalation processes	- More responsive service coordination - CHWs seen as central collaborative governance actors	Institutionalised CHW role in community and intersectoral governance
- Establishment of digital referral and feedback systems **- Implementation of escalation protocols**	- Bi-directional communication loops from household to ward to province *(Micro to Macro)* - Leadership support for War Room functionality *(Meso)*	**Trust** (in systems and between CHWs and users due to transparency and accountability)	- Better case tracking - Timely service response	- Improved referral success - Enhanced user satisfaction	Greater confidence in the system by both service users and frontline workers
- Policy engagement with provincial stakeholders **- Facilitation of adaptive learning cycles (Monitor → Reflect → Adapt)**	- Enabling policy environment for PHC reform *(Macro)* - Learning-oriented culture among clinic, war room, and provincial health actors *(Meso to Macro)*	**Mechanism chaining** (trust enables access, access facilitates advocacy, advocacy reinforces legitimacy)	- Feedback-informed implementation - Contextual tailoring of CHW strategies	- Adaptive, locally owned models of CHW system integration	Resilient, people-centred primary health systems that reflect local needs and values

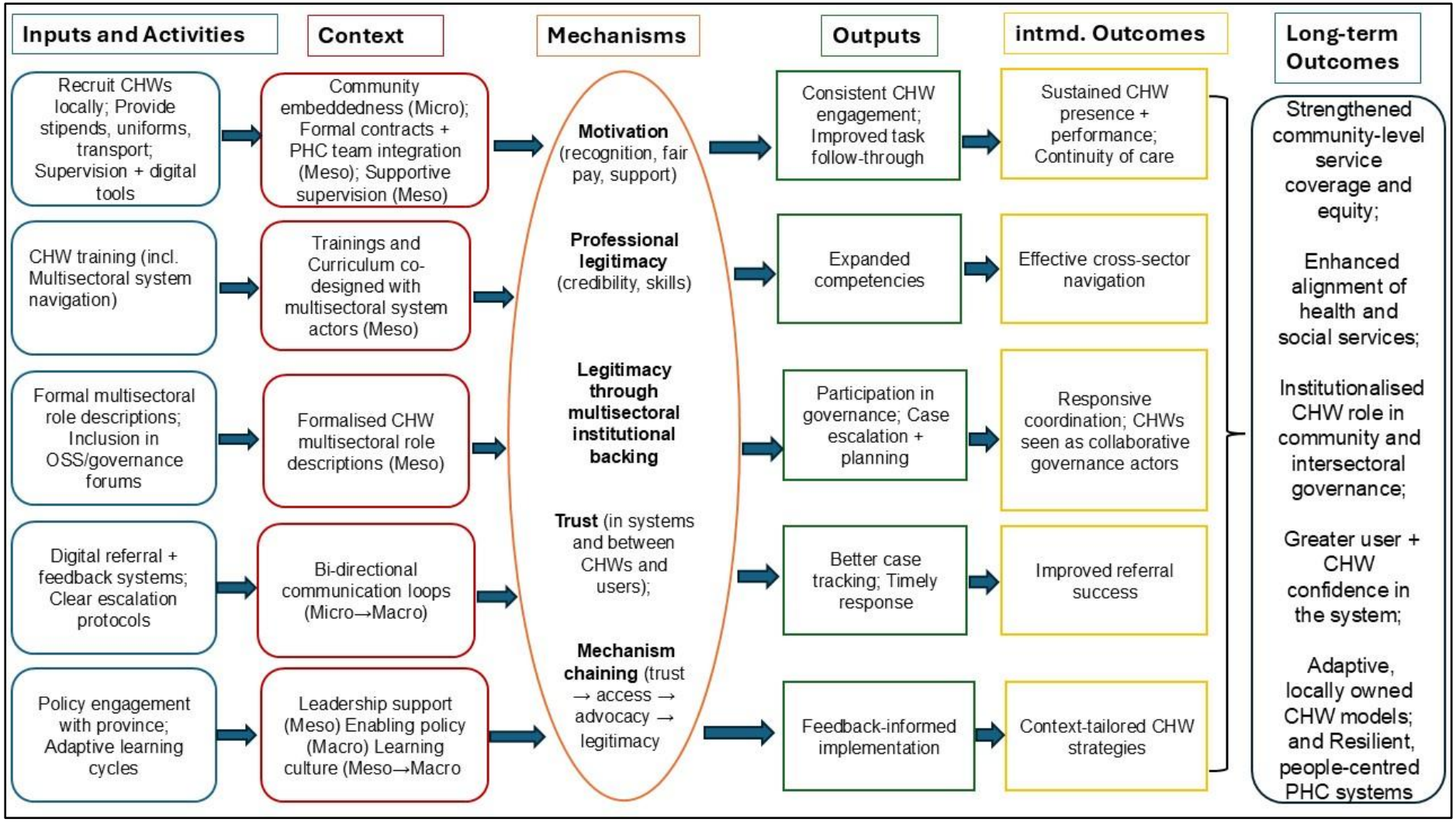

Figure 1: Realist-informed Theory of Change for CHWs as Boundary Spanners.

5. Discussion

This study contributes to both the theoretical and practical understanding of the roles and functions CHWs play in advancing integrated, people-centred care, particularly within health and social systems that remain fragmented and unevenly resourced. Drawing on a realist-informed Theory of Change, developed through a combination of realist synthesis and empirical evaluation, the study offers a mechanism-based model that elucidates the conditions under which CHWs function effectively as boundary spanners. Moving beyond conventional task-oriented perspectives, this research highlights the relational, navigational, and connective functions that CHWs perform across multiple levels of the health system - from the household and community, to the facility and governance structures, and up to informing national policy arenas. In doing so, it addresses persistent challenges related to implementation gaps in community health strategies and offers a context-sensitive, evidence-based roadmap to inform future reforms aimed at strengthening PHC and achieving more equitable health outcomes through CHWs.

Our findings show that CHWs in KwaZulu-Natal already function as informal boundary spanners by aligning services, coordinating across departments, and sustaining household engagement. This observation aligns with previous studies from Kenya (64)**,** Ethiopia (65), and Brazil (66,67), which demonstrate that CHWs navigate complex systems by mobilising relational capital and informal networks. However, our work goes further by offering an explanatory model that identifies how mechanisms like trust, motivation, and professional legitimacy are activated (or suppressed) under specific contextual conditions. This expands the literature by theorising not just what CHWs do, but what enables them to do it.

5.1. Reconciling Fragmented Governance with People-Centred Integration

Fragmentation remains a defining characteristic of many health and social systems (68). In South Africa, the siloed design of service delivery has long undermined integrated care (68–70). Our findings confirm that CHWs often operate at the intersection of disjointed systems, expected to coordinate intersectoral responses without the mandate, resources, or recognition to do so effectively. The OSS evaluation revealed that while CHWs were present in War Rooms, their contributions were inconsistently recognised and sometimes not acted upon, resulting in diminished

motivation and legitimacy. This finding resonates with a study from Tanzania, where fragmented governance characterized by overlapping structures, poor coordination, and lack of resources has weakened CHW effectiveness (71). However, our study adds specificity by identifying governance-linked mechanisms that determine whether CHWs can act as boundary spanners, namely, inclusion in decision-making forums, access to feedback mechanisms, and alignment between institutional and community expectations.

5.2. Realist-informed Theory of Change: From Explanatory Depth to Actionable Design

The use of realist principles to inform the ToC represents a novel methodological contribution. Our work contributes to expanding existing conceptualisations of realist-informed ToCs in three keyways. First, while prior applications have primarily been used to theorise change processes at the programme or intervention level (21,50), this study extends the approach to a system-integration level, explicitly mapping how mechanisms operate across household, facility, and governance structures. Second, we show how realist-informed ToCs can replace implicit assumptions with empirically testable causal propositions, articulated through “If–Then–What” statements that locate context, mechanism, and outcome. This strengthens their explanatory power and moves beyond the descriptive mapping typical of traditional ToCs. Third, by demonstrating mechanism chaining, for example, how trust enables access, access facilitates advocacy, and advocacy reinforces legitimacy; we provide methodological insights into how realist-informed ToCs can surface non-linear, dynamic causal pathways within complex systems. Collectively, these contributions advance the methodological use of ToCs from planning tools to explanatory system models that can inform adaptive implementation and unpack dynamic causal effects. In addition, using a realist-informed ToC adds granularity to the literature on systems integration and CHW effectiveness, offering both explanatory and operational value.

5.3. Contribution to Health Policy in South Africa and Beyond

This study comes at a critical moment in South Africa’s health policy journey. As the country advances its commitment to the National Health Insurance and community-oriented primary health care (2,69), gaining insight into how CHWs can be enabled to function as boundary spanners is both timely and essential. Our findings offer seven

strategic levers, ranging from accountability structures to adaptive implementation models that translate theory into policy-relevant action. This complements the work by Katzen et al. (2024), which calls for greater institutional recognition of CHWs and the development of enabling system conditions to elevate CHWs from the periphery into integrated system roles (15). However, this study goes further by specifying which conditions activate integration mechanisms and how these can be embedded into existing platforms like OSS and WBPHCOTs. Moreover, our emphasis on adaptability aligns to the critique of uniform CHW models that fail to accommodate local context (72,73).

Beyond South Africa, these insights are transferable to other decentralised or multisectoral systems seeking to integrate social and health care. Whether in Brazil's Family Health Strategy (67), India's Accredited Social Health Activists (ASHAs) programme (74), and Ethiopia's Health Extension Programme (75), where frontline workers face persistent tensions between expanding role expectations and systemic constraints in governance, resources, and integration. By foregrounding mechanisms that shape frontline worker effectiveness, our realist-informed contribution offers a transferable pathway for integrating health and social care in complex, decentralised systems - proposing CHWs as boundary spanners.

5.4. Limitations and Future Directions

While this study benefits from the integration of multiple data sources and realist methodology, several limitations must be acknowledged. First, the findings are rooted in one provincial context (KwaZulu-Natal), which may limit generalisability. However, the mechanisms identified are theoretically transferable and can be tested in other settings. Second, while the realist-informed ToC offers a strong explanatory foundation, its implementation utility remains to be evaluated in real-time reform processes. Future research could pilot-test this Realist-informed ToC to assess its feasibility, usability, and impact on CHW performance and system outcomes. Furthermore, the ToC would benefit from co-design workshops with implementers and policy makers to match practical realities.

5.5. Conclusion

This study reconceptualises CHWs not merely as extensions of clinical services, but as vital relational and institutional connectors capable of bridging fragmented systems

in ways that respond more effectively to the needs and priorities of communities. By employing a realist-informed Theory of Change, this research developed an empirically grounded and policy-relevant model that positions CHWs as boundary spanners; an approach that offers health system stakeholders a strategic and contextually responsive roadmap for reform.

As countries strive to implement more integrated and people-centred health systems, the critical question is no longer whether CHWs are able to fulfil this integrative role. Rather, the challenge lies in whether health systems will fully recognise, formalise, and support this role, particularly in settings such as KwaZulu-Natal and other settings, where the policy environment presents a timely opportunity for transformation aligned with broader PHC goals.

List of abbreviations:

BREC – Biomedical Research Ethics Committee
CCG – Community Caregiver
CDW – Community Development Worker
CHW(s) – Community Health Worker(s)
CMO – Context–Mechanism–Outcome
CMOC – Context–Mechanism–Outcome Configuration
COPC – Community-Oriented Primary Care
FGD(s) – Focus Group Discussion(s)
HIV – Human Immunodeficiency Virus
HRH – Human Resources for Health
IPCHS – Integrated People-Centred Health Services
IPT(s) – Initial Programme Theory(ies)
KZN – KwaZulu-Natal
MRT(s) – Middle-Range Theory(ies)
NHI – National Health Insurance
NGO(s) – Non-Governmental Organisation(s)
OM – Operational Manager
OSS – Operation Sukuma Sakhe
OTL – Outreach Team Leader
PHC – Primary Health Care
RiToC – Realist-informed Theory of Change
ToC – Theory of Change
UHC – Universal Health Coverage
WBOT(s) – Ward-Based Outreach Team(s)
WBPHCOT(s) – Ward-Based Primary Health Care Outreach Team(s)
WHO – World Health Organization

Declarations:

Ethics approval and consent to participate

Ethical approval for the study was obtained from the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal **(Ref: BREC/00002768/2021)**, with additional permissions secured from relevant provincial and district health authorities. All participants provided informed consent before participation

Consent for publication

All authors have read and approved the final manuscript and consent to its publication.

Availability of data and materials

All published data referenced in this study is openly available online. Unpublished dataset extracted and used in this article from the realist studies under review is available in NVivo format at the following link: https://figshare.com/articles/dataset/A_Realist_Perspective_on_Optimizing_Community_Health_Workers_roles_and_functions_to_deliver_Integrated_people-centred_care/29424230. The availability of the data share is in line with FAIRSharing principles (https://fairsharing.org/) and Wellcome Open Research Data Guidelines (https://wellcomeopenresearch.org/for-authors/data-guidelines). For more information on the data set contact crh@ukzn.ac.za.

Competing interests

The authors have declared that no competing interests exist.

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Authors' contributions

Usangiphile E. Buthelezi led the conceptualization of the study, in collaboration with André J. van Rensburg, Mosa Moshabela, and Inge Petersen. Data curation was undertaken by Usangiphile E. Buthelezi, Sanah Bucibo, and Gcina Radebe. Formal analysis was conducted by Usangiphile E. Buthelezi and André J. van Rensburg. Funding for the study was acquired by Inge Petersen, André J. van Rensburg, and Usangiphile E. Buthelezi. Usangiphile E. Buthelezi carried out the investigation and, together with André J. van Rensburg, developed the methodology. Project administration was overseen by Tasneem Kathree. Resources were provided by André J. van Rensburg and Inge Petersen. The study was supervised by André J. van Rensburg, Mosa Moshabela, Zamasomi Luvuno, Tasneem Kathree, Arvin Bhana, and Inge Petersen. Visualization was led by Usangiphile E. Buthelezi. Validation of the findings involved Arvin Bhana, Inge Petersen, Zamasomi Luvuno, and André J. van

Rensburg. Usangiphile E. Buthelezi prepared the original draft of the manuscript. All authors contributed to the review and editing of the final manuscript.

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