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Examining the Implementation Experience of Primary Health Care Networks (PCNs) in Kenya: A Qualitative Study

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Abstract

Background: Kenya has identified Primary Health Care Networks (PCNs) as a key reform to strengthen Primary Health Care (PHC) delivery. It has enacted the Primary Health Care Act of 2023 to facilitate their implementation. PCNs were piloted in Kisumu and Garissa counties in Kenya in 2020 and rolled out nationally in 2023. This study examined the implementation experience of the PCN reform in Kenya.

Methods: We used a cross-sectional qualitative process evaluation design. We collected data at the national level and five purposefully selected counties using in-depth interviews (n=65) and document reviews between February and June 2024. Participants included stakeholders from the national level (Ministry of Health, development and implementing partners, and the Council of Governors), county level (county health departments, sub-county managers, multi-disciplinary team (MDT) members, facility managers, and frontline health workers), and community level (community health committee chairs and community health workers). We reviewed policy documents and county reports on PCN implementation for document reviews. We analysed the data using a thematic approach.

Results: The emergence of PCNs as a policy reform was motivated by a technocratic process that identified underlying challenges in PHC service delivery and proposed PCNs as a solution, as well as political interest and support that facilitated their adoption. The implementation effectiveness of PCNs across the study counties varied, with critical aspects of PCN design, such as the establishment of MDTs and the digitisation of PCNs inadequately implemented. The effectiveness of PCNs was compromised by capacity gaps in key foundational aspects of PHC health systems, including financing, human resources, health commodities, and information systems. PCNs' effectiveness was further undermined by the limited integration of key health facility functions – financing, human resource management, health commodity supply chains, information systems, and care coordination.

Conclusion: Strengthening PCN implementation in Kenya requires investment in policy capacity for effective implementation. Foundational aspects of PHC systems must be reinforced. The PCN design should be refined to enhance the integration and coordination of key health facility functions.

BACKGROUND

Primary health care (PHC) is recognised as a critical pathway to achieving universal health coverage (UHC) (1). Kenya has prioritised strengthening its PHC system, aiming to deliver comprehensive, patient-centred, and integrated services. Ensuring high-quality, integrated care necessitates systematic coordination across various service delivery points. These include the integration of community-level interventions, which are increasingly acknowledged as essential components of effective health systems (2).

Kenya has a devolved governance arrangement, with a national government and 47 semi-autonomous county governments (3). The health sector is devolved, with the county governments responsible for primary and secondary service delivery, including the ownership and management of healthcare facilities

and the recruitment and management of healthcare workers (4). The national government has retained policy and regulatory roles as well as the delivery of tertiary-level care. Health service delivery in Kenya is offered by both public and private facilities. According to the 2023 health facility census, the private sector (for-profit and not-for-profit) owns 54% of all health facilities in Kenya (5). Healthcare service delivery is organised hierarchically into four tiers and six levels. Tier one is comprised of community health services (CHS) that include community-based demand creation activities and the community health unit (CHU) that form the 1st level of the service delivery hierarchy. Tier two represents PHC that is delivered by dispensaries (level 2) and health centres (level 3). Tier three is represented by county referral services that comprise sub-county (level 4) and county (level 5) referral hospitals that are managed by a given county. Tier 4 refers to national referral services comprising tertiary-level hospitals (level 6) (6).

A key component of PHC reforms in Kenya is the introduction of Primary Health Care Networks (PCNs). A PCN is a coordinated group of healthcare facilities that operate under a shared administrative and clinical management framework, working together to deliver integrated PHC to the general population (7–9). This reform aims to integrate public, private, and CHS into care networks, providing comprehensive and coordinated care. The PCN model seeks to enhance health system efficiency, improve service quality, and ensure equitable access across all regions. Additionally, it prioritises community involvement in health planning and service delivery, positioning Kenya's health system to effectively address the diverse needs of its population (2, 10).

Primary Health Care Networks (PCNs) in Kenya

In 2020, Kenya's Ministry of Health (MoH) proposed the creation of PCNs at the sub-county level. A detailed description of the PCN reform in Kenya is available in the study protocol published elsewhere (11). In summary, these networks consist of a PHC referral facility (level 4 hospital (public, private or faith-based)), serving as the hub, and several other PHC facilities (levels 2 and 3 (public, private or faith-based)) functioning as spokes and CHUs, forming an integrated PHC system (Fig. 1) (2, 10). The hubs function as the initial referral level within counties and are responsible for supporting spokes. This structure ensures that patients receive timely and appropriate care at all levels of the healthcare system (10). In 2023, the Kenyan government enacted the Primary Health Care Act 2023, aimed at establishing a regulatory framework for the implementation and nationwide expansion of PCNs (12).

A PCN should be managed by a multi-disciplinary team (MDT) with diverse expertise and skills led by a family physician. A functional PCN requires a PCN coordinator, a structured referral system, well-defined facility and community linkages, and integrated facility functions. To ensure the continuous delivery of essential PHC services, PCNs should optimise available regional resources, including human resources, infrastructure, health products, technology, finance, and governance, to effectively meet community healthcare needs (10). The national target is to establish at least one PCN per subcounty, totalling 315 PCNs, and as of February 2025, 221 PCNs had been established with support from various partners. This study aimed to examine the implementation experience of PCNs in Kenya, providing critical

evidence to refine the design and execution of PCN reforms while offering insights for similar health system reforms in comparable settings.

METHODS

Conceptual Framework

This study was guided by a conceptual framework (Fig. 2) that made the following assumptions. First, for PCNs to function effectively, the foundational capacity of individual health facilities within the network must be optimal. Specifically, critical facility functions—including financing, human resources, health infrastructure, commodities and supply chain management, information systems, and service delivery—must be operating at an optimal level or be strengthened prior to the introduction of PCNs. This foundational capacity is essential for ensuring that the intended outcomes of PCNs—such as efficiency, equity, quality, and access—are effectively realised.

Second, our framework assumes that the operationalisation of PCNs as a coordinated network of care requires structural and process relatedness and coordination among the health facility functions. For instance, financial management, human resource management, commodities and supply chain management, information systems, and service delivery should be integrated. Effective coordination may involve establishing a financial relationship that integrates revenue generation, resource allocation, and expenditure. For example, a PCN could be designed as a budgeting and expenditure unit, where facilities jointly budget and allocate resources. Similarly, coordinated human resource and health commodities management should enable the sharing and allocation of staff and resources across the network rather than confining them to individual facilities. Ideally, a PCN would also employ an integrated information system that ensures seamless information flow and visibility across all participating facilities.

Third, while this structural and process relatedness and coordination addresses the hardware components of the PCNs, the software elements—specifically, the relationships among actors within the PCNs—are equally critical. For instance, to foster effective collaboration and cohesiveness in implementing the structural and process elements, trust among staff and managers across the various PCN health facilities is necessary. Lastly, to effectively operationalise both the foundational capacity of PCN facilities and the integration of structural and process elements, it is essential to ensure implementation fidelity or operational effectiveness (Fig. 2).

Study Design

This study used a cross-sectional qualitative process evaluation to assess the implementation experiences of PCNs. Comprehensive details on the methodology are outlined in the published study protocol (11). The evaluation examined the emergence of PCN reforms, identifying key drivers and approaches that influenced their adoption. Additionally, it assessed implementation fidelity, including adherence to guidelines, reach to target populations and unintended outcomes. Socioeconomic and

political factors that could hinder or facilitate PCN implementation were also assessed (13). Data collection involved a combination of document reviews and in-depth interviews with key informants to provide a comprehensive understanding of the PCN implementation process.

Study sites

We collected data from 5 purposively selected counties in collaboration with the MoH. The selection of counties considered geographical spread and the diversity of funders and partners supporting the establishment of PCNs. To ensure participant confidentiality, we have anonymised the counties involved in the study. Table 1 outlines the characteristics of the selected counties.

Table 1
Characteristics of study counties

County	Population size (2019 census)	Geographical region	Funder and partners supporting PCNs	Year started PCN implementation	PCN implementation status
County A	1,155,574	Nyanza	UNICEF	2021	100% (7/7)
County B	841,353	Northeastern	UNICEF	2020	100% (7/7)
County C	866,820	Coast	Amref	2022	80% (4/5)
County D	2,162,202	Rift Valley	USAID Tujenge Jamii	2023	100% (11/11)
County E	987,653	Eastern	PATH	2023	100% (6/6)

Study Participants

We collected data from purposefully selected participants from the national, county, facility and community levels involved in PHC decision-making, implementation and delivery. Table 2 outlines the characteristics of the study participants.

Table 2
Summary of study participants

Level of respondents	Male	Female	Total
National level			
Partners	6	4	10
Council of governors	1	0	1
County level			
County Department of Health	14	3	17
Sub County Managers	7	0	7
MDT members	1	2	3
Health Facility Managers	7	5	12
Frontline health workers	1	6	7
Community Health Committee (CHC) Chair	3	0	3
CHWs	4	1	5
Total	**44**	**21**	**65**

Data collection

We collected data between February and June 2024 through document reviews and in-depth interviews (IDIs). We collected the data using a semi-structured interview guide (Supplementary file 1). All study participants were provided with an information sheet, and consent was sought for participation in the interviews. The interviews were conducted face-to-face at the participant's workplace and audio recorded using encrypted audio recorders.

Data management and analysis

Audio recordings from the IDIs were transcribed verbatim into English, with each transcript reviewed against its audio file to ensure transcription accuracy. Validated transcripts were then imported into NVivo (version 12) for coding and thematic analysis. The coding framework was based on a) a priori issues derived from the original research objectives and incorporated into the interviews, b) emergent issues identified by the respondents, and c) analytical themes that emerged from the repeated expression of specific views or experiences deemed significant and relevant.

Ethical considerations

This study received ethical approval from the KEMRI Scientific and Ethics Review Unit (SERU) under approval number KEMRI/SERU/CGMR-C/294/4708, as well as clearance from the Council of Governors, Kenya, and the National Commission for Science, Technology, and Innovation (NACOSTI), reference no. 296109.

RESULTS

Emergence of the PCN Reform

The PCN reform in Kenya had both technical and political motivations. The technical motivation was a response to the challenges identified in previous attempts to implement UHC reforms in Kenya. These included a tendency for patients to bypass PHC facilities to seek PHC services at higher-level facilities due to a lack of trust in PHC facilities and inadequate service provision at the PHC level. Moreover, there was weak integration between the community level and PHC facilities (10). In response to these gaps, the Kenya MoH initiated PCN pilots in two high-burden maternal mortality counties, Kisumu and Garissa, in early 2020. These efforts were formalised with the development of PCN operational guidelines in 2021.

*"When the UHC pilot was done, everyone went to level 5 facilities, bypassing lower-level health facilities. The whole point of PCNs is to ensure that facilities in the entire network are supported to be able to provide basic healthcare services so that, for example, you don't have to go to a level 5 healthcare facility when you have a simple ailment such as a flu"***1DI2_Female Maternal and Newborn Health (MNH) Lead Partner B**

*"Two counties were identified for the PCN pilot; that is where the PCN journey began. PCNs were intended to improve service delivery at the primary health level and ensure that the residents of the county can attain the highest possible form of quality care even at lower-level health facilities."***1DI1_Male PHC Coordinator County A**

The PCN reform was also motivated by political interest. The current ruling party, *Kenya Kwanza*, included PHC reforms as part of their political manifesto. With the coming into power of the *Kenya Kwanza* government in August 2022, PCNs were identified as a key strategy to implement PHC. This was solidified with the enactment of the PHC Act in 2023, which legislated the requirement for all counties in Kenya to implement PCNs as a model for the delivery of PHC services in the country (12).

"…the bills that were signed into law by His Excellency, the President of the country, William Samoei Ruto, just before Mashujaa day last year. So, we have the primary health care bill, we have the restructuring of the National Health Insurance Fund (NHIF) basically to the Social Health Insurance Fund (SHIF), as managed by the Social Health Authority (SHA), and then we have the digital bill and, you know, that…that kind of restructuring, is what is deliberately meant to ensure that we focus more on the primary health care, the preventive medicine, as opposed to the curative medicine, as has been the case, of course not

forgetting the curative medicine, we can't forget treatment." **IDI7_Male County Executive Committee member for Health County D**

The Establishment of PCNs

PCN Legislative and Policy Frameworks

The PCN reform was underpinned by legislative and policy frameworks. The Kenya Primary Health Care Strategic Framework 2019–2024 identified PCNs as a key strategy to advance PHC goals in Kenya (2). The Kenya Community Health Policy 2020–2030 and the Kenya Community Health Strategy 2020–2025 provided the policy direction and strategies to strengthen CHS and their linkage to facility-based PHC service delivery, which form a key component of PCNs (14, 15). Complementing these overarching PHC and CHS policies and strategies are specific PCN guidelines and the PHC Act 2023, which provide legal and operational directives for establishing and governing PCNs (10, 12). These documents underscore a cohesive approach to integrating and regulating PCNs within Kenya's health care delivery system.

*"Of course, the implementation is guided by the National strategic plans. Initially the national strategic plans, now we have the PHC Act of 2023."***IDI1_Female PHC Coordinator County B**

PCN Establishment Process

Table 3 outlines the steps that counties need to undertake to establish PCNs and the status of implementation across the study counties.

Sensitisation of the reform targeted multiple levels of the health system at the county level. All study counties had conducted sensitisation of targeted stakeholders on the PCN reform. The sensitisation was undertaken by the national MoH, partners, county and sub-county trainer of trainers for over one to two days. Sensitisation was more extensive at the higher levels of the county health system. **There was inadequate sensitisation of frontline health workers, community health workers, and community members.** This was reported to be due to resource constraints.

"…we started sensitising the executive, and then we went to the county health management team (CHMT), then we went to the sub-county Health Management Team (SCHMT), … after the sub-county HMT we went to the MDT leads, then the MDTs then the facilities…" **IDI6_Male PHC Coordinator County D**

"There was just a small sensitisation, a one-day sensitisation that involved a team from the MOH and the county team led by the PCN focal person, Dr. XXX, who did some little bit of training. But we feel that this team [SCHMT] needs to be capacity-built more so that they can understand their roles." **IDI10_Male SCMOH County D**

There were gaps in the establishment of PCN governance structures across the study counties. Figure 3 outlines the governance structure of a PCN as per the guidelines. All counties had County and Sub-County PHC coordinators and Medical Superintendents (Medsups) at the Hub facilities. These structures

predated the establishment of PCNs. The implementation of all other required governance structures varied across counties. For instance, the establishment of multi-disciplinary teams (MDTs) to coordinate team-based care in the PCNs was only achieved in three out of the five study counties, while the establishment of County PHC technical working groups (TWGs) and County PHC advisory committees were only achieved in one out of the five study counties. This incompleteness in the establishment of PCN governance structures was thought to be due to a lack of political support and resources to facilitate their operationalisation.

"…the establishment of governance and coordination structures is something that is supposed to come preliminary in the early stages of implementation. But then, because of politics and issues in the county government, sometimes you want the County Executive Committee (CEC) members for health to talk to other CECs and help you put up an advisory council. And they are all engaged, and you then decide to continue with other steps as those others are being put in place." **IDI10_Male Senior Technical Advisor Partner J**

All study counties conducted baseline assessments before the implementation of PCNs. This included an assessment of development partners to support PCN implementation and the needs of healthcare facilities and CHUs. However, only two counties assessed client needs, and none assessed the resources needed to establish and implement PCNs. Counties reported using these baseline assessments to inform the mapping of facilities within PCNs.

"We did a baseline survey where we went to all the six sub-counties and select facilities …we had several tools we were using …a client exits tool, facility assessment tool and the community assessment tool …" **IDI6_Male PHC Coordinator County D**

All study counties successfully mapped and established connections between their hubs, spokes, and CHUs. Adherence to the hub and spoke model was widespread among the counties, though two counties adapted this model by incorporating mini hubs. A mini hub is either a high-volume level 4 or level 3 facility. This adaptation was necessitated by political interests that required an equitable establishment of hubs across different geographical regions within the county. Other reasons included the need to address the long distances to hub facilities and varying demographic characteristics, including refugee camps and nomadic populations. The linkages spanned government, faith-based organisation (FBO) and non-governmental organisation (NGO) facilities.

"...things are not cast in stone, and each county and each population has its own different dynamics. It's not one-size-fits-all; for example, the idea of sub-hubs is not there at the national level. The only thing that the national recommends is you need to have a hub and spoke model, but we've introduced another layer of the sub-hub, and so there are things we are looking at; number one is involving the key players, the political class into the health agenda." **IDI1_Male PHC Coordinator County A**

None of the study counties reported identifying the financial requirements for establishing and managing PCNs. They all relied on estimates from the national MoH where four scenarios were considered: 1) the

total cost assuming zero investments (USD 10,410,518), 2) the cost based on needs and gaps using incremental costing (USD 1,526,439), the cost assuming the current human resources for health (HRH) and infrastructure are adequate (USD 759,656), and the cost assuming HRH, commodities/supplies, and infrastructure are available (USD 202,256). Moreover, none of the study counties had developed a sustainable financial plan for the operationalisation of PCNs. There was also a lack of established **monitoring and evaluation systems** for PCNs across all the study counties due to a lack of guidance from the national MoH. This indicates a gap in both financial planning and oversight mechanisms critical for the effective implementation and management of PCNs.

Finally, the digitisation of Primary Care Networks (PCNs) was found to be inadequate. Four of the study counties had implemented electronic Community-Based Health Information Systems (e-CHIS) to digitise their community health systems. However, only one study county had a partial smart PCN, where the electronic health information system was integrated from the community (e-CHIS) to the spokes level using the Kenya electronic medical record (EMR) plus system. This limitation was primarily due to interoperability challenges with the hub's EMR system (Fan soft), as well as political interference that hindered the changing of the EMR system at the hub. Additionally, **only one county had officially gazetted** its PCNs, having successfully established all PCNs within its jurisdiction (Table 3).

"…we are able to see their [CHPs] referrals .... And a system was installed, the Kenya EMR plus. …those facilities have Kenya EMR, which is working, and it was tested that we are able to see the referrals. But now the challenge has come: it is installed on the computer, but we are not using it. Because we had a previous EMR that we're using, Fan Soft, and there were issues with the management from the county, they have not given us the go-ahead to shift from Fan Soft to Kenya EMR, so we are not using it. But if we were allowed to use it, it has been tested, and we are able to do it. It's interoperable." **IDI5_Female MDT Team Lead County E**

PCN Functionality

Governance and Accountability

The planning and performance management of health facilities was not integrated as a PCN. The PCNs were expected to undertake joint annual work planning (AWP), budgeting and priority setting to enhance their efficiency (10). However, none of the study counties had done this. Further, health facilities within PCNs did not develop joint performance targets. Each facility in the PCN maintained the previous annual work planning and performance target development process, where they each developed their own. None of the study counties reported undertaking PCN performance management.

"We have the community health units; they have their own annual work plan, which is consolidated. We have the spokes; they have their own annual work plans. And then we have the sub-county annual work plan." **IDI1_Male Sub County Team Lead County E**

Multi-disciplinary teams (MDTs) did not play their supportive supervision roles for PCN health facilities. MDTs were expected to provide supportive supervision to spokes health facilities in PCNs. There was a

lack of clarity regarding the role of the MDT supportive supervision role and that of sub-county health management teams (SCHMTs), which were traditionally tasked with conducting quarterly supportive supervision visits to individual health facilities. Moreover, the MDTs did not recognise supportive supervision as part of their role, probably because it is the role of SCHMTs.

"Our roles are just …taking the services to the periphery. Mostly, when we go to the periphery, we go for the chronic cases; it's not just a mere outreach. We are supposed to see all outpatient cases. No, we only go there when it's a dispensary where it's only manned by a nurse; there are those conditions that he or she might not be able to handle. So, in such cases, she's supposed to book them, then liaise with us and go and review them at the facility." **IDI8_Female MDT Member County C**

Financing

PCN implementation largely relied on funding from non-state actors. International and local non-state actors (development and implementing partners) provided both technical and financial assistance to counties to set up and operationalise PCNs.

"We have played a role of…supporting capacity building across the various levels from the county to the community. We have also played a role of … helping them to engage… the legislators, to sensitise them on PCN and formation of multi-disciplinary teams…" **1DI15_Female Senior Technical Lead Partner A**

"…we have partners who have stepped in to take care of … some of the gaps. When you go for those outreaches … some partners will pay the staff allowances. I think XXX Kenya is doing that. I'm also aware that through the county government, we also have other partners who are coming in, and the aim is to bridge the gaps where they have been noted." **1DI3_Male Medical Superintendent County D**

The study county governments did not have dedicated budgets for PCN set-up and operations. According to PCN guidelines, counties were expected to allocate funds in their budgets for PCN activities. However, four of the study counties did not have an explicit budget designated for PCNs. Only one county had established a budget line for PHC that included a PCN sub-program due to the high political prioritisation of PHC. The absence of a dedicated funding allocation contributed to delays in PCN implementation and limited the scope of PCN activities.

"No, we don't have [a PCN budget]. In fact, that is the biggest issue because we want to do an activity, but we don't have a budget. Like these outreaches, it is now the sub-county. I've gone through the sub-county to see if we can get the drugs and all the HPTs that we need. But here, we don't have any budget for that." **1DI5_Female MDT Team Lead County E**

The budgeting process for PCNs was not integrated. The existing budgeting framework, guided by the Public Finance Management (PFM) act, did not recognise PCNs as a distinct budgeting entity. Instead, PCN facilities prepared separate budgets, limiting the integration and coordination of resource allocation and prioritisation within PCNs.

"You can only consolidate in the primary healthcare budget when you have one source of financing, right? But when you have each facility receiving money on their own, they'll come up with their needs."

IDI1_Male Sub-County Medical Officer of Health (SCMOH) County B

"I don't think that the facilities, the spokes, had a specific budget for PCN. They just had their normal budget for running the facility. That's why the Subcounty team now has taken that role to make the AWP PCN to be part of it. We have not taken the burden to the spokes or the main hub." **IDI6_Male SCMOH County C**

Outreach activities led hub facilities to experience revenue losses. Hub facilities charge for services offered to clients, while services provided by spoke facilities and in the community were expected to be for free. An unintended outcome of the PCNs was the loss of revenues by hub facilities when they provided health services in spokes or in the community as part of outreach activities because they were then required to offer these services for free.

"Currently, the hubs, which are the hospitals, charge, for example, for diabetes and hypertension drugs. The same if availed in the PCNs or in the dispensary, they are not charged. So, whenever patients hear there is an outreach, they rush there to get the free drugs. Okay. So, the hospital is losing revenue while clients are getting assisted." **IDI1_Male County Director of Health (CDH) County D**

Health Workforce

Across all the study counties, the implementation of PCNs was handicapped by a shortage of healthcare staff, particularly in rural and under-resourced areas. The effective implementation of PHC through PCNs required that the staffing of PHC facilities be strengthened to meet the capacity requirements for the anticipated workload. Of the study counties, four reported no changes in health worker numbers or distribution. Many facilities, especially at lower levels of the healthcare system, are operated by just one or two workers.

"…the challenge we have with some of the facilities is the staff shortage, and I think this is not unique because you might find a dispensary which has one nurse, and she's the only technical person in that facility. So, if she's out of the station for a particular reason, maybe on leave or on assignment, the facility closes". **IDI7_Male County Executive Committee member (CECm) for Health County D**

Only 0ne study county reported that consultants such as surgeons and obstetricians were posted to sub-county hubs for the first time, allowing for general surgeries and caesarean sections to be performed locally.

"Before the PCN, there was no surgeon, there was no paediatrician, there was no gynaecologist; currently, in the establishment of the PCN, we got the specialists, and we still expect more…" **IDI10_Male SCMOH County B**

Health workers in MDTs experienced an increased workload because of expanded responsibilities. This was because MDT members were expected to provide services not only at the hubs but also during outreach activities to spoke facilities and in the community. These additional responsibilities, combined with their regular duties, exacerbated the strain on healthcare staff.

"…you believe when the staff is one, and the workload is high, the quality will also be compromised, so we must also increase the human resource aspect if the workload will be increasing." **IDI10_Male SCMOH County B**

"The other challenge is staffing where for us to send a team, we have to leave other people offering services, and most of the level four people are strained in terms of staffing. So that is why we are not even able to do this more frequently, as these staff are also expected to offer services within the hospital." **IDI3_Male Medsup County D**

The study counties reported a lack of effective support for MDTs. Designed to support lower-level facilities by providing integrated care and reducing unnecessary referrals to higher-level hospitals, MDTs are hindered by financial constraints and inadequate logistical support. Without these resources, MDTs could not operate effectively.

"…one of the issues that we've had is there is no dedicated financing to PCNs. That's the biggest challenge. So, the movement for these specialised groups from the hubs to the spokes has been restrained because of budget and resource needs." **IDI1_Female PHC Coordinator County B**

"Another challenge is we normally go late for the PCN activities because of transport challenges, because we sometimes are rendered to go with the ambulance, and you know the work of an ambulance. So, in case of an emergency, you'll have to wait; first, you take the emergency to XXX, around 11,12, is when it comes back to take us." **IDI8_Female MDT member County C**

PCNs did not have an effective mechanism for sharing health workers. According to PCN guidelines, team-based care across PCN facilities was intended to be operationalised through MDTs. However, across the study counties, there was significant variation in the understanding of MDTs, and where MDTs existed, they were not fully operational because of resource shortages. Only one county organised consultants to visit hubs, and general practitioners handled issues at lower-level facilities. Half of the counties, especially the early adopters, did not have active PCN MDTs, often citing operational challenges that left these teams inactive, forming them only when necessary. Sharing HRH between hubs and spokes was largely achieved through referrals and outreach programs.

*"The MDTs are not permanent, really. We form them based on needs that arise within the community and within the sub-county. So, it is the hub that most of the time comes up with these ideas."***IDI8_Male Medsup County A**

*"… specialised doctors and consultants are going to our sub-county health facilities weekly. We have a gynaecologist going to that facility on Monday, for example, we have a surgeon going on Tuesday…prior to that, the medical officer who is there try to register all those patients, bring them together, prepare them for the respective specialisation and all the consultants."***IDI8_Male SCMOH County B**

MDT outreach activities disrupted service provision at hub facilities. All the study counties with active PCN MDTs reported a disruption of service provision at hub facilities. This happened because MDT members, whose roles originally entailed providing services at the hub facilities, were now required to

provide outreach services to spoke health facilities without the recruitment of additional staff to provide cover for the staff engaged in outreach services.

"…because the [staff that are] part of the MDT are also our staffs at the facility. So, you find a time that that staff is on duty here, and the PCN also wants him to join. So, sometimes you get that challenge that this person also has to be offering services around here, and he has to go to PCN." **IDI6_Male SCMOH County C**

Procurement and supply chain for health commodities

Inadequate availability of health commodities compromised PCN service delivery across all the study counties. The delivery of PHC services, especially in lower-level (health centres and dispensaries) health facilities in the PCNs, was compromised by chronic shortages of essential medicines, essential diagnostics and medical equipment. This limited the scope of services that lower-level PHC facilities could provide, forcing patients to seek referrals to higher-level hospitals. This undermined confidence in the PCN system.

"…sometimes there are no drugs in public facilities that is a challenge, and so when you refer clients, and then they end up at the pharmacy, and there are no drugs, then that brings a challenge, and so when you refer them again, they tell you "you are telling me to go to this place when I go I will just queue and reaching the pharmacy, I miss the drugs" **IDI8_Male Community Health Promoter (CHP) County A**

"But one of the biggest challenges that we have in terms of PCN implementation is infrastructure and equipment. Infrastructure because as we expand our scope to provide comprehensive services, we need to ensure that we have a matching infrastructure. So, I think it's very critically that we look at that." **IDI1_Female PHC Coordinator County B**

PCN health facilities across all the study counties did not have an integrated procurement and supply chain for health commodities. Key supply chain functions such as quantification, forecasting and ordering were not coordinated and integrated within PCNs. Each health facility in the PCN conducted quantification and ordering independently, with levels 2 and 3 receiving support from the sub-county pharmacist. Further, hub facilities were expected to support spokes by sharing laboratory and radiology services, offering diagnostic tests, and setting up sample referral networks for facilities lacking these services. However, across the study counties, the sharing of commodities was limited. One county reported sharing laboratory services by transporting samples from spokes without laboratory services to the hub for analysis.

"No, it's done as a facility. So, the facility will just place the orders based on their needs and based on available funds, which are actually allocated based on the workload. It's a problem because we have not yet established the workload of the PCN in our spokes." **IDI10_Male SCMOH County D**

"…when there are fewer patients or less consumption in the lower facilities, we borrow from them. And sometimes, when we have more in stock, we do help them. We use S11…a tool for whenever you want to give out anything from the pharmacy, you must have it signed." **IDI5_Male Medsup County B**

Information Systems

PCN health information systems were partially digitised. Existing health information systems included the Kenya Health Information System (KHIS) for health facility service use data, the Logistics Management Information System (LMIS) for health commodities supply chain management, and the Community Health Information System (CHIS) for community health interventions. There is a partial digitisation of health records, particularly at higher-level facilities. However, many Level 2 and Level 3 facilities still rely on manual data collection methods.

"And when you find that they are digitised, you only find that maybe only other departments, and this is probably in some hubs, the mini hubs or the hubs whereby we have maybe the pharmacy, the CCC, yeah there is that partial system that is being used, but we don't have a complete digitised system within the facilities." **IDI2_Female County Community Health Focal Person County A**

"...routine data coming to the hospital we have a register where every client is attended to and we ensure he is captured in the registers as the permanent source and then we report every month to the reports we give that is in summary and then from there we send to the HRIO to upload to the HIS that is the data we have. But there is no specific data that we have collected or intended to collect because of the PCN not yet." **IDI10_Male SCMOH County B**

Community-Based Health Information Systems (CHIS) have been fully digitised. The CHIS was digitised across all the study counties. Community health promoters (CHPs) used the e-CHIS to collect and report community data. All CHPs were trained to use the e-CHIS. However, while CHPs had access to digital tools, there were difficulties in integrating community data with health facility data, given that most primary healthcare facilities relied on manual systems. Only one study county had started integrating the e-CHIS with the information systems used at the health facility level.

"We have, like all the Community Health Promoters, now it's digital, though now when it gets to the referral, as in refer with the system of course, now it doesn't reflect at the facility because the facilities are not digitised." **IDI2_Female County Community Health Focal Person County A**

"...at the community level, they are digitised...household information is collected through the e-CHIS...the CHA and the sub-county focal person helps in ensuring there is quality data being collected from the community before it is keyed in by the sub-county health information record officers into the Kenya Health Information System (KHIS)." **IDI1_Male PHC coordinator County A**

Health information systems were not integrated across PCN health facilities. A significant challenge in PCN implementation is the lack of integrated HIS. The absence of a unified digital system across healthcare facilities disrupted the tracking of patient referrals and treatments, leading to fragmented and inefficient care. This lack of digital integration not only delayed service provision but also prevented the effective use of data for monitoring and improving health outcomes.

"What I'm grappling with right now is the visibility. Seated here, I am not able to see the PCNs because I don't have an integrated health [information] management system that should actually be in this laptop

or in this phone, and I can just click and see everything that is happening across the county. I wish I could just be able to open and see what is happening across the county." **IDI7_Male CECm for Health County D**

"The work entails supporting the PCNs to fully roll out the Kenya EMR plus, which will be integrated with the eCHIS so that data coming from the community can be viewed at the facility. So, we are in the preliminary stages of assessing the suitability of facilities for the rollout of the smart PCN." **IDI10_Male Senior Technical Advisor Partner J**

Service Delivery

Community units were effectively linked to PHC facilities. According to PCN guidelines, PCN facilities should ensure that 100% of the population is covered by CHUs linked to these facilities. Most of the PCN facilities were linked to CHUs, and most facilities had designated staff (Community Health Assistants) linked to the CHUs, providing supportive supervision. Further, most PCN facilities were conducting community outreach services.

Care coordination and integration across PCN facilities was inadequate. For instance, while hub facilities were expected to coordinate with spokes and CHUs to establish a unified catchment population for the PCN across the study counties, each facility independently defined its own catchment area. Furthermore, while counties were expected to establish effective gatekeeping mechanisms to manage patient referrals, across all the study counties, there was no gatekeeping mechanism. Patients could seek PHC services at any facility regardless of the level of care within the PCNs.

"Mostly, they [services] are coordinated by the sub-county health management team [SCHMT]. From the level one community health promoters, dispensary, health centre to the hub that's the work of the SCHMT." **IDI1_Male Sub-County Team Lead County E**

"... it's not really changed much. It's the same way; we are only insisting that now it has to be in referring across the network; if level two used to refer directly to level four, they shouldn't do that. They should try referring to a level three." **IDI6_Male PHC Coordinator County D**

Counties strengthened referral systems within PCNs. All the study counties strengthened their referral systems from the community level through the CHPs to the facilities and across the different levels of facilities using toll numbers and CHP referral desks. Moreover, with support from partners, all the study counties strengthened their emergency referral systems by repairing and or outsourcing ambulances.

"Referral mechanism …is an efficient one because there is a toll number to the call centre, we refer through the county referral call centre. When there is any critical case, we call an ambulance, which takes … approximately one hour to arrive here, and then the patient is picked up to get services in the referral hospital." **IDI8_Male Facility Manager Level 3 County D**

"…we have the emergency operation call centre in XXX, and the PCNs have ambulances that are designated to them. And those ambulances are not designated to a hospital; they are for the whole

PCN." **IDI8_Male Medsup County A**

There was inadequate engagement of private healthcare facilities. There has been insufficient integration of private facilities within PCNs. This gap stemmed from the lack of formalised structures that could facilitate more effective collaboration between the public and private sectors, particularly in areas where private health facilities could relieve pressure on public services. This lack of integration limits the potential reach and effectiveness of the PCN model, which could otherwise benefit from more robust resource sharing and patient load distribution across sectors.

"We've not really had very concrete interactions with the private sector yet...it's good to have them on board because their facilities can serve a huge number of patients within the population." **IDI6_Male PHC coordinator/SCMOH County D**

"...one of the gaps that has not really been addressed with these PCNs is the involvement of private and faith-based sectors…how they are going to be involved within PCN." **IDI1_Male PHC coordinator County A**

Facilitators of PCN Implementation

Political goodwill and leadership. Political support and leadership, both at the national and county levels, were identified as a crucial factor enabling the successful establishment of PCNs. Several actions taken by the current government have strengthened PCN efforts, notably the integration of PHC into the government's manifesto and the enactment of the PHC Act in 2023. This culminated in the launch of the *Afya Nyumbani* [health in your households] initiative in October 2023, a UHC initiative that is hinged on strengthening facility-based PHC and CHS. This commitment to improving PHC services facilitated the scaling of PCNs across the country.

At the county level, the involvement of governors, county executives, and other political leaders played a pivotal role in initiating PCN implementation. For instance, in one of the study counties, the governor's personal commitment, shaped by international experiences, directly supported the establishment of PCNs. This political goodwill not only enabled financial allocation but also fostered cross-sectoral collaboration, which is crucial in prioritising resources in environments with limited funding.

"Number one is political support from the Governor, right from the word go, through the CEC and basically the political class; the Governor was into the idea, so it means if he is supporting, then it's going to be implemented." **IDI1_Male PHC coordinator County A**

"I think the biggest success factor was how invested the political teams were. You had a deadline, and you had to report to the President. My friend, there is no bigger motivator, you have to give feedback to the President, and you know like the CS's jobs hang on the lines for such things." **IDI2_Female MNH Lead Partner B**

Non-state partners' support and collaboration. The implementation of PCNs has been greatly aided by the collaborations between the government and non-state partners. This collaboration facilitated the mobilising of financial resources and the technical support required to establish PCNs.

"The stakeholders here are the NGOs that have worked with us, the universities, medical universities, the pharmaceutical companies that have worked with us to try and ensure this is finally achieved." **IDI8_Male Medsup County A**

DISCUSSION

This study set out to examine the early implementation experience of PCNs in Kenya. The introduction of PCNs in Kenya illustrates how the problem, policy, and political streams in Kingdon's multiple streams framework converge and leverage a policy window to lead to policy emergence (16–18). Longstanding challenges in PHC service delivery led to the development and piloting of PCNs as a solution in 2020 during the previous government. The PCN reform subsequently got momentum when it was prioritised by the political class in 2023 as part of the new government's healthcare reform agenda. This finding resonates with previous observations in Kenya and other settings where major health systems and UHC reforms have responded to well-defined problems and have benefited from being part of a broader political agenda (19–21). The findings underscore the need for policy entrepreneurs to align specific policy solutions with political interests and to mobilise political support for reforms.

The implementation of PCNs was enabled by various legislative and policy frameworks. These institutional frameworks were critical in legitimising the reform, providing policy and legal backing, and providing guidance for the design and implementation of the reforms. The role of institutional arrangements in policy effectiveness has been recognised (22). For instance, legal and policy frameworks supported the institutionalisation of healthcare priority-setting reforms globally (23).

While strong non-state actors' support was an enabler of the PCN reform, the over-reliance on external support poses a sustainability challenge to PCN reforms, especially in a context where counties scarcely allocated domestic resources to implement the reform. External actor reliance on technical and financial support for reforms is prevalent in low- and middle-income countries (LMICs) (24). This reliance has been shown to crowd out domestic resource allocation compromise local priorities, and the sustainability of reforms (24).

The study found that implementation fidelity varied across study counties. While study counties had made progress in introducing PCNs by implementing most of the prescribed implementation steps, gaps existed in critical aspects of implementation. These included the sensitisation of lower levels of county health systems, the establishment of critical PCN structures such as MDTs and PCN committees, the assessment of client needs as well as resource needs, and the digitisation of PCNs. Implementation effectiveness is a critical determinant of the success of health policy reforms (25, 26). Often, well-designed policies fail because of sub-optimal policy implementation. Effective implementation, among others, hinges on policy capacity, which encompasses political, technical, and operational dimensions (27–30). While the findings from this study reveal the presence of adequate political capacity to mobilise health sector actors to support PCN reforms and technical capacity to design and implement PCNs, the varied implementation effectiveness points to challenges in operational capacity. This is emphasised by

the observation that PCN implementation in Kenya has relied largely on the technical and financial support of non-state partners in Kenya. As the country scales up PCNs, it is imperative that investments be made to strengthen the policy capacity of counties to implement the reform effectively.

Another observation is the inadequate underlying PHC health system capacity that characterises PCNs in Kenya. PCNs are expected to improve the delivery of PHC services by targeting the healthcare organisation to improve performance (31). For PCNs to be effective, the underlying functionality of health systems should be assured. Put another way, the reorganisation of service delivery is unlikely to achieve much if health facilities do not have medicines, health workers, basic equipment, and robust information systems. PCN implementation in Kenya reveals that inadequate investments in foundational aspects of health system capacity, such as health workers, medicines, and infrastructure, can compromise the success of well-intentioned health system reforms by reducing their effectiveness. It highlights the need for whole-system reforms, where a primary reform is accompanied by supportive and complementary interventions. Failure to do this can undermine the intended effect of reforms. For instance, the poor capacity of lower-level PHC facilities led patients to bypass them to high-level facilities, undermining the intention of PCNs to promote efficiency by strengthening the referral mechanism and gatekeeping. Poor underlying health system capacity can also lead to unintended policy effects. For example, the establishment of MDTs that were meant to provide outreach services to PCN facilities without strengthening the staffing complement of hub facilities meant that outreaches caused disruption of health services at hub facilities. The importance of using a whole-system approach to health system reforms has been demonstrated in other settings (32, 33).

Lastly, the findings show that PCNs in Kenya had limited functional integration. The anticipated impacts of networks of care, which include the improvement of quality of care, equitable access to healthcare, and efficiency of service delivery, are hinged on collaboration and inter-connectedness among the facilities in the network (31, 34). While the networks of care literature emphasises coordination of care delivery (31, 34, 35), our findings show that the coordination of care should be underpinned by the integration of key health facility functions. For instance, it is difficult to coordinate care and ensure continuity of care if information systems across networks of care are fragmented rather than connected. We found that key functional elements of health facilities in the PCNs were not integrated. These include financing and planning, human resource management, commodities and supply chain management, information systems, and care delivery. The fact that these functions were not integrated and coordinated meant that PCNs were networked *de jure* but operated with little or no coordination *de facto*.

A limitation of this study is the fact that we did not assess critical relational factors like collaboration, teamwork, trust, and communication. These are crucial for delivering high-quality PHC. We focused on the structural aspects of PCN implementation. These are key to preparing the health system to provide PHC services. Future research should explore the relational factors that impact the effectiveness of PCNs. Another possible limitation is that the study was conducted early in the implementation of the

PCN reforms. It is likely that the implementation outlook would be different after several more years of implementation.

These limitations notwithstanding, several recommendations can be drawn from the study to strengthen PCN implementation in Kenya and similar settings. First, it is critical that the national and county governments mobilise and allocate sufficient resources to facilitate PCN implementation. This would require increased prioritisation of PCNs in county health budgets, and within these budgets, specific allocations support the set-up and implementation of PCNs as a key PHC intervention. The overreliance on partner support could compromise the long-term sustainability of PCN reforms. An assessment of the resource needs of PCN set-up and implementation, which had not been done in all study counties, should be carried out to inform resource mobilisation efforts. Second, counties should ensure that all design and operationalisation aspects of PCNs are effectively carried out to enhance implementation effectiveness. These include comprehensive sensitisation, the set-up of governance and coordination structures such as PCN committees and MDTs, and the digitisation of PCNs. Third, counties should invest in strengthening the foundational aspects of PCN service delivery by ensuring that PCN health facilities have adequate financing, health workers, health commodities, and infrastructure to support the capacity requirements for PCN service delivery. Fourth, the national government, in collaboration with county governments, should design and implement functional integration arrangements for PCNs. Public finance management (PFM) frameworks that consider PCNs as a planning, budgeting and expenditure unit, as well as reimbursement frameworks that account for the networked nature of PCN facilities, should be explored. Commodity supply chains and information systems should be integrated across PCN facilities to facilitate effective allocation, reallocation, and sharing of resources across PCN health facilities, as well as the coordination and continuity of care. Further, human resource management should be integrated to facilitate the sharing of staff across the health facilities in the PCN. The integration of these functional elements should ultimately support and facilitate care coordination and integration through the strengthening of gatekeeping and referral mechanisms.

CONCLUSION

The implementation of PCN reform is a key strategy in Kenya's PHC-focused UHC reforms. The reform has received substantial political and stakeholder support and is facilitated by a robust legislative and policy framework. Experiences from other settings show that PCNs as a network of care intervention have the potential to improve PHC service delivery (31, 34, 35). Our study shows that for Kenya to realise these potential gains, attention should be paid to strengthening policy design to ensure functional integration within PCNs, enhancing implementation fidelity through strengthening implementation effectiveness, and investing in foundational health system capacity.

Abbreviations

AWP
Annual Work Plan

CECM
County Executive Committee Member
CHC
Community Health Committee
CHIS
Community-based health information system
CHMT
County health management team
CHP
Community Health Promoter
CHS
Community health services
CHU
Community health unit
CHW
Community Health Worker
eCHIS
electronic Community-based Health Information System
FBO
Faith Based Organization
IDI
In Depth Interviews
KHIS
Kenya Health Information System
LMICs
Low-and-Middle Income Countries
LMIS
Logistics Management Information System
M&E
Monitoring and Evaluation
MDT
Multi-Disciplinary Team
MoH
Ministry of Health
NACOSTI
National Commission for Science, Technology, and Innovation
PCNs
Primary care networks
PFM
Public Finance Management

PHC
Primary Health Care
SCHMT
Sub- county health management team
SCMOH
Sub-County Medical Officer of Health
SERU
Scientific and Ethics Review Unit
TWG
Technical Working Group
UHC
Universal Health Coverage
USD
United States Dollar
CDH
County Director of Health
EMR
Electronic Medical Records
SHA
Social Health Agency
SHIF
Social Health Insurance Fund
NHIF
National Health Insurance Fund
PATH
Program for Appropriate Technology in Health
UNICEF
United Nations International Children’s Emergency Fund
THS
Transforming Health Systems
USAID
United States Agency for International Development
NGO
Non-Governmental Organisation
Medsup
Medical Superintendent

Declarations

Ethics approval and consent to participate

This study adhered to the Declaration of Helsinki and received scientific and ethical approval from the Kenya Medical Research Institute Scientific and Ethics Review Unit (KEMRI/SERU/CGMR-C/294/4708). Informed consent was obtained from all participants before conducting the interviews.

Consent for publication

Not applicable.

Availability of data and materials

The dataset from this study will not be shared publicly for ethical reasons, including maintaining participants' confidentiality and anonymity. The data will be available through a formal request to the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

BA, JN, BT, PM, and EB formulated the research question and secured funding for the study. BA, JN, AM, BT, PM, and EB designed the research. BA prepared the initial draft of the manuscript. RM, AM, FM, EW, CM, WN, NR, SH, and EB contributed to the methodology and offered critical revisions to the manuscript. All authors reviewed and approved the final version.

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Table 3

Table 3 is available in the Supplementary Files section.

Figures

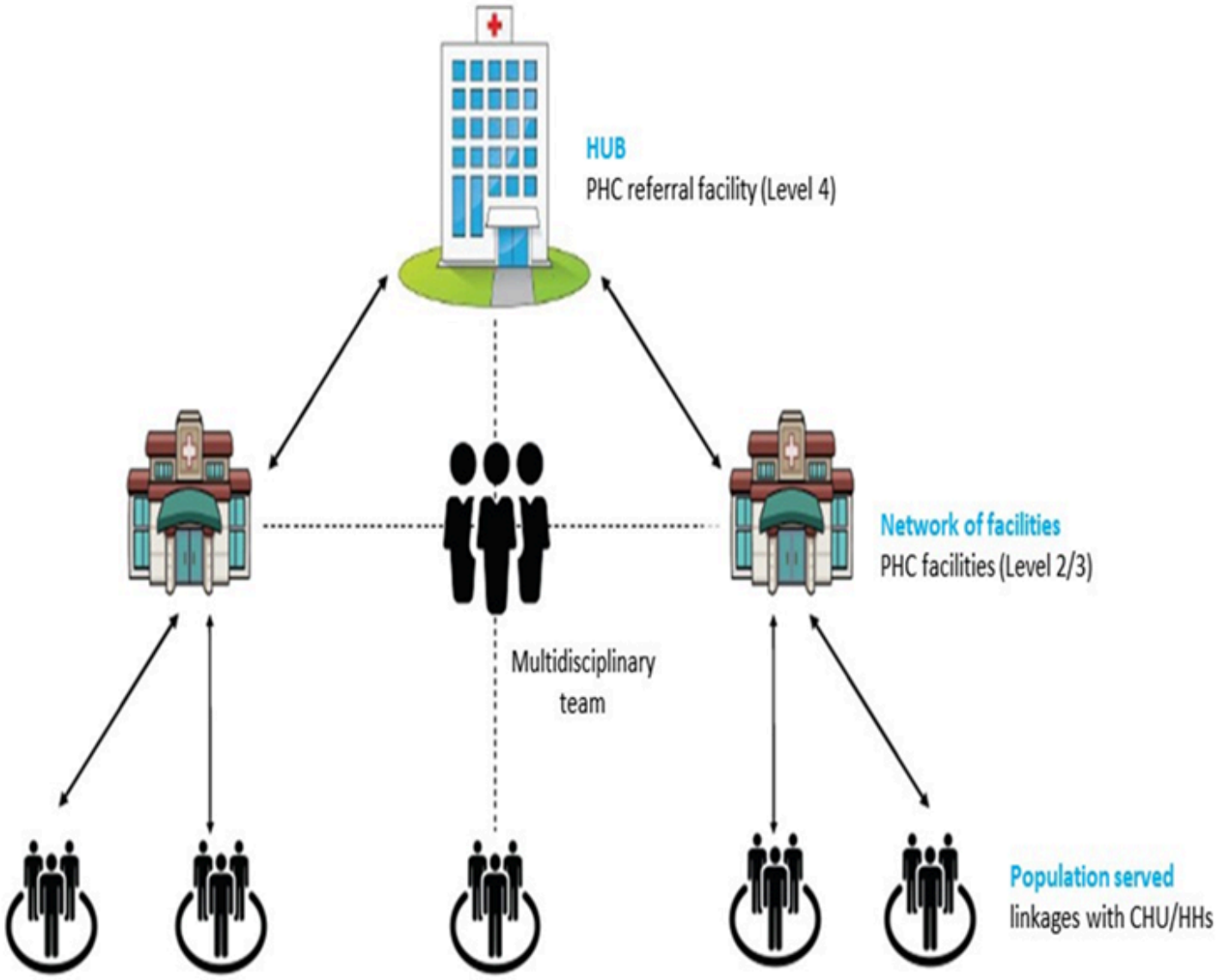

Figure 1

Proposed model of the Primary Health Care Network – 'Hub and spoke model' (10)

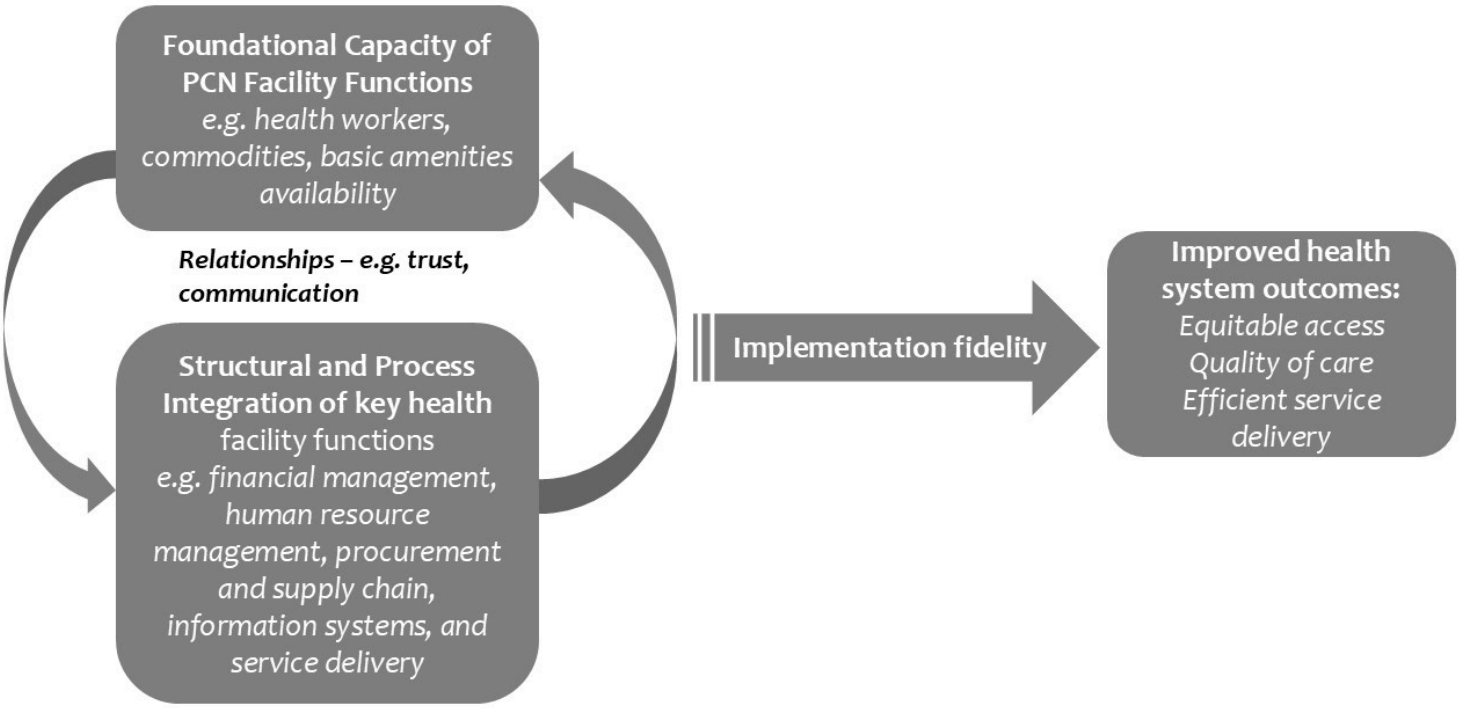

Figure 2

Conceptual framework

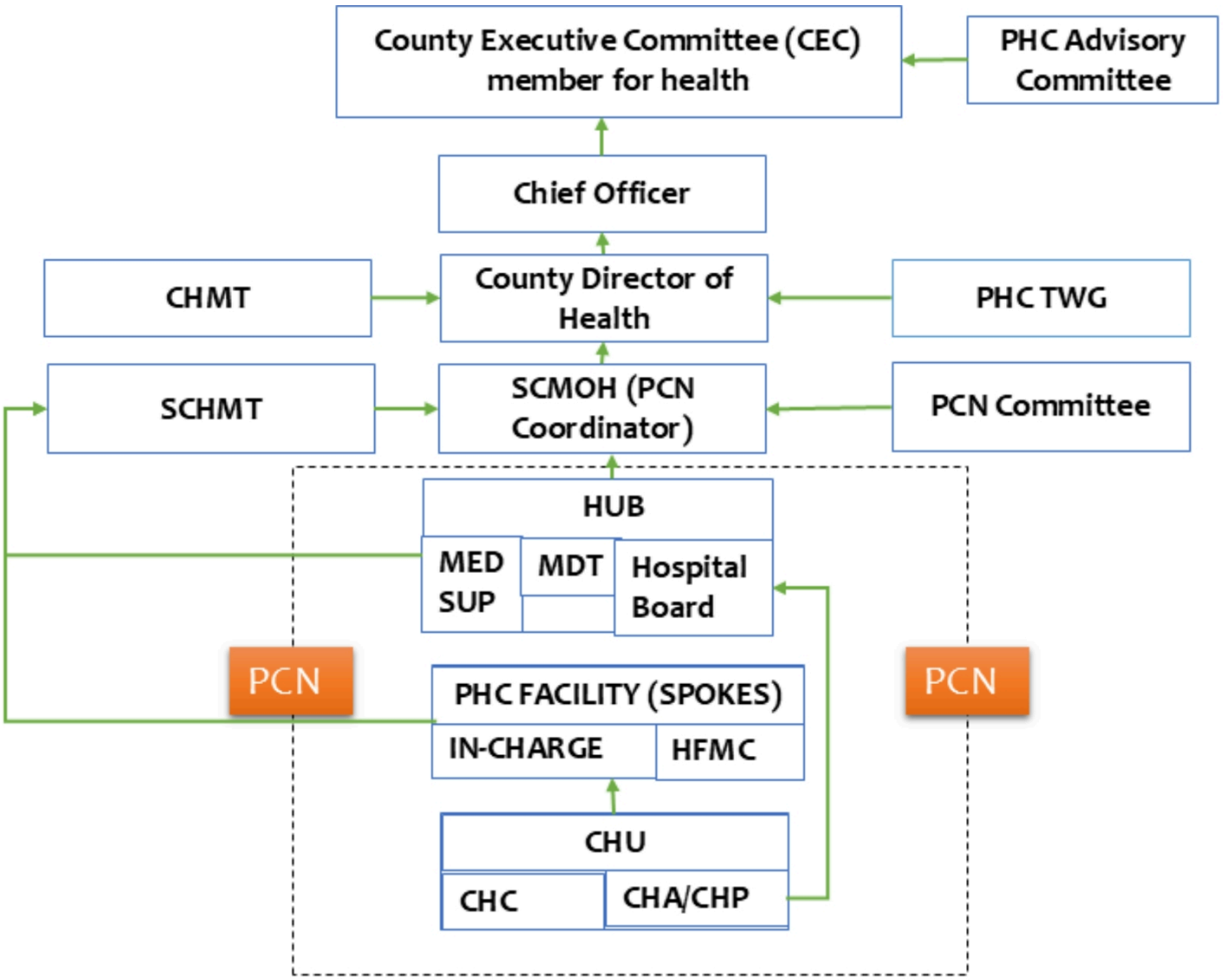

Figure 3

PCN governance and accountability structures (10)

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SuppFilePCNIndepthinterviewguidefinal.pdf
- Table3.docx