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Readiness of primary healthcare and community markets for joint delivery of cardiovascular disease prevention services in Kenya: an observational feasibility study of Health Kiosks in Markets (HEKIMA)

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ABSTRACT

Objectives The increasing burden of cardiovascular diseases (CVDs) in Kenya threatens its healthcare system. There is a need for innovative models that improve equitable access to CVD prevention services. Community markets are social establishments with untapped potential to promote public health. This is a multiphased feasibility study that explores the potential of Health Kiosks in Markets (HEKIMA) to improve access to CVD prevention services. In this formative phase, the aim was to assess the readiness of primary healthcare centres (HCs) and community markets to jointly deliver CVD prevention services.

Design Mixed methods using concept mapping and readiness surveys. Concept mapping with 35 stakeholders from different sectors (health and non-health) to identify feasible priorities for HEKIMA. The readiness questionnaire contained 193 items which were based on the guidance of the WHO Handbook for Monitoring the Building Blocks of Health Systems and adapted to suit the context of a single HC.

Setting Vihiga County is located in western Kenya and has a population of 590 013. A total of 18 HCs and 19 markets were assessed, with 10 HCs and 15 markets included in the evaluation.

Results 91 statements were generated from concept mapping and distilled into 8 clusters, namely equipment and supplies, access and referral, communication, manpower, networks and linkages, practice, service delivery and health promotion. Agreed actions for HEKIMA were provision of efficient quality services, health promotion and partnerships sensitive to the local context. HCs and markets had established governance systems and basic infrastructure. The majority of the HCs lacked essential CVD medications. No HC–market interface existed but there was willingness for a partnership.

Conclusion There was strong consensus that an HC–market interface via community health worker manned kiosks could have a positive impact on health systems, markets and CVD prevention in vulnerable communities. However, significant infrastructural, technical and resource gaps were observed that need to be addressed.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ A key strength of this study was the use of concept mapping: the participatory approach inherent in concept mapping identified priority actions that were agreed by stakeholders from different sectors which is critical for the successful implementation of a multisectoral programme such as Health Kiosks in Markets (HEKIMA).
⇒ The use of a readiness assessment tool tailored to a community setting such as markets was a novel methodological addition, which strengthened the understanding of the enablers and barriers to the implementation of HEKIMA.
⇒ By choosing community markets as the asset to use, there are possibilities of missing populations that may not frequent the markets; agreed on priority actions will inform targeted sensitisation strategies to maximise the reach of the health kiosks.

INTRODUCTION

Non-communicable diseases (NCDs) are a major challenge to the healthcare system that require at-scale, multilevel and multisectoral actions and cooperation.[1] NCDs account for 50% of hospital admissions and 55% of hospital mortality in Kenya, with cardiovascular diseases (CVDs) leading the NCD mortality.[2] Policy initiatives provide a platform for shifting emphasis from a

disease-focused perspective to health systems strengthening. They propose integrating prevention and control policies; promoting healthy lifestyles and implementing interventions to reduce modifiable risk factors; promoting and strengthening advocacy, communication and social mobilisation; and sustainable local and international partnerships.[3–6] There is global recognition of this needed transformation of health systems but there is sparse evidence on how to achieve it in complex sociocultural political contexts.[7]

Kenya has a population of approximately 50 million people who typically seek care at a local primary healthcare centre (HC).[8] Due to the unequal distribution of HCs, people in rural areas travel long distances for face-to-face consultations. Health expenditure is heavily skewed towards disease management as a result of delays in seeking care,[9] with those with chronic conditions exceptionally incurring high out-of-pocket expenditure.[10] Workforce shortages, skill mix imbalances and poor working conditions add to the challenges faced by the Kenyan health system.[3] Sustainable community-HC bridging initiatives may offer a unique route to address these challenges.[11] Globally, there is a scarcity of these initiatives, particularly in low-income and middle-income countries (LMICs).

The Health Kiosks in Markets (HEKIMA) study is a theoretically driven multiphased systems-level intervention. It seeks to explore whether kiosks in community markets, run by community health workers (CHWs), who are supervised by HC nurses, can improve the reach of CVD preventive care to communities. It draws on social capital theory,[12] which posits that resources available to individuals and groups through connections with a community, can facilitate behaviour change and adaptive coping. Markets are community assets with the potential to embed key health-promoting practices into everyday life in a culturally familiar and trusted context.[13] In Kenya, markets are conveniently juxtaposed to allied services (eg, pharmacies) and used by all sections of the community. Emergent evidence on the effectiveness of health information kiosks signals the potential to enhance self-management of chronic diseases among low-income/literacy populations.[14] Evidence on task shifting supports the cost-effectiveness of CHWs for the prevention and management of CVD in LMICs.[15]

HEKIMA was codesigned with stakeholders from the community, local health services and county government. In this paper, we report on phase 1 which, obtained stakeholders' perspectives on important and feasible actions for developing HEKIMA as a system interface between HC and community markets, with trained CHWs delivering CVD services, mainly screening for CVD risk factors, lifestyle modification advice and referral to specialist care; and assessed the infrastructural capacity and capabilities of the HC and community markets for implementing HEKIMA.

METHODS

Study site

Vihiga County located in western Kenya covers an area of 568.3 km2, has a population of 590 013 with 90% residing in rural areas, population density 1047 persons/km^2 compared with the national average of 82 persons/km^2, life expectancy of 56 years and overall poverty index of 38.6. The county has five subcounties, two in the upper and three in the lower midland agroecological zone[16] . Health service delivery in Kenya is organised into six levels.[1] Community health services form level 1, dispensaries, HCs, subcounty (primary) hospitals, county referral (secondary) hospitals and national referral (tertiary) hospitals form levels 2–6, respectively. Vihiga County has one secondary hospital, three primary hospitals, 18 HCs and 32 dispensaries, with a nurse:population ratio of 1:1947. The average distance to the nearest health facility is 5 km. It has 19 major markets with typical market days, 92% located in rural areas.

Design

A mixed-methods approach that uses concept mapping[17 18] and readiness survey assessments of HCs and markets.

Stakeholder perspectives

Concept mapping was used to obtain stakeholders' perspectives on actionable priorities for implementing HEKIMA. It is a participatory mixed method five-stage approach increasingly used in the planning of public health interventions.[19]

1. Purposive sampling was used to recruit multidisciplinary stakeholders (N=35), age range 25–74 years, who participated in a concept mapping workshop. They included HC practitioners—nurses, CHWs, medical officers, laboratory technologists, health promotion officers and public health officers (n=22), market and business community representatives (n=10), and non-governmental organization (NGO) and patient representatives (n=3).
2. Brainstorming: A focus prompt was agreed with a small group of stakeholders and was used for brainstorming with all stakeholders 'Factors influencing the use of the health kiosks by market users are……'. The research team distilled the completed statements, deleted duplicates, clarified ambiguities and combined points.
3. Sorting and rating: Participants sorted the statements into conceptually similar piles and created a name for the piles. For each statement, participants were asked 'How important do you think this will be for the prevention and control of CVDs in Vihiga County?' and 'How feasible is it to do this?' They then rated each statement on its importance and feasibility using a 5-point scale (Importance rating: 1=relatively unimportant, 2=somewhat important, 3=moderately important, 4=very important, 5=extremely important; feasibility rating:1=not at all feasible, 2=somewhat feasible, 3=moderately feasible, 4=very feasible).

4. Multidimensional scaling (MDS): The Group Concept Mapping App[20] was used to generate concept maps. First, the sorted data were analysed using MDS to create a two-dimensional 'point map,' or a visual representation of each statement and the distance between them based on the square symmetric similarity matrix. Each statement was represented as a numbered point, with points closest together more conceptually similar. The stress value of the point map is a measure of how well the MDS solution maps the original data, indicating a good fit. The stress value for the MDS analysis of the sort data was 0.3184 which falls within the average range of 0.10 and 0.35 for concept-mapping projects.[21]
5. Hierarchical cluster analysis was used to delineate clusters of statements (points) that are conceptually similar and create associated cluster maps using the grouping of statements from the point map. To determine the final cluster solution, the researchers consulted stakeholders on a series of maps and assessed the appropriateness and bridging values (BVs) of statements in each cluster, and the average BVs at cluster level. High coherence within a cluster (lowest BVs) meant that most participants agreed on the statements. Go-Zone graphs generated showed the most actionable (high importance, high feasibility) and least actionable (low importance and low feasibility) statements. Stakeholders were engaged throughout the process of analyses to ensure that the interpretation aligned with their expectations.

Preparedness of HCs and community markets

A readiness assessment of HCs and markets in Vihiga County was conducted in August 2021. The selection criterion for markets and HCs was the availability of two markets within 5 km of an HC, the agroecological zone, rural/urban status and market size based on average number of visitors on a typical market day. 10 out of 18 HCs and 15 out of 19 major markets in the county were assessed using semi-structured questionnaires (online supplemental table 1). Readiness assessments used adapted questionnaires that were developed in the CONgregations Taking ACTion against NCDs[11]. The HC readiness questionnaire contained 193 items which were based on the guidance of the WHO Handbook for Monitoring the Building Blocks of Health Systems [22] and was adapted to suit the context of a single HC. The questionnaire was completed by the most senior staff member at each HC (usually the facility-in-charge), except for an observation section that was completed by trained research staff. The market readiness questionnaire contained 81 items, adapted for markets. The respondents were market committee chairpersons. We aggregated the responses in HC and market assessments into the following domains: client base, governance, resources, community health programmes, collaboration with other sectors and perspectives on having a health kiosk in the market. Descriptive statistics and thematic analyses[23] were used to summarise the data.

Patient and public involvement

The health system research question was arrived at on extensive consultations with local stakeholders on the disease burden and strategic focus of the county and country as a whole. Engagement of local stakeholders was ensured using participatory research approaches such as concept mapping in identifying contextually appropriate priority actions for HEKIMA, consensus building and intervention codevelopment.

RESULTS

Stakeholder perspectives on important and feasible actions for developing HEKIMA

Online supplemental table 2 shows the 91 statements that were generated from the prompt, the 8 clusters that were coidentified, and the BV for each statement and cluster. The clusters were equipment and supplies (8 statements, 0.54), access and referral (12 statements, 0.45), communication (9 statements, 0.25), practice (10 statements, 0.24), manpower (14 statements, 0.34), networks and linkages (8 statements, 0.16), service delivery (8 statements, 0.05) and health promotion (22 statements, 0.17). The average BV among the clusters was 0.275. There was strong agreement on issues to do with the provision of efficient and quality services sensitive to the local context, partnerships and communication.

Figure 1 is the Go-Zone with the thematic summary of statements (online supplemental figure 1 with all statements) showing stakeholders' classification of actions by importance and feasibility. 45 of the 91 statements were rated as highly important and highly feasible (upper right quadrant), with most of the statements coming from a range of clusters. Issues to do with service delivery—competent workforce, functional equipment and drugs, cost-free services, privacy and confidentiality, flexibility in operating times, stakeholders' engagement and support, availability of counselling and follow-up services, and accessibility of health kiosk; health promotion—health education, community sensitisation by the market leadership, information sharing, timely communication and use of local dialect; and partnerships—linkages with other community units, participatory dialogue days and public–private partnerships, were rated as highly important. Highly important and feasible action points included securing equipment and supplies, partnerships, accessibility, safe spaces, and training of personnel. Constraining factors such as availability of health facilities and seasonality were rated as the least important and less feasible action points.

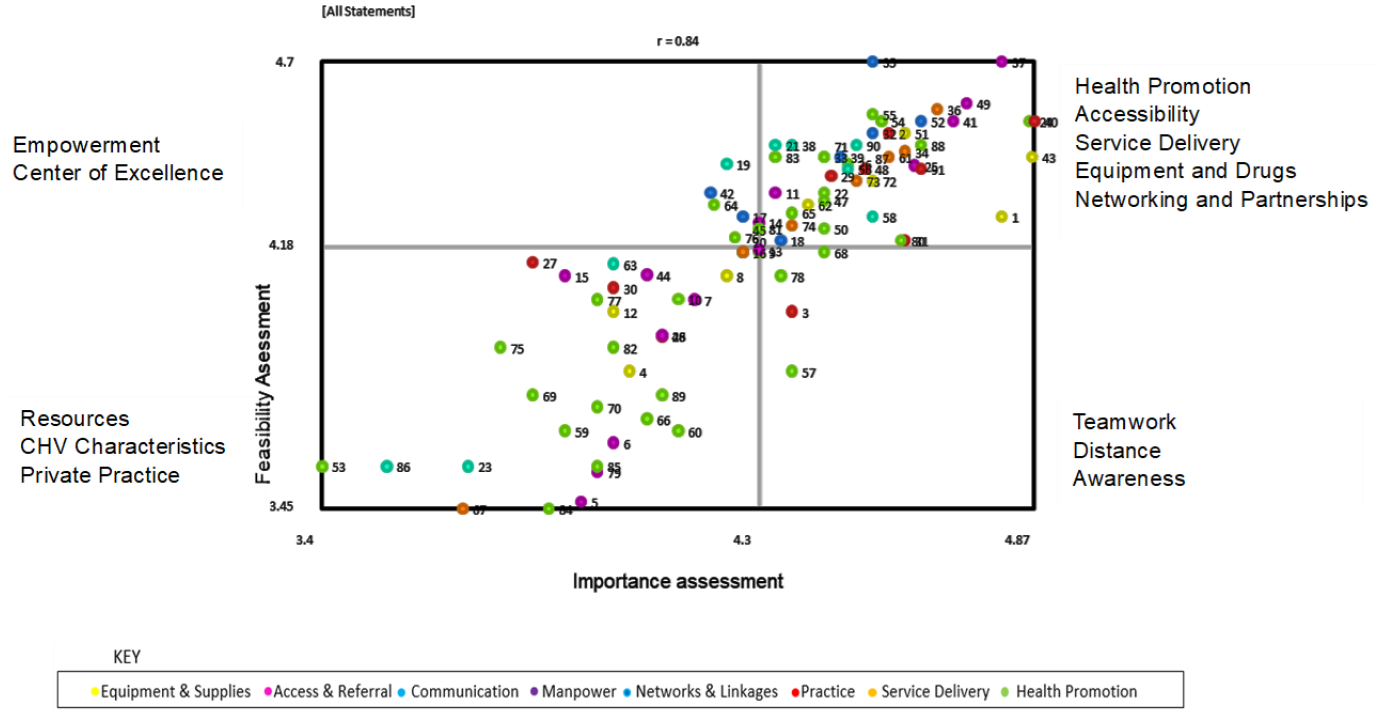

Figure 1 Go-Zone showing stakeholders' classification of statements by importance and feasibility. CHV, Community health volunteer

Infrastructural capacity and capabilities of HCs and community markets for delivery of HEKIMA

Tables 1 and 2 highlight the context and general preparedness of the HCs and markets for the intervention, respectively.

Client base

The median size of population served by an HC was 20 607. The markets served 80–5000 users/market day (average 2 days/week) and operated 8–17 hours depending on the market size.

Governance

The leadership and management of the HCs followed a hierarchical model. The HC governance was via committees which worked with the respective health facility management teams and reported to the executive. The county had designated NCD focal team, a CHWs supervisory framework and referral protocols. All markets had administrative structures (market management committees) established under the County Trade and Market Management Act 2018, responsible for decision-making, welfare and conflict resolution. They comprised county staff (market managers and revenue in-charge) and market community-based organisations (CBOs) officials (chairperson, secretary and treasurer) elected by peers and certified by the County Social Services Department.

Resources

The median number of nurses attached to an HC=8; CHWs/HC=22; 60% of HCs had a central database; 80% with a disease surveillance system; 40% with computerised data and 80% lacked essential drugs for hypertension (HT) and diabetes mellitus (DM), with stockout periods ranging from 2 to 24 weeks. The number of patients registered in the NCD clinics varied from 13 to 60 depending on the size of the population served. All HCs had basic equipment for blood pressure and blood sugar testing but lacked CVD risk assessment tools. There was partial implementation of protocols related to CVD and DM management; monitoring and audit remained weak. All HC had electricity but 80% lacked internet connectivity. The physical layouts of markets varied from enclosed to open air markets. All had access to electricity, the majority were constrained for space especially the larger markets, while some were in transition to new structures. Most traders were small scale. The CBOs collected revenues to run market affairs. Security varied by market size. 11 out of 15 market leaders lacked offices for record keeping.

Community health programmes

50% of the HCs offered HT and DM care services at least twice a week. 90% of HCs offered primary prevention and health promotion services. Health-related activities in the markets were evidenced by the presence of pharmacies, private clinics and traditional herbalists in all the markets, social health workers in four markets, and awareness of NCDs by market users. Barriers to CVD prevention included self-medication, lack of market-health sector collaboration regarding NCDs and market users' wary of referrals to HCs due to frequent drug stock-outs.

Collaboration with other sectors

Nine out of 10 HCs had nearby non-public health facilities offering NCD screening and testing services. None

Table 1 Readiness of primary healthcare centres for the delivery of HEKIMA

Health centre	Service delivery	Health workforce	Health information system	Essential medicines	Collaboration with markets
Sabatia	Basic clinical equipment. No haematology, radiology and biochemistry equipment. NCD primary health services, DM management protocol and weekly NCD clinic.	68 healthcare workers (HCWs) (medical officer-1, clinical officers-9, nurses-12, CHWs-30, allied workers-6).	Disease surveillance system. No internet access, no central database	Drugs for DM, HT, antidepressants and painkillers. No antibiotics.	No collaboration with markets targeting NCDs.
Serem	NCD primary health services, DM and HT management protocols, weekly NCD clinic, basic clinical equipment. No haematology, radiology and biochemistry equipment.	39 HCWs (clinical officers-5, nurses-10, CHWs-18, allied workers-6).	Disease surveillance system. Central database. No internet access.	Missing drugs for DM and HT.	No collaboration with markets targeting NCDs.
Tigoi	Basic clinical equipment. No radiology and biochemistry equipment. NCD primary healthcare services. Management protocol for DM, weekly NCD clinic.	29 HCWs (clinical officers-5, nurses-8, CHWs-10, allied workers-6).	Disease surveillance system. Internet access. Central database.	Drugs for HT, antibiotics and insulin out of stock.	No collaboration with markets targeting NCDs.
Vihiga	Basic clinical equipment. No haematology, radiology and biochemistry equipment. NCD primary health services, weekly NCD clinic. No management protocols for HT and DM.	64 HCWs (clinical officers-5, nurses-8, CHWs-44, allied workers-7).	Disease surveillance system. Central database. No internet access.	Missing drugs for DM, HT, antibiotics and painkillers.	Local organisations targeting NCDs. Prior collaboration with markets on NCDs.
Lyanaginga	Basic clinical equipment. No radiology, haematology and biochemistry equipment. NCD primary healthcare services. Weekly NCD clinic. Management protocols for DM and HT.	18 HCWs (clinical officers-4, nurses-4, CHWs-3, allied workers-7).	Disease surveillance system. No internet access. No central database.	Not reported.	No collaboration with markets targeting NCDs.
Ebusiratsi	Basic clinical equipment. NCD primary healthcare services. Management protocols for DM and HT, weekly NCD clinic. No radiology and biochemistry equipment.	62 HCWs (clinical officers-7, nurses-8, CHWs-40, allied workers-7).	Disease surveillance system, central computerised data. No internet access.	Drugs for HT, antibiotics and painkillers out of stock.	Local organisations targeting NCDs. Prior collaboration with markets on NCDs.
Enzaro	Basic clinical equipment, NCD primary healthcare services, weekly NCD clinic. Management protocol for HT. No radiology and biochemistry equipment.	36 HCWs (clinical officers-3, nurses-7, CHWs-22, allied workers-4).	Disease surveillance system. Central database. No internet access.	Drugs for HT, antibiotics, insulin and painkillers out of stock.	No collaboration with markets targeting NCDs.
Ipali	Basic clinical equipment. NCD primary healthcare services. Management protocols for DM and HT. Weekly NCD clinic. No radiology and biochemistry equipment.	60 HCWs (clinical officers-5, nurses-9, CHWs-40, allied workers-6).	Central database. No internet access. No disease surveillance system.	Drugs for DM, HT and antibiotics were out of stock.	No collaboration with markets targeting NCDs.
Ekwanda	Basic clinical equipment. No haematology, radiology and biochemistry equipment. Management protocol for DM. NCD primary health services.	34 HCWs (clinical officers-4, nurses-4, CHWs-21, allied workers-5).	Internet access. No disease surveillance system. No central database	Drugs for HT, antibiotics, insulin and painkillers out of stock.	No collaboration with markets targeting NCDs.
Bugina	Basic clinical equipment. No haematology and biochemistry equipment. Management protocols for DM and HT. NCD primary health services including mental health.	38 HCWs (clinical officers-2, nurses-10, CHWs-20, allied workers-6).	Disease surveillance system, central computerised data. No internet access.	Drugs for HT, DM, antibiotics and painkillers out of stock.	No collaboration with markets targeting NCDs.

CHW, community health worker; DM, diabetes mellitus; HEKIMA, Health Kiosks in Markets; HT, hypertension; NCDs, non-communicable diseases.

Table 2 Readiness of community markets for the delivery of HEKIMA

Market	Size and reach	Organisation	Health-related activities	Leadership perspectives on HEKIMA
Majengo	Open air market; 3 market days/week; Operating 17 hours/day. Average 500 users on a market day. Food sourced mainly from neighbouring counties.	Presence of a market committee. Had permanent and portable market stalls.	Pharmacies, herbalists and private clinics in the market. Had two CHWs serving in the market.	There was need for NCD prevention services in the market with the support of local government.
Mahanga	Open air market; 2 market days/week; 14 hrs/day. Approx. 200 users/market day. Food sourced mainly from neighbouring counties.	Had a market committee, and both permanent and temporary stalls.	Pharmacies within the market. A link health facility was within a 5 km radius.	Levers for HEKIMA's success will be sensitisation and mobilisation of community and government support, leadership and communication.
Bukuga	Open air market; open on Fridays for 8 hours serving approx. 100 users/market day. Public schools nearby.	Market committee overseeing all market affairs.	Private health practice within the markets. An HC and dispensary nearby.	Meets community need for health education. Location, sensitisation and partnerships key for success.
Mudete	Open air market; 2 days/week serving approx. 1500 users/market day. Food sourced from neighbouring counties.	Market committee. Shops and stalls within gated confines.	Pharmacies and clinics. Nearby hospital. Prior collaboration on health.	Development of HEKIMA will require community sensitisation and county support.
Mago	Open air market once/week for 12 hours; approx. 300 users/market day. Food sourced from neighbouring county.	Market committee. Private buildings and few temporary kiosks.	Allied services and health workers. History of collaboration with an HC.	Addressing community need. Success dependent on leadership, regular communication and consultations.
Shamakhokho	Open air market serving approx. 500 users/market day. Food sourced from neighbouring county.	Market committee. Private buildings hosting shops and supermarkets.	Private health facilities and public hospitals within range.	HEKIMA will improve awareness. Sensitisation and leadership central to its success.
Mwichio	Open air market; 2 days/week for 12 hours; approx. 300 users/market day. Food sourced from within the county.	Market committee. Financial and security services in the market.	Pharmacies in the market. Linked health facility within reach.	Addressing a health education gap. Setup, medication, communication, leadership support key to success.
Luanda	Open-air market; 2 days/week for 17 hours; approx. 5000 users/market day. Food sourced from neighbouring counties.	Market committee. Banks, shops and security apparatus.	Private health facilities, herbalists and social health workers. Three HCs within reach.	HEKIMA addressing community need. Communication, community and government support perceived as key to HEKIMA's success.
Ekwanda	Open air market; 2 days/week for 14 hours; approx. 500 users/market day. Food sourced from neighbouring counties.	Market committee present. Permanent and temporary stalls, offices and banks.	Presence of private health practice, market health committee and social workers.	HEKIMA will address the health education need. Public participation and government support key to its success.
Serem	Open air market; 2 days/week for 9 hours; approx. 2000 users/market day. Food sourced from neighbouring counties.	Market committee. Police and private security in the market.	Several pharmacies. Link HC located within the market.	Needed for educational purposes. Communication and leadership reported as key to HEKIMA's success
Ebuyangu	Open air market operating once/week for 13 hours, serving approx. 300 users/market day. Food sourced from within the county.	Market committee present. Public and private security in the market.	Presence of private health practice in the market. Link HC within close range.	Meeting local health need. Leadership support and communication are reported as key levers for HEKIMA's success.

Continued

Table 2 Continued

Market	Size and reach	Organisation	Health-related activities	Leadership perspectives on HEKIMA
Chavakali	Open air market operating once/week for 14 hours, serving approx. 1000 users/market day. Located on a highway. Food sourced from neighbouring counties.	Market committee present. Permanent buildings, stalls, banks, schools and eateries.	Pharmacies and herbalists. History of collaboration with local administration. Link HC within reach.	Addressing local need. Success dependent on good public relationships and government support.
Boyani	Open air market operating for 11 hours serving approx. 80 users/day. No designated market day. Produce sourced from neighbouring county.	Market committee present. Permanent buildings, school and churches.	Had one pharmacy and one social worker. Two HCs within a 5 km radius.	HEKIMA can improve awareness. Leadership, trust and partnerships key for success.
Esibuye	Open air market operating 2 days/week for 10 hours serving approx. 3000 users/day. Produce sourced locally and from neighbouring county.	Market committee present. Permanent and temporary buildings, mosque.	Four pharmacies and one clinic in the market. Link HC within easy reach.	Addressing local health need. A resourced kiosk coupled with supervision deemed necessary for HEKIMA's success.
Gambogi	Open air market operating 2 days/week for 8 hours serving approx. 400 users/day. Produce sourced locally.	Market committee. Permanent buildings, livestock market, banks and police station.	Three pharmacies, 4 clinics, 2 HCs within reach. Few social workers.	Addressing local need. Leadership, partnerships, trust and respect as perceived enablers.

CHWs, community health workers; HCs, healthcare centres; HEKIMA, Health Kiosks in Markets; NCDs, non-communicable diseases.

reported homecare for persons with end-stage NCDs, or collaboration with markets targeting NCD prevention. Two HCs had local activities targeting NCD control and two reported a history of collaboration with markets in NCD educational campaigns. 90% were optimistic about the benefits of HC–market collaboration to the community. All HCs were open to working with CHWs.

Perspectives on HEKIMA

There was a recognised need for health education, involvement of CHWs, mutual respect and trust, regular communication using appropriate channels, construction and equipping the kiosks with drugs, and supervision of the kiosks by an HC–Market joint team. Sustainability of the intervention would depend on funding, adaptability and acceptance of the intervention, government support, leadership and frequent monitoring (details in online supplemental tables 3 and 4).

DISCUSSION

With an emphasis on the participatory approach inherent in systems thinking,[24] we sought to explore factors that may influence establishment of an HC–market system interface (health kiosk), delivery of and uptake of CVD prevention interventions by market users and community at large. Overall, concept mapping identified priority actions likely to influence the use of HEKIMA. Results from the readiness assessments highlighted areas of synergy, opportunities and barriers to be addressed.

Stakeholder priority actions to improve CVD prevention using HEKIMA

Concept mapping enabled synthesis of views across stakeholders with differing access to resources and the ability to implement change.[25] Core elements of CVD prevention identified were efficient and quality service delivery, partnership and health promotion. Service delivery inputs encompassed functional aspects of the intervention such as provisioning of equipment and supplies, accessibility, cost-free services and competent personnel. They were complemented by relational priorities including good customer service, counselling and follow-up services, professionalism, privacy and confidentiality concerns. These priorities speak to the primacy of trust and mutual respect, key to building effective linking capital[26] between the community and the kiosk service providers. The actions align with global recommendations on providing accessible, responsive and inclusive adequate and quality health services.[1 27] The low BV for service delivery reflects strong correspondence and a shared vision of an acceptable standard of kiosk services. Provision of services sensitive to the local context was rated highly, implying that, to the extent possible, interventions should be sensitive to local culture and respect the cultural sensibilities of the communities in which they will be implemented.[28 29]

The stakeholders also identified health education, engagement of market stakeholders, social marketing,

timely communication and use of local dialect as key enablers of health promotion. Engagement of market leadership in community mobilisation was highly rated, which, coupled with social capital of the trade sector, recruitment of local CHWs and social marketing, provides potential levers for mobilising support for the intervention. This points to the importance of interventions tapping from the wealth in cultural practices that promote public health.[29 30] Also, empowering communities in the prevention and control of NCDs is of strategic importance to Kenya. Decisions involving social value judgements and participatory rights-based approaches are recommended when the potential for improved outcomes exists.[1] Factors such as patients learning self-management skills rated as highly important but less feasible require appropriate dissemination strategies. The use of local dialects, posters and health education was identified as potential process outcomes.

Action points related to partnership-building included linking with other community networks, participatory dialogue days and private–public partnerships. These speak to the complex collaborations, pragmatism and adaptations necessary in aligning research undertakings to the local context. Integrating perspectives of stakeholders from diverse backgrounds helps capture promising strategies to inform a conceptual model of implementation that focuses on stakeholder priorities while fostering colearning.[31] The least important and feasible actions such as the influence of private practice and the presence of other health facilities in the markets reflect structural factors inherent in market ecosystems, which needs to be factored in the design of complex interventions. Themes rated as highly important and feasible provide the basis to evaluate current research support. Future efforts should explore how to best support innovative targets, those rated highly important but less feasible.

Concept mapping is a time and resource-intensive consultative process. However, it revealed the complex interaction between the social, political, economic and environmental factors[32] in delivering complex health interventions and unearthed a shared understanding of likely facilitators and barriers for action. Both divergent and convergent perspectives emerged, and collectively created signals for where to prioritise actions within a home-grown framework.

Infrastructural capacity and capabilities of HCs and community markets to implement HEKIMA

There is considerable variability in the burden of NCDs and in corresponding preparedness to deal with it.[33] Existence of governance and coordination structures at HCs and markets showed strong policy support and demonstrated existing structural capital within the health and trade sectors and linking capital between the community and the local government, which provide opportunities for system strengthening.[34] The basic HC infrastructure to support CVD prevention, potential reach of the health kiosks and demand for health education by market traders emerged as key enablers.

Community markets have the client base, reach and potentially bridging capital for the kiosks to access the population, and the distribution of HCs in the county makes linkage to care within the recommended 5 km radius from community markets feasible. The use of CHWs who form part of a vibrant community health services infrastructure provides another ready resource of bridging capital that can be leveraged to connect the market community to the health kiosks and address the risk of missing populations that may not frequent the markets. This capacity can be strengthened by incorporating community priority actions such as the provision of safe spaces that guarantee privacy and confidentiality.

The general goodwill for co-operation between health and trade sectors despite no previous formal interactions was another welcome finding. Existing networks could provide a platform for the intersectoral engagement needed to develop and implement the intervention, with the observed enthusiasm for partnership including willingness to form a joint oversight committee further presenting an opportunity to build the additional bridging capital needed to entrench and sustain the intervention. Another valuable insight that emerged was the need for mobilisation of sound support for service provision at HC level, and in particular a mitigation plan for drug stock outs to support linkage to care, and adequate training and provisioning for kiosk staff. The observed inadequacies in health systems inputs are corroborated by a recent study in Kenya which found similar gaps in the readiness of healthcare facilities to provide integrated care services for CVDs and DM.[35] These and other long-standing health system challenges are potential confounders to the anticipated role of HEKIMA. Improved capacity of health information systems and capacity and quality of management within primary care facilities are necessary to improve the quality of care.[36] Familiarity with data management and disease surveillance systems, although in a few HCs, signals the opportunity to strengthen the health system through digitisation.[37 38] Consistent training of the healthcare workforce including CHWs, coupled with guidance and adequate logistical support, may hold promise in the creation of adaptable NCD service delivery models.[39 40] The intervention design, which brings nurses and CHWs together in serving communities, may address the perceived lack of recognition of CHWs by formally trained health workers.

Importance of multisectoral partnerships in bridging community-primary healthcare systems

Kenya visions a nation free from the preventable burden of NCDs and advocates for the inclusion of health-in-all policies and whole of government approaches in public sector engagements. One of its

strategic investments is reduction in exposure to modifiable risk factors through strengthening multisectoral and community-based interventions.[1] Creation and promotion of HEKIMA will require cross-sectoral action and cooperation to address noted system gaps and the actions perceived to be important and feasible. Existing policy and governance structures (structural social capital) for HC and markets provide the basis for formation of new coalitions and a paradigm shift in collective governance for health. Stakeholders' agreement on the action points reflects the commonality (roots of cognitive capital) and signals the possibility of linking activities and cooperation between different policy areas for joint outcomes.[41] Our findings also signal that the boundaries (norms, practices, etc) within which people work have different levels of permeability for the local government, HC and community markets. This will influence how each partner contributes to the HC–market systems interface, possibly unique (eg, supply of essential drugs for CVD management) but also complementary (establishing how the kiosk is managed, and the role of traders, CHWs, etc).[42 43]

NCDs also reflect wider upstream social determinants that require policy response beyond the health sector. A multisectoral and systems approach to health enhances interaction and mutual support among the system components in addressing the social determinants of health.[29] From our findings, strategies that incorporate local values and ideals in ensuring horizontal equity and social justice in health systems such as encouraging early and regular healthcare access through cost-free services and vertical equity through effective redistribution of information are essential. The current findings offer potential for understanding the mechanisms that contribute to the nonlinear behaviour of complex health and community systems, and the complementarity of partnering and boundary dynamics will be key to designing and operationalising HEKIMA.

Implications for policy and practice

Through concept mapping, primary care was being shaped with the community through codevelopment (bottom-up). The potential for this concept to be transferred under other conditions is tremendous (participatory approach). Use of community-based participatory approaches offers opportunities for sharing collective community experiences and knowledge generation for relevance and applicability. It offers planners a new frame for critically designing a social process that is responsive, and which fosters collaborative implementation of resulting plans.[44] It strengthens research and practice outcomes by entrenching multisectoral collaboration, adaptation, mutual learning, sustainability and legitimacy[30] and aligns with democratic rights to public participation (Kenya Constitution).

Primary healthcare is the cornerstone of strong and equitable healthcare in Kenya. Key enablers such as governance, NCD programmatic strategies, community mobilisation and partnerships can support multicomponent interventions for advancement of the universal health coverage, a central pillar of Kenya's health reform agenda.[28 32] However, attention to the critical barriers observed such as in financing, commodity supply and digitisation of health systems require high-level legislation and incentivisation to drive system change.[45]

Prevention efforts require investments in networking, communication, coordination and collaboration.[46] The willingness to form a joint HC–market committee provides the opportunity for the shared vision in creating culturally relevant and acceptable health promotion programmes using a people-centred approach.[47] Sustained advocacy and public education will be key to building and maintaining these relationships and trust.[40]

The identified priority actions, capacity and capabilities will inform implementation, process evaluation and intervention modelling in phase 2 of the study.

Strengths and limitations

Despite concept mapping requiring intense consultations with lots of statements to be pragmatically distilled and considerable investment of time and manpower, stakeholders from the different sectors improved comprehensiveness and gave breadth and depth in identifying priority actions of synergistic impact. Concept mapping by-passed power dynamics that usually stifle individual views thereby enabling diverse representation of views, customisation of the intervention and lends internal validity to the codevelopment process. By choosing the community market as the asset to use in this study, there are possibilities of missing populations that may not frequent the markets. The readiness assessments enabled rigorous assessment of the implementation context and gave a sense of who is likely to be missed, and for whom priorities identified in the concept mapping will help shape targeted sensitisation and mobilisation strategies. Combining readiness assessment and concept mapping provides in-depth understanding of an illustrative LMIC context within which CVD interventions can be implemented.

CONCLUSION

The concept mapping and readiness assessments highlighted a pressing need for community empowerment through accessible, readily comprehensible and trustworthy sources of health education on the prevention and control of CVDs. HEKIMA is premised on using existing resources in novel and innovative ways to build a closer community–HC interface. The social capital inherent in the markets and HC, and

consensus built during the concept mapping process points to a favourable environment for building the intersectoral linkage needed to successfully deliver the intervention. Implementation and sustainability of HC–market systems will depend on community acceptability and cooperation and resourcing responsive culturally appropriate health promotion services. Notable adaptations for the next phase of HEKIMA will include careful evaluation of the interaction between complex political, economic, social cultural contexts and the social practices of implementing CVD preventive services in market kiosks.

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