

# Barriers Influencing Linkage to Hypertension Care in Kenya: Qualitative Analysis from the LARK Hypertension Study

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**BACKGROUND:** Hypertension, the leading global risk factor for mortality, is characterized by low treatment and control rates in low- and middle-income countries. Poor linkage to hypertension care contributes to poor outcomes for patients. However, specific factors influencing linkage to hypertension care are not well known.

**OBJECTIVE:** To evaluate factors influencing linkage to hypertension care in rural western Kenya.

**DESIGN:** Qualitative research study using a modified Health Belief Model that incorporates the impact of emotional and environmental factors on behavior.

**PARTICIPANTS:** *Mabaraza* (traditional community assembly) participants ( $n=242$ ) responded to an open invitation to residents in their respective communities. Focus groups, formed by purposive sampling, consisted of hypertensive individuals, at-large community members, and community health workers ( $n=169$ ).

**APPROACH:** We performed content analysis of the transcripts with NVivo 10 software, using both deductive and inductive codes. We used a two-round Delphi method to rank the barriers identified in the content analysis. We selected factors using triangulation of frequency of codes and themes from the transcripts, in addition to the results of the Delphi exercise. Sociodemographic characteristics of participants were summarized using descriptive statistics.

**KEY RESULTS:** We identified 27 barriers to linkage to hypertension care, grouped into individual (cognitive and emotional) and environmental factors. Cognitive factors included the asymptomatic nature of hypertension

and limited information. Emotional factors included fear of being a burden to the family and fear of being screened for stigmatized diseases such as HIV. Environmental factors were divided into physical (e.g. distance), socioeconomic (e.g. poverty), and health system factors (e.g. popularity of alternative therapies). The Delphi results were generally consistent with the findings from the content analysis.

**CONCLUSIONS:** Individual and environmental factors are barriers to linkage to hypertension care in rural western Kenya. Our analysis provides new insights and methodological approaches that may be relevant to other low-resource settings worldwide.

**KEY WORDS:** qualitative research; hypertension; global health; cardiovascular disease; socioeconomic factors.

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## INTRODUCTION

Cardiovascular disease is the leading cause of mortality worldwide, with 80 % of cardiovascular deaths occurring in low- and middle-income countries (LMICs).<sup>1</sup> Hypertension, a major risk factor for cardiovascular disease,<sup>2</sup> is the leading global risk for mortality.<sup>3</sup> Over the next decade, the global cost of suboptimal blood pressure may approach \$1 trillion.<sup>4</sup> Unless it is adequately controlled, hypertension will continue to be responsible for significant morbidity and mortality worldwide.<sup>5</sup> In many LMICs, however, the rates of hypertension treatment and control are low.<sup>6</sup>

In Kenya, hypertension treatment and control rates have been reported at 9 % and 3 %, respectively.<sup>7</sup> Poor linkage to hypertension care, manifested as delays in seeking care after screening and referral, has been shown to be associated with increased mortality among pregnant women in sub-Saharan Africa.<sup>8</sup> Thus, screening and early linkage to hypertension care are critical components of hypertension management.

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However, while linkage to care is known to be a challenge, both in Kenya<sup>9</sup> and elsewhere in sub-Saharan Africa,<sup>10–12</sup> specific factors influencing linkage to hypertension care have not been identified in this population.

Given that qualitative research can uncover potential factors and issues that are hypothesis-generating, we conducted a qualitative study to evaluate factors influencing linkage to hypertension care in rural western Kenya. We embedded this study within an ongoing project aimed at optimizing linkage and retention to hypertension care in rural Kenya (LARK Hypertension Study).<sup>13</sup>

## METHODS

### Setting

The United States Agency for International Development-Academic Model Providing Access to Healthcare Partnership (AMPATH), which was initiated in 2001, has established a human immunodeficiency virus (HIV) care system in western Kenya serving over 100,000 patients.<sup>14</sup> Building on that foundation, and in partnership with the government of Kenya, AMPATH has expanded its clinical scope to include screening and management of hypertension.<sup>15</sup> This study was conducted within the AMPATH catchment area in western Kenya, in the Kosirai and Turbo divisions. The protocol was approved by the institutional review boards of all participating institutions.

### Conceptual Framework

We used the Health Belief Model (HBM) as the basic conceptual framework, modified by incorporating the additional impact of emotional and environmental factors on behavior (Fig. 1).<sup>16</sup> The HBM is a primarily cognitive model based on the domains of perceived risk, perceived benefits, perceived barriers, cues to action, and self-efficacy.<sup>17</sup> Given that both

emotional and environmental factors can influence behavior, we expanded the model to incorporate the complex interactions among cognition, emotion, environment, and behavior. Emotional factors include desires, aspirations, fears, and worries that may directly motivate action or serve as a powerful lens through which advantages and disadvantages of alternative actions may be considered.<sup>18</sup> Environmental factors include socioeconomic factors, health system factors, and physical factors, that may facilitate or constrain an individual’s behavior. We hypothesized that environmental factors may affect internal cognitive and emotional processes, and also may impact the ability of an individual to successfully carry out behavior change.

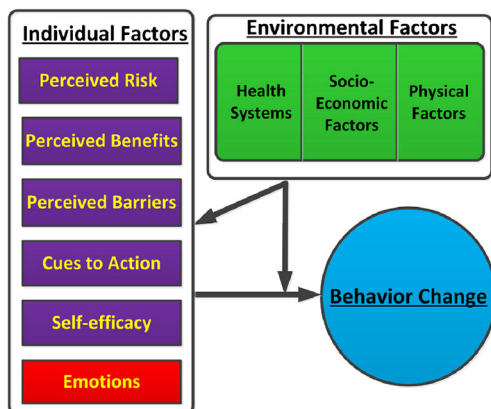
### Design

We used a combination of qualitative research methods, including analysis of discourse in traditional community assemblies (*mabaraza*; singular: *baraza*) and focus group discussions (FGDs), to identify the facilitators and barriers to linkage to hypertension care. In East Africa, *mabaraza* are used to address a wide variety of situations, ranging from local disputes to exchange of information. This unique and novel qualitative research method for exploring both community and individual perspectives has been employed as a form of participatory action research related to HIV care.<sup>19</sup> Focus groups, on the other hand, are small assemblies of individuals brought together with a moderator to engage in a facilitated discussion of a topic. The *mabaraza* allow us to organize large and heterogeneous groups of individuals to complement the purposive sampling inherent in FGDs.

### Participants

**Mabaraza.** We worked with the leadership of AMPATH and local community leaders to organize a “health *baraza*” in several community units within Kosirai and Turbo divisions. The general community was invited to each *baraza*. Invitations were issued to the local community leadership with a general description of the *baraza* discussion topic. A convenient day, time, and venue were confirmed. Approximately 40 participants attended each session. Given that each *baraza* was conducted in a separate community unit, no participant attended more than one *baraza*. A total of six *mabaraza* were conducted, at which point content saturation was achieved (i.e. no additional unique opinions were being expressed by *mabaraza* participants).

**Focus Group Discussions.** FGDs were conducted among three different groups: 1) four FGDs with hypertensive individuals, 2) ten with community members at large, and 3) three with community health workers. These focus groups were formed by purposive sampling to include a spectrum of age, sex, occupation, and distance from health facility. Focus



**Figure 1** Conceptual depiction of the relationship between individual factors [cognitive (purple) and emotional (red)], environmental factors (green), and behavior change (blue). Our model indicates that environmental factors may affect internal cognitive and emotional processes, and also may impact the ability of an individual to successfully carry out behavior change

group participants were not a subset of *baraza* participants. Content saturation was achieved after 17 FGDs.

All participants provided verbal informed consent prior to participation in the study.

## Procedures

We developed and pilot-tested a structured question guide that was used by three trained moderators fluent in the local languages (Kiswahili, Nandi) for both the FGDs and *mabaraza* (Appendix). The moderator used the guide to lead a discussion on chronic health conditions including hypertension, the health care options for these conditions, and facilitators and barriers to linkage and retention to hypertension care in the community. Participatory techniques were used to elicit emotional elements and to promote group interactions.<sup>20</sup> All sessions were audio-recorded, transcribed, and translated into English by the moderators.

## Analysis

Content analysis of the transcripts was performed using both deductive (a priori) and inductive (emerging) codes, using the NVivo 10 software package.<sup>21</sup> Deductive codes arose from prior literature, especially theories of health-seeking behaviors. Inductive codes were additional codes that arose from close review and interpretation of what participants said in *mabaraza* and FGDs. Using deductive codes, a code book was developed by one of the investigators (VN), which was then used independently by four investigators (VN, JR, PK, KL) to code separate transcripts. Any inductive codes were discussed among all four coders, with consensus achieved by agreement among all analysts, prior to being added to the code book. Each coded transcript was reviewed for validity by a second team member. If any discrepancy was noted between the two coders, all four team members discussed the differences and came to a consensus agreement.

Deductive codes included environmental issues (e.g. geographical access to different levels of health facility, drug supply, cost of treatment), cognitive issues related to the HBM, and emotional elements (e.g. desires, aspirations, fears, worries). The coded items were grouped together into distinct themes, and relationships among these themes were formulated. The themes and thematic relationships are reported below.

We used a two-round Delphi method involving nine co-investigators (CH, TI, JK, PK, CK, KL, DM, JR, RV) with expertise in hypertension management, health care in Kenya, and behavioral research, to rank the barriers identified in the content analysis. The Delphi method is a consensus technique that collects expert opinions through several rounds of surveys or interviews, and is characterized by anonymity, iteration, controlled feedback, and statistical group response (expression of the degree of consensus within a group).<sup>22–24</sup> For the first round, we requested that each Delphi participant indicate the top five to ten barriers from among all the barriers identified in

the content analysis. For the second round, we presented each participant with the sum total of anonymous votes for all barriers from the first round, and requested that each participant again indicate the top five to ten barriers. After two rounds, we summed the tally for each barrier. We then generated a list of the top ten barriers according to the Delphi exercise.

Ranking of identified factors was performed using triangulation of frequency of codes and themes in the *mabaraza* and FGDs, in addition to investigator assessments generated by the Delphi exercise. Triangulation is a process of comparing the results from two or more distinct analytic approaches or sources of data in order to enhance construct validity and trustworthiness of inferences.<sup>25,26</sup> Sociodemographic characteristics were summarized using descriptive statistics. Continuous variables were presented as median and interquartile range, whereas categorical variables were reported as frequencies.

## RESULTS

A total of 411 participants participated in *mabaraza* and FGDs. Table 1 summarizes the characteristics of our sample. The *mabaraza* participants constituted 59 % of the total sample, while the remaining 41 % participated in the FGDs. Male and female participants were nearly equal in number. Most study participants were married, and the most common occupation was farming. Only 22 % had attained a post-secondary level of education.

We identified 27 barriers to linkage to hypertension care (Supplemental Table). These were grouped into two major categories: individual factors and environmental factors. Individual factors were further divided into cognitive (derived from the HBM) and emotional factors, while environmental factors were further divided into physical, socioeconomic, and health system factors. The top barrier from each HBM domain (9 barriers), as well as the top ten barriers identified by the Delphi process (additional 4 barriers; total 13), are summarized in Table 2, with corresponding representative quotations. In general, the Delphi process results were consistent with the findings from the qualitative analysis, with a few notable exceptions. “Distance to the health facility” was ranked much higher in the Delphi process, while “fear of being confirmed hypertensive” and “lack of providers, drugs, and equipment” did not rank in the top ten. Given that the remainder of the results were similar, we report here the results of the content analysis, limited to the 13 most salient barriers.

### Individual Barriers to Linkage to Hypertension Care

**Cognitive Factors.** Cognitive factors—corresponding to HBM domains of perceived risk, perceived benefits, perceived barriers, cues to action, and self-efficacy—were cited as obstacles to linkage to hypertension care, although some more often than others.

Table 1 Characteristics of participants from the *mabaraza*, the focus group discussions, and the total sample

	<i>Baraza</i> sample (N=242) n (%)	FGD sample (N=169) n (%)	Full sample (N=411) n (%)
Age, median: years (interquartile range)	34 (27–45)	40 (32–50)	35 (28–47)
Gender			
Female	119 (49.2)	81 (47.9)	200 (48.7)
Male	123 (50.8)	88 (52.1)	211 (51.3)
Marital status			
Married	161 (66.5)	116 (68.6)	277 (67.4)
Single	74 (30.6)	49 (29.0)	123 (29.9)
Separated/divorced	7 (2.9)	3 (1.8)	10 (2.4)
Widowed	0 (0.0)	1 (0.6)	1 (0.2)
Education level			
None	8 (3.3)	1 (0.6)	9 (2.2)
Primary	110 (45.5)	54 (32.0)	164 (39.9)
Secondary	80 (33.1)	65 (38.5)	145 (35.3)
Post-secondary	43 (17.8)	48 (28.4)	91 (22.1)
Missing data	1 (0.4)	1 (0.6)	2 (0.5)
Occupation			
Farmer	129 (53.3)	56 (33.1)	185 (45.0)
Business	19 (7.9)	35 (20.7)	54 (13.1)
Community health worker	20 (8.3)	34 (20.1)	54 (13.1)
House wife	23 (9.5)	4 (2.4)	27 (6.6)
Teacher	8 (3.3)	11 (6.5)	19 (4.6)
Student	9 (3.7)	6 (3.6)	15 (3.7)
Other*	20 (8.3)	20 (11.8)	40 (9.7)
Missing data	14 (5.8)	3 (1.8)	17 (4.1)

Number (%) provided for each characteristic except age (median and interquartile range provided). Percentages may not add up to 100 % due to rounding. FGD=focus group discussions

\*Other: Includes casual workers, clinical officers, gardeners, watchmen, house help, social workers, laboratory technicians, pastors, carpenters, chefs, drivers, counsellors, public health officers, nurses, and clerks

The key barrier noted under the "perceived risk" domain was the asymptomatic nature of hypertension. Even though people had some knowledge of the causes, treatment, and potential complications of hypertension, they did not consider themselves vulnerable—until the condition produced unbearable symptoms. Participants reported that, in general, individuals in this setting, particularly men, do not readily go to the health facility for care without debilitating illness. Instead, they prioritize other daily needs. Particularly salient was the sentiment that people were reticent to seek care for asymptomatic conditions.

Some participants questioned the benefits associated with linkage to care. Conventional hypertension care was not fully appreciated as beneficial. One noteworthy concern was doubt among individuals that hypertension drugs could alleviate symptoms or resolve the problem.

The primary perceived barrier expressed by participants was competing obligations in their daily home and work routines. Many participants expressed the sentiment that it would be disadvantageous to leave busy activities at home and work to go and wait in long queues for hours at the health facility, especially if health services were considered to be of poor quality. They reported that they prioritized other daily needs and illnesses with more prominent symptoms, preferring to focus time and money on daily challenges considered much more urgent.

Limited hypertension information was described as a barrier affecting cues to action. Participants felt that limited exposure to information about chronic diseases such as hypertension was related to educational level, rural residence, and

agricultural occupation. When asked what should be done to improve linkage to hypertension care, a prominent response concerned the need to increase awareness and knowledge about hypertension in the general population, including such topics as causes, symptoms, complications, and management of hypertension, the benefits of screening and consequent care uptake, and sensitization to overcome religious beliefs that deter care-seeking behavior.

Self-efficacy was reported to be hampered by alcohol use. Alcohol was felt to impede the ability to successfully initiate care. Participants also reported that heavy alcohol use may be associated with individuals' apprehension about the ability to take charge of their health and the course of management that the providers might recommend they initiate.

**Emotional Factors.** Emotional factors, primarily described as fears, were noted by participants, and appear to have substantial influence on an individual's predisposition to link to care. These included the fear of being a burden, of being screened for stigmatized diseases such as HIV, and of encountering harsh care providers.

Several participants were concerned about being perceived as burdensome to their family because they were hypertensive. They feared that linking into care and being required to maintain this care would draw from their own resources and those of significant others. Conversely, by ignoring the symptoms and hoping they would not succumb to them, participants felt that hypertensive individuals would be able to avoid the unpleasantness that would come with feeling burdensome.

**Table 2** The most salient barriers to linkage to hypertension care, corresponding to each domain of the conceptual model, and divided into individual- and environmental-level factors. A representative quotation is provided for each barrier

Category	HBM Domain	Specific barrier	Representative quotation	
Individual	Perceived risk	Hypertension is asymptomatic	“There are others who are not sure that they are ill, they don’t think they are ill...they don’t believe that illness can kill them; they think that they are just well” (female participant, FGD #15)	
	Perceived benefit	Denial	“At times people see pressure like a joke and they don’t take it seriously” (male participant, FGD #2)	
	Perceived barrier	Competing obligations	“Maybe tractor/vehicle is damaged so all thought is concentrated on the damage and not treatment” (male participant, FGD #3)	
	Cues to action	Limited hypertension information	“Education in relation to hypertension is not high amongst the public and those who teach them” (female participant, FGD #12)	
	Self-efficacy	Alcohol impedes ability to successfully initiate care	“Maybe the person takes alcohol and if they go to the hospital, they will be advised to stop taking alcohol and take hypertension drugs. They might therefore refuse to go to the health facility so they can continue taking alcohol” (female participant, Baraza #6)	
	Emotional	Fear of being burdensome	Fear of being screened for other stigmatized diseases (HIV)	“They feel [burdensome] because everyone is looking up to them, and they would want to die because they cannot help [with family responsibilities] much.” (female participant, FGD #11)
			Fear of “harsh” treatment by clinicians	“...It (AMPATH) is dangerous (laughs), it is that name that is a big problem. When they hear that you have gone to AMPATH, it becomes a problem... because of that ‘animal’ (laughs), HIV. Once you are seen getting out of there, people will start talking (laughs). People believe that AMPATH only treats HIV, so now if you say, ‘Take me to AMPATH’, then you are done (laughs). They will say ‘He has HIV!’ They believe AMPATH treats only HIV, nothing else” (male participant, Baraza #6)
			There are some nurses who are naturally born to have bad language. Sometimes even when you get in they will command you saying ‘Come here, go there.’ You see, they do not show you a caring attitude. When I come to your house, you should start by asking me, ‘How is your morning?’ Then you can start diagnosing me. But you find their language is a bit harsh. I am not referring to the ones in this facility, no (laughs). You find others, their language is a bit harsh until you pity the patient...” (female participant, FGD #14)	
Environmental	Physical	Distance to health facility	“Maybe you live far away and there is no money, even for fare” (male participant, FGD #8)	
	Socioeconomic	Poverty, lack of finances	“You might start thinking that this is now a disease that cannot be cured and it needs a lot of money, and where will I get land to sell, where will I get something to use til I heal?” (male participant, FGD #16)	
	Health system	Poor quality of care and poor provider–patient relationship	“You know they tell you there are no drugs but the moment you show them money, those drugs will be available there and then” (female participant, Baraza #3)	
		Availability and popularity of alternative treatments	“And you should know traditional doctors sell these drugs in the market. So they advertise their drugs by saying that this disease [hypertension] cannot be managed with hospital drugs; they require herbal care” (male participant, FGD #1)	
		Long queues	“Sometimes they wonder, ‘what if they go to the hospital and there is a queue?’ So they would prefer to go on with their work” (female participant, FGD #6)	

HBM health belief model, FGD focus group discussion, HIV human immunodeficiency virus

One of the most commonly reported fears was being screened for stigmatized conditions such as HIV. In the AMPATH catchment area, hypertension services are offered in many of the same facilities as HIV care, and thus it is common practice to offer HIV testing to all patients, irrespective of their primary ailment. This can attract stigma and associated fears.

Fear of harsh treatment by providers was emphasized by participants. Several individuals expressed concerns regarding the manner in which they were addressed by clinicians, including harshness of speech, language spoken, being scolded for being late or missing appointments, and impolite manner.

### Environmental Barriers to Linkage to Hypertension Care

**Physical Factors.** Not surprisingly, long distance to the nearest health care facility was a physical environmental

factor that discouraged individuals from enrolling in hypertension care. Although it was not mentioned frequently overall, it was the primary physical factor reported. Increased distance to the health facility was associated with decreased affordability of transportation.

**Socioeconomic Factors.** The socioeconomic fabric was an important environmental factor influencing the propensity to seek care. The dominant socioeconomic factor was poverty and lack of finances to afford the costs of transportation, hospital bills, and drugs. Financial constraints were considered to discourage many from initiating care. In addition, control over financial decision-making was cited as a barrier for women; in this catchment, it is common for women to avoid making decisions about their health or health care access without consulting men. They need to get permission and financial

support from men in order to initiate care, which contributes to delayed care-seeking for women.

**Health System Factors.** Health system factors were reported as barriers to linkage, the most common of which was poor quality of care and poor provider–patient relationship. Barriers to quality of care included limited drug availability, poorly functioning equipment, and insufficient human resources. In addition, poor provider–patient relationship was felt to be manifested as absenteeism, language barrier, corruption, mistreatment, and poor services. Participants clearly stated their desire to be treated with respect and to consistently receive high-quality services. Long wait times at public health facilities was also mentioned as a prohibitive factor with regard to linkage, in combination with the quality-of-care barriers just described.

The other salient health systems factor was the popularity of complementary and alternative treatments, especially herbal care, that are extensively advertised in the region. These practitioners claim to treat a range of conditions, including communicable diseases, non-communicable conditions, and social problems. Consequently, many community members are persuaded to use non-conventional health care. Easy access to over-the-counter drugs also promotes self-medication rather than engagement of the professional sector.

## DISCUSSION

In this qualitative study from rural western Kenya, we used *mabaraza* and FGDs to explore barriers influencing linkage to hypertension care. Analytically, we utilized the Health Belief Model framework, modified by the incorporation of emotional and environmental factors. We were able to identify a large number of barriers related to linkage to hypertension care, and our analysis provides new insights that will likely be relevant to other low-resource settings. To the best of our knowledge, this is the first report describing emotional factors as important barriers to linkage to hypertension care in LMICs.

Our approach consisted of targeting distinct participant groups, using a combination of *mabaraza* and FGDs, and evaluating the results using both content analysis and a Delphi exercise. This approach allowed for triangulation across participant characteristics, study procedures, deductive and inductive content coding, and analytic approaches. As stated above, triangulation is a process of comparing the results from two or more distinct analytic approaches or sources of data.<sup>25,26</sup> Given the largely congruent and consistent results across the various methods and participants, triangulation helps to

increase the validity and trustworthiness of the results. To be sure, there were some notable differences among participant groups, as well as in comparisons between content analysis and the Delphi exercise. These differences may reveal the diversity of stakeholder perspectives and the ability to fully express opinions in different settings. Such differences also highlight the importance of attention to participant backgrounds in qualitative research, and point to further areas of inquiry that can be pursued in future research in similar settings worldwide.

The asymptomatic nature of hypertension seemed to outweigh the potential long-term seriousness and complications of the disease. Lack of symptoms and cost of treatment have been known to discourage uptake of hypertension health care.<sup>10</sup> In general, without debilitating illness, individuals in this setting did not readily seek care in a health facility—particularly men. Lack of information regarding the burden of potential long-term complications may contribute to this phenomenon. Conventional biomedical hypertension care was not fully appreciated as beneficial. In particular, some participants doubted that anti-hypertension drugs could alleviate symptoms. Such perceived lack of benefit has been shown to be associated with appointment non-adherence in the United States.<sup>27</sup> Inadequate information about hypertension in this region may partially explain this impression of the ineffectiveness of conventional allopathic care. Similar limited knowledge regarding the causes and control of hypertension has been noted in other parts of Kenya, and merits further attention.<sup>28</sup>

Emotional factors were important barriers to linkage, in particular the fear of feeling burdensome. Fear of being confirmed as hypertensive also featured prominently in the discussions. Receiving a hypertension diagnosis has previously been described as a “biographical disruption,” an event characterized by fear, anxiety, and psychological trauma, requiring an altered approach to daily life.<sup>29</sup> Individuals may therefore shy away from assuming the role of being ill, as the chronic nature of hypertension implies a lifelong commitment to this biographical disruption. The importance of fear as a factor in patient behavior has also been reported for hypertension medication adherence in the United States,<sup>30</sup> and similar emotional factors appear to contribute to the propensity to engage with the health care system in western Kenya.

The most prevalent socioeconomic factor in this rural, predominantly farming population was a lack of finances to afford the costs of transportation, hospital bills, and drugs. Financial constraints are known to discourage initiation of care.<sup>31–33</sup> This factor is not limited to LMICs; lack of health insurance, lack of medication

coverage, and higher costs are strong predictors of missing appointments among hypertensive patients in the United States.<sup>27,34</sup> In addition, poor adherence to anti-hypertensive medications has been associated with unaffordable drug prices.<sup>35</sup> Thus, it is not surprising that a lack of finances would feature prominently as a structural barrier in this setting, where the average income for a substantial proportion of the population is less than one US dollar per day.<sup>36</sup>

Aside from concerns about poverty, the other dominant environmental factors reported by the participants were health system features. A large number of concerns were raised regarding the quality of care at government health facilities, including a lack of providers, drugs, and equipment; poor-quality clinical services and poor provider–patient relationships; and long queues. Similar health facility barriers to linkage have been reported for HIV care,<sup>37</sup> and quality of care has been shown to be a predictor of appointment adherence for hypertension in the United States.<sup>34</sup> Given these concerns, it is understandable that alternative medicine (herbal remedies, non-allopathic practitioners) is highly popular and a significant barrier to linkage to hypertension care at allopathic health facilities. The use of complementary and alternative medicine for hypertension has been reported at rates between 40 and 60 % in other LMICs; however, these figures likely underestimate the actual use of such modalities in the general population, since these studies were conducted among patients attending clinics associated with tertiary-care academic medical centers.<sup>38,39</sup> Although we did not specifically survey our study population regarding the use of complementary and alternative medicine for hypertension, it is quite likely that similar care-seeking patterns are present in western Kenya.

The information gathered in this study is the first phase of the LARK Hypertension Study.<sup>13</sup> Specifically, the results presented here have informed the development of a tailored behavioral assessment tool that includes an evaluation of cognitive, emotional, and environmental factors. This tool, in combination with a tailored behavioral communication strategy, will be used by community health workers in western Kenya in attempts to link patients to hypertension care, and we will be evaluating the effectiveness of this intervention in blood pressure reduction. Previous studies of interventions to improve linkage to care have highlighted the importance of costs, distance, and time constraints.<sup>31,40</sup> However, it is conceivable that addressing emotional barriers may also have an important impact. Research has demonstrated that emotional factors such as stigma can impact engagement in HIV care,<sup>41</sup> although addressing emotional factors has yet to be proven effective for

hypertension linkage in LMICs. If shown to be effective in terms of clinical outcome, we anticipate that this approach will be used in the same geographic area with different chronic diseases. In addition, our approach may be relevant to similar programs in other low-resource settings worldwide, while taking into account contextual and cultural factors.

One potential limitation of our study is limited generalizability, since we recruited participants from specific geographic areas in western Kenya. In addition, the prioritization of barriers across domains and categories of our conceptual model is challenging. However, the purpose of this qualitative study was to uncover potential factors, themes, and issues that could be hypothesis-generating and subsequently tested in a larger population. In addition, the *mabaraza* did reflect more general community perceptions, as intended, and differed at times from the results of the FGDs, as illustrated in Table 2. We anticipate that the knowledge garnered from this study will be largely generalizable, but that relative weights and emphases will be context-specific, with elements that may be relevant to other low-resource settings on a global scale. Second, we did not record individual-level demographic information for the quotations and transcripts; hence, we are unable to report individual-specific information for each quotation. Rather, we view the data as arising from a collective session, not from any one individual within the collective session. Another potential limitation is the use of the modified HBM as the conceptual framework. There are numerous other conceptual models for behavior modification and health promotion, each with relative strengths and weaknesses,<sup>42</sup> and we both benefited from and were constrained by our choice. The addition of emotional factors to our conceptual model was critical in uncovering and exploring the importance of fears, stigma, and anxieties.

## CONCLUSIONS

Hypertension treatment and control rates are low worldwide, particularly in LMICs. Poor linkage to hypertension care contributes to less than ideal clinical outcomes for patients. Using a qualitative approach informed by a modified HBM, we were able to elucidate cognitive, emotional, and environmental factors that serve as barriers to linkage to hypertension care in rural western Kenya. In addition to informing the context-specific LARK Hypertension Study's planned intervention in this catchment area, our analysis provides new insights and methodological approaches that may be relevant to other low-resource settings worldwide.

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#### Compliance with Ethical Standards:

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## Appendix

### Focus Group Discussion (FGD) Guide

STUDY: Optimizing Linkage and Retention to Hypertension Care in Rural Kenya

Cover Sheet

<b>FGD moderator:</b> _____	
<b>FGD recorder:</b> _____	
<b>Category of FGD (tick):</b>	<b>Young Males &amp; Females</b> _____ <b>Older Males &amp; Females</b> _____ <b>Self Employed</b> _____ <b>Employed</b> _____ <b>&lt;5KM to health facility</b> _____ <b>&gt;5KM to health facility</b> _____
<b>Date:</b> ____/____/2012	
<b>Time:</b> _____	
<b>Community Unit:</b> _____	
<b>Location/Venue:</b> _____	
<b>Consent (no or yes) from participants:</b> _____	

FGD Completion Check List:

- ( ) Participant verbal informed consent read to the participants?
- ( ) Study cover sheet attached to field discussion notes?

Mabaraza Guide

STUDY: Optimizing Linkage and Retention to Hypertension Care in Rural Kenya

Cover Sheet

<b>Baraza moderator:</b> _____	
<b>Baraza recorder:</b> _____	
<b>Date:</b> ____/____/2012	
<b>Times</b> _____	
<b>Community Units:</b> _____	
<b>Location/Venue:</b> _____	
<b>Consent (no or yes) from participants:</b> _____	

## Baraza Completion Check List:

- ( ) Participant verbal informed consent read to the participants?
- ( ) Study cover sheet attached to field discussion notes?

**Guiding Questions****Domain 1. Introductory Questions on Hypertension and Associated Care in the Area**

## Health Issues in the Community

1. What are some of the important health conditions in your community?
2. How much attention should be paid to the following diseases: malaria, cancer, HIV, hypertension, and diabetes? Please list each disease, in order of importance.

## Moderator Note

Request participants to rank the 5 diseases in order of importance from 1 to 5. Facilitate discussion about the rankings.

**Knowledge of Hypertension and Associated Attitudes**

3. What is the local community's perception/understanding of hypertension?

## Probes:

- Define HTN:
  - What comes to mind when you think of the word hypertension? High blood pressure?
  - Do people perceive a relationship between high blood pressure and hypertension? If yes, explain
- Risk factors/causes:
  - What do you think causes it or makes people more likely to have it? (e.g. medicines, unhealthy eating, lack of exercise, weight, stress, heredity, fate)
- Detection:
  - Can people tell when they have it, or when their high blood pressure is up? How?
- Complications:
  - Why do you think having high blood pressure matters?
  - Can it cause problems, and if so, what kinds of problems? (e.g. stroke, MI, death, kidney, eye, diabetes, disability, financial)

## • Importance:

- How does it compare to other diseases?

## • Controllability/curability:

- Is it something people have on and off, or all the time?
- Does it go away/is it cured? If so, how?
- Can it be controlled? If so, how? (e.g. medicines, diet, Exercise, weight loss, stress, prayer, complementary medicine)

## Prevalence

4. How common is hypertension in your community?

Probes: Do you know people in your community affected by hypertension?

**Domain 2. The Goal is to Help Participants Reflect and Discuss Facilitators and Barriers to Linking and Retaining Individuals in Hypertension Care.**

## Barriers and Facilitators of Linkage

5. What influences enrollment for hypertension care?
6. How do people feel about seeking care for hypertension in an AMPATH building/clinic?

## Probes:

## Patient factors:

- Understanding what to do
- Do you experience language barriers or difficulty understanding technical jargon? Remembering to go for/initiate care, competing activities/roles

## Health system factors:

- Getting to care
  - Availability of transport
  - Transport costs
  - Time it takes to reach the health facility
- Availability of providers
  - Health care workers' attitude towards patients
  - Health care workers' ability to provide useful information to patients
- Paying for visit/cost of drugs
- Role of other therapies
  - Complementary medicine/healing

## Social/community factors:

- Community perception/attitude towards hypertension

## Emotional factors:

- Do people in your community like to be seen as physically fit?
- Do people in your community living with hypertension worry that they will not be physically fit enough to take care of their children? If yes, discuss/explain
- Are people fearful of being a burden to their family if they experience a complication of hypertension?

## Barriers and Facilitators of Retention

## 7. What influences retention in hypertension care?

## Probes:

## Patient factors:

- Understanding what to do (language barriers, technical jargon)
- Remembering to go for follow up care, competing activities/roles

## Health system factors:

- Getting to care
- Availability of transport
  - Transport costs
  - Time it takes to reach the health facility
- Availability of providers
  - Health care workers' attitude towards patients
  - Health care workers' ability to provide useful information to patients
- Paying for visit
- Availability of drugs, cost of drugs
- Role of other therapies (Complementary medicine/healing)
- Trust in health care workers/health system

## Social/community factors:

- Community perception/attitude towards hypertension/affected individuals

## Emotional factors:

- Do people in your community like to be seen as physically fit?
- Do people in your community living with hypertension worry that they will not be physically fit enough to take care of their children? If yes, discuss/explain.
- Are people fearful of being a burden to their family if they experience a complication of hypertension?

### Domain 3. The Goal is to Help Participants Discuss the Role of CHWs.

8. What are the various types of community health workers (CHWs) that exist in your community?

## Probes:

- What is the role/task of the AMPATH-associated community health workers (PHC CHWs, PHCT counselors)?
9. What are the perceptions of community members regarding the CHWs who work here?

**Moderator Note** For questions 10–11, brainstorm as a group and write responses on large flipchart.

## Discuss.

10. Can CHWs help people in your community get linked in care for chronic health conditions? If yes, what is their role?
11. Can CHWs help people in your community maintain follow up care for chronic conditions? If yes, what is their role?
12. What hypertension information would you like to be given by the CHWs who visit your homes?

## Probes:

- Lifestyle modification materials
- Treatment and prevention options
- Explanation of risks and complications of hypertension
- Strategies for overcoming barriers to linkage/retention

## Ending Questions

13. How can we address the barriers we have discussed today?
14. Is there anything regarding hypertension care you would like to add that we have not discussed today?

### Domain 4. Participant Characteristics – Mini Questionnaire

1. Age (Years): \_\_\_\_\_
2. Sex: \_\_\_\_\_
3. Marital Status:
- a. Single \_\_\_ b. Single Parent \_\_\_ c. Married \_\_\_  
d. Separated \_\_\_ e. Divorced \_\_\_
4. Education Level (highest attained):
- a. None \_\_\_ b. Primary \_\_\_ c. Secondary \_\_\_  
d. Certificate \_\_\_ e. Diploma \_\_\_ f. University \_\_\_
5. Occupation: \_\_\_\_\_