

IMPROVING HEALTH COMMUNICATIONS IN KENYA



A Feasibility Study on Engaging Frontline Healthcare Workers in Using Mobile Technology

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LIST OF ABBREVIATIONS

CBO	Community-based organization
CHEW	Community Health Extension Worker
CHW	Community Health Worker
CU	Community Unit
FBO	Faith-based organization
MCH	Maternal & Child Health
MOH	Ministry of Health
NGO	Non-governmental organization
SMS	Short Message Service (text messaging)
TBA	Traditional Birth Attendant

EXECUTIVE SUMMARY

Kenya faces severe shortages of skilled health workers, particularly in remote and poor communities. As a consequence, one strategy that is gaining currency is to delegate tasks to the least-educated level of workers able to complete them effectively. Over the years, community health workers (CHWs) who receive some basic training from the Kenyan government and/or healthcare organizations have helped to fill the gaps in medical coverage.

CHWs provide health services as diverse as making home visits to the ill, screening for tuberculosis, counseling on HIV/AIDS, and teaching families safe sanitation practices. Traditional birth attendants (TBAs), women who may have no formal training and who often learn their trade from their own mothers or grandmothers, also play a key role in Kenya's healthcare ecosystem, especially among low-income families. While currently under government pressure to stop delivering babies in their homes due to the medical risks, TBAs typically provide prenatal care to pregnant women, assist with labor and delivery, and follow up with mothers and their babies after childbirth.

In light of the vital services these frontline health workers provide in Kenya, the Internews Center for Innovation & Learning commissioned this study to explore the potential for CHWs and TBAs to use an interactive mobile platform to improve the dissemination of health information in their communities. As envisioned, such an "e-health" project would rely on mobile phone texting and would be implemented in partnership with one or more community radio stations and other local organizations.

Internews' Kenya office and the research team jointly determined two initial research sites to capture data from two kinds of marginalized communities: the Nairobi slum of Korogocho, and the small town of Matungu in Mumias District in rural western Kenya. Researchers gathered quantitative and qualitative data on the roles of CHWs and TBAs through focus group discussions, questionnaires and one-on-one interviews.

Key Findings

The study found that community health workers fall into four typical profiles. At one end of the continuum, there is the highly

structured role of CHWs who are elected to their position by their communities; these CHWs work within Community Units that fall under the Kenyan Ministry of Health, and are trained by the government. At the other end, there are self-selected CHWs who work on a single health project at a time for a non-governmental or community-based organization, and who receive minimal training.

Traditional birth attendants also fall into a range of profiles. In Korogocho, for instance, these women continue in the historic role of midwives who oversee labor and delivery in their own homes, despite government policy to discourage this practice. Besides the fact that Kenyan women have traditionally given birth at home, hospital births remain out of reach for many poor women given the obstacles of cost, transportation, and limited hours. In Matungu, under a Ministry of Health initiative, TBAs are making the transition to a new role as "Safe Delivery Advocates" (SDAs) who encourage pregnant women to get care at health facilities that are better equipped to deal with medical complications.

Study researchers learned that community health workers in Korogocho and Matungu already use mobile phones for their work fairly extensively, although most use them primarily for simple voice calls, not for texting or other features. Traditional birth attendants, who tend to be older and less literate, use mobile phones to a somewhat lesser extent, and very few use their phones for texting. At least one community-based organization, Pambazuko Mashinani in Korogocho, was found to be using mobile technology in its health programs, including bulk mobile phone texting.

Key Recommendations

The study resulted in the following recommendations for a pilot e-health project.

- The Nairobi slum of Korogocho would make an appropriate site for launching a health text project. It is representative of Kenyan slum realities and there is real potential for achieving concrete improvement in the health of its residents.
- Local partner organizations for such a project should be able not only to help implement the project but also to sustain project activities once outside funding ends. Respected local partners could also be key to mobilizing community support. Several potential partners expressed their interest in collaborating on such a project.
- In addition to relying on the region-specific knowledge and connections of local partner organizations, Internews could initiate a working group of such entities to help coordinate project activities and solicit the support of the local administration, particularly village chiefs, assistant chiefs and village elders.
- Internews should collaborate with those CHWs already working with local organizations in Korogocho and Matungu or with the respective district health offices to ensure that these health workers are currently active in the field.
- The proposed health text project should be designed to address the priority needs for CHWs, TBAs and local health organizations. Project activities could include training CHWs and SDAs in mobile phone technology, training community radio reporters in health coverage, and helping Ministry of Health officials to get CHWs and SDAs to refer patients to health facilities. The project could also design and implement mobile phone applications for CHWs and TBAs to use in recording, managing and disseminating data collected for community registers.
- The project should build on the practices and technology already in use, developing additional skills and tools as needed. This could include developing and disseminating a standardized list of codes for health providers to text information.

BACKGROUND

This section provides an overview of the roles of CHWs and TBAs in Kenya, and analyzes their use of mobile phones in the course of their work.

The Role of Community Health Workers (CHWs) in Kenya

Shortages of skilled health workers in Kenya, particularly in remote and resource-constrained communities, are a key element of the growing human resources crisis within the health sector (Otieno, 2012). While this multi-faceted crisis must be addressed through multiple measures, one strategy identified by the World Health Organization is “task shifting” – the delegation of tasks to the least-educated level of workers that can perform them successfully. In this context, the concept of empowering community members to render certain basic health services to their communities has regained currency in Kenya.

Community members, popularly known as community health workers (CHWs), have therefore been used over the years to render basic health services to their communities (SOCHARA, 2005). Even though the roles and activities of CHWs are enormously diverse, in most cases they perform tasks that can be preventive, curative and or developmental. In some instances, they have been selected to carry out very specific interventions (Karithathara, 1990).

Due to the breadth of the topic and the diversity of the literature on the subject, it is difficult to generalize about experiences with CHWs or what makes a good CHW program. However, there is agreement on the following issues:

First, CHWs make a vital contribution to community development, enhancing coverage for communities that have only basic health services. CHWs can undertake actions that improve health outcomes (Kaseje et al, 1987a) and conduct innovative and effective interventions. Nevertheless, they have also been accused of being unable to consistently provide services that have substantial health impact, and the quality of services they provide is

sometimes poor (Khan et al, 1998, and Gilson et al, 1989).

Second, CHWs must be carefully selected, appropriately trained, and adequately and sustainably supported (SOCHARA, 2005; Kelly et al, 2001; Fagbule & Kalu, 1995).

Third, CHW programs are neither a magic wand for weak health systems nor a cheap option for providing access to healthcare for poor communities. Several interventions implemented by CHWs have been unsuccessful in the past due to unrealistic expectations, poor planning and underestimating the effort and input required for success (Chevalier et al, 1993). This has gravely undermined the credibility of the CHW concept.

Fourth, by their very nature, CHW programs are vulnerable unless they are driven, owned by and firmly embedded in communities themselves (Kaseje, 1986). Where this is not the case, they exist on the geographical and organizational periphery of the formal health system, exposed to the vagaries of policy swings without the wherewithal to lobby and advocate for their cause. The concept of community ownership and participation is often mistakenly assumed to be an outcome that can be initiated from the center. Interventions that involve the work of CHWs thrive in communities that are already mobilized, but struggle where they themselves are expected to galvanize communities (Bose, 1993).

Fifth, it is still controversial as to whether CHWs should work on a volunteer basis or be paid (Chevalier et al, 1993; Khan et al, 1998; Bhattacharyya et al, 2001). There is no evidence that volunteerism can be sustained for long periods: as a rule, CHWs are poor and they require some sort of income. However, in most programs, they are only expected to spend a small amount of their time on health-related functions (Chevalier et al, 1993). Since CHWs provide services in environments where formal health services are inaccessible and residents are poor, it is difficult for their communities to provide core financing

for their work. Most of the evidence on community financing schemes shows high levels of failure, leading to high dropout rates among participants and the ultimate collapse of projects (Chevalier et al, 1993).

However, due to the current pressure on Kenya's health systems and their proven inability to respond promptly and adequately, existing evidence overwhelmingly suggests that programs that engage CHWs, while neither cheap nor easy, remain a good investment. In reality, the alternative is no care at all for the poor (Kaseje et al, 1987a). While there is more to learn about how to maximize the effectiveness of CHWs, programs can be strengthened by adopting best practices. Non-negotiable elements of successful programs include appropriate selection of CHWs, continuing education, involvement and reorientation of health service staff and curricula, and supervision and support.

CHWs therefore represent an important health resource whose potential in providing and extending a reasonable level of health care to under-served populations must be fully tapped" (Gilson et al, 1989). However, community health programs immediately need to address weaknesses in training, task allocation and supervision.

The Role of Traditional Birth Attendants (TBAs) in Kenya

In Kenya, Maternal and Child Health (MCH) is another critical health area where there is close collaboration between community members and the medical fraternity. According to the 2009 Kenya Demographic Health Survey, 57% of births in Kenya take place at home, and of those, 28% are assisted by a traditional birth attendant (TBA). The Kenyan government has increasingly encouraged women to deliver in hospitals, as home deliveries by unskilled traditional birth attendants are considered to be a major contributor to maternal deaths.¹ The last demographic survey released by the government in 2009 puts maternal death rates at 448 per 100,000 live births. But according to Ziraba, Madise and Kyobutungi (2009), the maternal mortality ratio for Korogocho slum is 706 deaths per 100,000 live births.

In a study specific to Korogocho and another Nairobi slum, Viwandani, the African Population and Health Research Center, found that less than 15% of health facilities were equipped to manage birth complications. The research also showed that about 10% of births in the slums are handled by TBAs, and that

poor women prefer TBAs to nurses when seeking services. As a result, home deliveries are considered a major contributor to this high rate of mortality.

The matter is considered so serious that the government has proposed to ban traditional midwives altogether. According to the National Reproductive Health Policy, TBAs "are not recognized as providers of skilled care," and should only be used as advocates of safe childbirth through encouraging pregnant women who seek their services to get care at health facilities (MOH, 2009).

However, the reality is that for the majority of women living in remote rural areas or the slum areas of Nairobi such as Korogocho, hospital delivery is not an option (Otieno, 2012). Hospitals are choking under increased demand for their limited services, and in many instances, poorer women simply cannot afford the relatively high cost of going to hospitals.

In an Inter Press Service story on this issue, Elizabeth Siboor, a traditional birth attendant in Nairobi, is quoted as saying, "When a woman goes into labor in the middle of the night in Mathare slums, the option of getting a taxi is out of question due to the cost and insecurity. Such women end up delivering with the help of TBAs. Pregnancy and labor is a matter of life and death, I will not sit back and let a woman and her baby die if I can offer assistance."²

Even though the proposed ban on TBAs is well-intentioned, it could have dangerous results. Rather than demonizing TBAs, the government is urged to consider reviving previous efforts to train TBAs as a bridge between the community and the public health system (Otieno, 2012). Scholars such as Knippenberg (2005) argue that at the current rate, unless extra resources are provided, less than half the population will have access to skilled birth attendants by 2015. It should be recognized that TBAs are highly regarded, especially in remote communities, where many already act as informal links to health clinics, encouraging women to be seen there, take their children for vaccinations, and get tested for HIV.

Mobile Phones and Healthcare in Developing Countries

The technological leap offered by mobile phones in Kenya is an opportunity to enable frontline health workers such as CHWs and TBAs to fill healthcare delivery gaps in their communities

¹ International Press Service (IPS): Jury still out on Traditional Birth Attendants. Retrieved from <http://ipsnews.net/news.asp?idnews=52274>

² Ibid

(Otieno, 2012). Mobile phone text messaging has been widely used in developing countries as a health communication tool (see Fjeldosoe, 2009; Lewis-Cole and Kershaw, 2010; Yen et al, 2009; Mahmud, Rodriguez, and Nesbit, 2010; Kunutsor et al, 2010; and Patrick et al, 2009). Such “e-health” technology has proven especially useful in the arenas of sexual health, disease prevention and management, patient compliance, patient adherence reporting by CHWs, appointment reminders, queries to physicians and prevention of communicable diseases.

For example, in an effort to curb child mortality in the Millennium Villages Project site at Sauri, Kenya, health workers were equipped with mobile phones to use text messages to register patients and send in their data. The ultimate goals were to improve child health and empower CHWs (Berg, Wariero and Modi, 2009). This Child Count Project proved that an approach based on using Short Message Service (SMS) technology can lead to improved maintenance of children’s anthropometric records, which in effect helps to monitor a community’s overall health.

2

DESIGN AND METHODOLOGY

This report presents findings of a baseline survey commissioned by the Internews Center for Innovation & Learning on the roles of frontline health workers in Kenya and their potential to improve the dissemination of health information through mobile phone texting.

The research consultant and the Internews office in Nairobi jointly decided on the study sites. Data for this report was collected in two districts in Kenya: Korogocho slum in Kasarani District in Nairobi, and Matungu in Mumias District in Western Kenya.

A qualitative research design with quantitative components was adopted for the study. Qualitative methods enabled the collection of respondents' perspectives, while quantitative data was gathered to provide context for qualitative information. Relevant project documents were analyzed to provide additional insight into the work of community health workers and traditional birth attendants.

Sampling of respondents was done using purposive sampling methods designed to identify a selection of respondents appropriate for the study requirements.

Tools used in the study included interview guides, questionnaires and guides for focus group discussions. More detail on the study design and methodology follows.

Study Design

Research for this study was conducted in two locations: Korogocho and Matungu. Korogocho is one of Nairobi's largest slums, a shanty town where an estimated 150,000 to 200,000 people live packed into just 1.5 square kilometers. "Korogocho" is in fact a Kiswahili term meaning "crowded shoulder to shoulder." Matungu is a small town in the Mumias District in Western Kenya, where neonatal mortality rates are among the highest in the country. This rural region is home to many sugarcane farmers and the Mumias Sugar Company is the largest employer. These two settings are good examples, respectively,

of an urban, low-income, informal settlement and a rural agricultural region with low to medium income.

This study used qualitative research and incorporated quantitative components to facilitate the analysis. Quantitative data collected included the numbers of community health workers and traditional birth attendants assessed, numbers of CHWs and TBAs making use of mobile phone texting technology, and numbers of organizations working in the focus districts. The methodological design of this study was deemed appropriate because of its flexibility and ability to capture the beneficiaries' perceptions, providing valuable quantitative information to draw a holistic picture of the situation.

Data Collection Process

Data was collected through one-on-one interviews, questionnaires and focus group discussions. In addition to collecting field data at the two research sites, researchers gathered secondary data from policy documents, research documents, and project documents from various organizations. Before on-site data collection began, the research consultant and research assistants visited the research sites to contact prospective respondents and schedule interviews. The research consultant also wrote letters and emails to prospective participants explaining the purpose of the study and requesting their permission to be interviewed.

Approaches to data collection depended somewhat on the prevailing realities on the ground, as described below. At both research sites, the researcher organized participatory workshops for TBAs and for CHWs. In addition, in-depth interviews were conducted with key respondents. Respondents' interviews

were recorded and reviewed at the end of the day of data collection to identify gaps and fill them before leaving the sites.

In Korogocho, the first participatory workshop was held with CHWs. A total of 17 community health workers attended the session. The group composition was diverse, including men and women spread across age groups. The session was organized into two parts. First, a moderated plenary session allowed participants to contribute to a discussion on different issues related to this research. This session was open and very productive. Participants exchanged information freely, revealing many insights into their work. In the second session, participants were broken into three groups during which they mapped their areas of operation and answered questions on topics such as the structure of their work, the organization they work with, and the training they have undergone.

The second participatory workshop was conducted with TBAs. Participants were mostly older women. The original plan was to follow the structure of the CHW workshop, that is, to hold an open session and a group mapping exercise. There were, however, some differences in the whole data collection process. The TBAs arrived very late for the workshop: the group was supposed to meet at 8:30 a.m., but only a handful had reported by 10:00 a.m., when the session started. The rest trickled in through the morning as the session continued. The first session was general; it included everyone giving a history of their work, training, and the organizations they have worked with. However, when the discussion touched on information such as births they had attended, most TBAs claimed they hadn't delivered any babies recently, some saying they last delivered in 1985. Generally, the TBAs reported that they had not delivered for years, yet they were able to discuss issues that affected them as TBAs.

Midway through the process, it became clear that participants harbored deep suspicions about the workshop's mission. Given the current Kenyan government position that TBAs should not deliver babies, participants feared that the organizers might be collecting information that could implicate them for wrongdoing. In fact, one TBA who had said in the group discussion that she hadn't delivered for years was heard whispering, "They should release us quickly because I have five clients at my place."³

It was evident that this workshop was not the most effective approach to reach TBAs, and after lunch, they were released. However, researchers later arranged for each of them to be approached individually by someone they knew personally who could gather data from them in a way that cultivated trust. This experience was an indication of the challenges that researchers could face in working with TBAs in Korogocho.

The data collection process in Matungu was similar to that conducted in Korogocho. However, the process of organizing the field research was smoothed through the cooperation of Umoja Women's Group and the Ministry of Health. An officer from the District Medical Office and a representative from Umoja Women's Group attended the workshops.⁴ In Matungu, all CHWs and most TBAs work closely with the District Medical Office as well as organizations such as Umoja Women's Group. Both sets of respondents were open and shared information freely. As in Korogocho, the composition of the CHW workshop was mixed, while the TBA workshop consisted entirely of older women.

In addition to the participatory workshops, researchers conducted individual in-depth interviews with TBAs and CHWs to gain deeper insight into their work. Researchers also conducted in-depth interviews with other key stakeholders, as summarized in the table below.

Interviews were conducted in different languages. In Korogocho, TBAs and CHWs were interviewed in Kiswahili while officials and organization leaders were interviewed in English. In Matungu, interviews were conducted in Kiswahili and in some instances, in Kiluhya through an interpreter. All data was transcribed for reference.

Relevant documents and reports were studied to provide context for the study. This also provided background information for the proposed health texting project to be conducted in Korogocho.

The following table shows the number of each type of respondent interviewed in Korogocho and Matungu.

3 Based on the information obtained through this research, TBAs in Korogocho are visited by women who need delivery assistance. Some of these women come to the TBA's home where they have small rooms to serve their clients. Women stay here for delivery, sometimes for as long as 48 hours.

4 Researchers were concerned when they learned that an officer from the District Medical Office would be in attendance, fearing it could affect participants' openness. However, during the session, participants spoke freely. Also, the DMO presence was helpful in that it gave researchers an aura of legitimacy in the eyes of participants.

NUMBER OF RESPONDENTS IN KOROGOCHO AND MATUNGU

Respondents	Locations		
	Korogocho	Matungu	Total
Community Health Workers	17	10	27
Traditional Birth Attendants	16	15	31
Medical Health Officers	2	3	5
NGO/CBO/FBO	3	1	4
Total	36	29	65
<i>* Non-Governmental Organizations, Community-Based Organizations, Faith-Based Organizations</i>			

The following table lists the organizations interviewed at the two research sites, including government medical officials, community-based organizations, a Catholic priest and a community radio station.

GOVERNMENT AND NGO/CBO/FBO RESPONDENTS

Government Officials and CBOs	
Korogocho	<ul style="list-style-type: none"> ✓ District Medical Officer ✓ Health Officer ✓ St. John's Catholic Church priest who has initiated projects involving CHWs in Korogocho ✓ Pambazuko Mashinani, a CBO working with Koch FM, youth, Health Officers, area chief, CHWs and TBAs in Korogocho ✓ Koch FM, a community radio station that covers health issues in Korogocho
Matungu	<ul style="list-style-type: none"> ✓ Umoja Women's Group, a CBO working with women, youth, Health Officers, CHWs and TBAs in Matungu. ✓ Acting District Medical Officer ✓ Health Officer ✓ District Public Health Office

FINDINGS ON CHWS AND TBAS IN KOROGOCHO AND MATUNGU

Research Findings on Community Health Workers

EDUCATION AND AGES

This study found that 89% of CHWs had at least a basic education and could therefore read and write. The majority of CHWs polled, 48%, fell within the 30-40 year age group. The tables below provide more detail.

TABLE: CHW EDUCATION

Site	Total	Education Level				
		Primary Incomplete	Primary Complete	Secondary Incomplete	Secondary Complete	Some Post Secondary
Korogocho CHWs	17	2	3	6	5	1
Matungu CHWs	10	1	1	3	5	0
Total	27	3	4	9	10	1
% Total	100%	11%	15%	33%	37%	4%

TABLE: CHW AGE RANGES

Site	Number	Age Range					
		20-30	30-40	40-50	50-60	60-70	70-80
Korogocho CHWs	17	3	8	6	0	0	0
Matungu CHWs	10	2	5	2	0	0	1
Total	27	5	13	8	0	0	1
% Total	100%	19%	48%	30%	0%	0%	4%

TYPICAL PROFILES

In the course of this research, several distinct profiles emerged of CHWs in Korogocho and Matungu. In terms of health issues and activities, there are marked differences between the urban, low-income setting of Korogocho and the rural setting of Matungu; the practice of community health workers varies accordingly. It is not possible to draw a single profile of a health worker in these two locations because they assume very diverse sets of duties and responsibilities and work under different arrangements. Some of these arrangements are organized and structured; others are less so.

However, it can be said that most CHWs work with organizations that are directly or indirectly involved in providing healthcare. These include government health agencies and institutions such as the Ministry of Health, district hospitals, health centers and dispensaries; non-governmental organizations (NGOs); community-based organizations (CBOs); and faith-based organizations (FBOs).

The study showed that CHWs operate under four distinct working arrangements. The first such arrangement was noted in Matungu where CHWs work under the auspices of the Ministry of Health. This is by far the most organized system. CHWs are recruited at the local level through local administrators and community members. The community then votes on the CHW. To ensure that the elected individual will provide continuity in their work, candidates must be local residents and must have long-term plans to stay in the village. These positions are unpaid.

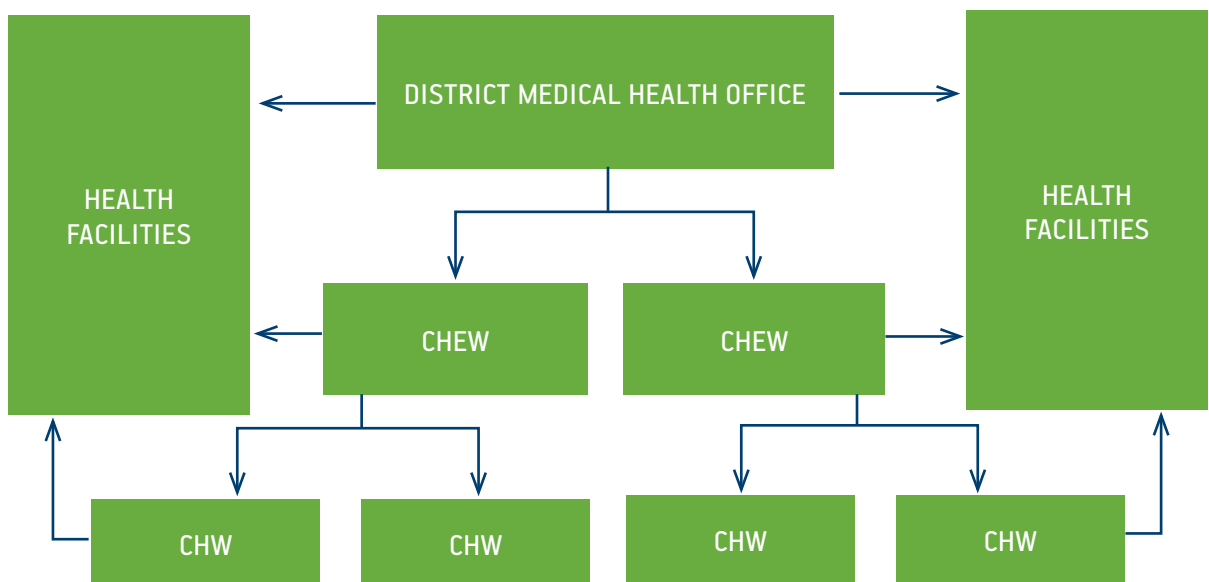
There is a CHW in every village in Matungu. Villages vary in size and composition. Some villages are organized by clans, which simplifies the work of CHWs because they are able to use some existing mechanisms to address health issues. This group of CHWs is primarily trained by the Ministry of Health. Under this arrangement, CHWs are organized into Community Units (CU), each of which is overseen by a Community Health Extension Worker (CHEW). Every Community Unit has 50 community health workers. CHWs are also attached to a specific health facility.

The second arrangement observed in Matungu is what one could call composite CHWs. A composite CHW is one who works within the government health system but also engages in other activities with an NGO or a CBO that is active in their area. Most of these CHWs have more experience; some have been working in healthcare for 30 years. As a result, they are well connected in the field and able to work with different organizations. Some are recruited for the new working structure but maintain their previous working relationships.

Composite CHWs also exist in Korogocho, and they share the characteristic of being highly experienced. However, there they are less organized and their practice is more fluid. They work with multiple organizations and, unlike CHWs in Matungu, they receive no established royalties. In Korogocho, the Ministry of Health does not have a very strong presence. The Nairobi City Council supports some projects, but these address only one health issue at a time, such as tuberculosis or HIV, while in Matungu the CHWs address health issues holistically.

The third type of arrangement might be called *CHWs/TBAs*, comprising community health workers who double as

MATUNGU ARRANGEMENT: CHWS WORKING WITH THE MINISTRY OF HEALTH



traditional birth attendants. (In Matungu, TBAs are also called safe delivery advocates.) Researchers found very few cases of this arrangement in Matungu. As noted elsewhere, most TBAs were older women who do not fit the profile of individuals who would be recruited to work in the new community health extension structure. However, in Korogocho, researchers found many CHWs who said they also work as TBAs.

The fourth and last group of CHWs were those who were recruited by a specific organization to carry out a specific duty. An example from Korogocho is a group of young people who were selected and trained by the community-based organization Pambazuko Mashinani. Their work includes community mobilization, organizing support groups for tuberculosis patients, providing home-based care to patients, tracing those who have stopped taking their prescription drugs, identifying potential new cases of TB, and health counseling.

Appendix 1 provides profiles of each of these four types of community health workers.

TRAINING

CHWs do not have formal health training, but they receive some basic training that may cover one or more health issues in depth. Experts are usually invited to train CHWs on a particular course and subject, depending on the health problems they will be addressing. CHWs working with the Ministry of Health in Matungu reported that they had had two weeks of induction training, and those working in Korogocho had gone through one week of training by NGOs working in the area. For many, that is the only medical training they have undergone. Some CHWs have participated in a variety of training sessions by different organizations. These trainings usually reflect an organization's thematic focus.

Merciline Osanya from Matungu has been working as a CHW for the last 28 years. She shed some light on how she was trained:

I started working in health work with missionaries. When they left I trained with GTZ and as a CBD. Then we went on to training with St. Mary's Hospital, Mumia. I also got training at Khalava Health Center with Eco Day. I also used to come to train here at Matungu. Since 1983 long before I started and I am going continuing to this point.

Generally, CHWs are trained to respond to a specific area of health intervention. The health issue is mainly defined by the organization that trained them and the project they are working on at the time of time of training, for example, maternal and child health in Matungu or TB diagnosis and tracking TB

patients who have stopped taking their medicine in Korogocho. The CHW may continue to work on that particular area, but more often than not, he or she is recruited to work in another project. As a result, some CHWs have multiple areas of competency. These may include:

- Screening for common ailments such as malaria and giving pregnancy tests;
- Conducting routine health procedures, including measuring temperature and blood pressure, administering oral vaccines, and giving injections;
- Providing counseling in areas such as HIV/AIDS, and advising expectant mothers;
- Advocating for better sanitation and hygiene practices in the community, such as teaching families the importance of digging latrines, washing their hands after using the bathroom, and cleaning utensils thoroughly;
- Urging community members to seek advanced health services in case of illness and helping them overcome fears and biases against such care;
- Encouraging pregnant mothers to deliver in health facilities;
- Assisting in the collection and collating of data for various health stakeholders, e.g. maintaining the community register of household health records and working as assistants in health-based research studies in their localities;
- Participating in health campaigns for issues such as child immunization.

RECRUITMENT AND SELECTION

In both Matungu and Korogocho, there are two distinct generations of CHWs. There is an older group that has been working in the area for over 30 years. These were trained by a variety of government and private organizations and health institutions. Another CHW cohort consists of CHWs who were recruited in the last few years, starting in 2008 in Matungu and as recently as 2011 in Korogocho, where 400 CHWs have recently been trained by the Ministry of Health.

Dickson Otsieno is from Nanyeni Sub-location, Mung'ungu village, which held a competitive recruitment process for two CHW positions. He became a CHW three years ago. Otsieno shared that following a district health report that identified the need for CHWs, every sub-location was directed to select two community health workers. Village elders were charged with leading the process of identifying two individuals for these positions.

He related that the process involved the whole community. People gathered and held an election to select the individuals to represent them. The following minimum qualifications were

required for candidates: (1) have completed at least form four at school, (2) come from the village, (3) have good rapport with village members, and (4) plan to stay in the area long-term.

After the sub-locations completed their selection process, the new members were taken to a five-day training where they were taught basic health skills. The training focused on mapping the area where they would practice and introducing their duties and responsibilities as CHWs. The CHWs are supervised by a Community Health Extension Worker (CHEW) in Matungu.

In Korogocho, there is no consistent structure such as organized by the MoH in Matungu. However, most CHWs in Korogocho are affiliated with local organizations that supervise them. In Korogocho, the recruitment process is conducted by different stakeholders in the area. There is a strong emphasis on specific qualifications that are not necessarily related to health or work skills. For example, St. John's Catholic Church emphasizes individuals' religious faith, respect from community residents, passion for volunteering in the community, and family values. Father John Weboosta of St. John's Catholic Church, Kariobangi, described the process to researchers as follows:

First of all, they [CHWs] must have a strong compassion, a strong understanding and love for the sick and skills of handling sick people. They should also be committed to having a conducive environment that can prevent illnesses and help one get cured, and that person should also be in touch with God because it is only when you are in touch with the origin of life that you will be able to understand the importance of life. So I say that because I know there are no atheists in Korogocho. So that [requirement] is very important notwithstanding which religion or denomination one is coming from, and somebody who basically has a family background and is respected in the community.

In Korogocho, there are more than 400 CHWs, of which about 35 are active. Because of the lack of a real framework in Korogocho and the unsystematic and sometimes overlapping way in which organizations work, it is hard to get a clear picture of CHW activities.

Matungu District, in contrast, is impressively organized. In each of the 12 health facilities that fall under the Ministry of Health, there are 25 CHWs. As a result, there are about 300 CHWs, all of whom readily identify themselves with the structure. During the workshop conducted for this study, researchers noted how CHWs in Matungu tended to start their introduction by citing

the administrative work area and the health facility with which they were associated. All introductions were framed along these lines:

My name is Wilson Munyekenye from Mundindi village and I am attached with Lunganyiro dispensary.

There is clearly a good working relationship among the various parties involved in healthcare delivery in Matungu, including the Ministry of Health, CBOs such as Umoja Women's Group and the CHWs. There is also cooperation with other health providers such as mission hospitals. For example, several older CHWs mentioned that they were trained at St. Mary's Hospital Mumias. Although new administrative boundaries have separated the town of Mumias from Matungu, there remains some overlap, as the new systems are not yet fully set.

DUTIES

CHWs perform a variety of functions, depending of course on the particular context in which they work. Two factors appear important in defining CHWs' work: the nature of the organization to which they are answerable, and individual motivation. CHWs focus on the duties that are defined by their individual's organizations, and therefore tend to work best when working within an organized framework. In Matungu, CHWs' duties are more extensive than in Korogocho, encompassing both direct and indirect health issues. Below are the key duties that CHWs perform.

Maintaining the Community Register

CHWs in Matungu maintain the community register for the village. A community register consists of records that help CHWs to follow up on health issues in their work area. The register describes individual households and their members, including gender, age, and education level. For each household under their jurisdiction, CHWs use the register to monitor health behavior, maternal and child health issues such as family planning, immunization and maternal death, and environmental and sanitation issues. The register is updated every month and forwarded to the District Medical Health Office.

CHW Dickson Otsieno provided researchers with a picture of how the community register works and shared one that he has maintained. He explained that he handles about 200 clients in 39 households. In his area, there are two social workers in one sub-location, which is in turn divided into two villages. Each village is inhabited by a group of people from the same clan; for instance, Otsieno's area of operation, Mung'ungu A, is peopled by the Abamucheka clan. The health work he does is integrated with other forms of village organization. For example, the clan

holds a monthly meeting where they discuss different topics of concern. As a CHW, Otsieno always gets a time slot to discuss health-related issues in the village.

Below is a copy of the community register that Otsieno has maintained.

Educating Households on Sanitation

Community health workers, especially in Matungu, reported that a large part of their work involved educating their community on sanitation as an important part of disease prevention. CHW Wilson Munyekenye said, "I deal with sanitation, I address toilets, clean water, educating women at home to plant vegetables."

CHW Michael Otsieno explains this work:

With sanitation, we encourage families to have a clean and safe [utensil] drying place, we encourage them to have a place to take bath and not in the river,

to treat water and have leaking can at the toilet sites and to have a clothes drying line, to dig toilets and so on. We tell them to treat water to control water-borne diseases, we also tell them to wash their hands before they eat, to wash fruits before they eat. We also tell them to clean utensils properly before they use them, personal hygiene.

Encouraging People to Seek Medical Care

CHWs in both Matungu and Korogocho serve a large segment of low-income families. For various reasons, these families generally do not seek medical care from available facilities when they need them. Pregnant mothers are reluctant to visit clinics for pre-natal care or to deliver in health facilities, even when they are relatively accessible. While some parents take their sick children to the hospital, others don't seek professional medical care because of cultural and religious beliefs. CHW Mohammed Asman gave an example of this type of work:

VILLAGE REGISTER MATUNGU DISTRICT NANYENI C.U. NANYENI C. - x x x																		
HOUSEHOLD NAME	AGE	SEX	DATE	CHILDREN	EDUCATION	CREATING INCOME	HOUSE TYPE	IMMUNIZATION ON	WATER SOURCE	FAMILY PLANNING	ENVIRONMENTAL SANITATION				DRINK ROOM	U-S DEATH	REMARKS	
											FLY-TRAP	WASHING PLACE	DIRTY WATER	TOILET				
MAGEE	21	M	11/12/2010	2	5	SEC	None	Semi-Permanent	B19/105	Bore-hole	Yes	L	L	L	L	NO	X	Minimum hygiene & sleep under it
MELLEN	26	F		3	3	PAI						PAI	L	L	L	L		
SAMANTHA	7	F		3	2	PAI												
ELVIS	5	M		3	2													
INDOCENT	15	M		3	2													Advised
GIET	15	M		3	2													to cons. truck a dash rack.
CRIS	22	M	11/12/2010	1	5	PAI	None T.B	Semi-Perm	-335/06	Bore-hole	NO	L	L	X	L	NO	X	
DORCAS	25	F		2	5	PAI												
STEPHEN	3	M		3	2													
				3														
PATRICK	33	M	11/12/2010	1	5	PAI	None/used - ENGAGEE WORK	Semi-Perm	-07/2001 -620/04 -91/01	Spring	NO	L	L	L	L	NO	X	Advised to cons. truck a dash rack.
EDITH	27	F		2	5	PAI												
CRAYAN	7	M		3	3	PAI												
ELVIS	4	M		3	2													
LIWAN	2	F		3	2													Advised to cons. truck a dash rack.
EMOLKA	27	M	11/12/2010	1	5	PAI	None	Temporary	-110	Spring	NO	L	L	L	L	NO	X	Advised to cons. truck a dash rack.
MINT	25	F		2	5	PAI												
JOSE	6	M		3	2													
JERITA	17	F		3	2													
SEFERIO	23	M	11/12/2010	1	4	PAI	None	Temporary	63/08	Spring	NO	L	X	L	L	NO	X	1TH USE
JUDY	20	F		2	4	PAI												
QUAS	20	M		3	2													
ROMAN	29	M	11/12/2010	1	5	PAI	Stomach	Temporary	-262/05 -452 -259/12	Spring	Yes	L	L	L	L	NO	X	
ZAINABU	21	F		2	4	PAI												
YVON	6	F		3	3													
COLINE	5	M		3	2													
BRANTON	2	M		3	2													
MUSA	29	M	11/12/2010	1	5	SEC	None	Semi-Permanent	-2539 -062 -1007	Spring	NO	L	L	X	L	NO	X	To use rec.
LILLIAN	27	F		2	5	PAI												
DELMAS	11	M		3	3													
KEITH	8	M		3	3													
CALEB	6	M		3	2													
AMOS	3	M		3	2													
SAWA	21	M	11/12/2010	1	4	PAI	None	None/used	-2539 -062 -1007	Spring	NO	L	L	X	L	NO	X	To use rec.
PRISCA	18	F		2	4	PAI												
DORINE	13	F		3	2													

A community register maintained by Dickson Otsieno, a community health worker for Nanyeni 2 Sub-Location (Mung'ungu Village) in Matungu district.

The other day I had a woman who had just delivered. We had advised her to deliver at a health facility but they delivered at home. When we sat with her, I advised her to go to the clinic and we discovered she was HIV positive. We then followed [up] and realized she is married in a household where the husband believes that wife should not go to the clinic for any kind of test. Luckily, the child is healthy but the mother is very weak, sometimes coughing and diarrhea. She is strong but the kid is vomiting and has diarrhea. I advised her to go to Mushivila [clinic]. My advice was for her to go to Matungu Hospital but she is afraid of the husband.

CHW Wilson Munyekenye also explained these duties, among others:

I am a volunteer and I encounter malaria, pregnant mothers, sick children, tuberculosis, HIV-positive people, and family planning [needs]. When it comes to malaria, you may find a mother or father has malaria and has no help. They will ask for your help. "My child, I am sick and have nothing." Sometimes I just take them to the dispensary. We also find children who have marasmus [a sign of malnutrition], you take them

Clearly, CHWs are on the frontlines of healthcare in their community. They have developed a reputation as the person to go to if one has any health challenge.

Specific Disease Intervention

Some CHWs work in projects that address a particular health problem. Researchers found a number who are working to address tuberculosis, HIV/AIDS, malaria and maternal health. These projects were more likely to be found in Korogocho.

Saidi is a CHW based in Korogocho working on a TB project:

I am based in Nyayo estate within Korogocho and I am mostly involved with TB patients. I am also involved in patient follow-ups that cover the whole of Korogocho... I am with an organization called MALTISA... MALTISA is an organization involved in TB. We make follow-ups on patients who have come for TB medication in order to make referrals and TB testing. If a patient is still infected with TB we do follow-ups. If the TB diagnosis is negative, we refer them for X-ray at other hospitals. We also educate young people on various reproductive health issues from sexually related infection including HIV and AIDS.

CHWs address a range of health problems.

We teach them so much in a slum like in Korogocho, we have many public health problems like TB, diarrhea, which is associated with poor waste disposal; there are also issues of pain and headache. Simple solutions – we equip them with oral dehydration salts to deal with diarrhea although we don't give them antibiotics. We also give women who want them contraceptive pills. They know those people who are using pills, but any complication arising due to use of a pill, there is a referral form that we give them and they give it to their clients.

CHALLENGES

This research found that community health workers must contend with a daunting array of difficulties in their everyday work.

1. In most cases, CHWs work on a voluntary basis. In rural Matunga, CSWs are not paid for their day-to-day activities. Most say that they have never received any remuneration for their work. However, once in a while, CHWs in Matunga are able to participate in health-related activities such as research and implementation of projects such as immunization and de-worming. During these activities, they are given some compensation in the range of 300 Kenyan shillings (3.60 USD). For other activities, CHWs receive some transportation allowances, such as when they submit the community register each month.
2. The community's lack of understanding of the role of CHWs. Because CHWs work with local organizations or government agencies, the community sees them as representative of those entities. This can lead to unrealistically high expectations that CHWs are in position to provide resources to take care of health needs. When CHWs explain their position, clients sometimes believe they are lying.
3. CHWs generally lack equipment to use in their daily work. Dickson Otieno, a CHW from Mang'ungu, recalled that when his group was trained three years previously, they were promised health kits to use in their daily work. These kits have never been delivered, making it difficult for him to fulfill some of his duties.
4. Community health workers are constantly traveling to visit their clients. Some villages are well-populated, which means the CHW must service a large clientele. However, most CHWs do not own any form of transportation. Many male CHWs in rural areas who were interviewed mentioned the need for vehicles such as bicycles. In some areas, CHWs

have been given bicycles; others have been promised bicycles that have yet to materialize.

5. CHWs find that while they are supposed to encourage clients to use clinics and hospitals, access to such facilities is limited. For example, CHWs are asked to encourage pregnant women to visit health outlets for essential maternal services. However, some of these facilities are only open during the day, so a pregnant woman who needs to deliver at night cannot access these services. Other clients have previously

experienced poor treatment at the medical institution they are being encouraged to visit.

6. Time is a real constraint for community health workers. Since most CHWs work on a voluntary basis, they need to spend time earning income to support their families, for example, through tailoring, selling groceries, farming or operating other family-based businesses.

Research Findings on Traditional Birth Attendants

EDUCATION AND AGES

Only 23% of TBAs in Matungu and Korogocho had completed primary school, as indicated in the tables below. As a result, many of the TBAs polled could not read or write, and were less receptive to the use of new technology.

The largest group of TBAs polled, at 35%, fell in the 50-60 year age range.

TBA EDUCATION

Site	Total	Education Level				
		None	Primary Incomplete	Primary Complete	Secondary Incomplete	Secondary Complete
Korogocho TBAs	16	8	5	1	2	0
Matungu TBAs	15	4	5	2	1	1
Total	31	12	10	3	3	1
%Total	100%	39%	32%	10%	10%	3%

TBA AGE RANGES

Site	Number	Age Range						
		20-30	30-40	40-50	50-60	60-70	70-80	80-90
Korogocho TBAs	16	1	3	6	5	1	0	0
Matungu TBAs	15	0	3	1	6	2	1	2
Total	31							
% Total	100%	3%	19%	23%	35%	10%	3%	6%

SKILL LEVEL

Traditional birth attendants (TBAs) have been fixtures of African communities for countless generations, providing vital care for pregnant women and their babies, especially for less affluent families. However, Ministry of Health officials interviewed for this research felt that TBAs should be considered "unskilled" practitioners. For instance, Alex Taiywa, an immunization extension officer with the Ministry of Public Health and Sanitation in Matungu, said:

When we talk of skilled [practitioners], it should be somebody who is able to comprehend the physiology of what is happening. [They] should be able to understand reproduction from conception to delivery and should be able to understand the anatomy of human reproduction. They should have acquired the skills such that if the mother cannot have a normal vaginal delivery, they should be able to operate on them and the client is safe. A skilled attendant is someone who can perform comprehensive maternity services. These skills can only be obtained through formal training.

However, community leaders interviewed felt that TBAs should be considered “skilled” and that it would be discriminatory and stigmatizing to say otherwise. Father John Weboosta, a priest with Comboni Missionaries in Korogocho, said of TBAs:

These people are... even more skilled than those who have gone to study in colleges. They are people who are very much in touch with the natural system of [the] human person and everything traditional is everything linked to nature. Whatever these people [professional birth attendants] learn for a short time, it has taken years for a TBA to learn through practice. TBAs therefore do things that are in them, and it is not just a profession but it's kind of a calling... not everyone can become a TBA. Anyone can go to study medicine, anyone can go and get those skills but still cannot be as people- friendly as TBAs.

Women of reproductive age who were interviewed also considered TBAs to be skilled. Interviewee Jane Munyendo explained:

It's a bit stigmatizing calling [TBAs] unskilled because I want to give this example that one mama gave me . . . This mama told me, “Look here, my mother gave birth to us twelve children in our family and all of us were born in the TBA's home, and we are still alive, we are healthy. This is the sixth pregnancy I am having and from the first pregnancy to this one I have been coming to the clinic but giving birth at home. So why should I stop going there [to the TBAs]? So these TBAs are skilled, this person can manage me.

While Kenyan government officials discourage the work of TBAs to some extent, at least some acknowledged that TBAs have skills and information on how to care for expectant and birthing mothers that they have learned from each other. As one medical officer put it:

A TBA is someone who does not have formal training

in midwifery, gynecology and all matters related to reproductive health. But these people still have knowledge; this could be knowledge that has been passed from maybe grandparents or parents.

TYPICAL PROFILES

There are five main types of traditional birth attendants in Kenya. First, there are TBAs who have had no formal training, but who pass on skills from one generation to the next. Peter Muguna, the health officer in charge of Korogocho, explained:

You see in the African society, there are some families that... produce TBAs. These people got some form of training to handle childbirth and all issues related to reproductive health. Sometimes they pass this knowledge from generation to generation, for example if you have a daughter, you can pass this to your daughter if you become too old... Where people are quite poor and cannot afford formal care or conventional medicine, people are still relying on these TBAs. And they are still effective. However, there are not well trained to deal with emergencies and complications associated with childbirth and all that.

Secondly, there is a group of TBAs who initially practiced home delivery, and were then selected and trained by the Kenyan government to improve their skills. This cadre of TBAs was then seconded to health facilities where they received hands-on experience under the supervision of skilled attendants. The trained TBAs were then given basic equipment to perform normal deliveries. Unfortunately, according to interviewees, there has been no follow-up or refresher trainings for this group. Josephine Ameyo, is one such TBA cum CHW from Korogocho who was trained by the government:

The third type of TBAs is made up of retired midwives who currently perform home deliveries within their communities. They have the skills and experience for the task, but they do not have the requisite equipment.

The fourth category is made up of TBAs who also serve as community health workers, in a composite role as described in the section on CHWs.

The fifth and last category is a new role introduced in Matungu, where TBAs are currently being trained to serve as Safe Delivery Advocates (SDAs). Under Kenya's National Reproductive Health Policy, TBAs are encouraged to transition their role from performing deliveries themselves to providing support for pregnant women and advising them to seek care at health centers. Jane Munyendo, program manager for Umoja Women's Group in

Matungu, described the evolution to the role of Safe Delivery Advocates (SDAs):

In Matungu district, the TBAs were like, “We should change our names now.” So they said they wanted to call themselves the community Safe Delivery Advocates so that they bring people to the hospital. So what we agreed was that the MOH office will, through the nurses in charge of the health facilities, come up with a health committee and this health committee will set a figure for the number of referrals that the SDAs [should] bring to the hospital and also look into ways in which these SDAs can be motivated.

GOVERNMENT APPROACHES

In interviews with government health officers, they were unanimous in the belief that TBAs should not be allowed to continue overseeing deliveries. Nevertheless, the government takes harder or softer approaches towards TBAs depending on the medical officer in charge of a particular region. For example, health officers in Matungu are taking the innovative approach of transitioning the role of TBAs into Safe Delivery Advocates, as described above. TBAs there have been mobilized and organized into support groups and assigned specific health facilities to which they refer pregnant women.

In Korogocho, however, the district medical officer absolutely discourages any partnering with TBAs in promoting maternal and child health, even though the health officers under him believe it is important to do so. Peter Muguna, health officer in charge of Korogocho, explained the policy:

[TBAs] were actually not stopped completely, but they are not licensed to practice formally as midwives. Structures are there so that they can make referrals to the nearest health facilities and can also be the link between the main hospitals, and they are actually not condemned though not licensed to conduct deliveries. Why? We are having so many people dying in the houses, many women die due to complications associated with home deliveries, especially mothers who are delivering for the first time. Because those are the mothers at risk: mothers who are delivering for the first time, called primigravida, [women] after the age of 35 years, and also mothers whom we call multipara, those who deliver for the sixth or seventh time. These are people who are likely to get complications associated with childbirth. So the government felt that [TBAs] are kind of increasing maternal mortality rates, so the government felt that it could

be OK if these people could be the link so that they can refer. Our emphasis is that primigravida and multipara deliver children within health institutions.

This policy has, however, been strongly criticized by local opinion leaders as self-defeating. Father John Weboosta of Korogocho says:

[TBAs] are very important because if the government really cares it would have given us health facilities here where women can give birth. If you stay here, there are no government-funded health facilities. Those that are here are private and costly. Many children are alive here because of TBAs... TBAs save lives of the poor. If we follow the conditions given by the government, many children and women will continue to die.

RECRUITMENT AND SELECTION

In Matungu, strategies for selecting TBAs involved use of community leaders such as village elders, assistant chiefs and especially women leaders during public meetings within the villages. The process was tedious and time-consuming. Jane Munyendo of Umoja Women’s Group explains:

When we came in, in Matungu, to start working on MNH [Maternal and Neonatal Health] project, the health facility was just wondering what they would do to bring back the TBAs on board. We then began by identification [of potential TBAs] through the community leaders. Thereafter we sat with the MOH office and brought in the names on the table and we pledged that Umoja Women will cater for the trainings, and expenses of the venue, food... We brought in the health professionals, the nurse in-charge, and [afterwards we led] the health professional training on what they expect the TBAs to be doing.

In some instances, TBAs have been identified through “snowballing,” in which current TBAs are asked to recommend others they know. This was the case of the community group Pambazuko Mashinani in Korogocho, where the Ministry of Health has a hard stance against TBAs.

CHALLENGES

This research study identified several serious hindrances to the work of traditional birth attendants in Kenya.

1. Although they may be highly experienced and love working with pregnant women, most traditional birth attendants are

poorly educated and cannot read and write. When asked to give reports, illiterate TBAs must rely on their memory.

2. Non-payment for services is a recurring problem: some women who give birth at the homes of TBAs then fail to pay them for their services, as is expected. This creates financial hardship for the TBAs.
3. TBAs are generally ill-equipped to tackle complications of pregnancy. Many patients who end up at the health centers were initially tended by TBAs but then faced complications. These include excessive vaginal bleeding, neonatal sepsis (severe infection of the newborn), ruptured uterus during prolonged labor, systemic complications from unhygienic conditions, and fetal death in the uterus. As a result, health practitioners have accused TBAs of delaying women from obtaining urgently needed obstetric care by skilled attendants. However, TBAs indicate that they face myriad obstacles to getting women to health facilities in a timely fashion. Key among these challenges are the cost of transportation, poor roads, lack of communication facilities, and opposition of the pregnant women's husbands. Anne Mbala, a TBA in Korogocho, explained the difficulties in getting birthing mothers to health facilities:

There's usually a problem of excessive bleeding by expectant mothers. At such a time, if she has no money to take her to hospital, it compels us to lend money, hire a car and rush her to hospital. When we get to the hospital, at times she is not attended to

immediately and this often results into her developing more complications. This has resulted in women shunning hospitals in preference for TBAs. At times we do not have efficient abilities to assist them, as a lady may give birth but lack sufficient blood in her body, lack adequate water in her system or energy to push the baby out.

4. Some pregnant women do not want to know their HIV status. In such cases, they may shun health centers because they know that they will be asked to go through the mandatory program for prevention of mother-to-child transmission of HIV (PMTCT). Such women prefer to deliver in the homes of TBAs. As one Muslim TBA explained:

Some of them even come when HIV-positive. This is mostly amongst people from my religion. Muslims fear that if they are HIV-positive they will be put to shame, yet it's not shameful, as God is in control. It would be better if they were tested and got medication for their own defense system. At hospitals we are told that if [women] are found to be HIV-positive, if they are expecting, there is medication they should take during labor and medication to take after labor. We traditional midwives do not have that kind of medication and it perplexes us why the ladies due for labor still want to come to us.

USE OF TEXTING FOR HEALTHCARE

The technological leap offered by mobile phones presents an opportunity for frontline health workers in Kenya such as community health workers and traditional birth attendants to address gaps in healthcare information. This study found that most CHWs and TBAs use mobile phones in their daily work, though primarily to make and receive voice calls. Some CHWs and a few TBAs have also begun to incorporate mobile phone text messaging into their work as a health communication tool.

Text messaging is proving particularly useful for the following:

- Appointment reminders for patients
- Field reports by CHWs
- Physicians' queries
- Monitoring of CHWs
- Mobilizing CHWs for meetings

This section summarizes findings on the use of mobile phones by frontline healthcare providers, and analyzes benefits, challenges, and possible solutions to incorporating text messaging in such work.

Ownership and Usage of Mobile Phones by CHWs and TBAs

To understand aspects of mobile ownership and use among CHWs and TBAs in Korogocho and Matungu, data was collected from 27 CHWs and 31 TBAs via a short questionnaire.

MOBILE PHONE OWNERSHIP AND USAGE AMONG CHWS

Site	Number of CHWs	Own cell phone	%	Use phone for work*	%
Korogocho	17	14	82%	15	88%
Matungu	10	10	100%	10	100%
Totals	27	24	89%	25	93%

* Totals may be higher than number who own phones, as some respondents borrow phones for work.

Of the 27 CHW respondents at both sites, a combined average of 89% owned mobile phones. All Matungu respondents had their own cell phone, compared with 82% in Korogocho.

All CHWs who owned cell phones used them for work purposes, and some who did not own phones reported that they borrow them from relatives for work-related communications. Fully 93% of CHWs reported that they use cell phones in their work.

MOBILE PHONE OWNERSHIP AND USAGE AMONG TBAS

Site	Number of TBAs	Own cell phone	%	Use phone for work*	%
Korogocho	16	12	75%	13	81%
Matungu	15	10	67%	11	73%
Totals	31	22	71%	24	77%

* Totals may be higher than number who own phones, as some respondents borrow phones for work.

Seventy-one percent of all TBAs interviewed owned mobile phones, including 75% in Korogocho and 67% in Matungu. As with the CHWs, TBAs who don't have cell phones of their own borrow from their relatives to use them for work as needed. Seventy-seven percent of TBA respondents use cell phones for their work.

The tables above illustrate heavy reliance on mobile phones by the two groups of healthcare providers, with some differences. The CHWs, who are overall younger and better educated, are more likely than TBAs to own and use mobile phones.

However, researchers found that both CHWs and TBAs mainly used cell phones for voice calls; very few used their phones to send text messages. In general, the extent to which both CHWs and TBAs used the various functions and services available on their cell phones was highly dependent on their age and literacy level. Younger, more educated CHWs and TBAs are more

open to mobile technology than older, less educated ones. Some of the phone functions, including text messaging, require a bit of technical understanding as well as literacy. One has to be able to read and write in order to navigate the text messaging function and write the message. Voice calls are much simpler: it only takes a push of a button to receive a phone call.

Who Gets Called: Use of Mobile Phones for Work Communications

This research sought to identify with whom healthcare workers communicate in their day-to-day work using mobile phones. Five categories were identified: clients, fellow CHWs and TBAs, non-governmental organizations (NGOs), civil society organizations (CSOs), and village elders who serve as administrative lynchpins for their communities. Respondents were asked to mark all groups with whom they communicate by cell phone in the course of their work. The following tables detail the responses.

WORK-RELATED COMMUNICATION BY CHWS

Site	Respondents	Clients	CHWs	TBAs	NGOs/CSOs	Village Elders
Korogocho	17	14	15	12	12	13
%		82%	82%	71%	71%	71%
Matungu	10	8	8	5	1	4
%		80%	80%	50%	1%	40%
Totals	27	22	23	17	13	17
% Totals		81%	85%	63%	48%	63%

WORK-RELATED COMMUNICATION BY TBAS

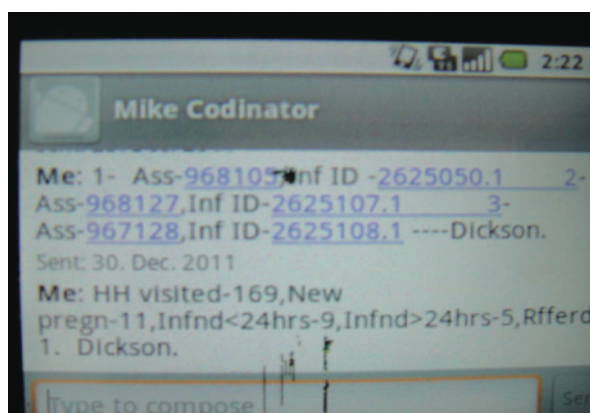
Site	Respondents	Clients	CHWs	TBAs	NGOs/CSOs	Village Elders
Korogocho	16	13	12	12	11	11
%		81%	75%	75%	69%	69%
Matungu	15	10	7	6	4	5
%		67%	47%	40%	27%	33%
Totals	31	23	19	18	15	20
% Totals		74%	61%	58%	48%	65%

The tables above show that 81% of CHWs use their cell phones to communicate with clients and 85% use their phones to contact each other. Seventy-four percent of TBAs use their phones to communicate with their clients; the next most frequently listed categories were village elders, CHWs and fellow TBAs.

How CHWs Use Mobile Phone Texting

Text messaging technology is proving particularly useful in the fields of sexual health, disease prevention and management, patient compliance, patient adherence reporting by CHWs, appointment reminders, physicians' queries and prevention of communicable diseases. Below are examples of communications by CHWs in the field.

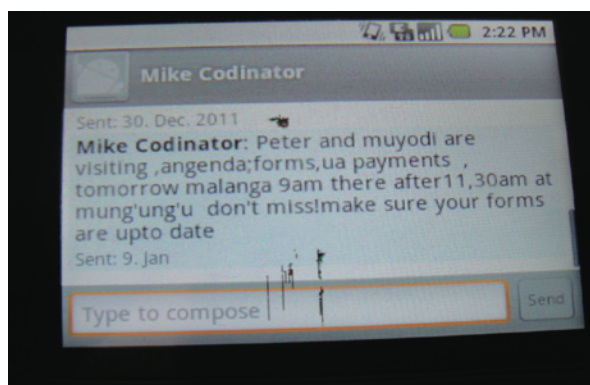
A CHW FIELD REPORT VIA TEXT MESSAGE



Me: HH visited-169; New pregn-11, infnd<24 hrs-9, Infnd>24 hours 24 hrs-5, Rfferd-1. Dickson

This is a message summarizing CHW Dickson Otsieno's record for the month of December. According to the report, 169 households were visited, 11 infants were captured within 24 hours of birth while 9 infants were captured after 24 hours of birth. One infant was referred to a health facility.

A TEXT MESSAGE TO MOBILIZE CHWS FOR A MEETING



"Peter and muyodi are visiting, agenda; forms, ua payments , tomorrow malanga 9am there after 11,30am at mung'ung'u don't miss!make sure your forms are upto date"

This message from the cluster coordinator of Mung'ungu Dispensary was sent to five CHWs to meet Peter, a doctor at Moi Referral and Teaching Hospital, and a Dr. Muyodi, also from Eldoret. The aim of the meeting was to discuss forms used on an ongoing neonatal sepsis study in the area. The message also informed the CHWs who are helping in the project that they would receive payments for their work and the venue would be at Malanga, a dispensary in Busia.

Peter Muguna, the health officer in charge of Korogocho, described the role of text messaging in his region:

At [the organization] Pambazuko Mashinani, I have seen CHWs dealing with TB issues reporting to their field coordinator through texting. Meetings would be convened through texting, the field coordinator would monitor CHWs through mobile phones and CHWs also gave reports through mobile phone texting. This has reduced the instances of CHWs going to offices of Pambazuko Mashinani, which is in Kariobangi, on a daily basis. We also had a polio campaign a few weeks ago. We reached about 4000 children in Korogocho, and I made use of mobile phones to call, mobilize and coordinate the CHWs.

How TBAs Use Mobile Phone Texting

Researchers found that, as they are older and many cannot read or write, most TBAs do not use mobile phones for texting. Some do not own mobile phones of their own, but borrow phones from their children or other family members as needed.

However, this study found that a few CHWs who double as TBAs, especially in Korogocho, are beginning to make limited use of texting. Anne Mbala, a CHW who also serves as a TBA in Korogocho, said:

We have found ourselves using mobile phones because of the distances between us and the many patients that we take care of. We have therefore made phone calls to colleagues to ask how they are faring. In the field, we have called fellow TBAs in Korogocho to discuss pregnancy issues, and we have also called the sick people under our care, including their close family members, when need be. Sometimes, depending on circumstances, we have texted each other.

Benefits of Using Texting for Health Care

As a tool for health communications, mobile phones have tremendous potential. Some of the benefits include:

1. **Affordability:** Mobile telephones are no longer just a tool for the wealthy; low-income segments of the population can increasingly afford to own these phones. Text messaging in particular is cheap in Africa, costing considerably less than voice calls.
2. **Interactivity:** Mobile phones present opportunities for two-way interactive communications between individuals at relatively low cost. Text messaging can serve as a simple way to facilitate greater participation and engagement.
3. **High penetration-to-cost ratio:** Mobile can be a cost-effective way of reaching people with health messages, especially when compared to other media. For instance, radio penetration is very high in Kenya, as is cell phone penetration, but radio production and advertising costs can be much higher than creating a mobile phone campaign.
4. **Reaching people anywhere:** Obviously, mobility is a fundamental characteristic of mobile phones, enabling health communications in a wide range of places. Since individuals on either end do not need to be in a fixed physical location, this is particularly useful for healthcare workers who are frequently on the move.
5. **Personal technology:** As the mobile phone is generally carried on the person, text messages are more likely to reach an individual than, for instance, communications that rely on the person seeing a billboard message. Further, text messages can be retained for future reference.
6. **Dealing with stigma and confidentiality:** Mobiles can be useful where privacy is important, for instance where there is stigma associated with a disease, such as HIV/AIDS. Of course, this is largely dependent on the user having his or her own phone rather than sharing one.
7. **One device, many uses:** Mobiles facilitate both voice and text communications, the latter in a variety of ways.

In both research sites, respondents were optimistic that mobile phone texting would make their work more efficient and effective. Jacqueline Awino, Field Coordinator for Pambazuko Mashinani, noted:

You know information quickly delivered is a big progress because so many lives have been lost because information has been delayed. In this kind of project, the information will be quickly delivered and action

will be quickly taken. So it will change the whole system of working, and it will also transform our operations.

Challenges of Using Texting for Healthcare

A number of challenges were identified that could hinder wider adoption of mobile phone texting for healthcare in the two research sites. The biggest challenges include:

1. **Cost:** Although the cost of owning and using a mobile phone is falling and text messages are inexpensive to send and receive, cost is still a consideration in developing country contexts. For instance, since sending a text message costs the user, designing communications so that people have to SMS to take part can seriously constrain uptake.
2. **Literacy:** Reading of text on a mobile phone requires at least some level of literacy, as does writing a message; careful assessment of a target market's literacy levels is thus necessary.
3. **Content length restrictions:** As mobile screens are small, it is difficult to read large amounts of content. In any case, texting may be limited to 160 characters per message. It takes a certain level of skill to fit meaningful content into such a short space, and the use of nuanced language is severely constrained.
4. **Network coverage:** It cannot be assumed that mobile phones can be used anywhere in a country. Sometimes networks do not penetrate into certain areas, such as very remote or mountainous areas like Matungu.
5. **Variability of phones:** All mobile phones are not equal; some have more functionality than others. While all phones enable text messaging and USSD (for instant messaging and other services), only some have Java and WAP, providing Internet capabilities.
6. **Phone sharing:** In some instances, where mobiles are used for health communications that are of a very personal nature or involve sensitive topics, phone sharing may present privacy risks. For instance, if a message implies that the recipient is HIV-positive, this could cause problems if the phone is shared and an unintended recipient sees the message.
7. **User familiarity with the technology:** While SMS is very popular among the younger generation, it is not widely used amongst those with limited literacy. As older people also use fewer of the functions on their phones, this difficulty is compounded with an older target market.

8. Participation of target communities: If a campaign wishes to involve the community in message development, this can be challenging on mobile, as the technical constraints (such as character limitations) make it hard for inexperienced people to participate. For instance, youth may be able to design posters or banners for their neighborhood, but getting them to write effective SMS texts for a campaign is not likely to be viable.
9. Integration of technology: In implementing projects that involve new technology, it can be difficult for a local organization to sustain such systems. For example, Koch FM, a community radio station in Korogocho, was unable to maintain a project involving mobile phone texting once initial donor funding ran out: the Internet service and the service for listener text messages proved unaffordable. Charles Kimani, a presenter at Koch FM, explained:

Last year Koch FM partnered with Internews and mobikash for a project. The project pilot phase is now complete and with that, the Internet is no longer affordable to us. Koch FM is currently shopping for an alternative which is affordable, as it cannot afford to pay 13,000 Kenyan shillings per month [156 USD].
2. Have Internews partner with major mobile phone service providers to offer a special line for free texting for health-care workers.
3. Provide TBAs and CHWs with smartphones, or at least mobile phones with more capability than basic voice and texting. As one TBA put it, "We have simple small phones that cannot access the Internet. So if we can have phones that can access the Internet and [have] other capabilities, that will be helpful in connecting us with other TBAs and CHWs."
4. Train CHWs and TBAs in how to use mobile phone technology, especially functions that involve using codes.
5. Install solar panels at strategic locations where CHWs and TBAs could charge their mobile phones. A CHW at Matungu said, "We come from regions where we have not electricity. If you have solar charge or have phones . . . which [don't] require constant charging, that can help."

Power outages in Korogocho have also affected the work of Koch FM in Korogocho. The station is forced to depend on a generator, which is very expensive to run. Charles Kimani, the Communications and Fundraising officer at Koch FM, shared that the station relies on this generator at least seven days out of each month, costing about 30,000 shillings per month (360 USD).

Possible Solutions for Using Texting for Healthcare

In the course of this research, several ideas emerged from discussions with interviewees that could solve the problems described above. These include:

1. Provide cell phone airtime to participating CHWs and TBAs, either as weekly allowances or in the form of reimbursing them for their costs.
6. Support local organizations that are already making use of emerging media technology, including bulk mobile phone texting, in order to spread the use of such technology to other potential users.
7. Identify or establish a central facility with Internet connectivity that CHWs and TBAs could use for work-related Internet communications.

The following table summarizes the benefits, challenges, and potential solutions for having CHWs and TBAs use mobile phone technology for healthcare. It also summarizes how two local healthcare organizations are currently using such technology in Korogocho and Matungu.

USE OF MOBILE PHONE TECHNOLOGY IN KOROGOCHO AND MATUNGU

Access	How mobile phones are used in both sites	Challenges faced	Suggested solutions	Benefits of using mobile phones	Organizations using mobile phone texting
Number of TBAs in Korogocho who own a mobile phone = 75%	a) Appointment reminders for patients	a) Cost of sending text messages	a) Provide free airtime to CHWs/TBAs	a) Reach many poor people	Umoja Women's Group: Basic texting to individual CHWs and health officers in Matungu
TBAs in Matungu = 67%	b) Field reports by CHWs	b) High illiteracy especially amongst TBAs	b) Provide toll-free texting support from mobile phone service providers	b) Greater interactivity amongst various stakeholders	Pambazuko Mashinani: a) Send bulk texts to CHWs, TBAs and other beneficiaries of their projects b) Update Twitter, Facebook accounts c) Monitor interactions generated by their other social media e.g. crowdmapping d) Monitor & receive reports from CHWs
CHWs in Korogocho = 82%	c) Physicians' queries	c) Content length restrictions for texting	c) Supply CHWs with smartphones	c) High penetration-to-cost ratio (reach many people cheaply)	
CHWs in Matungu = 100%	d) Monitoring of CHWs	d) Not all phones have all functionalities	d) Train CHWs/TBAs on the use of new technology	d) Reach people anywhere	
	e) Mobilization for meetings	e) Threat to confidentiality when sharing phones	e) Provide solar panel for communal mobile phone charging	e) Personal technology	
		f) TBAs not familiar with technology	f) Partner with local organizations already using mobile phone texting in their work	f) Reduces stigma and enhances confidentiality	
		g) Participatory SMS texting campaigns unlikely		g) One device, many uses	

Potential E-Health Project

A major goal of this study was to explore the potential for using a mobile technology platform to improve the spread of health information in Korogocho and/or Matungu through text messaging, in conjunction with local radio stations. Researchers surveyed the field to see which health groups have been active in those regions, and also queried current stakeholders to gauge their level of interest in such a project.

HEALTH ORGANIZATIONS WORKING WITH CHWS AND TBAS

Over the years, a number of international and local entities have worked with CHWs and TBAs to address health issues in Korogocho and Matungu, as listed below.

ORGANIZATIONS WORKING WITH CHWS IN KOROGOCHO

Years the organization was active	Organization	Health issues addressed	Allowances paid to the CHWs, in Ksh
1993 to 2000	ActionAid	sanitation, traditional birth attendants, microfinance	none
1997	Redeemed Gospel Church	counseling, hygiene, nutrition, family planning, first aid	none
2000	MAP International	home-based care	none
2001	World Vision	sponsorship of orphans and vulnerable children (OVCs), HIV/AIDS, home-based care, microfinance	none
2004	APHIA	home-based care	2000 per month
2004	AEE	home-based care, sanitation, Training of Trainers (TOTs)	none
2006 to 2010	JPHIEGO/city council	home-based care, community-based distribution, reproductive health, environment, peer education, sanitation, child rights, rape, domestic violence	none
2007	Oscar Foundation	home-based care, community-based distribution, reproductive health	none
2008	St. John's Catholic HOSPICE	home based care, institution-based care	none
2009	Concern Worldwide	nutrition, livelihood, breast feeding	2000 per month
2010	MALTESER	TB	2000 per month
2010	KAPLTD	TB	none
2010	WOFAK	HIV/AIDS	none
2011 to date	Pambazuko Mashinani	governance, TB, HIV/AIDS, maternal and child health, income generation for women	2500 per month

ORGANIZATIONS WORKING WITH CHWS AND TBAS IN MATUNGU

Year the organization was active	Organization	Health issues addressed	Allowances paid to the CHWs
????	Umoja Women's Group	maternal and child health, HIV/AIDS, family planning	none

The only organization currently working with TBAs in Korogocho is Pambazuko Mashinani. In Matungu, Umoja Women's Group works with both CHWs and TBAs (SDAs).

POTENTIAL PARTNERSHIPS WITH LOCAL STAKE-HOLDERS

In discussing a potential health texting project with researchers, respondents identified the following as the most effective means of identifying and mobilizing target families:

- Local administration: chiefs, assistant chiefs and elders
- Churches
- FBOs, CBOs and NGOs working with vulnerable communities
- Health facilities
- Government offices: local Ministry of Health and district health officials

Many of the organizations and individuals in Matungu and Korogocho said that they would support a health texting project, as discussed below.

District Medical Offices

District medical officers at the two research sites indicated that they would be willing to support an e-health initiative by assigning health officers to work with community health workers and community-based organizations. Peter Muguna, the health officer in charge of Korogocho said:

I can be of very much assistance because... I can train them on any issues related to health. I can become a good link between the MOH and the people at the grassroots... I can also refer to higher hospitals those cases that I cannot handle.

The acting district medical officer, the district public health officer and the health officers interviewed in Matungu also indicated that they would help integrate health text activities into their daily activities as long as they received the requisite technological support.

Umoja Women's Group in Matungu

Umoja Women's Group is a community-based organization that works with CHWs and TBAs on projects of preventive care for maternal and child health. The group is also engaged in peace building and reconciliation, youth rehabilitation, micro-finance for women, and civic education in Matungu. Umoja indicated that the health text project would make its work easier, and as a result, it would be willing to support the project however possible.

St. John's Catholic Church in Korogocho

The church welcomed the potential health text project, saying that health is one of the most basic human needs. It would be

keen to take part in such a health text project and ensure that it is sustained. Father John Weboosta, explained the church's health staffing:

We have nurses, and a doctor who comes from time to time, and the nurses are almost permanent. There is one doctor who is in Kariobangi dispensary. So we refer to him, and from there they can be referred to other health facilities such as Mbagathi District Hospital.

Pambazuko Mashinani in Korogocho

The community-based organization Pambazuko Mashinani is willing to put its resources, including staff, towards sustaining the health text project. The organization notes that it is already making use of multiple new media technologies to address social issues in Korogocho. David Oketch, the director of programs, reported:

First of all, as we will be working with different people and partners, we would want to sustain something that is good. We would not want to see the health text project die because of sustainability issues. It could be done even if it means help raising resources for it. If we put our hands inside there, it also means we put our resources inside there too because it is helping our people. We are already making use of Frontline SMS technology to send bulk mobile phone texting; we are on Facebook, Twitter, YouTube and LinkedIn. We are also making use of crowdmapping technology.

Koch FM Radio Station in Korogocho

The community radio station 99.9 Koch FM currently airs several health-related programs. The station has partnered with APHRC, AMREF and Pambazuko Mashinani to broadcast coverage of health issues. In 2011, Koch FM also partnered with Internews and mobikash. The station is an important mouthpiece for Korogocho: one study found that that 43% of Korogocho residents most prefer receiving health information through the radio (Otieno, 2011). The management and reporters of Koch FM say they look forward to embracing the use of emerging technology to disseminate health news and information in Korogocho. Koch FM will be critical in spreading such information and will provide a feedback mechanism among the various actors involved; the station is also willing to undertake awareness campaigns on health issues in Korogocho.

CONCLUSION AND RECOMMENDATIONS

This study has found that community health workers and traditional birth attendants constitute an extensive network that is potentially capable of expanding access to comprehensive health care for poor communities in Kenya. Most of these frontline health workers are eager to collaborate in such ventures, but few have been involved in any such efforts so far. Many are also eager to learn how to incorporate emerging media technology in their work. A handful are already using mobile phone texting in their work to some degree.

Initial research and discussions with frontline health workers and key local organizations in Korogocho and Matungu have demonstrated the potential for a health texting project to improve the sharing of vital medical information in these regions. Such a health texting project, once proven on a small scale, could be expanded and/or replicated in other regions. To be successful, this project would require several elements. These include building strong partnerships on the ground with healthcare organizations, mustering local political support, obtaining project funding, and providing frequent, regular training to CHWs and TBAs/SDAs.

Based on this research, following are recommendations for improving the dissemination of health information in Kenya using a mobile technology platform.

Choice of Pilot Site

The Nairobi slum of Korogocho would make an appropriate site for launching a health text project. It is representative of Kenyan slum realities and there is real potential for achieving concrete improvement in the health of its residents. Basing the project in Korogocho, rather than spreading it among several areas, would also ensure a more efficient and focused effort.

Working with Local Partners

In planning a health text project, Internews should identify local partner organizations that have the capacity not only to implement the project but also to sustain project activities once outside funding ends. Such work with local organizations

should include building their skills through joint project planning and training them in project management. Respected local partners could also be key to mobilizing community support for the project.

In the course of this research, several local organizations in Korogocho and Matungu offered assistance in the implementation of the proposed health text project. Internews should explore opportunities for collaboration with such groups, as detailed in the section "Potential Partnerships with Local Stakeholders."

In addition, chiefs and their assistants as well as village elders would be useful in identifying and mobilizing residents to embrace the health text project. They could also be asked to make announcements and mobilize CHWs and community members for events and activities.

Also, health facilities such Nairobi City Council Clinic and the health centers in Korogocho run by Provide International could potentially host CHWs and provide some organizational and logistical support.

Establishing a Working Group

In addition to relying on the region-specific knowledge and connections of local partner organizations, Internews might also consider forming a working group of such groups to help in coordinating project activities and soliciting the support of the local administration, particularly village chiefs, assistant chiefs and village elders. Such a working group could make the project more manageable and also improve monitoring of results.

Selecting Community Health Workers

This study revealed that there are no reliable statistics on the number of CHWs and TBAs/SDAs in Matungu and Korogocho. It is estimated that there are 450 and 300 CHWS in Korogocho and Matungu respectively, but it is difficult to ascertain the number of those who are active.

It is therefore recommended that Internews collaborate with those CHWs already working with local organizations in Korogocho and Matungu or with the respective district health offices. This way, the proposed project will involve only those who are truly active in the field.

Addressing Priority Needs

This study found that, given their limited time and resources, CHWs, TBAs, and local health organizations face numerous challenges in providing healthcare to people over a wide geographic area. These frontline providers had the following priority needs:

- training in how to use emerging communications technology;
- organizational capacity-building in order to efficiently manage project communications;
- solutions for streamlining paperwork; and
- improved access to health information and referral services.

The proposed health text project should be designed to address these needs. Among others, project activities could include training CHWs and SDAs in mobile phone technology, training Koch FM reporters in health coverage, and advising Ministry of Health officials in getting CHWs and SDAs to refer patients to health facilities. Internews could also design and implement mobile phone applications for CHWs and TBAs to use in recording, managing and disseminating data collected for the community register.

Implementing E-Health Technology

The study showed that e-health technology is already in use in both Matungu and Korogocho at a very basic level: CHWs use mobile phone texting in their work, for instance to contact patients, to report on household visits, and to send and receive meeting reminders.

It is recommended that the proposed health text project build on the practices and technology already in use, developing additional skills and tools as needed. This could include developing and disseminating a standardized list of codes for health providers to text information.

An e-health project that is modelled on these lines will help ensure that marginalized communities in Kenya have access to the information

APPENDIX 1: PROFILES OF FOUR TYPICAL COMMUNITY HEALTH WORKERS

FEATURES	PROFILE			
	Profile A	Profile B	Profile C	Profile D
Description	Has been working as a CHW in the last five years in a defined location. Is strongly grounded in his or her work.	Has been working as a CHW for the past ten years in multiple but geographically close locations.	Has been working as a CHW for the last five years in a defined location.	Experienced CHW who doubles as a TBA.
Training & Background	Has at least a form four certificate. Had no background (work or training) in health prior to recruitment as CHW. Was carefully selected (elected) by the community. Has had cumulative training of less than three months.	Has at least an eighth grade certificate. Had some background (work) in health and has continually built on this. Has cumulative training of more than three months.	Has at least a form four certificate. Had no background (work or training) in health prior to recruitment as CHW. Self-selected and works on own initiative.	Has at least a form four certificate. Had no background (work or training) in health prior to recruitment as CHW. Was carefully selected (elected) by the community.
Age	Between 25 and 30 years of age	Over 40 years of age	Between 25 and 40 years of age	Between 25 and 30 years of age
Work Arrangement	Works under and reports to the Ministry of Health at the district level. Activities are coordinated by the District Health Officer through the Community Unit that is overseen by a Community Health Extension Worker (CHEW). Works as a resource for health-based activity including research, studies, outreach and campaigns. Works as a volunteer but gets allowance for other activities.	Works for multiple programs. Is in the Ministry of Health's new CHW arrangement as in Profile A but may also have other duties with NGOs or CBOs. Involved in work beyond healthcare (e.g. peace building). Is attached to multiple health facilities. Performs both volunteer and paid activities.	Works with an NGO/CBO project. Work is confined to a specific project. There is little follow-up or connection with the organization.	Works under and reports to the Ministry of Health at the district level. Activities are coordinated by the District Health Officer through the Community Unit that is overseen by a Community Health Extension Worker (CHEW). Works as a resource for health-based activity including research, studies, outreach and campaigns. Works as a volunteer but gets allowance for other activities.
Duties and Responsibilities	Maintains community register. Serves as liaison between the village and health facilities.	Maintains community register. Serves as liaison between the village and multiple health facilities. Performs duties defined by NGO/CBO they are associated with.	Duties defined by the individual project. May include community education, peer counseling etc.	Maintains community register. Serves as liaison between the village and health facilities.
Jurisdiction	Clearly defined as a specific village and connected to a specific facility.	Not clearly defined, traverses one region.	Clearly defined, specified by a project.	Clearly defined as a specific village and connected to a specific facility.
Extra-CHW Activities	Modest income-generating activity such as farming, small business etc.	Health work is the main occupation.	Various activities including manual labor.	Modest income-generating activity such as farming, small business etc.
Knowledge Level	Elementary/Intermediate	Intermediate	Elementary	Intermediate
Recruitment	Selective	Mixed	Open	Selective
Location	Matungu	Matungu and Korogocho	Korogocho	Matungu
Technology Use	Receptive to mobile technology. Uses to communicate with fellow CHW, MOH officers, nurses, CHEW, clients.	Moderately receptive to mobile technology. Uses to communicate with fellow CHW, MOH officers, nurses, CHEW, clients.	Receptive to mobile technology. Uses to communicate with fellow CHW, MOH officers, nurses, CHEW, clients.	Receptive to mobile technology. Uses to communicate with fellow CHW, MOH officers, nurses, CHEW, clients.
CHW Persona	Dickson Otsieno, Matungu	Mohammed Asman, Matungu	Dickson Otsieno, Matungu	

APPENDIX 2: SAMPLE COMMUNITY REGISTER

Household Name	Age	Sex	Date	R/ship	Cohort	Educ	Chronic Illness	House Type	Immunization	Water Source	Family Planning	Environment				Preg Mother	Under 5 Deaths	Remarks
												Pit Latrine	Refuse Pit	Dish Rack	Clothe line			
Moses	31	M	17	1	5	Sec	None	Semi	619/05	Bore hole	YES	√	√	√	√	No	X	Maintains hygiene & sleep under ITN
Hellen	26	F	July	2	5	Sec		Perm										
Samantha	7	F	2010	3	3	Pri												
Elvis	5	M		3	2	Pri												
Innocent	19M	M		3	2													
Gift	19M	M		3	2													
Cris	28	M	17	1	5	Pri	None	Semi	335/06	Bore Hole	NO	√	√	X	√	NO	X	Advised to construct a dish rack
Dorcas	25	F	July	2	5	Pri	TB	Perm										
Stephen	3	M	2010	3	2													
Patrick	33	M	17	1	5	Pri	Nose bleed	Semi	07/2001	Spring	NO	√	√	√	√	NO	X	Advised/ referred to go to the health facility for checkup
Edith	27	F	July	2	5	Pri	Energy loss	Perm	620/04									
Crayan	7	M	2010	3	3	Pri			91/07									
Elvis	4	M		3	2													
Lilian	2	F		3	2													
Enoka	27	M	17	1	5	Pri	Body rash	Temp	-110	Spring	NO	√	√	√	√	NO	X	Advised on the importance of FP
Mily	25	F	July	2	5	Pri												
Jose	6	M	2010	3	2													
Jerita	19M	F		3	2													
Seferio	23	M	17	1	4	Pri	None	Temp	63/08	Spring	NO	√	X	√	√	NO	X	ITN Use
Judy	20	F	July	2	4	Pri												
Elias	2	M	2010	3	2													

Cohort: Organized by age group.
 Relationship: 1- Husband; 2- Wife; 3- Son/Daughter; 4- Relative
 ITN: insecticide-treated net
 FP: family planning

ABOUT THE INTERNEWS CENTER FOR INNOVATION & LEARNING

The Internews Center for Innovation & Learning supports, captures, and shares innovative approaches to communication through a creative program of research and development worldwide. Founded in 2011, the Center seeks to strike a balance between local expertise and needs and global learning in order to develop a comprehensive approach to understanding and catalyzing information exchange.

In Internews' 30-year history of promoting independent media in more than 75 countries around the world, the last five years have arguably seen the most changes in the global media and journalism environment. Across all Internews programs, adoption of cutting-edge technology is integral to advancing the work of the journalists, bloggers, citizen reporters, scholars and others who provide a vital interpretive role for their communities. The Internews Center for Innovation & Learning deepens and enhances our capacity to link existing expertise to research that helps define, understand and monitor the critical elements of changing information ecosystems and to pilot projects that apply and test the data, platforms and digital tools to meet information needs of specific communities. This is far from a solo endeavor. A network of partners, ranging from technologists to academics to activists is critical to creating and sustaining a dynamic and iterative collaborative space for innovation.

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Internews is an international non-profit organization whose mission is to empower local media worldwide to give people the news and information they need, the ability to connect and the means to make their voices heard.

Internews provides communities the resources to produce local news and information with integrity and independence. With global expertise and reach, Internews trains both media professionals and citizen journalists, introduces innovative media solutions, increases coverage of vital issues and helps establish policies needed for open access to information.

Internews programs create platforms for dialogue and enable informed debate, which bring about social and economic progress.

Internews' commitment to research and evaluation creates effective and sustainable programs, even in the most challenging environments.

Formed in 1982, Internews is a 501(c)(3) organization headquartered in California. Internews has worked in more than 75 countries, and currently has offices in Africa, Asia, Europe, the Middle East, Latin America and North America.