



Linkage to HIV Care for Refugee Populations: Adapting Intervention Mapping Methodology to Design a Theory- and Evidence-Based Intervention in Nakivale Refugee Settlement in Rural Uganda

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Scholarly Report Title: Linkage to HIV Care for Refugee populations: Adapting Intervention Mapping Methodology to Design a Theory- and Evidence-Based Intervention in Nakivale Refugee Settlement in Rural Uganda

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Abstract

Title: Linkage to HIV care for refugee populations: Adapting Intervention Mapping methodology to design a theory- and evidence-based intervention in Nakivale Refugee Settlement in rural Uganda

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Purpose: The world is facing an unprecedented crisis of forcibly displaced people (1). Refugees face unique health challenges, yet little is known about how to design effective health interventions in refugee settings. In Nakivale Refugee Settlement in southwestern Uganda, only 54% of people newly diagnosed with HIV will link to medical care (2). Linkage is lower than in other settings in sub-Saharan Africa, which suggests that interventions are needed to enhance engagement with HIV care among people accessing services in refugee settlements. We aimed to use the Intervention Mapping methodology to design a program aimed at increasing linkage to HIV care in Nakivale Refugee Settlement.

Methods: Intervention Mapping is a framework for developing theory- and evidence-based health interventions, and includes six iterative steps: logic model of the problem; program outcomes and objectives; program design; program production; program implementation plan; and evaluation plan (3). A diverse group of stakeholders (N = 14), including community members and humanitarian actors, participated in a one-day interactive Intervention Mapping workshop in Nakivale which included small group break-out sessions and large group discussions.

Results: Intervention Mapping provided an inclusive, efficient method for integrating community members and program implementers into the intervention planning process. Using Intervention Mapping, we developed a community-based chronic care program (C-3 Teams) to provide convenient, acceptable, integrated health services to clients with HIV, hypertension, and diabetes. The program would improve linkage to HIV care by integrating chronic care services at the community level to decrease stigma around receiving HIV therapy and to help clients overcome the barriers of distance to clinic.

Conclusions: This work demonstrates that Intervention Mapping can be applied in a refugee settlement, and contributes to the body of literature on method-driven health intervention design and implementation for humanitarian crisis-affected populations.

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Glossary of Abbreviations

ARC: American Refugee Committee

ART: antiretroviral therapy

CVD: cardiovascular disease

HIV: human immunodeficiency virus

MTI: Medical Teams International

NCD: non-communicable disease

PEPFAR: President's Emergency Plan for AIDS Relief

PLHIV: people living with HIV

UNHCR: United Nations High Commissioner for Refugees

USD: United States dollar

Project Description

The scholarly project question was: How should Intervention Mapping methodology be adapted to a refugee context in order to develop an intervention for enhancing linkage to HIV care in Nakivale Refugee Settlement, Uganda?

I studied an Intervention Mapping textbook to develop an understanding of the methodology, and discussed the Intervention Mapping principles extensively with my mentor, who had attended an Intervention Mapping training at Maastricht University in the Netherlands. I conducted a literature review on correlates of linkage to HIV care in sub-Saharan Africa, and reviewed theories of individual and environmental behavior and behavioral change. Based on this body of literature, I created an Intervention Mapping workbook for use in Nakivale, with guidance from my mentor.

I traveled to Nakivale Refugee Settlement, Uganda, with my mentor and a research team, and helped to facilitate a full-day Intervention Mapping workshop with stakeholders. After reviewing the results of the workshop with my mentor and with additional stakeholders, I drafted the following manuscript.

Introduction

Uganda is home to 1.2 million refugees, the third largest refugee population in the world (1). Refugee populations face unique health challenges, including a history of trauma, ongoing risk for violence (especially for women and girls), and food and water insecurity (4). They may also encounter barriers to accessing health care, including inadequate medical facilities, a language barrier, poor health literacy, and conflicts with the host population (5). For people living with HIV (PLHIV), the usual barriers to health care are heightened by HIV stigma (6).

Critical steps in the HIV care cascade are HIV testing, linkage to care, initiation of antiretroviral therapy (ART), suppression of viral load, and retention in care (7). In Nakivale Refugee Settlement in southwest Uganda, only 54% of clients who were newly diagnosed with HIV were linked to care, as measured by those who attended the first clinic visit within 90 days after a new diagnosis (2). This proportion that linked to HIV care is lower than in the rest of sub-Saharan Africa (8,9), indicating that there are particular barriers to engaging with HIV care in the refugee setting or among this population, and that interventions are needed to facilitate this step in the HIV care cascade in Nakivale.

Recent efforts are underway to integrate HIV care with management of non-communicable diseases (NCDs) including diabetes and hypertension (10–12). The rationale is to strengthen NCD management by leveraging the infrastructure in place for HIV care. Treating HIV along with other chronic diseases, these integrated programs could reduce the stigma associated with HIV (10). The integration of HIV and NCD services is particularly relevant because HIV and ART are associated with increased risk for cardiovascular and metabolic comorbidities (13). A recent review found that programs that integrated diabetes and hypertension services with HIV care had higher proportions of clients retained in care, and improved clinical outcomes including CD4 count, glycated hemoglobin, and blood pressure (11). However, it has not been well studied whether integrated HIV/NCD services can improve linkage to care. One integrated service intervention in South Africa showed only 51.3% linkage to care; however, this model was a mobile unit that provided only screening, and referred patients to follow up at a health care facility rather than providing long-term management of the diseases (14).

Another type of intervention aimed at improving engagement with HIV care is the delivery of HIV medications and counseling in the community, rather than at a health care

facility (15–17). In these interventions, clinically stable clients with HIV are invited to join “adherence clubs.” These clubs usually meet every 1 to 4 months and include counseling from a lay health worker or medical professional, rapid assessment of the clients’ symptoms, ART distribution, and social support provided by the HIV counselor and by peers. A review of community-based versus facility-based adherence clubs showed significantly greater retention in care for community-based interventions (16). However, because adherence club interventions enroll clients who are stable on HIV therapy, rather than those who are newly diagnosed, it is not known whether adherence clubs can improve linkage to care immediately after diagnosis.

Intervention Mapping is a systematic method for planning health promotion programs. It facilitates stakeholder participation and emphasizes the use of theory and evidence to inform intervention design (3). Program planners are encouraged to iteratively revise and refine their work from previous steps as they work together to gain more information and insight. Intervention Mapping has been used to design interventions for a variety of health problems, including a program to enhance adherence to ART in Canada (18), and a school-based program to prevent sexually transmitted infections among adolescents in Tanzania (19). These studies found that the Intervention Mapping process was applicable in a variety of settings and for a wide range of health problems. To our knowledge, Intervention Mapping has not been used to design a health intervention in a refugee settlement.

In this study, we aim to use Intervention Mapping to design an intervention to enhance linkage to HIV care for individuals newly diagnosed with HIV in Nakivale Refugee Settlement.

Methods

There are six steps in the Intervention Mapping process (Figure 1). In Step 1, “Logic Model of the Problem,” a needs assessment is performed to characterize a health problem. A working group of stakeholders is invited to participate in the intervention planning process. The health problem is described according to the PRECEDE model (20). In Step 2, “Program Outcomes and Objectives,” change objectives are established; these function as the goals of the intervention. In Step 3, “Program Design,” theory-based change methods and practical applications are selected for each change objective. In Step 4, “Program Production,” program materials and messages are designed, pretested, and piloted. In Step 5, “Program Implementation Plan,” the Intervention Mapping principles are used to design a plan for

adoption, implementation, and maintenance of the intervention. In Step 6, “Program Evaluation,” indicators and measures are selected to assess the implementation and efficacy of the intervention (3).

We used Intervention Mapping to design a program aimed at increasing engagement with HIV care in Nakivale Refugee Settlement. We first conducted a literature review in order to understand factors that affect linkage to care in sub-Saharan Africa, and reviewed relevant theories of behavior and behavior change. Then we reviewed findings from prospective research on routine clinic-based HIV testing in Nakivale (2,6,23–25). The data from these studies formed the foundation of the needs assessment to inform the intervention design.

We strategically selected a diverse working group of stakeholders including representatives from Medical Teams International (MTI, the implementing partner for health care delivery in Nakivale), the United Nations High Commissioner for Refugees (UNHCR), the American Refugee Committee (ARC), and Tutapona (a local non-governmental organization aimed at reducing gender-based violence). Stakeholders also included church leaders, community members, and two research assistants working on HIV research in Nakivale. Several of these participants were refugees (from Rwanda, Ethiopia, and the Democratic Republic of the Congo), and at least one was living with HIV. In total, including working group leaders who also participated in small group work, there were 14 participants. During the stakeholder workshop, we focused on steps 1 through 4, as has been described in previous literature (21,22).

With this group, we conducted a one-day workshop in January 2019. The venues included conference rooms at the UNHCR and ARC offices in Nakivale Refugee Settlement. In accordance with Ugandan culture, we provided lunch and two tea breaks to the participants, as well as a stipend of 50,000 Ugandan shillings (13.50 USD) for the participants who were community members. We did not provide a stipend to staff from UNHCR, MTI, ARC, or our own research team. We prepared workbooks in advance and distributed them to all participants. We also provided nametags, pens, T-shirts, and certificates of participation for each person.

We fostered an inclusive and collaborative environment among the group members by discussing the unique perspective and skills that each individual brought to the group. Then we used a combination of small-group brainstorming and large-group discussion to generate

and refine ideas for each Intervention Mapping step. After the workshop, we continued to present the findings to additional stakeholders for feedback and revisions.

Results

Step I: Logic Model of the Problem

Needs Assessment

Based on the published literature, the data from our ongoing research in Nakivale, and the expertise of our working group, we described in detail the health problem of untreated HIV in Nakivale. Nakivale Refugee Settlement in southwestern Uganda hosts about 100,000 refugees from the Democratic Republic of the Congo, Somalia, Burundi, Rwanda, and other countries. It was established in 1960 and spans 71 square miles (5,25). There are four health centers in the settlement, Nakivale Health Center (the largest and the main referral center), Kibengo Health Center, Juru Health Center, and Robondo Health Center. All are operated by the non-profit organization Medical Teams International (MTI). The health centers are attended by refugees and Ugandan nationals who live in and around Nakivale. As part of an ongoing prospective research study, our research team offers free HIV testing and counseling to adults in the outpatient department at Nakivale, Juru, and Kibengo Health Centers. Clients who are diagnosed with HIV are referred to the HIV clinic, which operates once per week. In 2016, the Uganda Ministry of Health enacted new test-and-treat guidelines so that willing clients would be escorted to clinic and initiated on ART on the day of diagnosis. Previously clients underwent a physical exam and CD4 testing to determine ART eligibility. This change was implemented in Nakivale in 2017.

Among the 6,850 adults who participated in a voluntary routine HIV testing study at Nakivale Health Center from March 2013 to October 2014, 276 (4%) were diagnosed with HIV (2). Seventy percent of those who tested were refugees. The HIV prevalence among refugees in Nakivale was 2% and the prevalence among Ugandans was 9%, compared to a Ugandan national prevalence of 7.3% in 2011 and 6.0% in 2016 (26). Of the people who tested positive for HIV, about half (54%) linked to care within 90 days after diagnosis, meaning that they attended at least one HIV clinic visit (2). Of those who linked to care within 90 days, 20% underwent CD4 testing. Eight percent of newly diagnosed clients were found to be eligible for ART based on the World Health Organization guidelines at that time (27), and 6% of clients initiated ART.

Among the 276 newly diagnosed HIV clients, none of the following demographic variables were significantly associated with linkage to care: gender, age, refugee status, country of origin, residence in Nakivale, residence > 1 hr from clinic, years living in Nakivale, relationship status, education level, knowledge about HIV, or prior negative HIV test (24). This suggests that engagement with HIV care may be associated with more complex or nuanced factors, such as mental health and substance use, HIV stigma and social support, migration patterns and resettlement policies.

Logic Model of the Problem

We produced a logic model of the problem of untreated HIV (Figure 2), using the PRECEDE model (3,20). Untreated HIV leads to secondary *health problems* including infectious, neurologic, and oncologic complications; increased risk for cardiovascular disease (CVD) and other NCDs; fatigue and malaise; risk for transmission to children and to sexual partners; and death.

Untreated HIV reduces people's *quality of life* in numerous ways. They may feel hopeless about the future, which can lead to reduced motivation to work or to engage in medical care. They may feel anger and resentment about the injustice of having HIV (and our working group reported incidents of people with HIV having unprotected sex in order to spread the disease to others). They may withdraw from their social network due to the fear of anticipated stigma or of becoming a burden to others. They may fear that their marriage will break down if they disclose their HIV status, or that they will not be able to have healthy children. Over time, people with untreated HIV will become unable to work and will suffer from reduced job options and income. Visibly apparent disease may lead to HIV-related stigma, and severe complications may lead to costly hospital admissions (28). They will be living with the stress of their diagnosis and the fear of death.

We next examined the *behavioral factors*, or behaviors of PLHIV who are not engaging in HIV care. The primary behavioral factor is not attending HIV clinic visits at the health centers. Other behavioral factors include prioritizing competing demands (childcare, work, collecting food rations, etc.) over HIV care (6), and traveling or resettling outside of Nakivale. For some individuals, substance abuse prevents them from engaging in HIV care (29,30). Others have legal issues and they are not able to access HIV care while in jail.

The *environmental factors* that impede engagement in HIV care can be classified into four ecological levels: interpersonal, organizational, community, and society. On an interpersonal level, factors include conflicts or anticipated conflicts with a romantic partner or family members, and negative interactions with clinic staff (29,30). Organizational factors include long wait times at clinic; inconvenient or infrequent clinic times; missing or disorganized clinic records; and lack of confidential space for counseling and medication pickup (29,31). In some cases there is a lack of high-quality counseling, which deters clients from seeking care. In the refugee context, the food distribution day is sometimes on the same day as the HIV clinic. Stock-outs of HIV test kits and medications also impede effective HIV care and undermine confidence in the medical system (29). On the community and society levels, factors include stigma, discrimination, and inadequate social support for PLHIV. In some communities, religious leaders counsel that HIV can be cured through prayer or alternative healing methods (29,30). For refugees, resettlement policies and migration patterns make continuity of care difficult (29). Distance to health clinics and the cost of transport are barriers, especially during rainy weather (29,31). However, some data suggest that subsidizing the cost of transport does not significantly improve engagement with care (30). Some individuals actually prefer to attend clinics farther from their home so that they are less likely to encounter people they know (32).

Finally, we examined *behavioral and environmental determinants*, or what causes individuals and environmental actors to engage in behaviors that prevent engagement in HIV care. For the individual with HIV, lack of knowledge about HIV and attitudes about living with HIV—including denial of the diagnosis and fear of anticipated stigma—are major reasons for avoiding health care (28–30,33). This includes fear (and misconceptions) about medication side effects, as well as aversion to taking lifelong medication (29,30). Some people do not believe that they could have HIV even though they feel healthy (29,33). Other people lose hope and expect that the only possible outcome is sickness and death, which decreases their motivation to engage with medical care.

Environmental determinants include a shortage of time, resources, and training for clinic staff, who then might lack the motivation, capability, and self-efficacy to provide high-quality, empathic care for PLHIV (28). On the community and society levels, deeply ingrained stigma and inaccurate beliefs about HIV transmission cause people to discriminate against their family members and neighbors with HIV.

Program Goal

The final output of Step 1 is to state the program goal: After 6 months of the intervention, the percentage of newly diagnosed people with HIV who link to HIV care will be significantly higher compared to individuals diagnosed in the pre-intervention period.

Step 2: Program Outcomes and Objectives

Program Outcomes

The program outcomes are statements of what needs to change on individual and environmental levels in order to reach the program goals. In our study, the *behavioral outcomes* are health-promoting behaviors that individuals should perform in order to engage with HIV care. The working group selected one primary behavioral outcome: individuals who are newly diagnosed with HIV will attend HIV clinic.

Environmental outcomes are health-promoting conditions that would facilitate PLHIV engaging with HIV care; these outcomes may be interpersonal, organizational, community, or societal. We selected three primary environmental outcomes:

- HIV clinics are accessible to clients in their communities (organizational, community).
- Clinic staff provide high-quality, empathetic care to clients with HIV (interpersonal, organizational).
- Clients can access supportive social networks (interpersonal, societal).

Performance Objectives, Determinants, and Change Objectives

For each of the four primary behavioral and environmental outcomes, we listed performance objectives, determinants, and change objectives. *Performance objectives* are the specific actions that must take place in order for the behavioral or environmental outcome to happen. *Determinants* are the reasons why individuals and environmental actors would complete the performance objectives. Examples of determinants include: knowledge, attitudes and beliefs, awareness and risk assessment, values, outcome expectations, self-efficacy, skills and behavioral capability, perceived control, perceived barriers, perceived norms, social influence, moral norms, and self-image (3). Through literature review and discussion with the working groups, we prioritized determinants that were both important and changeable. From the performance objectives and determinants, we created matrices of *change objectives*, which describe what

must change relative to each determinant in order to accomplish the performance objectives (Table 1).

Several broad themes emerged in the discussions of how to achieve the desired behavioral and environmental outcomes. The working group highlighted the problem of insufficient resources, including stock-outs of medications and diagnostic tests, inadequate clinic space for confidential counseling, and overburdened clinic staff. The consensus was that this problem was highly important, but difficult to solve given that the anticipated intervention would not provide enough resources to fully alleviate the need. Instead, the working group brainstormed strategies for using existing resources more effectively. For example, to address the problem of overburdened clinic staff, the working group emphasized the importance of supporting the staff with social events and workshops to prevent burnout and foster empathy for the clients living with HIV.

Step 3: Program Design

In Step 3 we developed the basic features of the intervention. First, the working group selected change objectives that were important and changeable, and that should be addressed with the anticipated intervention. For example, the change objective “*Program implementers recognize the importance of involving community leaders*” was gauged to be less important because there were already community leaders participating in the workshop, and was excluded during Step 3. Next, we grouped the change objectives by determinant (e.g., attitudes and values, skills and self-efficacy, knowledge, and so on). Then we used the taxonomy of change methods provided by Bartholomew et al. (3) to select *change methods* for each determinant (Table 2). Finally, with the working group, we brainstormed *practical applications* for each change method. We found that some change objectives could be achieved using overlapping methods and applications, and we grouped those together in Table 2. For example, the change objectives concerning the attitudes and values of clinic staff (C.1 to C.4) could all be addressed with increased staff support and training workshops, so these objectives were grouped together.

To guide the discussion, we provided background information on interventions that have been successful in improving HIV care in other settings, including integrated HIV/NCD programs and patient adherence groups (introduced in the Background section). With this evidence base in mind, the working group brainstormed several practical applications that

would be feasible in Nakivale Refugee Settlement. An HIV clinic could be combined with other services (e.g., diabetes and hypertension management) in order to increase the perceived benefits of HIV care and reduce HIV stigma. Groups of PLHIV could meet together for education sessions and social support. Clinic staff could prioritize confidential space for HIV counseling and medication delivery. Community leaders could be recruited and trained to decrease stigma and increase knowledge about HIV among community members. Educational materials could be disseminated in community centers where people tend to socialize. Staff training could be supplemented by educational methods such as role-play and empathy training, and staff could be supported through social events and burnout prevention strategies. Additionally, some strategies that are already used in Nakivale, such as posttest HIV counseling and involvement of lay health workers and expert clients, could be optimized to accomplish additional change objective.

Step 4: Program Production

In Step 4, we refined the practical applications from Step 3 into cohesive program components. The intervention will be community-based chronic care teams, or “C-3 teams”, in which clients will receive counseling and medications for HIV, diabetes, and hypertension in accessible, confidential community sites. Clients will be enrolled in the program immediately after diagnosis in order to facilitate linkage to care. They will be enrolled in groups of 15 to 30, with the intention that group members will pool resources and provide social support for one another. They will receive services for diabetes and hypertension in addition to HIV, in order to increase the perceived benefit of the clinic (6). Additionally, HIV-related stigma may be reduced by integrating HIV care with the management of other chronic diseases (10).

There was not consensus among the working group about whether only PLHIV should be enrolled in the groups, or whether some people without HIV but with hypertension and diabetes should also be enrolled. On the one hand, PLHIV might feel less comfortable if some group members do not have HIV; on the other hand, the stigma of HIV could be reduced if HIV is treated like any other chronic disease. Therefore, the proposed intervention could have two phases, one in which all participants have HIV, and one in which some participants have diabetes or hypertension but do not have HIV. We would evaluate the intervention in both phases to determine if one option is more acceptable and effective for participants.

In addition to this primary intervention, there will be two additional program components. First, the staff members for C-3 teams will undergo extensive training including role-plays and guided practice of posttest counseling. They will learn principles of motivational interviewing and participate in empathy training. They will also demonstrate knowledge about HIV diagnosis and management, and practice delivering this information in a style that is accessible to clients. Second, there will be a workshop for community leaders to increase knowledge about HIV, foster empathy for PLHIV in their communities, and encourage them to use their leadership position to influence members of the community.

We aim to implement the proposed intervention in Nakivale Refugee Settlement, and will continue to solicit feedback from our working group and other stakeholders throughout that process.

Discussion

Despite the unprecedented number of refugees and other forcibly displaced people in the world today (1), there is a lack of published literature on the best practices for designing health interventions in refugee contexts (34–38). In a humanitarian setting where resources are extremely limited and the sociopolitical situation is complex, it is essential to carefully consider the feasibility and impact of a proposed intervention before implementing it. A broad network of stakeholders, especially the future program participants, must be included in the planning process. Intervention Mapping provides a structured approach for including numerous stakeholders in designing a rigorous, evidence-based health intervention.

We used the Intervention Mapping process to design an intervention aimed at enhancing linkage to HIV care in Nakivale Refugee Settlement, Uganda. After review of the relevant theory and published literature, as well as an intensive interactive workshop, we designed a program of “C-3 teams” to provide community-based, integrated health care to people with HIV, hypertension, and diabetes. This program will enhance engagement in HIV care in several ways. First, the intervention will be based in the clients’ own communities, which will decrease the cost and time of accessing clinic. Second, the integration of three chronic diseases—diabetes, hypertension, and HIV—will reduce the stigma of HIV, lowering the psychosocial barrier to accessing care. Additionally, the integration of care for three diseases in one clinic will be of higher “value” for clients, which will encourage them to prioritize this clinic above

competing demands on their time and resources. Third, the patient groups of 15 to 30 people will function as a source of social support for participants as well as a forum for health education.

To our knowledge, Intervention Mapping has not been previously used for planning an intervention in a refugee setting. We noted several unique features of designing an intervention in the refugee context. First, there is less published evidence about refugee populations than about native populations. Therefore, we relied heavily on the expertise and experience of our working group to gauge whether the published literature from other settings might be generalizable to Nakivale. Second, there are multiple partner organizations and multiple levels of permissions involved in health care implementation in refugee settlements (including MTI, UNHCR, and the Ministry of Health). It is critical to actively seek participation and buy-in from these organizations. Third, there is high turnover in staff and leadership. This introduces challenges when planning and implementing long-term projects with local partners.

It was critical to start the workshop by building a collaborative, inclusive environment because the participants came from a wide range of backgrounds. Some were refugees, and some were Ugandans who worked in Nakivale. The participants were accustomed to different levels of social status in the community according to their age and occupation. Also, the workshop was conducted in English, and the participants had different levels of comfort with the English language. For example, one participant was a Congolese refugee who had high social status as a pastor in Nakivale, but was disadvantaged in the workshop because his English fluency was lower than other participants. He was encouraged and empowered to participate in the workshop because the other participants recognized his unique perspective and contributions.

A full-day, intensive workshop was enough time to discuss Steps 1 through 4 of the Intervention Mapping process. A longer workshop of two days or more would not have been feasible in Nakivale because the participants from UNHCR and MTI, among others, could not have been spared from their normal duties for more than one day. We expedited the discussion by conducting an extensive review of the literature and theory prior to the workshop. During the workshop, the structured, step-by-step format of Intervention Mapping allowed us to guide the discussion efficiently despite limited time.

Hosting the workshop in Nakivale Refugee Settlement allowed community members to participate. If the workshop had been held in the closest city of Mbarara, or in the Ugandan capital of Kampala, community members would not have been able to participate unless transportation was provided. Transport is costly (at least 130,000 Ugandan shillings or 35 USD for round-trip transport between Nakivale and Mbarara), so hosting the event in Nakivale kept the cost of the workshop quite low.

However, there were logistical challenges to organizing the workshop in the refugee settlement. The work schedules of the various offices in Nakivale, including UNHCR and MTI, were busy and unpredictable. Because of this, we were not able to confirm the venue at the UNHCR or ARC office until a few days before the event. Representatives from the Ministry of Health were not able to participate due to scheduling conflicts. Fewer participants from MTI were able to join than originally planned due to a last-minute audit from the President's Emergency Plan for AIDS Relief (PEPFAR).

An additional challenge of planning an intervention in this setting is the frequent change in HIV guidelines and policies. For example, when prospective data collection for our needs assessment began in 2013 (34), the standard of care for HIV management was to base ART eligibility on physical exam findings and/or CD4 count results. In 2016, the guidelines changed to a test-and-treat strategy, initiating all people with HIV on ART regardless of CD4 count. It is not known whether this change in treatment guidelines affected linkage to HIV care in Nakivale (2).

Conclusion

In this paper, we describe our application of the Intervention Mapping process in a refugee settlement. Intervention Mapping is an advantageous method for humanitarian settings because it allows for rigorous examination of existing evidence and theory, as well as consideration of potential feasibility and impact, while integrating diverse stakeholders including community members and humanitarian actors. It can be adapted to time- and resource-limited conditions. We designed an intervention to increase engagement in HIV care among newly diagnosed individuals, and aim to implement and evaluate the proposed intervention. We will continue to solicit feedback from the Intervention Mapping workshop participants and other stakeholders as we embark on this process.

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Figure 1: Six Steps of Intervention Mapping

Adapted from Bartholomew et al., 2016.

<p><u>Step 1:</u> Logic Model of the Problem</p>	<p>What is the problem?</p> <ul style="list-style-type: none"> • Establish and work with a planning group • Conduct a needs assessment to create a logic model of the problem • Describe the context (population, setting, community) • State program goals
<p><u>Step 2:</u> Program Outcomes and Objectives – Logic Model of Change</p>	<p>Why is the problem happening? How could it change?</p> <ul style="list-style-type: none"> • State expected outcomes for behavior and environment • Specify performance objectives for behavioral and environmental outcomes • Select determinants for behavioral and environmental outcomes • Construct matrices of change objectives • Create a logic model of change
<p><u>Step 3:</u> Program Design</p>	<p>How will the intervention achieve the desired change?</p> <ul style="list-style-type: none"> • Generate program themes, components, scope, and sequence • Choose theory- and evidence-based change methods • Select or design practical applications to deliver change methods
<p><u>Step 4:</u> Program Production</p>	<p>What are the materials and messages for the intervention?</p> <ul style="list-style-type: none"> • Refine program structure and organization • Prepare plans for program materials • Draft messages, materials, and protocols • Pretest, refine, and produce materials
<p><u>Step 5:</u> Program Implementation Plan</p>	<p>How will the intervention be disseminated, adopted, implemented, and maintained?</p> <ul style="list-style-type: none"> • Identify potential program users (implementers, adopters, maintainers) • State outcomes and performance objectives for program use • Design implementation interventions
<p><u>Step 6:</u> Evaluation Plan</p>	<p>How will we know if the intervention is effective?</p> <ul style="list-style-type: none"> • Write effect and process evaluation questions • Develop indicators and measures for assessment • Specify the evaluation design • Complete the evaluation plan

Figure 2: Logic Model of the Problem (Step I)

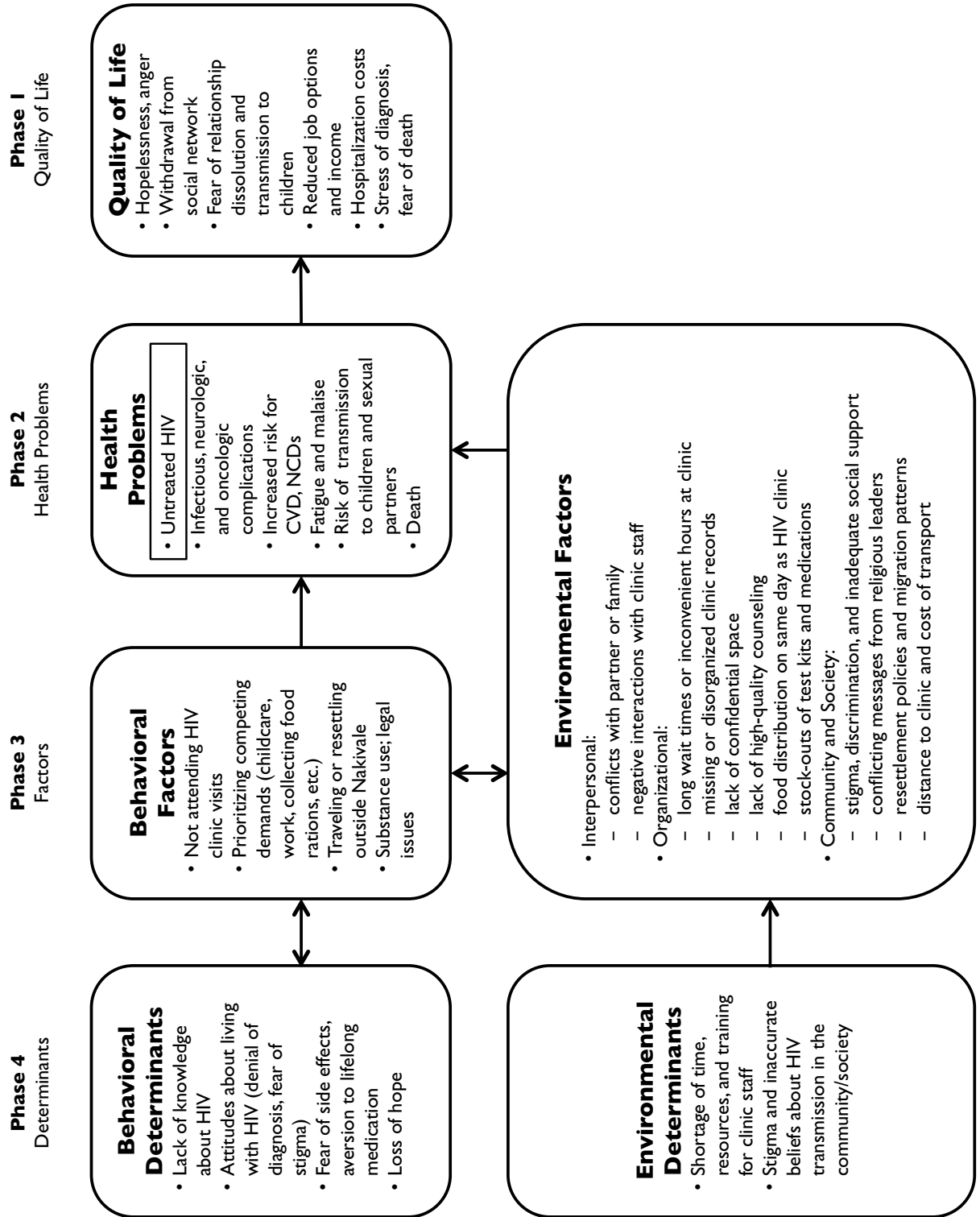


Table 1: Matrices of Change Objectives (Step 2)

A. Behavioral Outcome #1: Newly diagnosed individuals attend HIV clinic.				
	<i>Personal Determinants: Why would a person take these actions?</i>			
<i>Performance Objectives: What actions need to happen?</i>	Attitudes & Values	Skills & Self-Efficacy	Knowledge	Social Influence
A.1. Accept HIV+ diagnosis.	<p>a. Maintain hope about the future.</p> <p>b. Recognize that accepting HIV diagnosis will allow them to continue to care for loved ones.</p>	<p>a. Work with HIV counselor to brainstorm strategies for attending clinic, disclosing status, coping with stigma.</p> <p>b. Practice sharing emotions with HIV counselor.</p>	<p>a. Recognize that they can live a healthy life if HIV is properly treated.</p> <p>b. Recognize that they have HIV even if they feel healthy.</p>	Trust accuracy of diagnostic tests (despite rumors of false results).
A.2. Prioritize HIV clinic days.	Decide that the benefits of attending HIV clinic outweigh the barriers to seeking care.	<p>a. Demonstrate how to arrange clinic transport.</p> <p>b. Arrange plan to overcome competing demands (childcare, food distribution).</p> <p>c. Demonstrate ability to track clinic dates.</p>	<p>a. State the benefits of attending HIV clinic, and the consequences of <i>not</i> attending HIV clinic.</p> <p>b. List community resources available to assist with transport, competing needs, etc.</p>	<p>a. Strategize how to cope with negative reactions toward HIV care from partner, family, neighbors, etc.</p> <p>b. Request assistance from individuals for transport and competing demands.</p>
A.3. Take ownership of HIV diagnosis.	<p>a. Describe their role in maintaining their own health.</p> <p>b. Express reasons for health maintenance (family, religion, etc.).</p>	Express confidence in ability to cope with HIV care.	Actively seek information about HIV care from HIV counselors and others.	Consider disclosing status to trusted individuals.

B. Environmental Outcome #1: HIV clinics are accessible to clients in their communities.				
	<i>Personal Determinants: Why would a person take these actions?</i>			
<i>Performance Objectives: What actions need to happen?</i>	Attitudes & Values	Skills & Self-Efficacy	Outcome Expectations	Knowledge
B.1. Program implementers identify and involve community leaders.	Program implementers recognize the importance of involving community leaders.	Program implementers are able to persuade community leaders to participate in the program.	Program implementers expect that HIV outcomes will improve if community leaders participate.	Program implementers have the expertise to identify community leaders.
B.2. Community leaders encourage clients to engage with HIV care.	Community leaders believe that PLHIV deserve accessible HIV care.	a. Community leaders recognize their role in ensuring accessible HIV care for their communities. b. Community leaders are able to influence clients to engage in HIV care.	Community leaders expect that HIV outcomes will improve if people can access care in their community.	Community leaders demonstrate accurate, appropriate knowledge of HIV diagnosis, transmission, and management.
B.3. Program implementers and community leaders work together to identify HIV care venues that are safe and convenient.	Program implementers and community leaders recognize the importance of an accessible, safe, confidential HIV treatment space.	Program implementers and community leaders are able to negotiate for use of community spaces.	Program implementers and community leaders expect clients will engage in care if treatment is offered in an accessible, safe, confidential location.	Program implementers and community leaders know which locations are accessible, safe, and confidential for community members.

C. Environmental Outcome #2: Clinic staff provide high-quality, empathetic care to clients with HIV.				
	<i>Personal Determinants: Why would a person take these actions?</i>			
<i>Performance Objectives: What actions need to happen?</i>	Attitudes & Values	Knowledge	Outcome Expectations	Behavioral Capability
C.1. Clinic staff provide clients with accurate, accessible information about HIV care, in the clients' own languages.	Clinic staff express personal responsibility for improving their HIV expertise and counseling skills.	a. Clinic staff are knowledgeable about HIV. b. Clinic staff know how to access and use interpreter services.	Clinic staff expect that clients will have better health outcomes and quality of life if information is accurate and accessible.	Clinic staff are well trained in providing clients with accurate, accessible information.
C.2. Clinic staff protect the confidentiality of clients.	Clinic staff express personal responsibility for maintaining patient confidentiality.	a. Clinic staff can explain why it is important to protect confidentiality. b. Clinic staff can list ways confidentiality might be compromised.	Clinic staff expect that clients will be more likely to engage with care if confidentiality is preserved.	Clinic staff are well trained in protecting patient confidentiality.
C.3. Clinic has adequate supplies of HIV test kits and ART.	Clinic leaders take responsibility for obtaining adequate supplies.	Clinic leaders know what HIV supplies are needed and how to obtain them.	Clinic leaders expect that HIV outcomes will improve if clinics have adequate supplies.	Clinic leaders demonstrate a system for tracking and restocking HIV supplies.
C.4. Clinic has organized records and reliable hours.	Clinic staff are willing to make a personal effort to maintain a consistent clinic schedule and keep records organized.	Clinic staff recognize that a disorganized, unreliable HIV clinic is a barrier to care.	Clinic staff expect that clients will receive better care if records are organized and the schedule is reliable.	Clinic staff demonstrate a system for maintaining organized records and reliable hours.

D. Environmental Outcome #3: Clients can access supportive social networks.				
	<i>Personal Determinants: Why would a person take these actions?</i>			
<i>Performance Objectives: What actions need to happen?</i>	Attitudes & Values	Knowledge	Perceived Norms	Social influence
D.1. Partners and family members accept HIV positive diagnosis compassionately and assist with HIV care.	Partners and family members express compassion to the client.	a. Partners and family members know that risk for transmission is low if on ART. b. Partners and family know that social support is important.	Partners and family members perceive that families should be compassionate and supportive.	Partners and family members are prepared to cope with the stigma of having a partner or family member living with HIV.
D.2. Neighbors and community members provide social support.	Community members express compassion for neighbors living with HIV and wish to support them in their illness.	Community members know that HIV is not transmitted through casual contact.	Community members perceive they should treat neighbors living with HIV with compassion rather than stigma.	Community members treat neighbors living with HIV with compassion even if they see others discriminating against them.
D.3. Health providers replace blame and stereotyping with empathy.	Health providers express compassion for the client.	Health providers know that social support is a key factor in linkage and maintenance of HIV care.	Health providers feel responsible for providing social support to clients with HIV.	Health providers deliver compassionate care to PLHIV even if others do not.
D.4. Community leaders influence people in the community to reduce stigma against PLHIV.	Community leaders believe that PLHIV deserve compassion and support.	Community leaders are knowledgeable about their community members' beliefs about HIV.	Community leaders perceive they should influence people toward compassionate treatment of PLHIV.	Community leaders are willing to publicly support PLHIV even if other community leaders disagree.
D.5. Clients receive social support from other PLHIV.	Clients are open to sharing experiences with other PLHIV.	Clients know social support is a critical component of HIV care.	Clients perceive that PLHIV often support each other.	Clients are comfortable publicly associating with other PLHIV.

Table 2: Change Methods and Practical Applications (Step 3)

Determinant: Attitudes & Values		
Change Objective	Change Method(s)	Practical Applications
A.1.a. Maintain hope about the future.	Individualization Modeling Provide opportunities for social comparison Stereotype-inconsistent information	Posttest counseling Expert client support
A.1.b. Recognize that accepting HIV diagnosis will allow them to continue to care for loved ones. A.3.b. Express reasons for health maintenance (family, religion, etc.).	Belief selection Persuasive communication Individualization Framing Environmental reevaluation Anticipated regret Shifting focus	Posttest counseling
A.2. Decide that the benefits of attending HIV clinic outweigh the barriers to seeking care.	Persuasive communication Motivational interviewing Personalize risk Self-reevaluation Environmental reevaluation Anticipated regret	Posttest counseling Combine HIV clinic with other services to increase the benefits
A.3.a. Describe their role in maintaining their own health.	Tailoring Modeling Motivational interviewing	Posttest counseling
C.1. Clinic staff express personal responsibility for improving their HIV expertise and counseling skills. C.2. Clinic staff express personal responsibility for maintaining patient confidentiality. C.4. Clinic staff are willing to make a personal effort to maintain a consistent clinic schedule and keep records organized. D.3. Health providers express compassion for the client.	Participation Persuasive communication Tailoring Modeling Consciousness raising Self-reevaluation Environmental reevaluation Enhancing network linkages Empathy training	Support for clinic staff—to express appreciation and prevent burnout (e.g., social events) Staff workshop to build empathy and foster sense of personal responsibility for work

D.2. Community members express compassion for neighbors living with HIV and wish to support them in their illness.	Belief selection Tailoring Consciousness raising Self-reevaluation Environmental reevaluation Stereotype-inconsistent information Interpersonal contact Empathy training Entertainment education	Use community leaders to influence community
D.4. Community leaders believe that PLHIV deserve compassion and support.	Belief selection Persuasive communication Tailoring Consciousness raising Self-reevaluation Environmental reevaluation Stereotype-inconsistent information Interpersonal contact Empathy training	Community leader workshops
D.5. Clients are open to sharing experiences with other PLHIV.	Modeling Facilitation Interpersonal contact Empathy training Developing new social network linkages	Confidential space Facilitated patient group
Determinant: Skills & Self-Efficacy		
Change Objective	Change Method(s)	Practical Applications
A.1.a. Work with HIV counselor to brainstorm strategies for attending clinic, disclosing status, coping with stigma.	Individualization Scenario-based risk information Resistance to social pressure Guided practice Planning coping responses Enhancing network linkages	Posttest counseling
A.1.b. Practice sharing emotions with HIV counselor.	Facilitation Enhancing network linkages	Confidential space Posttest counseling

A.2.a. Demonstrate how to arrange clinic transport. A.2.b. Arrange plan to overcome competing demands (childcare, food distribution). A.2.c. Demonstrate ability to track clinic dates.	Individualization Feedback Guided practice Goal setting Self-monitoring of behaviors	Posttest counseling Group education sessions with clients
A.3. Express confidence in ability to cope with HIV care.	Tailoring Modeling Verbal persuasion Goal setting	Posttest counseling Facilitated patient group
B.2.a. Community leaders recognize their own role in ensuring accessible HIV care for their communities.	Modeling Self-reevaluation Environmental reevaluation Verbal persuasion	Community leader workshops
B.2.b. Community leaders are able to influence clients to engage in HIV care.	Participation Cultural similarity Guided practice Modeling	Community leader workshops Evaluation and feedback
Determinant: Knowledge		
Change Objective	Change Method(s)	Practical Applications
A.1.a. Recognize that they can live a healthy life if HIV is properly treated. A.1.b. Recognize that they have HIV even if they feel healthy.	Belief selection Modeling Elaboration Personalize risk	Posttest counseling Group education sessions with clients
A.2.a. State the benefits of attending HIV clinic, and the consequences of <i>not</i> attending HIV clinic. A.2.b. List community resources available to assist with transport, competing needs, etc.	Belief selection Discussion Personalize risk Guided practice	Posttest counseling Group education sessions with clients
B.1. Program implementers have the expertise to identify community leaders. B.3. Program implementers and community leaders know which locations are accessible, safe, and confidential for community members.	Participatory problem solving Cultural similarity Use of lay health workers	Community leader workshops Feedback from community members and lay health workers

B.2. Community leaders demonstrate accurate, appropriate knowledge of HIV diagnosis, transmission, and management.	Belief selection Feedback Guided practice	Community leader workshops Evaluation and feedback
C.1.a. Clinic staff are knowledgeable about HIV. C.1.b. Clinic staff know how to access and use interpreter services. C.4. Clinic staff recognize that a disorganized, unreliable HIV clinic is a barrier to care.	Providing cues Guided practice Goal setting	Staff training (with staff members helping to plan the training) Training involves guided practice, roleplaying, motivational interviewing
C.2.a. Clinic staff can explain why it is important to protect confidentiality. C.2.b. Clinic staff can list ways in which confidentiality might be compromised.	Feedback Providing cues Consciousness raising Guided practice Goal setting	Staff training
D.1.a. Partners and family members know that risk for transmission is low if on ART. D.1.b. Partners and family know that social support is important.	Elaboration Verbal persuasion Mobilizing social networks Use of lay health workers	Use community leaders to influence community Reinforcement from lay health workers
D.2. Community members know that HIV is not transmitted through casual contact.	Discussion Mass media role modeling Entertainment education Verbal persuasion	Disseminate educational materials in places where community members socialize Drama performance by clients who choose to disclose status Use community leaders to influence community
D.3. Health providers know that social support is a key factor in linkage and maintenance of HIV care.	Discussion Verbal persuasion	Staff training
D.5. Clients know that social support is a critical component of HIV care.	Modeling Discussion Mobilizing social networks Enhancing network linkages Developing new social network linkages	Posttest counseling Facilitated patient group Expert client support

Determinant: Social Influence		
Change Objective	Change Method(s)	Practical Applications
<p>A.2.a. Strategize how to cope with negative reactions toward HIV care from partner, family, neighbors, etc.</p> <p>A.2.b. Request assistance from trusted individuals for transport and competing demands.</p> <p>A.3. Consider disclosing status to trusted individuals.</p>	<p>Individualization</p> <p>Providing cues</p> <p>Resistance to social pressure</p> <p>Shifting focus</p> <p>Mobilizing social support</p> <p>Opportunities for social comparison</p> <p>Planning coping responses</p>	<p>Posttest counseling</p> <p>Group education sessions and workshops with clients</p> <p>Expert client support</p> <p>Assisted Partner Notification</p>
<p>D.2. Community members treat neighbors living with HIV with compassion even if they see others discriminating against them.</p>	<p>Tailoring</p> <p>Self reevaluation</p> <p>Environmental reevaluation</p> <p>Resistance to social pressure</p> <p>Shifting focus</p> <p>Mobilizing social support</p> <p>Planning coping responses</p>	<p>Disseminate educational materials in places where community members socialize</p> <p>Drama performance by clients who choose to disclose status</p> <p>Use community leaders to influence community</p>
<p>D.4. Community leaders are willing to publicly support PLHIV even if other community leaders disagree.</p>	<p>Participation</p> <p>Tailoring</p> <p>Modeling</p> <p>Environmental reevaluation</p> <p>Resistance to social pressure</p> <p>Shifting focus</p> <p>Planning coping responses</p>	<p>Community leader workshops</p>
Determinant: Outcome Expectations		
Change Objective	Change Method(s)	Practical Applications
<p>C.2. Clinic staff expect that clients will be more likely to engage with care if confidentiality is preserved.</p>	<p>Persuasive communication</p> <p>Environmental reevaluation</p>	<p>Staff training</p>
Determinant: Behavioral Capability		
Change Objective	Change Method(s)	Practical Applications
<p>C.1. Clinic staff are well trained in providing clients with accurate, accessible information.</p>	<p>Feedback</p> <p>Guided practice</p>	<p>Staff training</p>
<p>C.2. Clinic staff are well trained in protecting patient confidentiality.</p>	<p>Feedback</p> <p>Guided practice</p>	<p>Staff training</p>

C.3. Clinic leaders demonstrate a system for tracking and restocking HIV supplies.	Participatory problem solving Facilitation Nudging Organizational diagnosis and feedback Structural redesign	Feedback to leadership Participation from clinic staff
C.4. Clinic staff demonstrate a system for maintaining organized records and reliable hours.	Feedback Facilitation Participatory problem solving Organizational diagnosis and feedback Structural redesign	Feedback to leadership Staff training
Determinant: Perceived Norms		
Change Objective	Change Method(s)	Practical Applications
D.2. Community members perceive they should treat neighbors living with HIV with compassion rather than stigma.	Belief selection Tailoring Modeling Environmental reevaluation Entertainment education	Use community leaders to influence community Disseminate educational materials in places where community members socialize Drama performance by clients who choose to disclose status
D.3. Health providers feel responsible for providing social support to clients with HIV.	Persuasive communication Environmental reevaluation	Staff training
D.4. Community leaders perceive they should influence people toward compassionate treatment of PLHIV.	Modeling Environmental reevaluation	Community leader workshops