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Development, Implementation, and Evaluation of a Training Module for Community Health Workers in Rwanda: A Special Studies Project

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Development, Implementation, and Evaluation of a Training Module for Community Health Workers in Rwanda: A Special Studies Project

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An abstract of

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Abstract

Development, Implementation, and Evaluation of a Training Module for Community Health Workers in Rwanda: A Special Studies Project

By Johannah Ohlin

Background: Diarrhea remains the second leading cause of death in children under five years old, with the global estimate of deaths between 0.538-1.031 million. In Rwanda, diseases related to environmental health are among the major causes of morbidity and mortality in children under 5 years. Interventions targeting water may effectively reduce diarrheal diseases. This project was part of a larger study to assess the sustainability of installing membrane-filtered water kiosks in health centers that could be used by the community. Community level behavior change regarding drinking water practices is critical to the success of the project. This project aims to engage with community health workers (CHWs) to promote safe drinking water source selection and storage practices. CHWs currently lack training in behavior change strategies specific to drinking water messages.

Purpose: The immediate purpose was to develop a standardized training module that provided community health workers with training on behavior change strategies around safe drinking water practices. The overarching goal was to strengthen community health worker capacity in behavior change strategies in order to motivate community adoption of safe drinking water source selection, transport, and storage behaviors.

Methods: The module's content was based on key-informant interviews, observations, and existing training curriculums. The module was field tested, evaluated, revised, and then submitted to research partners for further revisions and translation.

Results: CHWs do not receive systematic training that applies behavior change communication to drinking water source selection and storage. The training module utilizes components of interpersonal communication, such as listening, empathizing, and affirming to motivate adoption of safe drinking water practices. Role-play activities are an effective teaching strategy for the adult learners.

Discussion: CHWs are well positioned to facilitate behavior change around safe water practices. CHWs currently emphasize health and disease as motivators when providing drinking water messages to community members, however using other behavior change strategies, such as interpersonal communication, may be more effective to motivate behavior change around drinking water source selection and storage.

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INTRODUCTION

Global Diarrhea Burden

Consistent and sustainable access to safe drinking water decreases the burden of diarrheal deaths and promotes healthy communities. In 2010, diarrhea remains the second leading cause of death in children under five years old, with the global estimate of deaths between 0.538-1.031 million, an improvement from the 2008 global estimate of between 1.336-2.004 million (Black et al., 2010; Liu et al., 2012). Unclean drinking water, along with poor sanitation and hygiene, contributes to about 88 per-cent of diarrheal deaths worldwide (Black et al., 2010; Black, Morris, & Bryce, 2003). The 2015 Millennium Development Goal (MDG) to halve the proportion of the population without sustainable access to safe drinking water was successfully met in 2010 (World Health Organization, 2012). However, it is estimated that at least 780 million people worldwide still lack access to safe drinking water (World Health Organization, 2012). Interventions targeting water, sanitation, and hygiene effectively reduce diarrheal diseases when implemented either individually or in combination (Cairncross et al., 2010; Fewtrell et al., 2005). Continued efforts must be made to expand drinking water coverage to communities that remain with limited access to safe drinking water, especially low-resource countries and rural communities.

Rwanda Diarrhea Burden

In Rwanda, diseases related to environmental health, including diseases related to unclean drinking water, are among the major causes of morbidity and mortality in children under 5 years (Government of Rwanda, 2005-2009). According to a 2010 survey, approximately 13% of children under five in Rwanda have experienced at least one diarrheal episode in the past two weeks, and diarrhea is one of the four main leading

of death for children under five in Rwandan hospitals (Ministry of Health Rwanda, 2010; National Institute of Statistics of Rwanda, Ministry of Health Rwanda, & ICF International, 2010). Increasing access to clean water, in addition to improving water source selection and storage practices, will decrease mortality due to diarrheal diseases in Rwanda.

Drinking Water Quality

Improved water sources, such as a piped connection into a dwelling or a yard, can be protected from contamination (Brown et al., 2013). Unimproved water sources, such as surface water, springs, or shallow wells, are more vulnerable to contamination and thus carry higher risk for diarrheal diseases (Brown et al., 2013). In Rwanda, about 22% of urban residents and 33% of rural residents use unimproved drinking water sources vulnerable to contamination, such as unprotected springs or wells (WHO/UNICEF, March 2010). However, drinking water obtained from improved drinking water sources may become contaminated through unsafe water handling practices during water collection, transportation, or storage (Gasana, Morin, Ndikuyeze, & Kamoso, 2002; Sodha et al., 2011). A 2002 water quality assessment in Rwanda found that 43.4% of the drinking water without detectable contamination at the source had total coliform levels much higher than the WHO drinking water standards at the point-of-use (Gasana et al., 2002). This is largely attributed to unclean water transportation and storage tools (Gasana et al., 2002). The communities in the study demonstrated a need for further education regarding safe water transportation and storage, in addition to consistent sustainable access to drinking water.

In addition to a safe drinking water source, safe water storage and handling practices are essential to keeping drinking water clean (Sodha et al., 2011). A 2008 study in Indonesia on the impact of boiling on water quality determined that prevalence

of *E. coli* contamination was greater in water storage containers with wide-mouths than in narrow-mouth storage containers (PR=1.4, 95% CI=1.1-1.8), in uncovered storage containers than covered storage containers (PR=1.8, CI 1.3-2.5), and in containers in which respondents touched the water while collecting it than in those that did not touch the water (PR=1.6, 95% CI=1.3-2.1) (Sodha et al., 2011). Any intervention to provide a safe drinking water source to prevent diarrheal disease must be combined with safe drinking water handling and storage practices.

Current Strategies in Rwanda

Poverty-related diseases in Rwanda, such as diarrheal diseases, can be largely avoided through improving hygiene and changing behavior (Government of Rwanda, 2005-2009). Community Health Workers (CHWs) in Rwanda play a vital role in encouraging sustainable hygiene practices and behavior change in the community. The Rwanda Ministry of Health (Rwanda MOH) is committed to capacity strengthening of CHWs to be efficient agents of change that promote healthy practices in both households and communities (Ministry of Health Rwanda, 2008). The Rwanda MOH desires to decrease the burden of disease and improve the health in Rwanda by improving community awareness of factors contributing to poor health and means of prevention (Ministry of Health Rwanda, 2008). The Rwanda MOH has recommended using participatory training methods in both schools and communities to ensure healthy, sustainable behavior change (Ministry of Health Rwanda, 2008).

The Rwanda MOH developed a National Behavior Change Policy for the Health Sector in which it states that most health education in Rwanda has been based on the assumption that people will choose healthy behaviors if they have the relevant, factual information (Ministry of Health Rwanda, 2008). This policy maintains that people's social and cultural environments strongly influence their decisions about health, and

advocates for multi-faceted strategic approaches to communication strategies targeting behavior change. The Rwanda MOH emphasizes that the CHW role must be strengthened by training in Behavior Change Communication (BCC), persuasion skills, and health information in order to maximize their interpersonal communication in order to successfully influence health behaviors (Ministry of Health Rwanda, 2008).

A reduction in the burden of diarrheal disease requires a comprehensive, multi-disciplinary approach that includes improvements in policy, infrastructure, socio-economic status, and health education (Gasana et al., 2002). One strategy targeting health education is capacity strengthening of CHW, who have a prominent role in community health education in Rwanda. To decrease the global burden of diarrhea, UNICEF and WHO advocate the use of innovative strategies to foster behavior change (UNICEF & WHO, 2009). Increasing community involvement, health education, and activities of health-promotion related to safe drinking water practices will decrease the global burden of diarrhea, in addition to improving basic water and sanitation services (UNICEF & WHO, 2009). The development of a CHW training module in Rwanda that applies BCC strategies to drinking water messages would incorporate community involvement, health education, and health promotion.

The Rwandan government is committed to using CHWs as community change agents for better health. The Rwanda MOH has adopted the Community-Based Environmental Health Promotion Program (CBEHPP) to achieve goals set by the Rwandan Government and Health Sectors to promote healthier lifestyles and prevent disease. The CBEHPP is a nation-wide household hygiene education program that utilizes the 45,000 existing CHWs in Rwanda to promote behavior change and social interaction through Community Hygiene Clubs. CHWs in Rwanda have the unique opportunity to convey safe drinking water messages through frequent interactions with the community, specifically in households or in community meetings. Adoption of

innovative strategies, such as efforts to strengthen CHW capacity in BCC skills specifically applied to drinking water messages are well-aligned with the MOH goals to address the burden of diarrheal disease in Rwanda.

GEF-Rwanda Project

Provision of safe drinking water usually requires some form of treatment. One solution for providing rural communities with access to clean water is a decentralized water purification system, such as a membrane filter. Membrane-filtration systems use porous plastic films to remove microbial pathogens from drinking water and also to improve taste and decrease turbidity. There is a knowledge gap about whether decentralized membrane-filter water purification systems are feasible and sustainable in resource-poor areas (Peter-Varbanets, Zurbrugg, Swartz, & Pronk, 2009). The Rwanda Ministry of Health, General Electric Foundation (GEF), The Access Project, and the Center for Global Safe Water (CGSW) at Emory University have partnered on the project "Evaluation of Health Centers as Sustainable Safe Water Sources and Community WASH Impact" (GEF-Rwanda). This project aims to assess the feasibility and sustainability of membrane filtration systems to provide clean drinking water in ten health centers in the Northern and Southern Districts of Rwanda. These water treatment systems are intended to provide clean water to the health centers and the surrounding communities.

The project will engage with CHWs to promote safe drinking water source selection and storage practices and promote the use of the new membrane-filtered water sources at the health centers. Behavior change at the community level regarding drinking water collection and storage is critical to the success of the program. This will be facilitated through the development of a standardized CHW training module that applies BCC strategies to CHW messages about drinking water source selection and storage.

Strengthening the CHW strategies to promote safe water handling behavior contributes to the larger project's goal to provide safe water sources that are sustainable, as community members' behavior change regarding water practices will help ensure the water remains safe.

Problem Statement

Behavior change at the community level regarding drinking water practices is critical to the success of the GEF-Rwanda project. GEF-Rwanda aims to engage with Community Health Workers (CHW) to promote safe drinking water source selection, transport, and storage practices, in addition to promoting the use of membrane filtration systems as a clean water source. CHWs currently receive some training in BCC, but they lack training in BCC specific to drinking water messages.

Purpose Statement

The immediate purpose was to develop a standardized CHW training module that applies BCC strategies to messages about drinking water source selection, transport, and storage. The overarching goal was to strengthen CHW capacity in BCC strategies in order to motivate community adoption of safe drinking water source selection, transport, and storage behaviors.

Project Objectives

- To determine what CHWs currently know and teach about safe drinking water
- To determine CHW learning styles and teaching strategies effective in teaching CHWs
- To determine what BCC strategies CHWs currently use with community members
- To identify the main barriers and facilitators to community member behavior change

- To create a CHW training module that applies BCC strategies to safe drinking water messages

Significance Statement

Developing and implementing a standardized training module that strengthens CHWs capacity in utilizing BCC strategies in conversations about drinking water will facilitate community adoption of safe drinking water source selection, transport, and storage behaviors. Motivating community members to practice sustained safer drinking water practices will promote healthier communities by reducing the burden of diarrheal diseases.

Conceptual Framework

There are multiple conceptual frameworks that address factors affecting water, sanitation, and hygiene (WASH) behaviors. However, many of the existing frameworks focus narrowly on individual-level determinants, thereby neglecting the societal and interpersonal levels. Furthermore, existing WASH-related behavior change frameworks do not differentiate among contextual, psychosocial, and technological factors that influence aspects of WASH behaviors. The Integrated Behavioral Model for Water, Sanitation, and Hygiene (IBM-WASH) was developed in response to the lack of a single model that was all-inclusive of the behavioral determinants and other factors that needed to be addressed in developing a comprehensive behavior change strategy in a WASH context (Dreibelbis et al., 2013).

Behavioral theories are vital in informing the design, implementation, and evaluation of any behavior change intervention (Parker Fiebelkorn et al., 2012). The IBM-WASH model is based on several behavioral theories, including the Social Cognitive Theory, Social Ecological Model, Health Belief Model, Theory of Reasoned

Action and Theory of Planned Behavior (Ajzen, 1991; Bandura, 1989; Carpenter, 2010; Fishbein & Ajzen, 1975; Janz & Becker, 1984; McLeroy, Bibeau, Steckler, & Glanz, 1988). The IBM-WASH framework includes three dimensions (contextual, psychosocial, technology) that operate at five levels (societal, community, interpersonal, individual, behavioral). This model provides an integrated framework for understanding WASH behaviors. The IBM-WASH framework was used to organize important factors influencing drinking water behavioral outcomes as identified during key-informant interviews. These factors were then used to develop a training module that addresses the multiple levels that influence drinking water behaviors. Although the development of a CHW training module primarily targets the individual and interpersonal levels, the IBM-WASH framework assists in identifying the larger context in which behaviors occur. The provision of safe drinking water sources in Rwanda must be done in conjunction with community member adoption of safe drinking water source selection, transportation, and storage practices. CHW are well-positioned to motivate community behavior change. A training module for CHWs that applies BCC strategies to drinking water messages would improve the health of associated communities in Rwanda by strengthening CHW capacity in BCC.

LITERATURE REVIEW

Introduction

Behavior change is an essential component of any public health intervention, especially those targeting drinking water practices. CHWs in Rwanda live and work in the communities in which they serve and are respected by community members. They are thus well positioned to be behavior change agents within their communities, specifically regarding drinking water practices. Any efforts to train CHWs in BCC strategies must be grounded in evidence-based theories and frameworks. While CHWs receive some training in behavior change, they lack standardized, consistent training in strategies specifically applied to drinking water messages. Training CHWs in interpersonal communication (IPC) strategies applied to drinking water messages is one solution to strengthening behavior change capacity. Participatory methods, such as group discussions and role-play, are effective adult education strategies that could be used to teach interpersonal communication (Bosse et al., 2010; Lane, Hood, & Rollnick, 2008; WHO & JHPIEGO, 2005). A gap remains in the literature regarding behavior change research in the context of WASH interventions. Training CHWs in behavior change strategies applied to drinking water messages will promote community behavior change regarding drinking water practices, resulting in healthier communities. What follows is a review of the existing literature on the CHW role on a global scale, the CHW role specifically in Rwanda, examples of CHWs as behavior change agents, the BCC frameworks relevant to this project, the behavior change strategies that have been successfully used by CHWs, the adult learning theory that informed the CHW training module, and the remaining literature gaps.

Community Health Workers

CHWs Globally

A substantial part of a CHW's role in Rwanda is community health education. The specific role of CHWs varies by country, as they "provide a variety of functions, including outreach, counseling, and patient home care and represent a resource to reach and serve disadvantaged populations" (World Health Organization & Global Health Workforce Alliance, 2010). In many countries, CHWs have close relationships with the communities in which they serve, which results in a good understanding of the social factors impacting the health of the community (Javanparast, Baum, Labonte, & Sanders, 2011). This, when coupled with a solid health knowledge, can have a positive influence on community health (Javanparast et al., 2011). CHWs are often tasked with providing basic antenatal care, in addition to managing simple childhood illnesses, in which they follow guidelines and algorithms provided by national health officials (Javanparast et al., 2011; Ward, Javanparast, & Wilson, 2011). Their performance in the management of these conditions is influenced by continued training in both knowledge and competencies, support from the community, readily available resources and equipment, and collaboration with other health workers (Javanparast et al., 2011; Ward et al., 2011). Any efforts to strengthen CHW capacity should focus on those areas that increase their performance and confidence.

The WHO commissioned a 2007 review to identify existing evidence on CHWs' impact on health outcomes, identify gaps in evidence on the use of CHWs to deliver basic health care services, and to provide policy recommendations on the use of CHWs in response to acute shortages of health workers in rural areas (Lehmann, 2007a). This review concluded that CHWs play a valuable role in impacting community health

outcomes. It also emphasized that in order to be effective, it is vital that they are carefully chosen, adequately trained, and consistently supported.

CHW in Rwanda

Rwandan CHWs are elected by their communities, trained by the Rwanda MOH, and supported by the health centers. They receive some training in BCC, but they would benefit from further training in BCC strategies applied to drinking water messages. They would then be further equipped to impact community health outcomes affected by drinking water choices. They are also easily mobilized to take treatment and prevention messages to community members. The Rwanda MOH (2008) reports that:

> CHWs have the advantage of knowing their community well in terms of the community culture, norms, beliefs, traditions, formal and informal networks, support systems, community strengths and their community's health problems…they need to be adequately trained, supervised, and supported in order to be effective…standardized packages which integrate community health activities at the community level must be developed and used for training CHWs. (Ministry of Health, Rwanda, 2008, p.2)

These standardized CHW training packages have been implemented in many parts of Rwanda. However, many CHW lack training in BCC strategies specifically applied to drinking water messages.

An estimated 12,000 CHWs have been trained in Rwanda since 1995 (Ministry of Health Rwanda, 2008). Rwandan CHWs work in a decentralized health system consisting of central level referral teaching hospitals, district hospitals, and health centers. Rwandan villages generally consist of 50-150 household and receive primary health care from the health centers. Each village elects five volunteers to serve their community as CHWs (Binagwaho, August 3, 2009; Ministry of Health Rwanda, 2008; "Personal

Communication," Summer 2012). Each of a village's five volunteer CHW has a unique role in promoting community health. One CHW is trained as a traditional birth attendant to promote deliveries at the health centers. Two CHWs, one male and one female, work with people living with HIV/AIDs, often coordinating end-of-life issues. The final two CHWs, one male and one female, receive training from the Rwanda MOH to manage common childhood illnesses, monitor children's growth and development, promote vaccinations, promote family planning, and promote prevention of malaria, tuberculosis, and HIV/AIDS in their villages. The CHWs receive various trainings through the health centers in their specialty area—child health, women's health, and HIV/AIDs. CHWs will often receive an initial training in their area, and then receive refresher trainings periodically as they are made available by NGOs or the Rwanda MOH.

Through a standardized reporting system, CHWs report their work to the health centers, which in turn provides further training and support to the CHWs (Binagwaho, August 3, 2009; Ministry of Health Rwanda, 2008; "Personal Communication," Summer 2012). CHWs are supervised directly by their local health center's Community Health Coordinator. For environmental health issues – including water and sanitation – the Community Health Coordinator works in collaboration with each Health Center's Environmental Health Officer. The Environmental Health Officers are representatives of the Rwanda MOH that work at each health center. They supervise CHW activities in the community, participate in the health center's WASH projects, and periodically conduct CHW refresher trainings on WASH topics ("Personal Communication," Summer 2012).

The GEF-Rwanda project aims to engage with CHWs to promote safe drinking water source selection, transport, and storage practices. In addition to training on WASH-specific content, the training module will equip CHW with behavior change communication strategies that they can use to make their current tasks more effective.

This is in line with the MOH commitment to the strengthening of CHWs capacity in behavior change communication (Ministry of Health Rwanda, December 2006):

> CHWs form the link between the health centers and the community serving as the mouth piece and ears of the health service at the community level. They know the communities well as they live and work among them, and they are often respected individuals …enhancement of this cadre in terms of skills and knowledge can do a lot of good for the communities (Ministry of Health Rwanda, 2008, p.16).

Strengthening CHW capacity in BCC strategies applied to drinking water messages will enhance their impact on the communities in which they serve.

Importance of Training CHW

Research on training Pakistani and Ethiopian CHW in communication strategies demonstrated that CHW are highly motivated to improve their knowledge and capacity in communication skills through participation in training opportunities (Behailu, 2010; Haq & Hafeez, 2009). A 2009 qualitative cross-sectional study of 105 randomly sampled Lady Health Workers, a type of CHW, determined that approximately 80% of those interviewed summarized their communication abilities as "moderately sufficient" and desired opportunities for further improvement in their abilities (Haq & Hafeez, 2009). This study called for a "continued process…[to] provide opportunities to health workers to update their knowledge, sharpen communication skills, and bring credibility to their persona as health educators" (Haq & Hafeez, 2009). In the same way, CHWs in Rwanda are motivated and eager to learn and develop their communication skills ("Personal Communication," Summer 2012).

Findings from a 2010 cross-sectional study in Ethiopia emphasize the importance of initial and continual training of health extension workers, a type of CHW (Behailu, 2010). Respondents expressed interest in educational opportunities for both personal

career development and increasing their effectiveness as CHWs (Behailu, 2010). CHW's desire for additional training and development should be addressed through trainings that focus on personal and professional development, strengthening communication abilities, and increase their knowledge base on relevant health issues.

CHWs & Behavior Change

A study was done in Ethiopia to explore the experience of health extension workers, a type of CHW, as promoters of behavior change in relation to sanitation and hygiene in the Southern Ethiopia. This cross-sectional study used key informant interviews and focus group discussions to explore the experiences of 90 health extension workers. This study claimed that in Ethiopia, the health extension workers have "succeeded in persuading many households to change their behavior" (Behailu, 2010). However, achieving sustainable behavior change is not an easy process: "Hygiene promotion is not a 'one-off' activity: promotion…needs to be maintained, until the desired behavior changes-to achieve behavior change which is lasting, frequent follow-up visits and regular monitoring are needed" (Behailu, 2010).

Another finding of this study was that households were often overwhelmed by CHW promoting too many messages at one visit: "to be effective, a household visit for hygiene promotion should focus on one issue per visit with a message or messages specific to that issue supported by relevant information" (Behailu, 2010). Training of CHW should include encouragement to focus on one issue during each interaction with community members in order to avoid information overload on the part of the community members.

CHW as Behavior Change Agents

Health communication programs are used to motivate change at each of the social levels: individual, organizations, community, and society ("Making Health Communication Programs Work," ; Rutebemberwa et al., 2012). The individual level is

often targeted as the fundamental level of health communication “because individual behavior affects health status” and individual behavior is the ultimate target ("Making Health Communication Programs Work," ; Michie, 2008; Rutebemberwa et al., 2012). Communication interventions are used to motivate individual behavior change, as they successfully influence people’s knowledge, awareness, attitude, skills, self-efficacy, and commitment to changing their behavior ("Making Health Communication Programs Work,"). Communication interventions are also effectively used to motivate community behavior change, as people’s community groups strongly influence their health decisions ("Making Health Communication Programs Work,"). Before behavior change interventions are implemented, people’s social, cultural, and behavioral factors must be examined and accounted for, since behavior change is a complex, multi-factorial issue (Figueroa, 2010). This ensures that the intervention will be contextually relevant and effective.

CHWs’ unique relationship with the community should be capitalized on through various communication interventions to influence individual, interpersonal, and community behavior change. Strengthening CHW capacity in BCC strategies will provide them with additional strategies to use during interactions with community members (Ministry of Health Rwanda, 2008, December 2006). While Rwandan CHW receive some training in BCC, further trainings and refreshers are needed to solidify their skills in BCC in order to achieve sustainable behavior change in the community. As previously mentioned, CHWs are eager for training that strengthens their capacity to serve their communities (Behailu, 2010; Haq & Hafeez, 2009). Rwandan CHWs should be provided with standardized continuing education opportunities to update their knowledge and skills base. A training module that reviews BCC strategies that can be applied to drinking water messages is one opportunity to strengthen CHW communication skills in Rwanda. Additionally, CHWs should be reminded that

community behavior change will be a long-term process that requires diligence and patience. They should be encouraged that, while they may not see immediate results, perseverance through repeated household visits may result in sustainable behavior change.

Behavior Change Communication Frameworks

As previously mentioned, the IBM-WASH model was used as the primary conceptual framework for this project (Dreibelbis et al., 2012). Two other programmatic frameworks addressing behavior change and WASH are relevant to this project, and were used in addition to the IBM-WASH model to inform the development of the CHW training module. These include the Model of Communication for Water Treatment and Safe Storage Behavior and the FOAM Framework (Coombes, August 2010; Figueroa, 2010).

Figueroa & Kincaid 2010

The 2010 Model of Communication for Water Treatment and Safe Storage Behavior was developed from various behavior change theories and health communication programs to be used to design communication interventions that change water treatment behaviors more effectively (Figueroa, 2010). The creators of the model conducted a review of the existing literature to determine the extent to which the findings from safe drinking water research and interventions support the determinants and variables included in the model. Out of the 27 studies identified as relating to water treatment interventions, eleven included information about drinking water behavior, and twenty studies discussed hand washing and sanitation behaviors. The review confirmed the usefulness of the variables included in the model as the main influencers of water treatment behavior.

One of the review's main points was that interventions targeting water treatment must begin with an understanding of the interventions' audience, including their perspective on the water treatment technology and behavior. While the CHW training module is not an intervention directly targeting water treatment, the same principles of knowing the audience of an intervention apply. The audience, in this case, both the CHWs and community members, must be accounted for in the development of the module. Their literature review determined that no single intervention will accomplish sustainable water treatment behavior change, it is a "multi-factorial problem, and what is needed is an innovative, integrated, holistic approach" (Figueroa, 2010). The CHW training module is one intervention in a multi-pronged strategy targeting drinking water behavior change.

FOAM Framework

Although the FOAM framework was designed to inform the implementation of hand washing behavior change programs, its components can be used to analyze and organize information for other behaviors, such as drinking water source selection and storage practices (Coombes, August 2010). This framework includes components of various models, such as the Health Belief Model, Theory of Reasoned Action/Planned Behavior, Health Locus of Control, Stages of Change Model, and Social Learning Theory. The Health Belief Model is a health behavior theory in which health motivation is the central focus of the adoption of new behaviors(Institute, Services, & Health, 2005). In this model, six main constructs influence an individual's decision about adopting new health behaviors (Institute et al., 2005). These constructs include perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy.

The FOAM Framework begins with clearly defining the intervention's targeted audience and specifying the behavior desired in this audience. Various behavioral

determinants are then organized by opportunity, ability, and motivation. Opportunity includes whether an individual has access to the resources needed to perform a behavior, in addition to whether social norms facilitate or discourage this behavior. Ability includes the knowledge about a behavior's risks or benefits and the social support facilitating or hindering adoption of the behavior. Motivation is influenced by one's attitudes and beliefs about a behavior, one's expectations of the behavior's consequences, one's perceived threat to failing to adopt a behavior, and one's intention to adopt the behavior.

As previously stated, the IBM-WASH Framework was used in conjunction with the FOAM Framework and the Model of Communication for Water Treatment and Safe Storage Behavior to examine the various behavioral determinants influencing drinking water practices in Rwanda. Additionally, these frameworks were used to inform the development and implementation of the CHW training module.

Behavior Change Communication Strategies

Interpersonal Communication (IPC)

The Rwanda MOH has committed to decreasing the prevalence of preventable diseases, thus improving the overall Rwandan populations' health, through interventions targeting sustainable behavior change (Ministry of Health Rwanda, 2008, December 2006, July 2008). The Rwanda MOH recognizes that there are multiple factors affecting community health in Rwanda, each of which must be addressed to expedite community behavior change.

> Behavior change can be facilitated in many ways such as stimulation of community dialogue…to discuss factors that contribute to the spread of infectious diseases and conditions and situations that create them. Such factors

> may include traditional customs and norms which have negative effects to reducing the spread of infections (Ministry of Health Rwanda, 2008, p. 23)

One way to stimulate community dialogue concerning factors contributing to the spread of diseases is to use CHWs that have been trained to use various BCC strategies to address various factors influencing people's health behaviors. The CHWs can then use the BCC strategies to motivate community members to adopt safer behaviors.

The Rwanda MOH has claimed that strengthening CHW capacity in BCC strategies, specifically in interpersonal communication (IPC), will facilitate sustainable behavior change at the individual and interpersonal level (Ministry of Health Rwanda, 2008). IPC is a communication strategy that aims to share information, respond to questions and doubts, and motivate people to adopt certain health behaviors (UNICEF, Februrary 2005). The strategy of IPC incorporates listening skills, the ability to empathize, and fostering a supportive environment in order to encourage individuals to change behavior (UNICEF, Februrary 2005). According to the Rwanda MOH, "IPC is a person-to-person, two-way verbal and non-verbal interaction that includes sharing of information and feelings between individuals or in small groups. It facilitates the establishment of trusting relationship" (Ministry of Health Rwanda, 2008). Motivational interviewing is a specific type of IPC that has been used in several behavior communication strategies targeting WASH behaviors. Motivational interviewing includes simple counseling techniques such as listening, reflection, and collaborating with clients to realize the need for change (Britt, 2004; Quick, 2003). Components of both the motivational interviewing strategy and the broader IPC strategy were present in the CHW training module. IPC was chosen as the BCC strategy because the CHW already use aspects of it during their interactions with members of the community, it is supported by the Rwanda MOH, and it has been shown to be effective in similar contexts, as illustrated below.

Examples of Successful Use of IPC

A 2007-2008 impact evaluation in Rwanda examined effect of combining IPC strategies with social marketing on household water treatment. This study compared two intervention groups with one control group over an 18-month period. Households with exposure to IPC about water treatment with chlorine were significantly associated with 17% increase in ever use of chlorine ($p<0.01$), 6% increase in current self-reported use of chlorine ($p<0.01$), and a 4% increase in verified current use of chlorine ($p<0.01$) (Chankova, Hatt, & Musange, 2012). In a Zambian field trial, the impact of an intervention of social marketing plus motivational interviewing was compared to a control of social marketing only. In this study, 14% of households in the control group and 78% of households in the intervention group had detectable residual chlorine levels in their stored water, demonstrating the impact motivational interviewing can have on product adoption (Quick, 2003). In a 1998-1999 study in Zambia, the percent of households that received the motivational interviewing intervention with detectable residual chlorine levels significantly increased from 1% of households at baseline to 65% of households ($p<0.001$), while comparison areas had no significant differences (Thevos, Kaona, Siajunza, & Quick, 2000). Motivational interviewing has thus been shown to be an effective behavior change approach in resource-poor settings using health workers from the community to promote and sustain safe water treatment behaviors

The BCC strategy of IPC has been successful in situations similar to Rwanda, in addition to being shown to be useful in the context of Rwanda itself. The development, implementation, and evaluation of a CHW training module that applies BCC strategies of IPC and MI to drinking water messages is in alignment with the GEF-Rwanda's goals of community outreach and CHW capacity strengthening, in addition to being in agreement with the Rwanda MOH's commitment to build CHW capacity in BCC strategies, specifically IPC.

Adult Education & Training

There are multiple approaches to adult education, and various adult education theories. When developing training modules for CHW in Rwanda, it is important to use evidence-based effective teaching strategies, while keeping in mind the context and what the trainees are familiar with.

Health worker education

The *Effective Teaching: A Guide for Educating Healthcare Providers* (hereby referred to the *Effective Teaching Guide*) is a reference manual developed by USAID, WHO, and Jhpiego in 2005 to guide faculty in the development and implementation of teaching tools and curricula for healthcare providers, mainly doctors, midwives, and nurses (WHO & JHPIEGO, 2005). The *Effective Teaching Guide* describes the steps involved in developing effective training tools for adult healthcare providers, such as developing the learning objectives and teaching plan. Other items included in this source include useful descriptions of how to prepare and use visual aids, deliver interactive presentations, facilitate group learning, and how to create knowledge assessments at the conclusion of a training session.

Although CHWs in Rwanda are not professionally trained healthcare providers, they do work in the health sector, and many of the teaching methods described in the *Effective Teaching Guide* are already effectively used in Rwanda to train adult CHWs. This guide was used as a source for the teaching strategies used in the CHW training module. Many of the key roles that education should prepare healthcare providers to function in are similar to those required for CHW, including training them as good decision-makers, communicators, and community leaders. Research on effective teaching strategies indicates that learners require an appropriate environment and a variety of learning activities that provide opportunities to practice skills and receive

feedback on their performance (WHO & JHPIEGO, 2005). To effectively convey information to learners, the effective teaching strategies should result in good student recall of the taught materials.

An investigation of the percentage of material recall of students three days after teaching sessions determined that students recalled 10-20% of material that was given in a verbal one-way lecture, 10% of material that was given in a written/reading format, 65% of material that was given in both visual and verbal (illustrated lecture), and students recalled 70% of material presented in a participatory format, which included role play and case studies (Dale, 1969). A combination of interactive teaching methods, such as participatory role-play and group discussions, seem to be more effective in conveying information to students than using only verbal lectures.

Adult learning theory

Use of adult learning theory is important when planning training materials for adult learners. Because adult students bring previous experiences and knowledge to the learning environment, adult learning theory suggests that the usual teaching methods, such as didactic lectures, are inadequate (Dale, 1969; Knowles, 1984.). Allowing adult learners to participate in developing and directing the learning experience increases their retention of the material (Knowles, 1984.; WHO & JHPIEGO, 2005). Adult learning theory has implications for teachers of adult learners, since "a spirit of mutual cooperation should exist between the teacher and students…the teacher is a guide who helps students learn, rather than an instructor in the charge of knowledge" (WHO & JHPIEGO, 2005). Adopting the role of a facilitator and guide, instead of solely an instructor, will help the teacher of adult learners better convey the content to adult learners. These aspects of adult learning theory were incorporated in the CHW training module, as the CHW audience is comprised of adult learners.

Participatory Teaching Techniques

An important component of adult learning theory is participatory learning experiences (Thompson, Kershbaumer, & Krisman-Scott, 2001; WHO & JHPIEGO, 2005). Adult learners gain much from participatory learning experiences, such as group discussions, case studies, simulations, role plays, and seminars that encourage the adult learner to draw from their own experience and apply the content to real life experiences (Thompson et al., 2001; WHO & JHPIEGO, 2005). Participatory learning has been described as:

> An interactive approach to learning that is based on real-life experiences, incorporates dialogue among teachers and students, and critically analyzes the structural, organizational, and systemic causes of problems. Its goals are not only to build knowledge, skills, and attitudes, but also to provide the basis for solving problems after the course or academic program has ended. (USAID et al., 2005, p. 1-9 to 1-10)

Participatory teaching strategies encourage student participation, stimulate student thinking about the topic, and help build communication and interpersonal skills. Since the training module focuses on behavior change communication strategies and interpersonal skills, group learning activities are ideal participatory teaching strategies to communicate the information in the module, as they work so well to teach communication skills. The *Effective Teaching Guide* gave practical guidance on how to plan, implement, and evaluate group learning activities, including role-play activities, with healthcare professional students, and strategies suggested were included in planning, developing, implementing, and evaluating group activities in the CHW module.

As previously mentioned, motivational interviewing is a specific type of interpersonal communication strategy. Although motivational interviewing has been studied as a behavior change intervention, there is little information available on the best way to teach motivational interviewing to health professionals. Health professionals are

often taught new communication skills through practice and rehearsal strategies, which often involve hiring a paid actor to act as a simulated patient. To determine the best way to teach motivational interviewing, 70 healthcare professionals that were participants in a 2-day workshop in motivational interviewing were randomly assigned to groups to do skills practice sessions (Lane et al., 2008). One group practiced the MI skills learned during the workshop with a simulated patient, while the other group practices the skills with fellow trainees, which enabled them to act in both roles. The participants' competence in motivational interviewing was determined with the Behavior Change Counseling Index, a validated ratings scale (Lane et al., 2008). Results in the participants' scores and satisfaction with the training demonstrated there was no significant difference in skill levels between the two groups. Groups practicing with simulated patients and groups practicing with role-play reached equal competency levels after the 2-day motivational interviewing workshop. Because this study shows comparable results between the simulated patients and role-play activities, the CHW training module employs role-play activities with other trainees instead of involving external participants.

Role play activities have been effectively used for communication training of health professionals. A comparative study done in Germany examined students' perspectives on the acceptability, realism, and effectiveness of communication training using either peer role play or standardized (or simulated) patients (Bosse et al., 2010). In this study, 69 students were assigned to groups that received communication training with either role play or standardized patients. They then rated the previously mentioned components on a six-point Likert scale. This study concluded that both training methods are comparably valuable tools to train students in communication skills. Although the students rated standardized patients as more useful and applicable than role play, role

play is less expensive and provided a greater empathetic appreciation of the perspective of the patient.

Remaining Literature Gaps

A single, comprehensive review of the literature that examined behavior change strategies that have been used with community water source improvement interventions could not be found. However, a systematic review of the peer-reviewed literature on behavior change research on point-of-use water treatment interventions in low-resource countries is available (Parker Fiebelkorn et al., 2012). While behaviors differ between point-of-use treatment and water source selection, this review does help clarify the current state of behavioral research as it relates to water and sanitation behaviors. The systematic review found 26 publications that met four inclusion criteria: implemented a point-of-use water treatment intervention, applied a behavioral intervention, evaluated behavior change as the outcome, and occurred in a low- or medium- development country (Parker Fiebelkorn et al., 2012). This review indicates that there is limited peer-reviewed behavioral research on point-of-use water treatment. Only seven (27%) papers used behavior change theory to design and evaluate their behavioral interventions. This is concerning, as behavior change theory should be used to guide interventions targeting behavior change, as well as provide a means to evaluate the effectiveness of the intervention.

The systematic review emphasized the importance of conducting formative research as part of intervention development, as formative research "can improve understanding of existing behaviors, cultural practices, social context, and the economic environment of the target population, should be incorporated into project design" (Parker Fiebelkorn et al., 2012). Point-of-use water treatment has been studied for a long time, but the existing research fails to thoroughly examine achievement of sustainable behavior change. Similarly, there is a research gap in the best way to achieve behavior change

within a project using a water filtration intervention. Further research should investigate sustainable behavior change strategies that have successfully been used with community water source improvement interventions.

Conclusion

Behavior change at the individual and community level is an essential component of building healthy communities. CHWs in Rwanda are well positioned to act as behavior change agents in the communities in which they serve. While CHWs currently receive some training in BCC, further training in BCC strategies would strengthen their communication abilities. The BCC strategy of IPC has successfully been used in several drinking water interventions. Using evidence-based adult educational strategies is the ideal way to train CHWs in behavior change strategies applied to drinking water messages.

METHODS

Overview

This section outlines methods used in the preparation and development of a CHW training module that applies BCC strategies to drinking water messages. The module development process was informed by a review of relevant literature, findings from key informant interviews, and observations of CHW trainings. The module was pretested with CHWs in Rwanda. Results from the pretesting sessions and the subsequent adaptations to the training module are described.

Project Preparation

The literature on BCC theories, BCC strategies, CHW roles, training manuals developed for CHWs, and studies on drinking water behavior was reviewed to inform the project. Experts in curriculum development at Emory University were consulted about evidence-based curriculum development process. Additionally, Center for Disease Control (CDC) employees that have developed a Safe Water System Module for health care workers in Kenya were consulted about their strategies, lessons learned, and recommendations for the module.

The project goals and aims were explained to representatives of the Rwanda MOH in the Environmental Health Office in order to gain their support of the project and ensure the cooperation of EHOs, CHWs, and other individuals for the duration of the project. This meeting provided information about the centralized government role in CHW training. Additionally, the Rwanda MOH representatives provided copies of CHW training materials and various relevant national policies (Ministry of Health Rwanda, July 2008). This meeting shed light on the context of the project, including CHW trainings the MOH had previously done or was planning to do with respect to

WASH and BCC. With this information, the training module was developed to complement previous trainings CHW may have received, instead of replicating content of previous trainings.

Interview Guides

Initial interview guides were developed based on the research goals and objectives. Secondary sources, including interview questions from an Ethiopian study on CHWs and WASH and a WHO report on CHWs were incorporated into the development of the initial interview guides (Behailu, 2010; Lehmann, 2007b). Guides were reviewed by Emory University professors of qualitative research, GEF-Rwanda project supervisors, and an Environmental Health Officer and revised according to their feedback. Interview guides were revised again after the initial interviews to improve the flow of the interview.

In-Depth Interviews

Purposive sampling was used to identify study participants for key-informant, semi-structured interviews. These interviews were conducted in Rwanda, specifically the Northern District of Musanze and the Southern District of Bugesera. All interviews that were completed with CHWs, Community Health Coordinators, and community members were interpretation by Rwandan Environmental Health Officers (EHOs). Before each interview, the interviewer met with the interpreters briefly to review the interview guide, the goal of the interviews, and the goal behind each questions to ensure that they understood the purpose of interviews.

Before each interview, verbal informed consent was obtained. Participants provided oral consent to audio record interviews; two participants elected to not have their interview audio recorded. As much as possible, interviews were done in quiet

offices or rooms to facilitate privacy and confidentiality. Interviews were done at various locations, including health centers, non-governmental organization (NGO) offices, CHW homes, and community members' homes. Interviews were done at six of the ten health centers participating in the larger research project in which this study is nested. Interviews lasted from 30 to 90 minutes. CHWs received a per diem for participating in the interviews, while other participants, such as community members and NGO workers, received small, non-financial incentives, such as cookies and juice.

Four staff members working at non-governmental organizations (NGO) with existing WASH and/or community health projects in Rwanda were interviewed to identify and catalogue previous approaches to WASH education in order to prevent CHW duplication of efforts. NGOs interviewed included Population Services International (PSI), Wateraid, UNICEF, and Winrock International. Representatives from those four NGOs were interviewed at their Kigali national offices. The interviews investigated previous CHW trainings on drinking water messages, geographic areas in Rwanda that had received those trainings, strategies that had been taken to develop CHW education materials, and current gaps in CHW education. Representatives from the NGOs provided the project with several training manuals, which were useful guides during the module development stage. For the NGO Interview Guide, see Appendix A.

Two interviews were done with both an EHO and Community Health Coordinator present at each interview. These interviews examined the CHW's role, training structure, WASH education, and support system. Interview questions targeted what CHWs are currently taught regarding safe drinking water practices, in order to determine the current training CHW receive, and identify any training gaps related to drinking water messages. These interviews also served as an introduction to the project for those who supervise CHWs, as well as requesting their support for the project. Both interviews were done in the Southern District of Bugesera. For the EHO Interview

Guide, see Appendix B. Several informal conversations with EHOs revealed valuable information about CHW training, support systems and the remaining gaps in CHW education regarding drinking water that informed the development of the module.

The eleven CHWs who were interviewed were identified by EHOs and Community Health Coordinators at six of the health centers. CHWs working at health centers not participating in the larger GEF-Rwanda project were excluded because of convenience and time constraints. Two interviews were done at the CHW's home, and nine were done at health centers in a private room. These interviews examined CHWs' education concerning drinking water, experience with giving health messages to the community, and their perceptions of barriers to the acceptance of those messages. For the CHW Interview Guide, see Appendix C.

Three of the eleven CHWs identified a total of five community members that been visited by a CHW recently. Inclusion criteria for the community members included that the community member had been recently visited by a CHW, and remembered the messages given by the CHW. Those CHWs then took the interpreter and interviewer to the community member's household, introduced them, described the project, and asked the community member if they were willing to be interviewed. Interviews were done in the community member's home. Two of the initial five community members interviewed could not remember very much of the CHW's messages given on the last CHW visit. Since the inclusion criterion was not well met, two more community members that could remember the last time a CHW had visited them were identified and interviewed, for a total of seven community member interviews. These interviews examined community members' experience with CHW's health messages, and their perceptions of the barriers and facilitators to accepting those messages. For the Community Member Interview Guide, see Appendix D.

Observations

The developers of the CHW training module participated in water source mapping and water sample collection activities with GEF-Rwanda collaborators. These activities provided exposure to the settings where community members collect water, including a variety of water collection and transportation practices. Also, these experiences informed the scenarios that were included in the CHW training module so that they were relevant to the context.

Additional observation activities that informed the development of the CHW training module included CHW training on cookstoves and water filtration systems conducted by DelAgua Health and Development Program, and a Community-Based Environmental Health Promotion Programme (CBEHPP) training of CHW in Musanze District conducted by UNICEF. These observational experiences provided insight into the training process and structures used in Rwanda. The training module was developed to have similar structure to other trainings that CHWs might receive. A CHW was shadowed for 2 hours. The CHW revealed his training materials, tools, documentation manuals, teaching aids, and the Integrated Management of Childhood Illnesses (IMCI) algorithms that guide his practice. He was observed while caring for a child with diarrhea who was brought to his house. This experience was helpful in understanding the interaction between CHWs and community members. Additionally, it provided exposure to the many tasks that CHWs complete.

Review of Interview Findings

Interview findings were reviewed for common themes and illustrative quotes. Interview data was analyzed for behavior determinants of health targeted by CHWs, and organized in a table based on the psychosocial column of the IBM-WASH framework

(Dreibelbis et al., 2012). This information informed the development of the content in the training module. The most common, most successful, and most unsuccessful strategies, in addition to the most common barriers and facilitators to behavior change were incorporated into the module as scenarios and discussion questions.

Module Development

The proposed CHW training module draws on aspects of several BCC theories and programmatic frameworks (Coombes, August 2010; Dreibelbis et al., 2012; Figueroa, 2010). The CHW module was developed from the findings of the interviews, observations, and literature review. Standardized training development process methods outlined in the *Effective Teaching Guide* and in a USAID document *Training Works* were used to develop the CHW training module (USAID, November 2003)(WHO & JHPIEGO, 2005). This process was developed to standardize the tasks needed to be completed in order to develop effective, high quality training courses. The process included conducting a performance needs assessment for the training, and then designing, delivering, and evaluating the training.

In following the standardized training development process, the CHWs' learning gap and training goals were first identified by investigating what CHW currently know and teach people about safe drinking water through examining the interview data. Background information on the CHW learners was gathered, including their reported learning styles, favorite and least favorite parts of training sessions, and this was then incorporated into the module. The module includes training methods commonly used in Rwanda, such as participatory teaching approaches and role-play activities, because these are teaching strategies that are familiar to the CHW learners.

Using the findings of the key-informant interviews, I then developed the overall module learning goal, learning objectives, and content outline. This was then used to

develop the training module content, including the pre- and post-tests. The interview findings were used to inform the development of the module content so that it was relevant to both the drinking water issues and the cultural context in Rwanda.

The findings of the key-informant interviews were then used to develop the overall module learning goal, learning objectives, and content outline. This was then used to develop the training module content, including the pre- and post-tests. The interview findings were used to inform the development of the module content so that it was relevant to both the drinking water issues and the cultural context in Rwanda.

Module content was reviewed by GEF-Rwanda Research Managers, a monitoring and evaluation specialist with The Access Project with experience in community development, and a community program coordinator with the Dian Fossey Fund. The module was reviewed for culturally appropriate messages and relevance to the context and was revised accordingly.

Pilot Testing of CHW Training Module

An English version of the Trainer's Manual of the CHW training module was pilot-tested once in both the Northern and Southern Districts of Rwanda. Each testing session began with a 2-3 hour training session with the EHO Trainer, who was fluent in English, to review the module content and learning objectives. The EHO then used the Trainer's Manual to teach the module to a group of 4 CHW in Kinyarwanda. After each testing session, the EHO and CHW provided feedback that was used to revise the Trainer's Manual. The Trainee's Manual will be developed from a revised Trainer's Manual.

Institutional Review Board

The project was included in the GEF-Rwanda Project application to the Institutional Review Board of Emory University in the United States (IRB00053040), and determined to be human subject research that was exempt from further IRB review and approval. The Rwanda National Committee of Ethics also approved the project.

RESULTS

Interview Findings

CHWs Training

After being elected by their communities, CHWs receive some training by the EHOs at their local health center. CHWs each receive a training manual developed by the MOH that includes health education about various relevant issues, including: family planning, prenatal care, and sanitation. The CHW may receive some general health education about drinking water messages they should give the community. These include "drink clean water" and "treat your drinking water with chlorine". The CHW interviewees did not report receiving education about behavior change strategies that could be utilized with drinking water messages. Additionally, CHWs occasionally attend training sessions offered by various NGOs. For example, one CHW interviewee reported that he had attended a training session on the methods of water treatment with chlorine that was conducted by Population Services International. While these training sessions were enjoyed by the CHW attendees, they are sporadic, and impact only a small portion of CHWs in Rwanda.

The Community-Based Environmental Health Promotion Program (CBEHPP) primarily focuses on behavior change strategies surrounding hygiene and sanitation. While clean drinking water is a component of hygiene and sanitation, additional training emphasizing behavior change strategies surrounding clean drinking water is needed. The CBEHPP had not yet been scaled up to training of CHW as of August 2012. Interviews with EHOs and NGO representatives involved in the CBEHPP, in addition to various soft documents that described the CBEHPP, described the main role of the CHW in this program being to facilitate the Community Health Clubs. The CBEHPP will train CHWs in the participatory behavior change strategies to be used at Community Health Club Meetings. To monitor community member adoption of the recommended health

practices, CHWs will conduct household visits with Health Club members every 3 months (Waterkeyn, 2011).

CHW Messages About Drinking Water

The CHW module was originally planned to include messages on water source selection, transportation, and storage in the module. However, the interviews revealed that CHWs consider water transportation and storage as one topic. During interviews, CHWs were asked about their messages on safe drinking water transportation, and they were subsequently asked about safe drinking water storage messages that they provide to community members. The CHWs reported that they provide the same messages for both water transportation and water storage. Further investigation revealed that in Rwanda, for the most part, water is transported and stored in the same containers, usually a jerrycan. CHWs thus combine their messages on this topic to decrease the amount of messages conveyed to community members. The final module also combines water transportation and storage in one topic to be in agreement with the interview findings.

The messages and frequency with which CHW messages were reported are presented in Table 1. These messages used by CHWs about drinking water were gathered from interviews with EHOs, CHWs, and community members. The majority of the CHW drinking water messages focused on water treatment, disease transmission, and health benefits from drinking clean water. Few non-health messages were utilized by CHWs to promote behavior change related to safe drinking water. Few messages targeted drinking water source selection and storage containers, and those that did were vague, such as “choose safe, clean drinking water”. The most commonly reported message was “treat water with Sûr’Eau or PUR”; 12 out of 20 participants (60%) mentioned this. The message “use clean jerrycans” was reported by 20% of interviewees, but “clean” was not well-defined.

Table 1
Drinking water messages provided by Community Health Workers in Rwanda, 2012, N=20

Category	CHW Messages	n(%)
Water Source Selection	• Collect safe, clean drinking water • Choose water sources with a piped water source • Avoid stagnant water	5 (25%) 2 (10%) 1 (5%)
Water Transportation	• Clean jerrycans before using • Keep water jerrycans as clean as milk jerrycans • Jerrycans that have changed color are dirty	3 (15%) 1 (5%) 1 (5%)
Water Storage	• Use clean jerrycans • Use jerrycans with lids	4 (20%) 3 (15%)
Water Treatment	• Chlorinate water with Sureau or PUR • Boil water • Use 1 capful of Sureau to treat 20 liters of water	12 (60%) 6 (30%) 2 (10%)

Main Barriers to Community Member Behavior Change

Nine CHW reported that people in their community had difficulty adopting behaviors that result in unfamiliar – or uncomfortable – physical responses, such as hot or irritating bednets or the smell of chlorine. Five CHWs reported that community members often misunderstand or incorrectly apply health messages. For example, one CHW described how a community member had misunderstood a CHW's advice about family planning methods, used the methods incorrectly, and became pregnant. These women are then less likely to use family planning methods in the future because they misunderstood the initial health message. One community member reported lack of financial resources as a barrier to following a CHW's advice. Two community members reported lack of access to other resources, such as firewood, as a barrier to following a CHW's advice to use boiling as a water treatment method.

Main Facilitators to Community Member Behavior Change

Factors that CHWs reported as facilitating behavior change included: low or minimal financial burden to the new behavior and individuals having a clear understanding of the benefits and purposes of the promoted behavior. Consistent with

findings from the CHWs, many community members believed they were more likely to adopt a new behavior when they had seen the benefits of following the message. One community member described how he accepted the CHW message to purchase health insurance because he has seen how it saves money and keeps his family healthier. Respect for CHWs' training and experience led many community members to believe that advice from CHWs is important and should be followed

BCC Strategies CHWs Currently Use With Community Members

During interactions with community members, CHWs are generally using BCC strategies informed by the Health Belief Model. When asked how they motivate people to adopt new, safe drinking water behaviors, CHW interviewees reported that they inform community members that drinking dirty water can cause diarrheal diseases, and that choosing clean drinking water prevents diarrheal disease. CHWs are using HBM in that they focus on community members' perceived susceptibility to diarrhea, their perceived severity of diarrhea, and perceived benefits of not getting diarrhea. Several CHW interviewees reported teaching community members how to build latrines and kitchen gardens, which utilizes the self-efficacy construct of the Health Belief Model.

Observed Training Sessions

One of the project's objectives was to determine the CHW learning styles and teaching strategies that are effective in teaching CHWs. The CHW trainings that were observed contained short lectures, group discussions, and role-play activities. CHW interviewees reported that some of their favorite parts of trainings that they have attended are the role-play activities, hands-on activities, and interactive group portions of the training. These participatory teaching methods were incorporated into the CHW training module, such that it is structured similarly to typical CHW training.

CHW Training Module

Since the CHWs that were interviewed already had a good foundation in safe drinking water, the training module focuses on BCC strategies instead of reviewing concepts about drinking water safety. The CHW training module draws on aspects of several BCC theories and programmatic frameworks (Coombes, August 2010; Dreibelbis et al., 2012; Figueroa, 2010). The CHW module utilizes the behavior change communication strategy of interpersonal communication (IPC), which incorporates listening skills, empathy, and affirmation to motivate people to adopt certain health behaviors (UNICEF, Februrary 2005). IPC was included in the module because CHWs already use aspects of it during their interactions with members of the community, and it has been shown to be effective in similar contexts(Chankova et al., 2012; Quick, 2003; Thevos et al., 2000).

The module discusses several factors that influence health behavior: self-efficacy, social aspiration, and motherhood. These determinants are already targeted by CHWs when discussing other health issues. The module applies these factors that influence health behaviors to drinking water messages. The module is about 1.5-2 hours in duration. The module is designed to be taught by an EHO to the target audience of CHWs. The module has five learning objectives (see Table 2).

Table 2
Community Health Worker Training Module Learning Objectives

After completion of this training module, trainees will be able to:	
Objective 1	List 3 determinants of healthy behaviors from memory or with use of a pocket card.
Objective 2	List 3 IPC strategies from memory or with use of a pocket card.
Objective 3	Identify examples of each IPC strategy.
Objective 4	Participate in discussion about application of IPC strategies to conversations with community members.
Objective 5	Apply the IPC strategies to safe drinking water messages during a role-play activity.

The introduction of the module includes community members' statements about why they trust and respect CHWs, in order to affirm the CHWs and their role in the community. This was done so that they would realize their integral role in encouraging community behavior change. The module continues with a group discussion of the strategies the CHW trainees currently use to motivate community member behavior change. This is followed with a discussion of various determinants of healthy behaviors, including self-efficacy, social aspiration, and motherhood. Each determinant is explained, and then discussed. The module then presents three IPC strategies: listening, empathizing, and affirmation. Each strategy is explained, discussed, and practiced with a role-play activity. In the module, CHW are given the focal message "Respect the drinking water path by keeping water clean at each step, from source to mouth". This message is re-enforced with a role-play activity. See Appendix E for the complete CHW Training Module.

Aspects of Adult Learning Theory were incorporated into module by using a combination of interactive teaching methods, including verbal, written, visual, and role-play activities (Knowles, 1984.; WHO & JHPIEGO, 2005). These participatory teaching strategies were used in the module because they are effective with adult audiences, and are already successfully used in Rwanda. In the Trainer Version of the module, the Trainer was given ideas and examples of how they should act as the facilitator in the training, instead of an expert teacher. This was done to facilitate adult learning on the part of the CHWs trainees.

CHW Training Module: Field Testing

The module was revised after two field-testing session with feedback from the EHO trainer and CHW participants. There were several items that were enjoyed by the Trainees and kept in the module, as well as several items that were removed or revised in

the module. When asked about what they enjoyed during the training module, the Trainees reported that they enjoyed the interactive role-play activities. They reported that acting in the role of a community member helps them be more sensitive to community member's needs and desires. Both the EHO Trainers and the CHW Trainees recommended that the role-play activities remain in the training module.

Flip-boards were observed to be used in other CHW training sessions, so they were initially used in the CHW training module. The goal of the flip-board was to serve as a way that the Trainer could notate Trainee's ideas and contributions, and maintain the Trainees' engagement. However, during the field testing sessions, the CHW Trainees focused on copying the Trainee's notes on the flip-board word-for-word, which lengthened the training session considerably. Since the goal of the module was not to introduce new, factual information, but instead to apply BCC strategies to drinking water messages, the flip-board was removed from the module. Also, since the module was created with the goal to be easily reproducible in a variety of settings, the flip board added to the items necessary to conduct the module.

The initial module version included abstract, lengthy descriptions and examples of the 'behavioral determinants' that influence people's health behaviors. The field testing of this version revealed that these complex concepts were confusing, and not well-understood by CHW trainees. Subsequent versions of the training module were revised to still include 'behavioral determinants' but in a much simpler and straightforward manner, with examples that were easier to understand.

The estimated time for the CHW training module was originally about two hours. However, during the participatory activities, CHWs were very animated, and spent about 10 minutes acting out each role-play activity. This lengthened the module considerably to about three hours. Estimates of how much time to spend on each portion of the module were included in subsequent module drafts. Trainers using the module will have

estimates on the expected duration of each portion of the module so that they can plan their time accordingly in order to keep the training session on schedule.

DISCUSSION

The primary goal of this study was to develop and evaluate a CHW training module that applied BCC strategies to drinking water messages. This CHW training module adds to the larger body of reports and tools targeted towards CHW intended to improve capacity for effective behavior change. The CHW training module developed as a part of the GEF-Rwanda, project includes BCC strategies that will complement the behavior change content taught through the CBEHPP. It provides another avenue for CHW to receive training in BCC, in addition to providing them with strategies that they can use during interactions with the community. The CHW training module developed in this project will provide CHWs that work with the health centers associated with GEF-Rwanda with foundational BCC training.

Key-informant interviews and field-testing of the module provided insight into the learning style of CHWs in Rwanda in addition to effective and ineffective teaching strategies used to teach CHWs. CHWs in Rwanda base most of their health messages on the Health Belief Model, a behavioral theory that focuses largely on knowledge and perceived risk. While an effective BCC strategy in some contexts, the Health Belief Model should be complemented with additional BCC strategies during discussions of safe drinking water messages that focus on the larger set of behavioral determinants that shape water collection and water storage practices, such as social norms and self-efficacy. Individual decisions about health behaviors are motivated by many factors besides one's beliefs about health and disease, so CHW efforts to motivate community members to adopt safe drinking water behaviors can focus on these additional motivators (Figueroa, 2010; Ministry of Health Rwanda, 2008).

CHWs tended to focus on knowledge transmission and skills demonstration during interactions with community members, without providing community members the opportunity to practice the new skills. This may result in low motivation on the part

of the community members to actually do the skills on their own. Future training efforts should encourage CHW to provide opportunities for community members to practice new skills in order to increase their self-efficacy and motivation to do the skills on their own.

Community Health Workers & Behavior Change

Several studies demonstrate the success of using CHWs to change health behaviors (Chankova et al., 2012; Thevos et al., 2000). In Rwanda, CHWs trained in interpersonal communication methods successfully promoted behavior change in point-of-use water treatment practices (Chankova et al., 2012). In Zambia, volunteer health promoters were successful in encouraging the community to adopt safer drinking water practices following training in motivational interviewing (Thevos et al., 2000). The goal of this CHW training module is to provide CHWs in Rwanda with additional training in BCC strategies and use them to successfully motivate behavior change within their communities.

WASH-specific training modules targeting CHW have focused on cholera prevention, water treatment, and hand-washing (Center for Disease Control and Prevention, 2011; Parker, November 2005). While applicable for their specific context, their application to the more generalized behavioral outcomes associated with the GEF-Rwanda project was challenging. Beyond the specific context of this project, our training module provides a potential resource for future efforts to incorporate basic water handling and water storage messages into existing CHW programs.

Teaching Strategies for Training Community Health Workers

Observed CHW training sessions used both didactic and participatory teaching strategies. CHW interviewees reported that they best learn information during group discussions, simulations, and lectures. Students, particularly adult learners, are able to

recall and retain more information when they are taught by a combination of interactive teaching methods, such as verbal, written, visual, role play, and case study (WHO & JHPIEGO, 2005). Incorporating these approaches to our CHW training module was intended to enhance critical thinking about and absorption of the information, rather than merely facilitating rote memorization of the material. Active participation during teaching sessions should increase CHWs ability to retain the information.

Health Behavior Motivators

Interviews with CHWs determined that CHW often use motivators, such as the perceived susceptibility of diarrheal disease, to persuade people to adopt safe water behaviors. Similarly, health extension workers in Ethiopia often used health benefits to promote sanitation and hygiene behavior change, ignoring other benefits to behavior change, such as dignity and privacy:

> Health Extension Workers and Community Health Promoters refer to the health benefits of improved sanitation and hygiene with little use of other arguments to persuade members of the household. The issues of privacy and dignity [are] not given due emphasis in the teaching and learning processes. (Behailu, 2010, p. 12)

This approach draws on components of the Health Belief Model as it uses the motivators of health benefits or consequences to convince people to change behaviors. However, people's behaviors are not always motivated by health benefits alone.

> [There are limitations to] using only education about the connection between pathogens in the water and diarrhea to convince people to purify their drinking-water at home. Water treatment behavior is clearly related to many other individual beliefs and values, family relationships, social norms, and ecological factors. (Figueroa, 2010, p. 3)

This is consistent with the Rwanda MOH's views that people's social and cultural environments strongly influence their health decisions (Government of Rwanda, 2005-2009). CHW messages to community members should target these other motivators of health behaviors, such as social norms or peer pressure, in addition to targeting perceived susceptibility to diarrhea. The CHW module reviews motivators of behavior change that are not solely health benefits. CHWs are then exposed to the behavior change strategy of IPC that can be used in combination with the Health Belief Model motivators during interactions with community members. Incorporating other motivators of health behaviors into conversations about drinking water will foster further behavior change and adoption of safe drinking water practices (Figueroa, 2010). The training module encourages CHWs to focus on additional motivators of health behaviors that may influence people's decisions about drinking water, specifically self-efficacy, social aspiration, and motherhood.

Moving from Knowledge Transfer to Skills Development

In Rwanda, CHWs attempt to reach a balance between transferring health knowledge to community members and helping them develop new skills, including building kitchen gardens, tippy-taps, and new latrines. Health extension workers in Ethiopia spend more time transmitting knowledge and information to community members than spending time developing their skills to apply the information (Behailu, 2010). Their interactions with community members would be more effective if they focused more on skills development and less on communicating information about behavior change. In contrast, Rwandan CHWs seem to have the opposite problem, in which they are performing the skills for the community members, instead of teaching the community members to perform the skills themselves. Transferring this responsibility to the community members themselves should promote community ownership and

adherence to new practices and improve sustainability of behavior change, while reducing CHW burn-out or fatigue from building latrines for every community member.

Limitations

Interviewees were identified by convenience, purposive sampling, and not by random selection. This may have introduced bias in the interview findings. The purpose of the interviews was not to collect information from a generalized, representative sample of the entire CHW population in Rwanda. Instead, the goal of the interviews was to gain a general understanding of the baseline knowledge and practices of the CHWs in the ten health centers included in our study in order to develop a CHW training module that was relevant to the context.

Another limitation of the project was the potential conflict of interest in using EHOs as interpreters during interviews with CHWs that work in that same EHO's district. The CHW may have been reluctant to share certain views or opinions with the EHO present, because of fear of repercussions on their jobs. Additionally, some of the interviews were done with an interpreter of the opposite sex of the interviewee. However, limited time, resources, and accessibility dictated the choice of interpreters. The use of interpreters during the interviews may have introduced some bias and editing into the results. Certain statements or ideas may have been lost during the interpretation. These limitations were taken into account when reviewing the interview results.

Community members identified by CHWs as interviewee candidates may have been the most motivated people in the community to adopt new behaviors. Although interviewees were told that their responses during the interview were confidential, they may not have answered all questions honestly. They may have feared that their answers may reach the CHW that visits them and affect the care that they receive for their children. This was taken into consideration when reviewing the interview findings.

Limitations to this project were addressed when possible. The preliminary interviews and observations were done to inform the development of a training module for CHW, not to elicit rigorous, representative data.

Strengths

CHWs are strategically positioned to use BCC strategies to improve community awareness of behaviors that contribute to preventable diseases. The key-informant interviews that informed the development of the CHW training module demonstrated the high levels of respect that community members have for the CHW that serve them. When asked why they listen to the CHWs, community members responded:

> "People respect the opinions of the CHW because they elected them to improve their health"
>
> "When a CHW says something, people see their advice as precious and do it" ("Personal Communication," Summer 2012)

The CHW training module leverages the unique position that CHW hold in their communities, as it builds on the respect and value community members place on CHW messages.

The questions asked during the interviews with NGOs and the trainers of CHW about how they conduct trainings of CHW sparked conversation about the best practices for training adult learners. The interviewees themselves pointed out that participatory teaching strategies are more effective than lectures or memorization of facts. This is consistent with adult learning theory (Knowles, 1984.; WHO & JHPIEGO, 2005). The CHW training module incorporates these participatory teaching strategies that are both recommended by experts in adult education and by leaders in CHW training in Rwanda.

While giving feedback on the field-testing sessions, CHW reported that they enjoyed the role-play activities and recommended that they remain in the module. In particular, participants enjoyed acting as community members during the role-play activities. They explained this was because they felt that they could "become similar to them" and "imitate the culture of the community health worker"("Personal Communication," Summer 2012). This appeared to stem from empathy—the CHWs appreciated the opportunity to adopt the world-view of the community member. Perhaps this aided them in better understanding the community members that they work with and potentially helped them form more effective health messages.

RECOMMENDATIONS

A good understanding of the target audience, specifically their learning needs and learning styles is essential to the success of any training session (USAID, November 2003). The first half of my time in Rwanda was spent gaining familiarity with the CHW audience that would be receiving the training. In my interviews with them, I incorporated questions such as "what are your favorite and least favorite parts of trainings", "what do you currently know and teach about drinking water" and "what would you like to learn during a training session on drinking water and behavior change". These questions were targeted at understanding the training module's target audiences' learning needs and styles. Anyone preparing to develop a training module must first take the time to assess the needs of the training target audience.

It is important to involve local experts in CHW training from the start of a CHW training module development project. These experts should remain involved throughout the training development process to ensure that the training is relevant and appropriate to the target audience's needs. Although I consulted with several experts in CHW training throughout my time in Rwanda, I failed to identify or involve a local expert in the project. When my role in the project was complete, I submitted the CHW training module that I had created to a Rwandan research partner on the GEF-Rwanda project with extensive experience in CHW training and community health. This research partner was not a team member during my time in Rwanda. I believe my project would have been more relevant to the context and would have undergone fewer revisions if I had involved a local expert from the start to the end of the project.

Those seeking to develop CHW modules should incorporate both participatory activities and culturally-appropriate visual aids in the modules. I used a source developed by USAID and partner organizations to guide the module development process—this source encouraged the use of participatory activities to increase participants'

understanding and application of the material (USAID, November 2003). The Rwandan MOH also advocates using participatory methods in training sessions (Ministry of Health Rwanda, July 2008).

One CHW training session that I observed incorporated visual aids in the form of laminated cards with pictures of a dirty latrine or a piped well into the training. Several individuals with experience in CHW training recommended including visual aids to complement the content of the CHW training module. The module was submitted to research partners that are experienced in CHW training; they worked to incorporate culturally-appropriate artwork and visual aids developed by local artists. Training modules for CHW will be more effective in imparting information to trainees if they contain both participatory activities and visual aids.

Future research efforts should investigate the impact of implementing financial incentives or performance-based financing program for CHWs in Rwanda. Rwandan CHWs face constraints similar to health extension workers in Ethiopia, as identified in a cross-sectional study (Behailu, 2010).

> The common agreement among respondents was that bringing about behavior changes in relation to sanitation and hygiene in rural communities is not easy. Respondents reported that the tasks assigned to… health extension workers were time-consuming and difficult, and there are a number of constraints—transportation, inadequate number of health extension workers, training, no compensation. (Behailu, 2010, p.9)

Similarly, CHWs in Rwanda serve their communities as volunteers. They support themselves through their farms, stores, and other livelihoods. While the spirits of volunteerism and community service are both highly valued parts of the Rwandan culture, CHW seem to feel the strain of having to find time to support themselves and their families, while also serving their community. Several quotes from CHW interviews

demonstrate the difficult balance between serving their communities and supporting themselves and their families. In response to the question "Do you feel that you have enough time to complete your tasks as a CHW?" several CHW described this tentions:

> "Yes, it is no problem with time, because even if I am busy with my farms or fields I'll come if I get called to someone's house" ("Personal Communication," Summer 2012)
>
> "I must sacrifice myself, it is not easy, but I try" ("Personal Communication," Summer 2012)
>
> "You're elected and committed to the work of a CHW, so you must find time to do it" ("Personal Communication," Summer 2012)

The Rwanda MOH currently provides performance-based financing to CHW Cooperatives, which consists of several CHW volunteers that serve at the same health center—this payment is to be used for the cooperative's collective benefit and is not for individual compensation (Republic of Rwanda Ministry of Health, 2008). Future efforts should focus on the most effective way to implement a national performance-based financing system that compensates CHW for their service to their communities. CHW will then be incentivized to continue providing excellent services to their communities, thus further promoting healthy communities.

CHW Training Module: Next Steps

The CHW training module will be submitted to research partners with experience in CHW education, who will conduct further field-testing, revisions, translations, and printing of the module. These research partners will incorporate local art and culturally appropriate visual aids into the training module. They will then implement the training module at the ten health centers that have received the water filtration systems. The

module will be available in Kinyarwanda. It will be implemented in a train-the-trainer cascade training approach.

CONCLUSION

Community member adoption of safe drinking water practices is critical to the achievement of GEF-Rwanda's goals. CHWs are well positioned to facilitate community member behavior change and can also be instrumental in promoting the new water sources at health centers. A standardized CHW training module was developed that applies BCC strategies to drinking water messages. This training module aims to facilitate safe drinking water source selection and storage practices in the communities surrounding the health centers with the newly installed water filtration systems.

When giving drinking water health messages to community members, CHWs currently use BCC strategies that emphasize health and disease as motivators of an individual's behaviors. Other BCC strategies, such as IPC, can be used by CHWs to further promote safe drinking water messages. CHWs can target determinants of healthy behaviors, such as self-efficacy and social aspirations, to motivate behavior change around drinking water source selection and storage.

Findings from key-informant interviews revealed that most CHW drinking water messages focus on water treatment. There was a lack of CHW messages addressing drinking water source selection, transport, and storage. To address this gap, the CHW training module developed in this project includes strategies to promote improved water source selection and safe storage. The CHW training module that has been developed should be implemented in CHW training sessions to further equip CHWs in the application of BCC strategies to messages concerning drinking water source selection and storage. Sustainable behavior change requires interventions that target multiple levels of a community (Michie, 2008). The GEF-Rwanda project's installation of new water sources in health centers must be complemented with behavior change interventions targeting the individual, interpersonal, and community level. The CHW training module facilitates this through strengthening CHW capacity in BCC strategies to

use at each of these levels. Increasing CHW capacity to effectively use BCC strategies will facilitate community member adoption of safe drinking water behaviors, thus resulting in healthier communities.

APPENDIX A
NGO Interview Guide

Introduction: Thank you for agreeing to an interview today. My name is Josie Ohlin and I am working with the Rwandan Ministry of Health, Emory University, and the Access Project. We are conducting research in Rwanda to understand CHW's training and health promotion experiences. We are interviewing several non-governmental organizations in Rwanda that work in the water, sanitation, and hygiene sector, and/or community health. Our goal is to identify previous approaches to CHW education to prevent duplication of efforts.

I want to hear about your personal experiences and opinions. I have a list of topics I would like to discuss. Your participation in this interview is completely voluntary. I would like to record our discussion so that I can review our conversation later. Our discussion today will not be shared with anyone outside of our research team. Is it OK if I record our discussion? Our interview will last about one hour. Do you have any questions before we start?

1. **Interviewee contact information**

2. **Describe the trainings you have done for CHWs in Rwanda**
   - Where did those trainings occur?
   - Who attended the trainings?
   - Who received training materials (CHW, EHO, hospital staff)?
   - Is it possible to get access to the training materials?

3. **What successes have you found in training CHWs?**

4. **What barriers have you found in training CHWs?**

5. **What knowledge gaps do you see in CHW, CM, EHO?**
   - Specifically related to water source selection, transportation, & storage?

6. **What content or teaching strategies would you like to see in an additional module?**

7. **What advice do you have for the development of an additional module?**

APPENDIX B
EHO Interview Guide

Introduction: Thank you for agreeing to an interview today. My name is Josie Ohlin and I am working with the Rwandan Ministry of Health, Emory University, and the Access Project. We are conducting research in Rwanda to understand CHW's training and health promotion experiences. I am interested to hear about your personal experiences and opinions on these topics. I have a list of topics I would like to discuss. Your participation in this interview is completely voluntary. I would like to record our discussion so that I have a record of what was said and can review our conversation later. Our discussion today will not be shared with anyone outside of our research team. Is it OK if I record our discussion? Our interview will last about one hour. Do you have any questions before we start?

1. **Interviewee contact information**
2. **Recruitment Process**
    - Elected by the community? For how long?
    - Input from MOH/local government about who becomes an CHW?
    - Are there any Minimum Requirements for CHW eligibility?
        - Education? Experience?
3. **Education**
    - Tell me about the education of the CHW
    - Courses? Certification exam?
    - Training styles: lecture, discussions?
    - Receive any WASH Training? Behavior Change Communication Content?
    - CBEHPP Trainings occurred?
    - What continuing education do they receive?
4. **Role & Duties**
    - What is in the CHW job description?
    - Describe a typical day as a CHW
    - What are their monthly tasks? How many HH visits…. community meetings?
    - Set program for each HH visit? Use same health messages for all HH?
        - Set program for community meetings? Depend on time of year?
    - How do CHW support themselves (Other jobs? Farms?)
5. **Accountability, Supervision**
    - Who do the CHW report to? Formal recording system? Record what information?

- Chain of command? How many times a month do they speak with supervisor?
- How are the CHW monitored for quality control?

6. **Support**
    - What mentorship support do they receive?
    - Who do the CHW go to when they have questions about health issues?
    - What would a CHW do if they arrived at a HH with a very sick child? Process
7. **Logistics** (transportation, drug supplies, equipment)
    - How do the CHW reach people?
    - How do CHW obtain and dispense medications? Supply chain.
    - What equipment do they use, how do they get it?
8. **Barriers to behavior change adoption**
    - Give example of last CHW message or training session
    - Give me an example when people DO follow the CHW health advice
        - Why do you think this was?
    - Give me an example when people DID NOT follow the CHW health advice
        - What are the reasons for this?

Thank you so much for sharing your experiences and opinions with me. This discussion has been very valuable. Is there anything else that you would like to share that I have not asked about?

APPENDIX C
CHW Interview Guide

Introduction: Thank you for agreeing to an interview today. My name is Josie Ohlin and I am working with the Rwandan Ministry of Health, Emory University, and the Access Project. We are conducting research in Rwanda to understand CHW's training and health promotion experiences. I want to hear about your personal experiences and opinions. I have a list of topics I would like to discuss. Your participation in this interview is completely voluntary. I would like to record our discussion so that I can review our conversation later. Our discussion today will not be shared with anyone outside of our research team. Is it OK if I record our discussion? Our interview will last about one hour. Do you have any questions before we start?

1. **Interviewee contact information**
2. **Describe how you became a CHW**
    - Recruitment
3. **Tell me about some of the recent trainings you have taken.**
    - Structure, teaching style?
    - What teaching methods did you learn BEST from? The LEAST?
4. **What do you remember learning about drinking water**
    - Source
    - Transportation
    - Storage
5. **What are your tasks as a CHW?**
    - Distribute medications….HH visits…Community meetings…others?
6. **Tell me about the last time someone brought a sick child to your house.**
    - What was the process? What health messages did you give the parents?
    - Do the same sick children keep returning to your house?
        - What did you say to the parents to persuade them to change their practices?
7. **Walk me through the steps of your last HH visit.**
    - Who did you speak with?
    - What supplies did you bring? (Posters, brochures?) Can I see them?
        - Can you show me how you use them?
    - **What HH items did you inspect?** Eating utensils, water storage vessels, bed nets
        - If you saw an uncovered water storage container, what would you say?
            - How would community member respond?
8. **What topics do you discuss during household visits?**
    - How do you pick those topics? Adjust topics by recent events?
    - What questions do people ask you? How do you answer them?

        - Have you ever demonstrated a process for a CM? (water treatment)

9. **Pretend that I am a community member that you are visiting—what would you teach me about drinking water?**
    - What questions do you ask me? What questions would I ask you?
    - How do you motivate/sensitize people about this topic?
    - What do you say to the community to stimulate their interest?
    - **What words and messages do you use to talk about this topic?**
    - Do you talk about the benefits of following this health message?
10. **Tell me about the last time you spoke at a Community Meetings**
    - What topics do you discuss? How pick topics? Adjust them by events?
    - Use #6 probes
11. **Do you use different communication strategies at C. Meetings & HH visits?**
    - How do you motivate people to change their behavior?
    - What strategies have you used that DID NOT motivate behavior change?
12. **What health messages are easily accepted in the community?**
    - **What health behaviors are easy for people to adopt?**
    - How did you present that health message?
    - Why do you think they accepted that message?
    - What do you say to CM to persuade them to change their old practices?
13. **What health messages are NOT easily accepted in the community?**
    - **What health behaviors are NOT easy for people to adopt?**
    - How did you present that health message?
    - Why do you think they DID NOT accept that message?
    - **How do you speak with CM who are reluctant to change their habits?**
14. **What do you think is the most important part of your job?**
    - What do you spend most of your time doing?
    - Do you feel that you have enough time to complete all of your tasks?
15. **What advice would you give to a newly elected CHW?**
    - Did you receive advice like this from anyone when you became a CHW?
16. **Thank you so much for sharing your experiences and opinions with me. This discussion has been very valuable. Is there anything else that you would like to share that I have not asked about?**

APPENDIX D
Community Member Interview Guide

Introduction: Thank you for agreeing to an interview today. My name is Josie Ohlin and I am working with the Rwandan Ministry of Health, Emory University, and the Access Project. We are conducting research in Rwanda to understand people's experiences with CHW. I want to hear about your personal experiences and opinions. I have a list of topics I would like to discuss. Your participation in this interview is completely voluntary. I would like to record our discussion so that I can review our conversation later. Our discussion today will not be shared with anyone outside of our research team. Is it OK if I record our discussion? Our interview will last about one hour. Do you have any questions before we start?

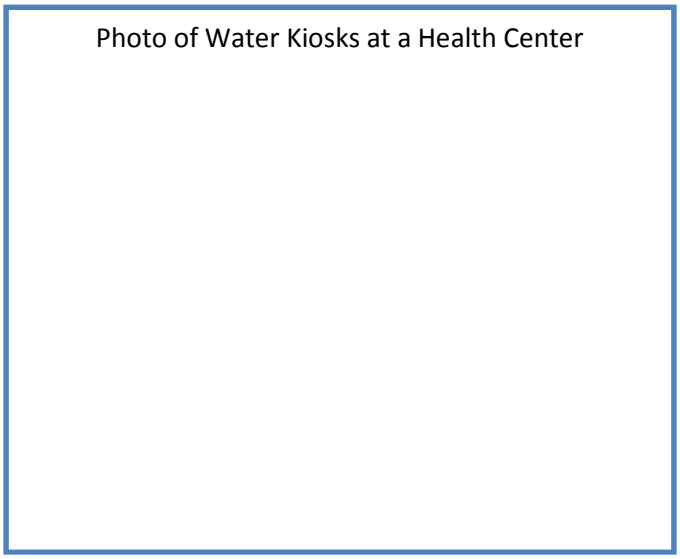
1. **Interviewee contact information**
2. **Walk me through the steps of the last time a CHW visited your house…you took your sick child to the CHW's house… heard a CHW speak at Community meeting.**
    - Is it always the same CHW?
    - What did they DO, SAY, EXAMINE, BRING?
3. **Tell me about the conversation that you had with the CHW**
    - What messages did they give? Were they useful?
    - Did they ask you questions? Did you ask them questions?
    - Did you understand what they said?
4. **What is the last health message you remember hearing?**
    - What messages do you remember hearing about drinking water, sanitation, hygiene?
    - Are these easy to practice?
    - What steps do you take to keep your drinking water safe?
5. **Are the CHW's health messages useful? How?**
    - What is more important than those health messages?
6. **Do you think that it is important to follow the CHW's advice?**
    - What makes it easy to follow the CHW's advice?
    - What makes it hard?
    - What CHW messages are EASY/ HARD to follow? Why?
    - What stops you from following their advice?
7. **Do you feel that you can trust that CHW? Why?**
    - What did they SAY or DO that made you trust them? Or not?
8. **Tell me one thing that a CHW told you that WAS useful.**
    - How did you implement that in your life?
    - Why was that useful and doable?
9. **Tell me one thing that a CHW told you to do that WAS NOT useful.**
    - Why was it not useful?
10. **What health topics would you like the CHW to teach you about?**

- Thank you so much for sharing your opinions and experiences with me. This discussion has been very valuable. Is there anything else that you would like to share that I have not asked about?

APPENDIX E
CHW Training Module

Behavior Change Communication Strategies for Safe Drinking Water Source Selection & Storage Messages:

An Interactive Training Module for Community Health Workers in Rwanda



Training Manual for Trainers

Rwanda 2013

Course Overview

Target Trainers: Environmental Health Officers (EHO) in Rwanda
Target Trainees: Community Health Workers (CHW) in Rwanda
Target Setting of Training: Training can be done during monthly meetings at health centers between EHOs and CHWs.
Number of Trainees per Training Session: 10-15
Module Length: About 1.5-2 hours duration

Learning Goals: After completion of this training module, Trainees will successfully apply the behavior change communication (BCC) strategy of interpersonal communication (IPC) to conversations with community members about safe drinking water source selection and storage.

Learning Objectives: After completion of this training module, trainees will be able to:

1. List 3 factors that influence health behavior from memory or with use of pocket card.
2. Identify examples of each factor that influences health behavior.
3. List 3 IPC strategies from memory or with use of pocket card.
4. Identify examples of each IPC strategy.
5. Participate in discussion about application of IPC strategies to interactions with community members.
6. Apply the IPC strategies to safe drinking water messages during a role-play activity

Training Preparation

Pre-Training Preparation	
Task	**Completed**
Set training date	
Invite Trainees	
Reserve a private room	
Review Trainer Manual	
Make a copy of the Post-Test for each Trainee	
Collect materials	

Training Day Preparation	
Task	**Completed**
Prepare training room by organizing chairs in a 'U' shape to encourage group participation	
Distribute materials to Trainees	
Start Training	

Materials Needed	
Material	**Obtained**
1 Trainer Manual	
1 Trainee Manual for each Trainee	
1 copy of Post-Test for each Trainee	
1 pocket card for each Trainee	
1 clean plastic drinking cup	
1 jerrycan, dirty on outside and inside	
1 liter of safe, clean drinking water	

Module Purpose
This module should strengthen CHW's ability to use BCC strategies in conversations with community members so that they can continue to encourage healthy behavior change. This module focuses on messages of safe drinking water source selection and storage.

Module Overview: This module includes information about:

- Factors that influence people's health behaviors, specifically their water source selection and transportation practices in Rwanda
- Behavior change communication (BCC) strategies that can be used to influence people to adopt healthy water source selection and storage behaviors.
- Application of BCC strategies during role-play activities

How to Use this Trainer's Manual

This module uses several teaching strategies to strengthen the Trainee's understanding of the behavior change strategies. These teaching strategies include explaining new information, leading discussions about the information, and giving Trainees an opportunity to practice the strategies during role-play activities. During this training, the Trainer should facilitate discussions and activities among the Trainees. The Trainer should avoid lecturing to the Trainees for the whole training, but instead encourage the Trainees to participate during group discussions and activities. During group discussions, the Trainer should encourage the Trainees to provide examples from their experiences. The Trainer can guide the conversation so that it remains on topic.

Role-play activities give the Trainees a chance to practice the BCC strategies that are discussed by applying them to situations that they might encounter. For each activity, the Trainer should ask for 2 volunteers—one to act as the CHW and one to act as the community member. The Trainer can then read the role-play scenario to the group, and then prompt the volunteers to act it out. If the volunteers have difficulty during the activity, the Trainer can help them by giving them ideas or advice. For each role-play activity, several examples are included. These examples can be used by the Trainer to give the Trainees ideas for the activity if they have difficulty thinking of things to say during the activity. After each role-play activity, affirm the volunteers by clapping for them. Then lead the group in a discussion, giving feedback to the volunteers about the activity.

The first half of the module reviews some factors that influence people's health behaviors, including self-efficacy, social norms, and motherhood. The second half of the module reviews three components of the BCC strategy called IPC, including listening, empathizing, and affirmation. For each of the three IPC strategies, the Trainer should explain the strategy, and then lead the Trainees in a discussion about the strategy's application to water messages. The Trainees can then practice the strategy during a role-play activity.

The module concludes with a review of the key messages. Additionally, each Trainee receives a wallet-sized pocket card that has the module's key messages printed on each side. This pocket card is to be a memory aid for the Trainees that they can use during interactions with community members.

Non-italicized text guides the Trainer in how to conduct the module, and explains each section. Italicized text within blue text boxes provides the Trainer with prompts on what to say during each section. An example is given below:

> *This text gives the Trainers ideas on what to say during the training. The Trainer should adapt the dialogue text when necessary so that it is relevant to their training context and Trainees.*

The training module is about 1.5-2 hours, but can be made shorter if needed by limiting the discussion and role-play sections, or removing the Water Path Activity at the end. Each section provides an estimation of the time that it should take in parenthesis.

What helps CHW learn new ideas?

This module targets CHW with training on BCC. It is important to use varied teaching strategies to motivate the CHW Trainees to stay engaged during the training session. CHW are motivated to learn when they:

- Learn new knowledge and skills
- Learn how to help people be healthier
- Receive time to practice new skills during a training
- Receive written reference materials that complement the training
- Get time to ask questions for further explanation of certain topics

What else would you add to this list, from your experience teaching CHW?

_____
_____
_____
_____
_____
_____
_____
_____

Try to look for ways that you can address these learning styles while leading this training.

Welcome

(Expected time: 15 minutes)

Welcome: Welcome the Trainees and give a brief overview of the Training

*Welcome to the training entitled **Behavior Chance Communication Strategies for Safe Drinking Water Source Selection & Storage Messages.** In this training, we will:*

- *Review the drinking water messages that you currently give the community, in addition to the barriers to those messages.*
- *Review factors that influence community members' behaviors regarding water source selection and transportation*
- *Discuss how you can promote safe water collection and storage practices.*
- *Review behavior change communication strategies*
- *Discuss how to apply the strategies to conversations about drinking water.*
- *Practice the strategies in role-play activities.*

Everyone should participate in the discussion and activities. Please feel free to share your experiences, and be respectful of other people's ideas. This training session will probably last about 1.5-2 hours.

Introductions: Affirm the CHW's role in the community's health, and lead the Trainees in introductions.

The community elected you to be CHW because they respect you. The community trusts you because they have seen how you have helped them in the past. You are role models to the community, and the community often follows your example. You have probably seen that behavior change happens very slowly. However, CHW have a very important role in motivating the community to change their behavior. In this training, we will review behavior change. We will review some strategies to motivate people to change their behavior, and apply those strategies to safe drinking water messages.

Let us introduce ourselves. Each person can say their name and the name of the village where they

Oral Pre-Test

For the Pre-Test, facilitate a discussion among the Trainees about the following questions. This discussion should encourage the Trainees to begin thinking about their current drinking water messages, barriers to safe drinking water practices, and behavior change strategies that they already use. This discussion should put the rest of the training session into the context of the drinking water behaviors the CHW see in the community.

Let us discuss the messages that you currently give the community about drinking water.

- *What messages do you give about drinking water source selection?*
  - *Example: "Collect water from public taps"*
  - *Example: "Avoid collecting water from lakes"*
- *What messages do you give about water storage?*
  - *Example: "Store water in a clean jerrycan"*
  - *Example: "Avoid using dirty fruits or vegetables as jerrycan lids"*
- *What are some of the reasons people do not follow these messages? What challenges do you face when encouraging community members to change their behavior?*
  - *Example: Cost, distance, lack understanding*
- *What strategies do you use to motivate people to accept those messages?*
  - *Example: "Compare price of sureau to price of taking a sick child to health center"*
  - *Example: "Compare community member to model neighbors with good practices"*

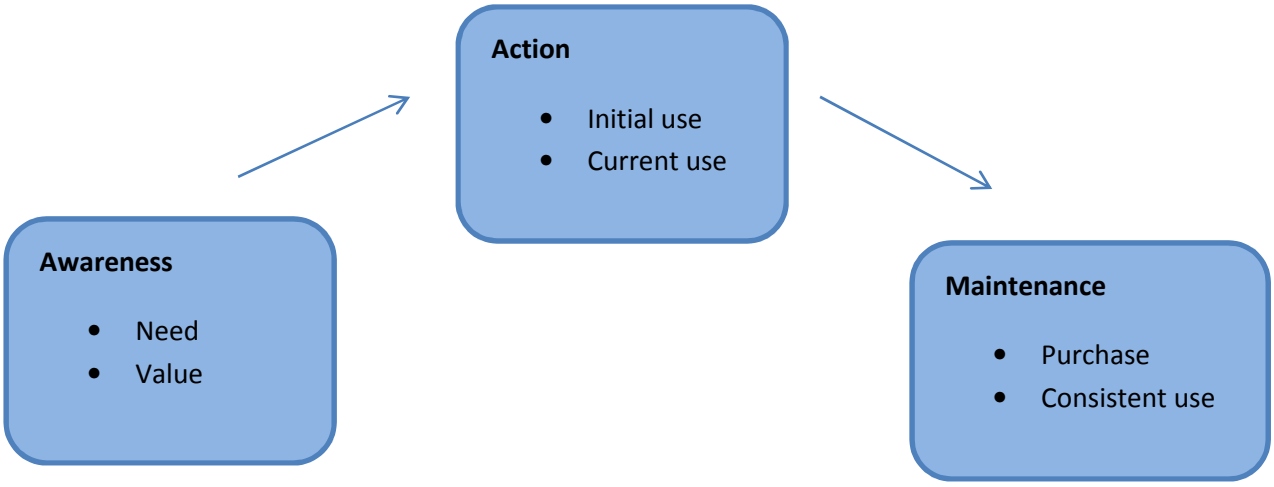
Introduction to Behavior Change

Behavior Change

People's behaviors are influenced by many factors, such as their traditions, beliefs, social support, and culture. Sometimes people have behaviors that are unsafe or may result in disease. One example is a community member whose behavior is to store their drinking water in the same jerrycan that they sometimes use to store urwagwa. This behavior results from many influences, including their traditions (they have always done this), their beliefs (this is safe to do), and their social support (their friends do this as well). Healthy behavior change in this example would be if the community member obtained a new jerrycan and dedicated it to clean drinking water storage only. It is important to encourage behavior change in community members by targeting the factors that are influencing their behavior.

Behavior Change Steps

Since behavior change can happen in multiple ways, there are several ways to explain the process of behavior change. The picture below provides a visual example of how behavior change can be a progression through multiple steps.



These steps will now be explained, with an example of the behavior of dedicating one jerrycan to safe drinking water storage only. The first step is that community members are aware of a need, such as the need to store drinking water in a clean jerrycan dedicated to water storage only. Also, the community member must value, or believe in the importance of, the behavior of storing water in clean jerrycan. The next step of action is when a community member decides to dedicate one clean jerrycan to drinking water storage only. In this step, they try the behavior for the first time, and then repeat the behavior several times. The final step is maintenance. In this step, a community member makes permanent behavior change to dedicate one jerrycan to drinking water

storage only. They may purchase a new jerrycan for water storage only. They use this jerrycan consistently for drinking water storage only.

People do not always go forward in these steps. Sometimes community members can get stuck on one step. For example, someone that uses the same jerrycan for storing urwagwa and drinking water may be aware that this is unsafe and that it would be better to dedicate one jerrycan for drinking water storage only. However, they have not made the action to purchase a new jerrycan for drinking water storage only. They are currently stuck in the "Action" step. Sometimes community members can go backwards in the steps. An individual might be in the "Action" step because they purchased a new jerrycan dedicated for water storage only. Then that person uses the new jerrycan to store urwagwa, even though they know it is not safe. They have gone backwards from "Action" to "Awareness". CHW should be aware of these possibilities as they try to motivate community members to adopt safe behaviors and encourage them to move forward in the behavior change steps.

Remembering these steps in the behavior change process can help CHW as they try to motivate community members to change their drinking water behaviors. CHW can learn what step the community member is in through a conversation with them, and then adjust their behavior change messages to be relevant to that step. CHW should know that people do not always go steadily forward through the steps.

This training session will teach CHW how to motivate CHW to adopt safe behaviors of drinking water source selection and storage. This training session will review various factors that influence these behaviors, and show CHW strategies to target these factors to encourage behavior change among the community members.

Behavioral Determinants

(Expected time: 30 minutes)

Explain how people's behaviors can influence their health and how there are multiple factors that influence these behaviors, and how CHW can target these factors or 'behavioral determinants'. Then explain three of the behavioral determinants: self-efficacy, social norms, and motherhood. After explaining each behavioral determinant, lead a discussion about its application to water practices.

Our behaviors – the things we do and the actions we take – can influence our health. Smoking is a behavior that can negatively influence your health, as you may develop a lung disease. Washing your hands is a behavior that can positively influence your health, as you are less likely to get sick from bacteria on your hands. There are many factors that can influence community members' behaviors. We will refer to these influencing factors as 'behavioral determinants'. Examples of these include people's knowledge, beliefs, perceived benefits, perceived barriers, perceived threat, self-efficacy, and social influence.

Often, CHW teach people that they must drink clean water to avoid getting sick with diarrhea. Community members need to know that they can get diarrhea from drinking unclean water, but sometimes this knowledge is not enough to motivate them to change their drinking water behavior. Other factors may influence whether this knowledge results in behavior change.

We will discuss 3 factors that may help people change their behaviors:
1) Parenthood
2) Social Aspirations
3) Self-efficacy

Parenthood: *Many parents have natural instincts to nurture their children. They want to be the best parents that they can be. Parents care for their children, and want them to be healthy.*

- ***Example**: "I want to be the best parent that I can be, so I will collect drinking water from a clean source"*
- ***Example**: "I collect water in a clean jerrycan because I want to be a good parent to my children"*

Appealing to the desire to be a good parent can be applied to the water collection and storage practices in several ways. Target parents' desires to nurture their children and provide a safe environment for their children by collecting water at the safest source possible. Explain to them that the water at a safe drinking water kiosk is very clean and, if handled properly, safe for their children to drink.

Discussion

- *How have you appealed to ideas of parenthood before in your interactions with the community? Give an example.*
- *How could you target parenthood to motivate the community to adopt safe drinking water practices?*
- ***Example**: "You can be a better parent to your children by collecting safe drinking water at a clean drinking water kiosk and storing and handling the water safely"*

Social Aspirations: *Society influences community members' behaviors. Community members follow the examples of their family, neighbors, and CHW. Social aspirations are the desire to increase one's social standing. Social aspirations also influence community members' behaviors.*

- ***Example**: "My neighbors collect water from this source, so I will too"*
- ***Example:** People follow the example of the CHW*
- ***Example**: Collecting water from the new water filters will give me a higher social standing in the community.*

Social aspirations can be applied to water collection and storage practices in several ways. Encourage community leaders or 'model neighbors' in the community to collect water at clean water kiosks, because others may follow their lead. You can encourage people to collect water at clean water kiosks because the water is "bottled-water quality at an affordable price" and the type of water they provide in large cities. This message appeals to people's social aspirations to increase their social standing in the community.

Discussion
How have you targeted social aspirations before? Give an example.
How could you target social aspirations to motivate people to collect clean drinking water?
Example: "Clean water kiosks provides bottled-water quality water at an affordable price"

Self-efficacy: *Self-efficacy is a person's confidence in their own ability to perform a specific behavior or achieve a goal. A community member is less likely to adopt a behavior that they do not believe that they can perform. A community member will be more likely to adopt a behavior that they have confidence that they can perform. For example, someone with high self-efficacy regarding safe drinking water storage believes that they can successfully achieve their goal to store their water in a safe manner. They are confident in their own abilities to achieve the desired goal.*

There are many ways to improve someone's self-efficacy related to a specific behavior. You can teach them the specific steps in carrying out a behavior until they are confident that they can complete the behavior on their own. You can help them identify problems and possible solutions to these problems.

- ***Example**: A community member has confidence that they can successfully protect their jerrycan with a lid*
- ***Example**: A community member is not confident that they can collect water at the public tap.*

There are several ways that improving self-efficacy can influence safe water collection and storage practices. You can teach community members how to protect their jerrycan with a lid. If a jerrycan's plastic lid is lost, you can help community members identify safe alternatives to use as lids, such as a clean, locally fabricated wooden lid.

By explaining the steps involved in collecting water at the new kiosk, or explaining the steps involved in finding a safe jerrycan lid, the CHW can encourage self-efficacy among community members.

Discussion
How have you targeted self-efficacy before? Give an example.
How could you target self-efficacy to promote the water filtration system?

Behavior Change Communication Strategy: Interpersonal Communication

(Expected time: 45 minutes)

Explain The BCC Strategy of IPC, and how it can be used to target behavior change.

It is common practice to target people's knowledge about diseases and health behaviors. This can include telling people the consequences of poor health behaviors, and telling them what to do. For example, a CHW may explain that drinking unsafe water may cause diarrhea, and tell people to treat or boil their water. However, there are alternative strategies that may be more effective to change people's behavior. The CHW may more effectively motivate the community members to change their behavior if they listen to the community members' experiences, beliefs, and concerns about water treatment, and discuss the various safe options available to the community members.

We will review a BCC strategy called Interpersonal Communication (IPC). You can use IPC to:

- *Share new information with community members*
- *Answer community members' questions*
- *Motivate community members to use the water filtration systems*

You can use the IPC strategy to target behavioral determinants during interactions with community members. Key strategies of IPC are listening, empathizing, and affirming. We will review, discuss, and practice each of these strategies.

Now explain each of the three IPC aspects: listening, empathizing, and affirmation. For each one, explain the IPC strategy, lead a discussion about how to apply it to drinking water messages, lead a role play activity to practice the strategy, and then give the volunteers feedback.

Listening

***Explanation**: It is important that CHW can use the IPC strategy of listening. By listening to a community member's experiences, beliefs, and concerns, a CHW will understand the community member's situation better. The CHW can then motivate the community member with strategies that apply to the community member's specific situation. A community member will probably not accept a CHW's advice if the CHW does not listen to them. There are several ways that a CHW can show a community member that they are listening to them. They listen to the community member, then summarize what they have heard.*

- ***Example**: "It sounds like…."*
- ***Example**: "What I hear you saying is"*

Discussion

- *When have you used this strategy before?*
- *How can you apply this strategy to encourage community members to adopt safe water practices?*

***Role Play**: A CHW is visiting a community member that has a new job at a restaurant. Their salary is now a little higher than before, and the community member is talking about buying a new radio with their extra money because it will give them a higher social status. The community member still collects water at the lake because it is "free" and it is "what they have always done in the past". In this role-play, the CHW should first practice listening to the community member, and then target the community member's social aspirations to encourage them to collect water at the water kiosk at health center.*

- *Example: The CHW can point out the higher social standing the community member will gain if they begin collecting water at the water kiosk at health center instead of the lake.*

***Feedback**:* Ask the other Trainees for their feedback on the role-play. Give your own feedback. Here are some questions you can use:

- *What happened in this activity? What was the outcome?*
- *How was listening used in this activity?*
- *How did the CHW target 'social aspirations'?*

Empathizing

It is important that CHW empathize with community members. To express empathy, CHW try to see the situation from the community members' perspective [5]. The CHW uses empathy when they try to feel what the community member feels, thinks like the community member thinks, and sees things like the community member sees them [5]. The community member may feel more comfortable when the CHW expresses empathy. The community member may then be more open to share their experiences with the CHW and consider the CHW's advice.

- *Example: "How did that make you feel"*
- *Example: "It sounds like that was very difficult"*

Discussion

- *When have you used this strategy before?*
- *How can you apply this strategy to encourage community members to adopt safe water practices?*

Role Play: *A CHW is visiting a community member that currently collects water from the water filtration system. However, the community member has only one jerrycan, and uses this jerrycan to carry both drinking water and banana beer. The community member realizes that it is important to dedicate one jerrycan to drinking water only, but they are not sure that they can purchase a new jerrycan and keep it clean. The CHW wants to communicate the message that it is important to dedicate one jerrycan to drinking water only. The CHW should practice empathizing with the community member, and then target the community member's self-efficacy about dedicating one jerrycan to water storage only.*

- *Example: The CHW can empathize with the community member's worries*
- *Example: The CHW can explain the steps to purchasing a new jerrycan, and explain the steps to keeping that new jerrycan clean.*

Feedback*:* Ask the other Trainees for their feedback on the role-play. Give your own feedback. Here are some questions you can use:

- *What happened in this activity? What was the outcome?*
- *How was empathy used in this activity?*

Affirmation

Affirmation is when the CHW uses positive, encouraging statements to recognize people's strengths. With affirmation, the CHW helps people feel better about themselves. People may then feel that change that was previously impossible may now be possible. Use affirmation to encourage them that they are capable of change. CHW can also use affirmation to recognize that that people have attempted to change, and support their continued efforts to change.

- *Example: "It is very good that you collect drinking water from the public tap instead of the lake"*
- *Example: "You are doing a good job of keeping your water jerrycan clean"*

Discussion

- *When have you used this strategy before?*
- *How can you apply this strategy to encourage community members to adopt safe water practices?*

Role Play: *A CHW is visiting a mother in the community. The mother cares for her 4 children and wants them to be healthy. She takes them to get their vaccinations and has purchased health insurance for them. She usually collects drinking water at the public tap, but sometimes collects drinking water at the lake. The CHW should affirm the mother's good choices, and then target the behavioral determinant of 'motherhood'.*

- *Example: "It is very good that you sometimes collect water at the public tap"*
- *Example: "You are doing a good job of taking care of your children"*
- *Example: "You can be a better mother to your children by collecting safe drinking water at the new water filtration systems"*

Feedback*:* Ask the other Trainees for their feedback on the role-play. Give your own feedback. Here are some questions you can use:

- *What happened in this activity? What was the outcome?*
- *How was affirmation used in this activity?*
- *How did the CHW target 'motherhood'?*

Drinking Water Path Activity

(Expected Time: 10 minutes)

This activity gives Trainees a visual example of the path of drinking water takes from source to mouth. Trainees can use this activity in other settings, such as at community meetings or during household visits. This activity reviews the drinking water message "Respect the drinking water path by keeping water clean at each step, from source to mouth". This message is important because clean water can be easily contaminated between when it is collected and when it is drunk.

Sometimes people learn best when they see a demonstration of a process or participate in an activity. We will now participate in an activity that goes with the message "Respect the drinking water path by keeping water clean at each step, from source to mouth". You can use this activity in other settings, such as at community meetings or during household visits. This message is important because clean water can be easily contaminated between when it is collected and when it is drunk.

- Get 2 volunteers.
- Give the first volunteer the dirty jerrycan.

This person represents a mother in the community that has come to the public tap to collect water. She has brought a jerrycan that is dirty on the outside and inside. It has been 1 month since she last cleaned this jerrycan.

- Give the second volunteer the clean cup.

This person represents a thirsty child at home that is waiting for their mother. They have a clean drinking cup. Their mother washes their dishes often, and ensures that the drinking cups are clean.

- You hold the 1 Liter bottle of clean drinking water.

I represent the new water kiosks, which is a clean water source. This bottle of water represents the clean water in the tap.

- Pour some water in the first person's dirty jerrycan. Explain that they are collecting water at a public tap. Then ask if the other Trainees think that the water in the jerrycan is still clean.

This mother is collecting clean drinking water from the public tap. She chose a clean water source. She has not cleaned this jerrycan recently. Is this water still clean?

- Ask the 'mother' to return home. She pours water from the dirty jerrycan to her 'child's' clean cup. Ask if the water in the cup is still clean. Ask the 'child' if they would like to drink the water in their cup.

The mother has poured her child a glass of water. The cup was clean. Is the water still clean? Should the child drink the water?

- Ask Trainees to clap for the volunteers. Conclude the activity by explaining that even if a water source is clean, if the water storage container is dirty, the water will become dirty. Emphasize that it is important to keep the water clean at each step along the water path, from source to mouth.

Let's clap for the volunteers. It is good to collect *water from a clean water source, but if the water container is dirty, the water becomes dirty. It is important to keep drinking water clean at each step along the water path, from source to mouth.*

- Ask trainees where they could repeat this activity for community members. Suggest that they could repeat this activity at community meetings, at public taps, or during household visits.

Where could you repeat this activity for community members? Perhaps you could repeat this activity at community meetings or during household visits. What was the message that goes with this activity? "Respect the drinking water path by keeping water clean at each step, from source to mouth".

Review
(Expected time: 5 minutes)

Review the key messages of the training module. First review the three behavioral determinants. Ask for volunteers to give examples of each one. Then review the three IPC strategies.

We are almost done with this training session. Let us review the main messages that we have learned. Who remembers one of the three health determinants that we discussed? Who can give an example of each one?

- *Self-efficacy*
- *Social Aspirations*
- *Motherhood*

Who remembers one of the three IPC strategies that we discussed? Who can give an example of each one?

- *Listening*
- *Empathizing*
- *Affirmation*

Who remembers the drinking water message from the activity?

- *"Respect the drinking water path by keeping water clean at each step, from source to mouth"*

Explain the pocket card and its purpose. Distribute the pocket cards.

You will each receive a pocket card that has these messages printed on it. You can use this card to remind you of these messages during conversations with community members.

Post-Test (10 minutes)

Distribute the Post-Test. Explain to the Trainees that they have 10 minutes to complete the post-test. They may use their pocket cards to help them answer some of the questions. Explain that they should not be worried or stressed during the test. This Post-Test is a way for them to show what they have learned in the training.

I am now distributing the Post-Tests—you have 10 minutes to complete these. You may use your pocket cards to help you answer the questions. You should not be worried or stressed during the test. This Post-Test is a way for you to show what you have learned during this training.

Conclusion

Thank the Trainees for participating in the training. Ask for any final questions, then dismiss them.

Thank you so much for your attendance and participation in this training session, in which we reviewed safe drinking water messages, and behavior change strategies that CHW can use in conversations with community members. Does anyone have any final questions about what we have discussed today? You are all free to leave.

Appendix 1: Pocket Card

Laminated Pocket Card for Trainees that can fit in a wallet.

Factors Influencing Health Behaviors • Self-efficacy • Social Aspirations • Motherhood
Interpersonal Communication Strategies • Listening • Empathizing • Affirmation **Drinking Water Message** "Respect the drinking water path by keeping water clean at each step, from source to mouth"

Appendix 2: Post-Test—Trainee Version

Question 1: Which of the following CHW statements targets self-efficacy?

a) "You will be a better parent if you collect water from the water filtration systems"
b) "You can easily dedicate one jerrycan to water storage only with a few easy steps"
c) "Water from the water filtration system is bottled-water quality water"

Question 2: Which of the following CHW statements targets social aspirations?

a) "You will be a better parent if you collect water from the water filtration systems"
b) "You can easily dedicate one jerrycan to water storage only with a few easy steps"
c) "Water from the water filtration system is bottled-water quality water"

Question 3: Which of the following CHW statements targets parenthood?

a) "You will be a better parent if you collect water from the water filtration systems"
b) "You can easily dedicate one jerrycan to water storage only with a few easy steps"
c) "Water from the water filtration system is bottled-water quality water"

Question 4: Which of the following CHW statements uses listening?

a) "What I hear you saying is that collecting water at the public tap costs too much money"
b) "You're doing a great job keeping your water jerrycan clean"
c) "It sounds like that was very difficult"

Question 5: Which of the following CHW statements uses empathy?

a) "What I hear you saying is that collecting water at the public tap costs too much money"
b) "You're doing a great job keeping your water jerrycan clean"
c) "It sounds like that was very difficult"

Question 6: Which of the following CHW statements uses affirmation?

a) "What I hear you saying is that collecting water at the public tap costs too much money"
b) "You're doing a great job keeping your water jerrycan clean"
c) "It sounds like that was very difficult"

Question 7: Did you participate in a role play activity?

a) Yes
b) No

Question 8: Did you participate in the discussions?

a) Yes
b) No

Question 9: Give an example of how you will apply these messages to your interactions with community members:

_____
_____
_____
_____

Question 10: What is the drinking water path message?

_____
_____
_____
_____

Appendix 2: Post-Test—Trainer Version

Question 1: Which of the following CHW statements targets self-efficacy? Answer is bolded:

a) "You will be a better parent if you collect water from the water filtration systems"
b) "You can easily dedicate one jerrycan to water storage only with a few easy steps"
c) "Water from the water filtration system is bottled-water quality water"

Question 2: Which of the following CHW statements targets social aspirations? Answer is bolded:

a)"You will be a better parent if you collect water from the water filtration systems"
b) "You can easily dedicate one jerrycan to water storage only with a few easy steps"
c) "Water from the water filtration system is bottled-water quality water"

Question 3: Which of the following CHW statements targets motherhood? Answer is bolded:

a) **"You will be a better parent if you collect water from the water filtration systems"**
b) "You can easily dedicate one jerrycan to water storage only with a few easy steps"
c) "Water from the water filtration system is bottled-water quality water"

Question 4: Which of the following CHW statements uses listening?
a) **"What I hear you saying is that collecting water at the public tap costs too much money"**
b) "You're doing a great job keeping your water jerrycan clean"
c) "It sounds like that was very difficult"

Question 5: Which of the following CHW statements uses empathy?
a) "What I hear you saying is that collecting water at the public tap costs too much money"
b) "You're doing a great job keeping your water jerrycan clean"
c) **"It sounds like that was very difficult"**

Question 6: Which of the following CHW statements uses affirmation?
a) "What I hear you saying is that collecting water at the public tap costs too much money"
b) **"You're doing a great job keeping your water jerrycan clean"**
c) "It sounds like that was very difficult"

Question 7: Did you participate in a role play activity?
c) Yes
d) No
Question 8: Did you participate in the discussions?
c) Yes
d) No

Question 9: Give an example of how you will apply these messages to your interactions with community members:
_____
_____
_____
Question 10: What is the drinking water path message?
_____
_____
_____

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