

From Innovation to Implementation: The Long and Winding Road

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Abstract Building on theory and past research, in early 2000 scientists in the Division of Reproductive Health developed a prevention innovation for CDC's Global AIDS Program for use in countries severely affected by the HIV/AIDS epidemic. This innovative program model is called MARCH: Modeling and Reinforcement to Combat HIV/AIDS (Galavotti et al. *Am J Public Health* 91:1602–1607, 2001). MARCH promotes behavioral changes that reduce the risk of HIV infection and creates normative environments that sustain these changes through two key program components: entertainment-education using mass media, particularly long-running radio serial dramas, and reinforcement activities at the community level. Using the framework developed by Wandersman et al. (*Am J Commun Psychol*, 41(3–4), 2008), we describe the key elements of the MARCH prevention innovation and outline how we support its adaptation and implementation. We focus on the following questions: How do we get from an innovative model to effective program implementation in the field?

The findings and conclusions in this article are those of the authors and do not necessarily represent the views of the US Centers for Disease Control and Prevention.

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How do we support implementation with fidelity when adaptation is required? And, once implemented, can we demonstrate fidelity of the adaptation to the original program model? Because our program model requires local adaptation for every instance of implementation, we suggest a potential enhancement to the Interactive Systems Framework—support for adaptation of the innovation—as part of the Prevention Support System. In this paper we describe how we supported adaptation of the radio serial drama component for unique contexts in several African countries. We focus attention on the tools and trainings we developed to build innovation specific capacity for implementation, including capacities for adaptation. We then present results of a qualitative analysis of scripts from the MARCH radio serial drama in Zimbabwe to assess the adapted program's fidelity to the original design of the innovation. Finally, we discuss lessons learned and explore implications for the field.

Keywords Theory-based behavioral intervention · Program adaptation · Entertainment education · Role models · HIV/AIDS

Introduction

Mass media have long been an important component of the international HIV/AIDS prevention response; communications-based interventions have been found to be both effective (Betrand et al. 2006; Vidanapathirana et al. 2005) and cost effective (Hogan et al. 2005) for prompting HIV risk-reduction behaviors, although the evidence for long-term effects is limited and the magnitude of effects tends to be small or moderate in size. There are many reasons for this: first, most reviews combine media approaches defined

as “any programs...that disseminate messages to produce awareness or behavior change...” (Bertrand et al. 2006) despite the fact that most social scientists would agree that message-based information campaigns are unlikely to produce behavior change. Second, because of the variability of the approaches in terms of quality of implementation, program goals (information dissemination versus behavior change), types of behaviors targeted (one-time service use like HIV testing versus consistent condom use), duration and levels of audience exposure, types of media (print versus broadcast), presence of complementary components (peer outreach, service provision), etc., it is extremely difficult to make overall statements as to effects. Finally, few studies provide evidence of the sort obtained through a classical experimental design, as it is extremely difficult and, some would argue, inappropriate, to evaluate mass media programs with randomized controlled trials (Hornik 2002). Mass media are intended to reach the broadest possible audience, and the effects of media on behavior are expected to be both direct and indirect. For example, an individual exposed to a media-based program may communicate and interact with others in their social network and may exert social influence on them in ways consistent with the program’s intended effects (e.g., encourage them to use condoms). Further, the effects of mass media may occur over long periods of time. These types of indirect and long-term effects are difficult to capture under the controlled conditions of a classical experiment in which the causal pathways are usually presumed to be relatively short and direct.

Because of the pressing need to reach large numbers of people with HIV prevention interventions in Africa, we drew from what was known about entertainment education and small group/community interventions to develop a program that we hoped would have stronger and more long-lasting effects than demonstrated to date. Entertainment-education strategies which are theory-based and focused on changing social and behavioral norms by providing role models for behavior change have become an increasingly popular media intervention strategy and the evidence for their effect is somewhat more encouraging than for traditional media campaigns, although far from definitive (Vaughn et al. 2000; Do and Kincaid 2006). Uniting a variety of traditions and research, entertainment-education is a behavior change communication strategy that has been used with some success to promote reproductive health and HIV prevention (for examples and summary of results, see Singhal and Rogers 1999, 2003). Building on this body of experience and on social cognitive and communication theory, in early 2000 scientists in the Division of Reproductive Health developed a prevention innovation for CDC’s Global AIDS Program for use in low-resource countries severely affected by the HIV/AIDS

epidemic. This innovative program model is called MARCH: Modeling and Reinforcement to Combat HIV/AIDS (Galavotti et al. 2001).

MARCH promotes behavioral changes that reduce the risk of HIV infection and creates normative environments that sustain these changes through two key program components: entertainment-education using mass media, particularly long-running radio serial dramas, and reinforcement activities at the community level. Referring to the Interactive Systems Framework for Dissemination and Implementation (ISF) developed by Wandersman and colleagues (2008), we describe the key elements of the MARCH prevention innovation and outline how we work with local staff to support its adaptation and implementation.

Because adaptation of the program model to the local context is critical, the ISF holds special relevance to the development, implementation and evaluation of MARCH. In particular, we show how we supported adaptation of the radio serial drama component for unique contexts in several African countries, and we describe the tools and trainings we developed to build innovation-specific capacity for implementation. We then present results of a qualitative analysis of scripts from the MARCH radio serial drama in Zimbabwe to assess the adapted program’s fidelity to the original design of the innovation. Finally, we discuss lessons learned and explore implications for the fields of both behavior change communication and research to practice.

The Innovation

MARCH is built on two fundamental principles of behavior change: modeling—showing people how to change—and reinforcement—supporting them in their efforts to change (Fig. 1). The MARCH strategy also recognizes that role models and reinforcement activities must be adapted to reflect the context in which MARCH is being implemented. Behavior change is central to preventing HIV: talking to one’s partner about HIV, avoiding situations that might lead to risky behavior, buying and using condoms, getting tested, changing infant feeding practices, or disclosing one’s status to partners, family, and friends. All of these prevention strategies require a complicated, difficult, and largely unfamiliar and uncommon set of behaviors, thus it is easy to understand why both behavioral role models and supportive reinforcement may be necessary for behavioral changes to occur on a large scale and to be sustained over time. Although reinforcement activities (e.g., listening and discussion groups, write-in contests, school rallies, community and church activities) are an important component of the strategy, the focus of this paper is on the modeling component, in the form of a radio serial drama.

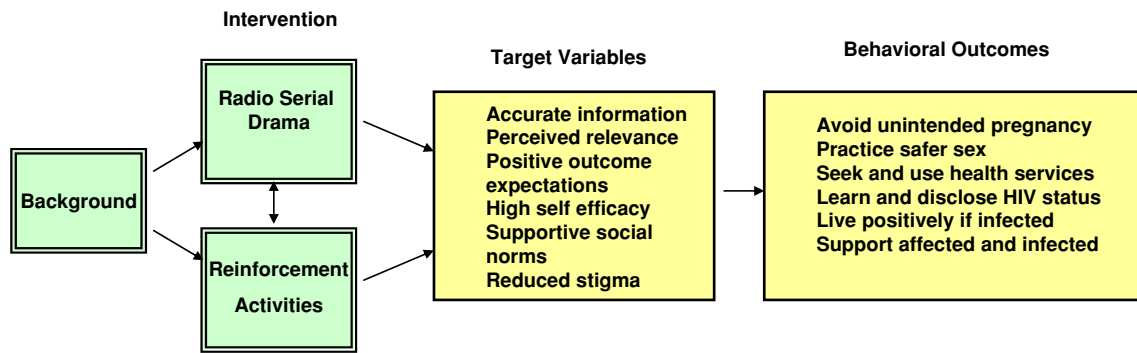


Fig. 1 MARCH conceptual framework

Like other long-running serial dramas that are effective at prompting behavioral changes (Rogers et al. 1999; Vaughan et al. 2000), MARCH is rooted in the social cognitive premise that much of what we know, we learn by observing others—through models (Bandura 1986). MARCH serial dramas rely on theory and local research to develop stories in which some characters become role models for the audience. There are three main types of characters (positive, negative, and transitional) who interact in ways that demonstrate the rewards of choosing specific behaviors (e.g., avoiding sex outside of marriage, using a condom consistently). Each transitional character is assigned a specific behavioral objective, and the story follows the behavioral trajectory of that character as he or she moves through the behavior change process to achieve the objective. The evolution of the transitional character occurs slowly so that the audience sees change occurring at a realistic pace and can change attitudes and behaviors along with the character. MARCH radio serial dramas may broadcast new episodes weekly and run continuously for several years (Galavotti et al. 2005).

Theory, particularly social cognitive theory (Bandura 1986), identifies a few key factors that are particularly important for behavior change and so must be woven into the characters and storylines of a MARCH serial drama. The first is outcome expectations: anticipated consequences can be either powerful incentives or disincentives to behavior change. Anticipated consequences can be personal (e.g., if I am faithful I will feel good about myself as a husband), social (e.g., if I disclose my HIV status I will be rejected by my family), or material/physical (e.g., if I use condoms I won't enjoy sex or, if I use condoms I won't become infected with HIV). Thus, in the drama, the negative characters are consistently punished for engaging in unsafe behaviors, and the positive characters are consistently rewarded for safe behaviors (e.g., remaining faithful), altering audience perceptions of the costs and benefits of specific courses of action. The second is self-efficacy: members of the audience need to believe they are

capable of change. Theory suggests that role models are particularly good at influencing efficacy beliefs, especially when the new behaviors are uncommon and unfamiliar (Bandura 1997).

It is important that key factors in the behavior change process be explicitly modeled. For example, the character must become aware of the need to change, perhaps by recognizing the risk of negative consequences of not changing through seeing someone else in the story experience negative outcomes. The character should weigh the pros and cons of changing behavior, and the storyline should make explicit links between the behavior and the attainment of desired outcomes. He or she should set a goal or state an intention to change and identify barriers and plan for contingencies; and he or she must experience and cope with setbacks, seek and get support, and ultimately overcome obstacles to change.

MARCH role models must be tailored to the prevention needs and contexts of the local setting. Social cognitive theory suggests that for models to be most effective, they should be similar to the audience and confront similar situations. Transitional characters (also called identification characters) must closely resemble the target audience and mirror the day-to-day issues they face. Transitional characters are neither all good nor all bad, but rather they are somewhere in the middle, just like the audience, as they struggle, slowly change and ultimately achieve their behavioral objectives. These characters serve as role models: they provide information on how to change, they model the steps, and they persuade and motivate by showing the attainment of desired rewards and by creating an emotional bond with the audience. In addition, characters and storylines must come to life in ways that will be both entertaining and effective in prompting behavior change. If characters are not entertaining, people will not pay attention to them; if they are too entertaining, they may not adequately model behavior change processes. Cultural notions of what is and is not entertaining, therefore, must guide character development as much as assessments of

behavior change barriers in the local context and theory about what prompts behavior change.

While the structure of the MARCH program model remains the same from place to place, characters, settings, storylines, and behavioral objectives must all be adapted to the local context; they must be created anew for each MARCH program because each story must contain familiar characters in familiar settings, thinking, speaking, and behaving in familiar ways and in local languages. It is this familiarity, this cultural consonance, that gives the innovation its power, yet obtaining it while maintaining fidelity to the principles of MARCH is also the greatest challenge. In the next several sections, we describe how we help program implementers remain faithful to the theoretical principles and structure of the prevention innovation while drawing on local culture, creativity, insight, and research (i.e., formative assessment, published literature) to create a unique, context-specific program.

The Prevention Systems

Wandersman et al. (2008) have identified three systems that ideally work together for successful dissemination and implementation of effective prevention innovations—the Prevention Synthesis and Translation System, the Prevention Support System, and the Prevention Delivery System. In their paper on the ISF, they discuss key characteristics and core elements of effective prevention interventions and the importance of tailoring such interventions to the needs of at-risk populations and agencies that were not involved in initial development and evaluation efforts. The ISF is, we think, a useful heuristic device for conceptualizing how MARCH can be adopted, adapted and implemented. As we've described above, the MARCH strategy must be adapted each and every time it is used; adaptation is, as such, a critical component of the theory-based intervention. To reflect this, we have 2 suggestions for the ISF. First, in addition to being a useful heuristic for dissemination/implementation purposes, the ISF is a useful tool to use during the development phase of an innovation. Second, we propose adding an additional level to the Prevention Support System—support for adaptation. Because our model is highly dependent on adaptation, establishing whether we can successfully support adaptation is part of program development. In other words, the development of the MARCH program is not complete until we build and test the processes for adaptation. Testing the effectiveness of the entire MARCH model will follow. Therefore, rather than using the framework proposed by Wandersman et al. to describe the implementation and dissemination of an effective intervention, we propose a modification of the framework that allows for building capacity to integrate

local information into the program. In this paper, we focus special attention to this adaptation component.

Like all prevention innovations, adopting, adapting, and implementing a MARCH project is an iterative process in which the three systems continually interact. Furthermore, a range of staff members, stakeholders, and technical assistance providers participate in different systems over time as the adapted MARCH innovation evolves into an institutionalized program in a specific country. As we describe the steps we took to support the delivery of MARCH, it is important to keep this interactive, iterative process in mind.

Prevention Synthesis & Translation System: Distilling the Innovation

Before beginning the process of adapting and implementing the MARCH strategy, key stakeholders must be convinced that (a) this innovation can help them solve an important public health problem, (b) it is their problem to solve, and (c) the new problems it may create are manageable. Key stakeholders include the CDC Country Director, who decides whether to fund the project, and heads of key institutions (e.g., Ministry of Health and Child Welfare, Ministry of Information and Broadcasting, National AIDS Coordinating Body, nongovernmental organizations), who decide whether to support and collaborate with the program. These stakeholders, as well as staff members who adapt and implement the program, all need a basic understanding of the underlying principles of MARCH as well as the main elements of the program. This includes understanding the goals and objectives, beneficiaries, main activities, and the time, commitments, and resources required to successfully adapt and implement the innovation.

To facilitate this decision-making, we developed materials for several audiences. For Country Directors and other stakeholders, we provided information on the relative advantages of MARCH compared to other interventions with similar goals (Galavotti et al. 2001; Rogers et al. 1999). We also described the innovation and how it works (CDC 2005) so they would know what effects to expect and how MARCH could support or be coordinated with other CDC and country initiatives. In addition to published papers and a lengthy technical document (most suitable for Country Directors), these materials included brief handouts (1–2 pages) and slide presentations that described the MARCH model, the rationale for its use in Africa, and the potential costs and benefits to the country.

The MARCH resource manual synthesizes and translates the prevention innovation for implementation staff. The manual is a comprehensive handbook of MARCH methods and procedures. It includes background literature,

a description of the conceptual model and key program components, sample timelines for key steps and activities, formative assessment tools, PowerPoint presentations for use in training workshops, and “management and administrative documents” such as position descriptions. For example, the chapter on the formative assessment describes the importance of such an assessment for adapting the strategy to local needs, includes tools for a formative assessment and describes how to use the data. The chapter on the radio serial drama outlines the tasks and the roles and responsibilities of staff who will manage, write, act and produce the drama, as well as considerations in identifying and selecting a broadcaster (e.g., signal reach, listener characteristics, languages of broadcast, cost) and staff. It also describes the role of the Technical Advisory Committee (a group of technical experts established to provide guidance to scriptwriters as they develop the drama), and provides examples of minutes from Technical Advisory Committee (TAC) meetings. It describes the trainings to conduct and includes agendas, reports, and training tools. In sum, the manual explains what is required to implement the innovation so that key staff members can decide whether it is feasible and applicable in their setting. It also serves as a compendium of key tools used in the Prevention Support System and draft materials needed in the Prevention Delivery System, all of which are included in appendices and on CD-Rom.

Prevention Support System: Supporting the Work

As the previous paragraph suggests, implementing a MARCH serial drama requires a staff with a range of skills, including managerial and administrative skills, research skills, and drama development and production skills. A critical addition to this part of the system, for MARCH, is the addition of the use of formative assessment findings to adapt MARCH to local needs. The need to use data requires that project staff have or build additional skills. Specifically, in addition to having the capacity to manage and administer projects and to write and produce entertaining radio content, staff members must develop MARCH-specific skills. MARCH-specific skills focus on understanding and incorporating behavior change concepts and research findings into the serial drama. Over time we have developed materials to help staff members use their general capacities to conduct formative assessment and manage the project. And, we have developed tools and trainings to help build MARCH-specific capacities.

General Capacity

General capacity needs include project management, formative assessment and evaluation skills, training and

facilitation skills, and writing, acting, and production skills. Adequate facilities and equipment as well as staff members trained to use and maintain the equipment are also necessary.

The CDC staff, in collaboration with local and international organizations, provides technical assistance in many of these areas. For example, we work with local university researchers to develop formative assessment protocols, train interviewers, and help analyze data that describe local barriers and facilitators of behavior change. We share protocols, data collection guides, and research summaries with other countries implementing MARCH and put these materials into the MARCH Resource Manual. Local and international organizations with expertise in communications and broadcasting (e.g., Media Support Solutions, a development communications consulting firm; Media for Development Trust, a not-for-profit media production house) provide training to enhance radio production, scriptwriting, voice acting, and project management skills. And, in some cases, CDC purchases equipment and leases facilities to support recording and production.

Innovation-Specific Capacity

To build MARCH-specific capacity, we collaborate with local CDC staff to conduct a series of workshops for the radio drama team. The first training workshop focuses on theories and principles of behavior change and differentiates MARCH’s behavior change communications approach from the information, education, communication (IEC) approach that is generally more familiar to trainees. This training presents stages of change as a way to think about how people change, and highlights key concepts and findings from social cognitive theory and from the behavioral intervention literature. For example, we explain and discuss concepts like outcome expectations and self-efficacy, and participants engage in activities and exercises to reinforce their learning. We also present the ecological model (cf. Bronfenbrenner 1979) and talk about how personal, social, and environmental factors all contribute to behavior. This leads into a discussion of the local context and specific personal, social, and environmental factors that may either encourage people to engage in risky practices or discourage them from changing such practices. At this point in the workshop, we describe key findings from the formative assessment to lay the foundation for their use in writing the drama. This initial workshop demystifies theoretical concepts and gets scriptwriters thinking about local factors that may influence behavior.

The remaining workshops focus on showing the writers how these concepts and the data from the formative assessment can be integrated into a radio serial drama in a way that inspires listeners to change their thinking and behavior. Writers learn about positive, negative, and

transitional characters and the different roles each play in the storyline. Transitional characters model the behavior change objectives selected by the project to meet project goals (i.e., behaviors that reduce the risk of acquisition and transmission of HIV). During the course of the drama, each transitional character will achieve one of the behavioral changes. Writers learn to identify the target audience for each selected behavior change objective so that they can design the intended role models to be similar to the segment of the audience the writers hope to influence. For example, if the behavior change objective is for parents to learn their HIV status prior to pregnancy to prevent HIV transmission to their offspring, then the writers might create two transitional characters—newlyweds eager to begin a family. These two characters might struggle as they think about having children: the wife may suspect that her husband is putting her at risk by being unfaithful, or the husband may fear he has been infected by previous sexual partners and not know how to discuss this with his wife. Next, writers learn that local storytelling traditions and popular culture can help identify characteristics and features that will be entertaining for the intended audiences. For example, if an important cultural characteristic is humor, the husband in this couple might be a humorous character whose smooth-talking gets him out of tricky situations.

Writers also review the use of more typical dramatic devices such as providing the transitional characters with plenty of obstacles to encounter on their journey. They also discuss how to populate the dramatic universe with characters with whom the transitional characters have relationships, and who influence them either positively or negatively. Positive characters will usually already be performing the behavior that the transitional character must achieve and thus serve as a role model for the transitional character. The negative characters may try to dissuade the transitional character from changing, and may initially experience rewards and thus demonstrate the benefits of not changing. Eventually, however, the negative characters suffer negative consequences of their behavior.

Writers are also made aware of some dangers they may face in trying to develop stories that will influence the audience: for example, it may not be wise to create positive characters who are “all good” and negative characters who are “all bad” because such characters may seem implausible or boring. Also, negative characters sometimes attract a large following (perhaps in part because they are often humorous as well as “bad”)—larger than the transitional characters who are the intended role models for the audience—and so care must be taken to ensure that the negative characters ultimately get their comeuppance.

Most importantly, the scriptwriters must embrace the idea that a good story can also be an effective behavioral intervention, and that the art of storytelling can be

harmoniously married to the science of behavior change. Indeed, it is critical that the writers do not become “health educators,” writing message-driven, formulaic stories. To adhere to the principles of MARCH, the writers not only have to incorporate the behavioral principles into the drama, but they have to write a story that is dramatic, unique, and compelling in their local context.

In order to develop this innovation-specific capacity during these workshops, we have developed a series of tools. These tools not only help build capacity, but also help guide and facilitate the adaptation of MARCH to the local context. They are designed to help scriptwriters integrate existing research, formative assessment findings, and theoretical principles into the creative development of storylines and characters.

Pathways to Change Among the most critical set of tools we have developed to support the delivery of the innovation is *Pathways to Change* (Petraglia et al. 2007). *Pathways to Change* is both a training system that teaches scriptwriters key concepts in behavior change theory and familiarizes them with local data, and a set of tools that aid in ongoing development and monitoring of the integration of theoretical principles and research into storylines. *Pathways* helps scriptwriters strike a balance between developing stories that are creative, dramatic, and entertaining, and stories in which characters model theoretically appropriate and epidemiologically accurate behavior change at a realistic pace. In short, *Pathways* is the set of tools we use to increase the prevention delivery system’s capacity to do the planned adaptation while retaining fidelity to MARCH principles.

Before the *Pathways* tools can be used in training and for ongoing serial drama development, the staff summarizes data from existing research and the formative assessment, including in-depth interviews with the target audience. This summary is presented in “Data Summary Grids.” Data are categorized into “facilitators,” “barriers,” and “other information” about particular behavioral objectives (e.g., condom use, HIV testing) for key segments of the target population (e.g., male, female). Trainers introduce the data summary grids and *Pathways to Change* tools—consisting of a game, a chart, and a set of monitoring tools—in this workshop, stressing that the data and tools should be used throughout the life of the project.

The Game: Trainers start the workshop with the *Pathways to Change* Game (Fig. 2). After dividing up into teams (3–4 people per team), scriptwriters, producers and other staff members select cards that designate a character (e.g., a 25-year-old man), a setting (e.g., a rural village), and a behavior change objective (e.g., get HIV test). Each team takes turns shaking the dice and landing on spaces that direct them to the data summary grids where they have

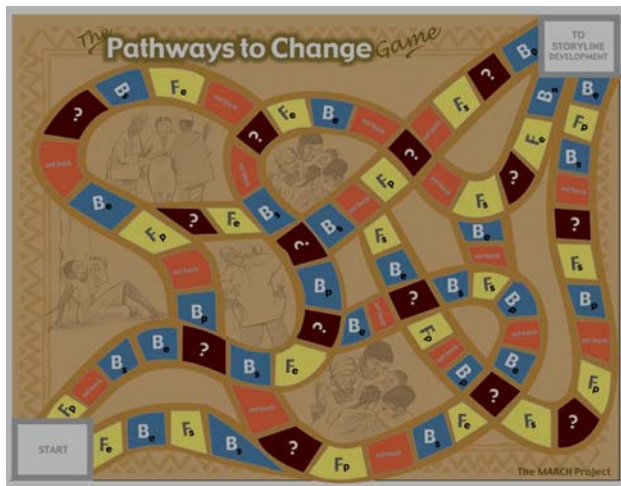


Fig. 2 Pathways to change game board

to find examples of certain types of barriers to and facilitators of behavior change for their character. Having made that decision, the team writes the barrier or facilitator on a card. For example, they might land on a “social barrier” space and would review the data summary grids to find a social barrier relevant to their character (such as this quote from a young Zimbabwean man: “My friends would steer clear of me if they saw me going for an HIV test; they would think I had AIDS.”) Or, they might land on a “question” space, answer a question correctly and take an extra turn. Or, they might land on a “setback” space and so draw a “setback” card that will be utilized in the next phase of the game.

At the conclusion of the game, each team will have accumulated several cards. Using all these cards, each team then works together to construct a story in which their character achieves his or her behavioral objective, facing and overcoming barriers and experiencing setbacks along the way. Thus, the game begins the process of building several MARCH-specific capacities, including understanding behavior change concepts, using formative assessment data to tailor the strategy to their context, and working together as a team.

The Chart: With this experience of the game, the scriptwriters are prepared to move on to the *Pathways to Change* chart. The chart helps scriptwriters see that behavior change is a process that occurs in stages and that the goal is to create a realistic model of behavior change for each transitional character. The trainer uses the chart to help the teams lay out their story on a timeline and plot the character’s movement through various stages of the change process from “precontemplation” (being unaware of the need for change) through “maintenance” (sustaining the change). Next, the teams fill out the storyline by adding the barriers and facilitators that drive the character forward along the continuum of behavior change. As they review

and revise the chart with the trainer, scriptwriters learn how to identify gaps in the behavior change process and how to go back to the formative assessment data for further insights because upward movement through the stages of change must be motivated by some variety of facilitators, just as downward movement suggests that barriers to change are at work. To prompt the writers to elaborate plausible barriers and facilitators, the trainer reviews stages in the character’s progress and asks questions such as, “Does the character observe events that make him think he might need to change? What good consequences are expected, and what bad? What strategies does he or she use to overcome the obstacles or to support change (e.g., who do they talk to)?” These questions keep the scriptwriters focused on the formative assessment data, because the answers must be drawn from the local context. They must think, “What would a young Zimbabwean do in this situation?”

Monitoring Adherence: The next challenge is to show the behavior change process through dialogue. For observational learning to occur, the audience must see, or in the case of radio, *hear*, the transitional characters in the radio drama going through this process of change—thus the dialogue in the drama is extremely important. The final set of tools in *Pathways to Change*, the Behavior Change Adherence (BCA) tools, track evidence in the dialogue that the characters and storyline are in fact moving in a theoretically consistent manner. With continued support from a behavior change consultant, scriptwriters and editors use the BCA tools to confirm that dialogue reflects key constructs of behavior change in the storylines. For example, dialogue that shows a character weighing the pros and cons of getting tested for HIV (perceived outcome expectations) or taking steps toward talking to her husband about testing and expressing increasing confidence in her ability to do so (self-efficacy) would be tracked. The BCA tools should show gaps in the behavioral change narrative and suggest areas of the storyline that need to be fleshed out and reworked. Continual monitoring and revision helps ensure that the adaptation of MARCH to the local context remains faithful to the key principles of the preventive innovation.

To reiterate, the tools developed are designed both to serve training purposes and to provide on-going support to the adaptation and implementation of MARCH. In particular, the Chart and the BCA tools are used by scriptwriters in drafting and editing the storylines. These tools help bridge the transition from the prevention support system to the prevention delivery system.

Prevention Delivery System: Putting it into Practice

To illustrate how the prevention research and support system—which includes building capacity for conducting

and using formative assessment and developing and producing a serial drama—might help country offices adapt and deliver the prevention innovation, we describe initial development and implementation steps in the Zimbabwe MARCH program. We highlight areas where adaptation to country needs occurred. Once the CDC Country Director confirmed interest in conducting a MARCH project, we carried out a series of steps with our CDC colleagues and their partners in Zimbabwe. First, we oriented key stakeholders to MARCH through meetings and presentations. Interested stakeholders were invited to participate as members of the MARCH Advisory Committee, and this group decided on the primary behavioral objectives for the project to ensure that the project met country needs. We shared findings from existing research (e.g., HIV epidemiology in Zimbabwe, social and environmental factors) and program knowledge to facilitate this process. To support the technical and financial resources CDC brought to Zimbabwe as part of the Global AIDS Program, particularly in the areas of preventing mother-to-child HIV transmission and prevention activities among young people, we identified prevention behaviors relevant to these issues (abstinence, fidelity, condom use, HIV testing) as priorities for MARCH. These stakeholders remained as the MARCH Advisory Committee, an important body that supported and advocated for the project and provided guidance on political, cultural, and other issues that would affect the program.

Next, CDC-Zimbabwe staff and local researchers conducted intensive formative assessment to collect the information needed to understand the local beliefs, cultural narratives, and environmental constraints that would inform the design of characters, storylines, and behavioral challenges characters would face. For information to make sense to people, the stories in the drama must be applicable to everyday life and easily integrated into local social expectations, norms, and values. We provided technical assistance to local researchers for qualitative interviews and focus groups with community leaders, health-care providers, and young adults. These activities generated a large amount of information on the culture, beliefs, behaviors, and conditions that put people at risk for HIV or make it difficult for infected people to live positively (e.g., eating nutritious food, avoiding undue stress) (Tsoka et al. 2002). This type of information is the key to adapting the innovation; writers use it to populate the drama with people the audience will recognize. The local staff summarized and shared this information with stakeholders and other interested parties in dissemination workshops and prepared data summary grids for use in the *Pathways to Change* training workshops and beyond (see Prevention Support System).

Next, the CDC-Zimbabwe staff identified and funded program implementation staff and organizations, as well as

key consultants. Contractors included local media organizations, producers, scriptwriters, actors, and communications and behavioral consultants. In addition, the local staff formed a Technical Advisory Committee (TAC) that included technical and cultural experts from within the Ministry of Health, academia, and the nongovernmental sector, as well as young people and representatives from support organizations for people infected with HIV.

Once all the key staff members and advisors were assembled, we helped the local staff facilitate a series of workshops (described in the Prevention Support System) to build its capacity to adapt and implement the program. Following the scriptwriters' workshops, the creative team met daily to develop the key characters and their behavioral objectives, the setting, the major dramatic themes and tensions, and the unifying elements of the drama. Next, they wrote and recorded pilot scripts that were tested for entertainment value, cultural appropriateness, appeal, and relevance to the target population. Once testing was completed, they began writing the first thirteen 30 min episodes, while theme music and publicity materials were pre-tested and readied for the launch of the broadcast.

Production of the radio serial drama was a complex and labor-intensive process requiring precise scheduling of writers, technical advisors, actors, producers, and recording studio time. Although the local team was talented and experienced in many aspects of radio programming, we continued to provide technical assistance on the behavioral aspects of character and storyline development. A full-time behavior change communications consultant worked with the team, helping plan and develop the behavior change trajectories for key characters and review storylines and scripts for consistency with the theoretical constructs. Further, the TAC met regularly to review storylines and to provide guidance and advice on cultural consonance (e.g., appropriateness of a mother talking to her daughter about sex) and technical accuracy of the information.

The resulting radio drama was called *Mopani Junction*—"a story of life and survival." The Mopani tree, native to southern Africa, withstands long periods of drought. The story focuses on the everyday lives of a typical, but fictional, extended family, the Gumbos. The Gumbo family and their relationships with each other are tested by all the challenges of life in southern Africa and most particularly by HIV/AIDS. The drama is set in characteristic locations such as a secondary school, a bar, a shop, and various homes, in the fictional communities of Mopani Junction, a small town, and Mopani Springs, a nearby village. In five main storylines, the transitional characters model behaviors that include abstaining from sex, practicing safer sex through monogamy and knowledge of partners' HIV status, and seeking counseling and testing. Over the course of the drama, they are helped and

hindered by their partners, their parents and friends, and people in the wider community such as pastors, health workers and teachers. One hundred and four 30-min episodes were written and produced in three languages (Shona, Ndebele, and English). The program was largely targeted to young people, and the English version particularly targeted “hip” urban youth.

Demonstrating Fidelity to the Original Design

We believe that supporting adaptation is an important component of the prevention systems, and that before we can test the effectiveness of the model, we must first establish whether we can successfully support adaptation. It is critical to demonstrate fidelity of the adapted program to the original program model including use of local data and adherence to the theoretical principles used to develop the model. Therefore, we now turn to the questions, “Did the prevention support system work? Was the adapted innovation faithful to the original principles and design of the innovation?” To address these questions, we conducted a qualitative analysis of storylines from *Mopani Junction*.

Methods

Role models in the drama are designed to enhance listeners’ awareness and perceived relevance of the HIV risk-related information, raise listeners’ positive outcome expectations associated with behavior change, increase listeners’ self-efficacy to perform the behavior, demonstrate skills (including how to plan, strategize, and seek support for change), and model positive social norms related to the behavior. To evaluate the fidelity of scripts to theoretical behavior change principles in light of the training and technical assistance provided and the tools developed (see Prevention Synthesis and Translation and Prevention Support sections), we analyzed the English language scripts from the Benji/Blessing storyline in *Mopani Junction*. Benji is a 24-year-old man from Mopani Springs, and his wife Blessing is 19 years old. They are newly married and their families eagerly await Blessing’s first pregnancy, while Benji struggles with finding a good job. Benji and Blessing are transitional role models; their behavior change objective was to get tested for HIV, maintain safe behavior through a 3-month window period, and get tested a second time. They did so within the first 94 episodes. Episodes typically include eight or nine scenes. Benji and/or Blessing appear in more than one scene in some episodes, while in other episodes neither appears at all. Thus, we abstracted all scenes and episodes through episode 94 that included Benji and/or Blessing.

Four analysts contributed to the development of an *a priori* coding scheme (see Table 1). The rows of the table represent stages of change from the Transtheoretical Model (Prochaska et al. 1992) and stage transitions. Listed in the column next to each stage and stage transition is a phrase indicating the types of dialogue in the storylines that are indicative of that stage or stage transition. These dialogue codes constitute the measurement of whether or not the character is in that stage or stage transition. In the next column, the corresponding theoretical constructs that are associated with the stages and form the basis of the MARCH program model are listed. So, for example, storyline evidence indicative of “preparation” may include dialogue about setting goals, making plans, practicing skills, or expressing confidence in ability to perform the behavior. Dialogue in this stage might show the character telling a friend she has decided to get tested and describing the positive outcomes she expects from that action. As can be seen in the table, the key theoretical constructs may be linked to more than one stage or stage transition.

For each character an additional column provides space to capture the storyline evidence (i.e., dialogue) by noting the scene and episode number in which the dialogue occurs. When completed, the table represents a character’s trajectory through the behavior change process based on dialogue in the storyline, highlighting stages or stage transitions skipped, showing the number of scenes in which specific constructs are clearly indicated in dialogue, showing whether any setbacks are suffered, and showing how quickly the character achieved the behavior change objective. It also allows for easy comparison of characters whose storylines and behavior change objectives are intertwined, such as Benji and Blessing.

Following standard techniques (Miles and Huberman 1994), the analysts individually coded scenes from the first 58 episodes of the Benji/Blessing storyline using the coding scheme. Each analyst highlighted dialogue he or she thought was indicative of the constructs and then noted these in the table. Analysts compared their coding, discussing discrepancies and reaching consensus on appropriate codes. The coding schema was revised slightly based on this initial coding. Two analysts then coded the entire Benji/Blessing storyline. Agreement between the two analysts on coding the complete storyline was 82.5%.

Results and Discussion

Thirty scenes within 22 episodes included specific dialogue indicative of the theoretical constructs related to HIV testing. First, looking at Blessing’s progress through the stages, we noted scenes with dialogue consistent with all of the stages. For example, as she moves into preparation, she

Table 1 Coding scheme for theoretical fidelity in radio drama script

Characters/storyline: Benji/Blessing		Behavior change objective: Get tested for HIV		
Stage of change	Indicative dialogue	Key constructs	Storyline evidence/scene: episode	
			character A	character B
Precontemplation	Lack of awareness Denial Misinformation	N/A		
<i>Stage transition</i>	Noticing information Expressing concern Reflecting	<ul style="list-style-type: none"> • Perceived relevance 		
Contemplation	Weighing pros/cons Observing +/- consequences Expressing arguments & counter-arguments Dealing with set-backs or failure Seeking or receiving information from others	<ul style="list-style-type: none"> • Outcome expectations • Self-efficacy • Social support 		
<i>Stage transition</i>	Expressing intent to change Explicating reasons for doing or not doing behavior Expressing confidence Dealing with set-backs or failure Seeking or receiving help/encouragement from others	<ul style="list-style-type: none"> • Outcome expectations • Self-efficacy • Social support 		
Preparation	Setting goal & making plans Anticipating obstacles & how to overcome Practicing skills Expressing confidence Observing others &/or discussing with others	<ul style="list-style-type: none"> • Plan & strategize • Skills • Self-efficacy • Supportive social norms 		
<i>Stage transition</i>	Anticipating success Committing to change Observing others &/or discussing with others	<ul style="list-style-type: none"> • Self-efficacy • Skills • Supportive social norms 		
Action	Doing the behavior Experiencing rewards/consequences	<ul style="list-style-type: none"> • Skills • Supportive social norms • Behavior change 		
<i>Stage transition</i>	Sharing experience with others Becoming committed to the safer behavior	<ul style="list-style-type: none"> • Supportive environment • Behavior change 		
Maintenance	Continuing to practice safer behavior Not succumbing to barriers & obstacles Experiencing positive benefits Sharing experience with others	<ul style="list-style-type: none"> • Supportive environment • Behavior change 		

demonstrates her commitment to change by adamantly expressing her intent to get tested to her husband Benji:

“If you don’t want to come with me, I’ll go alone.” (episode 52, scene 1) Blessing progresses linearly and rapidly through the stages of change, moving from pre-contemplation to action in just 12 episodes, from episode 47 to episode 58 (approximately 6 weeks).

Benji’s progression through the stages is also linear, but he appears to skip several stages, jumping from contemplation in episode 62 to action in episode 66 without much thought. Indeed, it is Blessing’s insistence that he get tested that causes him to act, rather than explicit recognition on

his part of his risk, the potential negative consequences of his behavior, or the benefits of getting tested.

Although Blessing repeatedly urges Benji to get tested, we did not find many scenes in which Benji and Blessing contemplated getting tested or discussed with each other the potential negative or positive consequences of behavior change; however, experiencing negative consequences was dealt with extensively in the dialogue. For example, Benji initially worries that he might die when diagnosed with an STD resulting from an extramarital relationship:

“Am I going to die? *Maiwe-e zvangu ini!*” (episode 24, scene 1)

Later, Blessing is overwhelmed when informed by a nurse that she has pelvic inflammatory disease:

“Where did I get it from?...I can’t believe this...I just can’t.” (episode 47, scene 8)

Neither Benji nor Blessing faces any setbacks, but they do face a few challenges that provide an opportunity for dialogue demonstrating refusal skills and thus potentially enhancing self-efficacy. For example, Blessing must talk Benji into getting tested:

“We need to know our status before we get pregnant...We have to know where we stand before we even think of having a baby...” (episode 55, scene 1)

And she further has to insist on condom use during the window period:

Benji: “You are my wife...you have no right to refuse. The test said we are both negative.”

Blessing: “We have been through this a thousand times. We can only be sure after retesting. If I feel my life is at risk, I have a right to refuse, Benji.”

And then later in the same scene:

Blessing: “We could have protected sex.”

Benji, a little happier: “Oh, well fine then. We use condoms then.” (episode 67, scene 3)

Similarly, Benji, finds himself taunted by a friend and asserts his commitment to remain faithful to Blessing:

Jackson: “There’s no need for you to be shy about these things, Benjamin. You know perfectly well that a married man cannot do without a woman when his wife is not there. I can arrange a nice girl for you.”

Benji: “I don’t believe that anymore, Jackson. These days, we can’t mess around. AIDS is killing people. I would rather spend time with my beautiful wife.” (episode 77, scene 4)

Because Benji gets tested as a result of Blessing’s urging, not because he accepts that he is at risk, we might have expected him (based on theory) not to maintain safe behavior after he tests negative. Contrary to expectation, however, both he and Blessing commit to staying safe (using condoms through the window period), and they successfully retest negative 3 months later. In part, Benji’s commitment to safety seems to emerge from his negative experience of infidelity—he contracted a painful STD—so although he does not appear to mentally process the consequences of unprotected sex outside marriage, he does suffer a negative consequence and clearly does not want to be in that position again:

Jackson: “You had a side-plate in the city...”

Benji: “I did, but it wasn’t worth it. I learnt my lesson.” (episode 77, scene 4)

Blessing also plays an important role when she insists on condom use.

Benji clearly learns some lessons in the story; he is perhaps not the strongest role model for young men, but he does model some important values (e.g., the value of listening to and respecting your wife). It is Blessing’s story that really stands out, however; Blessing challenges gender norms and provides a strong role model for young women. She does so in a slow and nonthreatening way; she gently pushes the limits of what is socially acceptable. First, she talks to her HIV-positive sister-in-law and gets encouragement and advice (episode 56, scene 5), and she seeks information from the nurse at the clinic (episode 58, scene 8). She talks to her husband multiple times about getting tested (episode 52, scene 1; episode 55, scene 1), and though she does not initially succeed in persuading him to get tested, she finally puts her foot down:

“No Benji. You have to get tested. I am very serious about this. In fact, if you refuse to go for the test...then there will be no sex in this bed.” (episode 60, scene 8)

We also noted that although extensive dialogue about outcome expectations did not occur where we expected (in contemplation), some of this dialogue appeared retrospectively; toward the end of the storyline, both Benji and Blessing reflect on the benefits and rewards of knowing their HIV status, identify potential risks to staying safe (“We realized that being apart made it difficult for us to stay faithful,” episode 82, scene 5), express their relief and happiness about their future, and restate multiple times their commitment to remaining faithful to each other. The storyline also skillfully interwove the positive and negative characters around Benji and Blessing’s transitional ones. Loveness, an in-law who is living with HIV infection, is a positive influence on Blessing. She is coping with her disease and she supports and encourages Blessing in her efforts to talk with her husband and protect herself from HIV. Feejay, a close friend of Benji’s, and also a promiscuous drinking buddy, is a negative character and, not surprisingly, ultimately dies of AIDS.

The challenge to writers is not trivial: to incorporate behavior change principles as well as local data in the development of complex storylines that unfold on a biweekly basis over 2–3 years. We provided training, tools, and ongoing technical assistance to support them in adapting the drama to the local context and to help ensure that the theoretical principles underlying the MARCH innovation would be adhered to. Although we did not see consistency with theoretical principles in every aspect of

the narrative, we did find ample evidence of the constructs, including many examples of both positive and negative consequences, examples of the transitional characters successfully meeting challenges and modeling skills (talking to your partner, refusing sex without a condom, going to a clinic for HIV testing, etc.), and a clear progression through the stages of change.

Conclusion

Getting from theory and research to program is always a challenge in public health. All too often we use only a fraction of the data we collect to inform program design, and we make only modest attempts to support the adaptation, implementation and dissemination of program models once the evaluation research is complete. This may be in part because we lack effective tools for integrating theory and research into program design as well as adequate frameworks for understanding how to support the adaptation, implementation, and dissemination of programs. Wandersman et al. have provided a framework to help describe how key systems work to support dissemination and implementation of innovations. We used this framework to elucidate how we supported the continued development, adaptation and implementation of the MARCH innovation.

Understanding how the prevention research, support, and delivery systems work together to enhance implementation can shed light on how these systems might be used most effectively. We found, for example, that the prevention support system was critical to the adaptation of the program to the local context. The more closely an intervention conforms to the needs, constraints, ways of thinking, and modes of operation of the local program implementers, the more likely the intervention will be adopted and implemented with fidelity (Dusenbury and Hansen 2004). Through our *Pathways to Change* training tools, we strove to illustrate for the scriptwriters how telling a good story can be consistent with telling a story that will inspire the audience to change behavior, and that behavioral constructs can in fact serve as useful dramatic elements in the telling of the tale. We encouraged them to work with the data and to practice developing theoretically sound storylines, but we also respected their skills as writers and their perspective as members of the culture and purveyors of the language in which the stories would unfold.

To implement a MARCH radio serial drama, adaptation is not only essential, but enormously challenging. The program has to be theoretically sound and research-based as well as highly entertaining, emotionally engaging, and effective in prompting the audience to change attitudes and

behaviors. It requires bringing together stakeholders and professionals from a wide range of fields, including creative writers, dramatists, producers and musicians; epidemiologists and public health practitioners; and behavioral and social science researchers. These professional communities bring with them different priorities, competing assumptions and values, and diverse skills and methods. We found in Zimbabwe, for example, that the most well-trained writers were initially the most resistant to the *Pathways* tools, believing that the tools cramped their creative style and freedom. Over time and with practice, however, the writers became convinced that the requirements of the system did not restrict their ability to tell a good story, and in fact supported good storytelling by prompting them to think about consistency and believability of characters' motivations, thoughts, and actions.

Many complex interventions or innovations will be adapted in the field; indeed, we believe that a balance between fidelity and adaptation must be struck if programs are to be optimally effective in the local context. Providing the tools, training, and support needed to do that, while preserving the essential integrity of our innovations, is critical to effective prevention programming. The tools and training we developed as a part of the prevention support system helped with implementation, but we also believe that ongoing technical assistance in the use of the tools may be needed to support fidelity to the model. As we gain experience with implementation and dissemination, we continue to incorporate lessons learned into the prevention innovation materials (e.g., manual) and prevention support system (training and tools), completing the research-to-practice loop.

The dissemination and implementation of prevention innovations has never been more critical than it is today. In 2003, the United States greatly expanded its support to countries most severely affected by the HIV epidemic, with \$15 billion over 5 years to be spent on expanded treatment, care, and prevention services. This effort holds out the hope of relieving tremendous suffering, returning people to the workforce, and enabling them to fulfill their roles as parents, family members, and community leaders. Ultimately, however, the success or failure of these efforts depends on people's willingness and ability to behave in certain ways—in other words, to change their stories. The goal of the MARCH innovation is to help capture, create, and sustain new health-promoting stories because, in the words of Amitav Ghosh (1990) "Everyone lives in a story. My grandmother, my father, *his* father...they all lived in stories, because stories are all there are to live in, it is just a question of which one you choose" (p. 182).

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