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A Strategic Framework for Setting Priorities for Research, Analysis, and Information Dissemination on Behavior Change and Maintenance for Child Survival in Africa

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Executive Summary

This strategic framework provides a structured format for determining future research, analysis, and dissemination activities in behavior change and maintenance for child survival in sub-Saharan Africa. In doing so, the document presents a number of provocative hypotheses and conclusions that will be of interest to professionals in a wide variety of projects, donor organizations, and ministries of health engaged in promoting and sustaining health practices.

The strategic framework provides a comprehensive review of published and non-published literature in the subject area, focusing on the factors associated with behavior change and the most common interventions used to date to bring about changes in practices for mothers and health workers. Emphasis is placed on the importance of a long-term perspective in fostering behavior change, and, particularly, the maintenance of learned behavior through continued supporting activities.

The literature shows that interventions designed to foster the adoption of child survival practices have focused on initial behavior change. However, gains made in practices and knowledge commonly erode over time unless explicit support for these practices continues. Unless newly learned behaviors of mothers and health workers are supported—by social reinforcement, public communication, and the health system—these behaviors fade with time because of a lack of reinforcement from the behavior itself or from external sources. Despite the need for maintenance strategies, supporting systems appropriate for maintaining health behaviors in sub-Saharan Africa are not well understood. Social support is clearly a critical concept, for example, but little is known about which individuals and groups could provide the sustained support necessary to adopt child survival practices in a particular locality.

We do not know what level of support is required to maintain behavior as opposed to creating initial behavior change, or at what point, if any, the child survival behaviors we are seeking to promote will become self-reinforcing and will no longer require significant outside support. As a result, we can currently only guess for how long maintenance programs will be necessary—although the required length will likely vary depending on the support activities and the type of behavior to maintain.

This strategic framework offers conclusions from the literature review, and points out information gaps in the literature and our current understanding of what brings about and maintains health behavior in sub-Saharan Africa. The paper recommends research, analysis, and dissemination activities based on the information gaps. Underlying these recommendations is a conviction that donors and ministries of health must take a long-term view to creating and then maintaining behavior change for child survival, and must experiment with approaches specifically designed to maintain behaviors once they are learned.

Acronyms

CCCD-ACSI	Combatting Communicable Childhood Diseases—Africa Child Survival Initiative
CDD	control of diarrheal diseases
CHW	community health worker
DDM	Data for Decision Making Project
DPT	diphtheria, pertussis, and tetanus
EPB	Expanded Promotion of Breastfeeding Project (Wellstart)
EPI	Expanded Program for Immunization
HealthCom	Communication for Child Survival Project
HHRAA	Health and Human Resources Analysis for Africa Project
ICRW	International Center for Research on Women
KAP	knowledge, attitudes, practices (survey)
MCH	maternal and child health
MMHP	Mass Media and Health Practices Project
MOH	ministry of health
NCI	National Cancer Institute
NCP	Nutrition Communication Project
NGO	non-governmental organization
ORS	oral rehydration solution
ORT	oral rehydration therapy
PRITECH	Technologies for Primary Health Care Project

PSI	Population Services International
RMO	regional medical officer
SANRU	Santé Rurale Project
SD	Office of Sustainable Development (USAID)
SSS	sugar salt solution
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USDHHS	United States Department of Health and Human Services
VHWs	village health workers
WHO	World Health Organization
WSS	water sugar salt solution

Introduction

Behavior change is important for achieving improved public health—more particularly, the sustained use of appropriate health practices by populations is necessary for public health impact. Many improvements in public health status are possible without relying on changes in individuals' behavior—through the introduction of new technologies, improved infrastructure (such as public sanitation), and additives to consumable items (such as vitamins A and D in milk). This paper, however, will discuss behavioral issues related to public health improvements and, specifically, behavioral issues important for sustaining child survival practices and the use of child survival technologies over the long term in sub-Saharan Africa.

Child survival depends on preventive and curative practices in households and at health facilities. The most important target groups for improving child survival practices, therefore, are mothers and health workers. Mothers' behavior is the ultimate behavior to change and sustain to achieve improved child health. Health care personnel, the most common point of human contact between mothers and the formal health system, greatly influence mothers' use of the system and the health practices it advocates.[1] Health workers' case management skills and performance are also directly related to the treatment of sick children.

Many of the child survival behaviors demanded of mothers are preventive in nature and do not produce immediate, visible positive results. Yet, for positive public health impact, mothers must repeat these unrewarding behaviors over long periods of time. Mothers, therefore, need regular support and encouragement to continue performing desired behaviors until the positive impact of the behaviors becomes apparent and they gradually become social norms. A similar process of reinforcement is required to sustain high quality performance by health workers. Many of the tasks they perform are complex and produce few immediate, positive results. Multiple sources of social and professional support are necessary until consistent, high quality performance becomes standard operating procedure.[2] We use the term *behavior maintenance* in this paper to refer to the support and reinforcement necessary to sustain learned behaviors over time.

In the paper we will examine strategies to maintain child survival behaviors over the long term. We will discuss groups and systems that can support mothers' and health workers' behavior, and suggest feasible programmatic

actions to sustain the supporting activities of these groups and systems. The term *support groups and systems* refers to the wide variety of factors that can influence and reinforce the behavior of a target audience. For the mother, support groups and systems include community groups, family members, health personnel, and pharmacists. For health workers, support groups and systems are likely to be supervisors, colleagues and professional associations, MOH staff, training and supervisory systems, the media, community members, and mothers and children themselves. Key to the analysis of support groups and systems are the actions and activities through which they support the target audience.

Objectives and Methodology of the Strategic Framework

This strategic framework defines the priorities of the Office of Sustainable Development (SD) and the Health and Human Resources Analysis for Africa (HHRAA) Project of the USAID Africa Bureau for supporting research, analysis, and information dissemination related to behavioral issues in child survival. A principal objective of both the SD Office and the HHRAA Project is to provide timely and useful information to USAID offices, African governments, non-governmental organizations (NGOs), and donors to assist in setting priorities and allocating resources. The ultimate goal of these efforts is to improve policies, strategies, and programs in health, nutrition, education, and population.

Objectives of the strategic framework

The public health literature demonstrates that a great deal is known about initial behavior change—learning and trial of new behaviors—but there is little systematic evaluation and analysis of the conditions necessary to sustain learned health practices over time. Within this context, the purposes of this strategic framework are to:

- draw conclusions from existing literature and program experiences;
- identify information gaps; and
- propose research, analysis, and dissemination priorities for the SD Office and HHRAA. Specifically, the strategic framework will propose behavioral research to provide answers to questions

about sustaining learned behaviors in a variety of target groups so as to have positive impact on the health of children.

Criteria for ranking research, analysis, and dissemination needs

In determining the research, analysis, and dissemination priorities of the SD Office and the HHRAA Project in behavior change for child survival, defined criteria will be used. Specifically, proposed research, analysis, and dissemination activities should:

- fill an existing information gap, as identified by the strategic framework;
- be of strategic importance to USAID and to African decision makers;
- have a regional significance shared by several sub-Saharan African countries;
- benefit from the comparative advantages of USAID and the Africa Bureau (see Annex 1, "Strengths of USAID Related to Research and Analysis"); and
- complement the ongoing programs of African governments, USAID, and other donors and institutions.

Research, analysis, and dissemination activities also, to the extent possible, will involve the active participation of African institutions and individuals (see Annex 2, Effective Research and Analysis and Dissemination Approaches).

Review of the Literature

This literature review is divided into two major sections—an examination of the factors associated with behavior change, and a review of interventions for behavior change. The section on the factors associated with behavior change looks at mothers and health workers, focusing on internal and external factors for each. The review of interventions is organized by type of intervention, analyzing each in terms of initial behavior change and potential for long-term behavior maintenance.

Factors associated with behavior change in sub-Saharan Africa

For mothers

As discussed above, the behavior of mothers is a key element influencing the survival of children. Interventions aimed at changing mothers' behavior clearly should be based on an understanding of the most important influences underlying and reinforcing mothers' current behavior. These influences include psychological, financial, and social factors. For purposes of this literature review, the most important determining factors of behavior change will be classified as internal or external factors. Documented research in a variety of African countries suggests which factors may be the most important for child survival practices across countries and cultural settings; these factors are summarized below.

Internal factors include skills, knowledge, beliefs, and attitudes. A mother's level of *education* and her *knowledge* of the health benefits of recommended child survival practices are strongly associated with her willingness to adopt these practices; these relationships are particularly well established for immunization. *Taboos and traditional beliefs* also strongly influence decisions to adopt or ignore recommended health behaviors. For example, in Nigeria and Swaziland factors inhibiting immunization include beliefs that witchcraft causes childhood diseases, particularly measles, and that these diseases cannot be successfully prevented by Western medicine. A review by WHO of the most important determinants of correct home use of ORT[5] cites cognitive factors constraining mothers' correct use of ORT solutions, including beliefs that children are unwilling to accept ORT solution, a lack of *self confidence* in preparation skills, and folk beliefs concerning the origins and appropriate cures for different diarrheal diseases. In many African settings, mothers differentiate among perceived causes and symptoms of diarrhea citing a variety of diseases with specific causes and symptoms.

Self-confidence, closely linked to education status, was found to be the most important factor associated with mothers' willingness to participate in community child survival and nutrition programs in Swaziland and Cameroon. To participate actively in child survival programs, mothers must believe that they can positively influence their children's health, increasing mothers' self-confidence is thus an important objective of health education programs. A viable approach for increasing mothers' confidence is to give them as much control as possible over the recommended behavior so that

they can see that what they do makes a difference. In growth monitoring programs, for example, health workers can encourage mothers to keep the cards showing children's growth and teach mothers to correctly interpret results. Evidence of children's growth provides mothers with feedback and reinforcement, increasing their incentive to continue with the program.[9] Improving mothers' *skills* for carrying out child survival practices also increases mothers' self-confidence.

Perceived severity of symptoms and *perceived consequences* of recommended behaviors are also important internal factors. Studies of ORT use in rural Benin[10] and childhood immunization in Togo[11] show that the perceived consequences of these activities are strongly associated with mothers' decisions to act. A study in Zaire shows that mothers' perception of the severity of children's diarrhea is related to treatment choices.[12]

External factors for mothers include barriers related to financial and other resources, geographical access to care, interactions with care providers, and the influence of families, communities, and other social supports. In mothers' decisions to begin or continue child survival practices, three external factors appear to play major roles - interactions with health workers, costs (including non-financial costs), and social supports.

Despite disincentives to go to health centers, several studies show that personal interaction with the *formal health sector* is a very important influence on mothers' health-related behavior.[13] In Guinea, a major determinant of mothers' willingness to bring their children for vaccinations is previous positive experience with vaccination services—not being made to wait or driven away, and being treated courteously.[14] Negative encounters with the health system would have the opposite effect. A study of treatment practices for acute respiratory infections in The Gambia found that the major incentive for mothers to go to health workers is better access to drugs.[15]

Financial costs related to transportation, cost of care, and lost income all discourage mothers from taking their children to health centers. In extremely poor societies, economic considerations can play a predominant role in determining health behavior.[16] At least one study, from the Gambia in the early 1980s, shows that poorer groups are less likely to maintain learned behavior than better-off groups.[17] To date there is little research related to the ability of African populations to pay for health services. One study in northern Cameroon indicates that transportation costs may be at

least as important as the cost of drugs and consulting fees, and that rural populations are willing to pay for health services perceived to be of high quality (often meaning the availability of drugs).[18] A study of measles vaccination in Cameroon[19] found that even when conservatively calculated, private costs—time spent and bus fare—were greater than the costs per vaccination incurred by the government.

Non-financial and social costs pose significant, sometimes insurmountable barriers to the adoption of recommended behaviors in sub-Saharan Africa. Non-financial costs include the level of effort and time required to participate in health programs for women whose daily lives are filled with work in and outside the home.[20] Another non-financial cost is social embarrassment, caused, for example, by showing up at a health center poorly dressed or with children who are poorly dressed.[21] Many social costs can be interpreted to be a lack of sufficient *social support*, which we argue is the key factor influencing long-term behavior change for mothers.

The concept of social support shows up repeatedly in the literature as a major factor enabling mothers to start or continue behaviors related to child survival. Social support includes the behavior of the family, and support from health workers, neighbors, and community groups.[22] A 1987 study of the acceptability of childhood immunization to mothers in Togo found social support and advice from community members to be among the most important factors facilitating immunization, the same study showed that a lack of social support (in this case from husbands) is a strong inhibiting factor for immunization.[23] A 1976 survey of postpartum practices in 278 cultures found that almost all of these societies have a support system to assist the mother as she takes on the new responsibilities of motherhood.[24] However, child survival practices and technologies that are not part of traditional cultures do not benefit from such built-in support systems.

Social support is clearly a critical concept in general, but the literature gives sparse treatment to the process and functions of support groups—how sources of support function locally and provide the sustained support necessary for the practice of child survival behaviors. Much remains to be learned about the reasons for mothers' resistance to, and acceptance of, different child survival innovations. One of the main conclusions resulting from the literature review is that the constellation of factors influencing behavior in different settings varies enormously within Africa; a thorough

understanding of the determining factors in any given area requires research specific to that area.[5]

For health workers

For the purposes of this paper, a health worker is any trained person who is a point of contact between the formal health care system and clients seeking care for and advice about their child's health. This definition includes, in the public and private sectors, physicians, nurses, midwives, health aides, and trained community volunteers. The critical role health workers play in encouraging or discouraging mothers' use of child survival practices and technologies is discussed above. Effective child survival practices on the part of health workers—in terms of clinical skills and communication with mothers—also need to be maintained over time. In this paper we view health workers as sources of long-term support for mothers' behaviors and also as a target audience for behavior maintenance programs.

Internal factors. Most of the literature on determinants of health worker performance has focused on their clinical skills and knowledge of disease and treatment protocols. Poor health worker performance is often associated with *lack of knowledge or incorrect knowledge.* For example, missed opportunities to vaccinate often account for a significant proportion of unvaccinated children or those behind in the immunization schedule. Missed opportunities occur when health workers mistakenly do not vaccinate an eligible child because, for example, the child has a fever, is malnourished, or came in for curative care, or because too few children presented that day to merit opening a vial of vaccine. In CDD programs, studies have found that many health workers teach the wrong ORS recipe to mothers.[6] Many health care providers use ORS only rarely, and prescribe instead anti-diarrheals and antibiotics for diarrhea.[7]

The literature also discusses health workers' *attitude* toward clients, work conditions, and their own role as health workers as influencing performance. Some health workers feel that mothers do not care for their children or are incapable of learning basic health behaviors.[8] Many health workers see their job as strictly curative, and do not feel they are responsible for educating and encouraging mothers.[9] These attitudes often result in negative encounters for mothers, which in turn negatively influence the likelihood of mothers' adoption of child survival practices and health workers' ability to improve children's health.[10]

External factors. The external factors influencing health workers' behavior in sub-Saharan Africa are well documented, especially in unpublished literature generated by projects. Erratic or insufficient supplies; scarce, nonfunctioning, or outdated equipment; inconsistent or poor supervision;[5] high case loads, poor patient flow, and other facility-based problems; and lack of recognition from the community especially for volunteer health workers[6]—all these factors mitigate against a health worker providing quality care and education. Interventions that have attempted to address these issues are reviewed later in this document.

Although knowledge plays a role in health worker performance, just as with mothers, the gap between correct knowledge and actual practice is large. In other words, although incorrect knowledge is often correlated with poor health worker performance, improving knowledge alone rarely produces significant changes in practices. Thus, much could be gained by directly tackling the performance deficits of health workers—finding ways to help them use learned knowledge and skills correctly and consistently. The principles of behavior maintenance applied to mothers are relevant to health workers too: behaviors that are complex and do not result in immediately apparent positive results need to be supported until their delayed benefits are perceived.

Many health workers in sub-Saharan Africa work under poor conditions, receive pay and supervision only sporadically, and rarely have gratifying interchanges with the mothers and children they serve. Programs aimed at maintaining health worker practices should mobilize a variety of relevant groups and systems to reinforce health workers: supervisors for problem solving, skill building, and feedback; community members for recognition; broadcast media for feedback and reinforcement; in-service training for problem solving and skill building, direct mail for technical information and feedback; facility based improvements for more efficient work; and self-monitoring for feedback and reinforcement.

Many of these interventions have produced improvements in health worker performance in the short run (typically measured within one year of the intervention). Yet, to refine these and other strategies for maintenance, they need to be streamlined and tested for longer periods. This type of research and analysis is missing. We know that behavior erodes if it is not reinforced over time, and we can hypothesize that the strategies noted above would maintain behavior, but which specific measures, to what

degree, and in what mix? There is little documentation of long-term successes.

The nature of the behavior

One factor that has received little attention in the international health literature is what effect the desired behavior itself has on continued performance for mothers and health workers. The *complexity* of a behavior can pose barriers to its adoption quite separate from difficulties related to other costs, whether financial or non-financial. An essential health practice such as handwashing—a seemingly simple behavior—actually takes 46 steps to accomplish as field workers in Guatemala discovered in an assessment session for a community-based CDD and water sanitation program.[33] Mixing and administration of ORS is a complex procedure, as are preparing and administering weaning foods, and feeding sick children with no appetite. Similarly, many behaviors required of health workers are complex, and programs often request health workers to do several things at once—such as informing a mother about side effects and when to return to the health center, while simultaneously immunizing her infant.

In addition to being complex, many preventive child survival practices produce few, if any, immediate and visible positive results. The positive effects of immunization, for example, are not perceived by health workers until coverage rates are made public; parents do not perceive any benefits to immunization until their child survives a measles epidemic sweeping through the region. Practices required for effective malaria prevention likewise cost time and effort with few tangible results in the immediate future.[34] To make behavioral conditions even worse, many child survival practices *punish* parents in the short term. A common example is related to immunization—parents may see the child upset because of the needle and mildly ill from the side effects.

Analysis of the nature of the recommended behavior—its complexity and the consequences it produces—underlies the rationale for applying social and other programmatic supports.[35] Support systems are necessary to reinforce behaviors that may provide little immediate incentive to continue. For complex behaviors, support and reinforcement can be effective at different steps in the behavior—mothers and health care professionals can be taught to realize the benefits their behavior produces in the short term (for example, "My child is no longer dehydrated because I gave ORS cor-

rectly," and "More mothers are returning for repeated immunizations because I am making sure each mother knows when she is to return"). Unfortunately, there has been little systematic analysis to date of the different steps involved in complex behaviors requested of mothers and health workers; such analysis is clearly a prerequisite to developing supporting interventions.

The introduction of this paper presents the hypothesis that learned behavior, if adequately reinforced for a long enough period of time, will become ingrained as a standard health practice. But at what point and under what conditions does a health practice become a social norm and therefore not need outside program support? A practice becomes an ingrained (or "frozen")[26] social norm when it produces reinforcement on its own. Reinforcement can occur a variety of ways: through self statements (for example, "I am a good parent"), cost savings (resulting from no longer purchasing cigarettes), physical impact (reducing caffeine intake makes one less jittery), social support (everyone does it), or escaping negative consequences (using deodorant). An example of an ingrained preventive health habit in the United States is brushing teeth. At first, the practice needs instruction and massive amounts of support from parents (such as reminders, threats, lectures, and incentives) to be practiced at all. After years, however, the practice begins to produce salient, immediate reinforcers: the fear of bad breath, the refreshing sensation after brushing, and habituation to a morning routine. These all help "freeze" the behavior even though its preventive health function remains a vague and distant payoff.

Each child survival behavior the medical community is trying to instill in populations around the world can be analyzed for its potential to produce immediate benefits. Program planners can encourage this process, and the nature of maintenance strategies will therefore evolve over time as reinforcements for child survival practices take effect. This process may take years or even generations. The literature does not yet reflect an analysis of this process, although oral rehydration has been present in some countries long enough for such an analysis to be started.

Review of interventions for behavior change in sub-Saharan Africa

Interventions for behavior change reflect the varied social, economic, and psychological factors that influence people's actions. Many interventions have successfully motivated populations to adopt new health behaviors.

While these results have been encouraging, experience has shown that sustaining these behaviors over time is critical for meaningful public health impact. Until recently, however, ministries, donors, and health planners have been mostly concerned with the need to *introduce* new health practices. As a result, few resources have been allocated specifically to design or strengthen support systems to *maintain* learned behaviors over the long term. It is not surprising, then, after initial successes, to see a steady decay of program-induced changes in many health practices.

Simply funding for longer periods the projects that successfully initiated changes is not the answer. The conditions necessary to promote the learning of new behavior are not necessarily the most favorable or the most practical conditions for maintaining practices over the long-term. The literature reflects this situation. Most of the program descriptions that document behavior change do so only for the short term; evaluation measures are typically taken within a year of the intervention. Current funding patterns and administrative structures make it difficult for long-term behavioral issues to be addressed specifically in project design or in measurement and documentation of the maintenance of behavior. This literature review therefore focuses on what has and has not worked in the short term. Extracting from the behavioral sciences, we discuss how appropriate these interventions would be for maintenance, and how, in some cases, they could be altered to provide the support necessary for maintenance.

Some general principles will guide us in discussing the major behavioral issues in maintaining learned health practices rather than initiating new ones:

- *Most behaviors critical to carrying out child survival interventions are not inherently rewarding.* Many of them are preventive in nature and do not produce immediately apparent, positive results to encourage adoption as health practices. To survive as normal practices until their long-term (preventive) health benefits are recognized, these behaviors need support from the social network and health system.

- *Attitudes and beliefs surrounding child health and influencing existing practices recede in importance as people gain experience with new behaviors.* Continued use of the behaviors (once learned) is increas-

ingly dictated by their costs (time, financial, difficulty) and the results they produce.

- *For optimal learning, certain conditions and procedures are necessary, but once an individual is more or less fluent in the behavior, many of these special procedures are no longer necessary or feasible.* In learning situations target behaviors are broken down into small steps; individuals practice in often artificial conditions and receive praise and suggestions for improvements. Extra rewards and incentives are frequently provided. In maintenance situations, depending on the nature of the target behavior, providing some kind of positive result through social reinforcement or displaying results, lowering the barriers, or providing reminders will suffice for maintaining many behaviors.

- *All behaviors will fade over time if they are ignored or do not themselves produce tangible results.* This applies not only to the ultimate target behavior of mothers, but also to support behaviors and maintenance activities. Thus, people or organizations providing support to mothers' behaviors will also need social support or tangible results, reminders, or lowered barriers to continue their maintenance functions.[5]

These general principles suggest that programs would need to fulfill certain *functions* to maintain gains from programs that result in initial trial of health practices. The nature of activities to fulfill these functions would depend on local conditions and the nature of the behavior being maintained. Generally speaking, however, maintenance interventions should provide opportunities to:

- engage social support for desired behavior from family, community, and peers;

- provide feedback on performance;

- find solutions to problems in performing desired behavior; and

- disseminate reminders of how to perform the desired behavior, and of time, place, and availability of child survival services.

For example, in addition to teaching new health practices, radio programs can engage social support and provide reminders and feedback for child survival practices, and community-based programs can find solutions to problems and disseminate reminders in addition to providing social support.

The following sections analyze interventions described in the literature and commonly used to produce behavior change for child survival. Interventions targeting mothers and health workers will be included. As stated earlier, most documented analysis of interventions focuses on short-term gains, and little concrete evidence of successful maintenance interventions appears in the literature. The literature review does discuss, however, how different types of interventions could fulfill some maintenance functions based on the principles listed above.

Community-based interventions

The most important support groups, outside of the formal health system, for maintenance of behavior change in sub-Saharan Africa are at the community and family levels. To quote from a review of health communication in support of immunization, "To sustain new behaviors over time, we must increasingly use strategies targeting community-level behavior change and providing more naturally occurring rewards, such as social support and endorsement by respected local leaders."[18] Community interventions effectively provide initial teaching and support for mothers, and have strong potential to be supporting mechanisms for the maintenance of mothers' behavior (see Case Study 1). Despite this potential, there is very little documentation of how community level interventions can be maintained as viable sources of support for mothers' continued practice of child survival behaviors.

The most common intervention at the community level has been the training of community health workers or volunteers; other interventions, described below, include school-based programs, the use of theater, and mothers' support groups.

Community health workers. Documentation of programs that have used CHWs (used here to include paid village health workers and volunteers) show that these types of health workers can be effective in supporting positive health practices at the community level.[19] However, the literature

Case Study 1: Working with communities — the experience of CCCD in Togo

A project in Togo supported by the Combatting Communicable Childhood Diseases Africa Child Survival Initiative (CCCD-ACSI) Project demonstrates the effective use of a tiered approach to increasing immunization coverage rates — through the work of district health teams, mobilizing community groups and health workers to teach and motivate mothers. In nine health districts, chief medical officers selected district health teams — composed of two mid-level health workers and a Peace Corps volunteer. These teams, trained in community mobilization, communication skills, and focus group techniques (for program planning), guided their communities in activities to increase the use of vaccination services. Village health committees were formed, and village volunteers, health workers, itinerant health agents, and school teachers collaborated with the district teams in village wide communication efforts. Activities included theater, storytelling, school-based sensitization, and health education at health facilities.

After seven months, vaccination coverage rates had increased dramatically. DPT1, DPT3 and measles went from 59 percent, 36 percent and 45 percent to 98 percent, 85 percent and 86 percent respectively, in the seven villages reporting data. Key to this success was a system of behavioral supports at different levels — supports for mothers' behavior and support for community activities and health worker practices. At one level, various communication activities in the community and health centers were effective in bringing mothers repeatedly to the health facilities during the seven months of data collection. At another level, the groups and systems responsible for these activities were in turn motivated during the seven months to continue their work with mothers. They were trained and mobilized by the district health teams, who, among other things, visited the communities on a regular basis.

Program and behavior maintenance: This project is instructive in that in its initial behavior change phase, it developed and used several layers of support that led to mothers returning repeatedly for childhood immunizations. But how can such impressive gains in coverage rates be maintained? Health workers' and community groups' enthusiasm and quality performance will not stay at high levels by magic — they also need to be supported until the positive results of their activities with mothers become evident enough to reinforce continued behavior. The central component of a *maintenance phase* would be to work through the district health teams by providing them the means (logistical, technical, and managerial) to support the community's and health workers' work with mothers. Specifically, a maintenance program would provide the following functions, starting at the national or regional level and working toward the community level:

(1) *Maintaining the active role of MOH and donors.* While the maintenance process described below sounds complicated and labor intensive, much of the behavioral support would come from the health workers and community members themselves. Donors would need to be involved mostly with the continued development and support of the district health teams — including materials and logistic and technical support. The MOH should ensure that team members are qualified and receive appropriate training and professional support.

(2) *Sustaining the activities of district health teams.* During the maintenance phase, the district health teams would shift their emphasis from training and direct involvement with communities to supervising the work of the village health committees. The actual activities most important in this support role would need to be developed and tested prior to implementation. They might include needs assessment and training in such skills as community mobilization, working in committees, and conflict resolution.

(3) *Supporting the village health committees.* These committees are the main sources of energy and planning for the communities on health issues. The committees need continued support and feedback to keep their skills and involvement high. A maintenance program would focus on mechanisms to achieve this — for example, encouraging the community to give feedback and recognition to the committee, and enabling the district health team to provide continued reinforcement and technical assistance to the committee.

(4) *Providing professional and social support for health workers.* Possible strategies include making their work easier (by continuing to use volunteers to help at immunization sessions, for example), promoting public recognition of their work, and providing professional feedback (by posting coverage rates monthly).

(5) *Encouraging social support for mothers.* Social support for mothers needs to continue, through the work of the village health committees. Examples of social support would vary by locality — and could include health education, theater, public gatherings, new songs, health programs in schools, and ways to involve village elders and fathers.

The primary source for this case study is Nannoh-Tetteh.

clearly states that CHWs must receive considerable encouragement and support for programs using CHWs to continue beyond the months immediately following training (and, therefore, to fulfill a maintenance function in support of mothers' behavior). The most important types of support for CHWs are continued training, supervision, adequate supplies, and—especially—recognition and encouragement from the health system and from the communities in which they work.

For these reasons, the most successful interventions with CHWs have been in relatively small areas where the necessary input and support systems for CHWs can be mobilized. For example, the child survival project supported by Africare in Ganzourgou Province, Burkina Faso, has trained more than 200 women to be neighborhood counsellors in selected villages of the province. Each counsellor supports approximately 15 households. These women have been effective in counselling mothers concerning ORT, growth monitoring, and immunizations.[6] Key reasons cited in the project evaluation for this success are that the messages have been kept very simple and the counsellors have been well trained.

Operations research from Niger[7] shows that the performance of village health workers is generally poor—VHWs often give SSS recipes and chloroquine doses incorrectly, and have a tendency to neglect preventive care. The reasons for poor performance are clear: very little supervision or assistance for sustaining services from the public health system, purchasing medicines and supplies, enforcing payment of fees, and managing finances. VHWs do not receive financial incentives or moral support from the communities with which they work.

Adequate support for CHWs is a prerequisite for achieving even initial behavior change among target populations and is even more important for sustaining CHWs as a support for maintaining mothers' behavior.[8] Sustaining enough CHWs to have significant impact on national child survival goals poses a particular challenge—requiring creative and inexpensive approaches.[9] Successful strategies for supporting CHWs over the long-term represent a significant knowledge gap in existing literature.

Theater Where popular theater is a common and accepted part of local culture, it appears to be an effective means of communicating health messages. In Zambia in 1992-93, the PRITECH Project engaged two local theater groups to perform plays promoting ORT. In three months, the groups

had reached an estimated 80,000 people, mostly women and children, and had recorded performances for radio broadcast. No measures of outcome were taken. The total cost of the intervention was less than $5,000.[14] The Nutrition Communication Project (NCP) has used theater in Burkina Faso, Mali, and Niger to reinforce messages related to food consumption, finding theater and skits to be particularly useful media for transcending cultural barriers to changing feeding practices.[15]

The use of theater for health education is limited to geographic areas where it is already a culturally important phenomenon and to the transmission of simple messages, since drama groups are ill-prepared to provide complex health explanations. Nevertheless, the adaptability and relative inexpense of theater make it a potentially attractive activity for maintenance interventions. To act effectively for maintenance, however, theater would have to be regular enough to provide mothers with consistent reminders and feedback for child survival behaviors. The long-term viability of the groups conducting local theater must be considered, along with any input necessary for the continued production of quality health dramas. More experience and research are necessary to adequately assess theater's long-term costs and impact on health practices.

School-based programs. Several interventions have sought to harness the potential of schools as a means of promoting behavior change, generally for immunizations. Programs have sought to improve the knowledge and practices of children, and to reach parents through the children. In many African countries the voice of the teacher is considered to be an indisputable authority,[16] and classroom interventions have produced several documented examples of initial behavior change. School-based programs for malaria control in Kisumu, Kenya, and Danfa, Ghana, resulted in a significant decrease in malaria infection in the target group of children compared with a control group.[17] Other school-based programs have resulted in increases in demand for immunization in target areas.[18]

Other experiences show that teaching children directly is much easier than achieving a transfer of knowledge from the children to their parents. In Swaziland, the EPI Program has targeted children in grades five and six with a series of eight radio programs accompanied by songs, skill drills, stories, and workbooks. This program has been successful in teaching children the targeted EPI messages, but using the children as a vehicle to reach parents has been much less successful. Interviews with parents in the

target area show that the clinic is still by far the most significant source of health knowledge for mothers, who reported learning little or nothing from their children.[17]

The available literature on school-based programs concerns short-term interventions only.[18] Important steps in realizing the potential of schools to sustain behavior change are encouraging feedback to teachers and children so they can see the effects of their activities, making the activities routine—by involving teachers in the transmission of messages on a regular basis—and finding ways of encouraging children to pass messages, and reinforcement, on to their parents. To date, there is little or no documentation of successful use of schools for long-term behavior maintenance in sub-Saharan Africa.

Mothers' support groups. Mothers' support groups have been effective in the United States and Latin America in promoting breastfeeding and permitting women to encourage and assist each other in resolving difficulties related to breastfeeding.[19] Women's groups are common in sub-Saharan Africa but as yet have not been used on a large scale to bring about or reinforce child survival behaviors. Research in Senegal shows that in just one region there are an estimated 200 women's groups, with 30 to 80 members per group—typically mothers of children under five years of age.[20] These groups are based on common economic interests such as credit sharing or the operation of a mill.

PRITECH conducted a small-scale research project in Senegal to judge the feasibility of using the women's groups to transmit messages for the feeding of young children suffering or just recovering from diarrhea. The project involved training nurses and traditional birth attendants to provide recommendations for child feeding, with the help of counselling cards, to mothers in the women's groups. Nearly all mothers accepted the recommendations and stated that they would continue to follow them. Follow-up research to judge whether the group members have been able to support each other in actually following the recommendations would help to answer questions about the long-term viability of women's groups as a mechanism for behavior maintenance.[21]

Mass media

Radio is the most practical mass media channel for achieving initial behavior change in sub-Saharan Africa; this is particularly true in rural areas. In rural Nigeria, for example, 75 percent of the population listens to the radio while 48 percent occasionally watches TV, 29 percent reads newspapers, and 19 percent reads magazines.[7] In Swaziland a HealthCom study found that radio was able to reach 62 percent of the population, while outreach workers were in contact with only 16 percent.

Moreover, radio offers a method to reach illiterate and dispersed populations. Documented programs that have used radio to change child survival practices include efforts supported by MMHP in The Gambia (see Case Study 2) and by HealthCom in Lesotho, where a survey has shown that ORT use at home is closely linked to radio ownership and listenership.[8]

As a communication medium, radio also has disadvantages. A review of the use of radio for health education in Nigeria[9] shows that illiterate individuals are less likely than others to pay attention to radio broadcasts. Women may not have the time to listen attentively as they are often responsible for household chores and income generation. It is difficult to develop culturally relevant programs for all potential listeners. The variety of spoken languages in sub-Saharan Africa complicates the communicator's task.[10]

Nevertheless, when frequent and regular, radio messages can provide an excellent means of sustaining initial behavior change.[11] Materials exist to help health planners and radio personnel inexpensively develop interesting and creative programs that can fulfill many maintenance functions.[12] However, there is little evidence that radio has been successfully used to support behavior over the long term.

Several child survival programs have envisioned using radio to maintain initial changes in behavior. In Cameroon, for example, the CDD Program in 1989–1992 prepared annual calendars of messages for radio transmission—messages that changed emphasis from "prevention" to "home case management" to match seasonal variations in diarrhea incidence. This program, designed to support and maintain behaviors over the long term, proved unsustainable because of non-continuous financial resources and institutional weakness in the MOH.[13] Maintaining radio interventions over the long term requires sustainable and solid institutional structures (or com-

Case Study 2: Mass Media and Health Practices in The Gambia

The work of the Mass Media and Health Practices (MMHP) Project with the Ministry of Health in The Gambia in the early 1980s, and follow-on work by the PRITECH Project from 1988 to 1993, demonstrate the creative and successful use of several different types of interventions to bring about behavior change—as well as the challenges involved in sustaining behaviors after initial change has occurred.

MMHP began collaborating with the MOH in 1981, emphasizing public education for home treatment of diarrhea-related dehydration with water sugar salt (WSS) solution. Over a two-year period, the MMHP Project and the MOH used radio broadcasts to reach mothers, as well as interpersonal education by health workers and print materials. The "Happy Baby Lottery" campaign, conducted in 1982, combined pictorial handbills showing how to mix the WSS solution, face-to-face teaching by health workers, and an intensive schedule of instructional radio programs. Villages were chosen randomly and mothers from those villages were invited to demonstrate the correct mixing of the WSS solution; successful mothers were rewarded with one-liter plastic cups or bars of locally made soap. Five "grand prizes," large bags of sugar and rice, were awarded to communities that had been particularly active in the contest. Winners were announced on the radio by the President's wife.

A longitudinal study showed that, after two years, the MMHP efforts had tremendous impact. The percentage of episodes of diarrhea treated at home with the WSS solution increased from 4.1 percent to 73.8 percent. The percentage of episodes treated with WSS by mothers who knew how to prepare the solution correctly increased from 0 percent to 49.5 percent. However, a follow-up study in 1987, three years after the end of the MMHP Project, found that most of these gains had eroded. The percentage of diarrhea episodes treated at home with the WSS solution was 10.8 percent. In 1987, 21 percent of mothers knew how to mix the solution correctly, compared with 43 percent in 1984.

After a period of inactivity, donor support for CDD was reintroduced under the PRITECH II Project. From 1988 to 1993, PRITECH's assistance featured many aspects of a maintenance intervention—attempting to reinforce and support behavior had already been learned. Health education activities included rebroadcast of the MMHP radio spots and newly developed half-hour radio episodes concerning home care for diarrhea. Updated flipbooks, fliers, and posters were produced for education in health centers, accompanied by significant case management training for health workers. Musicians and school children were engaged to develop dramas and songs about CDD. For home management of diarrhea, messages shifted emphasis from promotion of WSS to use of ORS packets.

A 1993 household survey showed that PRITECH's intervention had achieved success in introducing new behaviors for mothers who had not been influenced by the MMHP Project, and in motivating the use of learned behavior for those who had been influenced. Forty percent of diarrhea cases were treated at home with ORS, and an additional 16.5 percent with sugar salt solution. Other home treatment indicators were positive, including continued feeding during diarrhea (95.4 percent) and continued breastfeeding (97.5 percent).

This case study provides several interesting lessons:

(1) The MMHP Project effectively fostered "initial trial of new behavior," demonstrating the potential for initial behavior change when multiple channels of communication are used.

(2) As shown by the decline in WSS use from 1984 to 1987, unless the newly learned behaviors of mothers and health workers are supported, these behaviors will fade with time because of a lack of reinforcement from the behavior itself and from external sources.

(3) The reintroduction of promotion efforts with PRITECH assistance led to improved home case management. Because treatment practices had deteriorated from lack of support and with the passage of time, the PRITECH intervention results were similar in some ways to initial behavior change.

(4) PRITECH's intervention also fulfilled some of the functions of a maintenance program, through reminders to mothers and social support to mothers and health workers. Because it used a variety of interventions, it is difficult to tell which type of intervention was the most successful without more specific research. PRITECH's involvement unfortunately ended in 1993; ideally, long-term support for health workers and mothers would have continued and been adapted to increasingly fulfill the functions of a maintenance intervention.

Sources for this case study are: HealthCom 1985; Spain and McDivitt 1988; Levine 1990; McDowell and McDivitt 1990; Snyder 1990; HealthCom 1992; Rasmussen 1985; and Millsap 1993.

tinuous donor involvement—see below, Sustainability and Institutional Issues).

While existing literature provides ample discussion of use of radio, it contains only limited mention of the use of television and print media to promote child survival in sub-Saharan Africa. These media appear to have been used mostly in an irregular manner with unpredictable scheduling—making them unlikely tools for directly supporting sustained behavior change. Nevertheless, examples from other parts of the developing world demonstrate the potential of television to influence health practices. In Egypt intensive television campaigns to promote ORS in 1984 and 1985 resulted in very high rates of its recognition, use, and correct preparation. However, these gains proved unsustainable. With the end of large-scale donor assistance by 1990, CDD promotional activities were cut back dramatically. The ORT use rate (including ORS and home available fluids) was down to 34 percent in 1992.[7]

Two essential questions related to the choice of television as a communication medium concern its ability to reach the target audience and the management of air time. For example, television may not be useful for reaching rural women with child survival messages, but ideal for disseminating AIDS messages to urban, middle class youth.[8] A firm commitment must be made to transmit spots regularly for a sufficient period of time.

Mass media clearly play an important role in changing behaviors, but the potential for fast results through the media should not be viewed as a substitute for other communication strategies—particularly when the principal objective is maintaining learned behavior. During the maintenance phase of child survival programs, mass media—if well targeted and managed—can play an important and cost-effective role in supporting the primary target audience and the support groups and systems.

The broadcast media and health workers. Most media programs have focused on the consumer—teaching mothers information and skills for child survival. Yet, radio could also be used to reach health workers directly—especially those working in isolated health centers and as community volunteers. Radio messages directly evoking health worker roles and offering reinforcement can greatly improve motivation for volunteers and paid staff.[9] Nevertheless, radio can do more than just promote the image of health workers. Using a standard magazine format, for example, programs

could target and involve health workers in discussions of issues pertinent to delivery of services or provide performance statistics (such as the results of an immunization campaign or the number of safe births per month) to give workers and the community positive feedback.

In an example from Lesotho,[ ] nurses attending in-service training composed songs on immunization and CDD, sang them to familiar melodies, and were judged on which one was best. This competition was taped and aired on local radio. The inexpensive exercise gave health workers valuable recognition in the community and served as a reminder to parents about important child survival practices. Because radio is typically based at the regional or provincial level in Africa, focused, locally relevant programs would be of interest to local broadcasters.

Television might be better suited to supporting the practices of higher-level medical personnel and policy makers who live mostly in urban centers and can afford televisions. Television programs, in the form of spots, or better yet, news items, could recognize the efforts of pharmacists to promote oral rehydration packets, or describe the promotion of breastfeeding in hospitals. The broadcast media could play a role in maintenance by providing performance feedback and social recognition for the wide variety of people delivering health care. However, there has been little systematic analysis or evaluation of the effect of radio and television spots on the status and motivation of health workers in sub-Saharan Africa, representing another gap in our existing knowledge of interventions and their effectiveness.

Print materials

Printed materials are used in nearly all major health education programs in sub-Saharan Africa, yet very little systematic evaluation of their impact appears in the literature. An exception is a study conducted in the Gambia[ ] for a campaign promoting the use of water-sugar-salt (WSS) solution. Fliers represented the only health education mechanism that had a positive correlation with learning *and* maintenance of knowledge and practices (radio, posters, and health worker communication were also used). However, most of the studies that have been completed on this subject suggest strongly that mothers' ability to understand print materials depends on verbal explanations by health workers, and that the principal utility of

print materials is as an aid to health workers to educate patients and mothers.

For example, a study of the use of fliers, posters, and flipcharts promoting ORT in Mauritania, Mali, Niger, and Senegal[67] showed that few mothers could interpret these materials by themselves. Health workers did not take advantage of the materials, often not displaying them and rarely referring to them during interactions with mothers. Most health workers did not consider health education to be an essential part of their job. The principal lesson drawn from this study is the necessity to train health workers concerning the importance of, and techniques for, interpersonal health education. The importance of interpersonal communication is supported by a study by the Cameroon National CDD Program following the distribution of a flier for home treatment of diarrhea.[68] Print materials appear to have limited impact on mothers unless accompanied by explanations from knowledgeable health personnel.

Sustained and effective use of print materials by health workers is essential if such materials are to be part of maintenance programs. But what is required to encourage health workers to use print materials effectively? Evidence indicates that health workers and the general public experience "fatigue" after lengthy exposure to the same materials, so providing variations of the material is clearly important. Not enough else is known about under which circumstances health workers will use materials correctly and continuously.

National campaigns

Short-term, intensive national campaigns have been shown to be effective in initiating behavior change,[69] but are often at odds with the sustained, long-term effort required to maintain child survival practices. The most effective national campaigns have been those that combine mass-media and print materials with strong mobilization of health personnel to promote child survival practices. However, there are several references in the literature to the potentially negative long-term impact of campaigns, which can be "difficult to organize, often ineffective, and virtually impossible to sustain." Moreover, campaigns can divert resources and attention from other important programs and regular service delivery in health systems.[70]

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Social marketing

The term social marketing is used in the literature to describe widely varying types of interventions. The term most commonly refers to the use of concepts found in private sector product promotion, especially an emphasis on the consumer's perceptions and desires, and the application of these concepts to the active promotion of products and practices for public benefit. Under this definition, seat belt campaigns, nutrition education, and ORS promotion can all be examples of social marketing.[73]

Social marketing in this sense is an approach rather than a type of intervention. The methods of social marketing can be applied to all types of activities promoting health behaviors. The approach considers four "Ps"—product, price (monetary, psychological, and social), promotion, and place—each with an emphasis on what is appropriate for the consumers, who, for child survival programs, are principally mothers and health workers. A fundamental part of the social marketing planning process is research on the consumer by means of surveys, focus group studies, interviews, and behavior observation. These tools help to explain how to make health messages meaningful and motivational, and how to render the desired actions feasible. As with campaigns, the most successful social marketing efforts have used multiple communication channels to reach the target audience—including strong interpersonal communication.[74]

Social marketing has also been interpreted as a more literal use of the private sector itself to promote products and practices for the public good. We cover this use of the term below.

Private sector

In sub-Saharan Africa the most common collaboration between the public and private sectors for health behavior has been for the distribution, sale, and promotion of condoms and contraceptives. Generally enjoying public sector subsidies, these types of social marketing programs have achieved impressive sales of condoms in several countries.[75] Efforts to employ private sector channels for behavior change related to child survival, generally for the sale of ORS, have achieved only limited success.[76]

While the private biomedical health sector is generally smaller in sub-Saharan Africa than in other developing countries, there is considerable evidence that pharmacists and other sellers of drugs, in particular, have strong

potential for facilitating behavior change for child survival. Studies of treatment patterns for malaria and fever show the most common treatment to be chloroquine-based drugs purchased without consulting the public health system.[77] However, there have been few efforts to improve prescribing practices, and little is known concerning what approaches might work in influencing pharmacists.[78]

In principle, techniques used by private, for-profit pharmaceutical companies to maintain sales should lend themselves to the sustained promotion of products important for child survival, such as ORS. Unfortunately, the concept of profit—the ubiquitous incentive and motivator at all levels of distribution and sale of private sector products—is often at odds with public sector program sustainability in sub-Saharan Africa. The impressive sales of condoms referred to above rely on subsidies; these social marketing programs face uncertain futures once the subsidies are removed. If creative ways could be found to harness the profit motive within sustainable public sector interventions, profit would be an ideal reinforcement for a wide variety of maintenance activities.

There have been efforts to employ other private sector practices, such as detailing, or personal visits to health practitioners, in the promotion of ORS. In Niger and Mali in 1988–89, PRITECH trained personnel of parastatal pharmaceutical organizations to act as detailmen. This interesting intervention achieved limited success, compromised by the lack of a profit incentive or entrepreneurial spirit—found in the private sector but difficult to engender in public sector personnel.[79]

The traditional health sector plays an important role in sub-Saharan Africa, serving an estimated 80–90 percent of the population.[80] Several studies have shown a willingness on the part of some types of traditional healers to collaborate with the public sector,[81] and several interventions have attempted to involve traditional healers.[82] However, very little is known about how to work with traditional healers, or how effective they might be as a support group for mothers.

The prevalence of the traditional health sector in sub-Saharan Africa, despite competition from the biomedical health sector, means that the so-called behavior of seeking care from the traditional sector is well maintained. Traditional health services clearly provide, and benefit from, deeply ingrained systems of reinforcement and support. Through close

analysis of these systems, we could perhaps learn important lessons for supporting public health programs.

Programs directed at health workers

Most programs aimed at changing health worker performance feature a training component. In addition to training, this paper will explore other potential interventions for changing and maintaining behavior: supervision, the broadcast media (see Media, above), direct mail, and self-observation. Before discussing these specific activities to maintain health worker performance, however, it is important to discuss the essential *functions* that maintenance activities for health workers should fulfill. Maintenance activities should provide opportunities for health workers to:

- validate correct practices;
- receive performance feedback;
- update skills and technical information;
- solve service delivery problems;
- solve problems in contacts with mothers and community members; and
- receive social and professional recognition.

An example that illustrates the importance of maintenance functions comes from the Nigeria EPI program in 1991. Data show that initial use of immunization services was high and that health workers' general knowledge of EPI norms and procedures was adequate. The four reasons contributing to the high drop out rate from DPT1 to DPT3 (30 percent) were related to health worker behavior: "Health workers lacked the ability to gauge their own program performance, including immunization coverage rates; children with mild illness were not immunized...; mothers often felt mistreated or abused by health workers...; and inadequate information and misinformation about measles and immunization was widespread."[5] This description suggests that learned behavior was adequate, but that poor performance was caused by a lack of constructive feedback, poor relations with clientele, and a shortage of interpersonal communication. To tackle the complex problem of maintaining health worker performance, some combi-

nation of activities that fulfill the functions listed above needs to be designed, tested, and supported.

Training. Training is ubiquitous in international health as the intervention of choice for improving health worker performance. Many programs aimed at changing mothers' behavior also include training health workers. On the other hand, weaknesses in training are often blamed for continued unsatisfactory health worker performance. Two training issues emerged from our investigation: first, training, as currently conceived and executed, is not the appropriate solution for all problems concerning health worker performance. Second, training should be more accountable for the objectives it purports to achieve by providing concrete measures of training outcomes, taken over time.

Available literature often describes the content and length of training sessions, but rarely discusses the *methods* used. For example, a typical field training description reads as follows: "... a one-week training session was held for all village health workers in the study villages. This training *reviewed* the goals and strategies for home visits, and *offered a refresher course* in health education techniques and messages. Additionally, the nurses ... were *advised* on techniques for supervising the VHWs and *were provided* a newly formulated supervisory checklist ...."[84] Thoroughly covering information, in didactic or even participatory sessions, is seldom enough to accomplish changes in health worker practices.[85] Of particular interest, then, is the proportion of training time actually devoted to didactic sessions (changing technical knowledge), practice of skills with feedback (changing behavior), and addressing trainees' experiences (changing attitudes).[86]

Changes proposed to improve training include adding and strengthening training-of-trainer sessions,[87] increasing the time for practice with feedback,[88] decreasing time spent on theory and didactic presentations,[89] and spending more time on field practice.[90] While most training programs include an evaluation, evaluations rarely measure behavior change accomplished[91] but measure trainee satisfaction with the workshops instead.[92]

Much of field training wisdom lies outside the formal literature and can be found in materials describing the programs offered by large training organizations.[93] Many of the training principles they espouse (for example, competency-based training, adult education approaches) have not become standard for training programs in the field.

Training activities will no doubt continue to count for a large portion of interventions designed to improve and maintain health worker performance. Indeed, USAID projects in Africa with substantial training components are more likely to benefit from long-term ministry of health and donor support.[94] However, to maintain learned behavior, training must be defined *functionally* so that what it can and cannot accomplish is clear. Unanswered questions related to the use of training in maintenance programs include: What health sector problems should training programs address? How should training programs be integrated into supervisory systems and vertical disease control programs to ensure continued support of behaviors and practices taught in training? And, what essential, minimal components of training are necessary to produce reasonable changes in health worker behavior?[95] Once defined, this package of components could be tested for use in maintenance programs.

Supervision. Training is normally viewed as a discrete event. Supervision is a series of ongoing activities to reinforce skills and positive performance and to find solutions to problems encountered on the job. To make supervision a major vehicle for maintaining health worker performance, programs must focus on the skills of individual supervisors and the components of a broader supervisory system. Strengthening individual supervisory skills has resulted in better health worker performance,[96] but few programs have measured the impact of more effective supervision of health workers on mothers' health practices. On the other hand, weaknesses in supervision are well documented, including supervisors' low skills[97] and supervisors' focus on administrative details rather than on health worker performance. Inadequate supervision is often cited as a cause of poor health worker performance.[98]

Individual supervisors themselves often function in a weak system. In many ministries of health, supervision is administratively separate from in-service training, pre-service training, or activities under various vertical programs (CDD, EPI, MCH). This administrative set-up and these donor support patterns make it difficult to coordinate effective supervision with what health workers are trained to do. Even supervisors with appropriate skills need professional support to supervise effectively and frequently enough to help maintain health workers' practices. In each specific setting, improving supervision for maintenance requires an analysis of what essential behaviors mothers and health workers need to continue, and how support

from supervisors would help. Supervision of health workers, if strengthened and well targeted, can fulfill some of these maintenance functions.[77]

Supervision is especially important for maintaining the skills and activities of volunteer and community health workers. Often community-based programs provide initial training in primary health care and communication, but do not provide for follow up. Without support, skills deteriorate and participation fades[78] (see also Community-based interventions above).

Other forms of professional support for health workers. Training and supervision have been the main types of intervention to date for improving and maintaining health worker performance. Several other, less labor-intensive methods have been tried on a limited basis and should be considered for inclusion in a maintenance package for health workers. One of the most important functions of any maintenance activity is to generate feedback relevant to the individuals or groups performing a target behavior or engaging in a support activity.

Direct mail. Experiments with direct mail to health workers—especially in outlying areas where visits from supervisors are difficult—indicate that it has potential as a maintenance tool. In Zaire the USAID-funded rural health project (SANRU) corresponded directly with regional medical officers (RMO) to help them design training for health workers in their localities. The project had produced an interactive form, which when filled out, took the RMO through all the essential considerations in designing effective training. SANRU support for the training was contingent on the form being filled out. In Indonesia, after an initial small pilot mailing, 18,500 voluntary community health workers (Lader) were mailed an updated calendar insert, a letter of praise from the provincial health chief, a technical update on CDD, and a short questionnaire. Despite the fact that the Lader had to buy a stamp to return the questionnaire, more than 8,500 responses were received in the first weeks—many included long letters to the provincial chief.[79] These experiences suggest that newsletters or even periodic summation of statistics from field reports mailed to health workers are cost-effective ways to provide technical information and feedback.

Self-observation. Simple observation forms are being used increasingly in training to help participants and outside observers focus on concrete behaviors necessary for diagnosis, treatment, and communication with mothers. Observation checklists for supervisory and training skills have also been

used in training or research. In industrialized countries self-observation has mostly been promoted in the context of smoking cessation and weight control programs. Nevertheless, self-observation for health workers in Africa is a possible new tool to help in maintaining individual behavior.[102]

A general principle of self-observation for health workers is that, by continuing to use the same skill observation forms they have used in training sessions, they can select one or two behaviors to check when they are in contact with mothers. This kind of self-monitoring maintains health workers' awareness of key behaviors learned in training, and gives immediate, concrete feedback on practices they are trying to perfect without the presence of a supervisor. Self-monitoring cannot substitute for face-to-face supervision or in-service training, but it can help sustain motivation and performance between sessions.

Sustainability and Institutional Issues

Although the support of child survival behaviors requires interventions continued over a long period of time, the concept of sustainability receives little attention in the literature on behavior change, which is predominantly concerned with bringing about initial changes in behavior.[103] Documentation from the HealthCom project does provide analysis of the importance of sustainability for long-term behavior change, including an emphasis on ensuring that positive reinforcement is recurring over time—the essential concept underlying behavior maintenance programs: "We know from the applied behavioral sciences that sustainability of new health behaviors is largely a function of how people perceive their consequences, and that to sustain new behaviors in a public health setting, we must identify satisfying consequences, deliver those benefits in a culturally sensitive way; and compete successfully with the 'benefits' of less healthy behaviors .... To sustain new behaviors over time, however, we must increasingly use strategies targeting community level behavior change and providing more naturally occurring rewards, such as social support and endorsement by respected local leaders."

Other discussion of sustainability as it relates to behavior change focuses on institutional issues, particularly the capacity of MOH health education units to carry out long-term interventions. Health education units are often poorly staffed and funded. They tend to lack influence within ministries, and to be neglected by donors in favor of vertical child survival programs.[104]

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Donors should pay particular attention to long-term staffing needs and skills (particularly in formative research and planning[107]) within these units, and should be aware of the non-sustainable nature of short-term projects that inject cash and prestige. Donors should instead emphasize reinforcing the capacities of local institutions, which will eventually be required to support child survival maintenance interventions. In addition, decision-makers in ministries must be convinced of the value of health education.[108]

Sustainability is a critical concept in the design of programs to maintain and support behavior change over the long-term. This literature review has clearly pointed out that interventions for initial behavior change are not enough—that gains made in practices will quickly erode (and gains in knowledge will erode slightly more slowly) unless support for the desired behaviors continues. This concept is certainly not new to us; Coca-Cola knows it well, and advertises continuously to keep its clientele. But what we do not know is what level of support is required to maintain behaviors, as opposed to creating initial behavior change, and at what point, if any, the child survival behaviors we are seeking to promote will become social norms and will no longer require significant outside support. Answers to these questions require further research and analysis.

Conclusions from the Literature Review—What We Know

Our review of the literature concerning behavior change for child survival in sub-Saharan Africa leads us to the following conclusions.

Determinants of behavior change

- A variety of internal and external factors are found to influence mothers' care of their children. The most important internal factors are education, knowledge, indigenous and traditional beliefs, self-confidence, skills and perceptions of severity, and consequences. Important external factors for mothers are costs (including non-financial), interactions with health workers, and social supports.

- Health workers are in many cases directly responsible for the health of children (through case management), and are also an important influence on mothers. To fulfill both of these functions successfully, health workers require sustained support. Contributing factors to poor health worker performance are skill

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deficits and health workers' perceptions that limit the scope of their roles—often as an essentially curative role at the expense of promoting preventive care. Nevertheless, levels of correct knowledge are substantially higher than actual performance. The main reason for this gap is a lack of sustained reinforcement and support for positive health worker performance.

- For health workers and mothers, the *nature of the desired behavior* can in itself act as a strong influence either encouraging or discouraging the continued practice the behavior. Many child survival behaviors are preventive in nature, and thus lack an element of strong immediate and visible reinforcement for the person responsible. To maintain many of these behaviors, other sources of support are necessary to compensate for the lack of immediate reinforcement from the behavior itself. These supports, in turn, must be maintained long enough for the benefits of preventive behavior to become visible—more and healthier children surviving—and until the behavior becomes ingrained as a regular health practice.

Maintenance of learned behavior and sustainability

- Interventions for *initial behavior change* are not enough—gains made in knowledge and practices will erode unless support for the desired behaviors continues. Unless newly learned behaviors of mothers and health workers are *supported*—by social reinforcement, public communication, and the health system—these behaviors will fade with time.

- Once initial behavior changes are realized, a *maintenance phase*, lasting at least several additional years, is required. Since most donor-supported projects are limited in duration, and because permanent behavior change implies the gradual elimination of outside supports, maintenance programs must not require intensive financial resources. Rather, maintenance programs should, to the extent possible, take advantage of existing structures and non-financial sources of behavior reinforcement.

- The *functions* that maintenance programs should fulfill include engaging *social support* for desired behavior from family, commu-

nity, and peers; providing *feedback* on performance; finding *solutions* to problems in performing desired behavior; and providing *reminders* of how to perform the desired behavior, and of time, place, and availability of child survival services.

- The literature on behavior change is predominantly concerned with bringing about initial changes in behavior, and gives little attention to sustainability. However, donors should emphasize reinforcing the capacities of local institutions, which will eventually be required to support child survival maintenance interventions, and should pay particular attention to long-term staffing needs and skills (particularly in formative research and planning) within health education units.

Interventions for behavior change

- To support mothers and health workers effectively, programs designed for maintenance must receive adequate support. For example, community health workers must receive adequate compensation and recognition or they will gradually cease to perform their function of educating and supporting mothers.

- Most interventions use more than one set of support groups and systems; the most successful health communication efforts mobilize several different influences on the target audience.

- Among the mass media, *radio* has proven to be an effective channel for initiating behavior change in sub-Saharan Africa, particularly in rural areas. Frequent, regular, and effectively designed radio spots have strong potential for maintaining positive health practices. *Television* is infrequently cited in the literature and does not appear to have been used effectively for initial behavior change or maintenance in sub-Saharan Africa (other than for AIDS prevention campaigns). When used together with other support systems, mass media offer a promising channel for supporting behaviors for primary and secondary audiences, including health workers.

- Educational *print materials* are commonly produced in child survival programs, but are rarely evaluated. Mothers' ability to understand print materials depends to a great extent on verbal

explanations by health workers. The principal utility of print materials appears to be as a supporting tool for the health worker in educating and communicating with mothers. Evidence indicates that health workers and the general public experience fatigue after lengthy exposure to the same materials.

- Short-term, intensive promotional *campaigns* have been shown to be effective in bringing about initial behavior change. However, such campaigns are often at odds with the sustained effort required to maintain child survival behaviors.

- Efforts to use *private sector* channels and methods to bring about behavior change related to child survival have been limited. There is considerable evidence, however, that pharmacists and other sellers of drugs have strong potential for facilitating desirable behavior change. Traditional healers also appear to have potential as agents for behavior change, but very little is known about the traditional sector or how to influence it.

- For health workers, it is important to isolate the essential functions of activities that can support and maintain positive performance. *Training*, the most commonly used intervention for health workers, should be re-evaluated in light of long-term objectives related to reinforcing learned behaviors. Inadequate *supervision*, often cited as a cause of poor health worker performance, is caused by serious skills and performance deficits on the part of supervisors and weak supervisory systems in general. Supervisors also need effective systems of support to function adequately. In addition to training and supervision, promising interventions for supporting health workers include the *broadcast media*, *direct mail*, and *self observation*.

- Well-designed and -supported *community level interventions* appear to be the most effective type of intervention for supporting mothers' behavior. However, precisely because they are focused in small areas, community interventions typically have limited public health impact. CHWs require strong supporting systems and reinforcement from the community to be effective. Sustaining enough CHWs to cover a substantial population poses a particular challenge. Other community-level interventions that have been

successfully employed, on a limited scale, are theater, school-based programs, and mothers' support groups. However, in sub-Saharan Africa none of these interventions has been sustained for a long enough period of time to evaluate its effectiveness as a maintenance intervention.

Information Gaps—What We Don't Know

Our review of the literature reveals significant gaps in knowledge and understanding of behavior change for child survival in sub-Saharan Africa, particularly for maintaining learned behavior over the long-term. These gaps should orient future research and analysis activities. However, the gaps are wide, and not all of them can feasibly be addressed by HHRAA and the SD Office. The principal gaps are:

Determinants of behavior change

- The literature identifies in general terms the most important internal and external factors influencing mothers' decisions about the care of their children. However, the specific constellation of the factors that influence mothers can vary dramatically by setting, as well as by the nature of the behavior. For this reason, an understanding of the determining factors in any given area for the purposes of program design and planning requires *research specific to that area.*

- For health workers, we do not have sufficient explanations for *performance deficits*—gaps between knowledge and performance. A better understanding of the factors causing performance deficits in different settings could lead to strategies to increase the correct and consistent use of learned knowledge and practices and to sustain these practices over time.

- There has been little systematic analysis to date of the different steps involved in *complex behaviors* requested of mothers and health workers, or of preventive behaviors for which reinforcement is delayed (such as immunizations). Such analysis is a prerequisite for developing supporting interventions that can provide support and reinforcement at different steps of complex behaviors—for example, offering encouragement to a mother for

bringing her child to a health center for vaccinations, for having the child immunized, and for filling out the immunization card.

Maintenance of learned behavior

- We do not know what level of support is required to maintain behaviors as opposed to creating initial behavior change, and at what point, if any, the child survival behaviors we are seeking to promote will become social norms and will no longer require significant outside support. As a result, we can only guess for how long maintenance programs will be necessary—although the required length will likely vary depending on the type of behavior recommended, and the capacity of local groups to support it.

- Supporting systems that are appropriate for maintaining behavior are not well understood. *Social support* is clearly a critical concept, but little is known about which individuals and groups can provide the sustained support necessary for the continued practice of child survival behaviors. A determination of appropriate sources of social support in any given area will require research specific to that area.

Interventions for behavior change

- How interventions achieve initial behavior change is well documented, but how they could function over the years to support learned behavior is not. Many interventions have produced initial changes for mothers and improvements in health worker performance in the short run (typically measured within one year of the intervention). To use these interventions for maintenance, they need to be tested over longer periods of time.

- *Community support* is recognized as a critical element for sustaining learned behaviors. However, there is very little documentation of community level interventions designed for behavior maintenance rather than initial behavior change. Specifically, not enough is known about

- successful strategies for supporting *community health workers* (CHWs) over the long term;

- the potential of *theater* as a maintenance intervention;
- the use of *school-based programs* for behavior maintenance; or
- the long-term viability of *women's groups* as support groups for behavior change.

- There has been little systematic analysis or evaluation of the effect of *radio and television on the status and motivation of health workers.*

- *Printed materials* are used in nearly all major health education programs in sub-Saharan Africa, yet there has been very little evaluation of their impact on health practices. Research and experience has shown that these materials are much more effective when explained by health personnel, but not enough is known about the circumstances under which health workers will use materials correctly and continuously.

- Knowledge and experience concerning different elements of the *private health sector* that might help bring about and support behavior change is very limited. Despite the influence of *pharmacists and drug sellers*, there have been few systematic efforts to improve their prescribing practices; there is little knowledge concerning what approaches might work in influencing pharmacists. Little is known about how to work with *traditional healers*, or how effective they might be as a support group for mothers. Traditional health services provide and benefit from deeply ingrained systems of reinforcement and support. Through close analysis of these systems, we could learn important lessons for supporting public health programs.

- *Training* and *supervision* are common interventions directed at health worker performance. To better design training programs to maintain behavior, it is important to understand the essential, minimal components of training necessary to produce reasonable changes in health worker behavior. Once defined, this package of components could be tested for use in maintenance programs. Likewise, in each specific setting, improving supervision for maintenance requires an analysis of the essential behaviors requested

of mothers and health workers, and what supporting activities by supervisors would help.

Recommendations

The following recommendations flow directly from analysis of the conclusions and information gaps presented above. Underlying these recommendations is a conviction that donors and ministries of health must take a long-term view to creating and maintaining behavior change for child survival, and must experiment with new approaches designed to maintain behaviors once they are learned. While the recommendations are primarily intended for use by the HHRAA Project and the SD Office of the USAID Bureau for Africa, they are also applicable to centrally funded and bilateral USAID projects, other donors, and ministries of health in African countries. The recommendations are divided into three sections: analysis, research, and dissemination. They are not listed in order of priority.

Analysis

- *Develop a synthesis paper on maintenance of learned behaviors*, emphasizing the functions of maintenance programs and the need for a long-term approach to behavior change. This paper should emphasize that the specific conditions that will determine the composition of an appropriate package of supporting systems for maintenance vary by setting—so while a *general approach* to maintenance will be appropriate across settings, specific research will be necessary to design each *maintenance package*. This principle applies just as much for the support of health workers, where analysis of the needs and skills of the health workers is a prerequisite to improving performance, as for support of mothers' behaviors. Target groups for the synthesis paper will include program managers in African ministries of health as well as policy makers at donor institutions; given this variety, more than one version of the paper will likely be required.

- Within the context of a specific child survival behavior change initiative, develop a *methodology, or set of guidelines, to design, monitor, and evaluate maintenance interventions*. Steps in the methodology would include assessment, initial research (qualitative and quanti-

tative), definition of maintenance functions, intervention design (focusing on tiers of support), monitoring, and evaluation.

- *Develop instruments to implement the different steps in the above methodology.* The results of such a pilot implementation of program components designed specifically for behavior maintenance would provide examples and lessons learned for the design of additional interventions in the future.

- *Perform an analysis of training methods* focusing on the functions and objectives of training, and measurable outcomes. This analysis should explore how training can be used to support and maintain learned behaviors. A proposed package of training functions necessary for maintenance could then be tested.

Research

- *Conduct operations research to test the viability of different types of interventions for maintenance.* Research should ideally take place in a program where significant levels of initial learning of behaviors have already been realized, and should focus on:

  Functional analysis of existing interventions that teach and support mothers' and health workers' behaviors. Operations research would begin to establish the functional dynamics of maintaining learned behavior. Cumulative results would help establish and refine a list of essential functions that maintenance interventions fulfill. Once field tested, this list would become a part of the guidelines for maintenance interventions referred to above.

  The supports are necessary to sustain maintenance interventions. Cumulative results would help establish content of support packages.

  The benefits of maintenance interventions relative to their cost.

  Case studies of attempts to promote institutionalization of methodologies and skills in ministries and training schools—for example, curriculum changes that include counseling skills in medical, nursing, and public health schools. The impact of such changes could be evaluated by tracing the performance of students who have been exposed to the new curriculum.

Dissemination

- Circulate the synthesis paper or papers referred to under Analysis, above. Targets for dissemination will be donors concerned with health education programs, policy makers in ministries of health, and health education units.

- *Convoke a meeting of USAID projects and donors* to present the major themes underlying behavior maintenance, and to discuss the importance and implications of this topic in donor activities, projects, and operations research. The results of this meeting would be widely disseminated within the donor community.

- Disseminate the guidelines and instruments developed for implementing maintenance interventions, focusing especially on USAID projects, other donors, and health education units.

- Disseminate results of the operations research described above. By definition, research concerning maintenance interventions should take place over a relatively long period of time (the longer the better, within the limits of USAID projects). Dissemination of results should occur periodically, over a considerable period of time.

trained more than 200 education officers, who were in turn to train teachers in each of their zones. It is too early to evaluate the success of this program. Smith et al. 1993.

[51]Judy Canahuati, personal communication 1994. The Wellstart Expanded Promotion of Breastfeeding (EPB) Project and La Leche League International are both actively involved in promoting mother support groups in Latin America.

[52]Diene 1993. From a PRITECH trip report in the Fatick Region, 1991.

[53]Diene 1993.

[54]Brieger 1990.

[55]Sukkary-Stolba 1990.

[56]HealthCom 1992.

[57]Brieger 1990.

[58]Booth 1984. In comparing the use of radio in the MMHP projects in The Gambia and Honduras, Booth points out that The Gambia has 12 languages. Some sub-Saharan African countries have even more linguistic variety; Cameroon has more than 200 languages.

[59]Clift 1989.

[60]USDHHS/NCI 1984; Booth and Mata 1992; WHO 1994.

[61]Steinwand and Waters 1993. The CDD radio intervention in Cameroon was supported by PRITECH. PRITECH programs in the Sahel region also conceived of radio as a supporting, long-term intervention and encountered similar institutional difficulties.

[62]In 1986, 96 percent of mothers interviewed by an evaluation team had recognized ORS packets, 82 percent reported using it, and 97 percent of users were able to mix it correctly. The vast majority of mothers able to recognize ORS at that time attributed their knowledge to television spots (USAID 1987; UNICEF 1994). In another example, from the Philippines, television was successfully employed as part of immunization campaigns in metro Manila in 1988 and nationwide in 1990. These campaigns also em-

phasized direct promotion by health workers. The 1990 campaign lasted six months and resulted in an increase in complete immunization coverage for 9 to 11 month-olds from 33 percent to more than 56 percent (de Guzman et al. 1993).

[65]See Smith et al. 1993, Chapter 8, for a full discussion.

[66]Elder et al. 1992a. This example from Indonesia shows that radio programs directed at mothers and community leaders, and designed to promote the work of community health workers (kader), were an effective means of increasing community social support for the kader. In an experimental area, the programs, listened to by most mothers (64 percent) and kader (94 percent), led to an increase in compliments received by the kader and in health education sessions between the kader and mothers.

[67]Ed Douglass 1994, personal communication.

[68]Snyder 1990.

[69]Herman and Prysor-Jones 1993.

[70]Hyslop, Herman, and Waters 1993. Respondents who had received an explanation of the flier were significantly more aware of all of the recommended measures than respondents who had been given the flier without explanation—even when the former group had not kept the flier.

[71]This has been particularly true for AIDS prevention campaigns, which have produced focused messages for increasing knowledge and have often benefited from greater financial resources than child survival programs. See Smith et al. 1993, Chapter 8, for a discussion.

[72]For example, see Case Study 1 concerning the MMHP project in The Gambia. A 1988 campaign for immunization in Manila, the Philippines, supported by HealthCom, very clearly demonstrated the critical promotional role of health workers in a national campaign as "pivotal actors and actresses in the delivery, as well as 'selling' good health to their clients" (de Guzman et al. 1992).

[73]Rasmuson, Hornik, and Smith 1990.

[74]HealthCom 1992.

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Annex 1. Strengths of USAID Related to Research and Analysis.

Perhaps the single most important strength of USAID related to research and analysis is the presence of USAID missions and large projects working on a long-term basis in African countries. In several countries in sub-Saharan Africa, USAID is financing large, integrated child survival and family planning projects that are very concerned with behavior change. These projects are staffed by technically competent long-term advisors and in-country nationals. This presence lends itself to research within an on-going operational context, and to the use of research results to resolve specific problems within programs.

USAID regional offices in Abidjan and Nairobi offer additional technical expertise and increase the possibilities for comparable cross-country and regional studies. Several USAID projects, such as the BASICS project, also have regional offices that can help to coordinate and support cross country research. Centrally funded projects also offer experience and technical skills, specializing in technical assistance and research design and execution. These projects can call upon a wide range of experts from cooperating agencies and universities. The Africa Bureau of USAID, particularly the SD Office, provides oversight and technical support for on-going research, analysis, and operations activities.

USAID cooperation with and support for a variety of African institutions at the regional and national levels creates opportunities to conduct research and analysis activities in close collaboration with African individuals and organizations. The presence of long-term resident advisors facilitates the identification of needs and appropriate channels to execute activities. In addition, USAID is involved in promoting partnerships with the private sector in Africa. Social marketing, including the sale and promotion of products and behaviors and the local production of pharmaceutical products (such as ORS), are among USAID's initiatives with the private sector.

Annex 2. Effective Research and Analysis and Dissemination Approaches

For research and analysis activities supported by HHRAA, emphasis is placed on conducting studies and research within an operational context, including pilot projects and the on-going activities of African ministries and other institutions. Wherever possible, research and analysis activities should go beyond finding the response to discrete questions and should attempt to deal with difficult questions related to implementing results, and overcoming likely constraints to implementation.

To be most effective, research should be cross-country or regional, addressing specific problems found in more than one setting and more than one country. Methodologies, data collection instruments, and definitions used across countries should provide comparable results. Research should be completed within 12 to 24 months.

The issues identified should clearly be of strategic importance to African decision-makers, USAID, and other donors. Research should help to fill existing gaps in information as identified by this strategic framework. Research efforts should, from the start, identify measurable and verifiable objective indicators for general objectives (goal) and specific objectives (purpose).

Research and analysis activities should involve African institutions and, wherever possible, be conducted by African institutions and African researchers. The incorporation of the priorities of African decision-makers and the transfer of skills are essential elements of HHRAA research and analysis activities.

Timely and appropriate dissemination of results, and their impact on implementation, are key factors in determining the success of research and analysis activities. Dissemination efforts, whether in the form of written documents, workshops, or other contacts, should clearly be well targeted. Follow-up efforts after initial dissemination will be a critical part of efforts to ensure appropriate implementation of results.

Sequencing and phasing of activities

Research and analysis activities should in general employ the following schedule:

- Conceptualization and design of the activity.
- Field work and data collection.
- Analysis of results.
- Dissemination of results.
- Implementation of results.

Benchmarks and key indicators of progress

HHRAA-supported activities should employ three broad categories of indicators:

- Process indicators that measure outputs of the activity.
- Intermediate impact indicators that measure actions taken by target audiences of the activity—generally host governments, USAID, and other donors.
- Impact indicators that measure the ultimate effect of the activity—on the financing, provision, and consumption of health services.

[73]Andreasen n.d..

[74]See "Results and Realities" (HealthCom 1992) for a variety of examples of social marketing programs.

[75]Population Services International 1992.

[76]Population Services International has launched a program to sell and promote an ORS brand through the private sector in Cameroon. The social marketing of ORS in Morocco and Bangladesh has resulted in significant sales—15.8 million packets were sold in Bangladesh in 1991, with reinforcement from the mass media, school-based programs, and training of health personnel and pharmacists (PSI 1992).

[77]Snow et al. 1992. In a study in eastern Kenya, 72 percent of mothers interviewed said that, when their children showed symptoms of malaria or fever, they would bypass the public health system and go to shops to purchase drugs, mostly chloroquine-based ones. Similar studies in western Kenya and Togo showed that 30 percent and 79 percent, respectively, of respondents purchased drugs for home treatment of malaria.

[78]Laing 1991. In industrialized countries, the most effective methods are interpersonal communication and regular contact to check prescriptions and provide feedback to prescribers.

[79]Camille Saade, personal communication 1994.

[80]From the HHRAA document, *Strategic Framework for Strengthening the Contribution of Non-Governmental Health Care Provision to National Health Goals in Africa*, DDM Project.

[81]Including a survey in Cameroon (Ndonko 1990), which showed that traditional healers expressed enthusiasm for learning about and using ORS and SSS.

[82]Including the MMHP Project in Swaziland, HealthCom in Mozambique, and PRITECH in Uganda and Zambia.

[83]Clay 1992.

[84]PRICOR 1990a.

[56]Kanouse and Jacoby 1988; Laing 1991; Ismail et al. 1991.

[57]For example, Naimoli et al. n.d.-a.

[58]Herman and Pryson-Jones 1993; Casazza and Endsley 1993.

[59]Herman and Pryson-Jones 1993; Elder et al. 1992a.

[60]Berney et al. n.d.

[61]Elliott-Farino, personal communication 1994.

[62]Exceptions are Naimoli et al. n.d.; Elder et al. 1992a; Elder et al. 1992b.

[63]For example, Berney et al. n.d.

[64]For example, JHPIEGO n.d.

[65]Bossert (1990) cites training as an important activity favoring program sustainability.

[66]The following is an illustrative list of components necessary for training to achieve *initial* behavior change (Graeff, Elder, and Booth 1993):

- Focus on what trainees are actually required to do on the job. Training objectives should be in terms of the behavior that participants (health workers) are to perform.

- Assess trainees' skills and practices, knowledge, and attitudes (relating to training objectives) in designing training sessions. Design demonstration and practice sessions for skills deficits and begin with problem solving for performance deficits.

- Provide actual and repeated practice of the behavior to be performed on the job, followed by constructive feedback.

- To change attitudes that affect performance, incorporate experiences in training (modeling, field practice, role play, exercises) and process the trainees' perception of their experience to shape new attitudes and apply new attitudes to job related practices.

- Include multi level staff in training to strengthen support for health worker practices, and to increase effective follow-up activities.

Endnotes

[1]PRICOR 1990a; Elder et al. 1992a.

[2]Rasmuson 1990; Graeff, Elder, and Booth 1993.

[3]Cutts et al. 1991. Among an urban population in Conakry, Guinea, educational status (measured by ability to speak French) was the most important determinant of children's vaccination coverage. Eng et al. (1991) show that knowledge of beneficial effects was one of the most important facilitating factors for immunization in a study in Togo. Pillsbury (1990) cites lack of knowledge of immunizations as one of the principal reasons stated by mothers for not having their children immunized, and points out the positive correlation between educational status and immunization coverage.

[4]Pelto 1991.

[5]Pillsbury 1990.

[6]Levine 1990.

[7]In Zaire, for example, mothers named seven diseases with distinct causes and symptoms, all for diarrhea (Yoder, Drew, and Zhong 1989).

[8]Griffiths found that mothers in Swaziland had high levels of confidence in their ability to influence their children's (and their own) health, whereas in northern Cameroon self-confidence was lacking. Griffiths also cites the importance of preventive behavior fitting into mothers' daily routines, so that such behavior becomes self-reinforcing (Griffiths 1990).

[9]Brownlee 1990a.

[10]Hounsa et al. 1993. The perception that ORT and ORS are ineffective because they do not actually stop diarrhea has been shown to be a major disincentive to use. Their actual effect, preventing dehydration, is more subtle and less self-reinforcing.

[11]Eng et al. 1991.

[12]Yoder and Hornik forthcoming.

[13]Brieger suggests that interpersonal communication with health workers is the single most effective method for influencing health behaviors, in this case in rural Nigeria (Brieger 1990). Documentation of the importance of interaction with health workers (or the health system) for mothers' health practices includes Eng et al. (1991) for immunizations in Togo, and Herman and Pryson Jones (1993) who cite KAP studies in Mali, Mauritania, Niger, and Senegal revealing that more than 60 percent of mothers in those countries with knowledge of ORT had gained it from contacts with health personnel.

[14]Cutts et al. 1991.

[15]Gittelsohn, Sillah and Sanneh 1991.

[16]Farmer et al. 1991. A study of the factors influencing compliance with tuberculosis treatment among a poor population in rural Haiti found that the most effective aiding factors were economic – free treatment and financial and food aid offered at point of treatment. Patients' perceptions of the drugs, and characteristics of the patient, were secondary.

[17]Snyder 1990.

[18]Litvack and Bodart 1993.

[19]Makinen 1979 cited in Pillsbury 1990. (Costs per vaccination are variable costs.)

[20]Buvinic et al. 1987.

[21]Leslie 1987a.

[22]Yapchiongco 1987. This study of the determining factors of ORS use in the Philippines found social support from relatives to have the strongest impact on ORS use, followed by knowledge and self-motivation.

[23]Eng et al. 1991. Women often cite husbands' disapproval or lack of permission as reasons for not attending prenatal clinics or using contraceptives (Tobisson 1980, cited in Graeff 1987).

[24]Raphael 1976. Graeff (1987) differentiates between informal (family, friends, community members) and formal (health system, community organizations, government) sources of support for women.

[25]Pelto 1991.

[26]PRICOR 1989.

[27]PRICOR 1990c; Ismail et al. 1991.

[28]Holland, Donoso, and Graeff 1992.

[29]Kofoed et al. 1992; Herman and Prysor-Jones 1993; Shafritz and Roberts 1994.

[30]PRICOR 1990c, 1990a.

[31]PRICOR 1990c, 1990a; Sircar et al. 1991.

[32]Reis et al. 1990; PRICOR 1990b.

[33]As cited in Graeff et al. 1993, p.43.

[34]Helitzer-Allen et al. 1993; Oaks et al. 1991.

[35]Rasmuson 1990; Graeff et al. 1993.

[36]Ismail 1991.

[37]Graeff, Elder, and Booth 1993, Chapter 7.

[38]Rasmuson 1990.

[39]Examples of the use of CHWs to achieve initial behavior change include the Danfa Project in Ghana, where trained village volunteers educated villagers about immunizations and reminded them about dates, contributing significantly to increased immunization acceptance (Pillsbury 1990). In Katana, Zaire, USAID and the MOH supported a program of intensive home visits by village health workers. In six months the use of preventive health services increased from 53 percent to 88 percent; correct knowledge of the vaccination schedule and danger signs for dehydration also climbed sharply (PRICOR 1990a).

[40]Rubardt 1992. The project's midterm evaluation states that the work with neighborhood counsellors "appears very promising ... [and] can achieve behavior change at the household level, and continue with minimal support" (the report did not clarify what "minimal support" would en-

tail). The evaluation reports that participation in growth monitoring programs and knowledge of SSS were nearly universal in the target areas. A KAP survey measured use of SSS in these areas at 81 percent.

[44]PRICOR 1989 and PRICOR 1990b. A separate study in India (Sircar 1991) shows that training of CHWs for health education failed to succeed due to a lack of logistical support and proper supervision.

[45]HealthCom has worked with groups of women (Maman Tengeneza) in Ruashi, Zaire. These women received essential training for ORT, malaria, nutrition, and immunizations, and were encouraged to visit other mothers in their communities. While the women volunteers were very enthusiastic about their roles, many expressed the need for financial compensation if they were to continue their activities over the long term and also take care of their families and domestic responsibilities (Yoder, Zheng, and Zhou 1991).

[46]For example, in Indonesia, radio spots targeting mothers and CHWs (kader) have been effective in increasing the status of the kader as well as the quantity and quality of health education sessions (Elder et al. 1992a).

[47]Freund and Phiri 1993.

[48]Gottert 1993.

[49]de Fossard 1993.

[50]Ogutu et al. 1992. The study in Kisumu in Kenya 1988 looked at 100 children who were taught techniques for malaria control. At the end of the intervention, parasite infection among this group had been reduced by 32 percent, while a control group experienced a five percent increase in malaria parasite infection. The teaching techniques used were relatively simple and not time consuming—each of five groups of 20 children had one training session lasting 45 to 60 minutes.

[51]Pillsbury 1990.

[52]de Fossard 1993.

[53]A large school-based sex education program for AIDS prevention has been launched in Malawi. With assistance from UNICEF and the AIDSCOM Project, the government has printed almost 250,000 books and

[96]Linnan 1993; PRICOR 1990c.

[97]PRICOR 1990a.

[98]For example, PRICOR 1990c.

[99]For example, Local-Area Monitoring (LAM) is an innovative monitoring and supervision system developed and tested in Indonesia to improve vaccination coverage and quality. A joint initiative of the Ministry of Health and the Ministry of Home Affairs, LAM involves the feedback of coverage and quality indicators to health workers in the form of easily readable graphs. Competitive comparisons are made among localities and provinces, and health workers are publicly recognized by local governments for their achievements (Kandun and Hatfield 1992).

[100]Sircar et al. 1991; PRICOR 1989; Yoder and Zheng 1991. In Indonesia, efforts to improve the supervision of CHWs (kader) resulted in positive results in the practices of the kader and in mothers' attendance at the health centers (Linnan 1993).

[101]HealthCom 1990.

[102]In an example from Bolivia, a USAID-funded project in collaboration with CARE introduced a self-observation checklist (of training skills) for participants in a training-of-trainers workshop. Participants used the checklist when they conducted their own training in the three months following. Many of the participants then mailed the forms back for use in evaluating the initial TOT workshop (Uccellani et al. 1993.)

[103]For further details, see chapter on monitoring in Graeff et al. 1993.

[104]Buzzard 1987. A review of sustainability in Africa and Central America (Bossert 1990) cites five project characteristics that improve prospects for sustainability; they are: (1) demonstrated project effectiveness; (2) integration of activities into established administrative structures; (3) significant levels of funding from national sources; (4) project design with a "mutually respectful process of give and take"; and (5) a strong training component.

[105]Rasmuson 1990.

[106]See Steinwand and Waters 1993, for an example from Cameroon.

[107]Rasmuson, Hornik, and Smith 1990.

[108]HealthCom 1992; Rasmuson, Hornik, and Smith 1990.

References

AHRTAG. (1991). Learning About What People Do and Why. *Dialogue on Diarrhoea* 47, London, England.

Andreasen, A. (n.d.). *Social Marketing: Its Potential Contribution in the Public Sector.* HealthCom Project, Academy for Educational Development, Washington, D.C.

Aziz, K. M. A. (1990). Reduction in Diarrhoeal Diseases in Children in Rural Bangladesh by Environmental and Behavioral Modifications. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 84: 433–438.

Barnhoorn, F., and H. Adriaanse. (1992). In Search of Factors Responsible for Noncompliance Among Tuberculosis Patients in Wardha District, India. *Social Science and Medicine* 34(3):291–306.

Berney, K. T., A. A. Olukoya, and A. Voigt. (n.d.). *Challenging Health Workers to Develop a Participatory Approach to Patient Education*, Centers for Disease Control and Prevention, Working Paper #099-4012, Atlanta.

Booth, E. M. (1984). Radio: The Daily Reminder. In HealthCom Project. *Summary Report of the Major Findings: The Mass Media and Health Practices Evaluations in Honduras and The Gambia.* Washington: Academy for Educational Development.

Booth, E. M., and J. I. Mata. (1992). *Introduction to the Design and Production of Educational and Promotional Radio Materials.* HealthCom Project, Washington, D.C.

Bossert, T. (1990). Can They Get Along Without Us? Sustainability of Donor-supported Health Projects in Central America and Africa. *Social Science and Medicine* 30(9):1015–1023.

Brieger, W. (1990). Mass Media and Health Communication in Rural Nigeria. *Health Policy and Planning*, 5(1):77–81.

Brownlee, A. (1990a). *Growth Monitoring and Promotion: The Behavioral Issues.* Washington: International Health and Development Associates.

Brownlee, A. (1990b). *Breastfeeding, Weaning and Nutrition: The Behavioral Issues*. Washington: International Health and Development Associates.

Buvinic, M., J. Graeff, and J. Leslie. (1987). *Individual and Family Choices for Child Survival and Development: A Framework for Research in Sub-Saharan Africa*. Washington: International Center for Research on Women.

Buzzard, S. (1987). *Development Assistance and Health Programs: Issues of Sustainability*. USAID Program Evaluation Discussion Paper, No. 23.

Casazza, L., and S. Endsley. (1993) Linking Training and Performance: An Evaluation of Diarrhea Case Management Training in the Philippines. In K. White and E. Hanlon (eds.). *Implementing Diarrheal Disease Control Programs: The PRITECH Experience*. Arlington, VA: Management Sciences for Health PRITECH Project.

Clay, R. (1992). *The Challenges of Building Sustainable Immunization Programs*. Paper for Pan-African Polioplus meeting, Nairobi, Kenya.

Clift, E. (1989) Social Marketing and Communication: Changing Health Behavior in the Third World. *American Journal of Health Promotion* 3(4):17–24.

Cutts, F. et al. (1991). Determinants of Vaccination in an Urban Population in Conakry, Guinea. *International Journal of Epidemiology* 20:1099–1106.

de Fossard, E. (1993). Radio Broadcasts on Immunization to Schools in Swaziland. In R. Seidel (ed.). *Notes from the Field—Communication for Child Survival*. Washington: HealthCom Project, Academy for Educational Development.

de Guzman, E. et al. (1992). Launching a Social Marketing Project for Immunization in Metro Manila. In R. Seidel (ed.). *Notes from the Field—Communication for Child Survival*. Washington: HealthCom Project, Academy for Educational Development.

Diene, Sérigne (1993). *Improving Child Feeding Practices During and After Diarrhea and Malnutrition in the Fatick Region of Senegal.* PRITECH report number RAD 045-OR.

Douglass, E. (1993). Institutionalization of the HealthCom Methodology in Lesotho. In R. Seidel (ed.). *Notes from the Field—Communication for Child Survival.* Washington: HealthCom Project, Academy for Educational Development.

Elder, J., and P. Touchette. (1987). *Behavioral Approaches to the Management of Diarrheal Diseases in Developing Countries: The HealthCom Project.* In "Modifying Nutrition-Related Behaviors: Public Health Perspectives." Symposium presented at the 21st Annual Convention of the Association for the Advancement of Behavior Therapy.

Elder, J., et al. (1992a). HealthCom Indonesia: The Use of Radio Spots to Improve Performance and Motivation of Kader. *Hygie, International Journal of Health Education* XI 4:21–25.

Elder, J., et al. (1992b). The Use of Diarrhoeal Management Counselling Cards for Community Health Volunteer Training in Indonesia: The HealthCom Project. *Journal of Tropical Medicine and Hygiene* 95(5):301–308.

Eng, E., et al. (1991). The Acceptability of Childhood Immunization to Togolese Mothers: A Sociobehavioral Perspective. *Health Education Quarterly* 18(1):97–110.

Farmer, P., et al. (1991). Tuberculosis, Poverty and "Compliance": Lessons from Rural Haiti. *Seminars in Respiratory Infections* 6(4):254–260.

Favin, M. (1991). *Acceptability of Immunization—The REACH Experience.* Washington: The Resources for Child Health (REACH) Project.

Freund, P., and B. Phiri. (1993). Zambian Popular Theater Dramatizes Diarrhea Treatment and Prevention. In K. White and E. Hanlon (eds.). *Implementing Diarrheal Disease Control Programs: The PRITECH Experience.* Arlington, VA: Management Sciences for Health PRITECH Project.

Gittelsohn, J., B. Sillah, and Karamo Sanneh. (1991). *Ethnographic Study of Acute Respiratory Infections in The Gambia.*

Gottert, P. (1993). Using Drama for Health Communications: Report from Burkina Faso, Mali and Niger. *Mothers and Children* 12(3):6–7.

Graeff, J. (1987). *Women's Social Support and Child Welfare.* Washington: International Center for Research on Women (ICRW).

Graeff, J., J. Elder, and E. M. Booth (1993). *Communication for Health and Behavior Change: A Developing Country Perspective.* San Francisco: Jossey-Bass Publishers. (Prepared under the HealthCom Project.)

Green, E. (1986). Diarrhea and the Social Marketing of Oral Rehydration Salts in Bangladesh. *Social Science and Medicine* 23(4):357–366.

Griffiths, M. (1990). How to Improve Child Well-Being? First, Increase Mothers' Self-confidence. *Development Communication Report* 70:7–18.

HealthCom Project. (1985b). *Lessons from Five Countries.* Washington: Academy for Educational Development.

HealthCom Project. (1985c). Field Notes. In Healthcom Project. *Summary Report of the Major Findings: The Mass Media and Health Practices Evaluations in Honduras and The Gambia.* Washington: Academy for Educational Development.

HealthCom Project. (1990). *Indonesia Final Report.* Washington: Academy for Educational Development.

HealthCom Project. (1992). *Results and Realities: A Decade of Experience in Communication for Child Survival.* Washington: Academy for Educational Development.

HealthCom Project. (n.d.). *The Application of Behavioral Analysis in the HealthCom Project.* Washington: Academy for Educational Development.

Helitzer-Allen, D., C. Kendall, and J. Wirima. (1993). The Role of Ethnographic Research in Malaria Control: An Example from Malawi. *Research in the Sociology of Health Care* 10:269–286.

Herman, E., and S. Prysor-Jones. (1993). Posters, Flyers and Flipcharts: Use of Health Education Materials in the Sahel. In K. White, and E. Hanlon (eds.) *Implementing Diarrheal Disease Control Programs: The PRITECH Experience.* Arlington, VA: Management Sciences for Health PRITECH Project.

Holland, J., J. F. Donoso, and J. Graeff. (1992). Factors Affecting Completion of Childhood Immunizations in Rural Ecuador: An Observation Study. In *Behavioral Research in Child Survival: Studies from the HealthCom Project.* Washington: Academy for Educational Development.

Hounsa, A., et al. (1993). An Application of Ajzen's Theory of Planned Behavior to Predict Mothers' Intention to Use Oral Rehydration Therapy in a Rural Area of Benin. *Social Science and Medicine* 37(2):253–261.

Hyslop, A., E. Herman, and H. Waters. (1993). *Follow up and Evaluation of a Flyer on the Household Management of Diarrhea: A Study Conducted by the Cameroon Diarrheal Disease Control Program.* PRITECH Project, Washington, DC.

Ismail, R., A. Bakri, M. Nazir, and N. Pardede. (1991). The Behavior of Health Care Providers in Managing Diarrheal Disease in Palembang City, South Sumatera, Indonesia. *Paediatrica Indonesia* 31:123–135.

JHPIEGO-Johns Hopkins Program for International Education in Reproductive Health (n.d.). *Approach to Training.* Baltimore, MD.

Kandun, N., and R. Hatfield. (1992). Local Area Monitoring and Supervision in Indonesia: Tools to Improve the Coverage and Quality of Vaccination Services. *Mortality and Morbidity Weekly Report Supplement* 11:24–28.

Kanouse, D., and I. Jacoby. (1988). When Does Information Change Practitioners' Behavior? *International Journal of Technology Assessment in Health Care* 4:27–33.

Keith, N. (1992). *Young Child Feeding, Weaning, and Diarrhea Illness: Practice in a Hausa Village and Educational Implications.* PRITECH Project, Assignment No. LPC 089-NG, Washington, D.C.

Khin, M., et al. (1992). Risk Factors for the Development of Persistent Diarrhoea and Malnutrition in Burmese Children. *International Journal of Epidemiology* 21:1021–1029.

Kofoed, P. E., S. Zeitlyn, A. Rahman, M. Gomes, and B. Nielsen. (1992). Reasons for Low Tetanus Immunization Coverage in a Hospital: a Focus Group Discussion. *Acta Paediatra* 81:632.

Laing, R. (1991). Prescribing Practice—What Changes Behavior? *Dialogue on Diarrhoea.* 15, ARTEAG, London.

Lee, W., et al. (1991). The Impact of a Community Based Health Education Program on the Incidence of Diarrhea Disease in Southern Thailand. *Southeast Asian Journal of Tropical Medicine and Public Health* 22(4):548–556.

Leslie, J. (1987a). *Time Costs and Time Savings to Women of the Child Survival Revolution.* Washington: International Center for Research on Women.

Leslie, J. (1987b). *Evaluation of Mass Media for Health and Nutrition Education: A Review of the Literature.* Paper presented at the joint meeting of the World Federation of Public Health Associations and Canadian Public Health Association, Halifax, Nova Scotia.

Levine, N. (1990). *The Determinants of Correct Use of Home-based Oral Rehydration Therapy: A Critical Review.* Prepared for the Diarrheal Diseases Control Program of the World Health Organization, Geneva.

Linman, H. W. (1993). *Reinforcement of Nutrition Communication Through Supervision.* Washington: Nutrition Communication Project-Project Concern International.

Litvack, Jennie I., and Claude Bodart. (1993). User Fees and Improved Quality of Health Care Equals Improved Access: Results of a Field

Experiment in Cameroon. *Social Science and Medicine* 37(3):369–383.

Malik, I., et al. (1992). Mothers' Fear of Child Death Due to Acute Diarrhea: A Study in Urban and Rural Communities in Northern Punjab, Pakistan. *Social Science and Medicine* 35(8):1043–1053.

Mathison, J. (1986). *Oral Rehydration Therapy in Nigeria.* PRITECH Project, Assignment No. SS 79, Washington, D.C.

McDowell, J., and J. McDivitt. (1990). *The HealthCom Resurvey of Oral Rehydration Therapy Practices in The Gambia.* Menlo Park, CA: HealthCom Project, Applied Communication Technology.

Millsap, J. (1993). *Final Country Intervention Report—The Gambia.* PRITECH Project.

Naimoli, J., et al. (n.d.-a). *Strengthening Patient Education for ORT Services in the C.A.R.* Working Paper #099-4026, USAID-Centers for Disease Control and Prevention/Atlanta.

Naimoli, J. E., et al. (n.d.-b). *Working with Communities to Increase the use of Health Services: An Experience from Togo, West Africa.* Working Paper #099-4037, Centers for Disease Control and Prevention/Atlanta.

Nirupam, S., R. Chandra, and V. K. Srivastava. (1992). A Survey of Missed Opportunity for Immunization in Lucknow. *Journal of Indian Pediatrics* 29:29–32.

Ndonko, F. (1990). *La Place du Secteur Traditionnel dans la Prise en Charge des Maladies Diarrheiques.* PRITECH Project, Assignment No. RAD 032-EA, Washington, D.C.

Nutrition Communication Project. (1993). *Beyond Child Survival: An Assessment of Infant and Child Nutrition in Africa.* Washington: Academy for Educational Development.

Oaks, S. C., et al. (eds.). (1991). *Malaria: Obstacles and Opportunities.* Washington: Institute of Medicine, National Academy Press.

Ogutu, R., et al. (1992). The Effect of Participatory School Health Programme on the Control of Malaria. *East African Medical Journal* 69(6):298–302.

Pelto, G. (1991). The Role of Behavioral Research in the Prevention and Management of Invasive Diarrheas. *Reviews of Infectious Diseases* 13(Suppl. 4):S255–8.

Pillsbury, B. (1990). *Immunization: The Behavioral Issues.* Washington: International Health and Development Associates.

Population Services International. (1992). *Social Marketing and Communications for Health.* Washington: Author.

PRICOR Project. (1989). *Systems Analysis Finds Weak Preventive and Promotive Activities Among Village Health Workers.* Bethesda, MD: PRICOR Child Survival Report.

PRICOR Project. (1990a). *Improving Utilization Rates of Child Survival Services Through Operations Research.* Bethesda, MD: PRICOR Child Survival Report.

PRICOR Project. (1990b). *Stimulating Community Participation in the Village Health Worker Program.* Bethesda, MD: PRICOR Child Survival Report.

PRICOR Project. (1990c). *Examining the Link Between Supervision and Health Worker Performance: Malaria Case Management in Senegal.* Bethesda, MD: PRICOR Child Survival Report.

PRICOR Project. (1990d). *Operations Research Improves Home Treatment of Malaria in Children.* Bethesda, MD: PRICOR Child Survival Report.

Raphael, D. (1976). *The Tender Gift: Breastfeeding.* New York: Schocken Books.

Rasmuson, M. (1985). Report on the 1982 "Happy Baby Lottery." In Healthcom Project. *Summary Report of the Major Findings: The Mass Media and Health Practices Evaluations in Honduras and The Gambia.* Washington: Academy for Educational Development.

Rasmuson, M. (1990). *Sustaining EPI: What Can Communication Do?* Washington: HealthCom Project.

Rasmuson, M., R. Hornik, and W. Smith. (1990). *Household Management of Diarrheal Diseases: Communications Issues.* Background paper prepared for the Meeting on the Household Management of Diarrhea and Acute Respiratory Infections, Johns Hopkins School of Hygiene and Public Health, Baltimore.

Reis, T., et al. (1990). An Examination of the Performance and Motivation of Indonesian Village Health Workers. *International Quarterly of Community Health Education* 11:19–27.

Rubardt, M. (1992). *Midterm Evaluation—Africare Child Survival Project, Ganzourgou Province, Burkina Faso.* Washington: U.S. Agency for International Development.

Schubert, J. (1993). Participatory Project Design: The First Step in Sustainability. In R. Seidel (ed.). *Notes from the Field—Communication for Child Survival.* Washington: HealthCom Project.

Seidel, R. (ed.). (1993). *Notes from the Field—Communication for Child Survival.* Washington: HealthCom Project.

Shahritz, L., and A. Roberts. (1994). The Value of Focus-Group Research in Targeting Communication Strategies: An Immunization Case Study. *Health Transition Review* 4(1):81–85.

Sircar, B., et al. (1994). An Operational Study on Implementation of Oral Rehydration Therapy in a Rural Community of West Bengal India. *Indian Journal of Medical Research* [A] 93:297–302.

Smith, W., et al. (eds.). (1993). *A World Against AIDS: Communication for Behavior Change.* Washington: Academy for Educational Development.

Snow, R., et al. (1992). The Role of Shops in the Treatment and Prevention of Childhood Malaria on the Coast of Kenya. *Transcripts of the Royal Society of Tropical Medicine and Hygiene.* 86(3):237–9.

Snyder, L. (1990). Channel Effectiveness Over Time and Knowledge and Behavior Gaps. *Journalism Quarterly* 67(4):875–886.

Snyder, L. (1991). Modeling Dynamic Communication Processes with Event History Analysis. *Communication Research* 18(4):464–486.

Sosminsky, S., M. Mhloyi, and D. Ewbank. (1993). Child Feeding in a Rural Area of Zimbabwe. *Social Science and Medicine* 36(7):937–947.

Spain, P., and J. McDivitt. (1988). Continuous and Non-continuous Use of WSS Solution for Oral Rehydration Therapy among Rural Gambian Women. *Journal of Tropical Pediatrics* 34:88–90.

Stanton, B. (1992). Theory-driven Behavioral Intervention Research for the Control of Diarrheal Diseases. *Social Science and Medicine* 35(11):1405–1420.

Steinwand, R., and H. Waters. (1993). Collaborating for Effective Health Communication in Cameroon. In K. White, and E. Hanlon (eds.). *Implementing Diarrheal Disease Control Programs: The PRITECH Experience.* Arlington, VA: Management Sciences for Health PRITECH Project.

Sukkary-Stolba, S. (1990). *Oral Rehydration Therapy: The Behavioral Issues.* Washington: International Health and Development Associates.

Uccellani, V., J. Ramirez-de-Arellano, and S. Baldizon. (1993). *Tecnicas y Principios de la Capacitacion Aplicada a la Nutricion.* Washington: USAID/PPE and CARE.

UNICEF. (1994). *The State of the World's Children, 1994.* Oxford and New York: Oxford University Press for UNICEF.

USAID. (1987). *Report of the Second Joint Ministry of Health/USAID/UNICEF/WHO Review of the National CDD Project—Egypt,* February.

U.S. Department of Health and Human Services/National Cancer Institute. *Making PSAs Work: A Handbook for Health Communication Professionals.* NIH Pub. #84-2485. Bethesda, MD.

World Health Organization. (1994). *Radio Guide: A Guide to the Effective Use of Radio Spots in National CDD Programmes.* WHO/CDD/94.48. Geneva: World Health Organization, with support from UNICEF and the HealthCom Project of USAID.

Yapchiongco, A. (1987). *Psychosocial Determinants of Mothers' Health Behavior Related to Oresol Use.* Manila: University of the Philippines College of Nursing.

Yoddumnern-Attig, B., G. Attig, and U. Kanungsukkasem. (1992). Incorporating Explanatory Models in Planning Nutrition Education Programmes in Thailand. *Nutrition and Health* 8:17–31.

Yoder, P. S., R. Drew, and Z. Zheng. (1989). *Knowledge and Practices Related to Diarrheal Disorders, ORT, and Vaccinations in Lubumbashi, Zaire.* Philadelphia: Annenberg School for Communication, University of Pennsylvania.

Yoder, P., and Z. Zheng. (1991). *HealthCom in Lesotho—Final Evaluation Report.* HealthCom Project, Center for International, Health, and Development Communication, The Annenberg School for Communication, University of Pennsylvania.

Yoder, P., Z. Zheng, and F. Zhou. (1991). *Results of the HealthCom Evaluation in Zaire—Lubumbashi, 1988–1990.* HealthCom Project, Center for International, Health, and Development Communication, The Annenberg School for Communication, University of Pennsylvania.

Yoder, P. S., and R. Hornik. (forthcoming). Perceptions of Severity of Diarrhea and Treatment of Choice: A Comparative Study of HealthCom Sites. *Journal of Tropical Medicine and Hygiene.*

Zimicki, S. (1988). *Effect of the 1988 Metro Manila Vaccination Campaign: Evidence from an Observational Study at Health Centers.* Center for International, Health, and Development Communication, The Annenberg School for Communication, University of Pennsylvania.