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**COMMUNICATION FOR DIARRHEAL DISEASE CONTROL:**

**SWAZILAND PROGRAM EVALUATION  
1984-85**

**ANNENBERG SCHOOL OF COMMUNICATIONS  
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CONTROL: EVALUATION OF THE SWAZILAND PROGRAM  
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## Executive Summary

The Swaziland 1984-1985 Diarrheal Disease Control Campaign was, in many ways, a remarkable success in achieving substantial change in home treatment of diarrheal episodes. At the same time, the experience raises some caution flags, both for the Swaziland program and for programs elsewhere.

The campaign was a collaboration of the Ministry of Health of Swaziland, and the USAID-funded Combatting Childhood Communicable Diseases project, and the Mass Media and Health Practices program. The MMHP Program has recently been expanded and is now called Communication for Child Health (HEALTHCOM). It was based on earlier work in Swaziland as well as the previous MMHP programs in Honduras and in particular in The Gambia. Like the other programs, it used mass media, printed materials and face-to-face channels in an attempt to change practices related to the treatment of diarrheal disease.

The preparatory phase of the campaign began in April, 1984 and lasted until the start of the formal campaign in September of that year. The campaign lasted until March of 1985, although some follow up activities have continued since that time. The Public Health Unit of the Ministry (including Gladys Matsebula, coordinator of diarrheal disease control activities, and two health educators, Alfred Mndzebele and Bongani Magongo) with their technical advisor, Dale Huntington of the Academy for Educational Development, planned a three-pronged campaign: radio programs to be developed in an intensive radio workshop and broadcast on established development programs on the national radio system, printed materials including a flyer with mixing instructions and posters for display at health clinics and at other points, and workshops to train much of the health staff of the country as well as various other extension personnel and local volunteers in treatment of diarrheal disease. Local volunteers and other information distribution personnel were given yellow flags to display outside of their homes to indicate that they could help with diarrheal disease treatment.

About 1/3 of the country was covered by the 18 health staff training workshops during the first months of the campaign. By the start of the campaign, the radio workshop produced 20 15-minute radio programs, 46 5-minute radio inserts and 22 spot announcements. Throughout the campaign 5 or 6 of the programs were broadcast each week in addition to several daily spot announcements. 260,000 mixing flyers and 7500 posters were printed and distributed.

The campaign focused on a small number of objectives; for this summary the most interesting were acceptance of the use of home-mixed sugar-salt solution as a treatment for diarrheal disease; maintaining feeding during episodes of diarrheal disease, and giving special feedings afterwards. A particular concern of the campaign was the need to introduce a new formula for mixing water-sugar-salt (of 1 liter of

to introduce a new formula for mixing water-sugar-salt (of 1 liter of water, 8 soda bottle capfuls of sugar and 1/2 capful of salt) to replace a previously advocated solution with 1 capful of salt which project medical advisors believed risked toxicity.

### Evaluation of the Campaign

An evaluation of the campaign was undertaken by the Annenberg School of Communications at the University of Pennsylvania. The evaluation relies on data from a number of sources, including before and after the campaign surveys, each with 450 rural mothers chosen through national random sampling procedures, and a diarrheal disease registry kept by some 20 clinics which recorded information about diarrheal disease symptoms and pre-clinic visit treatment of more than 10,000 children during the course of the campaign. Extended interviews with 23 mothers after the campaign, a small study of the validity of self-reported SSS use, and interviews with project staff to develop an administrative history of the program complemented the major survey and clinic studies.

**Exposure.** This was a short campaign: six months from the initiation of technical assistance to the first campaign broadcast, and then seven months of information diffusion activity. Nonetheless it reached a large proportion of the Swazi nation; nearly 85% of all homesteads were substantially exposed to at least one of the campaign's channels:

**RADIO:** 62% of respondents reported regular listening to at least two of the program series on which campaign messages were broadcast.

**CLINIC NURSES:** 22% reported visiting clinics during the campaign period - visits which involved treatment of children's diarrheal episodes with ORS and, presumably, an opportunity for exposure to campaign messages.

**OUTREACH WORKERS:** 16% reported contact with a yellow flag volunteer or other health extension worker about diarrheal disease treatment.

**FLYERS:** The only printed materials with mass distribution were recognized by 3 out of every 5 mothers (although only 1 in 5 still owned the flyer).

**TRAINING:** Program training efforts were essential to both outreach efforts and flyer distribution. As many as one-half of the mothers in areas where workshop training had taken place reported some recent interaction with either clinic staff or local 'yellow flag' volunteers about oral rehydration therapy. About one-fourth of those in other areas reported such recent contact. 50% of the respondents who had contact with an outreach worker still owned the mixing flyer. Only one-eighth of the rest of the rest of the sample still owned the flyer.

**Knowledge.** Precedent campaigns in The Gambia and Honduras sought to produce knowledge and practice about SSS or ORS where there was little or none before. The Swaziland program, in contrast, was launched into a chaotic situation. Different formulas had been publicized and accepted and a large proportion of those were possibly dangerous. The new campaign sought to bring order, in the form of a focus on a single new formula, out of dangerous disorder. To some extent it was successful, but the dent it made in inappropriate behavior was limited.

8% of SSS users used the new, campaign-taught, formula before the campaign. Three times as many, 26%, did so afterwards.

28% of users knew the correct amounts of water and sugar before the campaign. Twice as many, 59%, could name the quantities of those two ingredients (which had remained unchanged from before the campaign) at the end.

SSS users, before the campaign, offered 47 different formulas for its mixture. The two most popular could claim no more than 25% of the respondents. After the campaign, 53% of the users cited just two formulas.

However 54% of the sample was still offering an SSS formula with sodium levels above the WHO maximum (100 mEq) and 12% were offering a formula with sodium levels over 140 mEq after the campaign. This was a reduction from 66% and 29% respectively, but clearly was still a substantial concern. The best explanation for the continued use of too much salt (essentially one cap rather than 1/2 cap) was the difficulty of learning a fraction as part of a formula.

Other campaign messages provided mixing instructions. Two clear messages were adopted and one vague one was ignored.

80% volunteered that clean water was needed in the preparation of SSS and 41% said that the mixture needed to be prepared fresh daily after the campaign. Each of those numbers was about double the level from before the campaign.

A vague message about how much liquid a sick child should be given: "as much as the child can drink", produced no changes in the audience.

Reduced food intake and consequent growth faltering is a central worry associated with diarrheal episodes. Campaign recommendations about special feeding efforts during and after episodes received quite different responses.

42% of the sample accepted the need for feeding specially during episodes before the campaign; Only a few more (53%) accepted the need after the campaign.

In contrast, before the campaign, 16% recognized the need to feed differently after an episode, while 44% did so after the campaign.

We found no evidence that the small response to the 'during-episode' recommendations reflected contradictory advice from any particular source. This had been suggested by some readers of an earlier draft. A remaining speculation attributes non-response either to a perception by the mother that the advice is inconsistent with common sense or to an actual unwillingness of the child to eat.

Attitudes and Intentions. The campaign's emphasis on SSS, along with its explicit rejection of purges, appears to have affected the expressed worldview of respondents about traditional medicines. Particularly for purges, and to a lesser extent for imbibat (herbal concentrates), attitudes became increasingly negative during the campaign. However attitudes toward traditional healers, perhaps too sensitive an issue to be measured through these procedures, showed few campaign effects.

32% thought purges were "good" or "sometimes good" for treatment of children's diarrhea before the campaign; only 14% gave these answers afterwards.

46% said they would not use imbibat for children's diarrhea before the campaign; 63% said so afterwards.

'Modern' treaters and treatments are universally well-regarded, or so respondents told our interviewers. Clinics started and remained that way; health workers gained credence during the campaign. Sugar-salt solution was widely accepted before the campaign and added to its acceptance level.

88% before and after the campaign reported that clinic treatment of children's diarrhea was "good".

56% before the campaign and 88% after the campaign report a belief that healthworkers will be helpful as sources for treatment.

78% of the sample planned to use SSS in the future even before the campaign started. 14% more, or 92%, declared that intention after the campaign.

Practice. Estimates of the effects of the campaign on practice were drawn from two indicators. First, data were gathered from the subsample of women who reported that one of their children was either currently sick with diarrhea or had been sick in the past month. These women were asked what they had done to treat that particular case.

Before the campaign, 36% of them said they had treated at home with ORT; after the campaign 48% said they had done so.

This is a statistically significant change but it does not represent a change of the magnitude campaign planners might have hoped for. However it hides a more dramatic change in the quality of practice.

Only 4% of families with current cases before the campaign both said they used ORT and knew all three ingredients of the correct formula. 17%, four times as many, did so after the campaign.

11% before the campaign and 34% after the campaign said they used ORT and knew at least the quantities of water and sugar in the formula.

A second indicator, drawn from the clinic registry study, gives a parallel and more optimistic picture of use.

Of the children coming to clinics at the start of the campaign about 43% had been treated with oral rehydration therapy before coming to the clinic, according to the person who brought the child; by the second month of the campaign about 52% of the children had been treated and by the third month 60% had been treated with SSS or ORS, and that was the level at which treatment incidence stayed for the rest of the campaign, within a few percent.

The consistency of these two indicators of current practice, although they are both based on self-reports, one to an interviewer and the other to a clinic nurse, suggests that there is change occurring and that it is closely associated with campaign activities.

Health Outcomes. The study provides no evidence as to health outcomes. Our attempt to use the clinic registries to trace the number of severe dehydration cases coming into clinics proved unsuccessful. It foundered both because severe dehydration seems relatively rare and may be unreliably diagnosed by clinic personnel.

Campaign Exposure and Quality of Practice. Supporting evidence for the power of the campaign to affect health practice comes from regression analyses which predicted quality of practice variables from campaign exposure variables. The results suggested both that the inferences from before-after findings about the power of the campaign were correct, and that radio and outreach workers were particularly powerful channels.

5-6% of the variance in quality of practice was associated with exposure variables. This was more than half of the variance accounted for in each equation.

Regression coefficients suggested (albeit crudely) that a person in contact with an outreach worker (versus not in contact) was about 22% more likely to practice correctly and that a heavy radio listener (versus a non-listener) was about 20% more likely to satisfy the quality of practice criterion.

These results may be examined in combination with the evidence that radio reached 62% of the population and outreach workers only 16%. Given similar effect but far greater coverage by one channel than the other, this is intriguing evidence for a substantial return on investments in radio.

**Self-report Validation.** A supplementary study asked respondents who claimed to have a current case of diarrhea in the household, and who said they used ORT, to show the interviewer the solution. Only a small sample (n=27) satisfied these conditions and were actually asked by interviewers to show the solution. Of those, one-third showed the solution, one third didn't but gave possibly credible explanations for their failure to show the solution (e.g. It is all finished; I finished it yesterday), and one-third neither showed the solution nor offered a credible explanation for the failure.

A relatively high proportion of current treaters claimed to be using ORS at home (about 67%). To estimate actual usage, we can use the actual proportion who could show the solution as a lower limit and the proportion who either showed the solution or had a credible explanation for not doing so as the upper limit. This study would suggest that the per-case coverage rate lies between 20-45%.

**Conclusions.** Findings from the evaluation suggest that 1) much of the intended audience was reached by the campaign, often through more than one of its channels, 2) that knowledge of the correct sugar-salt-solution increased, as did knowledge of the need to feed children in special ways after diarrheal episodes, 3) that intentions to use SSS increased somewhat during the campaign, but from an already positive baseline, and 4) that self-reported practice, particularly quality of practice, increased sharply as the result of the campaign. There is evidence that radio and outreach clinics were particularly effective in influencing practice.

Concerns include the implications of a worrisome level of sodium concentration in SSS solutions despite some campaign success in counteracting this. This practice may reflect confusion left over from previous information programs, or, more probably, the difficulty of remembering a fraction (1/2 cap) as part of a formula. A second concern reflects the small validation study which suggested that self-reported use of SSS exaggerates, perhaps substantially, actual use.

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## INTRODUCTION

The Government of Swaziland implemented an intense public health communication campaign directed towards the treatment of diarrheal disease, beginning in September of 1984 and continuing through March of 1985. The Public Health Unit and other components of the Ministry of Health carried out the campaign with technical assistance from the Academy for Educational Development under contract with the U.S. Agency for International Development. Significant financial support for the implementation came through the CCCD (Combating Childhood Communicable Disease) program of the Centers for Disease Control, also under USAID funding.

These implementing groups asked the Annenberg School of Communications at the University of Pennsylvania to design and supervise the implementation of a small scale evaluation of the campaign. Robert Hornik and Pamela Sankar of the Annenberg School traveled to Swaziland in July of 1984 to design and initiate the evaluation. Ms. Sankar returned in April of 1985 to supervise the end study and do interviews with program staff.

The evaluation involved five distinct components:

- 1) Before-after surveys of caretakers of children. Interviewees were chosen randomly in a two stage sample of 15 census enumeration areas and 30 homesteads per area, with one woman being interviewed in each homestead. Only homesteads on Swazi Nation Land were

eligible for inclusion. Separate samples were chosen for the before and after studies. Each study involved individual interviews, focusing on opportunity for exposure to campaign channels, learning of campaign messages, attitudes and intentions with regard to diarrheal disease treatment, treatment practices, and certain background variables.

2) Clinic Study. Nurses in the twenty-three largest clinics in the country were asked to register all cases of diarrheal disease brought to their clinics among children less than five years old. The registry began in September, the first month of the campaign, and continued through April, 1985. A special registry form was distributed on which was recorded the child's name, age, and sex, and the nurse's estimate of the child's hydration status, how many days of diarrhea, whether the child had been given ORT before coming to the clinic, and whether the child was suffering from measles.

If the campaign was successful we expected to see an increase in the number of children brought to the clinic having already been given ORT, a specific message of the campaign, and possibly some decline in the incidence of severe dehydration cases presenting at the clinic.

3) Self-report validation study. As part of the questionnaire study, we also tried to verify the accuracy of self reports of ORT use. When a respondent indicated she had a child with diarrhea currently, and that she was treating it either with ORS or SSS, the

interviewer asked to see the solution.

4) Institutional/Process/Administrative History. Through interviews with project staff and others concerned with the project, through review of available documents, and through observations made during the evaluators' visits, we have tried to develop an overall picture of the background of the campaign, its history, and its institutionalization.

5) Extended interviews with a small sample of mothers. Ms. Sankar, during her second visit, did 23 interviews with mothers to obtain a fuller picture of diarrheal disease perceptions and actions. Working with Thandie Metsebele, Ernest Mnisi and Wellington Mbhele, she used the questionnaire as a starting point and then asked for extended clarification of particular answers. These responses allowed further interpretation of questionnaire responses.

In this document we present the results of the evaluation studies. We begin with a historical section, tracing the antecedents of the campaign and describing what it entailed. Next we turn directly to the central evaluation questions. We answer five questions which allow us to present the essential evaluation findings. The questions include:

1) Did the campaign reach the audience? Were they exposed to its messages?

2) Did the campaign affect knowledge, attitudes, and expressed intentions? Were the messages learned and accepted?

3) Did the campaign affect health practices relevant to the treatment of diarrheal disease?

4) Did the campaign affect health outcomes, particularly, the incidence of severe dehydration?

5) What is the promise for institutionalization within Swaziland of the public health communication approach?

We begin with the background and details of the campaign. First, however, we must express our gratitude to Bette Booth, Deborah Helitzer-Allen, Anthony Meyer and Judith McDivitt and many participants in the August, 1985 evaluation results seminar held in Mbabane, Swaziland for comments on an earlier draft. Important assistance in data analysis came from Chien Lei, Clement So, Nina Ferencic, as well as Ms. McDivitt. Jane Whittendale ably supervised final manuscript preparation with help from Ingrid Brennan and editorial assistance from Barbara Furst.

**BACKGROUND TO THE CAMPAIGN**

Diarrhea kills about four million children a year (Lessons from Five Countries, AED, October 1985). During the last decade, international health organizations have dedicated their energies to devising new ways to control and treat this disease. Dissemination of a new treatment, oral rehydration therapy (ORT), has been this effort's primary focus.

ORT does not attack the causes of diarrhea--complex and solved only with great financial and time investment--nor does it cure the disease which is causing the diarrhea. Instead, ORT prevents dehydration and strengthens the child so that he can fight off the infection which is causing the diarrhea and reach a clinic if he needs further treatment. ORT can be prepared with a home-made sugar-salt solution called SSS, or with a pre-packaged concentrate, called ORS (oral rehydration solution). SSS is especially useful in the Third World because it can be made easily with locally available measuring devices--soda bottles and their caps--and locally available ingredients. The main obstacle to ORT's widespread use is not technical or financial; it is informational: mothers need to be made aware of its existence.

The Offices of Health and Education of the Science and Technology Bureau of the United States Agency for International Development (USAID), as part of their participation in the ORT activity contracted with the Academy for Educational Development to develop and implement a program for the prevention and treatment of acute childhood diarrhea in rural areas of developing nations. This program, Mass Media and Health

Practices (MMHP), attacks the problem of diarrheal disease through a concentrated campaign combining radio, training programs, and printed materials.<sup>1</sup>

AED's MMHP contracts, signed in 1979 and 1980 respectively with Honduras and The Gambia, called for three-year programs in each of these countries. As these programs neared completion, evaluations demonstrated their success and AID signed an extension of the MMHP contract to continue these programs and to replicate the program in five more countries. USAID funded these diffusion sites on a reduced budget to determine whether the MMHP model could decrease its cost without diminishing its effectiveness. In March 1984, the Kingdom of Swaziland in Southern Africa agreed to host one of the MMHP diffusion sites.

#### MMHP

MMHP is an example of a recently emerging approach to health education known as the "public health communication" approach. This approach attempts, in a pre-defined period of time, to change a particular set of behaviors in a large-scale target audience with regard to a specific problem. (MMHP/AED, 1984, p.6). MMHP Swaziland sought to use a six-month campaign to change the behaviors of rural mothers concerning treatment and prevention of children's diarrhea. The approach has three stages: preprogram planning and development, instructional intervention, and ongoing monitoring and evaluation.

The planning phase concentrates on gathering information so that each project can be tailored to fit the specific needs of the targeted population. The instructional intervention is distinctive for its integration of three communication channels: radio, print, and face to face. "Women hearing health messages on the radio also hear the same advice from a health worker, receive printed information from her child's school, participate in community health fairs and see related posters" (MMHP/AED, 1984, p.7). Ongoing monitoring and evaluation contribute to the program by feeding back information about the relative success of different aspects of the project, allowing for adjustments during the campaign. The final evaluation serves as an example for later programs using the public communications approach for development activities in the same country or elsewhere.

### PROJECT ANTECEDENTS<sup>2</sup>

Life expectancy at birth in Swaziland is 44 years, the lowest in the Southern Africa region. Infant mortality is over 150 per 1000 live births. Childhood mortality is also high with 23% of the children dying by age 10. Diarrheal disease contributes significantly to these high mortality rates among the young. Although no morbidity data are available, analysis of clinic data gathered in early 1983 shows that over 13% of the outpatient discharges were related to diarrheal disease.

Since the mid-1970s, the Swaziland government has acted to contain the threat of diarrheal diseases. They have supported preventive programs

for improving sanitation and personal hygiene and treatment policies concentrating on ORT. In 1976, public health nurses in Swaziland began disseminating the instructions for preparing home-based SSS. Radio broadcasts echoed the message and Rural Health Motivators (RHMs) (rural residents trained in rudimentary health care) learned about SSS in their training workshops. In 1978, clinics and RHMs began distributing ORS packets.

Changes in preventive measures began to take shape in late 1980 with the initiation of the USAID-funded Rural Water-Borne Disease Control Project (RWBDPC). Most of the diarrheal diseases in Swaziland are transmitted through contaminated water and this project seeks to control them through a three-pronged effort focusing on health education, latrine construction and infrastructural improvements in the water supply.

An outbreak of cholera in 1980-1981 resulting in 31 deaths deepened the Swazi government's commitment to improve diarrheal disease control measures. In response to this epidemic and as part of the RWBDPC, two consultants visited Swaziland in late 1982 to advise on the development of a national plan for diarrheal disease control. Both of these consultants focused their inquiry on improving the use of oral rehydration therapies. Their other recommendations included expanding and decentralizing health education services, exploring mass media use, and training a national diarrheal disease control coordinator at the International Center for Diarrheal Disease Research in Bangladesh (ICDDR,B). The Swaziland government implemented many of

these recommendations over the following years.

As a part of these efforts, AED and the Swazi government held a series of communications workshops to train development personnel in the most effective methods of spreading messages about diarrheal disease control. The first of these workshops took place in October 1982. This workshop introduced the use of radio broadcasts for development work and began training participants to produce messages, specifically concerning health issues.

During this visit, members of the Academy staff initiated two other communication-related activities. First, with the workshop participants, they discussed establishing a permanent organization for overseeing communications and development activities. Second, with Ministry of Health (MOH) officials, they formally presented the MHP-Honduras project for review as a possible strategy for diarrheal disease control in Swaziland.

During a second workshop held in early 1983, a communications strategy for disease control began to take shape. The workshop came up with a jingle and a name for the campaign--"Ayihlome Mawati!", or "Arm Yourself, Swazi!". At this workshop, participants from Swaziland Broadcasting and Information Services and the Ministries of Health and Education produced 14 radio dramas and 19 radio spots concentrating primarily on preventive practices. Swaziland Broadcasting Service, SBS, broadcast these messages twice weekly during the prime time Health Education program.

**SWAZILAND MMHP**

On the basis of the success of these workshops and other activities aimed at developing a national plan for preventive health practices, the Swazi government entered into an agreement with USAID to co-sponsor the MMHP project. The Draft Work Plan authored by AED in consultation with USAID and the Swazi MOH characterized the MMHP program as a means of concentrating the ongoing diarrheal disease control activities. "It is essential that primary attention be given during the next twelve months to organizing these efforts into a single coherent attack on the leading contributors to infant mortality in the Kingdom: diarrhea, immunizable diseases and malaria." (Ramuson and Smith 1984. n.p.) MMHP was to organize this attack, and in so doing, it was to introduce the public communications approach to the health education system in Swaziland.

The original agreement required Swaziland MMHP to accomplish these objectives in 12 months. Although the MOH and AED eventually lengthened this period to 18 months, it was still considerably shorter than the MMHP projects in Honduras or The Gambia which were three year projects. The justification for a shortened duration was that MMHP Swaziland could use materials and experience accumulated through the years of work in Honduras and The Gambia.

Swaziland MMHP also differed from earlier MMHP projects in its institutional structure. In the past, MMHP has been within or

connected to the health education unit of the host country. Swaziland MMHP, however, was placed in the Public Health Unit (PHU). The Swazi government took this action for the following reasons. First, the Health Education Unit (HEU) had limited resources: office space was scarce, and no health educators could be spared from their ongoing responsibilities. Second, the MMHP project, requiring intense activity and complicated coordination, diverged from HEU standard practices. MMHP's integration into HEU on short notice might have disrupted HEU's long-term plans. As a result, MMHP was situated in PHU, but was to maintain ties with HEU through shared personnel, regular staff meetings, and dependence on its graphic design and printing facilities.

Swaziland MMHP, unlike other MMHP programs, was not an independent project. Instead, it was administratively subordinate to the RWBDCP. Practically this meant that official communications with the AID mission had to be routed through the RWBDCP chief-of-party and that he controlled MMHP's local finances. The decision to place MMHP under RWBDCP was reached in an effort to hold down the number of US-sponsored projects and maintain a desirable balance between foreign-sponsored and local projects. In addition, because support for materials production and certain other expenses came from CCCD, the MMHP program also had to coordinate with that program.

The Swaziland work plan scheduled the program in two phases: the first, April through August 1984 for preparation and the second, September 1984 through March 1985 for implementation. The planning phase included researching local conditions, designing and producing

print materials for the campaign, writing and producing radio messages, and designing and scheduling the training workshops. Projected activities for the campaign included radio broadcasts, training workshops, flyers, posters, flags, and a national lottery to focus attention on the campaign.

### PREPARATIONS

The preparation phase for Swazi MMHP required assessing and adapting campaign strategy and materials from other MMHP programs to Swazi conditions. Many of the print materials and much of the campaign's basic approach were adopted almost unchanged from The Gambia project, but some alterations were required. The greatest production task was the creation of radio messages.

Several individuals participated in the preparation of the MMHP program including representatives from HEU, PHU, Swaziland Broadcasting Service (SBS), AID, and MOH. These representatives held regular meetings to sketch out a strategy and then to oversee its implementation. The primary participants included Dale Huntington, AED technical advisor, Alfred Mndzebele and Bongani Magongo, health educators assigned to the project, and Gladys Matabula, Public Health Unit nurse and coordinator of diarrheal disease control activities for the Combatting Childhood Communicable Diseases project.

To design the Swaziland MMHP campaign, the group began collecting information about local conditions. They referred to prior research on

Swazi beliefs and practices concerning diarrhea carried out by anthropologist Edward Green, and conducted several smaller investigations themselves. These investigations included a radio listenership survey, a review of ORS packet distribution practices, a clinic study concerning potassium depletion, an analysis of the current SSS formula, and a survey about mothers' ORT practices. Throughout the planning process, this group also relied on themselves as representatives of the Swazi culture to provide important information about local conditions.

### Strategy

In planning the strategy for the campaign, the group used findings from the formative research to weigh the relative advantages of ORS packets versus SSS home-mixed solution. ORS packets are easier to mix and they contain the electrolytes and potassium necessary in cases of severe dehydration cases. Because research indicated that potassium depletion might be a problem among Swazi children, the ORS packets seemed preferable. Also, because the packets are pre-measured, they reduce the likelihood of mixing mistakes.

Dependence on the packets, however, requires assured access.

Pre-campaign research demonstrated that the Swaziland packet distribution system had several bottlenecks and that over half of the clinics had run out of packets during 1983. Although reforms were planned, they would not go into effect until after the campaign. In light of this, the SSS home-mix solution was chosen as the preferred

practice for the MHP campaign.

Because SSS does not treat potassium-depletion, the campaign strategy was further modified to include instructing the mothers to begin treatment with SSS at home and then to go to the clinic where potassium depletion could be treated. The "Diet-for-Diarrhea" poster was also adapted to include potassium-rich foods.

The decision to emphasize SSS also required a heavy emphasis on the correct formula. The Swazi population had been exposed to three different formulas in less than 10 years. The most recent change resulted from MHP-initiated research which revealed the earlier formula to have been possibly toxic. To highlight the new formula a "rehydration kit" was introduced into the campaign. Assembling a kit would require the mothers to set aside the supplies needed to make SSS, thus assuring that they would have the necessary ingredients and proper measuring devices.

#### Messages

A radio workshop convened in July 1984 and lasting for ten weeks created the campaign radio messages. Workshop participants were drawn from the Ministries of Agriculture and Health. About half of the participants were new to radio production; the other half had participated either in a previous development communications workshop or had been given preliminary training at SBS. Esta de Foscard, AED consultant, led the workshop, assisted by Wilma Lynn also from AED.

During the workshop, participants were trained in message development and radio production skills. Formative research had suggested that the Swazi audience liked drama and music on the radio, so the workshop participants tried as much as possible to incorporate these features into their programming.

The radio broadcasts ranged in content from selected preventive measures, such as digging rubbish pits, to treatment strategies including diagnosing diarrhea and dehydration, mixing and administering SSS, and the child's proper nutritional care during and after a diarrheal episode. A portion of the content for the campaign's messages was based on The Gambia project. Certain facts discovered during the formative research, however, helped the group to adapt some messages to the Swazi context.

A primary issue in developing the radio messages was how to characterize diarrhea's greatest threat: dehydration. Prior ethnographic research had shown that traditional Swazi beliefs did not connect diarrhea with dehydration, hence the necessity to rehydrate the child would not be apparent. The same research suggested that many Swazis did believe in the necessity of maintaining the body's balance of fluids. The radio workshop created programs which characterized the problem of diarrhea as loss of liquids leading to an upset in the body's natural equilibrium. This imbalance could be remedied by replacing the lost liquids with SSS.

Research also uncovered a particularly dangerous traditional diarrheal treatment: purging the child. The MHP team felt that this practice posed a serious threat to children's well-being. They developed several messages critical of this practice, using the same logic about the necessity to maintain a balance of liquids in the child's system. Other findings from the ethnographic research concerning different types of diarrhea were considered too complicated to integrate into the campaign's messages.

The group wrote and produced 20 15-minute radio dramas, 46 5-minute radio inserts and 22 spot announcements. Completion of these radio programs demanded considerable energy from both the instructors and the participants. Minor organizational problems, such as faulty equipment and slow travel reimbursements for the participants, marred the workshop. In general, however, the work went smoothly. According to interviews with participants, this success can be attributed to the instructors' and participants' enthusiasm and the helpfulness of SBS personnel.

### Workshops

Preparations for the workshops required developing a training curriculum and making the scheduling and lodging arrangements. Alfred Mndzebele and Bongani Mgongo, with the collaboration of Dale Huntington, designed the curriculum by adapting a standard WHO manual. The training sessions were divided into separate tracks which grouped together health personnel with similar skills and jobs.

Track 1 consisted of professionally-trained health personnel associated with rural clinics. These people received a two-day training program focussing on hydration status assessment, ORT treatment guidelines, and children's nutritional needs during and after diarrheal episodes.

Track 2 refers to the nursing staff of major urban medical facilities. The program originally intended to give this group training in supervisory skills for diarrheal disease control programs. Due to time limitations, however, these workshops were not held.

Track 3 personnel included RHM's, Red Cross First Aid assistants, and traditional healers. These people received a one day training program which was similar to the Track 1, but less technical. Both Track 1 and Track 3 personnel were given mixing flyers to distribute in the countryside when teaching people how to mix the solution.

A major function of these workshops was to train participants to instruct other people how to mix and administer the solution. The workshop participants were asked to go out and train ten (later reduced to five) community members in these skills. These community members were also given yellow flags depicting a "happy baby" to fly at their homestead alerting neighbors that they knew how to mix SSS. These "Yellow Flag Volunteers" were also given mixing flyers to distribute. Radio messages and clinic nurses informed the community about these volunteers.

In reflecting on the preparation phase, several participants commented during interviews that the time was too short. MHP's institutional setting exacerbated the scheduling problems. The ambiguity in the relationship between MHP and HEU caused delay in some materials production and pilot testing. The lack of financial autonomy for MHP may also have slowed preparations.

Still, in less than five months this group completed background research, designed print materials, produced a radio campaign, adapted a training manual and made arrangements for more than two dozen workshops. Some participants in the preparation process thought that this hectic schedule had perhaps been draining, but they also felt that the rapid pace of the activity helped to generate the excitement which carried them through it.

### THE CAMPAIGN

The campaign was an intense, coordinated effort. It began the second week of September and lasted through the middle of April. During this time SBS broadcast messages several times weekly, the MHP team held 18 training workshops, and over 260,000 flyers and 7500 posters were distributed. Periodically throughout the campaign, the MHP team informally evaluated their work. It was decided to drop a planned lottery because the logistics of organizing it would have overtaxed the personnel resources of the project, and because of some doubt as to its necessity given widespread ORT awareness.

## Radio Broadcasts

SBS broadcast the Ayihlome programs during four different weekly time slots. The longest shows were dramas lasting fifteen minutes which were broadcast every Wednesday evening and repeated every Saturday. In addition, each week the station dedicated two five-minute segments to Ayihlome programming, one during an agricultural program and the other during a women's program. SBS also broadcast the Ayihlome jingle and a few 30 and 45-second spots regularly throughout the day. This schedule, put into operation in September, continued for 24 weeks with only one major revision. After several months of broadcasting, MMHP and SBS decided to omit the five-minute spot in the women's show and concentrate on the agricultural show because SBS felt the programs were too repetitive.

In December the MMHP team undertook an informal evaluation of the programs. In several interviews, RHMs indicated that in their areas people with whom they were familiar enjoyed the programs and listened to them regularly. The interviews also showed that more emphasis on the Yellow Flag Volunteers and the rehydration kit might be necessary.

In January former members of the radio workshop, under the supervision of Alfred Mndzebele and Bongani Magongo, started to produce a new series of radio programs. The MMHP team had left open several weeks of programming because they did not know whether the lottery would be held requiring a new set of messages. The lottery was not held, so they filled the empty slots with new programs designed to stress Yellow Flag

Volunteers and rehydration kits. SBS began broadcasting these new programs in February interspersed with some of the old programs. Besides these changes, programs on malarial disease and measles vaccinations were added to complement activities undertaken by CCCD, MHP's sister project.

### Workshops

To complete the training workshops before the beginning of the rainy season and the onslaught of diarrheal disease, the MHP team held training workshops almost continually from mid-September through November. They completed 7 Track 1 and 11 Track 3 workshops. There was not enough time for Track 2 workshops, but the team hoped to reach some of these people by giving a presentation as a part of another workshop in mid-May.

Two Track 1 workshops had to be cancelled, the first because the training materials were not ready, the second because of transportation problems. The rest of the training schedule was so tight that these workshops could not be held later. In addition, the MHP team also participated in two HEU-sponsored traditional healer workshops, to bring the total number of people trained to 440.

The MHP team conducted two informal evaluations during these workshops. The first questioned the participants: had they learned the material presented? The second graded the workshops: had the participants found them useful? Both evaluations had positive results.

Participants complained only that certain segments, such as the one on the physiology of diarrhea, were too short.

The MMHP team had planned to do longer term evaluations to determine whether participants had retained their skills and whether they had gone on to train five Yellow Flag Volunteers, as planned. But they could carry out only very limited versions of these evaluations. The team cited lack of transportation as the major obstacle to this activity.

A brief evaluation of the Yellow Flag Volunteer program by MMHP staff during December and another in March showed mixed results. The Yellow Flag Volunteers interviewed (fewer than ten) demonstrated an adequate knowledge about children's nutritional needs during bouts of diarrhea, and SSS mixing and administration practices. For the most part, however, workshop participants had been able to train only 2, perhaps 3, of the 5 to 10 volunteers projected in the original plan.

MMHP team members felt that completing the training program had required a strenuous effort. They had to conduct as many as two workshops a week with considerable time devoted to travel. Some people suggested that either more time or more personnel might have eased the situation, but all the participants agreed that once the rhythm of the workshops and preparations had been established, the work went smoothly. Everyone commented that this was due in large part to the trainers' consistent commitment as well as the participants' enthusiasm. A great deal of energy and skill went into the

implementation of the campaign. We turn now to evidence about how it all came out, asking first about exposure to the campaign.

## DID THE CAMPAIGN REACH THE AUDIENCE?

The campaign included radio broadcasts on three different programs, training of health professionals and local volunteers in diarrheal disease treatment, distribution of flyers, and the establishment of yellow flag locations. Campaign planners have good knowledge of what was done: number of broadcasts, number of attendees at training sessions, number of flyers and yellow flags printed and sent out. What distribution statistics do not indicate is the extent to which the audience was actually reached. Were they exposed to the campaign? All of the data reported in this section reflect responses to the after-campaign survey.

### RADIO EXPOSURE

About 65% of the sample reported listening to their radios every day of the week. Of the rest, 25% didn't have working radios, and about 10% reported listening only 1, 2, or 3 days each week. Thus, 75% of the target population had some possibility (most with some high probability) of hearing the messages; the rest were unlikely to be directly exposed, although others around them might well have told them about the messages. (See Appendix A1).

Diarrheal disease messages were transmitted over three regular programs: Ayihlome, a women's program, and the agricultural program (Table 1.) The audience was regularly exposed to these programs.

Virtually everyone who had a working radio reported listening to at least one of those programs (73% of the population; 96% of those with working radios) and half of the sample reported listening to all three programs. Follow-up questions about listening last week and remembering the content of last week's program (much more stringent tests of exposure) still suggested that 42% of the sample listened to one or more of the programs and 34% reported remembering the content of one or more of the programs broadcast in the previous week. (Table 2 indicates the proportions listening generally, listening last week and remembering last week's content for none, one, two and all three programs.)

We created a scale (called LISTEN) to summarize the variation in likely exposure to the diarrheal disease messages over the radio. An individual received one point each if: 1) her family owned a working radio, 2) she listened to the radio, 3) she reported listening to at least two of the three programs, 4) she reported listening to at least two of the three programs in the last week, or 5) she reported remembering the content of the broadcast for at least two of the programs.<sup>3</sup>

On that scale (Table 3), about 20% of the sample (scores 4 and 5) were intensely exposed to the radio campaign, 40% substantially exposed (score 3), 12% somewhat exposed, and the rest either minimally exposed or not exposed at all.

**Table 1: Listening to Each Program (N=431)**

	<u>Ayihlome</u>	<u>Women's</u>	<u>Agriculture</u>
Percent who ever listen	67.3%*	62.4%	58.2%
Percent who listened last week	34.1	19.7	16.2
Percent who can remember content	25.8	10.0	10.2

\*67.3% said they listened to the Ayihlome program, out of the entire population. Since only 76% of the sample had access to working radios, this means that almost 90% of the eligible population reported some listening.

**Table 2: Type of Listening Across All Three Programs (N=431)**

	<u>Listened</u>	<u>Listened Last Week</u>	<u>Remember Last Week Content</u>
No Programs	26.9%	57.5%	66.8%
One Program	7.4	22.3	22.7
Two Programs	16.5	12.8	8.1
Three Programs	49.5	7.4	2.3

**Table 3: Scale Scores for LISTEN (N=430)**

0	1	2	3	4	5
18.6%	7.0%	12.1%	41.6%	11.4%	9.3%

**FACE-TO-FACE EXPOSURE**

Three personal sources were expected to be carriers of diarrheal disease control messages: 1) health care professionals at the clinics and hospitals, 2) rural health motivators and other health extension agents who are likely to visit individual homesteads, and 3) individuals in communities who are given some SSS training and who

display yellow flags to indicate that they can provide assistance.

This last group may sometimes overlap with the second group.

Estimating exposure to such personal sources of information is, like exposure to radio, largely a matter of seeing what opportunities individuals have had for such exposures. The most common opportunity was at the clinic, when caretakers have brought their under 5 year old children for treatment of diarrhea. Seventy-six percent of all respondents reported having brought a child to the clinic for treatment of diarrhea at some past time. Fifty-four percent reported taking the child who most recently experienced a diarrheal episode to the clinic, and of that group 71% (or 38% of the entire sample) reported doing so within the previous six months, the period of the campaign.

The issue is did the visit to the clinics involve just treatment or was there some education as well? It is difficult to know in any particular case, but we do have an indication that nurses are providing some education. Fifty-five percent of the sample reported receiving ORS or SSS at the last visit to the clinic, and it is difficult to imagine that such treatment is given without some educational intervention, since it involves actions by the caretaker. Similarly, of the 60% of the sample who claim to be able to mix ORS from a packet, all but a very few (5%) claimed they learned it from a clinic nurse.

We can make a conservative guess as to the extent of caretaker exposure to the campaign through contact with nurses by creating the following scale. We consider caretakers to have had exposure if their contact

with the clinic included all of the following elements: 1) contact with a clinic nurse, 2) during the previous six months, 3) for the treatment of the last case of diarrheal disease for a child under 5, and 4) treatment with ORS or SSS for this case. Using that criterion, we find that about 22% of the sample has had high probability of contact with a nurse about campaign messages. If we broaden the definition of clinic contact, to include any past reported clinic contact for diarrheal treatment in which ORS or SSS was recommended, close to 60% of the sample can be said to have contact with clinic nurses about campaign messages.

In addition to the quite common contact with clinic nurses, there are individual health extension workers who visit homes. It appears that such contact is frequent. Forty-two percent of the sample reported visits either by the RHM (Rural Health Motivator) and/or by another health worker. However, diarrheal treatment was reported only rarely (by 16% of the visited homesteads, 7% of the entire sample) as the topic of such visits.

The last personal source we checked was the one explicitly developed by the campaign: the yellow flag volunteer. Productive educational contact with these people was not common. While half the sample reports knowing that a yellow flag volunteer has something to do with health, and one-third report that someone "around here" has such a flag, only one-in-eight reported personal contact with a volunteer. Virtually all of those people said that they learned about SSS from the volunteers.

The rarity of contact with yellow flag volunteers reflects the limited reach of the training components of the campaign. Given the short campaign period, trainers reached only a portion of the country. Forty percent of our sampling clusters (6 of 15) were described as focus areas for training efforts, or showed clear evidence of some presence of yellow flag volunteers. However, even within these areas apparently reached by training efforts, outreach to caretakers was limited. In these districts, only 21 % of respondents reported yellow flag contact.

In sum, personal contact has been substantial, but thus far has been focused on the clinic nurse. Twenty-two percent claim recent, and 60% claim past, direct clinic contact about ORT for diarrheal disease treatment for young children. Contact outside of the clinic is less common. Seven percent of the sample report contact with an RHM or other extension worker about diarrheal treatment, and 12% report contact with a yellow flag person. Given some overlap between these two types of outreach contact, a total of 16 % of the sample reported out-of-clinic contact. A useful picture of overall contact comes from Table 4. Either 35% (if we use our conservative definition of clinic contact) or 65% of the sample appears to have had face-to-face contact about campaign messages.

Table 4: Personal Contact: Overall, and focus/non-focus area comparisons.

	Entire Sample (N=431)	Focus Area (N=180)	Non-Focus Area (N=251)
A) Clinic Contact within 6 months for treatment with ORS or SSS	21.8%	25%	19.5%
B) Some Clinic Contact for treatment with ORS or SSS	56.8%	57.8%	55.6%
C) Extension contact for diarrhea treatment	6.7%	12.2%	3.9%
D) Contact with Flag Person	11.8%	21.1%	5.2%
E) Outreach Contact: either C or D	16.5%	28.3%	8%
Conservative Contact Measure: either A or C or D	35.5%	48.9%	25.9%
Less Stringent Contact Measure: either B or C or D	65%	71.1%	60.6%

An additional note may be added here. In one part of the questionnaire, respondents were asked to describe what treatments they believed traditional healers gave to children with diarrhea. Very few (8% of those who gave any answer) reported that traditional healers gave ORS or SSS to treat diarrhea. While there was some training of healers that occurred during the campaign, it has not had a large effect on audience perception of what healers are likely to do.

It has been mentioned that the program concentrated its direct training activities in a limited number of places. We defined 6 of our 15 sampling clusters as places in which training had been relatively more intense. And, as is clear from Table 4, those training foci were the places where we were most likely to find people who reported some direct exposure to a personal source of information. We compare the 6 focus areas with the 9 non-focus areas for the reported contact variables.

On every criterion, except for the vague, "past clinic contact", the focus areas show a sharp advantage. On the scale which credited either recent clinic treatment, extension contact, or flag person contact, focus area respondents were virtually twice as likely to have had personal contact than were non-focus area respondents. Most of the increase reflects additional outreach contacts: Health personnel training was indeed turned into sharply increased personal contact about campaign messages among the audience. In a subsequent section, we ask whether each type of contact, in-clinic and out, affects knowledge of campaign messages and practice of recommended behaviors.

### **FLYERS**

The third component of the campaign meant to reach respondents were special flyers which provided instruction in how to mix sugar-salt solution. The implementation staff reported distributing 260,000 flyers during the campaign, more than one for every homestead in the country. During the final survey, interviewers showed respondents a

copy of the flyer and asked them if they had ever seen it and whether they owned it. If they owned it, they were asked to show their copies to the interviewer. Anyone who recognized the flyer was asked to describe what it was about.

More than one half of the sample recognized the flyer and knew it dealt with mixing SSS. One in five claimed to own the flyer, and one in eight could actually show it to the interviewer.<sup>4</sup> As they stand, these results speak to considerable success in diffusing the idea of the flyer, and even in distributing the flyers themselves. One in five owning an educational flyer, where none did five months before, is of note. Nonetheless, there were enough flyers distributed for every homestead in the country. Why didn't more caretakers have them?

The data allow a clear explanation. To the greatest extent flyer ownership reflected contact with an extension worker, or yellow flag volunteer--an outreach worker. Almost one in two respondents who had contact with an outreach worker owned a flyer. Only one-eighth of the rest of the sample claimed to own a flyer. Recent contact with clinic nurses made no difference in flyer ownership (or flyer recognition).

Flyers require a physical distribution channel. The clinics apparently were not asked, or not able, or not willing to serve as a channel. Or, if people got flyers from clinics they tended not to keep them. In contrast, yellow flag volunteers and health extension personnel served as effective distributors. They reached only a small portion of the country, however, because training did not occur in all sections of the

country, and because even in areas of the country where training did occur, many people did not have contact with any outreach workers.

This result, of substantial effectiveness by outreach workers where they operate, but of limited penetration in the population, will be repeated in subsequent sections of this presentation. It is a subject requiring further discussion, and it will have it, after additional results are presented.

Table 5: Exposure to the Campaign Flyer

	Entire Sample (N=431)	Contact with Outreach Workers		Contact with Clinic	
		None (N=360)	Some (N=71)	No Recent Contact (N=337)	Recent Contact (N=94)
Saw Flyer about SSS	54.3%	49.4%	78.9%	55.2%	51.1%
Own Flyer	18.5%	12.5%	49.3%	19.3%	15.9%
Can Show Flyer	12.5%	8.3%	33.8%	13.1%	10.6%

### SYNTHESIS

For each of the four campaign exposure variables: radio listening, recent personal contact at the clinic, personal contact with an outreach worker, and flyer exposure, we can describe, crudely, two levels of exposure: not exposed or minimally exposed versus exposed. Table 6 presents this information. It is then possible to combine all four campaign exposure variables into a single scale, to understand whether each source is reaching the same or different, people (Figure

I). We divide the population into four groups: those who report exposure to three or four sources (8.2%), those who report exposure to two sources (20.5%), those who report exposure to one source only, (54.8%), and those who do report no substantial exposure to any source (16.5%). Clearly, the great majority of the respondents had some substantial exposure to the campaign. Most often that included exposure to radio (72% of those exposed to a single source were exposed to radio).

**Table 6: Campaign Exposure Summary for Each Channel**

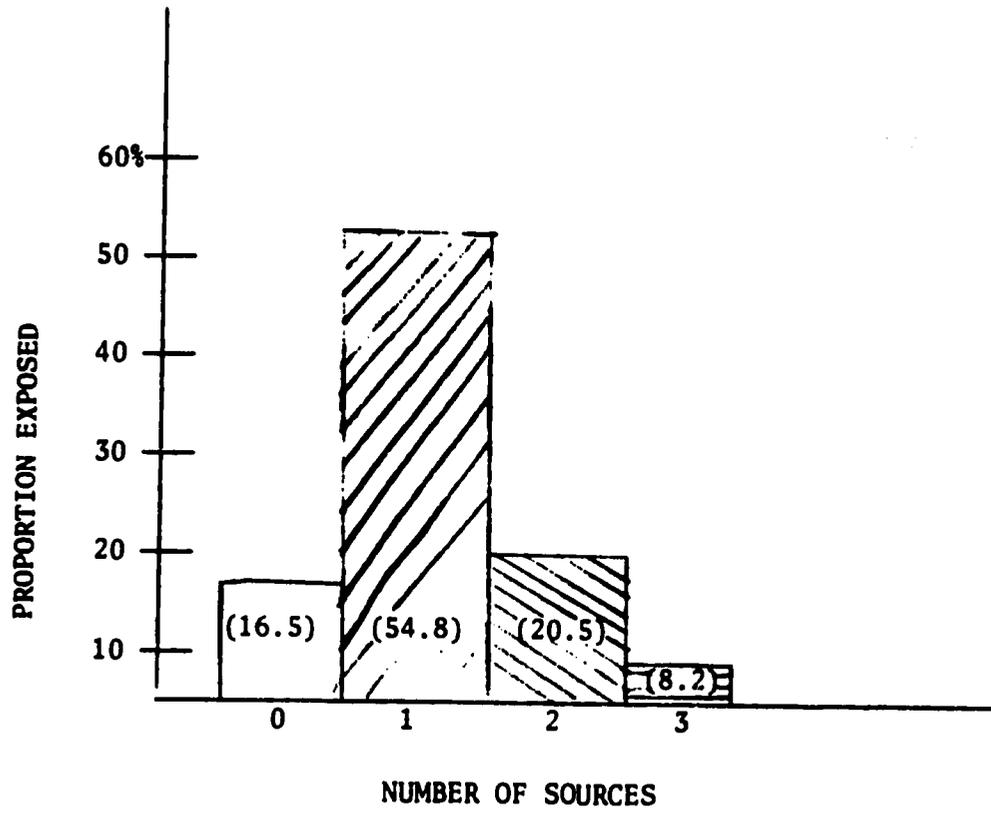
	Radio	Flyer	Recent Clinic Contact	Outreach Contact
Not Exposed	37.7%	81.5%	78.2%	83.5%
Exposed	62.3%	18.5%	21.8%	16.5%

**Radio:** Listening Scale 0, 1, 2 = not exposed; 3, 4, 5 = exposed

**Clinic Contact:** Previous six months clinic ORS Treatment = exposed; otherwise = not exposed.

**Outreach Contact:** Extension Worker contact re ORT or Yellow Flag Volunteer Contact = exposed; otherwise not exposed.

**Flyer:** Claims to own and knows what it teaches = exposed otherwise = not exposed.

**FIGURE I: Exposures to Campaign Channels**

## DID THE CAMPAIGN AFFECT KNOWLEDGE AND EXPRESSED INTENTIONS?

In this section we examine the effects of the campaign on two types of variables: knowledge, particularly of the correct mixing instructions for the sugar-salt solution, and attitudes or intentions, as reflected in questions about how respondents think about alternative diarrheal treatments. We use data from the before and after questionnaires, assuming that large differences in responses may be attributed to the campaign. (5,6)

### KNOWLEDGE EFFECTS

#### Ingredients in the Sugar/Salt Solution

Much of the campaign's energies were devoted to transmitting knowledge about the proper way to mix the sugar-salt solution. This was a particularly difficult task, because the recommended formula for the campaign (1 litre of water, 8 caps of sugar, 1/2 cap of salt) was a change from a formula that had been in circulation previously (recommended 1 cap of salt, which produces a potentially toxic solution containing 140 meq [millimoles per liter equivalent] of sodium, above the 100 meq upper bound of the WHO guidelines). Other areas of knowledge the campaign addressed include how much solution to give a child, what type of water to use in preparing it, and how often it should be prepared.

The results (described in Tables 7 and 8) suggest a generally positive response to the campaign, but with some reserve. The results can be evaluated from either of two perspectives: they are evidence for the effectiveness of the communication activities in producing desirable educational outcomes; also they are evidence about whether what was learned was sufficient, given health criteria. Specifically, when we deal with SSS, it is possible that we have substantial communication success--lots of people learning important concepts--without necessarily satisfying one crucial health success criterion: few users of SSS "knowing" dangerous formulas. We present the results keeping both perspectives in mind.

The campaign planners faced two difficult circumstances from the start. The Ministry did not believe that it would be possible to reach the mass of the population through an ORS packet distribution program. Neither the logistics of packet distribution nor the frequency of mothers' clinic use would support that strategy. Instead the campaign focused on the continuation of home-mixed sugar salt solution, by its nature a more complex practice than ORS packet use with clinic-based distribution. The fact that previous efforts had endorsed a potentially dangerous formula made it doubly difficult.

At the outset of the campaign, fifty-one percent of all of the women interviewed said, without specific prompting, that they had used sugar-salt-solution when they described their treatment regimen for the last case of diarrhea for a child under five, or if they reported no specific past case, they said they planned to use SSS for the next

case.<sup>7</sup> The formulas they reported using, however, were highly varied. There were 47 different formulas reported by the 223 respondents who claimed to use sugar-salt solution. Of those, 19 did not offer a specific formula. The rest were divided as suggested in Table 7. Between them, the old, previously recommended formula, and the new formula were given by less than 25% of those using SSS.

The campaign changed this pattern sharply. Sixty-eight percent<sup>8</sup> of the respondents to the post-campaign survey claimed to have used SSS for the last case (or described it as part of their next case planned treatment regimen, if they reported no last case.) Not only were there more respondents reporting using the formula, but they were much more concentrated in the formulas they offered. The 247 respondents offered a total of 47 formulas, (that was unchanged) but more than half offered one of just two formulas: the new or old recommended versions. In particular, while only 8% of those SSS users offered the campaign-endorsed formula before the campaign, 26% did so at the end.<sup>9</sup>

A useful additional perspective on the campaign comes when we examine learning of the two elements of the formula that were unchanged (one liter of water and eight caps of sugar.) Twenty-eight percent of the before sample knew both water and sugar quantities, but fifty-eight percent specified both correctly after the campaign. From a communication campaign effectiveness perspective, these results are, without question, a major success (Table 8.)

**Table 7: Most Frequently Offered Formulas  
for SSS Before and After the Campaign**

Formula Number	<u>Before the Campaign</u>			N	%
	Water (liters)	Sugar (cups)	Salt (cups)		
1.*	1	8	1	35	16%
2.**	1	8	1/2	18	8%
3.	1	2	1	16	7%
4.	1	1	1/2	14	6%
5.	1	2	1/2	8	4%
6.	1/4	1	1/2	7	3%
(40 other formulas with fewer than 3% of sample)				106	47%
No formula offered				19	9%
<b>Total</b>				<b>223</b>	

Formula Number	<u>After the Campaign</u>			N	%
	Water (liters)	Sugar (cups)	Salt (cups)		
1.*	1	8	1	67	27%
2.**	1	8	1/2	64	26%
3.	1	3	1	16	6%
4.	1	1	1	10	4%
5.	1	1	1/2	9	4%
6.	1	8	3	7	3%
(40 other formulas each with less than 3% of sample)				59	24%
No Formula offered				15	6%
<b>Total</b>				<b>247</b>	

- \* The formula advocated before the campaign  
 \*\* The formula recommended during the campaign (and briefly  
 before it)

Table 8: Knowledge of Sugar Salt Solution, Among SSS Users

	Before (N=223)	After (N=247)
Percent knowing correct amounts for all three ingredients	8.2%	25.9%
Percent knowing both water and sugar amounts	28.3%	59.1%
Percent including more than 100 mEq of sodium per liter	66.4%	54.3%
Percent including more than 140 mEq of salt	29.1%	12.1%
Percent knowing should use clean water	45.9%	80.2%
Percent knowing should prepare daily	17.3%	41.3%
Percent, appropriate answers, amount per day	70.2%	75.2%

From the perspective of achieving health outcomes, however, concerns must remain. Two issues are worth attention. First, there is an increase in the proportion of people (from 16% to 26%) who are reciting the old formula, a formula which was changed because it was considered potentially dangerous. How is that increase to be explained? One possibility is simple misunderstanding of the message with respondents remembering one cap when the instruction was 1/2 cap of salt, either by those who have heard it directly from the radio or other channels, or indirectly from friends or neighbors. A second possibility is that some sources of information, particularly clinic nurses or health extension workers, continue to diffuse the old formula, even after the campaign. A third possibility is that word of mouth is still spreading the old formula in communities, although no official source was doing

so.

Without direct observation of clinic and extension worker activities, to establish what information they were diffusing, it is difficult to choose among these explanations. Nonetheless, we can try to distinguish among them by looking at the association between exposure to particular campaign channels, and the likelihood of reciting the old or new formula. If the problem was that inaccurate information was being diffused by a single channel (e.g., nurses or extension workers), one would expect to find a concentration of old formula answers among those exclusively exposed to that source. Or, if residual diffusion was the problem, we would expect that people who did not report exposure to any source would be particularly likely to offer the old formula.

In fact, none of these patterns is consistent with the data where samples were large enough to tell: regardless of the source of exposure, the probability of reporting the old formula remains the same. (See appendix A-3.) Thus, two of the three possible explanations: misteaching of the message and delayed word of mouth, are unlikely to be generally true although they may hold among some segments of the population. However, the lack of association of old formula responses with exposure to any one channel might suggest that people are capable of learning the wrong message from any source. People seem to be learning an incorrect message from channels providing correct information. Thus the third explanation, mislearning the message, is consistent with the data. It may well be difficult to

convey a fraction as part of a formula to be memorized.

A related, but distinct health outcome concern, has to do with the total proportion of people who are claiming to use SSS, but are reporting the preparation of a dangerous formula. Too much sugar or too much salt may produce a dangerous solution. We have very few respondents reporting more than the recommended 8 caps of sugar at the close of the campaign, so there need be little concern about that ingredient. Concern with too much salt is substantial, however.

We've already noted that 27% of the sample after the campaign offered the old formula, incorporating one cap of salt. In addition, 27% gave other incorrect formulas with sodium levels above 100 meq per liter of water. Thus, a total of 54% of the SSS-using sample reported formulas considered dangerous by some medical authorities. Only 12% gave formulas with sodium levels above 140 meq (or one cap of salt per liter).

Clearly this was an improvement over the before-campaign situation, when more than 66% of the SSS-users suggested a formula with a sodium level over the 100 meq liter and 29% offered formulas with sodium levels over 140 meq. Nonetheless, the six month campaign, at best, made only a small dent in this problem.

### Preparation and Administration of Sugar-Salt Solution.

We also evaluated the learning of three additional concepts with regard to the preparation and administration of SSS. Four-fifths of the user sample spontaneously mentioned "with clean water" when asked how they made the SSS solution at the end of the campaign; 46% did so at the start. Awareness that a new solution should be made daily more than doubled during the course of the campaign, but still only 41% knew that at the campaign's end (Table 8).

There was little change in the number of those who gave appropriate answers to a question about how much liquid to give a child each day. The campaign's messages were vague on this score (suggesting a child be given as much as he or she could take) because the appropriate amount varies with the age of the child, and this was seen as too complex to communicate. As a result, the distribution of responses across categories, listed in Table 9, really does not vary from before to after the campaign.

Table 9: Amount of Solution a Child Should Have Among SSS Users

	Before (N=223)	After (N=247)
As Much as Can Take When Thirsty	.3%	3.2%
Less Than 1/2 Cup	15.2%	17.8%
1 Cup or 1/4 Liter	16.8%	18.6%
2-3 Cups, 1/2-3/4 Liter	21.4%	23.9%
4 Cups-1 Liter	28.0%	13.4%
Between 1-2 Liters	3.7%	-
More Than 2 Liters	.6%	4.5%
Doesn't Know/Not Asked	14.0%	12.5%

#### Feeding During Diarrheal Disease

A second, although lesser, area of emphasis for the campaign was on proper feeding during and after diarrheal episodes. The campaign messages advocated special feeding during episodes, and named foods known to be high in energy and in potassium. After diarrheal episodes, extra feeding of foods high in energy and in protein were suggested. For reasons about which we can only speculate, the messages about during episode feeding were ignored and those about after episode feeding were often accepted.

As is clear from Table 10, a few more respondents (53% vs 42%) after than before the campaign accepted the need for special foods during episodes, but there was virtually no change in the proportions naming specific recommended foods. Those more or less exposed to campaign channels gave identical responses. In contrast, acceptance of the need to provide special foods after an episode jumped sharply (from 16% to 44%), as did specific mentions of energy-dense and protein-rich foods.

Table 10: Feeding During/After Diarrhea

	Before (N=438)	After (N=431)
<b><u>During Episodes</u></b>		
Needs Special Foods During	42.3%	53.4%
Mentions a Potassium Rich Food	10.0%	10.2%
Mentions an Energy Dense Food	32.4%	30.2%
<b><u>After Episodes</u></b>		
Should Feed Differently	16.3%	43.6%
Mentions an Energy Dense Food	13.3%	23.7%
Mentions a Protein Rich Food	7.8%	30.9%

Three explanations for the contrasting results can be suggested. First, the clarity of the two messages may simply have been different. However, none of the producers believe that to be the case. Or, substantively, people may find it more difficult to accept a message advocating special feeding during a diarrheal episode. Such a message may violate common sense notions that a child ill with diarrhea needs to avoid food, not eat extra food.

Finally, and this is the explanation several Swazi Ministry of Health readers of an earlier draft have endorsed, it may be that health clinic staffs give counter-feeding advice. However, when we checked to see whether clinic-users were more likely than non-users to reject special feeding during episodes, we found no such evidence. Thus, without clinic observation establishing poor staff practice, we can view this explanation as speculative, as are the other two.

### The Dangers of Diarrhea

A last area of investigation of knowledge gain draws on a question which asked respondents "what kills a child when he has diarrhea?" The campaign introduced and emphasized the difficult concept of dehydration, or loss of liquids, as the cause of mortality to justify the use of ORT as supplier of lost liquids. We see some success by the campaign in spreading this understanding (Table 11).

Table 11: Perceived Causes of Diarrheal Mortality

	Before (N=438)*	After (N=431)
Don't know	18.7%	16.5%
Loss of Strength	64.8%	39.8%
Names Signs of Dehydration	26.7%	11.6%
Other	1.6%	8.6%
Liquid Loss/Dehydration	30.3%	39.8%
Mean Number of Responses Given	1.234	1.00
Proportion of All Responses Which Were Liquid Loss/Dehydration	24.6%	39.8%

\* Columns total to more than 100%, since each respondent could give up to 2 answers.

The proportion mentioning loss of liquids goes up, but only from 30% to 40%. Much of that addition seems to have been drawn from the group who, at the before measure, named a specific sign of dehydration (like sunken eyes, dry skin, etc.) and particularly from the group who mention the vague, if correct, diagnosis "loss of strength."

The effect of the campaign comes into sharper focus if we examine the "loss of liquids" response as a proportion of all responses given. The campaign seems to have reduced the total number of answers and increased their focus on the endorsed response. Less than 25% of the before campaign responses were "loss of liquids", while 40% of the after campaign responses repeated the campaign message. Nonetheless, we can not claim universal acceptance of this message.

Teaching the concept of dehydration has proved difficult in campaigns elsewhere and, despite some success, it appears also to have experienced problems here. As a consolation, however, when we turn to the section on use of ORS/SSS, there seems to be no evidence that mastery of the concept of dehydration is required before mothers accept ORT as an appropriate solution.

#### Rehydration Kit

A specific innovation of the radio campaign (and thus a marker for its penetration) was advocacy of a rehydration kit. Listeners were asked to put together a liter bottle, a bottle cap, a spoon and cup, and sugar and salt and keep them to the side for use when children have diarrhea. The message spread quite rapidly. More than one-third of the respondents (35.7%) had heard of the kit, and most of those knew it contained a bottle, sugar and salt, although only about one-half knew that a cap, spoon and cup were to be included. (See Appendix A-4)

From the point of view of knowledge gained in a short time, starting from zero, this success is admirable. Unfortunately, knowledge did not lead to practice. Only 5.6% of the sample reported owning such a kit, and only half of those could show it to the interviewer when asked. The rehydration kits are a knowledge success, but practice is another story.

Whatever success was achieved appears to be an effect of radio broadcasts. Eight percent of those heavily exposed to radio owned the kit, but less than one percent (1 person out of 162) who did not listen to radio heavily owned the kit.

In informal interviews, when asked about why they did not keep the kits, some mothers replied it was impractical; the elements of the kit were everyday utensils and condiments, and could not be put away. Whether that will turn out to be a temporary or a long term obstacle won't be known until additional effort is made to persuade mothers of the utility of such kits.

#### ATTITUDES AND INTENTIONS

We have just finished a discussion of knowledge outcomes, and in the next major section we turn to health practices. In conventional persuasion theory, between knowledge and practice change lie attitudes or intentions to practice. It is to them we turn now.

We present two types of outcomes in this section: evaluative beliefs like "is this a good treatment for diarrhea?" and intentions to practice like "would you use this treatment in the future?" We distinguish them from self-reported practice measures like those which ask for details of treatment for the last case of diarrhea. These "I did it" measures are discussed in the next major section, although we recognize that the line between future intentions and past practices, when all are reported on the same questionnaire, may be less than definitive.

We asked about a series of types of treatment and sources of treatment both before and after the campaign, including; 1) use of imbitas (herbal concentrates) to stop diarrhea, 2) use of purges, 3) use of ORS, 4) use of SSS, 5) treatment by traditional healers, 6) by clinic staff, and 7) by health workers. We also asked separately about preferred treatments for mild diarrhea.

We begin with a discussion of changing responses to traditional treatments for diarrhea: imbitas to stop diarrhea, purges, and references to the traditional healer.

### Traditional Treatments

**Purges.** Purges, in Swaziland, according to survey results were not well-regarded or frequently used, even at the start of the campaign. However the campaign, if the questionnaire data are to be believed, has brought about a further sharp decline in positive attitude and

intention with regard to this dangerous treatment.

Table 12 summarizes the important results. At the start one-in-four respondents said they had ever used purges; six months later, barely one-in-ten say they have. These results should not be taken literally as a measure of historical use; it is unlikely that six months has brought so many new never-users into the population. Rather these can be seen as an attitude response, an unwillingness to admit having used purges in the past, or a desire to forget such use. Thus it suggests what the current perspective is on purges, rather than what an individual had done in the past.

Table 12: Attitudes and Intentions: Traditional Treatments

	Before (N=438)	After (N=431)
<b>A. Purges</b>		
1. Proportion who report ever using	24.4%	10.7%
2. Proportions who believe purges to be "sometimes good" or "good"	31.6%	14.4%
3. Proportion who will <u>not</u> use in future	71.0%	85.2%
<b>B. Imbitas (herbal concentrates) to stop diarrhea</b>		
1. Proportion who report ever using	46.5%	39.2%
2. Proportion who believe "sometimes good" or "good"	53.8%	43.4%
3. Proportion who will not use in future	46.3%	62.9%
<b>C. Traditional Healers</b>		
1. Proportion with healer around here	89.7%	87.2%
2. What treatments does healer give		
a) Imbita or Purge	42.3%	29.7%
b) Don't Know	51.5%	67.4%
3. Proportion who believe "sometimes good" or "good"	35.4%	32.2%
4. Proportion who report ever using	20.5%	15.9%
5. Proportion who will <u>not</u> use in future.	72.7%	79.4%

This finding is confirmed by responses to the other two questions. There is sharp jump in the proportion who see purges as "not good" (36% to 61%). rather than, "good" or "sometimes good" or "not sure". Future non-users, while high at the start of the campaign (71%) jumped as well, to 85%.

One interpretation of these results is to credit the campaign with an important reduction in intentions with regard to a pernicious behavior. Two objections might be raised to this inference, although neither is overwhelming. First, given the relatively low use of purges at the start of the campaign, isn't it possible that positive attitudes toward purges were declining anyway, and would have reached this level regardless? This seems an unlikely explanation. The sheer speed of the change we've seen isn't consistent with a spontaneous diffusion process, given experience elsewhere. For changes of this magnitude some stimulating force is surely necessary, and in this case, there is no rival outside cause, insofar as we know, besides the campaign.

A second concern is whether the strong negative attitude expressed is a reflection of actual behavior, or merely conforming with what they believe official questioners expect. Since we've done no direct observation, we cannot be sure. However, even if practice and intention are not the same thing, we clearly see a change in respondents knowledge of the "right" answer. We can speculate that such coherent knowledge of what modern medical sources expect, alongside respect for those sources reflected in regular use of clinic facilities for some illnesses, is likely to be translated into practice

consistent with those expressed beliefs.

Even in the in-depth interviews, structured to ease reporting less acceptable behaviors such as purges or enemas, we see a low reported use of these treatments. In the 23 in-depth interviews, only four caretakers answered that they had used purges or enemas to treat their children's diarrhea. Of these, two offered that they would no longer use this treatment because they now understood that it was bad for the child. Fourteen mothers said that they had never used purges for diarrhea and of these, four added that purging was a dangerous treatment for children with diarrhea. The remaining five mothers agreed that purges were not good for the treatment of diarrhea, but contended that they could be useful for the treatment of stomach ailments.

Imbitas To Stop Diarrhea. Purges were a direct subject of the campaign. The results suggest substantial acceptance of those messages. In contrast, the other common traditional treatment, imbitas (herbal concentrates) to stop diarrhea, was not directly attacked. At best, a decline in their use would be a reflection of the positive emphasis placed on SSS or ORS as preferred treatments, which implicitly lessens the legitimacy of alternative treatments.

In fact, we do see some change in attitudes and intentions with regard to imbitas, but less than for purges. This pattern is consistent with the direct attack on one but indirect attack on the other. There was only a slight decline in those who admitted ever using imbitas (again

to be interpreted as current attitude rather than historical record). and in the number of those who believed it to be "good" or "sometimes good". The change in the proportion who plan to use imbitas in the future is somewhat sharper, moving from 2 out of 5 to 1 out of 5. It may be that the endorsement for SSS given by the campaign is directly relevant to actual alternative practice, thus intentions to use imbitas decline. In contrast, in the short run, positive evaluations of imbitas, since they are not directly attacked, can remain. This is particularly so since imbitas are used for many different illnesses.

Traditional Healers. Use of traditional healers, ubiquitous in Swaziland, is the area of questioning that we need to report most tentatively. We will see, subsequently, that almost no one reports use of traditional healers in their treatment of children's diarrhea. Yet many informal reports suggest that this is not the case. We can speculate as to explanations for the contradiction. Perhaps respondents are reluctant to admit to official interviewers that they use traditional healers. Or, the type of diarrhea asked about in the questionnaire is distinguished from the type of diarrhea that traditional healers can cure. It may even be that the informal reports are inaccurate, and what we are told on the questionnaires is correct. It may be that children's diarrheas are seen as something to be cared for in the modern medical system. We simply do not know, and present these results with some tentativeness.

In order to encourage respondents to tell us about traditional healer treatment without fear of censure, we structured these questions

differently than for other treatments. We began simply asking whether there was "a traditional healer around here". This permitted a noncommittal yes, and both before and after the campaign 9 out of 10 people gave it. We then asked about what treatments the traditional healer gave, again not asking respondents about their personal experience, only for the facts.

With this question respondents were shying away, however. Many appear to be using it as a present attitude indicator, with half before the campaign and two-thirds afterwards saying they didn't know. This response, if taken literally, seems not credible. We can only take it as a measure of reluctance to admit any involvement with traditional healers. This pattern continues with the next three questions; only one-third will admit that they think healers are "good" or "sometimes good" sources, both before and after the campaign; 20% before and 16% after admit to ever using traditional healers for treatment of children's diarrhea; about three-quarters of both before and after samples reject future use of traditional healers.

What can we conclude from all this? We can say that there is little evidence of any campaign effect, except some increased denial of any knowledge of traditional healer treatments. We can't say that we have much confidence that we have accurately portrayed Swazi attitudes toward traditional healers. More than for any other set of questions, we have to say that the survey data is inconclusive.

The in-depth interviews revealed a different pattern in traditional healer use. Of the 23 mothers interviewed, 13 offered that they had used traditional healers for the treatment of children's diarrhea. Of these, only two claimed that it was their sole, preferred treatment. Four others said that they used both traditional and clinic treatments, simultaneously or serially when the first one chosen appeared to be ineffective. The remaining seven mothers distinguished treatments of different types of diarrhea. When asked about umhezulu or kuhabula (less common syndromes of which diarrhea is one symptom), they answered that they went to traditional healers for treatment. For treatment of umshako (a more common form of diarrheal illness) however, they went to the clinic or used SSS at home. The questionnaire used only the word umshako to refer to diarrhea because it is the more general term and the more common ailment. (See Green n.d. for a detailed description of traditional Swazi beliefs about types of diarrhea). This discrepancy in terminology may account for the the low reported use of traditional healers in the questionnaire data.

In sum, the campaign produced declines in positive attitudes towards and intention to use purges, a theme of radio messages. The campaign addressed the use of imbitas to stop diarrhea but only implicitly. Perhaps as a result, the campaign affected intention to use imbitas negatively, but not attitudes toward them. With regard to traditional healers, little effect of any sort was seen.

## Sources for Modern Treatments (Table 13)

Clinics. Clinics are universally well-regarded, or so respondents told our interviewers. Three-quarters of the respondents have gone with their children to clinics for treatment of diarrhea; 9 out of 10 report the treatment is good, and 19 out of 20 will go to the clinic again in the future. We see essentially no campaign effects on these general evaluations; they were high and they stayed high.

The one major difference the campaign seems to make is on a knowledge rather than an attitude variable: the treatments given at the clinic. Each respondent could give up to three treatments in response to a question which asked what treatments were given at the clinic. About 45% of both before and after samples cited ORS, and 10% cited SSS. Sharp changes, however, can be seen in the reduction of other treatments respondents claim clinics gave for children's diarrhea. Forty-two percent before, but only 19% afterward, claimed that injections were a common treatment.

In general, we see a much more focused set of treatments reported in the after survey. For example, among those who mentioned any treatments, the average number of treatments mentioned before the campaign was 1.82. Afterwards, it fell to 1.53. Before, 32% of all treatments named (counting every treatment mentioned by every respondent) were ORS or SSS. Afterward, that had increased to 43%.

Table 13: Attitudes and Intentions: Modern Treatment Sources

	Before (N=438)	After (N=431)
<b>A. Clinics</b>		
1. Proportion who ever go	74.8%	75.9%
2. Proportion who believe it "good"	87.7%	88.2%
3. Proportion who will use in future	93.8%	97.4%
4. Treatments given at clinic- proportion who mention		
a) ORS	43.1%	46.9%
b) SSS	8.0%	11.6%
c) Injections	41.8%	18.8%
d) Medicines	63.3%	55.5%
5. Mean number of treatments for those who mention any treatments	1.82 (N=387)	1.53 (N=379)
6. Proportion of all mentioned treatments which are ORS/SSS	31.7%	43.4%
<b>B. Healthworkers (HW)</b>		
1. Proportion for whom health worker has been involved in treatment	18.3%	28.3%
2. Proportions who describe help HW can give as		
a) ORS or SSS	23.9%	52.2%
b) Reference to Clinic	13.5%	17.2%
c) Don't Know	57.1%	26.9%
3. Proportion who believe HW will help	56.4%	88.4%
4. Proportion who will use HW in future.	62.0%	72.3%

As the result of the campaign, one of two things seems to have happened. Perhaps the clinics are in fact changing their mode of treatment, focusing on ORS. Or, as an outcome of the campaign, caretakers are gaining a clearer perception of what it is that children receive at the clinic. We cannot sort out these explanations with our data. A separate analysis, however, finds that reports of injections are concentrated in only a few sampling areas. This suggests that the results reflect real changes in clinic practice, rather than just campaign-induced perceptions of changes.

Health Workers. The campaign seems also to have enhanced the position of health workers as a part of diarrheal disease treatment. Changes are sharp, and if absolute scores are not so enthusiastic as for clinics themselves, they are nonetheless quite positive. Twenty-eight percent after, versus 18% of the sample before, reported direct involvement of health workers in diarrheal disease treatment. There is increased knowledge as to what help health workers can give (after 27% don't know, while before 57% didn't know), and that the most common aid is ORS or SSS (24% before versus 52% after). There is also a substantial jump in the numbers who accept that health workers can help, and a smaller jump among those who will definitely use health workers in the future. For the last two questions, some skepticism as to their elevated values may be warranted. Nonetheless, the change during the campaign is substantial, and provides good evidence that the regard for health workers is increasing.

### Modern Treatments

Sugar-Salt-Solution. In the previous major section, we reported on the changes in knowledge in preparation and administration of SSS associated with the campaign. These changes were clearly there, although some concerns about the formulas was expressed. Evidence about attitudes and intentions vis-a-vis SSS were noteworthy in somewhat different ways. We were surprised, when we looked at the before data, at just how widespread positive regard for SSS was even before the campaign started. Ninety-two percent of the respondents said they'd heard of "a medicine for diarrhea which is made of water, sugar and salt." Sixty-two percent claimed to have used SSS at least once, 77% claimed that they thought it was good, and 79% definitely planned to use it in the future. There was an increase in these numbers during the campaign, but clearly the message had already spread. Sugar-salt-solution was not a new idea. Nonetheless, improvement there was: 98% said they'd heard of it by the end of the campaign, 75% had used it, 83% believed it was good, and 92% would use it in the future (Table 14).

Clearly, while SSS was not novel in Swaziland, it is well regarded, and the campaign coincided with a period of increases in that regard. Perhaps the most noteworthy change is in intended future use, which jumped from 79% to 92%.

Table 14: Attitudes &amp; Intentions: Modern Treatments

	Before	After
<b>A. Sugar-Salt-Solution</b>		
1. Proportion who have heard of it	92.3%	98.1%
2. Proportion who have ever used	61.6%	74.7%
3. Proportion who believe it is good	76.9%	82.8%
4. Proportion who will definitely use in future	78%	92.1%
<b>B. Treatment of Mild Case of Diarrhea</b>		
1. Proportion who treat	44.6%	69.6%
2. Treatments Given		
a) Proportion giving SSS, among treaters	40.0%	61.2%
b) Proportion giving SSS-entire sample	17.4%	43.2%
<b>C. Treatment with ORS packets</b>		
1. Proportion who recognize ORS packet as treatment for diarrhea	61.6%	69.1%
2. Proportion who have prepared ORS	50.2%	59.4%
3. Proportion who say clinic nurse is source of knowledge of ORS, among those who have prepared it	94.0%	94.9%

Treatment of Mild Cases with SSS. One message of the campaign encouraged the use of ORT for every case of diarrhea to prevent dehydration. In order to measure the acceptance of that message, we asked whether or not respondents would customarily treat a mild diarrhea. If they said they did, we asked how they would treat it. The absolute levels of apparent use, perhaps, are of limited interest since a need to give a socially expected response may well have inflated them. Nonetheless, the changes in responses associated with the campaign represent another indication of its success.

We see a jump from 45% to 70% in the proportion who report treating, and a jump from 40% to 61% in the proportion of treaters who say they will use SSS. Putting these results together, 43% of the entire after sample, without a specific prompt, report that they would use SSS for treatment of mild diarrhea. Only 17% did so at the start of the campaign. These results further support the notion that SSS is becoming established as a part of accepted diarrhea treatment, with the campaign playing an important role in accelerating that process (Table 14.)

Use of ORS. The campaign focused its energies on the preparation of sugar-salt-solution for home treatment of diarrhea; at the same time ORS packets are the customary treatment for children who go to clinics. Not surprisingly, we find a substantial proportion of the sample recognize ORS and have used it. And almost all those who have prepared it say that the clinic nurse is the source of their knowledge about its preparation. However, the campaign effects appear to be quite limited,

as we would expect. There are quite moderate changes in the proportions recognizing ORS and in the proportion who have prepared it. One could sensibly argue that these changes were entirely due to improving consistency in use of ORS by clinics, as treatment of preference (Table 14.)

SUMMARY: KNOWLEDGE, ATTITUDES AND INTENTIONS

Overall, the effects of the campaign on knowledge, attitudes and intentions are substantial and positive. Knowledge of the correct SSS formula grew, but still only 26% of self-reported SSS users knew the correct quantities of all three ingredients; the struggle against a previously disseminated formula was difficult, and requires additional effort. Acceptance of SSS as a treatment is high and growing. Rejection of purges, the most dangerous of traditional treatments, is nearly absolute. Health workers have gained status most sharply during the campaign: respondents are more likely to see them as having a role in diarrheal treatment. SSS is now a commonly preferred treatment for mild diarrhea, which respondents claim is now more likely to be treated.

In general, some of the themes targeted directly by the campaign (SSS, purges, need to treat all cases, need to provide extra food after an episode) were most obviously affected. Themes ignored, except by implication, (role of traditional healers, use of imbitas to stop diarrhea, ORS) showed much less of an effect. Some items, even though they were targets of the campaign, proved difficult to change: role of loss of liquids in mortality and use of special foods during episodes.

### DID THE CAMPAIGN AFFECT HEALTH PRACTICES?

Exposure to the campaign is a necessary pre-condition; knowledge is an essential step; attitude and intention reflect movement towards a campaign's goal, but health practice and, eventually, health outcomes are the criteria against which the campaign will be judged.

Never mind what they know or intend, do people do what is recommended? In this section we consider practice change; in the next we turn to evidence about health outcomes.

We approach the problem of estimating diarrheal disease practice in two ways. The first makes use of the before and after questionnaire data. The second turns to the separate clinic study.

### QUESTIONNAIRE RESULTS

The questionnaire allowed us to classify respondents as oral rehydration therapy practitioners in many ways. We can, as we did in the attitude and intention section, point to respondents who reported ever using SSS. That grew from 60% to 75% over the campaign. We can, as we did in the section on knowledge, include among SSS users any respondent who included it in describing a case-specific treatment regimen for a child under-five with diarrhea. Under this criterion, SSS users grew

from 51% before the campaign to 64% afterwards. Finally, we can focus on the respondents who can report about a current case of diarrhea, or a case that occurred within the last month. In the belief that such cases are more likely to be remembered accurately and reflect actual practice, it is that third subsample we emphasize in this section.

Everyone in each sample was asked to recall the last case of diarrhea among their children under five. They were asked to focus on a particular case by naming the child involved. To maximize the specificity of the memory, we chose only those respondents who could recall a specific case that they were either treating currently, or that they had treated in the past month. We include respondents who said they had a current or past-month case, but did not treat it. About 35% of both before and after samples reported about such recent cases.

Before reporting the results of the before-after comparison, there are methodological concerns that need to be raised. They will influence the interpretation of the results. Although the wording of the questionnaire is identical for the before and after studies, it appears that what interviewers did on the two occasions may have varied.

The question we asked the caretaker who had indicated she treated a diarrheal case was "what did you do to help your child?" If no home treatment was mentioned, the interviewer probed: "Did you do anything else at home?" The answer format listed each likely source (clinic, health worker, traditional healer, home treatment) and for each source,

relevant treatments (e.g. ORS, SSS, medicine [like antibiotics or anti-diarrheals], injection, imbita to stop diarrhea, purges, or refers to clinic). While this was merely for coding convenience, it appears that for the before questionnaires, some interviewers used the list of sources as prompts, asking, for example, did you go to the clinic, to the health worker, to the traditional healer, if these responses weren't volunteered. This seems to be the explanation for the sharp reduction in the number of sources named from the before to the after survey (an average of 2 before and 1.5 afterwards for each respondent). We think this is a reflection of interview format rather than an effect of the campaign because it led to the virtual elimination of references to health workers and to traditional healers. We can only assume that, when prompted, respondents cite these sources with greater frequency because either 1) they feel that they should say "yes, I did that too" if prompted, or 2) they are unwilling to mention some treatments (like traditional healers) unless prompted. Thus when we see a decline in a particular practice, or practice doesn't rise so much as we expected, we need to interpret the results carefully. It was easier for the before sample to report a practice than it was for the after sample. This bias did not affect the opportunity to report treating at all, or not treating, which was asked as a separate question before specifics of treatment were probed.

Table 15 presents the data about types of treatment accumulated across all sources. First, we see an increase in the numbers who claim to have treated the last case in some way. Next, we see a decline in reports of administration of injections and in the proportion of the

sample who were given imbitas. These results, if it were not for the questionnaire administration problems, would have been straightforwardly interpreted. While they are consistent with a move away from inappropriate treatments, they are also consistent with a decline in opportunity to report such treatments. However, there is supporting evidence for these changes already presented in the attitudes and intentions section of the report. Albeit cautiously, we can accept them as legitimate changes.

Table 15: Diarrheal Treatment, Current or Past Month Cases  
Before (N=164) After (N=132)

Proportion who report giving

Some treatment	74%	83%
Medicine	59%	49%
ORS	18%	38%
SSS	42%	51%
ORS or SSS	52%	65%
Unspecified Imbita	7%	2%
Imbita to Stop	16%	8%
Imbita to Purge	4%	5%
All Imbitas	27%	14%
Injections	27%	13%

\* Both subsamples are about 35% of the relevant total samples. The after sample is smaller because it was necessary to eliminate the responses of one interviewer who did not use the "Did you treat at home" probe.

The results about ORS use allows rather a different interpretation. ORS jumps from 18% to 38% reporting its use for the last case. All of that ORS use took place at clinics. Clearly, treatments at clinics are moving rapidly to conformity with current recommended practice vis-a-vis ORS.

The one superficially disappointing result is about the growth in SSS practice. For this we should focus on Table 16, and the results for home treatment with SSS. Forty-eight percent of the sample claims to have used SSS for a current or recent case. This number is certainly respectable. However, it is only a moderate increase from the before proportion of 34% reporting use of SSS. (Even that difference is attenuated if we combine ORS and SSS home treatments, with 36% using oral rehydration therapy in one of its forms before the campaign and 48% afterwards.) However, if the absolute growth in the numbers of respondents claiming to use ORS and SSS for the last case is moderate, it hides, perhaps, a greater increase in the quality of use. We can combine the self-reported use data with data about knowledge of preparation and administration and construct quality of use variables. We take the three potential SSS-user samples: those with current and past-month cases, those reporting specific last case or next case treatment regimens, and those for the entire sample who reported ever using SSS or not. We can then compare them before and after the campaign on three quality of use variables: knowing exact recommended quantities of all three SSS ingredients, knowing exact quantities of water and sugar in the SSS formula, and the number of preparation and administration items, (including 3 ingredients, clean water use, need

to prepare fresh daily, appropriate amount of liquid to give a child), that were answered correctly.

Table 16: Diarrheal Treatment, Current & Recent Cases, at Home

	Before (N=164)	After (N=132)
Mentioned Going to Clinic	68%	62%
Mentioned Home Treatment	54%	62%
Home Treatment Mentioned		
ORS	3%	2%
SSS	34%	48%
ORS or SSS	36%	48%
Medicine	6%	2%
General Imbita	8%	2%
Imbita to Stop	10%	8%
Imbita to Purge	2%	4%

No matter which quantity of practice variable we use, there is only a moderate increase in the numbers claiming to use ORT at home. In contrast, no matter which quality of practice variable we use, we invariably see a major positive change, so that the after proportion satisfying the quality criterion is three or four times the before proportion. (Table 17) (See Appendix B for an extended report about the validation of self-report measures of SSS use.)

Table 17: Quality of ORT Use

	Before (N=164)	After (N=132)
<b>Current and Past Month Cases</b>		
Used ORT at home	36%	48%
Used ORT at home and knew amounts of 3 ingredients	4%	17%
Used ORT at home and knew amounts of water and sugar	11%	34%
Used ORT at home and knew at least 4 of 6 Prep./Adm. items	13%	35%
<b>Most Recent or Next Episode Treatment Regimens</b>	(N=438)	(N=364)
Used SSS*	51%	68%
Used SSS and knew amounts of three ingredients	4%	18%
Used SSS and knew amounts of water and sugar	14%	40%
Used SSS and knew at least 4 of 6 Prep./Adm. items	13%	39%
<b>Entire Sample, Reporting SSS Use or Not</b>	(N=438)	(N=431)
Ever used SSS	62%	75%
Ever used SSS and knew amounts of 3 ingredients	4%	17%
Ever used SSS and knew amounts of water and sugar	15%	42%
Ever used SSS and knew at least 4 of 6 Prep./Adm. items	15%	44%

\* These proportions are higher than those for current and past month cases because all respondents supplied a treatment regimen. If a caretaker said that she did not treat the last case, she was asked how she would treat the next case. In contrast, non-treaters (22 out of the 132 after sample) for current/past month cases were included as non-treaters in that analysis. If the 48% ORT use at home among the current/past month sample was corrected for inclusion of non-treaters, it would be 57%, not far from the estimate among the entire sample.

### THE CLINIC STUDY

A separate approach to the issue of practice relied on data gathered over eight months directly in clinics. At 23 of the largest clinics in the country, nurses were asked to register every case of diarrheal disease among children under five. Over eight months, they registered

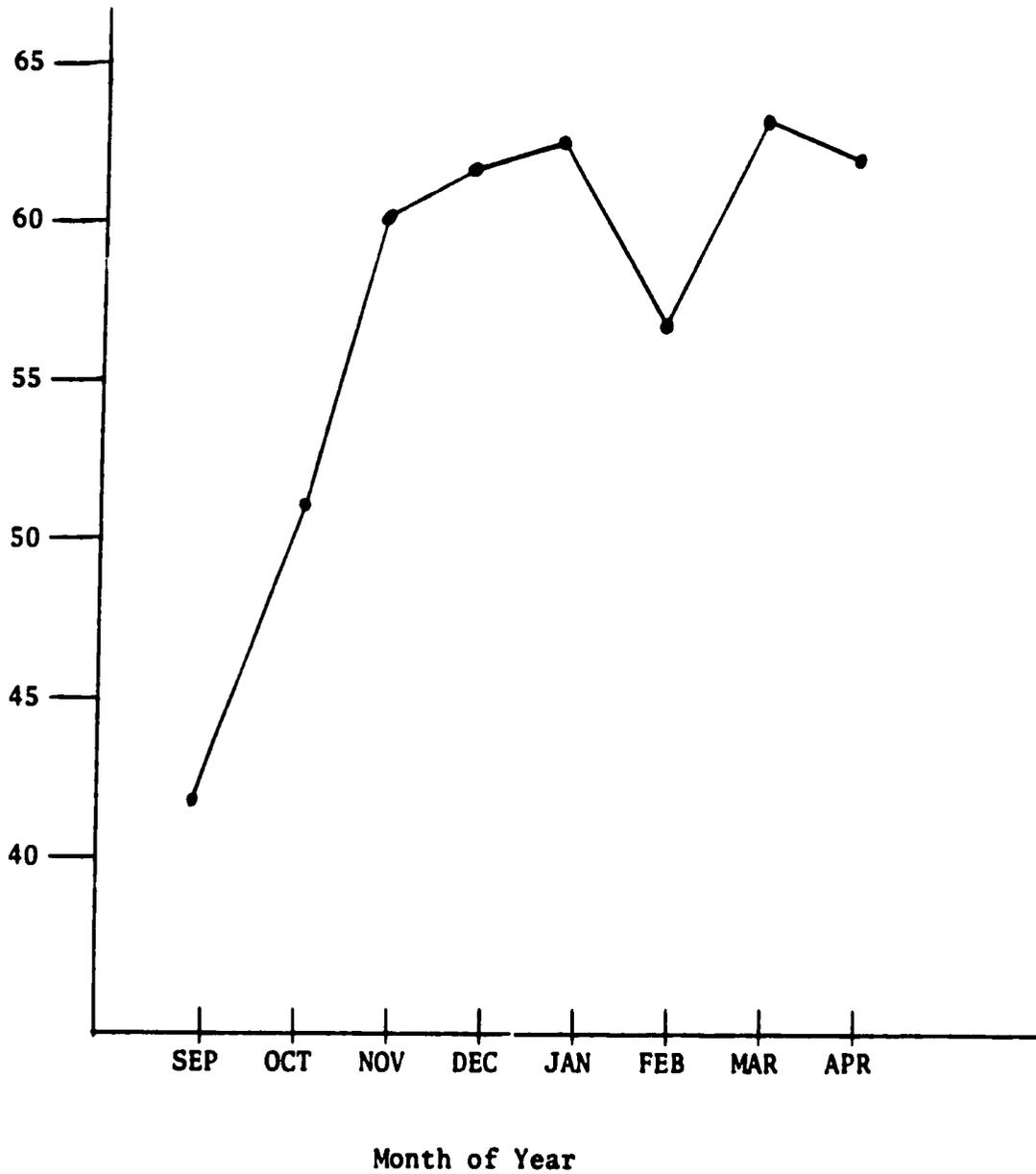
some 10,500 cases. Among the questions asked of the caretakers who brought the children to the clinic was whether they had given the child SSS or ORS before coming. It is an encouraging result that over the course of the campaign, the proportion of children who had been given ORT increased from about 40% to over 60%, with substantial consistency over the last six months (Table 18).

From the results in Figure II, we see that almost all the gain occurred during the first two months of the campaign, and then something of a plateau was reached with little additional increase. The 60% figure for the final months of the project is very close to an estimate for home ORT use that could be derived from the after questionnaire.<sup>10</sup>

Table 18: Clinic Study: SSS before coming to Clinic

	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total Sample
Proportion reporting, previsit use.	43.5%	52.0%	59.8%	61.9%	62.5%	55.4%	62.6%	61.5%	57.3%
N, each month	1321	1574	1440	1280	1512	897	1202	1186	10,412

**FIGURE II**  
Proportion of mothers bringing children  
to clinics with diarrhea who report use of ORT,  
this episode



Of the entire current and past month sample, 48% reported ORT use at home. However, this sample included one in every six who reported not treating the recent case. If we eliminate this group so that the sample includes only treaters (and thus parallels the clinic sample more closely) we would find that 57% are claiming they used ORT, almost exactly matching the clinic results. The before sample, similarly corrected to include only treaters, would suggest 49% had treated with ORT, a number somewhat higher than the beginning clinic estimate, but not fundamentally inconsistent with it. The two sets of estimates provide rough confirmation from two sharply different research approaches.

#### SUMMARY OF PRACTICE RESULTS

Use of ORS at clinics is sharply up, and use of SSS at home shows moderate gains from the questionnaire data and sharper gains if one relies on the clinic data. Improvements in quality of ORT use at home sharply surpass the quantitative improvements.

CHANNEL EFFECTS ON SSS PRACTICE

We digress from our steady march from exposure through knowledge, attitude, intention, practice and health outcomes. We ask about the relationships between two stages of the process: campaign exposure and practice outcomes. There are two good reasons for looking at this set of relationships. First, if it can be shown that exposure to specific campaign channels is associated with campaign-recommended practices, that is supporting evidence for the effectiveness of the campaign. Readers might have been anxious that the apparent before-after differences in knowledge and practice were the result of some unknown stimulus acting simultaneously with the campaign. If so, evidence that exposure to campaign channels was associated with practice ought to alleviate that concern. Secondly, evidence that specific campaign channels (in this case, recent clinic contact about ORT, contact with health outreach workers, and listening to radio programs produced for the campaign) were associated with practices might give some guidance as to the power of each channel to affect the audience.

These analyses made use of only the questionnaire data collected after the campaign. They are examined using multiple regression analysis, a statistical procedure which allows some sorting of joint effects of a set of variables on an outcome measure, in this case SSS practice.<sup>11</sup> In particular, if one specifies a causal structure for a set of variables, multiple regression procedures allow one to test whether or not that hypothesized structure matches the data. These

procedures do not guarantee that the proposed causal structure is the only one that fits the data.

### The Variables

We report analyses using two different indicators of SSS practice as dependent variables for the equations. Both are derived from the quality of use measures in Table 17. The first indicator combines the data about preferred treatment regimen for the last case or the next case with knowledge of the three ingredients in the recommended SSS formula. There were 364 members of the sample who provided adequate data for these analyses.

The second practice indicator joined the response to the 'Have you ever used SSS to treat your child's diarrhea?' with knowledge of two of the three formula ingredients. This indicator, like the first, was coded as 'no' or 'yes', yes meaning the respondent had used SSS and knew two out of three formula ingredient quantities. Analyses with this indicator could make use of the entire sample of 431.

The first set of predictors were dummy variables representing which interviewer questioned the respondent. There was some variation in responses associated with who asked the questions, and that needed to be controlled.

The next predictor was education of the respondent, coded as the number of years of education a respondent claimed. This was meant to stand in

for background characteristics of individuals that might have explained observed differences in both campaign exposure and tendency to use and know about SSS. (A homestead wealth variable was also used in preliminary analyses to stand in for background characteristics, however it was eliminated in the final analyses reported here. It made no difference in the results and caused the loss of a substantial number of respondents from equations because they lacked wealth information.)

The third set of predictors, and the ones of greatest interest, are the campaign exposure variables. The first indicated whether or not the respondent reported contact with an outreach worker, including either a health worker who spoke to her about diarrheal disease control or a campaign trained yellow flag volunteer. In Table 19 that variable is called OUTREACH. The second is called CLINIC and indicates whether or not a respondent had visited a clinic to obtain treatment for the last case of children's diarrhea. In order to be assigned a positive score on this variable, the treatment received had to include ORT and had to have taken place within the previous six months. The third campaign exposure variable is the LISTEN scale which was described previously. It varied from 0 to 6, with those at the higher levels reporting relatively more exposure to the programs which featured campaign messages.



## The Analyses

The first analysis used the last case/next case preferred treatment regimen plus knowledge of all three ingredients as its dependent variable. About 18% of the sample satisfied this criterion.

It turned out that this set of variables, overall, were not able to predict individual responses with great power. Only a little over 10% of the variance is accounted for. However, more than half of that accounted for variance can be attributed to the campaign exposure variables. This supports the earlier inference that the changes in quality of practice from before to after the campaign were due to the campaign activities.

The second interesting part of the results from this analysis are the coefficients associated with each campaign channel. The largest is associated with the OUTREACH variable. A rough interpretation of the unstandardized regression coefficient (B in Table 19) would suggest that respondents who had contact with an outreach worker were 22% more likely to report both use of SSS and know the complete correct formula. The LISTEN coefficient is of a similar magnitude, and suggests that for each point on the scale that a caretaker received she was 4% more likely to satisfy the 'practice with knowledge' criterion. If she had a score of 5 on the scale rather than a score of 0 she would be 20% more likely to practice with correct knowledge. In contrast to LISTEN and OUTREACH, the CLINIC contact seemed to produce no increase in performance. We will hold interpretation of that result until the

second set of analyses is presented.

The second analysis features an easier to satisfy criterion as dependent variable: a claim that an individual had ever used SSS along with knowledge of at least two of the three formula ingredients. About 50% of the entire sample satisfied this criterion at the end of the campaign. Table 19 reports the results. The total variance accounted for is somewhat less than for the previous equation, but the amount explained by the campaign exposure variables is essentially unchanged. Once again there is supporting evidence that the campaign did have an important effect.

The more intriguing result has to do with the individual contributions of the exposure variables. OUTREACH continues to be an important predictor and LISTEN, albeit slightly less important, is still statistically significant and in the same range as for the previous equation. The contrasting result is for the CLINIC variable which now shows a predictive power comparable to either of the others. A respondent with clinic contact is 18% more likely to satisfy the 'ever use plus two ingredients knowledge' criterion than one without such contact, all else held equal.

How are the sets of coefficients to be interpreted?

We turn first to the overall pattern of coefficients before turning to the contrasting CLINIC results. Both OUTREACH activity and radio LISTENing make independent and statistically significant contributions

to both equations. For the first equation, in some sense the more important one, a full range shift in either LISTEN (from 0 to 5) or in OUTREACH (from 0 to 1) is associated with the same magnitude in shift in the 'practice with knowledge' criterion. Since the OUTREACH effects are slightly larger it might be tempting to confirm the frequent assumption of information campaigns that personal contact is more effective than media contact in producing change. Taken superficially, one might conclude that both channels have substantial effects but that the interpersonal channel is the more powerful. However from a policy perspective, that might be the wrong conclusion. Clearly, if one can do it, a face-to-face outreach network has important effects. However, for some countries, doing face-to-face outreach and maintaining it over time is a difficult task. In Swaziland, only one out of every six respondents had been reached by an outreach worker. In contrast more than 60% had scored three or more on the LISTEN scale, which represented substantial campaign radio exposure.

An appropriate conclusion may be that OUTREACH had important effects when it was realized in Swaziland, but it occurred only rarely. In contrast LISTENing had slightly smaller effects but was much more likely to have taken place. The cost per person reached (although we do not have specific estimates to support this conclusion) is also likely to be much lower for radio than for face-to-face contact. Overall, OUTREACH and LISTEN are complementary: they reach and affect different audiences but both were part of the MMHP methodology and served their expected purposes. Choosing to place more or less emphasis on either one will be a reflection of both political judgment

and technical guidance. Careful consideration about the costs, both financial and logistical, of relative emphasis on each channel in contrast to its apparent effectiveness, both in the short run as in this evaluation and over a longer period, might be part of that technical consideration.

The second matter for interpretation concerns the varying importance of CLINIC contact between the two equations. One speculation might suggest the following explanation. People who bring their children to the clinics are not now being taught to mix SSS at home. Rather they are given ORS packets for administration at the clinic or for use at home. Thus they have not learned the correct SSS formula as taught during the campaign. Before the current campaign period, however, clinics did not have an adequate supply of ORS packets. (That was in part the justification for the focus on SSS during the campaign.) We saw that a substantial number of those who went to clinics for treatment before the campaign received not ORS but SSS (about 21% of clinic treaters among current and recent cases), assumedly because the clinics did not have ORS packets. After the campaign the numbers getting SSS at clinics fell to about 7%. If clinic-attending caretakers had been getting SSS frequently before the campaign they would have been able to answer 'yes' to the question about ever using SSS and they might have known the old formula for SSS, which would have given them two out of three ingredients right. That would have been enough to satisfy the 'ever use plus two ingredients' criterion. Since they were no longer getting SSS at the clinic, they would no longer either report SSS as current preferred regimen nor have had any reason

to learn the new formula. If this speculative narrative is correct, it would explain why CLINIC predicted 'ever use plus two' criterion but did not predict the 'current use plus three' criterion.

In sum, this channel effects section supports three inferences. First, it eliminates whatever doubt might have remained from previous analyses as to the effectiveness of the campaign. Exposure to campaign channels produces statistically significant quality of practice outcomes. Next it suggests that while both outreach efforts and radio broadcasts were effective in achieving campaign outcomes, contact with clinic nurses did not achieve those ends. Finally, clinic contact (as well as outreach and radio contact) did produce one time trial of SSS, perhaps because pre-campaign shortages of ORS led regular clinic-users to SSS use. However the ending of such shortages during the campaign period meant that they did not use SSS during the current period. Apparently clinic staffs were no longer encouraging SSS use.

DID THE CAMPAIGN AFFECT HEALTH OUTCOMES?

This is, unfortunately, a short section. We only did one study (given limitations of time and budget) directed towards health outcomes. We tried to use the clinic registry data to estimate whether there was a decline in incidence of severe dehydration among children coming to clinics. The campaign wasn't designed to lessen the numbers of children brought to clinics; indeed one of its messages encouraged clinic attendance if diarrhea lasted more than two days. However, it was possible that the campaign would, through encouraging use of ORT before coming to the clinic, reduce the incidence of severe dehydration. (See Appendix D for the registry form.)

What we found was the following: 1) that severe dehydration was a rare event from beginning to end of the campaign, at least in the judgment of the nurses keeping the registries. Only 1% of all children were diagnosed as severely dehydrated, 2) there was a very slight trend toward a decline in severe dehydration incidence; although statistically significant after some complex manipulation, it was essentially meaningless given the irregular patterns over time and doesn't allow an inference of campaign effect, and 3) there is substantial variation from clinic to clinic in incidence. Whether that represents a variation in clinic catchment areas or vagaries in nurses' judgements about what was and was not severe dehydration we do not know (Table 20).

Two results, irrelevant to campaign evaluation, but intrinsically interesting, did turn up in the clinic study. There was a clear decline in the incidence of measles over the course of the campaign - from 8% and 5% in the first months to less than 1% in the last two months (Table 21). One epidemiological consultant suggested that was typical of measles cycles. Separately, we saw a strong positive effect of age of the child on incidence of measles. We interpret this as a reflection of loss of natural immunity not always replaced by vaccination.

Table 20: Clinic Study: Severe Dehydration

	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total Sample
Proportion Severely Dehydration	2.9%	.1%	.5%	.7%	.9%	.7%	.9%	1.9%	1.1%
N, each month	1249	1433	1316	1170	1355	837	1061	1011	9432

Table 21: Clinic Study: Measles

	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total Sample
Proportion with Measles	8.4%	5.9%	5.2%	4.0%	2.4%	1.8%	.9%	.6%	3.9%
N, each month	1233	1431	1312	1165	1353	842	1063	1013	9412
Ages (in months)									
	0-3	4-6	7-11	12-23	24-35	36-47	48-60		
Proportion with Measles	1.2%	2.7%	3.8%	4.4%	5.1%	7.9%	7.8%		
N, each month	1105	1312	2434	3004	1048	305	166		

### WHAT IS THE PROMISE FOR INSTITUTIONALIZATION?

This section examines two related issues. The first asks how well the project went from an institutional point of view. Was it possible to realize the campaign as its authors expected it to evolve? Which institutional arrangements eased the project's implementation and which made it more difficult? The second question, the more important of the two, asks about the future of the public health communications methodology. Will the Ministry of Health choose to integrate it into its normal operating procedures, and if it so chooses, to what degree will it be able to do so successfully?

Could Swaziland MMHP accomplish its goals in the time allotted and given its institutional arrangements?

MMHP was fortunate, given its goal of a quickly realized campaign, in finding a sympathetic ear in Swaziland. It won't always find so receptive an audience, with the possibility of such a quick response. Preparation for the campaign depended on a group of enthusiastic, well-trained personnel. SBS was accustomed to and interested in development communications work. Over half of the radio workshop participants had prior radio experience, some with the same instructor who led this workshop, and the PHU offered an enthusiastic senior nurse recently returned from ICDDR,B trained to coordinate the diarrheal disease control program for CCCD. Without minimizing the

amount of training effort expended by AED personnel in all areas of this program, the extant competence of the Swazi counterparts must be noted.

MMHP also found fertile ground for the campaign because the Swazi population had already been thoroughly introduced to the idea of ORT. Mothers had been told about some version of SSS for eight years. Pre-test results showed that before the campaign started 92% of mothers had already heard of SSS, and 60% said that they had used it. The RWBDCP had been broadcasting diarrheal disease control messages for over two years. MMHP Swaziland was correctly characterized in its workplan as "simply one more ingredient in this coordinated attack on infant mortality."

MMHP's participation in this coordinated attack consisted of affirming and extending ORT practices. The program particularly sought to educate people about the new formula and its proper administration and to discourage selected traditional treatment practices. While on the surface a 12 month activity, this campaign was, in fact, for its staff and for its audience, part of a longer timeline. As such it permitted some accomplishments that might otherwise have been impossible.

Even so, the brevity of the campaign schedule had some consequences. Many participants commented on the shortness of the preparation and training periods of the program, evidencing their concern. Nonetheless, everyone also felt that they had done an adequate job in preparing materials to fit the Swazi context and of reaching an

acceptably large portion of the Swazi health personnel.

One victim of this tight scheduling, however, was ongoing monitoring and evaluation. Monitoring was relegated to a secondary activity primarily because of time constraints and lack of transportation.

Because minimal systematic monitoring was done, it is not known whether any adjustments should have been made in the campaign's messages or strategies. Some minor revisions were incorporated in the second radio series, but more subtle changes might also have helped. The ongoing response of the audience and the success of various key aspects of the campaign such as people's understanding of the purpose of SSS (rehydration, not stopping diarrhea), their learning of the new formula and unlearning of the old, and the effectiveness of the Yellow Flag Volunteer training could not be assessed.

Another victim of the tight scheduling was the planned lottery modeled on the one which was part of The Gambia campaign. Given pressures to meet training workshop schedules, which themselves suffered minor breakdowns, and evidence of substantial prior diffusion of ORT, it was decided not to implement the logistically complex lottery plan.

Thus, the tightness of the schedule did force some plans to fall by the wayside, but, overall, most activities occurred as expected. In earlier sections we saw unmistakable evidence that a substantial portion of the audience was indeed exposed to the campaign.

If the short timeline for the project was a problem, but one that was overcome, were there any other institutional obstacles to successful operation?

Both anomalies in MMHP's institutional setting--its subordination to RWBDCP and its placement outside of HEU--created organizational problems for the program. Its subordination to RWBDCP made realizing certain minor decisions more cumbersome than desirable. This problem, however, was resolved in time.

MMHP's placement outside HEU is the more significant institutional concern. In a few instances HEU's plans were inconsistent with the campaign's, causing delays. Nevertheless, because PHU had some flexibility, because HEU did cooperate in general, and because outside resources from MMHP or CCCD permitted the accomplishment of goals which would normally be difficult, the project worked despite the institutional tension. That tension looms larger, however, when we turn to future institutionalization of the public health communication methodology. Will Swaziland use it in the future?

Will Swaziland choose to use the public health communication methodology, and will it be able to integrate it into normal operating procedures?

This evaluation can take post-project institutionalization only up to August, 1985, just a few months after the April close of the diarrheal

disease control campaign, and while the AED resident advisor was still in-country. Since the close of the campaign, the Public Health Unit had planned new activities within the public communication model, initiating serious broadcasting and healthworker training efforts directed toward immunization coverage. The Health Education Unit was considering taking some more active role in the extension of the diarrheal disease control programming, but had not yet committed itself. The new Development Communication Center (whose technical advisor, Esta De Fossard, did the radio training for the diarrheal campaigns) was committed to working on new program development for health communication and in particular to addressing some of the areas which the evaluation suggested might still be weak. USAID had committed additional funds to mount continuing primary health care efforts, including more health communication efforts. Thus, the institutions, while they had not sorted themselves out in defining long-term roles nor made fundamental commitments to the public health communication model, were acting to make such definition of roles and establishing of commitments possible.

At the seminar in August where the results were presented and immediate plans described, there was substantial appreciation of the successes of the project and the future potential of its methodology. There was concern, at the same time, that some factors in the organization of development communication in Swaziland would make institutionalization difficult.

On the optimistic side, there was the evidence for success, which encouraged further action. There were several trained staff and administrators with a strong sense of the way the program had operated and the potential to manage a future, related, program. There was the already mentioned potential for additional financial and technical support from USAID and other donor agencies. There was the fact that the Ministry staff were already at work on a new phase of the health communication program, focussing on immunization.

On a less optimistic note, there was a need to admit that eventually prime responsibility for health communication activity was going to have to be taken over by the Health Education Unit, and that had not yet occurred. While future cooperation was promised, the Health Education Unit had not yet decided whether it wanted to commit the level of resources required to the public health communication methodology since that would mean some shift away from currently planned programming.

Thus, four months after the initial campaign, the future is promising but ill-defined. There is enthusiasm for subsequent programs, and the outside financial and technical support will be available, it appears. Some post-campaign activity is assured. Long term institutionalization, however, awaits some redefinition of roles and additional commitments.

**ENDNOTES**

1. Since the fall of 1985, MMHP has been refunded by USAID and renamed HEALTHCOM, or the Communication for Child Survival program.

2. Much of this section is drawn from the "Overview of Project" published by the Rural Water Borne Disease Project.

3. The LISTEN scale is highly reliable with a Guttman coefficient of reproducibility of .98 and coefficient of scalability of .90. However, this is largely a reflection of questionnaire design. One could not even answer questions about specific program listening without previous positive answers to owning and listening questions. Of greater concern are issues of validity; have we measured real exposure to campaign radio messages? The best evidence of validity of this measure is the correlation with knowledge of specific messages--particularly among those who did not have access to any other channel. The power of radio messages (and thus our measures of radio exposure) is suggested in the section on learning about the rehydration kit, and in other analysis of channel effects. This is presented elsewhere. However, the most striking result compares those with the lowest score on the LISTEN scale to those with the highest scores, on whether or not they had heard of the rehydration kit. Only 15 percent of the first group had heard of it, but 63 percent of the latter group had done so. That extreme difference (which is not explained by personal characteristics of respondents or exposure to other channels) would only have been found if the radio message had gotten through and our measure of radio exposure was highly valid.

4. The difference between numbers owning the flyer and numbers able to show it isn't necessarily a reflection of false claims by respondents. Some interviews were done away from people's homes which would have made showing the flyer difficult. These two numbers, 12.5 percent showing and 18.5 percent owning should be seen as lower and upper bounds on actual ownership.

5. The campaign occurred over a six month period. While a simple before-after design is ordinarily a weak research strategy for causal inference, in this case we do not believe threats to inference are particularly worrisome. We know that no other educational program was operating on a national level simultaneously, and we have no reason to believe spontaneous change in knowledge, resulting from natural diffusion processes, could account for other than small changes over this time period. Supporting evidence for the legitimacy of inferences about campaign effects come from the high correlations between exposure to campaign channels and level of knowledge among respondents.

6. All before-after comparisons reweight before data to correct for a sampling anomaly--the tendency for the two samples to be differently distributed across the large geographical districts (velds) of the country. The reweighting, in fact, makes very little difference in the estimates.

7. About 30% of both before and after samples denied that any of their under five year old children had ever had diarrhea. This response is difficult to interpret. In some cases but probably few, no diarrheal episodes may be the fact. In others, a simple reluctance to admit that their child was sick may have been operating. Among others a tendency to view much diarrhea as normal might have left caretakers with a sense that mild cases were not to be reported. Since we did not want to lose cases, we asked these people (as we did for the 10% or so who said they did not treat the last case) to describe how they would treat the next case. It turned out that their pattern of intended treatments matched the pattern of previous treatments reported by the rest of the sample quite closely. As a result, we have chosen to interpret the results of the next case reports as equivalent to last case reports, a measure of preferred or typical practice regimen, with similar self-report biases.

8. Only 364 of the 431 post-campaign respondents were analyzed for this section. One interviewer had followed inappropriate procedures in asking about treatment regimens.

9. In general, we do not report the statistical significance of differences between before and after samples on any of the criterion variables. However all differences used as evidence for campaign effects are very large and without question are highly significant at a .001 level of confidence. We decided that reporting them would be tiresome for the reader. Indeed, some differences which are statistically significant are ignored on the grounds that they are small and might easily be explained as effects of spontaneous change in the population.

As a technical note, in calculating statistical significance we have taken into account the fact that our sample was drawn through a two-stage cluster sampling procedure. In general such samples produce estimates of standard errors larger than those produced by simple random sampling procedures of a similar size. To take account of that difference we did the following: First, we calculated statistical significance using standard errors generated by the statistical package (Statistical Package for the Social Sciences) which assume simple random sampling. We then chose a small number of variables (use of ORS or SSS, radio ownership, knowledge of SSS ingredients) and recalculated, for the after sample, what the standard errors would be if they had been calculated correctly. This was a somewhat cumbersome procedure following techniques described by Kish (1966). It turned out that the required corrections were very small for all three variables (intraclass rho estimates were .0204, .0097, and -.005) producing changes in standard errors of no consequence. For example, the largest change was for the last use of ORS or SSS. For that variable the standard error was 2.2% for the simple random sampling assumption and 2.8% for the cluster sampling assumption. Since the observed difference between before and after scores was around 17%, the slight change in the standard error would be of no importance. As the result of these calculations, we decided that further hand correction of standard errors would not justify the time it would require.

10. As a technical note, the clinic data required further analysis

because the number of clinics reporting at each month varied, and the individual clinics produced very different average rates of pre-visit ORT use. However, statistical controls for the contribution of particular clinics to the results did not materially alter the picture we have already presented.

11. The appropriate statistical procedure for analyzing data with a dichotomous dependent variable, and some dichotomous predictors, would be discriminant analysis or some form of logistic regression. We have not done these analyses for reasons of simplicity of presentation and in the belief that the basic findings would be unchanged.

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**Appendix A**  
**Self Report Validation Study**

Any time questionnaire results are reported as evidence for practice, there is appropriate skepticism about the match between such self-reports and actual practice. The act of measurement risks biasing the response. If respondents are aware that the 'right' answer is "I use Sugar-Salt Solution" and they want to please or impress the interviewer, there is some tendency to say "SSS" when describing last practice. This may be exacerbated by the intense informational campaign which announces the 'right' practice so clearly.

There are several dimensions of such risk, only some of which are of concern here. First, there is a concern that people who are saying they use SSS actually do not have any knowledge of it and never use it. This extreme self-report bias is inconsistent with these results, however. Fewer than 10% of all last case/next case users of SSS did not know any of the formula's ingredients, and two-thirds of all users could name the quantities of two out of three ingredients correctly. The knowledge questions were not subject to the self-report bias since the quantities of each ingredient had to be reported by the respondent without any cues.

A less easily dismissed concern is one which suggests not complete fabrication of use but an exaggeration of the probability of use of SSS for a specific case. This is plausible on two grounds. First, the

last case remembered may be a relatively severe case, with untreated mild cases ignored in reporting. Thus the number of cases to which treatment is given are exaggerated by last case estimates, and in turn the proportion of all cases treated with SSS are exaggerated. However the questionnaire results turn out to be essentially inconsistent with these expectations. If, indeed, memory exaggerated the probability of treatment, then we would expect current and just recently past cases to report lower levels of treatment, overall, and lower levels of SSS treatment, specifically, than would last cases remembered from longer ago. That turns out not to be the case. Eighty-six percent of all last cases were treated -- about the same as the 83% of all current or past month cases, and 82% of all current cases.

The second ground on which to expect exaggerated self-reports is the 'please the interviewer bias' already mentioned. Ministry of Health interviewers may need to be told that recommended practices are adopted. No internal analysis of questionnaire responses is likely to sort out this bias. To try and understand its presence, we added a substudy to the general questionnaire protocol. It allowed us to estimate, albeit roughly, actual SSS practice.

We knew that some proportion of the sample (we estimated 10% which turned out to be close to correct) would have a current case of diarrhea in the homestead. These respondents (along with the entire sample) were asked to describe the treatment, if any, given to the child who was named as having diarrhea. If a caretaker reported giving either ORS or SSS at home, she was then asked to show the interviewer the solution. The results from that observational study are reported

here.

There were a total of 51 respondents out of 364 eligibles in the final study (one interviewer's questionnaires were eliminated for reasons described earlier) who said they had a current case of diarrhea in the homestead, about 14%. Of those, 34, or 67%, said they treated with ORT: 25 with SSS and nine with ORS. Eight others didn't treat at all and nine treated in some other fashion, only. Of those 34 who could be defined as current home ORT treaters, the interviewers did not ask seven to show the solution for reasons we do not know. This left 27 who were asked to show the solution. Of these, nine, or 33% did and eighteen, or 67%, did not show the interviewer the solution.

We can examine this result from several perspectives. We can take the result at face value and argue that the number who can actually show the solution is the best estimate of actual practice. If so, nine respondents could show the solution out of 44 (51 less seven respondents not asked to show the solution through interviewer error) which would give us a 20% observed level of coverage. Because the actual numbers of cases involved are small the sampling error around that estimate would be substantial (plus or minus 12% at the 95% confidence level.)

A different perspective would ask whether 20% isn't merely a lower bound on the practice estimate, assuming that some of the respondents who did not show the solution had some legitimate reason for not showing it and were ORT users for this episode. This turns out to be the case. Of the eighteen respondents who were asked to show the

solution but didn't, eleven said that the solution was finished or gave a similar answer when asked why they did not show the solution. While such a response could be termed a face-saving rationalization offered to avoid embarrassment, and in some cases it may have been, it also may be an accurate response. Some cases of diarrhea which a respondent might have considered current may have been treated for a day or two with ORT and no longer were a concern. In these cases the report of use of ORT for the current case, despite the inability to show the solution, would be correct.

There is no way of calculating how many of the eleven "it is finished" responders fell into the practicing category and how many into the rationalizing category. If we were to put them all into the practicing category our estimate of practice would be around 45% (20/44). That would then be an upper bound estimate of practice.

In sum, this perspective would argue that the appropriate way to present a coverage estimate would be to report both lower and upper bounds rather than a single point. From this study our estimate of true SSS practice would lie between 20% and 45%.

It is worth noting that this study, while it examines the relation between self-reported use of ORT and observed use, doesn't touch on the more complex matter of the details of administration and use. We did not test the solutions to see what their sodium and glucose contents were, we didn't observe to see what sort of water was used in its preparation, and we didn't see how much of the solution was actually given to the child in what period. However we do know that the small

sample of respondents who could actually show us the solution were about the same as the rest of the user sample in their accuracy of recall about the ingredients of the SSS formula -- about 30% knew all three current ingredients and about 70% knew two out of three ingredients. This suggests that our concerns about too much sodium in the solution are not alleviated by evidence that high sodium 'knowers' are less likely to actually use the solution than correct 'knowers'.

This small and limited self-report validation study does help interpret some of the practice results in the main text of the report. It makes clear that self-reports are exaggerations of actual coverage; however, few observers would have guessed otherwise. It does set a floor on estimated case coverage (20%), while suggesting that a ceiling may be as high as 45%, although probably lower.

Comparison of knowledge data for observed versus unobserved users (it is more or less the same) suggests that both groups are in fact users. If the observed users were in fact the only ones to make use of SSS, we would have expected them to be much more knowledgeable about its preparation. However they were not. We might infer that case coverage estimates reflect some probability of use for each episode among almost all respondents rather than every-time use for some self-reported users and no use for others.

**APPENDIX A1: Additional Data, Radio Exposure**

<b>Variable</b>	<b>Question</b>	<b>Before</b>	<b>After</b>
1. Radio Ownership	Q 73-percent owning	88.8%	88.2%
2. Radio Working?	Q 74-percent working	76.9%	76.3%
3. Radio Listening (Yes/No)	Q 75-percent listening	76.6%	75.6%
4. Radio Days Per Week	Q 76-Mean # of days, those with working radios	6.43	6.32
5. Program Listening	Q 79, 82, 85 percent who listen		
Ayihlome		62.8%	67.3%
Women's		55.3%	62.4%
Home		59.4%	58.2%
6. Last Week Listening	Q 80, 83, 86 percent who listened last week		
Ayihlome		35.2%	34.1%
Women's		22.4%	19.7%
Home		23.5%	16.2%
7. Last Week Remembering	Q 81, 84, 87 -percent who remembered what was talked about		
Ayihlome		23.3%	25.8%
Women's		9.8%	10.0%
Home		8.0%	10.2%

Appendix A2: Clinic, RHM, Healthworker Contact: Additional Data

<u>Variable</u>	<u>Question</u>	<u>After Survey</u>
1. Last Case	Q 22-Mean months previous for last case, of those reporting cases.	X=5.89, for 312; 119 had no case
2. Went to Clinic	Q 25-Percent who went to clinic, of those who reported treating a last case	85.6%
3. ORS Treatment at Clinic	Q 25-Percent who were given SSS treatment at clinic, of last case treaters.	44.1%
4. SSS treatment at Clinic	Q 25-Percent who were given SSS treatment at clinic, of last case treaters.	8.1%
5. Child ever to Clinic	Q 47-Percent who have taken a child to clinic for diarrhea	75.9%
6. Treatment given at Clinic	Q 48-Percent who report ORS/SSS as clinic treatment for diarrhea	1st treatment ORS or SSS 54.5% 2nd treatment ORS or SSS 3.3% 3rd treatment ORS or SSS 1.4%
7. RHM Access	Q 93-Percent who say RHM is in community	50.6%
8. RHM Visit	Q 94-Percent Visited by RHM	36.4%
9. Healthworker Visit	Q95-Percent visited by other health work (if not by RHM)	7.7%
10. Topic of Discussion, RHM on Healthworker	Q 96-Percent who talked about diarrheal disease, total sample.	6.7%

**Appendix A3: Exclusive Exposure to One Source and SSS Formula Knowledge**

	<u>New Formula</u>	<u>Old Formula</u>	<u>Other Response</u>	<u>N</u>
I. No Exposure	11.8%	21.6%	66.7%	51
II. Exposure to Radio Only	23%	30%	47%	100
III. Exposure to Clinic Only	19%	19%	62%	21
IV. Exposure to Extension/ Flag Person Only	50%	30%	20%	10

**Appendix A4: Rehydration Kit Responses**

	<b>of entire sample (N=431)</b>	<b>of those who had heard about it (N=154)</b>
<b>Proportion who had heard about</b>	<b>36%</b>	
<b>Proportion who said they owned it</b>	<b>6%</b>	
<b>Proportion who showed it to interviewer</b>	<b>3%</b>	
<b>Proportion who knew bottle included</b>		<b>88%</b>
<b>Proportion who knew sugar included</b>		<b>89%</b>
<b>Proportion who knew salt included</b>		<b>88%</b>
<b>Proportion who knew spoon included</b>		<b>61%</b>
<b>Proportion who knew cup included</b>		<b>55%</b>
<b>Proportion who knew cap included</b>		<b>51%</b>
	<b>Not Heavily Exposed to Radio</b>	<b>Heavily Exposed to Radio</b>
<b>Proportion who owned (N)</b>	<b>.6% (162)</b>	<b>8.3% (268)</b>



\_\_\_\_\_ mentioned HEALTH WORKER  
 (If checked, ASK the following question)  
 b. What treatment did the health worker give?  
 (Check all that are mentioned)  
 \_\_\_\_\_ ORS \_\_\_\_\_ refers to clinic  
 \_\_\_\_\_ SSS \_\_\_\_\_ other, specify \_\_\_\_\_

\_\_\_\_\_ mentioned HEALTH WORKER  
 (If checked, ASK the following question)  
 b. What treatment does the health worker give?  
 (Check all that are mentioned)  
 \_\_\_\_\_ ORS \_\_\_\_\_ refers to clinic  
 \_\_\_\_\_ SSS \_\_\_\_\_ other, specify \_\_\_\_\_

\_\_\_\_\_ mentioned TRADITIONAL HEALER  
 (If checked, ask the following question)  
 c. What treatment did the traditional healer give?  
 (Check all that are mentioned)  
 \_\_\_\_\_ ORS \_\_\_\_\_ imbita/enema to stop diarrhoea  
 \_\_\_\_\_ SSS \_\_\_\_\_ imbita/enema for purge  
 \_\_\_\_\_ medicine \_\_\_\_\_ other, specify \_\_\_\_\_  
 \_\_\_\_\_ unspecified imbita

\_\_\_\_\_ mentioned TRADITIONAL HEALER  
 (If checked, ASK the following question)  
 c. What treatment does traditional healer give?  
 (Check all that are mentioned)  
 \_\_\_\_\_ ORS \_\_\_\_\_ unspecified imbita  
 \_\_\_\_\_ SSS \_\_\_\_\_ imbita/enema to stop diarrhoea  
 \_\_\_\_\_ medicine \_\_\_\_\_ imbita/enema for purge  
 \_\_\_\_\_ other, specify \_\_\_\_\_

\_\_\_\_\_ mentioned TREATED AT HOME  
 (If checked, ask)  
 d. What home treatment did you give?  
 (Check all that are mentioned)  
 \_\_\_\_\_ ORS \_\_\_\_\_ imbita/enema to stop diarrhoea  
 \_\_\_\_\_ medicine \_\_\_\_\_ imbita/enema for purge  
 \_\_\_\_\_ unspecified imbita  
 \_\_\_\_\_ SSS \_\_\_\_\_ other, specify \_\_\_\_\_

\_\_\_\_\_ mentioned TREATED AT HOME  
 (If checked, ASK the following question)  
 d. What home treatment do you give?  
 (Check all that are mentioned)  
 \_\_\_\_\_ ORS \_\_\_\_\_ unspecified imbita  
 \_\_\_\_\_ SSS \_\_\_\_\_ imbita/enema to stop diarrhoea  
 \_\_\_\_\_ medicine \_\_\_\_\_ imbita/enema for purge  
 \_\_\_\_\_ other, specify \_\_\_\_\_

26. (IF the respondent says child HAS DIARRHOEA NOW (Q.21) AND that SHE IS USING ORS/SSS (Q.25), ASK the following question) (If not, go to Q.28)

26. When one of these children has a mild diarrhoea, do you treat that, or do you observe to see if it gets worse before treating it?  
 \_\_\_\_\_ not treat it (0) \_\_\_\_\_ treat it (1)  
 (Go to Q.30)  
 \_\_\_\_\_ no response (8)

May I see the solution?  
 \_\_\_\_\_ shows (1) \_\_\_\_\_ doesn't show (0)  
 (go to Q.28) (go to Q.28)  
 \_\_\_\_\_ no response (8) Explanation, if any, for why  
 (go to Q.28) solution not shown \_\_\_\_\_  
 \_\_\_\_\_ not asked (9)

29. How do you treat it?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 (see separate coding instructions)

27. If any of these children had diarrhoea, what would you do to take care of that child? Probe: Wou you do anything else at home??

(READ THIS TO RESPONDENT:)  
 There are many different ways that people treat young children's diarrhoea. I'll mention a number of ways that are common. For each way I mention, I'd like to know what you think about it -- to treat the diarrhoea of a child who is not yet five. Please remember it is important that you say what you really think and what you really do.

(Code: 0=not mentioned; 1=mentioned; and 9=Q.27 not asked)  
 \_\_\_\_\_ mentioned CLINIC  
 (If checked, ASK the following question)  
 e. What treatment does the clinic give? (Check all that are mentioned)  
 \_\_\_\_\_ medicine, pills \_\_\_\_\_ injection  
 \_\_\_\_\_ ORS \_\_\_\_\_ other, specify \_\_\_\_\_  
 \_\_\_\_\_ SSS

30. Have you ever used herbal teas (imbita to stop diarrhoea) to treat you child's diarrhoea?  
 \_\_\_\_\_ no (0) \_\_\_\_\_ yes (1)  
 \_\_\_\_\_ no response (8)  
 31. Do you think (imbita to stop diarrhoea) is a good treatment for diarrhoea or not such a good treatment?  
 \_\_\_\_\_ not good (0) \_\_\_\_\_ good (2) \_\_\_\_\_ no response (8)  
 \_\_\_\_\_ sometimes good (1) \_\_\_\_\_ not sure (3)  
 32. If your child has diarrhoea again is this the method of treatment you will use?  
 \_\_\_\_\_ no (0) \_\_\_\_\_ yes (2)  
 \_\_\_\_\_ sometimes (1) \_\_\_\_\_ no response (8)



55. We talked to you before about water-sugar-salt solution. Have you ever made it yourself?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 \_\_\_ no response (8)
56. Do you know how to make it?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.59)  
 \_\_\_ no response (8)
57. How do you make it?  
 \_\_\_ clean water or boiled water  
 \_\_\_ make it fresh everyday  
 \_\_\_ add water  
 if mentioned, ask how much \_\_\_\_\_ water  
 \_\_\_ add sugar  
 if mentioned, ask how much \_\_\_\_\_ sugar  
 \_\_\_ add salt  
 if mentioned, ask how much \_\_\_\_\_ salt  
 (see separate coding instructions)
59. What quantity of the sugar-salt solution should a child with serious diarrhoea have in one day?  
 \_\_\_\_\_  
 (Probe for quantity if not mentioned)  
 (see separate coding instructions)
60. How often should you make fresh sugar-salt solution?  
 \_\_\_ doesn't know (0) \_\_\_ other, specify \_\_\_\_\_ (3)  
 \_\_\_ when the bottle is finished (1)  
 \_\_\_ everyday (2) \_\_\_ no response (8)
61. Do you have salt in your homestead now?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 \_\_\_ no response (8)
62. Do you have sugar in your homestead now?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 \_\_\_ no response (8)
- \*\*\*STOP: Show respondent an ORS packet\*\*\*
63. Have you ever seen this?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (go to Q.68)  
 \_\_\_ no response (8)
64. What is it for?  
 \_\_\_ does not recognize packet as medicine for diarrhoea (0)  
 \_\_\_ recognizes packet as medicine for diarrhoea (1)  
 (Go to Q.68)  
 \_\_\_ no response (8) \_\_\_ not asked: has never seen packet (9)
65. Have you yourself ever prepared ORS?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.67)  
 \_\_\_ no response (8) \_\_\_ not asked (9)
66. Where did you learn how to prepare it?  
 \_\_\_ doesn't know (0) \_\_\_ radio (3)  
 \_\_\_ clinic nurse (1) \_\_\_ neighbors or relatives (4)  
 \_\_\_ health worker (2) \_\_\_ other, specify \_\_\_\_\_ (5)  
 \_\_\_ no response (8)  
 \_\_\_ not asked (9)
67. Has the clinic or health worker ever given you an ORS packet to take home to continue treating your child?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 \_\_\_ no response (8) \_\_\_ not asked (9)
68. In your opinion what kills the child when he has diarrhoea?  
 \_\_\_ doesn't know (0)  
 \_\_\_ loss of liquids and/or sales, dehydration (1)  
 \_\_\_ loss of strength (2)  
 \_\_\_ names signs of dehydration (such as, sunken eyes or fontanelle, dry skin, etc.) (3)  
 \_\_\_ other, specify \_\_\_\_\_ (4)  
 \_\_\_ no response (88)  
 (Code up to TWO answers. Use a 9 for the second column if only one answer is given).
69. Does a child need any special foods during the time he or she has diarrhoea?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.71)  
 \_\_\_ no response (8)
70. What foods are these? (Probe: anything else)  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 (see separate coding instructions)
71. What about just after an episode of diarrhoea -- do you think that a child needs to be fed differently than normal or should the child be fed the same as normal?  
 \_\_\_ the same (1) \_\_\_ differently (2)  
 (Go to Q.73)  
 \_\_\_ no response (8)
72. What should you feed the child after an episode of diarrhoea?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 (see separate coding instructions)
73. Does anyone in this homestead own a radio?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.75)  
 \_\_\_ no response (8)
74. Is that radio working now?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 \_\_\_ no response (8) \_\_\_ not asked (9)
75. Do you, yourself, ever listen to the radio?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.88)  
 \_\_\_ no response (8)
76. How many days each week do you usually listen to the radio?  
 \_\_\_ days (Code actual number 1-7 days.  
 8=no response, 9=not asked: doesn't own a radio)
79. Do you listen to the "Home" program?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.82)  
 \_\_\_ no response (8) \_\_\_ not asked (9)
80. Did you listen this past week to the "Home" program?  
 \_\_\_ no OR doesn't remember (0) \_\_\_ yes (1)  
 (Go to Q.82) \_\_\_ not asked (9)  
 \_\_\_ no response (8)
81. Do you remember what they talked about during the program?  
 \_\_\_ doesn't remember (0) \_\_\_ names some part (1)  
 \_\_\_ no response (8) \_\_\_ not asked (9)
82. Do you listen to the "Women's" program? "Tentele Mera"  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.88)  
 \_\_\_ no response (8) \_\_\_ not asked (9)

83. Did you listen this past week to the women's program?  
 \_\_\_ no OR doesn't remember (0) \_\_\_ yes (1)  
 (Go to Q.86)  
 \_\_\_ no response (8) \_\_\_ not asked (9)

84. Do you remember what they talked about during the program?  
 \_\_\_ doesn't remember (0) \_\_\_ names some part (1)  
 \_\_\_ no response (8) \_\_\_ not asked (9)

85. Do you listen to the "Ayihloma" program?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.86)  
 \_\_\_ no response (8) \_\_\_ not asked (9)

86. Did you listen this past week to the "Ayihloma" program?  
 \_\_\_ no OR doesn't remember (0) \_\_\_ yes (1)  
 (Go to Q.86)  
 \_\_\_ no response (8) \_\_\_ not asked (9)

87. Do you remember what they talked about during the program?  
 \_\_\_ doesn't remember (0) \_\_\_ names a part (1)  
 \_\_\_ no response (8) \_\_\_ not asked (9)

88. How many cattle do you have?  
 \_\_\_ cattle

(Code actual number using two columns,  
 for example: code 3 as 03 or code 12 as 12)

Or use the following codes:

- 00=no response
- 98-99 or more cattle,
- 99=doesn't know,
- 00=one cattle)

89. Do any members of this homestead have the following?  
 (for each item code: 0=doesn't own, 1=owns, 8=no response)

	Yes	No
1. bed	_____	_____
2. stove	_____	_____
3. working spring machine	_____	_____
4. maize milling machine	_____	_____
5. car or other vehicle	_____	_____

90. Where do you usually get your water for drinking?  
 \_\_\_ piped at home  
 \_\_\_ public tap  
 \_\_\_ bore hole/well  
 \_\_\_ river/stream  
 \_\_\_ spring/pond  
 (If checked, ask) Is it protected?  
 \_\_\_ yes \_\_\_ no

(see separate coding instructions)

90.A Is this water protected from disease?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 \_\_\_ no response (8)

90.B Do you usually do anything to improve the water after you collect it?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.91)  
 \_\_\_ no response (8)

90.C What do you do to improve the water?  
 \_\_\_ adds jik or javel (0) \_\_\_ other, specify \_\_\_\_\_ (2)  
 (Go to Q.98 0) (Go to Q.91)  
 \_\_\_ boils water (1)  
 (Go to Q.91) \_\_\_ no response (8)  
 \_\_\_ not asked (9)

90.D How much jik or javel should be added to make the water safe?  
 \_\_\_ doesn't know (0)  
 \_\_\_ 1/4 lid to 10 liter container (1)  
 \_\_\_ 1/2 lid to 20 to 25 liter container (2)  
 \_\_\_ 1 lid to 40 liter container (3)  
 \_\_\_ other (5)  
 \_\_\_ no response (8) \_\_\_ not asked (9)

91. How long does it take you to get from here to the nearest clinic? (Estimate time in hours from the response)  
 \_\_\_ total travel time  
 (see separate coding instructions)  
 \_\_\_ no response (8)

92. How long does it take you to get from here to the nearest road? (Estimate time in hours from the response)

\_\_\_ total travel time  
 (see separate coding instructions)  
 \_\_\_ no response (8)

93. Is there an RHM in this area?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.96)  
 \_\_\_ no response (8)

94. Has this RHM ever visited you?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.96)  
 \_\_\_ no response (8) \_\_\_ not asked (9)

95. Has any other health extension worker visited you to talk about health?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.97)  
 \_\_\_ no response (8) \_\_\_ not asked (9)

96. What did they talk about?  
 \_\_\_ doesn't remember (0) \_\_\_ cleanliness (4)  
 \_\_\_ diarrhoea prevention (1) \_\_\_ other, specify \_\_\_\_\_ (5)  
 \_\_\_ nutrition (2) \_\_\_ no response (8)  
 \_\_\_ latrines (3) \_\_\_ not asked (9)  
 (Code TMS responses)

97. What is the highest level of education that you have completed?  
 \_\_\_\_\_  
 (see separate coding instructions)

99. Can you read?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 \_\_\_ no response (8) (Go to Q.101)

100. Is there anyone in this homestead who can read?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 \_\_\_ no response (8) \_\_\_ not asked (9)

101. What is the highest level of education the head of this homestead has completed?  
 \_\_\_\_\_

(see separate coding instructions)

103. Is there a Zenzile committee in this chiefdom? (Or sub-chiefdom?)  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.105)  
 \_\_\_ no response (8)

104. Are you a member of this Zenzile Committee?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 \_\_\_ no response (8)

105. Have you ever seen this flyer? (Shows flyer to respondent)  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.111)  
 \_\_\_ no response (8)
106. Do you own one of these flyers?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.108)  
 \_\_\_ no response (8) \_\_\_ not asked (9)
107. May I see it?  
 \_\_\_ doesn't show (0) \_\_\_ shows (1)  
 Explain why \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_ no response (8)  
 \_\_\_ not asked (9)
108. What does this flyer teach you?  
 \_\_\_ doesn't know (0) \_\_\_ about SSS (1)  
 (Go to Q. 111)  
 \_\_\_ no response \_\_\_ not asked (9)
109. Where did you learn what this flyer means?  
 \_\_\_ doesn't know OR \_\_\_ friend, neighbor (3)  
 \_\_\_ doesn't remember (0)  
 \_\_\_ radio (1) \_\_\_ other person (4)  
 \_\_\_ clinic (2)  
 \_\_\_ no response (8) \_\_\_ Rural Health workers (5)  
 \_\_\_ not asked (9)  
 (If answer is a person, then Go to Q.110.  
 If any other answer is given Go to Q.111)
110. Is this person a Yellow Flag Volunteer?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 \_\_\_ doesn't know (2) \_\_\_ not asked (9)  
 \_\_\_ no response (8)
111. What does this flag mean? (Shows flag to the respondent)  
 \_\_\_ doesn't know (0)  
 \_\_\_ diarrhoeal related treatment (1)  
 \_\_\_ health related (2)  
 \_\_\_ no response (8)
112. Does anyone living around here have one of these flags?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.116)  
 \_\_\_ doesn't know (2) \_\_\_ no response (8)
113. What is this person's name?  
 \_\_\_\_\_
114. Have you ever talked to this person about diarrhoeal treatment for your children?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.116)  
 \_\_\_ no response (8)
115. What did they tell you to do? (Check up to three responses)  
 (Code 00 if only one or two answers are given)  
 \_\_\_ doesn't know or \_\_\_ give unspecified habits (06)  
 \_\_\_ doesn't remember (00) \_\_\_ give habits to purge (06)  
 \_\_\_ give special foods (01) \_\_\_ give habits to stop  
 \_\_\_ give SSS (02) \_\_\_ diarrhoea (07)  
 \_\_\_ give ORS (03) \_\_\_ go to traditional healer (08)  
 \_\_\_ go to clinic (04) \_\_\_ other, specify \_\_\_\_\_  
 \_\_\_\_\_ (09)  
 \_\_\_ no response (00)  
 \_\_\_ not asked (99)
116. Have you ever heard of something called a rehydration kit?  
 \_\_\_ no (8) \_\_\_ yes (1)  
 (Go to Q.120)  
 \_\_\_ no response (8)
117. What goes into a rehydration kit? (Check all that are mentioned)  
 (Code: 0=not mentioned, 1=mentioned, 9=not asked)  
 \_\_\_ liter bottle  
 \_\_\_ bottle cap  
 \_\_\_ spoon \_\_\_ sugar  
 \_\_\_ cup \_\_\_ salt
118. Do you have one of these kits?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to Q.120)  
 \_\_\_ no response (8)
119. May I see it?  
 \_\_\_ doesn't show (0) \_\_\_ shows (1)  
 If not, explain why?  
 \_\_\_\_\_  
 \_\_\_\_\_
120. Some people say that using a latrine protects the family from sickness. Other people say that using a latrine does not protect their families from sickness. What do you say?  
 \_\_\_ does not protect \_\_\_ does protect from  
 from illness (0) illness (1)  
 (Go to Q.122)  
 \_\_\_ doesn't know (2) \_\_\_ not asked (9)  
 \_\_\_ no response (8)
121. What is the main sickness it protects from?  
 (Check up to two responses: Code 0 if only one response given)  
 \_\_\_ doesn't know (0) \_\_\_ other, specify \_\_\_\_\_  
 \_\_\_ diarrhoea, stomach ache (1) \_\_\_\_\_ (4)  
 \_\_\_ cholera only (2) \_\_\_ no response (8)  
 \_\_\_ flies only (3) \_\_\_ not asked (9)
122. Does the homestead have a latrine?  
 \_\_\_ no (0) \_\_\_ yes (1)  
 (Go to end)  
 \_\_\_ no response (8) \_\_\_ not finished (2)
123. What materials are you using for the floor?  
 \_\_\_ doesn't know (0) \_\_\_ other (2)  
 \_\_\_ concrete (1) \_\_\_ not asked (9)  
 \_\_\_ mud and poles (3)  
 \_\_\_ no response (8)
124. Does this latrine have a single pit or a double pit?  
 \_\_\_ doesn't know (0) \_\_\_ double pit (2)  
 \_\_\_ single pit (1) \_\_\_ not asked (9)  
 \_\_\_ no response (8)
125. Who or what, if anything, motivated you or influenced you to build a latrine? (Record first item mentioned)  
 \_\_\_ nothing, motivated us (00) \_\_\_ Chief or induna (08)  
 \_\_\_ needed a private place. \_\_\_ family member (09)  
 \_\_\_ wanted to avoid the bush. \_\_\_ neighbors, friends (10)  
 \_\_\_ needed privacy (01) \_\_\_ teacher or headmaster (11)  
 \_\_\_ wanted to avoid disease (02) \_\_\_ Zanzala (12)  
 \_\_\_ radio (03) \_\_\_ other, specify \_\_\_\_\_  
 \_\_\_ health assistant or \_\_\_\_\_ (13)  
 \_\_\_ inspector (04) \_\_\_ no response (08)  
 \_\_\_ Rural Health Motivators (06) \_\_\_ not asked (09)  
 \_\_\_ Nurse (05)  
 \_\_\_ Agric. Extension (RDW, RDD, RDD, etc.) (07)
125. Which members of your homestead regularly use the latrine?  
 A. What about children less than 3 years old, do they use the latrine?  
 \_\_\_ no (8) \_\_\_ yes (1)  
 \_\_\_ no response (8) \_\_\_ no children under three (2)  
 \_\_\_ 0. not asked -- no latrine (9)

B. What about children 3 to 5 years old, do they use the latrine?

no (0)                     yes (1)  
 no response (8)         no children 3 to 5 (2)  
 Q. not asked -- no latrine (9)

C. What about children over 5 but under 10 years old, do they use the latrine?

no (0)                     yes (1)  
 no response (8)         no children over 5 but under 10 (2)  
 Q. not asked -- no latrine (9)

D. What about children over ten, but under fifteen, do they use the latrine?

no (0)                     yes (1)  
 no response (8)         no children between 10 and 15 (2)  
 Q. not asked -- no latrine (9)

E. What about adult women, do they use the latrine?

no (0)                     yes (1)  
 no response (8)         no adult women (2)  
 Q. not asked -- no latrine (9)

F. What about men, do they use the latrine?

no (0)                     yes (1)  
 no response (8)         no adult men (2)  
 Q. not asked -- no latrine (9)

126. When children do not use the latrine, where are their stools left?

doesn't know (0)  
 left where they defecate (1)  
 throw in the bush (2)  
 throw in latrine (2)  
 throw in a hole and buried (4)  
 other, specify  
 no response, (8)  
 not asked (9)

APPENDIX C: CLINIC REGISTRY FORM  
**MINISTRY OF HEALTH**

PUBLIC HEALTH UNIT

**ASSESSMENT OF DIARRHOEAL DISEASE**

CASE REGISTRY

0 to 59 MONTHS

CLINIC NAME \_\_\_\_\_

	DATE	CHILD'S NAME	AGE (MONTHS)	STATUS OF DEHYDRATION	DAY OF DIARRHOEA	ORS/SSS BEFORE?	MEASLES ALSO?
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							
11.							
12.							
13.							
14.							
15.							
16.							
17.							
18.							
19.							
20.							
21.							
22.							
23.							
24.							
25.							
26.							

**CATEGORIES:****STATUS OF DEHYDRATION**

N: NORMAL HYDRATION

M: MODERATE DEHYDRATION

S: SEVERE DEHYDRATION

SEE REVERSE FOR DEFINITION.

**DAY OF DIARRHOEA**

1: FIRST DAY

2: SECOND DAY

3: THIRD DAY, OR  
LONGER**ORS/SSS BEFORE?**

DID THE MOTHER GIVE

THE CHILD ORS PACKET

OR SUGAR SALT SOLUTION

BEFORE THEY CAME?

Y: YES

N: NO

**MEASLES ALSO?**

Y: YES

N: NO

# HOW TO ASSESS THE HYDRATION STATUS

## NORMAL HYDRATION

• General appearance	well
• Skin elasticity (best to pinch-up skin on abdominal wall)	normal
• Eyes	normal
• Pulse	less than 120/minute
• Respiration	20-30/minute
• Urine output	normal
<u>Amount of dehydration is less than 5%</u>	

## MODERATE DEHYDRATION

• General appearance	restless or floppy
• Skin elasticity (best to pinch-up skin on abdominal wall)	reduced
• Fontanelle	depressed
• Eyes	slightly sunken
• Tongue	dry
• Pulse	120-140/minute
• Respiration	30-40/minute
• Urine output	decreased
<u>Amount of dehydration is 6 - 9%</u>	

## SEVERE DEHYDRATION

• General appearance	very limp, or unconscious
• Skin elasticity (best to pinch-up skin on abdominal wall)	severely reduced
• Eyes	severely sunken
• Pulse	very weak or absent more than 140/minute
<u>Amount of dehydration is 10% or greater.</u>	