Lessons

FROM FIVE COUNTRIES

HEALTHCOM
COMMUNICATION FOR CHILD SURVIVAL

LESSONS FROM FIVE COUNTRIES:

Honduras, The Gambia, Swaziland, Ecuador, Peru

ACADEMY FOR EDUCATIONAL DEVELOPMENT

Dr. William A. Smith
Elizabeth Mills Booth
Project Director

Ecuador
Dr. Reynaldo Pareja

The Gambia
Mr. Mark Rasmuson

Honduras
Ms. Elizabeth Mills Booth
Mr. Ignacio Jose Mata
Dr. Reynaldo Pareja

Peru
Dr. Reynaldo Pareja

Swaziland
Mr. Dale Huntington

STANFORD UNIVERSITY

Dr. Dennis R. Foote, ACT
Dr. Reynaldo Martorell
Project Directors

Honduras
Dr. Karl Kendall
Dr. Maria del Carmen Miranda
Dr. Antonio Pinto

The Gambia
Mr. Peter Spain
Ms. Leslie Snyder

UNIVERSITY OF PENNSYLVANIA

Dr. Robert Hornik
Project Director

Swaziland
Ms. Pamela Sankar

AGENCY FOR INTERNATIONAL DEVELOPMENT
Bureau for Science and Technology
Office of Education
Office of Health

Dr. Anthony Meyer and Mr. Robert Clay
Project Managers

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OVERVIEW

Diarrhea kills about four million children a year. Oral rehydration therapy (ORT) could save many of these lives if there were effective diarrheal disease control programs in developing countries. Yet ORT is not widely used because health care providers and mothers still do not recognize its true potential.

In 1978 the Agency for International Development through the Academy for Educational Development initiated a project to apply what is known about communications and social marketing to promote oral rehydration therapy and related child survival practices. The project began work in Honduras and The Gambia as the Mass Media and Health Practices Project, focussed primarily on ORT and the control of diarrhea. Today the project has an expanded focus and includes a variety of child survival technologies, particularly immunization, infant nutrition, and preventive measures. The project is now known as Communication for Child Survival--HEALTHCOM. In addition to its work in Honduras and The Gambia, the project is working in Swaziland, Ecuador, Peru, and Indonesia and soon will begin work in Malawi and Lesotho.

In Honduras and The Gambia HEALTHCOM focussed on those most at risk, children under the age of five. Using mass media, combined with health worker training and simple print materials, rural women were taught what oral rehydration therapy is, how they could use it at home, and how to monitor their children's progress during episodes of diarrhea. Special emphasis was also given to feeding advice in an effort to break the vicious cycle of diarrhea and malnutrition.

In Swaziland a standardized homemade oral rehydration solution (ORS) formula was developed and popularized along with infant feeding and child care advice. Again promotion involved health care workers, radio, and simple printed materials. Special attention was given to the diagnosis of dehydration, the mixing and administration of the ORT solution, the special care and additional feeding required after diarrhea, and the prevention of diarrhea through simple hygiene.

In Ecuador HEALTHCOM worked within the Integrated Rural Development Project and created radio, health worker training, and print materials on the recognition of dehydration, the promotion of Suero-Oral (the locally produced WHO-formula rehydration salts), the correct mixing and administration of these salts and related child care and hygienic practices.

In Peru HEALTHCOM helped to develop an "umbrella" media campaign which included phased radio and TV broadcasts and print materials on diarrhea, immunization, and child spacing.

In Honduras:

- At the end of two years, 95 percent of the mothers who had heard campaign messages could name LITROSOL (the local ORS packet) as the medicine promoted.

- After two years, over 60 percent of the women in the project area reported having used LITROSOL to treat diarrhea at least once.

- After two years mothers reported using LITROSOL for over one third of all episodes of diarrhea.

- Of those who said they used LITROSOL, at the end of the campaign:

  - Over 90 percent knew how to mix it properly
  - An average of over 70 percent reported giving the correct daily amount

- The number of deaths associated with diarrheal dehydration dropped by 40 percent, from 39.8 percent in the two years prior to the program to 24.4 percent in the two years after the program started.

In The Gambia:

- By the end of the campaign about 90 percent of the mothers were aware of a water/sugar/salt treatment for diarrhea.

- After two years of the campaign, 70 percent of the mothers in the country knew the correct formula promoted for the homemade oral rehydration solution.

- During the second year of the campaign, over half of all episodes of diarrhea were treated with the sugar/salt solution.

In Swaziland:

- By the third month of the campaign 60 percent of those children coming to the clinics had been given ORS before coming to the clinic.

Stanford University evaluators concluded:

The overall picture that emerges of the project in Honduras is one of an intensive, well integrated campaign that achieved impressive successes in teaching people about health and getting them to change specific behaviors related to infant diarrnea.

The overall portrait of the campaign in The Gambia is one of an intense level of activity that has become highly salient for rural Gambians. The campaign and the recognition it has received have produced impressively high levels of awareness and behavioral change in the population in a relatively short time.

Two Gambian mothers use the instructional flyer to remind them how much salt, sugar, and water to use in mixing the oral rehydration solution.

I. BACKGROUND

The Academy for Educational Development began working with the Government of Honduras in 1979 and with the Goverment of The Gambia in 1980 to implement the Mass Media and Health Practices Project. The Project had three goals:

1) to develop a communications methodology which would apply the latest methods of social marketing and summative research to changing health behavior,

2) to strengthen the health education capacity of the cooperating countries through the systematic application of mass communication, and

3) to contribute significantly to the prevention and treatment of acute infant diarrhea in isolated rural areas of both countries.

Communication for Child Survival (HEALTHCOM), the successor to the Mass Media and Health Practices (MMHP) project, is funded by the Office of Health and the Office of Education of the Bureau for Science and Technology of the Agency for International Development with significant additional support from the USAID missions in each country. The work in Honduras and The Gambia was done in cooperation with the Ministry of Health in each country. The evaluation of the work in Honduras and The Gambia was performed by the Institute for Communication Research and the Food Research Institute of Stanford University and by Applied Communication Technology (ACT). The University of Pennsylvania is conducting an evaluation of the work in Swaziland.

Under a new contract with the Academy for Educational Development, HEALTHCOM has recently been expanded to include other child survival practices and programs in up to 17 countries. HEALTHCOM is currently working in Swaziland, Ecuador, Peru, and Indonesia and will send resident advisors to more countries in the near future. Subcontractors and collaborating institutions include the Annenberg School of Communications of the University of Pennsylvania, Applied Communication Technology, Needham Porter Novelli, PATH, CIBA-GEIGY, the Futures Group, the John Snow Health Group, Management Sciences for Health, University Research Corporation, and the Wilmer Institute (ICEPO) and the Department of International Health, School of Hygiene and Public Health, Johns Hopkins University.

This monograph presents in some detail the health communication projects in Honduras and The Gambia and the results of their evaluations. This is followed by reports on work in Swaziland, Ecuador, and Peru. The monograph concludes with short descriptions of lessons learned during the course of project implementation.

2. HONDURAS AND THE GAMBIA

The Problem: Diarrhea Kills

About four million children die each year from diarrhea related causes. As many as 30 percent of all infant deaths in the world today are due to diarrhea. Diarrhea kills through dehydration and malnutrition. Intense bouts of rapidly dehydrating diarrhea cause a loss of as much as ten percent of body weight and can kill in a matter of hours, while prolonged bouts of moderate diarrhea interact with general malnutrition to produce wasting and finally death.

There are virtually no effective drugs to combat the bacterial or viral organisms which are responsible for most diarrhea. Effective prevention must interrupt a complex transmission chain involving feces, hands, water, vector transmission, and food. Each link in the chain represents a need for significant, often unrealistic, changes in environmental conditions and personal habits. Any one change by itself is unlikely to dramatically reduce diarrhea morbidity.

There is, however, an effective weapon against diarrheal dehydration. Independent of the causal agent, **oral rehydration therapy** represents a practical means of saving thousands of lives each year. ORT focuses on three aspects of the diarrheal syndrome. First, ORT can replace the water and salts lost by a child in 95 percent of the cases of dehydration caused by acute diarrhea, restoring the child's capacity to absorb liquids and replacing lost body fluid. Secondly, it does this through a low-cost oral method, rather than the costly intravenous route, opening up the possibility for widespread administration by non-professional and even illiterate personnel. Thirdly, ORT promotes a series of related behaviors which, it properly applied, reduce the impact of diarrhea on malnutrition and wasting. The clinical significance of ORT has been demonstrated in numerous studies throughout the world, and it now represents the world health community's primary weapon against death due to diarrhea.

The key to effective ORT is the correct preparation and administration of an oral glucose-electrolyte solution, often referred to as ORS. ORS in its simplest form is a combination of water, salt, and sugar and can be mixed using home ingredients. A slightly more complex formula including sodium, glucose, potassium, and bicarbonate is available in a pre-packed envelope and is designed to be added to a standard volume of locally available water. It is now recommended that countries consider a two tier approach: simple sugar and salt or other liquids in the home during the early stages of diarrhea and the complete formula in the home and rural clinics for most moderate and severe dehydration. In all cases ORS should be supplemented with additional feeding and child care information.

While ORT represents a major improvement over intravenous therapy in the treatment of diarrheal dehydration, it does require certain minimum criteria in order to be effective. The ingredients for ORS must be easily available to isolated populations. If packets are to be used, an effective distribution system must be in place. If a simple sugar and salt mixture is to be advocated, these ingredients must be widely available. In both cases, mothers must be taught how to mix the ingredients in exactly the right proportion to avoid ineffective and even potentially dangerous concentrations of sodium. They must also learn to give the solution correctly, i.e., slowly, over a 24-hour period, continuing to do so even if a child vomits or refuses the liquid.

These requirements, combined with advice on breastfeeding, feeding solids and other liquids during diarrhea, and the use of other medications, create a complex set of educational tasks. ORT is now at a stage of development in which attention has turned away from the clinical effectiveness of the electrolyte solution towards the effective development and administration of delivery systems for ORS and related educational messages on ORS preparation and administration and child care.

Poster used in Honduras to remind physicians that breastfeeding is important.

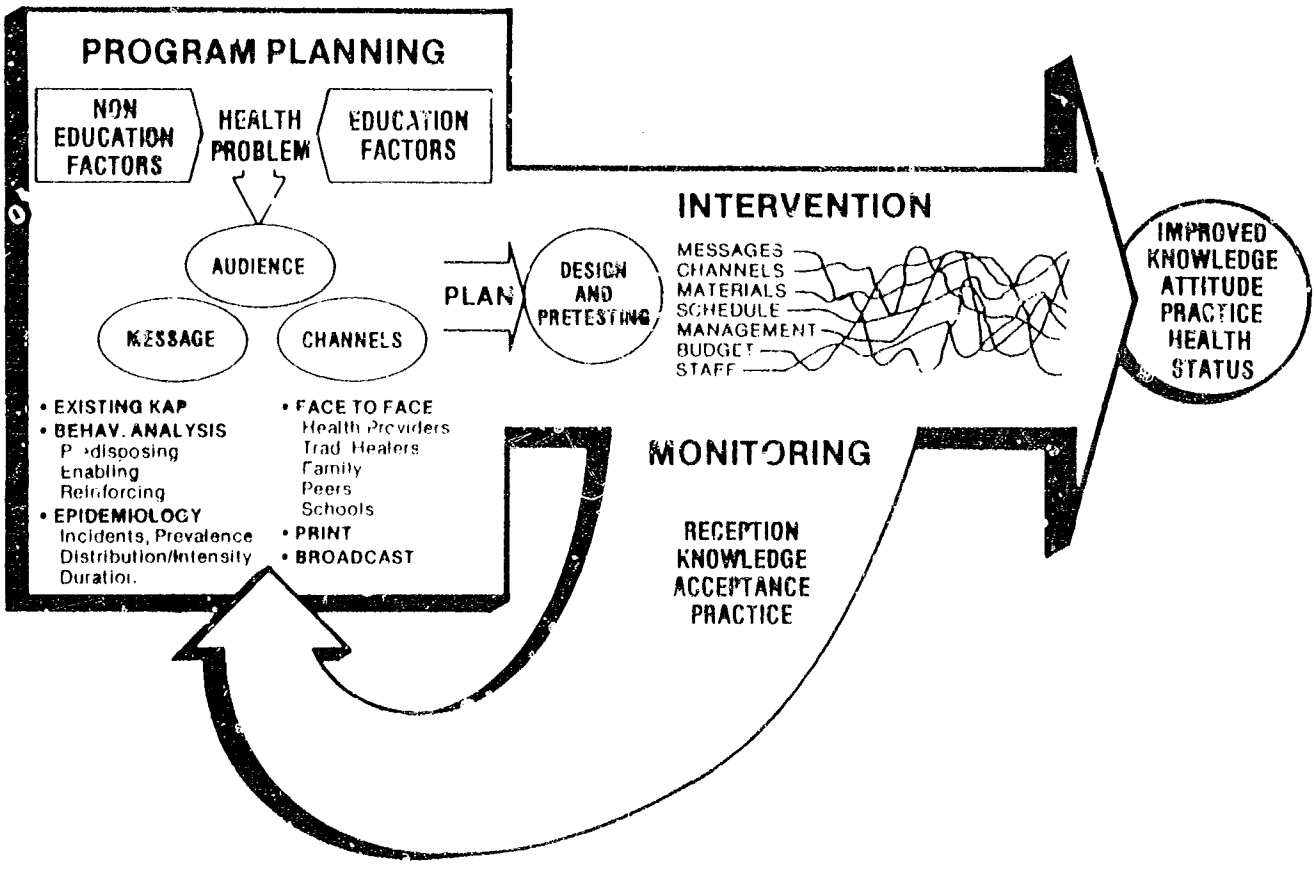
Poster used in The Gambia to remind health workers to recommend breastfeeding.

The Health Communications Approach

The particular health communications strategy developed by HEALTHCOM is part of a growing genre of health education activities referred to generally as social marketing or health communications. This approach attempts, in a pre-defined period of time, to change a particular set of behaviors related to a specific problem in a large-scale target audience. During the past two decades dozens of campaigns on topics as varied as forest fires, mental retardation, energy conservation, smoking, alcoholism, littering, seat belts, venereal disease, malaria, breastfeeding, latrine construction, population control, and infant diarrhea have attempted to inform, motivate, and often change the behavior of a large audience in a short time. Experience has shown that the short-term campaign which relies too heavily on media alone has been little more effective than traditional programs which rely solely on direct patient education through health workers. The program is using many of the lessons learned from short intensive campaigns but is integrating them as part of a long-term, consistent health communication strategy designed to promote health priorities such as diarrheal disease control, immunization, improved infant nutrition, malaria control, and family planning.

The approach is illustrated in the following diagram which shows the relationships among three key stages in the strategy: pre-program planning and development, the instructional intervention, and monitoring and evaluation of knowledge, attitudes, and behavior.

PUBLIC COMMUNICATIONS MODEL



The **planning and development stage** emphasizes the collection of information needed to prepare an effective program design. This information answers important questions such as: (a) Who in the total population should be selected as the principal audience? (b) What communication channels are most appropriate for these people? (c) What behaviors should be advocated? (d) What resources are needed to conduct the program? The final program plan, including budget and resource requirements, is based upon the results of this investigation.

The **intervention** is divided into discrete cycles. Each cycle covers the same basic information with a slightly different approach. These cyclical changes reduce audience fatigue and permit a continued renewal of audience involvement. From an administrative perpective, the cycle approach is more important because it permits program planners to design segments of the program sequentially. This means they can work with fewer production facilities over a longer period of time. More importantly, they incorporate results of the earlier phases into the planning of later phases.

In order to reach large numbers of people, mass media, particularly broadcast media like television and radio, play a central role. **But it is the integration of broadcast, print, and face-to-face support which is essential to campaign success.** Women hearing health messages on the radio also hear the same advice from a health worker, receive printed information from their children's school, participate in a community health fair, and see related posters.

Monitoring and evaluation permit the planner to detect problems and make important iterative changes in educational strategy. A monitoring system which permits the regular sampling of select segments of the audience is developed. Planners know: (a) how a microcosm of their intended audience feels about the advice they are receiving; (b) whether or not they are taking that advice; and (c) what obstacles they are encountering. These monitoring devices can also point out important logistics problems such as a breakdown in delivery of printed matter or the use of inappropiate broadcast times for reaching target audiences. This type of on-going evaluation is essential for making corrective changes in future cycles as well as for providing program administrators with a clear idea of their overall potential success.

The working premise which makes this model relevant to the prevention and treatment of infant diarrhea is the belief that lives can be saved by altering the way in which rural people now behave. Improvement does not necessarily require significant new investments in health infrastructures such as water systems, latrines, or new health centers. This project is not attempting to install new mechanical technologies nor promote sophisticated cognitive conceptualizations. The task is to increase the likelihood of people doing things which are well within their capacities but which are currently unlikely. The emphasis is on **behavior.** Attitudes, even those which may contribute to what people do, are of secondary interest.

From a behavioral perspective, there are five circumstances which singly or in combination account for absent behavior. First, necessary materials or implements like ORT packets may be unavailable. Second, prerequisite skills, discrimination, or knowledge may be lacking. For example, rural mothers may know that boiling water is good but may not understand that it actually kills the parasites they fear. Third, there may be no incentives such as immediate improvement in their child's health for adopting the behavior. Fourth, there may be incentives to adopting inappropriate behavior like giving kaolin or purges. And fifth, there may be punishing consequences which discourage the desired pattern. A child may vomit when ORS is administered, for example, or his diarrhea may actually appear to increase. An understanding of these

factors on the part of program personnel is absolutely critical in the development of an effective instructional intervention.

Behavioral analysis also makes an important contribution to our understanding of how to change behavior patterns, whether it be altering an existing pattern or creating a new one. Many health messages, for example, carry an implicit or explicit threat. This approach has been shown to be less effective than providing **rewards for approximations** of the desired behavior. The use of approximations requires the identification of relevant existing behavior which is desirable and which can be reinforced. This may mean including a few behaviors in the instructional campaign which the audience is now doing correctly. For example, rather than telling mothers to stop bottle-feeding, it may be better to praise mothers each time they breastfeed their babies.

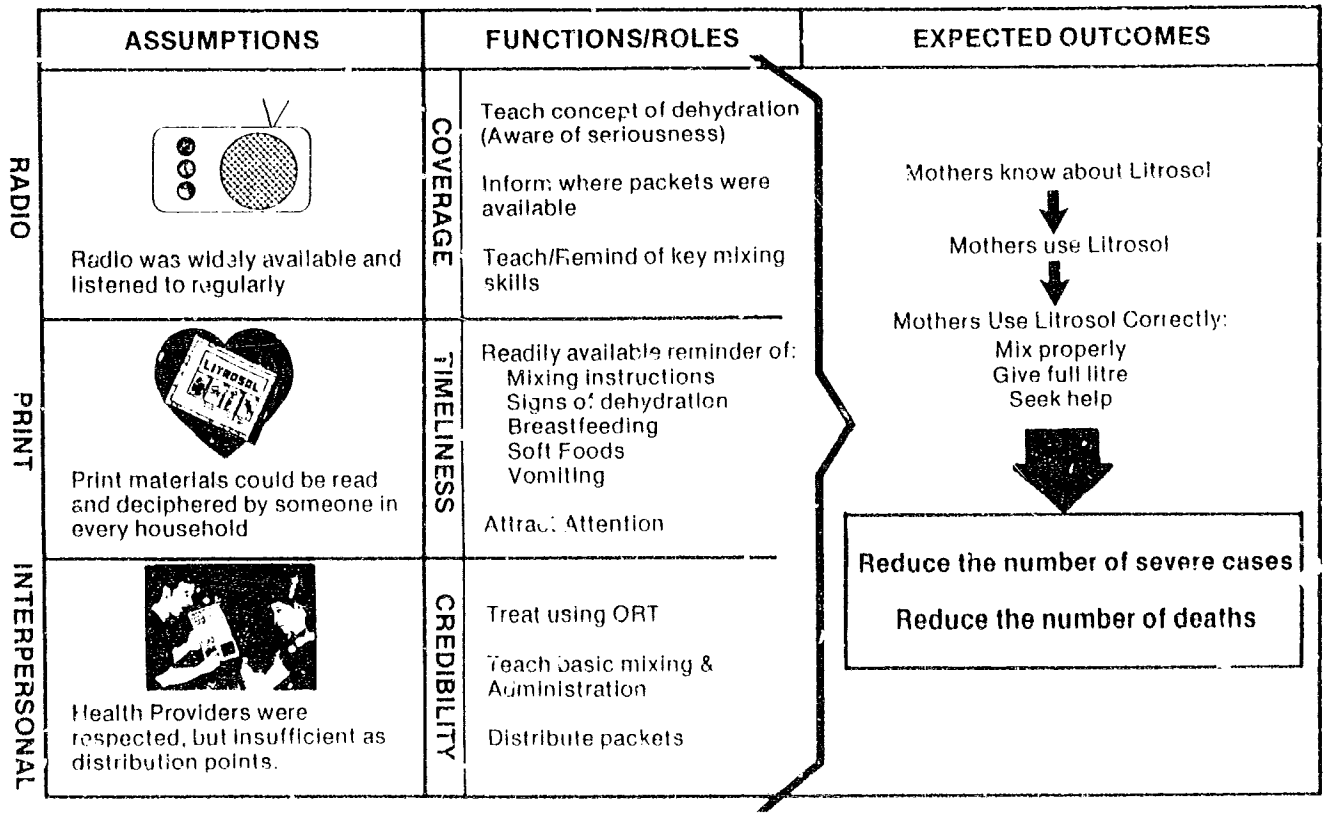
Another important point to emphasize is effective **delivery of positive consequences or rewards.** Behavior does not change unless rewards are actually applied to the desired behavior pattern or some reasonable approximation of it. It is not sufficient, for example, for nurses to tell outsiders how important it is that rural mothers be praised for administering ORT. One must be certain that the nurses are in fact praising mothers and that the mothers perceive the nurses' actions as praise or support. The project may be one of the first efforts to use mass communication primarily to support positive existing behaviors rather than to extinguish negative patterns or create entirely new ones.

The success of a public communication approach depends upon its ability to provide a sufficiently large number of people with practical and important new information. It must make an impact on the consciousness of the intended audience by rising above the everyday clutter of advice and suggestions to become an important new priority in their lives. It must change what people do as well as what they think and believe. This cannot be achieved by the mere repetition of simple slogans, the exhortation to do the right thing, or the indiscriminate use of mass media alone. It requires:

- A sensitive understanding of how people are affected by specific health problems
- Articulate crafting of useful and practical educational messages
- A coordinated distribution network that reaches each individual through various channels simultaneously

The following section describes the specific project activities in Honduras and The Gambia, showing how these principles have been applied to the real-life conditions existing in each country. The illustration below defines the programmatic assumptions and the specific functions and roles and the expected outcomes for each of the three primary communication channels used in both countries.

Radio is used to provide widespread coverage of key new skills and as a regular reminder of critical mixing, administration, and feeding advice. **Print materials** are used for more detailed instructions and so they are available in a timely way--when the mother needs to know how to mix ORS, how to give ORS, and how to monitor her child's progress. **Interpersonal channels,** physicians and health workers, provide overall credibility for the new health technology and constitute the primary distribution system for packets in Honduras and mixing advice in The Gambia. The following model is a graphic presentation of the Diffusion Model developed for the Honduran Diarrheal Disease Control Program.



DIFFUSION MODEL

The Campaign In Honduras

The Problem

Honduras reported that 1,030 infants died from diarrheal dehydration in 1977. This accounted for 24 percent of all infant deaths and represented the single greatest cause of infant mortality in Honduras. The most commonly available treatment for diarrheal dehydration in Honduras was intravenous therapy. Intravenous therapy is expensive, requires trained medical personnel and a relatively sterile environment, and is available only in fixed health facilities which serve a small portion of the country's population.

Communication Objectives

The campaign in Honduras had the following main objectives:

- Substantially reduce the number of deaths from diarrheal dehydration among children below the age of five.
- Extend rehydration therapy to isolated rural areas where it is not now available.
- Substantially reduce the per-patient cost of rehydration therapy in Honduras.
- Introduce several diarrhea-related prevention behaviors to a significant number of rural people living in isolated areas.

Audience Definition

The audience in Honduras was divided into two main groups:

- The primary audience is rural mothers and grandmothers responsible for the care of children under the age of five and primary health care workers called guardianes.
- The secondary audience includes physicians, nurses, auxiliary nurses, midwives, fathers of children under five, rural school teachers and school children, and regional health promoters.

Communication Strategies

The project was designed to teach the primary audience:

- To properly prepare pre-packaged oral rehydration salts and administer them to infants (less than one year) as soon as the child gets diarrhea and to toddlers (older than one year) as soon as the child loses appetite or becomes listless.
- To seek outside assistance if the child does not improve after administering the above regimen.
- A cluster of behaviors associated with breastfeeding, infant food preparation, and personal hygiene.

The secondary audience was taught to support the primary audience through:

- Physicians and nurses using oral therapy in all fixed facilities.
- Fathers and midwives understanding and approving oral therapy.
- Rural schools teaching prevention measures.
- Regional health promoters distributing ORT packets.

Message Tone

The tone of the campaign was serious and straightforward. It sought to promote a mother-craft concept which supported what mothers were already doing and added several new components to "being a good mother." ORT was presented as the latest achievement of modern science: **a remedy for lost appetite and an aid to recovery.** ORT was not presented as a remedy for diarrhea.

Execution

The following diagram illustrates the various project inputs over time, including the different evaluation instruments used by Stanford. The evaluation data reported later in this paper reflect the time period from February 1981 through February 1982. As illustrated, some 20,451 radio spot broadcasts and some 200,000 print materials plus 150,000 packets of oral rehydration salts were produced and distributed.

The campaign took two years and was divided into four sequential phases timed to coincide with the peak seasons of diarrhea. Phase I, which preceded the first diarrheal peak, stressed face-to-face training of health workers and medical professionals in the proper application of oral rehydration therapy for mild, moderate, and severe cases. Phase II, during the first diarrheal peak, shifted from an intensive face-to-face effort to a media-based mass campaign directed at rural mothers and grandmothers. Messages during this period focused on diagnosis, the procurement, mixing, and administration of ORT, and recovery. A few prevention concepts were addressed during this phase. Phase III shifted to a prevention focus, but selected treatment messages were broadcast to reinforce therapy compliance. This period preceded the next diarrheal peak season and prepared mothers to apply useful prevention techniques. Phase IV, during the second diarrheal peak time, re-emphasized ORT treatment. During this phase, media was used to reinstate treatment behaviors elicited during Phase II and to provide continued reinforcement to selected prevention measures.

A message pattern was developed which differentiated messages by specific audiences. The treatment pattern was built around a core cluster of treatment behaviors which was either expanded for audiences like physicians, nurses, and **auxiliares,** or selectively chosen for groups like school children and midwives. This means that physicians learned how to treat severe dehydration with oral therapy in addition to the moderate rehydration therapy being taught to rural mothers. School children were not taught the entire core cluster of oral therapy behaviors directed at mothers but focused on early diagnosis and alerting mothers to a possible problem.

Prevention messages were also differentiated by target audience. For example, breastfeeding was emphasized with physicians, diaper storage with **guardianes,** and general environmental sanitation in school programs.

HONDURAS ACTIVITIES

EVALUATION LEGEND
B = Baseline
A = Anthropometry
M = Morbidity
C = Communication
N = Nutrition & Breastfeeding

RAINY SEASON | RAINY SEASON

PHASE I									PHASE II				PHASE III						PHASE IV						PHASE V				
OCT 1980	NOV	DEC	JAN 1981	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN 1982	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN 1983	FEB	MAR

MESSAGE SEQUENCE

- Dehydration
- Infant Special Care
- Breast is Best
- Reheat Foods
- Wash Hands

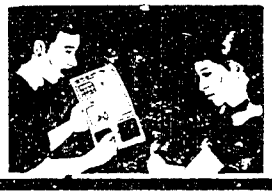
LITROSOL For Dehydration Available at Center Flag
- Give to Infants For All Diarrhea
- 3 8oz. Bottle Makes a Liter
- Litrosol For All Children's Diarrhea
- Give During Entire Episode

- Feeding during Diarrhea
- Instruction on Packet
- Breastfeeding
- Litrosol

- Litrosol for all episodes
- Signs of dehydration
- Mix all of packet
- Give with other medicines

Breastfeeding

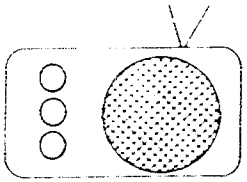
INTERPERSONAL



DIRECT						73	23	195	26								15 Phy.	30	50	80							100		
INDIRECT							160	200	200	200	200							900 Retraining											

1,200

RADIO



SPOTS						6,450			5,424				8,577				2,801	Local Sta. Only	9,611						10,833				
VOZ De SALUD																	3 Per week								4 per wk.		5 per wk.		
OTHER																		Sports - Game Show TV											

43,696

PRINT/GRAPHIC

POSTERS/ DISTRIBUTION						37,000			18,600				17,400				5,000								Breastfeeding 15,000				
FLYERS									80,000										75,000										
WITH LABELS									160,000										150,000										
WITHOUT LABELS																													

93,000

PACKETS

300,000

EVALUATION

B | A | M | C | N | A | M | C

Radio was the principal means of initial contact with most rural mothers. While simple print materials such as posters and graphic pamphlets were distributed widely, it was expected that many mothers would receive only the radio messages. Word-of-mouth was expected to be an important secondary source of information for mothers. The primary contact points for mothers were **guardianes,** local **alcaldes,** rural clinics, children's hospitals in Tegucigalpa, and rural primary schools. Schools were added to the communication network because they offer a relatively simple way to provide structured information to a large number of rural homes. The **guardianes** were reached by an intensive preliminary training effort and supported through regular bi-monthly meetings, radio broadcasts, and simple print materials. Secondary audiences such as physicians, nurses, and health promoters were reached principally through print media, although regular news items were important motivators for these groups.

Institutionalization

By 1985, the Health Education Unit of the Ministry of Health had expanded from a two-person team, to a national office with seven professionals organized into radio, graphic arts, and planning and research sections. From distributing paper and magic markers to clinic staff and sending technical briefs to radio stations, the Unit is now planning four integrated public health communications programs a year. Each of these programs includes designs for radio and print materials, health provider training, conducting regular field research to test materials, and developing monitoring systems with division chiefs of the Ministry. A national budget, including five new full-time staff positions, has been created by the government, and formal plans to further strengthen the health education activities of the Ministry have been approved.

The Campaign In The Gambia

The project in The Gambia lasted three years. It was divided into a six-month pre-program development investigation and the actual execution, monitoring, and revision of the public education program. The project had modest financial resources to develop and produce radio, graphic, and in-service training materials. The project also provided one expatriate technical assistant to the Health Education Unit of the Medical and Health Department.

The Gambian Ministry of Health provided one full-time counterpart and office space, and the national radio system provided all radio broadcast time. As in Honduras, a coordinating committee was established by the Ministry to review project activities and to ensure that the project was consistent with the government's overall health priorities.

The Problem

The Gambia reported that gastroenteritis and malnutrition accounted for 21.3 percent of all deaths in children under five years old in Banjul where health statistics are most reliable. It is estimated that rural areas of the country experience comparable or more serious mortality rates due to the same two causes. This represents the most significant cause of death for children of this age group. Existing methods of prevention and treatment vary widely within the country and are generally considered inadequate to meet the problem.

Communication Objectives

The main objectives of the campaign in The Gambia were the following:

- Substantially reduce the number of deaths among children below the age of five from diarrheal dehydration.
- Establish one sugar/salt rehydration regimen as a standard for village-based prevention of dehydration.
- Adapt the village level management of diarrheal disease to meet the different requirements of the wet and dry seasons and the diarrhea/ malnutrition complex.
- Establish a regular feces clean-up campaign within a significant number of rural family compounds.

Audience Definition

The audience in The Gambia was divided into three main groups:

- The primary audience was rural mothers, grandmothers, and older female siblings of children under five.
- The secondary audience included Rural Health Inspectors, Community Health Nurses, Health Peace Corps Volunteers, Leprosy Inspectors, Maternal Child Health teams, and Primary Health Care Workers.
- A tertiary audience included general physicians, dresser/dispensers, local leaders (alkalos), and rural fathers of children under five.

Communication Strategies

The campaign was designed to teach the primary audience:

- To properly mix the simple sugar/salt rehydration solution.
- To administer the solution along with breast milk and solid foods during episodes of wet season diarrhea.
- To administer the solution intensively along with breast milk during episodes of dry season diarrhea.
- To seek outside assistance if the child shows signs of listlessness and/or dark sunken eyes.
- To identify one member of the family to regularly clean up human, primarily infant, feces from the family compound floor.

The campaign hoped to teach the secondary audience:

- To properly mix and administer the sugar/salt rehydration solution.

- To properly manage moderate and severe dehydration in the health centers using ORT packets.

The tertiary audience were motivated to support and praise mothers who properly used the sugar/salt solution for diarrhea.

Message Tone

The tone of the campaign was serious and straightforward. It sought to promote a remedy, the basis of which builds upon existing widespread recognition and concern over "dryness" in small children, which offers mothers a powerful new diet for "dryness." The sugar/salt solution will be presented as part of this "diet for dryness" which includes specialized feeding and continued breastfeeding.

Execution

Radio, print, and health worker training were combined to provide the same messages over multiple channels. Radio spots, mini-programs, and magazine format radio programming delivered a seasonally structured series of messages. A national rural lottery which used radio to teach the audience how to use a color-coded mixing flyer was a central element in the program to teach sugar/salt mixing to rural women. This was strengthened by trained Traditional Birth Attendants (TBA) identified by a speical "happy baby flag" in a significant percentage of rural villages. These TBAs provided back-up support for mothers by helping them remember how to mix sugar/salt solution. Simultaneously, packet rehydration was introduced at rural health centers as the preferred treatment for moderate and severe rehydration. A feces clean-up campaign relying heavily on radio was conducted to link the concept of cleanliness during prayer, advocated by Islamic principles, to the need to maintain the floor of the family compound as a clean place upon which to pray.

The first year was divided into three sequential phases timed to coincide with the seasonal variations in diarrhea.

Phase I, which preceded the wet season diarrheal peak (characterized by prolonged, debilitating bouts of diarrhea) emphasized the relationship between diarrhea, dryness, and malnutrition, establishing the concept that "dryness," or dehydration, can be prevented through a special diet of sugar/salt solution, breast milk, and adult cereals given to young children during bouts of diarrhea. Phase I included an intensive face-to-face training program for rural health workers (Health Inspectors, Community Health Nurses, Peace Corps Volunteers, Leprosy Inspectors, and Maternal and Child Health teams) in the proper management of diarrhea including sugar/salt solutions, UNICEF packets, and intravenous/intraperitoneal therapy. These health workers in turn trained mothers in 1,000 villages in the proper mixing and administration of the sugar/salt solution, leaving a happy baby flag on the hut of the trained women as an identifying marker.

Phase II, which corresponded to the wet season diarrheal peak, emphasized proper mixing of the sugar/salt solution in the home along with administration and feeding advice. During this period a national rural lottery was operated to publicize and popularize the sugar/salt mixing instruction.

Phase III, which immediately preceded and coincided with the dry season diarrheal peak (characterized by short, intensive, and rapidly dehydrating bouts of diarrhea) reinforced the sugar/salt mixing behavior promoted in Phase II and emphasized the rapid,

systematic administration of the sugar/salt solution from the on-set of the diarrheal episode in children under five.

Following the initial emphasis on popularizing the home mix solution, the program's messages shifted to stress infant feeding after bouts of diarrhea, promoting solid foods as "power" foods for children recovering from diarrhea and restoration of weight as a goal in post-diarrhea treatment. Specific local dishes were studied and recommended to mothers, and locally available ingredients such as groundnuts, sugar, milk, and oil were suggested as particularly important to the recovering child. This second phase again combined radio, print, and health worker training but did not rely on a single, high-impact intervention like the lottery to carry the primary message.

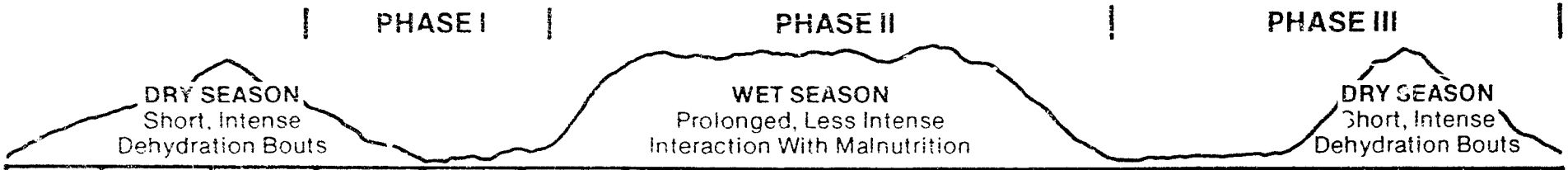
Institutionalization

Several positive indicators of institutionalization in The Gambia have resulted since the Academy staff left in 1984. The Gambian Government continues to distribute the lottery flyers as instructional guides to mothers in rural villages. Selected radio programs have been rebroadcast, and several new radio programs have been created since the end of the second phase of project activity. New primary health workers have been trained, using the Health Worker's Guide developed by the project. Forty senior nursing personnel have been trained in clinical management of diarrheal disease. A recent MOH Primary Health Care Review reported that 75 percent of mothers in PHC villages and 44 percent in non-PHC villages said they treated diarrhea with ORS. Division of Education staff have presented The Gambia experience at international health conferences in Senegal, Malawi, and Kenya.

Despite these positive signs of institutionalization, there is less expansion of the methodology than hoped for. Severe economic constraints and conflicting demands on the health education staff have prevented them from concentrating with the same precision on a single set of health problems. Further deterioration of the country's precarious economic situation has required the Ministry of Health to ration gasoline and other essential resources, thereby interrupting its maternal and child health outreach services. The Ministry of Information has cut back Radio Gambia's daily broadcast hours by 50 percent. The government, however, has recently requested assistance to apply the HEALTHCOM public health communications methodology to family planning and nutrition and to establish a surveillance system to replace the one developed by Stanford University but discontinued at the end of the project. The Health Unit plans to follow up and reinforce established ORT behaviors and plans a study on current ORT knowledge and practices among Gambian health workers and rural mothers to identify areas of needed programs and materials reproduction. Institutionalization remains a possibility in The Gambia, but without additional support it is doubtful that the government alone will be able to continue with the same level of effectiveness as that noted during the earlier phase of the program.

THE GAMBIA

OVERALL CAMPAIGN STRUCTURE



JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MARCH

Campaign Begins

	DEHYDRATION/ MALNUTRITION	FEEDING & S/S	DEHYDRATION & S/S
PRINCIPAL CAMPAIGN THEMES	• Identify Dryness As Problem • Dryness Is Especially Dangerous In Children Under 2 • Introd. S/S Packets To Housewives	• Feed Children More Often • Feed Children Adult Food During Bouts As Possible • S/S Emphasis On Mixing Skills And Giving As Much As Child Will Take Early In An Episode. • Regular Faeces Clean-up In Family Compound	• Dryness Kills • Signs of Dehydration • Dehydration Especially Dangerous In Children Under 2 • S/S - Emphasis On Administration Of At Least One Bottle A Day; Make Fresh Every Day

TRAINING

CHN, NM, PCV, HI, LI	Primary Training	Follow-Up	Retraining	
D/D, AUX, ORDEUES		Secondary Training	Follow-Up	Retraining
TBA			Follow-Up	Retraining

PRINT

H.W. POSTERS LOTTERY FLYER SASH IDENTIFIER LOTTERY PRIZES	Distribution (Through Training For CHN/HI/PCV)	Pretesting Printing New Graphics

RADIO

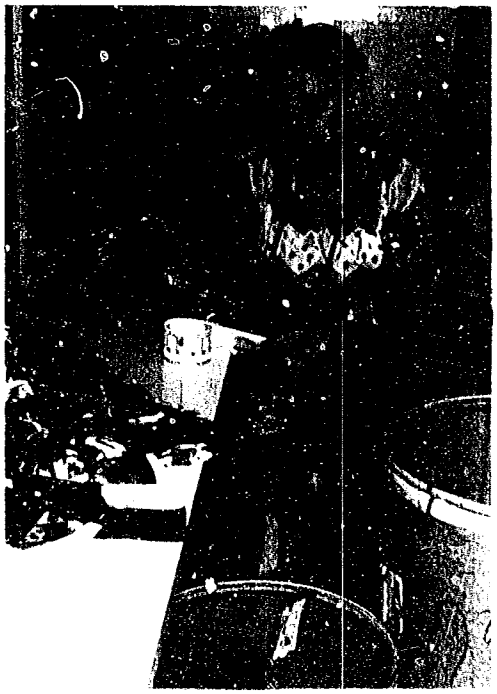
MAGAZINE PROG.	Pilots Pretesting	Final Production	Airing	Pilots Pretesting	Airing	Airing	Airing	Pilots Pretesting	Airing
MINI PROGRAMS								
SPOTS								

1000 — 250,000 — 600

LOTTERY

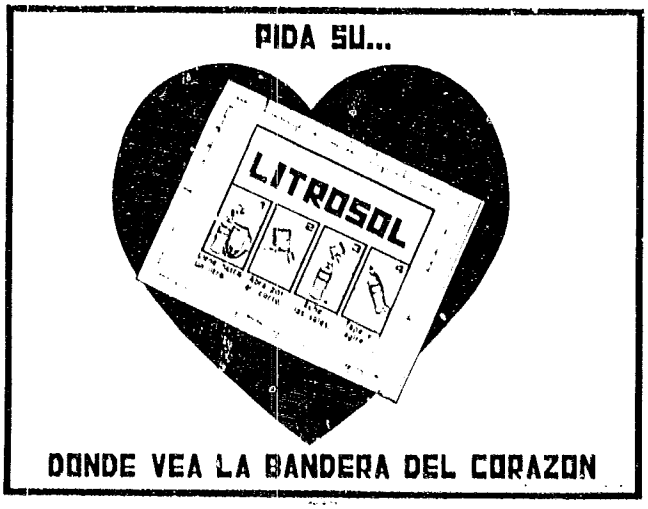
IMAGES FROM THE FIELD

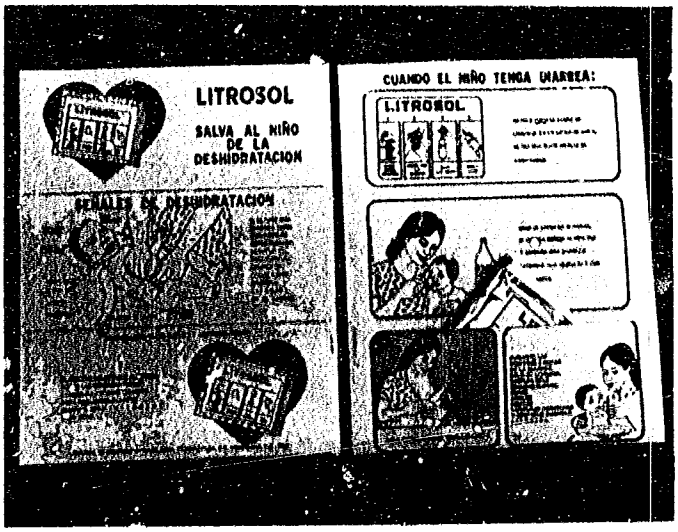
IN HONDURAS



A complete formula oral rehydration packet is produced locally by the national pharmaceutical company.

Called LITROSOL, this brand name is widely publicized through posters, pamphlets, radio programs, and an instructional label which remind mothers how much water to use in mixing the prepackaged salts.





Most packets are distributed with a simple flyer folded to look like an envelope. The flyer carries important instructions on how to mix the packet with water, how much to give, and how to feed a child with diarrhea.

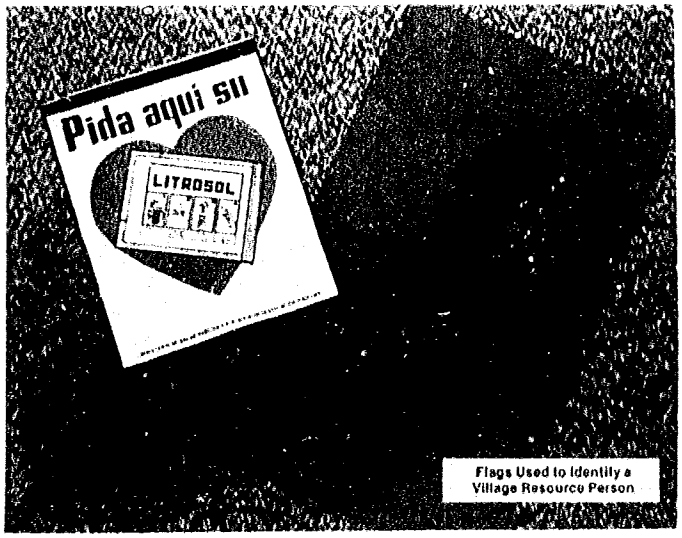
These materials were developed after months of intensive investigation in rural areas to determine how mothers were treating diarrhea and what they expected from a diarrheal remedy. Simple photographs were used as discussion starters to help mothers talk about treatment and their experiences with diarrhea.

One of the most difficult tasks is analyzing the results of these investigations. Hours are spent reviewing questionnaires, discussing their importance, and using the principles of behavioral psychology to rank problems and select promising educational solutions.

One solution which emerged was the development of a loving image for the campaign. A red heart was chosen as a central visual symbol, signifying the love that mothers have for their children. It is repeated often on print materials.

Radio programs, thousands of spot broadcasts, and dozens of weekly programs are broadcast on carefully selected local stations. These programs build upon the loving theme selected for the graphics and talk directly to mothers, grandmothers, and older siblings in words they can understand and appreciate. Radio is both the first contact with LITROSOL and a regular reminder of key mixing and administration instructions.

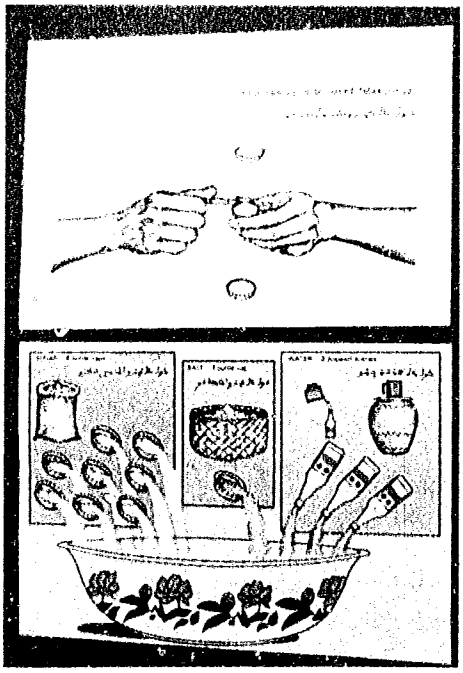
Local health workers and health professionals were trained to use and promote LITROSOL. Practice sessions, using a simple doll, replicate each step in the rehydration process. The fun of using a doll heightens the workers' interest and enthusiasm.



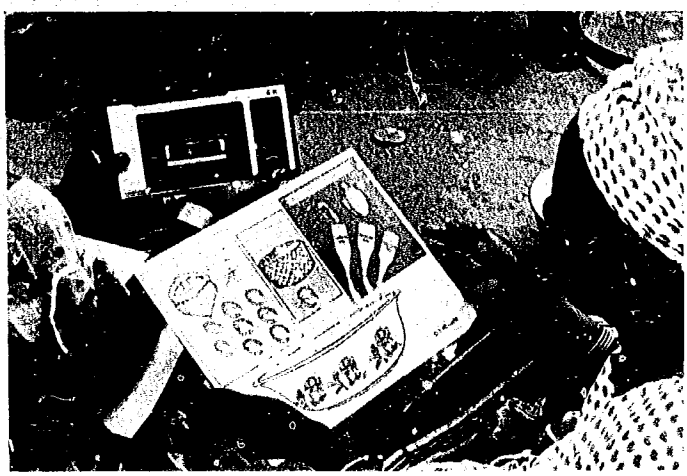
A simple flag with the red heart symbol was given to each trained health worker. Radio programs then announced that LITROSOL was available at houses with the red flag. This integration of radio, graphics and health workers proved to be a powerful combination. The "happy baby" flag was used in The Gambia.

Village health workers learn to mix the correct water, sugar, and salt solution using the same materials and containers found in rural homes.

A village health worker proudly displays a "happy baby" flag, symbol for the community indicating that he is a source of information on the water/sugar/salt diarrhea medicine.

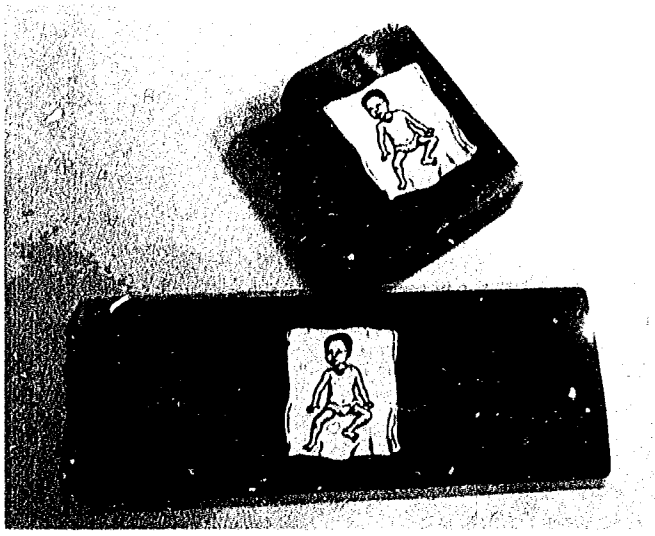


A one-page flyer shows how to use a bottle cap and a local soft drink bottle to measure the correct proportion of sugar, salt, and water.



Women got their flyer from local leaders and health centers and then listened to special radio programs which taught them what the flyer means. Color coding of the flyer allows the radio announcer to be clear and specific about each of the pictures on the flyer.

Women crowd around a health worker at the nation's first Happy Baby Lottery. Women who can properly mix the diarrhea medicine won a simple prize. The lottery provided not only motivation to get a flyer but also practice in mixing the solution in supervised settings.



One of the prizes was a bar of local soap wrapped in a gummed label with the happy baby symbol printed on it.

Mothers keep the flyer and use it to remind them of how much sugar, salt, and water to mix.

Follow-up radio programs used the testimonials of Happy Baby Lottery winners, to continually reinforce the value and importance of the sugar, salt, and water solution. These programs provided an ideal opportunity to repeat the mixing instructions which had been captured in a song using popular rhymes and rhythms.

Comparing Honduras and The Gambia

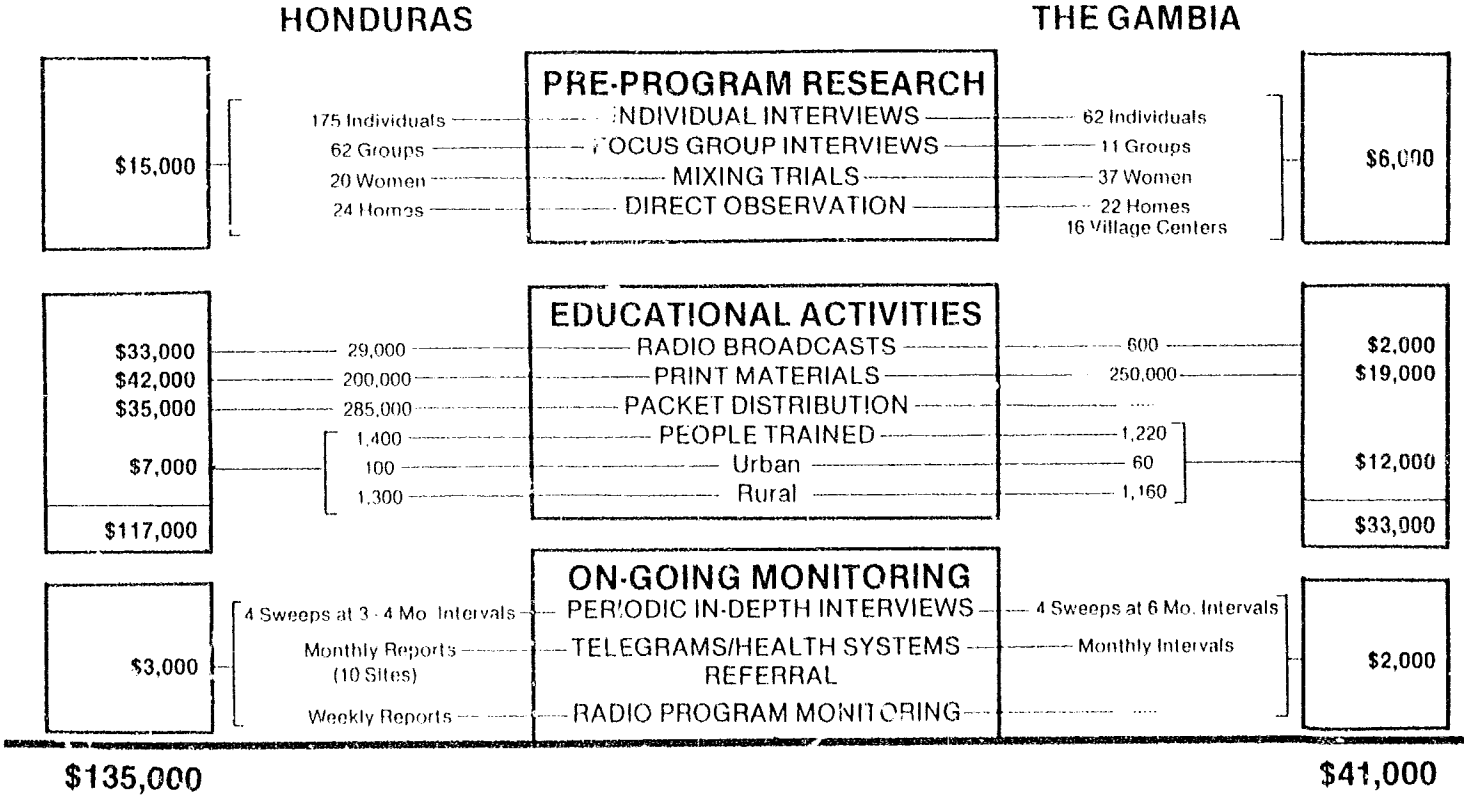
The project had the opportunity to compare the usefulness of a single communication methodology applied to two different environments and cultural settings. In both Honduras and The Gambia, diarrheal dehydration is the leading cause of death. Yet teaching about ORT to prevent dehydration due to diarrhea had major local constraints. There is a three percent female literacy rate in The Gambia, and 48 percent of the women had great difficulty in interpreting two-dimensional pictures or drawings without assistance, a difficulty sometimes called "pictorial illiteracy." In both countries, the practice of purging and withholding food during diarrhea was common. In almost everything else relevant to an educational campaign, the countries were different. Spanish language and culture contrasted with The Gambian Wolof and Mandinga languages and tribal customs. Nuclear family dwellings of six to ten members in Honduras contrasted with extended family compounds of up to 100 members, including multiple wives, in The Gambia. Numerous private radio stations and publications in Honduras contrasted with one national station and relatively few print materials in The Gambia. In Honduras locally packaged oral rehydration salts (ORS) were promoted under the product name of LITROSOL. In The Gambia, a water/sugar/salt homemade solution was promoted, while World Health Organization ORS packets were reserved for clinical use.

The chart below illustrates the most relevant differences between the two sites.

SOME DIFFERENCES BETWEEN THE TWO SITES

		The Gambia	Honduras
EXISTING ENVIRONMENT	The Health Problem	Striking seasonal variation between short dry season of watery diarrhea, and longer wet season of prolonged diarrhea interacting with malnutrition.	Seasonally prominent watery diarrhea.
	Target Audience	Striking linguistic and cultural differences between major sub-groups.	Homogeneous cultural groups
	Health System	Limited central resources, with significant potential for rural coverage	Significant central resources with relatively limited rural outreach.
	Radio	Single, centralized government broadcast channel. Limited potential coverage.	Multi-channel commercial broadcast system. Excellent potential for coverage.
	Print Media	Practically unknown at village level	Limited availability, but some exposure.
PROPOSED INTERVENTION	Rehydration Regimen	S/S in the home-Packet and IV in the health center.	Packet in the home. Packet and IV in the health center.
	Treatment Strategy	Reinforce significance of dryness. S/S means to prevent dryness. Teach signs of mild dehydration as point to seek help.	Teach significance of dehydration. Teach signs of mild dehydration as point to seek help.
	Principle Treament Objective	Standarize and popularize proper mixing and use of S/S solution in the home.	Popularize appropriate application of the packet in the home.
	Principle Prevention Objective	Regular fece. campaign within compound.	Cluster of prevention behaviors.
	Campaign Structure	High impact radio lottery targeted at rural women with print and health worker support.	Multiple, intensively repeated short radio messages, broad print material and health worker focus.
	Time	24 months total/12 month broadcast cycle.	36 months total/24 month broadcast cycle.

The following chart illustrates the different outputs and their relative costs for each country. Costs exclude foreign technical assistance but include local salaries, benefits, travel, transportation, research, printing, production, and broadcast. The program in The Gambia was much less expensive than that in Honduras because in The Gambia air-time was provided free and commercial printing costs were much lower. In addition, the prior experience with the research process in Honduras permitted significant savings in protocol development in The Gambia and a smaller sample size resulting in a lower total pre-program research cost.



1st YEAR ACTIVITIES

Important Similarities Of Approach

To understand the project it is also important to note the following similarities, not of setting but of approach, which characterized the project in both countries.*

- A significant **pre-planning** investigation was conducted of the medical problem, the social context, and the instructional tools.
- **Focused instructional goals** were established around a narrow health objective.
- The ultimate criteria against which specific messages were selected were the feasibility, practicality, and reliability of **audience adoption.**
- **Behavioral design principles** were used to select target behaviors, develop the training design, and orient the campaign structure.
- Radio, print, and face-to-face support were designed as **integrated,** mutually supportive, and interactive components.
- Significant use was made of radio for direct instruction as well as information dissemination and popular mobilization.
- Systematic **materials testing and on-going project monitoring** were included as fundamental elements.

* The elements of the approach are described above in Chapter 2.

Evaluation Findings

Overview of the Major Findings

1. The target audiences in both Honduras and The Gambia had good access to all communication channels and were heavily exposed to campaign messages.

In Honduras, an average of 44 percent of mothers reported hearing a project Radio spot on the previous day. The same number could describe a project poster without help from the interviewer.

In The Gambia, more than three-quarters of the sample mothers said that they had seen the ORS mixing flyer, and most could actually produce their flyer. Nearly two years later, 30 percent of all mothers could still show their flyers.

2. Exposure resulted in learning gains over time for topics covered in campaign messages.

By the time the Honduras radio spots ended, half the sample knew that LITROSOL would prevent dehydration.

Mothers in The Gambia learned the importance of continued breastfeeding during diarrhea. Honduran mothers were able to tell interviewers more reasons why breastfeeding was valuable.

Knowledge of accurate ORS mixing and administration increased steadily in both countries throughout the campaigns.

3. Mothers adopted the recommended practices in feeding and treatment of diarrhea. Adoption of oral rehydration solution (ORS) was particularly high.

Within six months of the campaign's beginning, more than a third of the Honduran mothers had tried LITROSOL at least once. After two years, nearly two-thirds of the sample mothers said that they had tried LITROSOL.

In The Gambia, more than three-quarters of the mothers used the water/sugar/salt solution at least once during the campaign.

4. Mothers properly administered ORS often enough that an impact on health status could be expected.

After only one year, Gambian mothers reported that half the diarrhea cases in the previous two weeks had been treated with the solution. After two years, repeated use had climbed to two-thirds of the sample.

By the Honduras campaign's second year, one-third of all cases were regularly treated. Other evidence suggests that mothers most often treated the children who were most at risk--the youngest and most severely ill.

5. In Honduras, reported diarrheal mortality among children declined substantially, with a corresponding drop in total mortality.

For children between one and five years of age, diarrhea as a cause of death went from 40 percent of all deaths before the campaign to 27 percent after. For children under one, the rate fell from 40 percent to 23 percent--a statistically significant drop.

The pattern of the findings is consistent across both countries and provides strong support for the conclusion that the approach used by the project can be a very effective tool for accomplishing change in rural populations. It also strongly suggests that in the case of oral rehydration, the complex behaviors involved can be taught well enough to have an impact on aggregate health status.

HONDURAS*

The evaluation of the program in Honduras tracked the process of the intevention's effects, as well as measuring the impact of the entire effort. It used a model that stipulates that, in order for a final outcome to be achieved, a series of interim steps must be successfully completed. These steps include determining: that the population had access to the channels of communication used by the campaign, that the messages actually reached the population through those channels, that the content of the messages was learned and retained by the audience, that members of the target audience actually changed their behaviors in response to the campaign, and that the health status of children was improved as a result of these changes in behavior.

PROCESS MODEL

1. Creation of Campaign Components	2. Potential Exposure	3. Actual Exposure	4. Knowledge Change	5. Attitude Change	6. Trial of Behavior	7. Adoption of Behavior	8. Change in Health Status

* From The Mass Media and Health Practices Evaluation in Honduras: A Report of the Major Findings, Stanford University and Applied Communications Technology, August 1985.

The context in which the project took place is typical of many parts of Central America. The area is in South-Central Honduras, with terrain ranging from rolling hills and valleys to steep mountains. It is populated primarily by subsistence farmers, although some parts support large-scale commercial agriculture. Half of the subsistence farmers own land, and their major crops are corn and beans. Communities are small (seldom larger than 1,000 people), and houses are often widely separated from one another. The county seats have service infrastructure (roads, bus service, a health center, and telephone service), but services in the other communities are usually limited to a primary school.

The evaluation design included a number of studies with different methodologies, but relied primarily on large-scale survey data from repeated visits to a panel of mothers of small children. A sample of roughly 750 mothers was selected from 20 communities; these mothers were visited monthly for interviews about various aspects of the campaign. To control for the influence of repeated measurements on the sample mothers' knowledge and behaviors, comparison groups were also measured in additional communities that received all the elements of the campaign but not of the evaluation. The experimental and control samples were structured to yield quasi-equivalent groups of women of child-rearing age that were representative of the full range of differences found in Honduras. Examples of the other study approaches include anthropometric measurement, behavioral observations, community mortality, and health professional interviews.

Access

Access to the channels used by the campaign was high. Radio carried the largest portion of the campaign's messages. On the average, two thirds (67.4 percent) of the families had a radio that worked on any given day. Radio ownership was higher (79.5 percent of families) but radios went in and out of service, usually due to dead batteries. Radio listening peaks in the early morning and at noon, and tapers off fairly abruptly after eight to nine in the evening. An average of 60 percent of mothers listened to the radio on any day. These levels represent strong evidence that access to the population through radio is a feasible strategy.

Access through interpersonal and print channels is also confirmed. Interpersonal contacts with health care workers and traditional healers were measured. In general, families reported about one contact every six months with some type of care worker, with the majority of contacts taking place at fixed facilities. When contacts with traditional sources of care are included, the facility levels accounted for four out of five contacts (80.5 percent). Traditional healers account for the rest. There is clearly enough contact with the health care system for it to function as an instructional channel. Print access is conditioned by literacy. Over half of the mothers in the sample (56.8 percent) can read well by themselves; the household literacy rate is 86.8 percent, so there will almost always be at least someone in a household who can read print materials.

Exposure

Exposure to campaign messages through the different channels is the second link in the chain. Radio coverage with campaign spots or programs was extremely high, as might be expected given the saturation of the airwaves with campaign messages. For mothers actually listening to the radio in a given hour, the odds of hearing a spot were two out of three (66.7 percent). When mothers who were not listening at that time are included, the total population coverage works out to 11.4 percent of the mothers reporting hearing a campaign message each hour from four a.m. to nine p.m. Reaching

roughly ten percent of the population every hour of the day with a campaign message is an extraordinarily high rate of coverage. Over the course of an entire day, nearly three-quarters (73.2 percent) of women who listened to the radio at all during the day reported hearing at least one spot. Even if women who did not listen to the radio were included, coverage was still 43.9 percent of all women hearing a campaign spot every day. Obviously, women who listen to the radio are getting high exposure, and enough women are listening for messages to be very well diffused in the population.

Print media exposure consisted primarily of seeing posters printed for the campaign or the instructional materials in which the salts were usually packaged. When mothers in the experimental group were asked to describe health posters they had seen, an average of over 40 percent could describe a poster thoroughly enough that it could be identified as a campaign poster. Most of the posters were seen during visits to the health center.

Learning

Learning changes resulting from exposure to campaign messages were investigated. The content of some messages was known long enough in advance to permit the collection of baseline information prior to the first broadcasts. In general, these measures show an extremely rapid rise in knowledge within a short time after broadcasts start, with the rate of gain gradually diminishing over time. For those messages which were not identified far enough in advance to permit the gathering of pre-broadcast baseline information, the learning curves show a truncated version of the general pattern. These variables show a pattern of starting at a moderately high level and gradually rising to a still higher plateau. A separate analysis of the effect of withdrawal of some messages (as in the seasonal phasing of message content) shows clear evidence of "forgetting" of information at a slow rate, beginning as soon as the messages are discontinued. It appears that the relationship between exposure and learning is consistent and stable across item types and content areas. It follows a pattern of extremely rapid initial rise, followed by a slow arrival at a high plateau. A gradual decline in knowledge level about specific topics begins as soon as messages on that topic are stopped, but reintroduction of those messages recovers the lost ground very quickly.

Two examples of measurement of learning in major areas are knowledge about LITROSOL and knowledge about breastfeeding. LITROSOL awareness was not measured prior to the broadcasts because it had never existed before. Within six months after broadcasts began, however, half the mothers (49.5 percent) could name it as the medicine being promoted. By the end of the period, this figure seemed to have leveled off at about three-fourths of all mothers able to remember the name of the medicine. A composite index of breastfeeding knowledge rose from 9.2 percent before any significant broadcasting about breastfeeding began to 41.1 percent at the end of the project. An index of the ability of mothers to complete the jingles used in the campaign, which was obviously zero before the campaign, had jumped to 50.5 percent within six months and continued to rise to 56.0 percent by the end of the study period.

Thus the evidence is clear that a great deal of learning of the specific content of campaign messages took place. The pattern of acquisition and retention of the knowledge, plus evidence from various control groups, indicates that the measured changes reflect real learning and not merely the effects of repeated measurement of the population.

Behavior Change

Health-related behavior change is the next step in a successful path to summative project impact. The evaluation focused its analysis on three major categories--diarrheal disease and the use of LITROSOL, feeding behaviors, and observation of the preparation and administration of LITROSOL. Prevalence of diarrhea was high and showed seasonal fluctuations. Point prevalence among children five years or less in age averaged 14.3 percent in the rainy season and 9.9 percent in the dry season. The distribution of cases by age shows the expected concentration of cases among younger children with a peak roughly between 12 and 24 months. There is a slight tendency for male children to be reported sick more than females--males accounted for 55 percent of the total reported episodes.

LITROSOL use was measured both as a percentage of mothers who had ever tried it and as a percentage of episodes being treated. Within six months of the start of broadcasting, over a third of the mothers (36.7 percent) said they had tried LITROSOL. This percentage rose to 62.4 percent by the end of the intensive campaign. This is a very high level of trial usage by any standards. When calculated as a percentage of episodes occurring in the two weeks prior to the interview (the most reliable reporting period used) the proportion of episodes treated rose from none before the start of the project to a maximum of 35.7 percent, with an average of roughly 20 percent of episodes over the final 18 months of the campaign. For cases recalled from the last six months, mothers reported much higher usage rates, averaging 45 percent of episodes over the final 18 months of the campaign. The most likely interpretation of this discrepancy is that mothers tend to forget milder cases and hence unconsciously select the more severe episodes in recalling past behavior.

Younger children are more likely to be treated than older ones (33.6 percent of episodes in children under 12 months are treated, while only 23 percent of episodes for children older than 48 months receive LITROSOL). There are no consistent differences in treatment probability by sex. One municipio (Yuscaran) is consistently better than the rest, and cases occurring in villages are much more likely to be treated than those occurring in the county seats, but there is no clear explanation for the difference. More serious cases are more likely to be treated, but no single indicator of severity is a consistent predictor of high treatment probability.

Mothers received their LITROSOL from a variety of sources. Although the distribution of particular sources changed over time, sources in the community accounted for over half of the distribution, with clinics accounting for most of the rest. The single most useful source of information for learning about how to mix and administer LITROSOL was the packet itself, which came in an envelope printed with instructions. However, interpersonal instruction (from health care workers) and the radio were also significant information sources. Mothers who had used LITROSOL reported correct mixing behaviors in using a liter of water and using the whole packet of salts over 90 percent of the time. However, they did much less well at behaviors such as throwing away unused liquid after one day (an average of 36 percent) and knowing to seek help if after three days of LITROSOL use the child has not improved (an average of ten percent).

Use of other medicines concurrently with LITROSOL was common--an average of 43 percent of LITROSOL-treated cases were also treated with other medicines. About 20 percent of all episodes were taken to the clinic for treatment. Slightly over ten percent of cases were seen by village health workers. Both these numbers remained stable over time. Reported treatment by sobadoras or traditional healers averages

four percent of episodes, but fluctuated more over time. The relationship between LITROSOL use and seeking care from those sources for diarrhea episodes occurring in the last two weeks and in the last six months was tested for significance; clinic contact was significantly more likely to result in LITROSOL treatment in eight out of twelve comparisons, while village health worker contact was significantly related to LITROSOL treatment in ten out of twelve comparisons. Village health workers clearly played an important role in providing LITROSOL, probably because they were easily available and because they had few available responses other than offering LITROSOL. Clinics were also important sources, but they may have made more flexible responses than village health workers. Interestingly, use of traditional health care sources had no effect on the likelihood of LITROSOL use--people who sought help from healers were just as likely to use LITROSOL as those who did not.

Feeding behaviors, particularly breastfeeding and feeding during episodes of diarrhea were also targets of the campaign. Breastfeeding is high in rural Honduras and appears to have been increased by the campaign. Early in the intervention, 65 percent of children under 18 months were breastfeeding; by the end of the campaign, the number had risen to 81 percent of children under 18 months. Similarly, bottle-feeding of the young children dropped from 64 percent to 50 percent over the same time period. Virtually all mothers who were breastfeeding or bottle-feeding reported that they continued to do so during episodes of diarrhea. There was a slight rise in the giving of other liquids during episodes, and the rise was slightly sharper for younger children than for older ones.

An observational study was conducted for a small number of mothers to measure treatment behaviors directly. The mothers were selected when they brought their children to clinics complaining of diarrhea and observed afterwards in their homes. A total of 50 percent of these cases were treated with LITROSOL, either before coming to the clinic or during the observation period at home. Mothers who did treat during the observation period gave LITROSOL at a rate that would, if sustained, result in the consumption of a liter in 10 to 15 hours. Mothers were tested on their mixing skills after the observation period and performed quite well. Some mothers' mixtures would have been extremely over-concentrated, although the mean values for the group were generally very good. The average mixing volume was between 900 and 1,000 cubic centimeters, even though only one in five had a bottle of exactly a liter volume. They used all the salts (94 percent) and surprisingly, used boiled water (97 percent) even though the instructions did not require it. Thus, mothers were observed to mix accurately and to administer in amounts that would be clinically effective, if they gave LITROSOL at all.

Health Status Change

Health status change is the ultimate objective of the campaign effort. Health status is measured with a variety of anthropometric measurements as well as mortality rates. There is evidence that the overall nutritional and growth status declined during the campaign period. Stunting went from 27.8 percent to 33.4 percent for boys and from 31.1 percent to 38.3 percent for girls. The percent "normal" under the Gomez categories fell from 43.4 percent to 36.7 percent for boys and from 40.9 percent to 33.3 percent for girls. However, wasting was essentially zero throughout, and there may even have been a slight improvement in arm circumference measures over time. The decline in nutritional or growth status seems to be a secular trend toward increased growth retardation. It is consistent across sex, age, municipio, and type of village. However, there is no evidence

of acute wasting. Further analyses are planned to differentiate the group according to health behaviors to see whether children in families more influenced by the campaign fared better than those in other families.

Mortality data were collected from the official Death Registries kept in the county seats. An analysis of mortality for children less than five, using the cause of death reported by the mother, showed marked declines in deaths involving diarrhea in any way. In the two years prior to the campaign, death of children under five involved diarrhea in 39.8 percent of the cases. In the two years after the start of the campaign, deaths involving diarrhea fell to 24.4 percent of all mortality. Total mortality dropped, although by a slightly smaller amount. Virtually identical reductions in the percentages of cases involving diarrhea before and after the campaign are found when the analysis is restricted to children less than two years and to children less than one year, but the drop in total mortality is smaller. There may be several contributing factors to these reductions in reported diarrheal mortality, but it does appear that there has been a reduction in diarrheal deaths that could be attributed to the oral rehydration intervention.

In sum, the evaluation has found that the campaign environment and impacts were as follows:

- there was good access to all the communication channels used by the campaign;
- the target audience was heavily exposed to campaign messages through those channels;
- the exposure resulted in learning gains across virtually all the topics covered in campaign messages;
- the audience adopted the promoted behaviors at high rates and sustained the behavior changes over time at high enough rates and with sufficient accuracy that an impact on health status could be expected;
- the nutritional status of children worsened over time in ways that suggest a secular trend related to Honduras' difficult economic situation; and
- mortality involving diarrhea has declined sharply, with a corresponding, though smaller, drop in total mortality.

The pattern of the findings is consistent and provides strong support for the conclusion that the approach used by the campaign can be a very effective tool for accomplishing change in health behaviors in rural populations. It also suggests strongly that when the behavioral change being advocated is adoption of home-based oral rehydration therapy, the complex behaviors involved can be taught to a sufficient degree of accuracy, that impact on aggregate health status can be detected.

THE GAMBIA*

The evaluation of the project in The Gambia found that the introduction of the oral rehydration solution (ORS) was successul. More than half of all episodes of diarrhea were being treated with the water/sugar/salt solution during the second year of the campaign. Knowledge of how to mix it correctly was high; more than 70 percent of all mothers knew the exact formula. Other behaviors were also changed by the campaign. Feeding of children during and after episodes of diarrhea improved, and personal hygiene and household sanitation improved.

The evaluation tracked the process of the intervention's effect during its two years of effort and measured as well the overall impact at the end. It used a model of the program effects that was used in Honduras (see above).

The context within which the project operated is representative of many characteristics of West Africa. The climate has clear-cut rainy and dry seasons, and the nature of the diarrheal disease problem changes with the seasons. People live in compounds with extended families. Their houses are usually mud or mud-brick with earthen floors. Cooking is done over an open fire. Very few rural communities have electricity. The population is culturally and linguistically diverse. The need to limit the number of languages for broadcast mandated the use of the local trade languages Wolof and Mandinka. The fundamental heterogeneity of concepts and practices posed special difficulties for mass media-based projects. Planning research is all the more important in the face of such variabilities. The media environment is simple, however, because the single central government radio station, Radio Gambia, has little competition, and the general environment is not saturated with broadcast or print messages.

In this context, the project designed and carried out an innovative campaign integrating use of radio, print, and interpersonal channels. The design built on a four-month development investigation, using the information acquired there to develop training for health workers, messages directed at mothers, and other activities. Message content was synchronized to seasons to ensure its appropriateness for the most salient current problems. Village volunteers were trained, and a national contest, the "Happy Baby Lottery" was devised to enhance the distribution of and attention paid to a pictorial instruction sheet, the "Mixing Flyer." The different media channels were carefully developed to play complementary roles in the project.

The evaluation design included a number of different studies with different methodologies, but relied primarily on large-scale survey data from repeated visits to a panel of mothers of small children. A sample of roughly 1,000 mothers was selected from 20 communities; about 800 of these mothers were visited monthly for interviews about various aspects of the campaign. To control for the influence on the sample mothers' knowledge and behaviors of repeated measurements, comparison groups were also measured in an additional eight communities that received all the elements of the campaign but not of the evaluation. The experimental and control samples were structured to yield quasi-equivalent groups of women of child-rearing age that were representative of the full range of differences found in The Gambia. Examples of the other study approaches include anthropometric measurement, behavioral observations, community mortality, and interviews of health professionals.

* The Mass Media and Health Practices Evaluation in The Gambia: A Report of the Major Findings, Stanford University and Applied Communications Technology, August 1985.

Access

Access to the channels used by the campaign was very good. Radio reception was clear in the measurement areas (one division was excluded from the very beginning because of unreliable radio coverage). People live in compounds that may contain more than one family, and they often listened to radios that belonged to other people in the compound. Interviewers asked women to exhibit a radio which was working if they could, and 60.5 percent of the mothers succeeded. A total of 67 percent of the women reported that they listened to the radio either daily or several times a week, with the heaviest listening taking place in the evening.

Access through interpersonal channels was also high. The health care system in The Gambia penetrates into the rural areas fairly well, and the small size of the country means the distances to service points are less daunting. Nonetheless, only 15 percent of mothers in the sample lived in communities that had full time health care facilities, and an additional 35 percent lived in places that were served by traveling teams of health workers. Three-quarters of the villages in the sample were served by a "red flag volunteer," a local mother who received special training from the project in oral rehydration therapy (ORT) and served as a local training resource.

Print channels were objects of special emphasis in the evaluation. Mothers' literacy was very low (2.9 percent), although a third of the compounds at the time of the interview had someone in them who could read. Printed materials were virtually non-existent in rural homes. Thus print channels had to be utilized in a way that did not depend on the ability to read, or even necessarily on pictorial literacy. A special study on pictorial ability showed that although the majority of mothers could identify simple line drawings, there were limits even to this. These issues were particularly important because flyers distributed during the campaign had to be designed to be used in conjunction with other channels as well, in order to play a major role in disseminating knowledge. The flyers, carefully designed to bypass these limitations, were well understood.

Exposure

Exposure of mothers to the campaign messages is the second link in the chain of events leading to health status impacts. Radio coverage varied over time but was generally quite high. In the first year, when a lottery was used as a part of the program, radio exposure reached high levels. About two-thirds of the women (68.5 percent) eventually reported having heard radio broadcasts about diarrhea. For topic areas of the campaign that were not treated in the Happy Baby Lottery or that were given less emphasis, exposure levels were lower. A maximum of about one-third of the mothers reported that they recalled being exposed to radio messages about feeding.

The lottery, which was held midway into the first year, was associated with high levels of exposure and knowledge change. About half (48.9 percent) of all mothers reported awareness of the lottery when asked about it. When asked to name characteristics of the lottery activity, mothers who had reported awareness were able to describe features of the lottery at high levels. Of mothers who were aware, 94 percent could give at least one detail and 84 percent could give at least two details about the terms of the lottery. The print material associated with the lottery (the mixing flyer) achieved extremely high exposure levels--much higher than for the lottery itself. After the lottery, 79 percent of mothers reported having seen the flyer, and 71.5 percent of all mothers could actually show the interviewer their copy of it. This points out the

importance of having more than one channel of information, since women got the flyer and learned from it even when they did not receive the radio messages about its relationship to a lottery.

Awareness of the presence of a red flag volunteer in town reached a high of 77.8 percent, an indication that there was good exposure to this interpersonal channel. Contact with regular health care personnel was also high. When asked to think back over the three months prior to an interview, 80 percent of the mothers of young children said they had been to a health clinic about the health of their children during that time. Because roughly two-thirds (69 percent) of the women reported that they received advice or instruction during health worker contacts, this level of exposure to health workers implies that health workers have a very important role as transmitters of campaign messages. In fact, for mothers who were aware of the water/sugar/salt solution an average of over 80 percent reported that one of the sources from which they learned about it was health workers.

Learning

Learning of the content of campaign messages was the next area investigated. During the campaign, awareness of and specific knowledge about the water/sugar/salt solutions increased steadily during the first year, when radio messages focused on it. Increases in knowledge leveled off in the second year, when messages focused on feeding and sanitation. The mothers seem to have needed continued high levels of information to maintain learning. Overall awareness of the solution climbed to 90 percent during the campaign.

The largest increase in knowledge was for the mixing proportions to make the solution. At the start of the campaign, only one mother knew how to mix it correctly. By the end, 70 percent of the mothers and all of the health workers knew the correct proportions. Thus, the most important of the educational objectives was achieved at a very high level.

Learning the instruction for correctly administering the solution started out high and remained high. The percentage of mothers who knew to start giving the solution at the first sign of diarrhea fluctuated between 72.8 percent and 93.6 percent, while the percentages knowing to administer it with a cup or spoon ranged from a low of 73.1 percent to a high of 93.7 percent. There is some indication that mothers became confused by some of the radio messages about how long to keep giving the solution. Mothers also showed differing rates of learning for different administration instructions, some of which were learned after the lottery had ended. Overall, mothers needed time and continued reinforcement to learn about the administration of the sugar/salt solutions.

One major content area of the campaign was teaching about dehydration. Immediately after the broadcast emphasis on signs of dehydration was completed, mothers could name an average of two signs of dehydration. When an additional year had passed with no emphasis on dehydration signs, they could only name an average of 1.2 signs.

The campaign seems to have had no effect in convincing mothers that the sugar/salt solution does not stop diarrhea. This may be because mothers refused to believe that a medicine recommended for diarrhea would not stop it or because diarrhea tends to stop after two or three days anyway.

Health personnel also learned from the campaign. They received interpersonal training and printed materials, but they too also seemed to have benefited from radio broadcasts. Learning of the material covered in the broadcasts was higher than learning about treatment of different levels of dehydration (only covered in the manual and workshops).

During the campaign, increases in correct knowledge were seen for continuing to breastfeed during episodes of diarrhea and feeding of additional solid foods after diarrhea. The high levels of knowledge were maintained after radio messages decreased. The campaign was not successful in teaching mothers that solid foods should be given during diarrhea. A majority of mothers also did not learn that solid foods give more "power" than paps. These two beliefs seem related and may be part of mothers' traditional beliefs about the treatment of sick children.

A separate study examined the relationship between exposure to Radio Gambia and knowledge about the sugar/salt solution after removing the influence that other factors might have on the relationship. The analysis found that: mothers with high radio exposure were significantly more likely to know something about the sugar/salt solution than mothers with low radio exposure; mothers with interpersonal sources of information (health worker, red flag volunteer, or other mothers in the compound) were more likely to know about the sugar/salt solution than mothers without such contact but, for mothers with low interpersonal contact, frequent listening to the radio could teach them about the sugar/salt solution.

Behavior Change

Health-related behavior change is the next step in a successful path to summative project impact. The evaluation focused its analysis on three major topics: behaviors related to feeding, behaviors related to treatment of diarrheal episodes, and direct observation of the process of treatment. By far the greatest emphasis in the campaign was on the promotion of the home treatment of diarrhea with the sugar/salt solution, and it was in this area that the largest changes were seen. The proportion of cases that were treated with the solution rose from 3.6 percent in the first measurement period to 49.4 percent in the twelfth. Thus, its use as a home treatment achieved a very high level of adoption within two years. Among the effects of this change were that the percentage of cases being treated at health centers dropped from 80.6 percent to 59.2 percent. This represents a savings for the mothers in the time and cost of visiting the clinic and for the Ministry of Health in terms of demand on health facilities.

Not only was the proportion of cases treated at home rising because of the adoption of the sugar/salt solution, but this treatment was displacing virtually all other home treatments. If one restricts the analysis to those treatments chosen for cases treated at home, the sugar/salt solution rose from 21.7 percent in the first measurement period to 94.1 percent in the twelfth. Because many of the previously used home treatments were either ineffective or possibly harmful, the displacement effect represents a significant improvement in the "quality of care" beyond the simple rise in percent of cases treated with sugar and salt.

Virtually all mothers in our sample reported that they breastfed their infants. The percentage of mothers breastfeeding their youngest child fluctuated over time but never fell below 87.9 percent. The percentage of mothers who gave only a bottle to their youngest child ranged from 0.7 percent to 9.1 percent.

The only real room for improvement in breastfeeding was change in such aspects as breastfeeding during diarrhea and weaning behaviors. The campaign promoted a better diet for children during and after diarrhea. Breastfeeding continued during a bout of diarrhea for 85 percent or more of the mothers. The innapropriate practice of stopping other feeding during diarrhea fell from 31.5 percent to 3.4 percent, and the giving of solid foods rose from 13.6 to 44.6 percent. The giving of special additional food after diarrhea hovered around two-thirds of the cases, rising briefly to a high of 91 percent after a particular campaign emphasis on it, but falling back to its previous range shortly after the messages were withdrawn. Ages at the beginning and end of the weaning process differed considerably across measurement periods; the changes appear unsystematic, but may be related to season, a drought in 1983, or economic conditions.

A number of additional analyses about the use of the sugar and salt solution were carried out. Treatment probability appeared to be only very weakly related to age--the changes over time in proportion of cases treated with the solution by age were consistent across all age groups. There may have been a slight tendency for the oldest children to be treated less frequently in the second year of the campaign.

The relationship between completeness of knowledge and use of the sugar/salt solution was also investigated. The mixing and administration behaviors are complex, but, in the aggregate, they were well learned. However, treatment with sugar/salt solution must be accurately done in order to be clinically effective and risk free. At the time of the first measures, some home treatment with the solution was being done, because of previous Medical and Health Department efforts. However, none of the women using it at that time knew the proper formula, defined here using the strict criterion of a perfect score on all the mixing questions. By April of 1983, 49.4 percent of all episodes were being treated, and 41.0 percent of all episodes were being treated by women who had perfect scores on the mixing questions. Thus, 83 percent of the treated cases received the sugar/salt solution from mothers who knew exactly how to mix it. This finding provides reassurance that the success of the campaign is likely to have a positive clinical impact.

A separate observational study was also conducted in order to provide a comparison to the self-reported data of the surveys. The observational study provides strong support for the validity of the basic findings from the survey research: the proportion of cases being treated was high and correctly mixed water/sugar/salt solutions were being used.

Fieldworkers carried out direct observation of the morbidity and treatment characteristics of 39 cases of children ill with diarrhea. The children in the study all had acute diarrhea. The diarrheal episodes had lasted an average of 3.3 days when the observer arrived, and the children had bowel movements an average of once every hour-and-a-half during the observation period and vomited an average of once every two hours.

The observed feeding practices support the validity of the self-reported levels. Pap was given to 87 percent of the children, 74 percent were breastfed (an unknown number were already weaned), and 64 percent were given solid foods. A total of 67 percent of the observed children were treated with sugar/salt solution. The treatment was already going on when the fieldworker arrived for 28 percent of the cases, and in the remaining 38 percent of cases that received sugar/salt solution, the treatment was begun after the fieldworker arrived. For cases that began treatment after the fieldworker arrived, it was possible to observe the mothers' mixing behaviors. All of the mothers got the formula and mixing process exactly right, which is slightly better than the analysis of

self-reported levels. All sugar/salt solution administration was done by cup or spoon. Concurrent treatment with other home remedies was much higher than mothers self-reported--herbal teas and pills were the other main home treatments, but sugar/salt solution was still given about two-and-a-half times as often as the next most frequent treatment. Cases that were more severe were significantly more likely to receive larger amounts of sugar/salt solution and more frequent feedings.

Change in Health Status

Change in health status was the long term objective of the intervention. The analysis of morbidity data on prevalence revealed strong seasonal influences along with marked variation in levels from year to year. Point prevalence estimates ranged from a low of 0.8 percent to a high of 9.0 percent; two week prevalence ranged from 10.4 percent to 33.7 percent. By any standards, these are high rates. Rainy seasons showed higher prevalence rates and longer lasting episodes; dry season cases had a slightly higher tendency to be associated with reduced urine output and dry eyes, both signs of dehydration. Younger children had higher rates of disease, with weaning age showing the peak rates. However, the characteristics of the cases of old and young children, given that they had diarrhea, did not differ by age.

Estimates for historical rates of infant mortality were derived from pregnancy history data after attempts to elicit concurrent measures by surveying communities were thwarted by community resistance. The causes of death reported by mothers for their children of all ages had diarrhea in second place, or the cause of a quarter of all deaths. The pregnancy history yielded a historical estimate of infant mortality of 153.7 per thousand. This estimate is very high in an absolute sense, but it may be too low because of poor recall or reluctance by mothers to give the information.

Extensive anthropometric measurement of sample children was carried out. Gambian children, when compared to National Center of Health Statistics standards, were one to one-and-a-half standard deviations low in height. Their age-specific weight for height values fell from nearly normal to about one standard deviation below normal over the course of the two-year intervention. The measures of stunting were essentially constant over time, while prevalence of wasting tripled. Measures of skinfold thickness and arm circumference and calculated values for arm muscle area and arm fat area all showed consistent trends--that children became considerably leaner and more wasted. This is assumed to reflect effects of the drought and economic crisis, rather than an impact of the intervention.

To summarize, the evaluation found that the campaign had the following impacts:

- There was good access to all the communication channels used by the campaign.
- The target audience was heavily exposed to campaign messages through those channels.
- The exposure resulted in learning gains across virtually all the topics covered in campaign messages.
- The audience adopted the promoted behaviors at high rates and sustained the behavior changes over time at high enough rates and with sufficient accuracy that an impact on health status could be expected.

- The nutritional status of children worsened over time in relation to the drought and worsening economic situation.

The pattern of findings is consistent and provides strong support for the conclusion that the approach used by the campaign can be a very effective tool for accomplishing change in health behaviors in rural populations. It also suggests strongly that when the behavioral change being advocated is adoption of home-based oral rehydration therapy, the complex behaviors involved can be taught to a sufficient degree of accuracy that an impact can be expected on aggregate health status.

3. EXPANDING TO MEET NEW NEEDS

Early indicators of success from Honduras and The Gambia led to further expansion of the approach to new health topics and new country settings. This section describes briefly how the approach has been tried initially in areas such as immunization, breastfeeding, tuberculosis and malaria control, and family planning.

HONDURAS

Expansion

After two years of broadcasting, the Ministry of Health expanded the diarrhea disease control program nationwide and included three other health topics each year. The diarrhea program was designed to maintain and expand the considerable gains in consumer awareness and use developed under the original program, but tuberculosis, malaria, family planning, immunization, and rabies were also included. In each case, a similar methodology was used. Radio, print materials, and health provider training were coordinated to produce a single integrated educational strategy around a few selected health messages following the HEALTHCOM model described above.

The **immunization campaign** stressed the importance of completing the doses of DPT and polio vaccine and taught mothers the importance of returning for the measles vaccination between the ninth and twelfth months. A new immunization card with drawings depicting the number and place of each vaccine was designed when research identified that most mothers could not read the complicated MOH card and did not know when their children had completed the immunization schedule. Immunization coverage for the third dosage of DPT and polio increased from roughly 50 percent to approximately 78 percent.

The **tuberculosis campaign** focused on case identification and completion of treatment. A brightly colored sputum sample cup, which graphically depicts the steps necessary for obtaining a useful sample, was developed when research identified that most clinic staff said lack of good sputum samples was a major constraint of the program. Radio spots motivated rural people to come to clinics for treatment and taught that tuberculosis is not contagious when a patient is in treatment. These spots were instrumental in overcoming the identified constraint that patients with tuberculosis were isolated from their communities and family members because they were believed to be unclean. A flipchart was developed to assist the clinic staff in their work with families and communities to develop support for the tuberculosis patient's completion of treatment. Demand for newly design sputum collection cups for tuberculosis examination increased significantly.

The **malaria program** focused on increased village support to malaria spraying teams and correct use of malaria treatment. Radio programs taught families when to expect the spraying teams, thereby creating better coordination between service delivery and the community. Spraying teams were taught how to use a simple flyer to teach families how to maximize the malaria spray. The flyer was then left with the families as a timely reminder of principal malaria-control messages. Radio spots also taught when and how to take the malaria treatment when formative research indicated that one of the primary constraints to consumer compliance was side effects which could be alleviated by simple practices such as eating before taking the medication. Fewer village families were washing away insecticide after malaria spraying team visits. Malaria spraying teams reported greater public support for their activities, and demand for blood sampling and prophylaxis malaria medication increased in the malaria areas.

The **family planning program** was the first attempt by the MOH to address this problem and demonstrated the confidence in the methodology and the Division of Education which had developed it. In keeping with the traditional mores of the Honduran rural areas, the program focused on the importance of child spacing for a more healthy family. Radio spots, complemented by attractive posters, developed the theme that responsible parents have only the children that they can care for. Additional spots addressed the importance of child spacing on the mother's health and the health and economy of the family. This overall "enabling" campaign promoted an attitude of acceptance within the target population, while the MOH focused on developing their first family planning policy and training health center staff in the use of family planning methods. The MOH is now developing new materials that will motivate families to seek help at clinic facilities and teach specifically about each contraceptive method.

A separate expansion of the program in four regions of the country focused on **water and sanitation-related behaviors** in support of a large-scale investment in new water and latrine systems. This effort included a community action component as contrasted with a focus on individual or family health behaviors in the previous programs.

SWAZILAND

Infant mortality in Swaziland is 133 per 1,000. The principal causes of infant mortality are upper respiratory diseases and infant diarrhea.

The Academy for Educational Development through the HEALTHCOM project provided 16 person-months of long-term assistance between March 1984 and August 1985, plus three person-months of short-term assistance. Summative evaluation was done through a subcontract with the Annenberg School of Communications. The AID-funded Combatting Childhood Communicable Diseases (CCCD) provided operational funds for training, formative research, and print and radio materials production.

The Swaziland project started in April 1984 focusing initially on diarrheal disease control with a target population of 651,000. Broadcasting began in October 1984.

By March 1984 Swaziland had already made a considerable investment, funded largely by the local USAID Mission, in a national program of rural waterborne disease control. Extensive village research had been completed on traditional beliefs regarding diarrhea and its treatment. The project was asked to provide a long-term advisor for up to 12 months to assist the government in developing a systematic communication approach based on lessons learned from The Gambian and Honduran programs. The intervention in Swaziland also has been significantly strengthened through collaboration with the AID-funded Combatting Childhood Communicable Diseases project. CCCD has provided technical guidance to the new MOH Communicable Disease Control (CDC) Division, as well as operational funds for the public health communications activities. The project has provided a resident technical advisor to work with the CDC Division, Health Education Unit (HEU) staff, and the Government radio station, Swaziland Broadcasting System (SBS), to develop the educational program.

Intervention

Swaziland furnishes WHO-formula packets only in fixed health facilities and promotes the use of a homemade sugar and salt solution to prevent dehydration at the homestead level. A standardized homemade formula was developed and popularized, along with infant feeding and childcare advice. Special attention was given to diagnosis of dehydration, mixing, and administration of the homemade solution, along with specialized recovery behaviors and additional feeding of infants. Prevention behaviors include hand washing, homestead clean up, and protection of springs and wells.

Project staff initially reviewed the substantial amount of existing research on beliefs and practices related to diarrhea. Five areas of additional information were identified: (1) radio listenership patterns, (2) ORT distribution systems and clinic practices, (3) local foods and home-based treatments, (4) possible potassium depletion due to extensive purging, and (5) sodium-level analysis of the current government sugar/salt mixture.

Results of these studies showed that potassium depletion was a problem and the message strategy was changed to encourage mothers to bring children to clinics after the first, rather than the second, day of the episode. Specific potassium-rich foods also were included in the infant feeding advice. Analysis of sodium levels showed dangerously high levels in some cases and the home-mix formula was changed to reduce the volume of salt recommended. Rural listenership patterns were identified and used in scheduling the radio broadcasts.

A cadre of "yellow flag" volunteers were trained at the village level in addition to clinic-based MOH staff to expand the face-to-face support available to rural villagers. Training focused on acquiring new skills in diarrhea management and in teaching ORT skills to rural mothers. A colorful mixing flyer and a "Diet for Diarrhea" poster were developed and distributed. Radio programs taught mothers how to use the flyer as a reminder of the new sugar/salt formula.

Special attention was given to orienting and involving the country's traditional healers. Ethnographic research demonstrated that traditional healers were numerous, dispersed throughout the country, and the first source of treatment outside of the home for most rural mothers. Although the Ministry was hesitant to legitimize personnel and treatments they could not control, they decided to attempt a pilot experiment incorporating traditional healers into the diarrheal disease control program.

Radio programs were produced during a seven-week workshop which not only trained representatives from several ministries in how to use radio to teach specific skills but also produced some 66 programs for future broadcast. Close cooperation developed between the Swaziland Broadcasting System and the Ministry of Health, reflecting the important role that SBS plays in the educational outreach of the country. Print materials included 1,000 Health Workers' Manuals, 3,000 yellow flags, 200,000 mixing flyers, a "Diet for Diarrhea" poster, and a "Diarrhea Management" poster for health centers.

Early in 1985, after reviewing the success of the first year public health communications activities, the MOH decided to apply the HEALTHCOM methodology to support their immunization program and requested that the project advisor remain an additional six months to assist in the design and start-up of that program. Pre-program research has been conducted with clinic staff and rural women on beliefs and practices concerning immunizations. This research, complemented by the Annenberg School of

Communications evaluation discussed below, will serve as the basis for the second year implementation plan supporting both immunizations and the CDD programs.

Impact

An evaluation of the impact of the public health communications activities in Swaziland was conducted by the University of Pennsylvania's Annenberg School of Communications. The evaluation focused not only on changes in knowledge and attitudes, but also on a behavioral study of those mothers claiming to have used the new sugar/salt solution. A health status measure of clinic patients was also carried out.

After the first six months of the campaign, more than one in five rural women had learned and could repeat the correct formula. Although acceptance of feeding during diarrhea was little affected by the campaign, the perceived need for after-diarrhea feeding was substantially affected by the campaign (16 percent before versus 44 percent afterwards). Among those women who reported that they currently or within the past month had a child with diarrhea, 45 percent of the women said they had treated the child at home with the sugar/salt solution before the campaign. After the campaign, 57 percent reported doing so. Only 16 percent used the solution and knew the correct formula before the campaign, but 32 percent used it and knew the correct formula after the campaign. Of the children coming to clinics at the start of the campaign, about 43 percent had been treated with oral rehydration therapy before coming to the clinic. By the third month, 60 percent of the children had been treated with the homemade solution--a level sustained over the remainder of the campaign.

Institutionalization

The Government of Swaziland has been sufficiently impressed with the use of this communications strategy to approve a full-scale program of development communication across all major ministries--agriculture, health, and education. USAID is supporting the government's initiative to open a new broadcast channel and will be providing technical assistance to train Swazi broadcasters for a new development communications center being created by the government. One of the primary goals of this center is the application of the HEALTHCOM methodology throughout governmental programs.

The link between the two activities will partially be made this fall through an AID-supported Public Communications Workshop for members of the new Development Communications Center Policy Board. This policy board is made up of representatives of the various ministries who will be working with the center. The workshop will provide a forum for the MOH to present the diarrheal disease control and immunization public health communications activities and the Annenberg School of Communications to present the evaluation data formally. The policy board will then identify steps to further institutionalize systematic public health communications in Swaziland.

ECUADOR

Infant mortality in Ecuador is 74 per 1,000. Diarrheal disease causes 21 percent of these infants to die. The principal other causes of death are upper respiratory infections and immunizable diseases.

Ecuador has had an active diarrheal disease control program since 1977. By 1983, considerable progress had been made in terms of physician training and the establishment

of norms, but utilization rates for oral rehydration therapy were disappointingly low and physician and health worker resistance in the provinces continued to be quite high.

A full-time HEALTHCOM advisor began working with the Ministry of Health in July 1983. The objective was to develop a successful home-based distribution and utilization system in three provinces of the country. These areas are characteristic of the three primary cultural divisions of the country--Indian, Ladino, and coastal.

The Academy for Educational Development provided 24 person-months of long-term assistance plus one person-month of short-term advisory assistance from July 1983 to December 1985 and the USAID Mission provided funding for materials, formative research, training, and other activities. The project began in July of 1983 and focussed on diarrheal disease control. Broadcasting began in November 1983. A new expansion of this program includes immunizations, growth monitoring, and breastfeeding as well as diarrheal diseases. From an original target population of 100,000 in three provinces, the program now reaches eight million people nationwide.

Intervention

The program was coordinated by the MOH's Division of Health Education which, like the Honduras program, contracted radio and printing companies to produce and broadcast materials. Unlike the Honduran effort, however, the program also was coordinated with and implemented through the Ecuadorian Integrated Rural Development project (IRD) and reflects the emphasis of integrated development and community participation throughout the program design and implementation. The HEALTHCOM Field Director worked with representatives of the Ministries of Education and Agriculture, Department of Cooperatives, and other nongovernmental organizations, as well as with the Ministry of Health in developing the program. Rural communities participated in the development of graphic materials, as well as in program design, through a formative research and program monitoring model similar to that used in Honduras and The Gambia projects.

The existing Ministry of Health program promoted a standard one liter UNICEF ORS sachet distributed free through existing health posts. The pilot project expanded this distribution network to include rural village volunteers, frequently IRD community leaders, to provide coverage throughout the three provinces. A principal constraint of the program uncovered in pre-program research was the lack of a liter measure in most rural areas. A novel and inexpensive plastic bag, which serves as an instructional guide, a liter measuring volume, and a package for the two ORS packets given to each mother was developed to overcome this constraint. Health workers and village volunteers were taught to use the bag as a reference to the principal mixing and administration instructions as well as a means to correctly measure the liter of water necessary to mix the individual sachets.

Key education messages include recognition of the signs of dehydration, recognition of the product's new name **Suero-Oral**, knowledge of where Suero-Oral is available, understanding that Suero-Oral is for dehydration, correct preparation and administration, including how to use the plastic bag as a measuring tool, continued feeding during bouts of diarrhea, and when to seek help at fixed facilities. These treatment behaviors were supplemented with preventive behaviors, including breastfeeding, boiling drinking water for children, personal hygiene, and protective covering of selected foods.

A distinctive metal logotype sign was developed and used as a means to identify where Suero-Oral would be available. Some 60,000 plastic bags were produced and

distributed to more than 4,000 community leaders. A brightly colored cloth flipchart was developed as an instructional aid to health workers, and a training flyer was created as a reminder to village health workers of the ten essential points in using ORT and teaching these skills to mothers. Radio spots and programs emphasizing and reinforcing principal behaviors were broadcast on an intensive schedule in each of the regions. Both the broadcast and graphic materials were carefully developed to reflect the culture, beliefs, language, vocabulary, and music of the distinct audience segments.

The training program for health workers was carefully tested with physicians, nurses, auxiliary nurses, and village volunteers. The resulting scheme emphasizes practical mixing trials and practice sessions on teaching mothers how to use Suero-Oral. Group dynamics techniques combined with sociodramas enabled providers to practice new skills in teaching the correct use of ORT using the new educational aids--flipchart, flyer, and plastic bag.

Impact

A Ministry of Health-conducted evaluation indicates that after 12 months of broadcasting, 93 percent of the mothers knew of the new Suero-Oral product and 30 percent reported using Suero-Oral to treat their child's last episode of diarrhea. In observation trials, some 80 percent of the mothers tested could properly measure and mix ORS packets using the new plastic mixing bag. In complementary in-depth interviews, these mothers could list all of the steps for correct compliance of the ORT behaviors. Only seven percent responded that children should not be fed during bouts of diarrhea, a dramatic shift from early studies which showed marked fasting during bouts.

Institutionalization

Ecuador has designed a new expansion of the diarrheal disease control program which includes immunization, breastfeeding, and growth monitoring as part of a national program of child survival. This pilot region experience form the basis not only for the CDD program but also for the communication strategy planned for the entire program.

The Ecuador Child Survival Program began in 1985 with major assistance from USAID, UNICEF, and PAHO. It is to be a three-to-five year effort with annual phases linking and integrating the four themes in a single attack on child mortality. The Academy has been actively involved in orienting and obtaining support from decision-makers such as the First Lady of Ecuador and is working with the newly established National Child Survival Coordinating Committee, representatives of the Ministry of Health, the Social Welfare Department, the Catholic Church, non-governmental organizations, and the military, to plan a coordinated delivery system for the new child survival program. Community-level research on immunization is being performed to compliment the diarrheal disease control research for the design of the promotion strategy. An advertising agency is being contracted to design the promotional strategy, with technical guidance provided by the Academy.

Ten national ministries and Government agencies in Ecuador, working together to mount a massive nation-wide campaign on immunization and diarrheal disease control, inaugurated the Ecuador Child Survival Program on Saturday, October 26. Supported by USAID, UNICEF, and WHO, the program began with two intensive days of immunization services. As part of the program, some 3,500 immunization posts were set up throughout the country. Approximately 133,000 fifth and sixth grade school children visited homes in their areas and delivered a personal, printed invitation from the First Lady of Ecuador to all of Ecuador's mothers to have their child immunized on that day. School children

also distributed an educational flyer on immunization which answers mothers' primary questions. A new immunization card was distributed and immunization workers wore a special identifying apron with the program logo. The military provided transportation assistance to move vaccines throughout the country. The church, civil defense, and social security systems cooperated in this program.

PERU

Infant mortality in Peru is 99 per 1,000. The principal causes of infant mortality are upper respiratory diseases, diarrhea, and immunizable diseases.

In 1983, the Minister of Health approached the USAID mission for assistance in creating a National Health Literacy Campaign. Initial discussions with the Minister and his staff reduced the original 14-theme campaign to a three-theme program emphasizing diarrheal disease control, immunizations, and family planning with a target population of 20 million. Significant private sector resources, furnished through a Peruvian commercial agency, were used to assist the Ministry of Health. The agency conducted consumer research, developed a message strategy and materials, placed broadcast media, and monitored the program's success. USAID agreed to fund the development and implementation of the public health communications activites, and the project provided an advisor to work with both the Ministry and the advertising agency.

The Academy for Educational Development provided eight person-months of technical assistance from December 1983 through December 1985 and summative evaluation through a subcontract with the Annenberg School of Communications. The USAID mission contracted the advertising agency and market research firm and provided funds for materials production and mass media broadcast. The project Field Director/Ecuador has provided periodic technical assistance in Peru since September 1983. Broadcasting began in September 1984.

Intervention

The first step in the intervention was to sponsor a workshop for ministry and advertising professionals to exchange information on disease problems and advertising strategies. This workshop resulted in a detailed three-month research plan, including both qualitative and quantitative data, on the three themes--diarrhea, immunization, and family planning. By May 1984, the research uncovered considerable resistance to family planning by Peruvian males based largely on the fear of increased promiscuity by their wives and a loss in prestige due to accusation of impotency. Six types of audiences for family planning messages emerged ranging from users to resistors. The principal obstacles to immunization which emerged were the lack of adequate immunization services and the fear of side effects. In the area of diarrhea treatment, awareness of a locally produced oral rehydration solution called **Salva-Oral** was low and the government product, produced by the same pharmaceutical company under no brand name, was virtually unknown. Home mixes of sugar and salt were widespread, but formulas were widely divergent and often dangerous.

The advertising agency created an umbrella theme for the health literacy campaign: "Healthy Child Today - Healthy Peru Tommorrow." The campaign attempted to rise above national political differences and political parties in a united attack on infant mortality. The themes were phased during the year to coincide with the diarrhea season and MOH Immunization Weeks; family planning was then emphasized during those months between these targeted seasons. The family planning messages used vocabulary

and concepts abstracted from the audience research to develop a positive confrontation with male views. The immunization campaign motivated mothers to come to the Health Centers during Immunization Week when fixed facilities were better able to meet the demand and taught mothers how to reduce side effects from the vaccinations. Due to vaccine shortages, the immunization campaign was limited to the Lima-Callao area where service could be adequately delivered. The diarrhea program focused on creating more demand for ORS through consumer awareness of when to use ORS and how to monitor a child's progress during bouts of diarrhea. It also emphasized correct preparation and administration of the packets as well as feeding during diarrheal episodes.

Each theme had a broadcast, print, and interpersonal component; the preceding interpersonal training, however, was much weaker than any of the preceding interventions. This situation was due largely to the time pressure of the campaign and to the virtual disarray of the government during the period when the communication program was developed. Frequent national strikes reduced the government's ability to participate fully, and the campaign became largely a well-designed mass communication strategy.

To compensate for the lack of interpersonal training, a more extensive set of graphic materials was developed so that health workers could use them as self-instructional training materials. The "Health Calendar" was printed on a plastic bag, which contains a package of educational materials on all three themes. An instructional mixing bag, similar to that developed in Ecuador, helped to solve the volume measuring problem for ORS and serves as a timely reminder of principal ORT behaviors. A new vaccination card was developed as well as a method-specific flyer on family planning. The "Health Calendar" was designed to be hung in rural homes to serve as a reminder to mothers when their children need health services. Other important health documents, as well as new graphic materials, can also be stored in the bag.

As a result of the relative instability of the formal health system, much reliance was placed on the broadcast media. A series of high-quality television spots were developed on each of the three themes and broadcast over national media. Radio spots, reinforcing the primary television messages, were also broadcast in selected areas of the country.

Impact

Pretesting of the individual materials showed high degrees of recognition and acceptance. In March 1985, the project contracted with The Annenberg School of Communications, University of Pennsylvania, to design a post-campaign evaluation strategy. The resulting evaluation plan includes an analysis of the effects of the family planning and immunization campaign using centrally stored clinic service data, an analysis of the effects of the immunization campaign using independent national nutrition survey data which were collected before and after the campaign, and an analysis at the community level of the relationship between the campaign intensity and family planning and immunization resources. These data will be collected in September 1985 and the analysis presented in March 1986.

Institutionalization

The Peru program was an excellent proving ground for several new concepts. It showed conclusively that government and private sector institutions could cooperate effectively in developing a public health communications program. It also showed that strategies have to be developed to assist governmental and private sector institutions in learning to work effectively together. Second, it demonstrated the potential of television as a medium of choice for public health communications themes, such as diarrhea and family planning, and led to an increased interest in television in subsequent interventions. Peru was one of the first examples where three themes for child survival were linked together in a complex sociocultural environment. Finally, Peru demonstrated the potential of communication strategies to proceed faster than service delivery systems and highlighted the need for strong project management to ensure that communication and service delivery are coordinated. Again, while actual impact data are currently unavailable, the basic feasibility of such an approach has been supported.

Interestingly, project institutionalization was probably highest within the private advertising agency. The agency account executive has reported that this work taught the agency the difference between marketing and social marketing. In particular, it taught the agency how to design a strategy for poorer populations in rural as well as in urban areas, none of which had been principal audiences for the agency before. The experience also taught the agency to include correct usage of the product in the promotion strategy and gave them more respect for the technical expertise and role of the Ministry of Health. This agency is now applying these techniques to other social programs. Peru has a newly elected government which is studying the health literacy campaign. They plan to develop a new Child Survival Program, building on the experience of the project.

4. LESSONS LEARNED

Lesson #1: Coverage, Timeliness, and Credibility - All Three are Necessary.

If the goal is to produce widespread use of ORT in unsupervised settings, then three factors are critical: coverage, timeliness, and credibility.

- Coverage is the ability to reach many people quickly, and it is best achieved through the media. In most countries, this means radio.

- Timeliness, or the availability of specific mixing and administration reminders at the moment they are needed is best accomplished by print and graphic material--specifically a packet label and a one-page graphic flyer.

- Credibility, or the acceptance of ORT by patients, is best achieved through the full support and use of ORT by recognized health professionals in the country--physicians, nurses, and health workers.

Lesson #2: A Plan Must Be Comprehensive. Piecemeal Programs Don't Work.

To bring these three elements together, a comprehensive plan is needed. It must include:

- An adequate supply and distribution system of oral rehydration salts.

- An explicit link between what health providers, radio, and print media tell the public--a single set of simple, noncontradictory messages on:

  -- How to mix ORS.
  -- How to give ORS.
  -- How to know when ORS is not working.

- A training program for health providers which emphasizes how to teach ORT to mothers, as well as how to use ORT in the clinic.

- A radio broadcast scheduled to reach specific audiences.

- A series of simple print reminders of key skills that accompany each packet.

Lesson #3: The Plan Must Be Based on Field Research.

An effective plan must be based on field research of existing audience practices and beliefs. A few key questions that need to be answered in this research are:

- How will mothers mix the solution? What containers are available?

- Where can mothers obtain packets if they cannot get to a health center?

- Whose advice do mothers take about diarrhea?

- What do mothers want a remedy for? The loose stool, appetite loss, weakness? What do they most worry about when a child has diarrhea?

- What are mothers doing now? Purging, giving teas, withholding food, etc? And why do they feel these are appropriate methods?

- What type of print material would be most valued and used? Pictures? Words?

- Why do mothers listen to radio? Who do they trust as radio announcers?

There are many other questions which also need answers, but these key areas will trigger responses critical to developing a sound plan.

Lesson #4: The Plan Must be Corrected as Required—It Must be Flexible.

Monitoring the campaign is essential. Regular visits to villages, watching how ORT is being used or misused, and systematic interviews with health workers and mothers will expose weaknesses impossible to predict otherwise. Once discovered, these mistakes must be corrected and not "argued away." Mistakes are normal, almost inevitable, and they can be corrected if they are admitted.

Lesson #5: Emphasize Simplicity.

The temptation to complicate matters must be avoided. Advice to mothers must be simple—using only a few print materials. Health workers must not be asked to do much more than they are already doing. A few good radio programs should be repeated over and over rather than making dozens of new ones.

5. OBSTACLES TO EFFECTIVE ORT PROGRAM IMPLEMENTATION

Experience during the first year both in Honduras and The Gambia demonstrated clearly that five obstacles to an effective ORT program are particularly important. Below is a list of those obstacles in brief outline form as a possible guide to future program planners.

Inadequate Training/Orientation of Health Care Personnel

- In how to use ORT themselves.
- In how to teach mothers to use ORT in the home.
- In what child care advice to give--i.e. regarding feeding, signs of dehydration, etc.
- In what vocabulary to use with mothers.

Physicians often comment:

- ORT doesn't really work with moderately or severely dehydrated children.
- ORT is too labor intensive--"my nurses don't have time to rehydrate orally."
- Children should not be fed while in rehydration treatment.
- Antibiotics are an essential part of all effective diarrheal treatment.
- Mothers clutter up my rehydration ward--"I don't want lay people administering medical care."
- ORT doesn't seem as professional, as serious a treatment, as intravenous treatment.

Inadequate Supply/Distribution Systems for Packets and other supplies

Inadequate Education of Users

- Told too little--no explanation of dehydration or exact mixing.
- Given wrong advice--told to stop breastfeeding, stop feeding during bouts of diarrhea, give antibiotics, use purges.
- User constraints are often ignored--boiling water, how to measure a liter--how to read instructions, time needed to administer ORS properly.
- Existing beliefs are ignored--purging, fasting, desire to stop diarrhea rather than dehydration.
- Reaches too few people directly--too great a dependence on health workers alone.
- Messages are often contradictory--several different sugar/salt formulas promoted at the same time.

- Messages are often unclear to user--wrong vocabulary is used.

Mothers often ask:

- Can I give my local remedies along with ORS?
- Can I use ORS for adults as well?
- Do I really have to give a whole liter?
- Can I add other ingredients to the ORS?
- What do I do if my baby vomits?
- Is ORS good for all kinds of diarrhea?
- Does ORS cure my baby's diarrhea?

Inadequate Information on Program Performance, particularly on the:

- Distribution system
- Health care providers attitudes and practices
- User attitudes toward ORT
  - difficulties in applying ORT
  - confusions or mistakes in applying ORT

Inadequate Planning

- User education/promotion begins before supplies and training are completed
- Training is done before supplies are ready
- Supplies run out after first four months--resupply is delayed
- Program proceeds without full cooperation of the medical community
- Program proceeds without overall policy
- Program responsibility is shifted from one office to another
- Resources for monitoring (travel and per diem costs) are unavailable

6. ORT: SEVEN KEYS TO EFFECTIVE PLANNING

1. User Profile: **Who Should Benefit?**

Who is most in need?
Where are the greatest targets of opportunity? Who could be reached easiest?
What are the greatest existing constraints and opportunities to using ORT (beliefs, practices, resources)?
Who most influences the health beliefs and practices of the user?

2.. Treatment Approach: **What ORT Regimen Will be Promoted?**

What combination of home-based solutions and prepackaged ORS is optimal in the home and at each level of the health care system?

What ingredients exist in the home? Can packets be effectively delivered? Are packets affordable at every level? What are existing attitudes of health providers?

3. Program Management: **How Will the ORT System be Administered?**

Who is responsible for the various administrative tasks necessary to implement an effective program?

Define Program Objectives/Message Strategy
Packet Production/Distribution
Training: Physicians, Nurses, VHWs
Educational/Promotional Materials: Design/Production
Research and Program Monitoring
Institutional Liaison/Promotion

How will ORS be packaged? How much will be required? If purchased outside the country, what time frame is required? Where will packets be made available locally? How will packets and other supplies be delivered on a regular basis to these distribution points?

How should seasonal variations in diarrheal morbidity influence annual program planning?

4. User Education: **How Will User be Made Aware of ORT?**

How can educational materials and messages maximize existing user beliefs and practices? How can these beliefs be identified and fed into programming decisions?

What is the most effective combination of channels (interpersonal, print, broadcast, traditional) to reach the primary user?

5. Training: **What Training is Required to Ensure Effective Implementation?**

Who will be trained, by whom, for how long, where and in what skills?

6. Cost Planning: **How Will the Program be Financed to Ensure Long-Term Continuity?**

What are current expenditures for diarrheal disease control, and what savings can be expected from structural changes in the approach to control of diarrhea?

What sources of funding now exist (government, international donor, private), and what is the projected duration of this funding support?

What innovative ways can be identified to promote cost effectiveness and self-sufficiency?

7. Monitoring and Evaluation: **How Will Mid-Course Correction be Incorporated?**

What programmatic aspects need to be monitored (distribution system, health care provider performance, user acceptance and adoption, health status changes)?

How can adequate information be collected and analyzed at the lowest possible cost?

The oral rehydration program plan should include:

1. **Program Objectives:** What is to be accomplished
2. **Target Audience:** Primary Users and Secondary Influencers
3. **Treatment Strategy:** Home, Clinic, Hospital
4. **Packet Production and Distribution System**
5. **Training Plan**
6. **Health Communication Strategy:** Message and Channel Strategies
7. **Research and Evaluation Strategy**
8. **Detailed Time-Line:** Showing how training, distribution, education and monitoring interrelate
9. **Financial Plan:** Budget with long-range financing program
10. **Personnel/Management Plan:** Who is responsible for each aspect

KEY PERSONNEL

The following individuals have contributed directly to the success of HEALTHCOM:

AGENCY FOR INTERNATIONAL DEVELOPMENT
BUREAU FOR SCIENCE AND TECHNOLOGY

Office of Education

Dr. Anthony Meyer
Dr. Clifford Block

Office of Health

Mr. Robert Clay
Ms. Ann Tinker
Dr. Donald Ferguson

ACADEMY FOR EDUCATIONAL DEVELOPMENT, INC.

Dr. William Smith
Dr. Reynaldo Pareja
Mr. Mark Rasmuson
Ms. Elizabeth Booth
Mr. Hector Valladares
Ms. Miriam Martinez
Mr. Arturo Diaz
Mr. Yahya Sanyang
Mr. Dale Huntington
Mr. Edward Greene

STANFORD UNIVERSITY

Dr. Dennis Foote
Dr. Carl Kendall
Dr. Peter Spain
Dr. Reynaldo Martorell
Dr. Maria del Carmen Miranda
Mr. Musa Saine
Dr. Everett Rogers
Dr. Barbara Searle
Dr. Antonio Pinto
Ms. Leslie Snyder

UNIVERSITY OF PENNSYLVANIA

Dr. Robert Hornik
Ms. Judith McDivitt
Ms. Sikandra Spain

CONSULTANTS

Dr. Michael Levine
Dr. Robert Black
Dr. Norbert Hirschhorn
Dr. Mary Lou Clements
Dr. Michael Rowlands
Dr. Andrew Tomkins
Dr. Paul Touchette
Mr. William Novelli
Dr. Thomas Cook
Ms. Esta de Fossard
Mr. Jose Ignacio Mata

HONDURAS

Dr. Gustavo Corrales
Dr. Francisco Cleaves
Dr. Alberto Guzman
Dr. Elias Aleman
Dr. Rito Padilla
Dr. Gilberto Castillo
Dr. Arturo Zelaya
Ms. Maria Teresa Cerella
Ms. Rosa Bonano
Dr. Wilfredo Alvarado

THE GAMBIA

Mr. Hatib N'jaie
Dr. Fred Oldfield
Dr. Philip Gowers
Mr. Sehou Conate
Mr. Marcel Tomasi
Mr. Sehou Dibba
Ms. Heddy Gabadon
Ms. Ami Joof-Cole
Ms. Yamai Jack
Mr. Ismaila Senghor
Mr. Bemba Tomadu

SWAZILAND

Ms. Gladys Matsabula
Mr. Alfred Mndzebele
Mr. Bogangi Mangongo
Ms. Pitnara Mthembu
Dr. Ruth Tshabalala
Mr. Tars Makama

ECUADOR

Lic. Eliana Franco
Mr. Matias Thorner
Mr. Jose Orquera
Mr. Carlos Rosero
Mr. Eduardo Salazar
Dra. Ligia Salvador
Ms. Nancy Bedon
Mr. Luis Flor

PERU

Mr. Jorge Salmon
Mr. Jose Romero
Mr. Hugo Torres
Mr. Samuel Bermeo
Mr. Robert Ralston
Ms. Betty Philips
Ms. Zoila Cabrera
Ms. Monica Petrosi
Mr. David Serpa
Mr. Alberto Solis
Mr. Javier Zignago
Mr. Bernardo Batiesky
Mr. Pablo Rey de Castro
Lic. Jorge Martinez
Dr. Carlos Bazan
Dr. Pompeyo del Hierro
Lic. Wilma Gallo
Dr. Juan DiNegri

SPECIAL APPRECIATION TO:

USAID MISSION/HONDURAS

Mr. Ronald Witherell
Dr. Barry Smith
Dr. John Massey
Mr. William Smith
Dr. Thomas Park

USAID MISSION/THE GAMBIA

Mr. Anthony Funicello
Mr. Keith Simmons
Mrs. Cynde Robinson
Ms. Meri Ames

USAID MISSION/SWAZILAND

Mr. Charles DeBose
Ms. Linda Lankenau

USAID MISSION/ECUADOR

Mr. Kenneth Farr
Ms. Jean Audrey Wight
Ms. Martita Marx

USAID MISSION/PERU

Mr. Arthur Danart
Ms. Joanne LaRosa
Mr. John Sambrailo

WORLD HEALTH ORGANIZATION/PAN AMERICAN HEALTH ORGANIZATION

Dr. Michael Merson
Dr. James Rust
Dr. Pablo Isaza
Dr. Hugo Villega
Dr. Alvaro Rueda

CENTERS FOR DISEASE CONTROL (CCCD PROJECT)

Mr. John Nelson
Dr. Stanley Foster
Dr. Andrew Agle